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# The United States

# MILLER



Volume 6.—No. 1.

MILWAUKEE, NOVEMBER, 1878.

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Single Copies, 10 Cents.

## AN EXPERIMENT WITH PEARL MILLET.

BY PETER HENDERSON.

Pearl Millet has been cultivated for some years as a forage plant in some of the Southern States, as "African Cane," "Egyptian Millet," "Japan Millet," and in some places as "Horse Millet," but little was known of it at the North before last year, and then only in such small quantities as to hardly allow of a fair trial. From what we saw of it in 1877, we determined to give it a thorough trial this season. A piece of good strong loamy ground was prepared as if for a beet or turnip crop, by manuring with stable-manure at the rate of 10 tons to the acre, plowing 10 inches deep, and thoroughly harrowing. The Millet was then sown in drill 18 inches apart, at the rate of 8 quarts to the acre. We sowed on the 15th of May, about the date that we plant corn; in 12 days the plants were up so that a cultivator could be run between the rows, after which no further culture was necessary, for the growth became so rapid and luxuriant as to crowd down every weed that attempted to get a foothold. The first cutting was made July 1st—45 days after sowing; it was then 7 feet high, covering the whole ground, and the crop, cut 3 inches above the ground, weighed, green, at the rate of 30 tons per acre; this, when dried, gave 6½ tons per acre as hay. After cutting, a second growth started, and was cut August 15th—45 days from time of the first cutting—its height was 9 feet; it weighed this time at the rate of 55 tons to the acre, green, and 8 tons dried. The third crop started as rapidly as the second, but the cool September nights lessened its tropical luxuriance, so that this crop, which was cut on October 1st, only weighed 10 tons green, and 1½ tons dried. The growth was simply enormous, thus: 1st crop in 45 days, gave 30 tons green, or 6½ tons dry; 2d crop in 45 days, gave 55 tons green, or 8 tons dry; 3d crop in 45 days, gave 10 tons green, or 1½ tons dry. The aggregate weight being 95 tons of green fodder in 135 days from date of sowing, and 16 tons when dried to hay. This exceeds the clover meadows of Mid-Lothian, which, when irrigated by the sewerage from the City of Edinburgh, and cut every four weeks, gave an aggregate of 75 tons of green clover per acre. There is little doubt Pearl Millet is equally as nutritious as corn-fodder, which it resembles even more than it does any of the other Millets. We found that all our horses and cattle ate it greedily, whether green or dry. If sowing in drills is not practicable, it may be sown broadcast, using double the quantity of seed—say 16 quarts per acre. The ground should be smoothed by the harrow, and again lightly harrowed after sowing; if rolled after harrowing, all the better. I know of no farm crop that will better repay high manuring, but so great is its luxuriance that it will produce a better crop without manure than any other plant I know of. In those parts of the Southern States where hay cannot be raised, this is a substitute of the easiest culture, and being of tropical origin, it will luxuriate in their long hot summers; even though our Northern seasons may be too short to mature the seeds, our experiments in New Jersey this summer show what abundant crops may be expected if the similar conditions are secured. Pearl Millet as a fodder-plant presents a new feature in our agriculture, and I feel sure that within ten years we shall wonder how we ever got on without it.—*American Agriculturalist.*

## LESSONS FROM THE FEVER.

There is a strong corroboration of the impression, which seems nearly universal in the South, that the rapidly approaching cold weather is already bringing with it healing, and the telegraphic reports are already beginning to impute the blame of the severity of the epidemic to the proper causes. In New Or-

leans alone, during the ninety-seven days of the prevalence of the scourge, there have been 12,426 cases, 3,775 of which have been fatal, and New Orleans has been the gateway through which the malady has spread over the immediate neighborhood, and attacked the cities and towns higher up the river. The truth of what is now said by many has long been apparent to all who cared to trace results to their causes; but while the ravages were so horrible, with no speedy prospect of their abatement, there were but few whose hearts were stern enough to permit a more than passing allusion to the underlying facts. Now, however, that the winds are colder and frost is settling down upon the land to kill the germs of the disease, it is not to soon to speak out. If all with common consent should wait until the fever had snatched its last victim and health were re-established all over the South, half the force of the opportunity would be lost, for it is natural to tens of thousands to forget nothing so quickly as the incidents of a period of calamity, and to neglect nothing so readily as the proper means for preventing its recurrence. But these last the people of the South must think of if they are brought directly to their notice before the pestilence has ceased.

It is, therefore, proper to tell the authorities and people of New Orleans that in the past they have disregarded the proper performance of a plain and obvious duty. Yellow fever always prevails more or less virulently every summer at Havana, and New Orleans is the port through which by far the greater portion of our business is transacted with Cuba. Havana is a badly-drained and mismanaged municipality, with whose improvement, in the absence of another treaty with Spain, we can have but little, if anything, to do, beyond offering friendly advice.

But for the condition of New Orleans American citizens are immediately responsible, and its drainage and the evil condition of some of its districts seem to have been allowed to remain in nearly as pestiferous a state as those of Havana itself. Of late years this has been going on from bad to worse, and the accumulations of the miasmatic dirt of a long-continued term have, as a matter of course, created a vast supply of material adding virulence to the poison, contaminating the air, and weakening the constitutions of the inhabitants by its foul effluvia. The telegraphic reports published yesterday brought strongly confirmatory evidence of these facts, at which physicians, during the last two or three months, after it was too late, have been hinting delicately. It is plain that refuse, including no doubt all sorts of garbage, has been allowed to rot and grow fetid in the resident sections of the town, and the necessary result has been abundantly manifest. The cleansing process has just begun after the useless sacrifice of many valuable lives; but for the future the people of the smitten cities, and all those which are even remotely liable to the epidemic should take to heart and practice the wise maxim, that prevention is better than cure.

It may be some time yet before the report of the Commission of Medical Experts is given to the world, but nothing can be said capable of refuting the dicta of plain common sense, or persuading any one who takes the trouble to think that plenty of good water and pure air, which are the great fruits of urban cleanliness and good government, will not in time, if not wholly eradicate, at any rate almost incalculably mitigate the severity of the affliction.

It is by these very means that Galveston has been protected and cholera so effectually guarded against in the best administered communities of both the new and the old world that, were it not for the irrefragable documentary evidence of the past, few would be able to realize the horrible destruction it once wrought, not merely in its native home on

the banks of the Ganges, but also in civilized Europe and America. Small-pox, also, is another instance of the control of a disease by effective legislation wherever it has been vigorously carried out. Typhus fever is another. By a system of proper drainage it has been entirely driven out from many of the haunts it once made its own. All the experience of the past, and all analogy, prove that similar beneficial results will flow from a wise, strenuous and persistent adherence to the laws of hygiene in the case of yellow fever also. All the Southern cities, and New Orleans especially from its position, owe it as the most sacred duty to themselves and the country at large, to insist upon such proper precautions for the future as the experience of the past may have suggested or the forthcoming report may advise. Among these it may possibly be found that a more rigid system of inspecting vessels arriving from Cuba during the unhealthy season may be recommended; but the first duty of the citizens lies at their very door, and as soon as possible after the frost has really set in the cleansing process and the necessary improvements, both above the ground and under its surface, should be pushed on so rapidly that the spring may see their entire completion.—*St. Louis Globe Dem.*

## THE ARKANSAS VALLEY.

The Soil and Climate Attractive to Settlers—Some Facts About the Population, Crops and Markets—The Lands of the Government and Railroads.

[Correspondence of the Milwaukee Sentinel.]

MILWAUKEE, Oct. 28.—I have recently made a trip to the much talked of State of Kansas, and since my return many inquiries have been addressed to me in regard to that section of the country, but I find it impossible to answer each individual query, and can only do so through that reliable medium of general intelligence—*The Sentinel*. So I should like you to publish, for the benefit of such as are interested in the subject, the following statement of facts, as I have found them:

I had, on previous trips, carefully examined the north half and the eastern portion of the State of Kansas, but on this trip I confined my observations to that portion lying along the line of the Santa Fe Railway, from Topeka, westward to Kinsley, a distance of 300 miles—the last 150 miles being in the great valley of the Arkansas River.

This river is a rapid stream about twice as broad as the Milwaukee River, and is crossed by substantial bridges at all the principal towns on its banks. The valley varies in width from thirty to fifty miles, and more than nine-tenths of it can be ploughed and cultivated. The surface of the country is rolling prairie. The soil is a black, sandy loam, apparently very rich, as will be seen further on, and varying from three to ten feet in depth. It holds moisture remarkably well. At the time of my visit, there had been no rain in Edwards county for four weeks, but on turning up the soil with a spade to the depth of six inches in a dozen different localities, on cultivated lands, I invariably found the ground at that depth moist and in fine condition. There seems to be just enough sand in the soil to render it porous, easily worked, retentive of moisture and quick to yield returns. There is none of that sticky character in the soil, when wet, which is so prominent a feature in the prairie lands of Wisconsin and Illinois, and as a consequence they have the finest natural roads in the world—hard, free from sand, dust and mud at all seasons of the year.

*The Climate.*—The climate is subject to extremes of heat and cold, the same as in Wisconsin, but the extremes are not so great. The warm weather of summer continues longer there than here, but the hottest days are always followed by cool nights which permit sleep, and render the hot days endurable.

The extremes are about 102 degrees in the shade on the hottest days, and 3 degrees below zero on the coldest in Edwards county. The average temperature of summer being about 7 degrees, and of winter about 25 degrees warmer than at Milwaukee. The climate is said to be favorable for persons with weak lungs and those troubled with asthma and catarrh. The air is very pure and apparently free from malaria. Good soft water, in abundance, can be found at a depth varying from twelve to thirty-eight feet. Taxes are about 1 per cent on the actual value of property. The prices for all store goods are about as at Milwaukee. Agricultural implements and lumber about one-fourth higher. Farm produce sells for about one-fourth less than at Milwaukee.

*The Population.*—The people are largely American; Illinois and Wisconsin furnishing the largest number. The foreigners are principally German. The census of 1860 placed the population of the State at 107,000. In 1870, there were 364,000; in 1875, 528,000. There are now 800,000. This rapidity in growth is simply wonderful, and nothing but the fine soil, climate and natural advantages of the State could induce such an influx of people.

*The Crops.*—In 1874 Kansas, like Nebraska, Dakota, Iowa, and part of Wisconsin, was devastated by the locusts, but many of the fields were resown that year and yielded well, and the immense crops of wheat and other grains that have been grown in the valley each year since, have restored entire confidence to the grangers. The average yields of wheat for the whole State the present year is placed at twenty-six bushels per acre, the average in the valley being about thirty bushels per acre. The rich, porous soil, retentive of moisture, the even distribution of rainfall during the growing months, the warm days and cool nights of the Arkansas valley, alone can account for so large a yield.

*Government and Railroad Lands.*—Cattle, sheep and hogs are grown in large numbers. There is about 200,000 acres of vacant Government land in Rice, Barton, Pratt, Edwards and Hodgeman counties, subject to homestead and pre-emption entry, or to be taken up under the timber culture laws, the latter requiring the cultivation of ten acres of forest trees. Large quantities of railroad lands are yet unsold, ranging in price from \$2 to \$10 per acre. The cheapest—and in the opinion of many, the best—are the lands lying south of the Arkansas river.

There is no timber in the valley. Coal of good quality at \$5 per ton is used for fuel. Building stone is abundant in some localities. Brick can be had at \$8 per thousand.

The railroad companies, those corporations without souls to be damned, will carry a car load of household goods for \$100, or a car load of lumber for \$140 from Milwaukee to Kinsley. Kinsley is the county seat of Edwards county, contains about 1,000 inhabitants, and has grown up in about two years. It has a large number of business houses, one of which as I was credibly informed, did a business last year of \$250,000 in general merchandise, agricultural implements and lumber. It has a good school building as Milwaukee possessed when she had a population of 100,000.

If any desire more explicit information, and will take the trouble to call on me personally, I shall be glad to see them. I have no lands for sale, and am interested only in the small tract which I have located and on which I expect to work and wait with an ever present hope—that health broken by sedentary habits and over work in doors, may return to make life endurable.

GALEN B. SEAMAN.

Edw. P. Allis & Co have closed a contract with the Reliance Mills, of Milwaukee, for a 28x48 improved Corliss cylinder and regulator, on a guarantee of 33½ per cent. saving over an Eastern-made engine.

## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, NOVEMBER, 1878.

We send out monthly a large number of sample copies of **THE UNITED STATES MILLER** to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us **One Dollar** in money or stamps, and we will send **THE MILLER** to you for one year.

CAWKER'S Saw and Planing Mill Directory of the United States and Canada is now ready for delivery. All dealers in machinery used in this class of establishment should order at once. Only 125 copies have been printed. The book is printed in clear, plain type, on heavy paper, and bound substantially in cloth. It contains between 11,000 and 12,000 names. Price, Five Dollars per copy. Remit by registered letter, post office order, or draft on New York.

CAWKER'S Millers' Address Book, containing the names and postoffice addresses of the flour mill owners of the United States and Canada, should be in the hands of every dealer in supplies or machinery used in a flour mill. Since its publication a large number of names and post office addresses of mill owners have been added in the shape of supplementary sheets. We have already supplied many of the leading mill furnishing houses in the United States and some in Europe. The book will be sent together with supplementary sheets to any address in the United States, Canada or Europe, post paid on receipt of five dollars.

**THE MILLER'S TEXT BOOK.**—We have just been appointed the agent for this country for the sale of the above mentioned work which should be in the hands of every apprentice, journeyman, head miller and mill owner in this country. Its author, Mr. J. M'Lean, of Glasgow, Scotland, has been a miller for over 30 years and has traveled extensively through Europe, America and Australia, and has thoroughly studied the subject of milling. **THE MILLER'S TEXT BOOK** is a standard work amongst millers in Great Britain and will be in this country now that it is brought before the milling public, and is so easily and cheaply obtained. A copy will be mailed to any address in the United States or Canada post-paid on receipt of sixty cents in cash or stamps. Address the UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

HOPPIN in his last *Northwestern Miller* gives the public an article entitled "What Women Most Need." Well! he is a husband and a father, and, we suppose, ought to know.

We would call the attention of our readers to the late list of purchasers of the celebrated **BECKER BUSH**, published on our first page. No flour mill should be without it.

**A PITHY TELEGRAM.**—A few days ago the following telegram was published in our dailies:

**KILBOURN CITY.** Oct. 15.—C. C. Remington of Baraboo had a surgical operation performed on him for stone in the bladder. Funeral to-morrow.

**MESSRS. JOHN T. NOYE & SON**, the well-known mill furnishers of Buffalo, N. Y., have ordered the belt tightener manufactured by Geo. Walker, of Hamburg, Erie Co., N. Y. It is the best in the market.

There are some eight or ten milling papers (so called) in these United States, all of which with charming unanimity style themselves "official organ of the Millers' National Association." And they each believe the legend, too, notwithstanding the National Association denies that it has such a thing as an organ.—*St. Louis Commercial Gazette.*

Ya-as. So we've heard.

**THE NEW MILLERS' NATIONAL MAGAZINE** of Chicago, has made its appearance. It is very handsomely printed,—in fact, nice enough for a lady's parlor. It is published quarterly, and will no doubt meet with liberal patronage. The subscription price is fifty cents per annum in advance—or seventy-five cents, if paid for at the end of the year. Send for it at once.

We produce 50 bushels of grain per head, estimating our population at 40,000,000, while Europe with a population of not quite 300,000,000, produces only 16 bushels per head.

It being estimated that the average consumption of grain per head is 15 bushels, we produce three times as much as we require, Russia not twice it wants, and Great Britain not much over one-fourth her requirement.

Oct. 30, the Chicago elevators contained 2,899,793 bushels of wheat; 905,566 bushels of corn; 331,281 bushels of oats; 109,884 bushels of rye, and 1,257,337 bushels of barley, making a grand total of 5,613,861 bushels, 5,736,599 bushels a week ago, and 1,831,619 bushels at this period last year.

Wichita, Kan., is in need of another railroad. The Secretary of the Board of Trade of that town, has written to the Secretary of the St. Louis Board of Trade, complaining of a wheat embargo, caused by an inability to get sufficient railroad transportation. The Secretary states that over six hundred wagons, loaded with grain, have been turned away because there was no storage capacity to be had. Railroad facilities are deficient, and another road or more cars are wanted.

The following is given as about the average: The number of seeds of wheat in a pound is 10,000. The number of seeds in one pound of oats is 30,000. The number of seeds in one pound of buckwheat is 25,000. The number of seeds in one pound of red clover is 249,000. The number of seeds in one pound of white clover is 688,400. A bushel of clover seed, sixty pounds, will contain 20,976,000 seeds, which, equally distributed over an acre, will give about three seeds to the square inch of ground.

**THE COCHRANE SUIT.**

A telegram has been received by a gentleman in this city, interesting to those engaged in the milling business, in reference to the suit of Cochrane et al. vs. Vail, Shotwell & Co., of New York City, on the application of the plaintiff for an injunction. The matter has been before Judge Blatchford for some time, and the last news from the case is summed up in the following dispatch:

"Judge Blatchford drove the enemy from Court, and denounced them for seeking to make of him a Moot Court."—Dispatch dated Oct. 28th, 1878.

It has been stipulated between the parties in the St. Louis cases to try them in November or December.

Jno. A. Hafner, of Pittsburg, Pa., manufacturer of the celebrated Eureka Coil Spring and Automatic Release Friction Clutch, in a recent letter says: "I have constructed machinery at an expense of about \$1200, for the special purpose of weighing the power lost or utilized by different modes of driving. The dynamometer shows that when driven by gear and spring, the engine gives 5340 units of power; but when driven by belt, from periphery of flywheel, gives only 3040 units of power, which is 2300 units of power, or 43 per cent. less, that is destroyed by cramping the motion of the flywheel (for when driving from periphery of flywheel the driven machinery has the leverage over it, and, when thus connected, can no more absorb and transmit the full force of a stroke to the centers than a man can deliver an effective blow when his sledge is impeded in its course), friction and slippage. When driven by gear and spring, the flywheel has a free and elastic movement, thus transmitting the surplus power from point of greatest efficiency to the dead points, or centre line of stroke, and the friction is reduced to a minimum.

**A DRILL WHICH BORES SQUARE HOLES.**—One of the novelties of the Paris exposition is a drill which bores square holes, the invention of Mr. Julius Hall, of London. The work is done too, says a correspondent of the *Scientific News*, in a way so simple and so easy that any one may prove the fact for himself. The invention has excited genuine astonishment among the mechanics gathered at the exposition. There is a constant crowd surrounding the inventor, watching him bore hole after hole square, and puzzling over the provokingly simple solution of the problem. All that is required is an ordinary hand drill stock. A stationary one with a chuck below for holding the work is used by the inventor; but he says a common brace will answer—"anything, in fact, will do that will properly hold the drill." The tool itself is the usual form of three-square drill—so that no special apparatus is required. Clamp or chuck this drill in its hold so that "it will wobble," that is the whole secret. Instead of making a round hole, as it will if tightly grasped, when loosely held it produces a square one; and, according to the inventor, it is immaterial whether the drill wobbles in the work or the work under the drill.

Packard & Co., of Covert, Mich., are converting one of their saw mills into a grist and planing mill.

## Correspondence.

FROM PHILADELPHIA.

[Philadelphia letter from our own correspondent.]

PHILADELPHIA, Pa., Oct. 21st, 1878.—The fall has been marked by a very decided improvement in the industrial interests of Philadelphia and Pennsylvania. The awakening has not been confined to any one particular interest, but every industry has started up with new life and vigor, and the present situation—which is even better than that previous to the panic of 1873—does not seem to be spasmodic, but has, apparently, come to stay.

The iron, lumber, cotton and woolen manufacturing industries are especially in a very bright condition, and the prevailing prosperity bids fair to become still more encouraging as the season advances. The iron masters in the great Lehigh, Schuylkill, Susquehanna and Lackawanna regions are jubilant over the brisking up of their business, which has been in a rather demoralized and unprofitable state for several years past. The factories are well supplied with orders, have others in prospect, and have secured fair rates for the material ordered. Thousands of unemployed iron-workers have been put to work, and where, a few months since, destitution and misery existed, there is now plenty, comfort and happiness in the homes of the deserving workmen, who had been thrown out of employment by the unfortunate reverses in the business of their employers.

At this season of the year, in good times, there is always more or less activity in the cotton and woolen manufacturing establishments, but this year the situation is even more excellent and encouraging than at any other period in the history of the textile interest. The great works in the Kensington, Frankford, Germantown, Manayunk, Falls of Schuylkill and Bridesburg manufacturing districts are nearly all running on full time and forces, and the daily production of the various lines of fabrics designed for ornamentation and general use is quite large. From the assurance of their agents, the manufacturers have reasons to believe that the demand for their goods will be unusually heavy this fall and winter, and accordingly extra efforts are being made to meet the anticipated influx of business.

The flour manufacturing interest, which extends from Philadelphia to almost every section of the State, is also enjoying a portion of the good times, and the "dusty millers" and their assistants are industriously engaged in handling "the staff of life" to an extremely large extent. The several thousand flour mills scattered throughout the Keystone State have been grinding away at the hardest rate imaginable ever since the opening of fall. A flying trip of the correspondent of the UNITED STATES MILLER through the flour milling districts in the interior of Pennsylvania has illustrated the fact that all the millers are doing a fair business. Of course many of the worthy millers complain of the hardness of the times, but they all agree that there is a decided change for the better, and, if the prevailing easy situation continues for a little while, all apprehensions for the future will be dispelled. The Philadelphia flour men are all doing well. The principal flour milling establishments, those of Detweiler & Welsh, Col. Wm. B. Thomas & Co., Hartranft & Co., and Bennett & Co., are operating to their fullest extent, and are putting on the market large consignments of flour. Hartranft & Co. and Bennett & Co. are two of the oldest and best-known concerns in the State, and have won the widest celebrity for their manufactures. The weekly production of all these mills is much in excess of that for the same period last year, and it is anticipated that there will be a still further increase in the product in the early future, as parties are about contracting for large quantities of flour for the South American trade, and the Philadelphia flour men expect to get a portion of the orders.

The shipment of American milled flour from the port of Philadelphia has already reached considerable proportions, and, from the present indications, it looks very much as if Philadelphia is to outstrip all other cities in the East in the race for the Brazilian flour trade. The shipment of flour from this port to Brazil is now averaging from 700 to 1,700 barrels weekly. The schooner Mary E. Douglas loaded, on the 15th October, with 3,000 barrels. This is the largest shipment that has yet been made by any one firm, but it is possible that just as soon as competition augments, larger shipments will be undertaken by the millers and shippers. The principal points to which the consignments are made are Para, Rio de Janeiro and Maraboa. From these places samples are sent to the interior of the country, and orders are filled from the consignments. The flour that has so far been sent away is of the highest grade, and will stand the inspection that it is expected to undergo upon its arrival at the point of shipment. It is said that the agents of English millers, who are stationed in Brazil, have, through fear of the American flour gaining standing in the market, run down its merits, and, to explode their idea, the very best article that could be produced has been forwarded.

W. A. E.

## FROM JERSEYVILLE, ILLINOIS.

For the handling of wheat and grain Jerseyville has superior facilities. She has two large elevators and three flouring mills. The Jerseyville Elevator and Milling Company have the largest establishment in this section of country. Their building has

a capacity of 40,000 bushels. They ship from 100 to 125 cars per month. So well equipped are they that they can load a car with wheat in three minutes. This company make large shipments to mills throughout the State, selling to them on the track at this point. This company also own and control the First National Bank, which is one of the strongest and most popular banks in this part of the country.

E. Cockrell runs a large elevator and lumber yard and does a large and profitable business. His elevator was built in 1867, and has from the start been a paying concern. Mr. C. ships from six to ten cars of grain daily. Mr. C. also owns and runs an elevator of 12,000 capacity at Medora, Ill.

The City Mills, owned by Chas. Jacobs, are among the largest flouring mills in the county. This mill turns out seventy-five barrels of flour daily, of the finest quality. Mr. Jacobs is known all over the county as the "boss miller," and his work does not belie the reputation.

The Empire Mills are the oldest in the city and were established in 1853. The mills are owned by H. O. Goodrich, who is one of the fathers of Jerseyville. Their capacity is 100 barrels per day, and the flour made here is only of the best quality, and the popularity which it has is a sufficient testimony to its merits. Mr. G. is a popular citizen and was for five years Mayor of the city, and has been for years a member of the City Council.

The National Mill closes the list of Jerseyville's milling interests. The proprietor, Mr. Theo. Dodson, is a young man full of life and vim, and the people appreciate his efforts in their behalf by giving him their patronage. The mill turns out fifty barrels of flour daily, and a more popular brand is not found than the National Mills. The mill has all the new improvements for manufacturing only the best grades of flour, and Mr. Dodson shows himself to be one that is able to make a complete success of his work.—*St. Louis Post.*

## IMPORTANT TO MACHINERY DEALERS.

CAWKER'S SAW AND PLANING MILL DIRECTORY OF THE UNITED STATES AND CANADA, contains the names and post office addresses of the owners of Saw and Planing Mills in every State and Territory and Canada. The names of the post-offices are arranged alphabetically by States, and the Saw Mill Owners are separate from the Planing Mill Owners. Corrections made up to July 1, 1878. We believe the work to be as complete and correct as it is possible to get it. It is invaluable to dealers who wish to quickly place before the trade their catalogues, circulars, price lists, etc. The price of the work is Five Dollars, on receipt of which, with order, the work will be forwarded by mail, post-paid. Address all orders to E. HARRISON CAWKER, editor of the *United States Miller*, 62 Grand Opera House, Milwaukee, Wis.

## THE BEER SITUATION—THEN AND NOW.

O dot bully lager beer of eighteen fifty-nine,  
It tasted awful good, and made you feel so fine;  
You miled fill yourself chuck full, empty out and fill again,

Und got up in der morning mid out one bit von pain.  
But now dot lager beer, although it looks quite nice,  
Ish made von corn und barley, und dot confounded rice  
Und of you don't look out, und a bid too much you take,  
You vill vake up in der morning mit a mity pig headache.

Some months ago the Lord Bishop of — came to this country on a visit to the Rev. Dr. —, of the Episcopal Church of New York. The Doctor instructed a colored boy in his service to knock at the bedroom door of the Lord Bishop early in the morning and say, "My Lord, the boy." Accordingly, the next morning, the boy, somewhat dazed by so much grandeur, knocked at the Bishop's door, who called out, "Who is there?" The boy responded, "The Lord, my boy."

## Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

**NOTICE.**—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

**IMPORTANT NOTICE TO MILLERS.**—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

**THE MILLER'S TEXT BOOK.**—By James M'Lean, of Glasgow, Scotland.—A descriptive and explanatory account of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation, including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel, vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

## A NEW FUEL.

## Use of Petroleum in Producing Steam—The Results of the Discovery Upon the Manufacture of Iron.

[New York Correspondence.]

Mr. S. C. Salisbury, a mechanic, has been at work for twenty years on a plan to utilize petroleum for fuel in producing steam. He has hit it, and is in a fair way to make a fortune. It was tested in the Brooklyn Navy-yard on Saturday, and was found to work to the utmost satisfaction of the officers who inspected it. The furnaces were in full blast, but no smoke was visible. Great volumes of white steam rolled away from the pipe, but no coal was thrown upon the fire below. It had the look of an effect without a cause.

"The most wonderful sight I have ever seen," the veteran engineer Isherwood said. "It revolutionizes the iron and steel manufacture of the world over," one of the largest iron men of the country exclaimed. "It opens a new era in glass manufacture. We shall soon have glass roofs on our houses and French plate will be as cheap as common window glass," said a large glassmaker.

The results were so extraordinary in the perfect combustion attained, in the intensity of heat quickly produced, in the enormous pressure of the super-heated steam, in the astonishing evaporation of water, in the freedom from dust, cinders, sulphur and all impurities, that these experts at once realized that a revolution in all departments where steam is used must occur immediately.

The fuel is made of the residue of petroleum and coal-tar, which is mixed to about the consistency of molasses. It is conducted from the barrel to the furnace by means of a small gas-pipe. At the end of this pipe as it enters into the door of the furnace is a funnel-shaped apparatus. As the fuel enters this funnel it comes in contact with a current of highly super-heated steam, which atomizes the liquid as that it leaves the machine. It induces the required amount of oxygen to enter and mix at the point of ignition. Thus the atomized fuel shoots, in a fierce but delicate spray, into the blazing furnace. The brick arches of the great furnaces are kept at a white heat, and a pure white flame flashes along the whole length, registering a heat of 5,000 degrees, melting pig-iron in ten minutes, and making liquid glass in two hours, instead of sixteen. All that there is to maintain this extraordinary heat is the light spray darting from the little furnace, which comes just within the door. "I can send this intense white flame from the Battery to Grace Church if I have a furnace arch that long," said the inventor.

The amazing scope of this new discovery may be estimated from its effects upon the oil trade alone. Mr. Salisbury says he is about to make a proposition to the producers and the United Pipe Lines for a permanent contract to take from them, at Pittsburgh, all of their surplus and all their distillate tar naphthas, at a price that will give the producers fully 50 per cent profit and also pay the pipe lines for piping it to Pittsburgh. The ocean steamship business will also feel the effect of this revolution in steam-producing fuel. Experiments already made show that in a single trip across the Atlantic a saving of about \$5,000 will be effected in freight-room alone, as the space now taken up for 800 tons of coal will be used for freight.

But the greatest achievements of the new system will be in iron-making. Said the leading representatives of this interest: "This is the grandest achievement of science in this age, and this inventor's income, even on very small royalties, will be greater than any living capitalist. With the mechanism, invented by Mr. Salisbury, a blast furnace of thirty tons per day will convert its liquid iron into blooms or ingots of wrought iron or steel at a cost so trifling that it enhances the value of pig metal 100 per cent."

## A FORTUNATE CITY.

A city which has fuel and light without cost ought to make rapid progress in industrial enterprises. Such a city is East Liverpool, Ohio, of which the correspondent of the *Cleveland Leader* says:

The natural gas wells are situated in and around the city, and give it a continual supply of the finest light. The gas is almost as free as the air. It costs practically nothing and forms the illuminator and heater of the town. The city is lighted by it, and the street lamps blaze away at noonday as well as at midnight. It costs nothing to let them burn and it takes trouble to put them out. Its light is not the flickering mockery of poorly manufactured gas, but a flame which proximates in its brilliancy to that of the electric light. Almost the entire fuel used in the town is this gas. It is conducted into the grates and stoves in pipes, and by it all the cooking and heating is done. It is also used in furnishing steam power for many of the largest pottery and iron stone china manufacturing establishments, twenty-two of which are in operation and busily engaged, employing over 2000 hands, and which it is considered justly entitled East Liverpool to be designated as the "ceramic city" of America. Regarding the duration of the supply from these wells it is stated that the first well discovered now burns as brightly as when it was first opened, and for the last twenty years has never flagged in its brilliancy, and none of those now in operation have ever shown any signs of giving out. For years Liverpool used manufactured

gas, never dreaming of the rich supply that was wasting away daily under its feet. The poor quality of the manufactured product induced the opening of the first well in 1859. This well, which is 450 feet deep, has been furnishing fuel and light to several houses, producing the steam for a large engine, and burning pottery kilns for over twenty years.

Three young men arrested in New York for drunkenness and disorderly conduct explained that they were "members—hic—of Mr. Talmage's—hic—church, and we've just been round to the—hic—low chabert sh'loons to see ef our below—hic—ed pastor tells 'er truth." "Ten dollars and costs," replied the hard hearted Magistrate.

A select party was highly entertained one evening by the precocious 4-year-old of the host. The youngster attracted universal attention by the singular movements of his elbow. His aunt resolved to ascertain what the little chap was up to, and in answer he said: "I see cooking my elbow." "What are you crooking it for, Johnny?" "I want to det a nice little strawberry on my nose." "Why, Johnny, that won't make a strawberry." "Yes it will, aunty, 'cause nurse says papa wouldn't have a strawberry on his nose if he didn't cook his elbow so much, and I dess nurse knows."

M. Buchner, a French scientist, has discovered that a single drop of alcoholic extract of Campeachy wood, placed upon pure flour or bread, will cause a brownish yellow stain. If the flour contains alum, in the proportion of one or two per cent, the color will turn to a grayish blue or violet gray. With one-half per cent of alum the tint is reddish yellow, with a border of gray blue, and small blue spots can be discovered by examining it with a lens. One-fourth per cent of alum is the limit of reaction, when the blue border disappears, although the small spots are faintly discernible.

"THE CHINESE MUST GO."—There is a copper-colored, almond eyed son of Tartary in Gold Hill who must obey Kearney's injunction. About six months ago he bought 500 shares of Bodie stock at 40 cents a share, and when it reached \$53 he sold out, putting the entire capital in Sierra Nevada at \$9 a share. When this favorite was booming the other day he sold his stock on the street for \$190 a share. The coin thus obtained was immediately converted into United States bonds, and the Mongolian is now so rich that he has quit sawing wood and will not accept any kind of a situation less dignified than that of dishwasher in a first-class restaurant. Verily the agitator is right. "The Chinese must go."—*Gold Hill (Nev.) News.*

IMPROVE THE SEED WHEAT.—We may very well take the trouble to improve the varieties of wheat we have, and which we know to be good, so as to enlarge the yield and better the quality. The best attainable yield is somewhere about sixty bushels per acre, the best weight per bushel about sixty-six pounds. The best crops now grown in this country yield about forty bushels, and the best weight is not more than sixty to sixty-two pounds per bushel. Where such crops as these are grown it would not be difficult to reach a maximum product if we could add somewhat to the prolificness of the seed and increase its size and weight. But what shall be said as to those ordinary crops which reach but ten bushels per acre, and which have year by year grown less and less by neglecting to improve the seed. Here there is abundant room for the most certain improvement. There can be no doubt that better preparations of the soil and the use of good seed would result in immediate improvement. Then by selecting the best ears from each crop and sowing these upon soil still better prepared, the yield could gradually be brought up to a high, if not the highest point. Sixty bushels per acre, if not more, have been produced by one farmer, who has been patiently engaged for years in improving his grains by selecting the best each year and using the best methods of cultivation.

The *Manufacturer and Builder* calls the attention of manufacturers who cast heavy pieces of glass, and also of millers, to a recent German discovery, that the finest flour is produced by those millstones which have the most glassy texture and composition, and the consequent discovery that pieces of glass combined in the same way as the French burr, and similarly grooved on their surfaces, will grind better than the burr millstones. The consequence of this discovery has been the invention of the glass millstones now made by Messrs. Thom, and used in Germany and Borkendorf with great satisfaction, as it is found that they grind more easily and do not heat the flour as much as is the case with the French burr stone. In grinding grist they run perfectly cold. In order to make such stones, blocks of glass of from six to twelve inches wide are cast in a shape similar to the French burrs, but more regular and uniform. They are connected with cement in the same way, and dressed and furrow cut with picks and pointed hammers; but it is believed that diamond-dressing machines might be profitably applied. It is said that these millstones, made of lumps of hard glass, do not wear away faster than the burr stones. Stones of four and a half feet in diameter, driven by six-horse power, ground two hundred and twenty pounds of flour an hour, and did it remaining cold. The grist is drier, looser, and the hull more thoroughly separated from the kernel than is the case with other stones.

## REVIEW OF THE MARKETS.

OFFICE OF J. H. DRAKE &amp; Co., 119 LaSalle St., CHICAGO, Oct. 30, 1878.

WHEAT—With an improved feeling in financial circles and stronger cables, the course of our market was upward during the early portion of the week, but since Wednesday we have had a dull and sagging market, notwithstanding the effort made by several strong parties to sustain it. Receipts have fallen off somewhat, but are still in excess of the demand, and our stock of the speculative grade has steadily accumulated until we have now fully 2,000,000 bushels in store for which there seems to be no demand, except from speculators who are buying to carry against November sales. The premium has been such as to make it a good investment, and the cash wheat has not been pressed upon the market. It is being largely cared for by provision men whose legitimate business is almost at a stand still just now, but who will find other use for their capital next month when the winter packing season begins in earnest. Of our daily receipts a smaller proportion has graded No. 3, and by reason of a lighter supply, the price has appreciated slightly, but there is still a difference of 11 cents per bushel between No. 2 and No. 3, which is too great and must be diminished, we think, by a shrinkage in the price of No. 2, before the latter will be taken freely for shipment. Present prices are certainly low and not very remunerative to the average farmer, but with speculation crippled in England, as it must be by the recent financial troubles, she is likely to buy only to supply present wants, and with a stock of nearly 17,500,000 bushels in sight in this country, and the season for cheap inland transportation nearly over, the outlook is not encouraging to holders here, and it appears to us that values must give way until a point is reached where capitalists will buy for investment, or farmers will stop selling.

Receipts at the Western primary markets for the week have been 2,069,000 bushels as compared with last week 2,545,000 bushels. Receipts at New York, Baltimore and Philadelphia, for the same time, were 2,566,000 bushels, while the exports from these ports foot up 1,140,000 bushels, showing a decrease which should tend to stiffen the English markets. Cash wheat @ 79 3/4 c. with intermediate charges 16c., would cost 95 3/4 c. alongside ship. With sail freights 5s 9d and 2 per cent commission on the currency value, would cost 38s. 9d. Cork for orders. Beerbohm's quotation, spring for prompt shipment 36s. @ 36s. 6d. or 7 to 8c. per bushel to the disfavor of shipments.

CORN has ruled very dull, and slightly in buyers' favor, since our last; receipts have been moderate and the shipping demand very light. A season of bad weather would doubtless delay receipts and give us temporarily higher prices, but aside from this we can see little to advance us. Most of our stock in store is held by one shipper who seems to be moving it only as storage expires and when freights are weak. There seems to be a general lacking of faith in the future as is shown by the discount on December and January. The former sold yesterday at 33c., and the latter at 32c.

PROVISIONS have ruled dull during the past week and at the close are several points lower than last Saturday's prices, caused by the daily very heavy receipts of hogs at all of the primary markets, as well as by Cincinnati's annual autumnal unloading of stock which they have persistently carried since last winter, through all of the ups and downs in the market, and are now forcing the property in order to make room for the winter work.

We had reason to expect the demand from the destitute fever district, upon the opening of trade, would be such as would lift prices and start speculation which has been so long dormant, but the "Grangers" seem determined to market their hogs regardless of cost, and until the weather is uniformly cold so as to start all of the pork houses in the Northwest, the same apathy we have so long experienced will continue; but with continuous freezing weather, we fancy, with the very low prices of hogs, country packers and those at the primary points will get up such a spirit of rivalry for them that in a very short time there will be a marked improvement in the price of hogs and a buoyant market for consumption and speculation. This time last year, foreign buyers had made contracts for November and December deliveries for from 40,000 to 50,000 boxes. This year the estimates for the same months are less than 50,000 boxes. From this we assume that they will only be the larger buyers for cash at our very low prices, evidence of which we now have, for the bulk of the past week's shipments are to the seaboard. We quote: D. S. cribs, loose, \$4.70 f. o. b.; shoulders, \$3.50; boxed, 30c. additional. Pork strips washed bright, packed in new salt, \$4.15.

B. H. Skoyles has sold a half interest in the Lee Mills to Mr. Lovell of the Cortland Mills, and he has leased the remaining half interest for three years. He will hereafter run both the Cortland and Lee mills. He is thoroughly refitting the mills and getting ready to do a first class merchant business. He has employed an English miller, now on his way to this country, to take charge. He has added a new run of stone, new purifier, bolting cloths, reels, etc.

A. F. Huntly, of Clear Lake, Minn., is putting a new run of burrs and new bolting cloth into his grist mill at Lexington, which he intends to make as good as any mill of its class in Minnesota.

## Items of Interest.

It is computed that Minnesota is capable of producing 700,000,000 bushels of wheat annually, and that the water power of Minneapolis alone can manufacture half of it into flour.

The first oil well was bored in 1859. There are now 10,000, and the amount of capital invested is \$100,000,000. Petroleum stands number four on our export list; cotton, flour and provisions only taking precedence in value.

The Samoan Islands are the great cocoon producing islands of the world. The inhabited ones are nine in number, and they have a population of about 35,000. One German firm, dealing in the staples of those islands, does a business of \$5,000,000 a year. Pagopago is the harbor lately purchased by the United States.

The Commissioner of Agriculture has ordered from Japan a large number of bambo shoots, which he intends to plant in this country, feeling convinced that their culture here could be made a success. He also expects a number of silk-worm eggs to arrive within a few weeks from Japan, and experiments will be made by the Department in the breeding of silk-worms.

A good paste, convenient for many purposes, is made as follows: Dissolve a piece of alum the size of a walnut in a pint of boiling water; to this add a couple of table-spoonfuls of flour made smooth in a little cold water, and a few drops of oil of cloves, and let the whole come to a boil. This paste put in a glass canning jar, or a well-cleaned blacking bottle, will keep for months.

SOWING SELECTED WHEAT.—W. J. F. tells the *Country Gentleman* that some of our best farmers intend to sow only four or five pecks of wheat per acre. Their idea is to grade the wheat, selecting all the large grains. This, they think, will give as good a seeding as two bushels sown in the usual way. Using some concentrated manure where the young plants can get it, will cause them to "stool" and cover the whole ground.

DAKOTA WHEAT.—The Chicago correspondent of the *N. Y. Bulletin* says: "The Territory of Dakota has this season produced the finest quality of No. 1 spring wheat, and upon lands which were always thought to be worthless. The extract we make from a letter just received from Fargo, Dakota, gives some very interesting facts upon this subject. Our correspondent says: 'The yield of wheat and barley throughout the entire Red River Valley has exceeded the expectations of the most sanguine; wheat yielding 20 and 35 bushels; barley, 60 bushels. Wheat is being put in the elevators and shipped as fast as cars can be obtained. There is a general blockade of freight and scarcity of cars all along the line of the Northern Pacific railroad.' In Traill county the yield is from 25 to 30 bushels per acre; half the crop will go into market at once, the balance will be held for higher prices.'

A MODEST REQUEST ANSWERED.—The late sentimental ballad is entitled "Give me the home of my childhood." Bless your soul, we'd do it in a minute, but—why, haven't you heard? Old Tagers closed out three mortgages on it in 1867 and 1868, and the next year it was sold for taxes, it was seized for debt the summer following, then your oldest brother claimed that it belonged to his wife, and brought suit in her name to recover, and before that was through they found an old flaw in the title and in trying to straighten that out it transpired that your grandfather had no Government patent on it at all, but had stolen it bodily from the Indians; and now two half-breeds have brought suit to recover the property as the heirs. The house was burned down about two years ago and the neighbors have used the fences for kindling wood; your wife's cousin is trying to get hold of the lot and your half-brother jumped the property one night, put a little shanty on the alley corner, and is now in possession. There doesn't seem to be much show for you, but you might file your papers, buy a lawyer and sail in.—*Burlington Hawkeye.*

AMERICAN WHEAT AND FLOUR IN FRANCE.—French millers are again complaining of the tax on foreign wheat imported into France. It seems that European wheats only pay a small duty of 60 cents per 100 kil, whilst others, such as American, have to pay the flag duty of 3 francs per 100 kil. Although the latter kind is the nearest in quality to French wheat, no remunerative use can be made of it in France, owing to this heavy tax. Belgium millers are much better off; they import American wheat, manufacture the flour, and send it to France, without paying duty, at prices 1s. to 1s. 6d. per sack less than French millers can afford to manufacture it. A miller, writing to the *Paris Echo Agricole*, describes this as anomalous, and says that either the tax of 3 francs on American wheat ought to be abolished, or else American flour should be taxed to an equal extent. Further, it appears that Antwerp imports American barrel flour; this is put into sacks, leaved and designated by some brand, and sent into France without payment of duty. These matters are bitterly complained of by French millers, and certainly merit the attention of the French Government, especially during the present season, when so much will be imported by France.—*Corn Trade Journal.*

The Star mills at Waupaca, Wis., owned by G. L. Lord, have been thoroughly repaired. The millwright work was done by J. Sipes, and is first class.

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MILWAUKEE, NOVEMBER, 1878.

A. MILLOT, of Zurich, Switzerland, has invented a machine for separating garlic from grain.

**AMERICAN EXPORT OF AGRICULTURAL MACHINERY.**—A report of the Bureau of Statistics shows that in the year ending June 30, 1878, the exports of mowers and reapers amounted to 10,896, valued at \$1,018,916. Of plows and cultivators there were exported 20,710, valued at \$154,977. Of all other agricultural implements and tools there was exported \$1,379,467 worth. Taking all the exports grouped under the head of agricultural implements, the gain was nearly fifty per cent. as compared with the same for 1877.

A writer in the London *Times* asserts that, by the practice of shoeing horses, we diminish the sureness of the animal's feet, and foster a kind of splints and other diseases. He maintains that any horse, even one accustomed to shoes, would very soon go more easily in every way on our hardest roads, and with far less liability to slipping and disease, unshod, than he now does when shod with iron. All that is necessary is to "keep the edges of the hoof slightly rounded off with a rasp, to prevent the raveling-up of the edges."

The Halifax award of \$5,000,000 for damage to the Canadian fisheries has not been paid, and it is doubtful if the money will change hands until further light is thrown upon the subject. It is now claimed at Washington, by those who have been examining the subject, that the British bill of particulars, as it was submitted, only entitled the Canadians to \$120,000 a year for ten years, which would amount to but \$1,200,000, instead of the amount awarded. It is further claimed that there is an offset to the Canadian claim for special duties on fish and fish-oil remitted by the United States to Canada, amounting to \$3,000,000 in the ten years covered by the award. This would entitle the United States to \$1,000,000 from Great Britain, which would be far more comfortable than the award as it now stands.

The report of the official investigators of the City of Glasgow Bank shows the condition of that bankrupt institution to be worse than at first reported. The most damaging feature of the report is the evidence showing the frauds practiced in reporting vast amounts of bullion in the vaults of the bank, when they were really almost empty, and in understating the amount of loans outstanding. Among the "available assets" reported by the Directors was £7,345,357 in bad debts. The total loss is over \$30,000,000. A call for \$2,500 per share will soon be issued, and it is thought that not more than half the shareholders will be able to meet their obligations. There is some comfort in knowing that the mismanaging officials are in the hands of the law, and almost certain to receive well-deserved punishment.

While the older States are complaining of hard times and small profits, the Territories seem to flourish with marked vigor; Montana, away in the far north, sitting astride of the Rocky Mountains, is rapidly growing in population and material

wealth. Heretofore mining has been the chief industry, but farmers have been flocking in of late years, and it is found that agriculture pays even better than gold-digging. The wheat crop ran as high as sixty bushels to the acre in many of the fertile valleys this year, and the stock raised is said to surpass in excellence the best specimens offered by Iowa, Missouri and Illinois. It seems to be an excellent place for the banking business, as the First National Bank of Helena, the capital of the Territory, has just reported a net profit for the year of \$39,540 on a paid-up capital of \$100,000. This is doing well enough to tempt other capital to that country. It is said that there has hardly been a failure in the Territory in three years.

Good petroleum (kerosene), according to Prof. J. Lawrence Smith, should have the following characteristics: 1. The color should be white or light yellow, with a blue reflection. 2. The odor should be faint and not disagreeable. 3. The specific gravity, at 60 deg. Fahr., ought not to be below 0.792 nor above 0.84. 4. When mixed with an equal volume of sulphuric acid of the density of 1.53, the color ought not to become darker, but lighter. A petroleum that satisfies all these conditions, and possesses the proper flashing-point may be regarded as pure and safe.

A very ingenious machine, invented by James H. Williams, was exhibited this fall at a Mechanic's Fair in Boston, viz., a machine capable of indicating, six to eight times per minute, the superficial area of surfaces, however irregular, not exceeding twenty-five square feet. The machine can, for instance, compute in less than ten seconds the square contents of a circle without reference to mathematical rules. It is certain to find practical application in many departments of trade. It is specially of use to leather dealers and manufacturers for measuring exactly the superficial area of hides and skins.

First scientific party (of the name of Richard A. Proctor, with his telescope)—There is a steep five miles off; I can see a fly walking on it. Second scientific gentleman (called Prof. Hughes, with his microphone)—I can't see him, but I can hear him walk. Third scientific person (named Edison, with his carbon thermopile)—I can measure the amount of heat produced by the friction of his movement. And, producing a phonograph from his pocket, by attaching this machine to your microphone, I can preserve and reproduce the noise of his walking, so that people can hear him walk a thousand years hence.

**A GENEROUS LITTLE DARLING.**—The *Independent* says: "I'm glad to say that our child is a generous little body. The other day her grandfather gave her a cent to buy herself some candy. As she was going out she discovered a little beggar boy on the front steps. She stopped, and looked first at him, then at her cent; then looked down on the ground, apparently lost in thought. Finally, with the sweetest smile on her beautiful face, she stepped up to the forlorn child, and, laying her hand on his shoulder, said, in a gentle tone, 'Here, little boy, take this cent and go and buy yourself a suit of clothes and some dinner.'"—

**COMMERCE WITH SIBERIA.**—We had in our last issue the pleasure of informing our readers that the Neptune, Captain Rasmusen, belonging to Helsingor had arrived at Hammerfest from the mouth of the Ob with a cargo of wheat, and we now learn that not only has the screw steamer Fraser, Captain Nilson, arrived at the same place loaded with a full cargo of grain and tallow, put on board at a place called Dudinsky, situated about 450 miles from the mouth of the Jenisej River, but that also the sailing ship Express, Captain Gundersen, belonging to Mr. Astrup, of Stockholm, has arrived with a similar cargo loaded at the same place. As the Express is a good-sized ship, the fact of her being able to load at such a distance from the mouth of the Jenisej River, and afterwards to sail across the Carian Sea, is sufficient demonstration that the route to the Jenisej is commercially practicable; a fact of which we should imagine our merchants will not be the last to take advantage of. The Fraser and the Express, as we mentioned some time ago, accompanied Professor Nordenskiold to the mouth of the Jenisej River, on his expedition to find the Northeast Passage, etc. After discharging their cargoes of coal, etc., to the Vega and Lena (which two vessels left the Jenisej for the East on the 10th of September) at the mouth of the Jenisej, they continued their passage up the river to the point mentioned. From Dudinsky to Hammerfest the voyage occupied 15 days. The foregoing facts seem to suggest that it would be far better for our own countrymen, instead of wasting their energies on impracticable attempts to reach the North Pole, to try something likely to be of service to mankind in general in the way of geographical discovery. Professor Nordenskiold has informed Mr. Dickson that good prospects exist

for the expedition getting to the goal, as the great enemy to be feared, ice, was conspicuous by its absence on the way to the Jenisej.—*Timber Trades Journal, England.*

## THE GRASSHOPPER NO LONGER FEARED.

BY PROF. S. AUGHEY, UNIVERSITY OF NEBRASKA.

It is well known in the West that during the winter and spring of 1877, I predicted that that season would be the last of the locust visitations for many years. The United States Entomological Commission entertained the same opinion. On the 16th of June, 1877, I predicted that that season would be the last of the locust visitations for many years. The United States Entomological Commission entertained the same opinion. On the 16th of June, 1877, Prof. C. Thomas and myself, in a report to the Governor, which was published at the time, used the following language: " \* \* \* We consider the danger from the young, which have hatched out this season in Nebraska, over, and that this part of the problem is solved. We also believe that the long series of visitations has come to a close. There may be, and doubtless will be, at irregular periods, visitations by migrating swarms, but it is not at all likely that the present generation will witness another such a series as that which has just passed." The predictions made at that time were singularly verified for that year, and have been for this. Our conclusions were based on facts that we had learned about the natural history of the locust, which have stood, and no doubt will stand, the tests of time. There need, therefore, be no fears of another series of visitations from these insects. Even if they should come again in the distant future, they cannot hereafter do the damage that characterized their last visitations. There will be then such a large amount of produce in the State, owing to the greatly increased area cultivated, that locusts will not be able to make much, if any, impression on the crops. Besides, the people have learned how to contend against them. They know now how to meet this enemy as it appears in spring, and it has lost all its terror to them, especially to those who were here during the spring of 1877.

## BACK LASH.

## Its Causes and Remedy.

[Read by A. W. Foster, of Pittsburgh, Pa., before the Iowa Miller's Association.]

A great deal has been said and written in regard to backlash, its cause and remedy. The main cause in grist mills is easily traced to the engine, when we examine into its construction, and the principle on which it depends for changing the reciprocating into a rotary motion. The crank receives the piston pressure, (which is anything but regular) varying from twenty to one hundred per cent. twice in each stroke, or four times in each revolution of the crank, and frequently pulling in the wrong direction, at the latter part of the stroke. Some of the irregularity is due to the "Cut-off," but most of it to cramped opening, badly proportioned valves, and eccentric in the wrong place. The crank depends not only on this constantly changing power, for its rotary motion, but on a more constantly changing speed of piston, which is nothing at the beginning, and from two to six hundred feet per minute at the middle of stroke, falling off again to nothing at the end, and as the power depends on the pressure multiplied by the speed of the piston, it is easily seen how very irregular the power must be, when it is the result of such a jumble of causes; and the motion dependent on such must be as irregular as the causes, unless we have a reservoir in which to pour the surplus ready to give it out again when and in such quantities as a constant speed may require. This reservoir is partially furnished by the fly wheel, which if heavy enough and run at proper speed makes the rotary a tolerably but by no means perfect motion, for in many mills with good engines and fly wheels, you may hear the rumbling and clanking of the wheels, as though complaining of the stupidity of the engineer who designed, and the owner who permitted, the constant quarrel between the honest old burr, who wants to go steady on about his business, and its driver, but which is jerked back then banged ahead by the impulsive spurts of the engine. A good many apply a belt to the spindle to overcome this trouble, but this merely changes the audible to a silent sea-sawing backlash, with the result that the engine pulls on the burr, while the crank is at right angles, and the burr returns the compliment when the crank is on centers, and the engine helpless. From experiments made in

England, in 1863, it was found that even under the most favorable circumstances, about two revolutions per hundred were lost by slipping of the belt.

Another cause of backlash (not only confined to steam only, but also existing in almost every water mill,) is to be found in the wheels, some of which are cast from crooked patterns, many of the teeth being patched in the sand, the pattern being so out of shape that it will not leave the mould without taking some of the teeth with it; and again, from wheels being bored out of center, the slightest imperfection of the gearing, although nearly imperceptible, being detrimental to uniform working motion. But the grand cause is an irregular motion, and as no way has been discovered to give regular speed to the engine, and the tendency of the stone being to keep a regular motion, the most direct, and probably the only way to stop this quarrel between the contending parties, and quiet the grumbling of the wheels, is to make another reservoir within easy access of the stone, so that any surplus power hurled at the stone by the engine, can be stored away, to be drawn upon when the motion is not so generous. The most reliable, compact, and in the long run cheapest, reservoir, is a good and durable spring on the spindle of the burr, so proportioned that its elasticity is great enough to overcome all irregularities, and maintain a constant elastic pressure on the burr. This will, aside from improving the working capacity, also save a great deal of wear and tear on the machinery, and utilize all the power killed by the causes stated above, which is a greater per cent. than many persons are aware of. There are about a dozen kinds of backlash springs patented, and as many that are not, but as it is not my intention to endorse, or even mention, any particular make of spring, writing, as I do, for the general benefit of the milling community, I would merely say that in this, as in many other things, the best is the cheapest in the long run, even should the original cost be four-fold.

**THE HINDOO MARRIAGE.**—Among the Hindoos early marriages are the rule. By the time a boy of good family has reached the age of 14 or 15, a wife has been selected for him, usually a year or two younger than himself. Very possible he has never seen her until the marriage ceremony is about to be performed. At the wedding both families lay themselves out to make the utmost possible display. Relatives, friends and guests are gathered in the house of the bride's father. Clad in her richest attire, the girl kneels on a slight platform covered with a rich tissue, the boy sitting cross-legged opposite her. The bride's father raises her hand over a vase filled with the holy water of the Ganges, and places her hand in that of the bridegroom, who puts the ring on her finger, amid the prayers of the Brahmins. This is the essential part of the ceremony, which makes them husband and wife. The genealogy of the husband is then formally read, and the stipulated dowry is paid over to him. After this the festivities begin, and are kept up for several days.

**SAGACITY OF THE BEAVER.**—A Mississippi correspondent of *Chamber's Journal* recounts several interesting instances of the sagacity of the beaver, and of the readiness with which that animal grows accustomed to the presence of man. At a place near this correspondent's residence a railroad crosses some wet, springy ground, where there used to be several beaver dams. The line of embankment supplied the place of these dams, and the beavers, taking the good the gods provided, worked no more on their own dams, but enjoyed the pond of four or five acres which the embankment had made for them. A year or two since, the railway-workmen undertook to put a culvert through the embankment and drain the pond, which, after running freely for a few days, and nearly emptying the pond, suddenly stopped one night; the flow had been arrested by the beavers. The men opened it again, but once more it was stopped up. This went on for some time. As the men passed that way they would open the entrance to the culvert, and at night the beavers would shut it up. At length, finding that closing at the entrance, where their work could so easily be broken down, did no good, the beavers moved their dam to the middle of the culvert, which was some forty feet long, out of the reach of the poles used to poke it down. Here was a community of beavers working with express trains thundering over their heads.

Dr. Babcock, inventor of the fire-extinguisher bearing his name, is a drunken outcast in Oakland, Cal. He was once moderately wealthy.

THE

# Cochrane Ring

TRY A NEW DODGE!

## George T. Smith

Thinks that

### ANOTHER PURIFIER

Is a much

## BETTER ONE

Than his own, and, with the aid of the Cochrane tribe of leeches, and the expenditure of some

Thousands of Dollars,

Makes the attempt to

## CAPTURE the PATENT

And in this makes a virtual acknowledgment of the inferiority of his Purifier.

Fighting against odds (for TRUTH was on the other side) he is beaten: appeals the case again and again with the same result, and finally appeals to the last tribunal AND FAILS.

Poor Ring!!

Poor George!!!

Poor Cochrane!!!

Weep and wail together, for your efforts to get a good Purifier to take the place of the big, clumsy thing which is now furnished by the Ring have been, alas! unavailing. You knew it would require

LESS CARE,  
LESS ROOM,  
LESS POWER,

And that it would do more and

## Better Work

Than any other Purifier in the world, and you wanted it.

## Read the History.

In the fall of 1873 one Milford Harmon claimed to have invented a Middlings Purifier and shortly thereafter applied for a patent. Failing to pay the final fee in the time required by law, his application lay in the archives of the Patent Office neglected until within a few days of the time when it would be no longer possible to revive it, when, according to the testimony of Harmon, it was assigned to George T. Smith. Among the devices shown in the Harmon Purifier, was one which was the important feature in the celebrated Garden City Purifier, and Smith thought that if he and his pals could only get hold of the patent for that device, they would be on the sure road to fortune. Immediate steps were taken to renew the application and soon began one of the most important interference cases on record, that of "Application of Milford Harmon vs. Patent of Louis Gathmann." A complete history of all the tricks which were attempted by the Smith crowd would fill a whole issue of this paper, and we will have to forego the pleasure of reciting it here. In-

vestigation soon showed that Gathmann had invented and used the device a whole year before the alleged invention by Harmon. This would have been a stumbling-block in the path of ordinary people, but George T. Smith and his pals have no use for an attorney who would stop at such little things. The war went on just the same. Every expedient which talent could suggest or money could pay for, was tried in the vain attempt to wrest the Gathmann patent (now worth over \$100,000) from its rightful owners. Even before the final marriage of the Smith ring, with the still more notorious Cochrane ring, the little legal talent which the latter possessed was brought in to aid the conspirators in their efforts to obtain the right to manufacture the Purifier which they knew to be far better than any other in the world. On the subject of purifiers, George T. Smith is nobody's fool, and even his pals are wise enough to know a good purifier from a poor one. They all knew what they were striving for and fully appreciated the immense advantage it would be to them to be able to make and sell the Garden City Purifier instead of their own. The fact of their knowledge of the impossibility of getting anything more out of the millers by bull-doing was probably one of the reasons for the desperate tenacity of their fight. Beaten on all sides, they will now have to retire wiser, poorer, and we hope, better men. We would not do our duty to ourselves, nor to the readers of this paper, if we failed to call their attention to some of the advantages which the device which has been in dispute gives the Garden City Purifier over all of its competitors. Divested of the verbiage of the Patent Office, the claim was for a double carry-board, the simple device which enables us to build a machine occupying much less space, requiring much less power and at the same time having greater capacity than was possible without it. This peculiar construction also enables us to grade the middlings on the machine, and to have perfect control of the draught of air upon each grade. The importance of being able to grade both the middlings and the air is fully understood and appreciated by those who have made a study of Purifiers, and this accounts for the fact that a large number of the most successful millers in the country use and recommend the Garden City, as it is no doubt true that a majority of those who are able to distinguish between a good purifier and a poor one are also able to distinguish between good and poor methods of milling. We would ask you, reader, if you are not already familiar with the principles and construction of the Garden City Purifier, to send at once for a circular and study it carefully. After having done so, you will without doubt make up your mind (as did the ring) that the "Little One" is a good machine to have.

COLLINS & GATHMANN.

#### THE ST. LOUIS FAIR—MACHINERY DEPARTMENT.

Messrs. Caldwell & Watson, the well known and extensive elevator builders, exhibit in the Machinery Department Caldwell's Improved Conveyor, now conceded by all practical mill and elevator men to be superior in many respects to any other conveyor now in use. Among the many points of excellence possessed by this conveyor is that it is all wrought iron or steel, with continuous and self-supporting flights. The shaft is hollow and very small, rendering it light and cheap, yet true, strong and durable. It is made for any capacity desired, from 1000 to 10,000 bushels per hour, and is adapted to carrying all kinds of grain, flour, middlings, salt, sugar, cement, or any kind of crushed ore or minerals, and from its lightness requires but little power to propel it for mill and flour purposes. It is galvanized and entirely supersedes the old-time wooden shaft conveyor wherever introduced. The same firm have on exhibition a new and very superior elevator boot, being the first of the kind ever made and exhibited. It is all iron instead of wood, and, being adjustable, the bottom of the boot remains equi-distant from the bottom of the pulley, rendering it absolutely self-cleaning and anti-choking, and being all iron, is of course fire-proof. It is the invention of Messrs. Caldwell & Watson, and was suggested to them by the many defects of the old old wood boot, and constructed so as to completely overcome all the disadvantages encountered in the use of the old style boot. Its principle and workings are the result of actual practical experience, and when once introduced will doubtless take the place of all other elevator boots. Messrs. Caldwell & Watson, whose address is 2709 Mill street, St. Louis, are among the most extensive elevator builders in the West, their operations extending all over the wheat and corn growing region of the Union. They have recently erected an extensive elevator at Pittsburgh, Pa., to replace the one destroyed by the mob during the strike. They are now constructing a large establishment for Gov. Pillsbury, of Hermann, Minn., and have built at least a dozen extensive elevators in and around St. Louis. The above machinery carried off the blue ribbon.—*St. Louis Commercial Gazette.*

#### \$46,000,000 IN SPECIE.

The public seem to need to be reminded of the fact that an important amount of calls for Five Twenties will mature within the next few weeks. From the 11th of October to the 16th of November, eight instalments, of \$5,000,000 each, of the bonds of 1865, become due and payable at the Treasury. This will bring out of the Treasury a supply of \$40,000,000 of coin, we presume all gold. In addition to this, the quarterly interest on the Fives of 1881 becomes payable on the first of November, amounting to \$6,335,000. Thus within the next forty days the Treasury becomes subject to the disbursement of over \$46,000,000 of coin; and, as nearly all the bonds to be redeemed are held at home, it is reasonable to conclude that very little of this amount will be permitted to remain in the Treasury from the neglect of holders to call for their money so soon as it is obtainable.

The transfer of this very large amount of gold from the Treasury, where it rests idle, to the banks or into general circulation, is calculated to have effects which do not appear to have been anticipated. Its bearing upon the gold premium are very obvious. An addition of forty-six millions to the stock of coin upon the market is calculated to extinguish the small premium on gold that still exists; and with the disappearance of the premium, gold would naturally come into general circulation in advance of the resumption of specie payments, which would materially facilitate the transition to take place on the first of January.

The effect of these disbursements upon the money market also must be important. They will make an addition to the reserves of the banks which would be equivalent to increasing the lending power of those institutions by over \$150,000,000, thus constituting an element of extreme ease in the loan market and stimulating the growing anxiety in banking circles to find a larger employment for idle balances. So far as ease in the money market may be supposed to contribute, in these times, towards the encouragement of business and a demand for investments, this sudden large addition to the available lawful money of the country must be regarded as calculated to have a very potent influence.

The present condition of the foreign exchanges suggests a strong probability that to this supply of coin coming out of the Treasury we may have important additions arriving from Europe. We showed on the 4th inst., from official returns, that the exports of August exceeded the imports by \$22,000,000, and that the foreign trade of the first eight months of the year left a balance of \$189,000,000 in favor of the United States. All the present conditions of our foreign trade indicate a continuation of this immense excess of exports. The freight engagements on breadstuffs and cotton for the next two months foreshadow an unusually large export trade, even for these times of unprecedented shipments; while we see no symptoms as yet of any increase in the imports. So long as bonds were being sent back from Europe in large amounts, there was a way of adjusting this trade balance without drawing upon the European stocks of specie; but now the reflux of securities has almost ceased and really few remain to be returned. It therefore seems within the range of reasonable probability that the condition of our foreign trade will call for the remittance of gold from Europe at an early day, and that, possibly, in important amounts.

These facts have a bearing upon the gold market, upon the public credit, upon securities and upon trade at large, which on the whole must be regarded as highly satisfactory and as tending to help the influences that are now promoting a sound revival of business.—*N. Y. Daily Bulletin, Oct. 9th.*

#### A READY MEANS OF ESTIMATING THE VALUABLE CONSTITUENTS OF CEREALS, ETC.

By means of a very ingenious method, first discovered by Mr. A. A. Hayes, of Roxbury, and Dr. Chas. T. Jackson, of Boston, it will be found that if a kernel of corn be split longitudinally, and immersed in an aqueous solution of sulphate of copper, the germ, or "chit," only, becomes colored green, thereby beautifully defining the limits of the phosphates by the formation of phosphate of copper. The same process may be applied to all seeds (except those of an oily nature), tubes, roots, and stems of vegetables for defining the parts containing phosphoric acid. If a kernel of corn be split open, as before described, and thrown into a solution of sulph-hydrate of ammonia, the "chit" will soon be changed to a dark olive color, which is due to a change of the salts of iron in the seed to a sulphuret of that metal; a dark-colored matter forming with the ammonia turns the vegetable coloring matter yellow, and the two colors combined produce an olive. Again, by taking split specimens of corn, or other grains, and soaking them in a tincture of iodine, the limits of the starch and dextrine will be distinctly defined—the iodine striking an intense blue with the starch, and a deep port wine red with the dextrine; so that, from this test, a rich violet (being the combination of the blue and red colors) will indicate the presence of both the starch and the dextrine in the grain. If the oil be extracted from the transparent horny part of the corn by means of alcohol or ether, the tincture of iodine will show the presence of starch in that part of the grain associated with the gluten. By these means we may easily cause any of our cereal grains to represent to us the extent and precise limits of its phosphates, iron, dextrine, starch and oil; and thus, by

the eye alone, we may form an approximate estimate of the relative proportions of these ingredients. Among other curious results of some experiments made by Dr Jackson is the proof that the relative proportions of the phosphates in grain depend on the appropriating power of each species or variety; for an ear of corn having been selected which had on it two different kinds, namely, the Tuscarora and a variety of sweet corn, and these seeds having been split and immersed in the same copper solution, soon gave evidence that there was more than double the amount of phosphate in the sweet than there was in the Tuscarora. Now, since the kernels came from the same ear, and grew side by side, they obtained unequal amounts of phosphates from the same sap, derived from the same soil. A crop of sweet corn will take twice as much of the phosphates as the other variety, and consequently will sooner exhaust the soil of them. Some interesting facts were observed, too, in the variable proportions of phosphates in different varieties of the same species of other grains. The fact that the smaller grains, such as wheat, oats and barley, contain so much less than Indian corn would seem to explain their peculiar properties as food for animals, the more highly phosphatic grain being more likely to surcharge the system in adult animals with the elements of bony matter, producing concretions of phosphate of lime, like those resulting from gout.—*Scientific American.*

#### CONCERNING BREAD.

The art of the miller consists not less in properly mixing the various kinds of wheat to produce the best flour than in well grinding and preparing it for food. Wheat is of two principal kinds, known as white and red wheat, but there are numerous varieties of the plant which do not affect the color of the grain. The red is the stronger food and the grain is usually smaller and harder, while the white is the large grain, and particularly adapted to the production of fine white flour and to mix with red wheat for the same purpose. The red variety is most widely grown and in nutriment is to be preferred.

A hot summer and a sunny climate produce grain with the least proportion of water and nitrogen. Hence wheat from Southern Europe, the shores of the Black Sea, and the steppes of Asia and the Caucasus, is preferred in England, as is also that of any temperate climate in which the heat of the sun is great during the summer months, as for instance in the interior of America and Russia. Wheat does not flourish under a tropical sun or in a high northern latitude. By the miller's art wheat flour is adulterated with potato starch, rice flour, plaister of paris, pea flour, alum, sulphate of copper and other materials, which cost less than flour, or add to its weight or bulk at a cheaper rate.

According to the quality of flour will be the weight of water which it will take up and retain in the process of bread making. Flour produced from wheat of the finest quality, and in hot summers or in hot countries, takes up much water and is known as strong flour, but sprouted wheat or the produce of cold climates and cold summers yields flour of the contrary tendency. In practice 100 pounds of flour will make 133 to 137 pounds of bread, or an average of 136 pounds. The art of the baker is to increase this quantity, which he does by hardening the gluten through the agency of a little alum, or by means of a gummy mixture of boiled rice and water. Bread naturally contains a large quantity of water, or from thirty-six to forty per cent, but it is frequently made to contain greater amounts by the use of rice flour or potato starch, either of which will absorb more water than wheat flour. Another way to increase the quantity of water in bread is, after having incorporated as much water in the dough as possible, to put it in a hot oven, which causes the crust to form speedily, and thus the escape of water is prevented. This same object is in a measure attained by throwing sacks over the loaves when removed from the oven, thus preventing part of the evaporation, although the crust thereby suffers in crispness. Salt has much the same effect as alum, in making the bread white and firm, and in enabling the flour to produce a greater weight of bread from a given amount of the raw material. Various adulterations are practiced both in the flour and in the subsequent process of bread making, but the independent farmer who raises his own wheat and takes it to the neighboring mill need have no fears of being thus poisoned with alum or sulphate of copper.—*Boston Cultivator.*

PATENTEES REWARDED.—The following compiled from the *Tribune* indicates the manner in which Great Britain rewards her inventors: Since 1860 England has paid £102,775 to inventors for discoveries in connection with ordnance and small arms. Mr. Henry got £5600 for breech-loading rifles and improvements in firearms; Mr. Westley Richards, £2,375 for his breech loading carbine; Mr. Snider, Mr. Wilson and Col. Roden, £16,000 for their plan for converting muzzle-loaders into breech-loaders; Col. Snider got another sum of £5000 for the Snider rifle, and Mr. Lancaster £4000 for his plan of rifling guns and small arms. In artillery, Maj. Palliser got £15,000 for his chilled projectile, £7500 for his plan for converting cast iron guns, and £1500 for his improvements in artillery; Capt. Moncrieff got £10,000 for his method of mounting guns, with £1000 a year and £5000 when his engagement ended in 1875; Mr. Hale got £8000 for rockets; Mr. Frazer, £5000 for construction of guns; Capt. Scott, £2000 for improvements in gun carriages and £8000 for other gunnery inventions, and Com. Harvey, £10,000 for torpedoes.

## DRESSING, BOLTING, OR SEPARATING.

BY JAMES M'LEAN, OF GLASGOW, SCOTLAND,  
AUTHOR OF THE MILLERS' TEXT BOOK.

After leaving the stones, the flour or rough meal is either run into bags and allowed to stand some days, when it dresses better, or it is cooled on traveling discs, with fixed angled blades directing it outwards and inwards, or in screws, and dressed at once. Generally the former method is used with wire machines, and the latter with silk ones.

In old times, with their mild-grinding heat, rapid cooling didn't seem to be approved of, mixed wheats ground and standing thus for some time, loosely packed in bags, being said to be improved thereby—no doubt by better fermentation. Americans, however, who often ground with an injurious heat, had to follow a different method, by cooling it as quick as possible; and as this course saves time, labor and expense, since the introduction of silk machines it has been followed in Britain also, although with mixed wheats it is an open question if it is the most profitable in the end.

Nearly all flour-dressing machines work as sifters—that is, separation by specific gravity, and sizing, although few imagine so. The wire-dresser is commonly imagined to work by sizing alone. Such is not the case, however. Separation by sizing is simple, and the principle always apparent. It is far otherwise with separation by specific gravity, as exemplified in the gold-diggers' operations, the oatmeal sifter and fanners, its application is extremely varied, and in flour separation especially the principle is apt to be lost sight of altogether, as the working of some patented machines testifies. If the miller reflects well on this principle, he will perceive that some so-called improved separators are in reality very poor ones; and by pondering on its working in its most original and simplest state, effects which too often seem a profound mystery are easily understood.

As mentioned before, nature shows the working of this principle, with its usual incomprehensible vastness, wind and water being the chief apparent agents. Water, which can either be a very gentle or a very powerful disintegrator, is equally efficient as a sifter, and the gold digger, with his sluice-box, uses it for both purposes at the same time, wind or air is like water in its effects, but has so much less density that its own natural motive power is rarely available or steady enough for sifting. Reflecting on these operations of nature, the digger's tin basin, oatmeal sifter, and the dust screen, it is apparent that the degree of motion has a vast influence. Without motion there is no sifting. Too violent, again, like the dust screen, it is very imperfect. The more violent a sifter's motion, beyond certain speeds, the less effective it is. Sifting, then, is simply motion at certain speeds, the heavier particles sinking, and the smaller ones dropping through the sieve holes, the large ones always keeping the light particles clear of the sieve or sheet. The importance of a certain speed is apparent when the same machines can be made good sizers, with a different rate of speed. The difference, then, between shaking sizers, fanners and sifters, is in the first. The motion is either so violent that the stuff is all jumbled through either, or, if the motion is milder, it is so thin that no separation by specific gravity can take place, and all particles of a certain size escape; so that for sifting thickness of stuff is of great importance.

With fans the yielding motive power is applied to the particles with such force that their shape or form and momentum has too great influence, as instanced in the oats descending the vertical air current, like a spear; and much of the gold dust in the bottom of the digger's tin basin would be blown away long before the heavy stones could be affected. The dust, also, of the oatmeal sifter would have the same liability, before the heavy seeds could be moved, and the same with the flour and bran; fans therefore can never approach sifting for perfectness, except the substances to be separated differ widely from each other in their specific gravities. If otherwise, the particles of each substance must have regular definite shapes and sizes, presenting near the same amount of resistance to the current in proportion to their size and weight. This should always be kept in mind, as of late in some machines sifting is rendered too much subordinate to wind. The oatmeal revolving sifter and digger's tin basin are instances of the extent by which the principle, applied in this form, can separate, and it does so to an extent that is almost incomprehensible. The easy centrifugal swing, with the rough-edged holes in the one, and the water in the other, keeps a gentle motion on the dust that does

not adhere to the lighter particles descends with the heavy round stuff, as if by magic. Well may the young miller, when using a hand-sieve, which works exactly similar, wonder how the dust descends. Fans would blow away all the dust soonest and farthest. It is slow in action compared to fanners; but, like breaking a bunch of sticks one by one, it can do what the other cannot. It is the innumerable particles lying on and communicating an infinite gentle, unyielding pressure and motive power to each other which allows the slightest difference in specific gravity to prevail, the incessant motion giving them every opportunity to edge downwards, without momentum, and let the particles arrange themselves accordingly. It will thus be observed sifting requires an amount of stuff on the surface sufficient to keep the lighter particles from touching it, and that the more mild and gentle the motive power, so as there is sufficient motion, the more efficient the sifting, till the particles are so far separate in relative weight as to counter-balance the effects of shape, when the speedier agency of wind is applied; and from the greater toughness of the bran, the difference in weight of the particles increases faster than their diameters.

The flour separators are the silk and wire machines, and the various shakers and air currents. As for the old cloth-covered bolters with beaters, they have been so long extinct in some parts of the country, the oldest millers often never having seen them, that I need not, or cannot, say anything about them, never having had personal experience of their working. The principle of their action, however, is sufficiently illustrated by the others.

The silk dresser is generally admitted to be the most efficient, surpassing all others for efficient flour sifting, though not for speed, as observed before, all other circumstances being equal; good sifting requires time, which the working of this machine can show to a remarkable extent, and like the digger's basin, revolving sifter and hand-sieve, it is extremely simple, and the less its simplicity is interfered with the better it performs its work, and many so-called improvements in reality tend the other way. It is in the form of a hexagon or six-cornered frame, commonly over three feet in diameter, of different lengths, according to circumstances, with an incline, if the stuff traveling inside is not interfered with, of from an eighth to a half inch per foot of length; some being arranged so as they can be raised or lowered at one end as desired. The cloth generally travels at a speed of from three to four feet per second; and often there are wooden balls on iron rods on the inside, which, as the machine revolves, slide down, and give a smart tap on the frames. The cloth sheets, which are commonly betwixt thirty and forty inches wide, and can be obtained as high as two hundred threads per inch for French, or one hundred and eighty for Swiss cloth—the Swiss threads being generally thicker—is arranged with considerable difference betwixt head and foot, such as ninety at the top end, and one hundred and fifty at lower end, of fine sheets, which is used by many. The sharps cloth is then arranged with less variation of numbers, the highest generally being a little under the lowest of the flour numbers. The thirds or pollard cloth is then fixed, with no variation in their numbers, the bran going over the end.

This machine, which I will call the hexagon, to avoid confusion, as silk is used in other machines also, although still wrought in some districts after the above-mentioned arrangement, doing all the dressing required at once, without any more regrindings or siftings. In others, the arrangements are so various, that to mention the different machine sizes and various cloth numbers used of, only a part of them would only be giving a confused list of no benefit whatever; and I shall confine myself to the principles of the different systems followed, nearly all agreeing in having the cloth traveling rate between three and four feet per second, and the diameter over three feet.

As to the silk, its extraordinary durability and fine sifting surface is too well known to require anything said about it. Oat seeds sometimes cut it badly as they get old and thin on the parts when there is not sufficient pressure of stuff to work them out. Some put them in or draw them out with a soft haired brush, others use any sticky material which leaves the silk clean, but adheres sufficient to draw them out. In some countries, if the machine stands long insects out it badly unless well looked after.

The hexagon shape would seem to have been adopted as the best for sifting, the cylinder being a slow sifter, with too much rolling for perfect work, the motion with the square

would be too irregular, and more apt to be checked with violence at the end of the slide. As for the average diameter, betwixt three and three and a half feet, it is curious how closely the speed and amount of traveling at each slide corresponds with that made by the revolving sifter at each revolution, hand sifters inclining to the same amount of speed. The inventor, who appears to have been a Frenchman, would seem to have understood sifting better than many others who have tried to improve it. As to the reasons of its being level or with an incline, its length, the variations of the cloth numbers, and the object in having balls, they can be best accounted for by comparing it with other sifters.

As noticed before, the revolving sifters surpass all others for thorough sifting, but they appear never to have been used for flour except in the laborious hand-sifting process, nor have the direct shaking sifters with several sieves. Flour sifters as yet having only one sieve. The hexagon inventor would know the principle well, as it appears to have been principally hand sifting before that, and he would know the difficulty to be encountered by applying silk to a flat surface, it being a yielding flexible material, the stuff would be too irregular in depth when in quantity sufficient for proper sifting, and supporting it to be level would but increase the liability to choke with a gentle motion. The idea then would occur of having a cylinder with vibration to make the particles drop back again from the top, similar to the hand-sieve man reversing his sieve and striking some object violently with the rim to make the particles drop out, as he knows from experience they come out easier that way than forcing them through the way they entered. Practical experience then would make him prefer the hexagon shape, and determine the necessary incline. As the flour is continually on the ascending side its weight does not bend the cloth so much as on a dead level, and any bending affects the sifting but slightly. With those advantages over the level sifter its motive sifting power may rank equal to the direct shaker with one sieve, but inferior to the revolver. As ascending a certain distance the stuff is motionless, when it begins to descend the motion is gradually accelerated till the maximum is attained at the bottom, where it is gently checked and stopped. It is thus similar in its irregular motion to the shaker. The crank on the outside shaft giving little motion when nearest and farthest from the sifter, and gradually increasing each way till the shaft center is reached. The hexagon is less affected by inequality of speed. The others, if too slow, stopping sifting altogether, and requiring very regular motion for good sifting, while the hexagon can sift as long as there is motion. Centrifugal force disturbs proper sifting, with it as with the revolver, if driven too quick; but the effects are less than the violent jerks of the shaker when too fast.

As proper sifting is the incessant motion and change of position, allowing the particles to arrange themselves according to their specific gravities, it follows that tendency to arrange themselves should never be disturbed. Here the frames of many machines act most injuriously; in fact, the hexagon is far too often looked on as a sizer, instead of a simple and most efficient sifter. Many of them have huge frames; which, when the stuff slides down the incline intercepts the heavy rolling stuff at bottom, letting the lighter stuff at top shoot over next the cloth, the frame taking a large quantity with it, and then letting it tumble all through. It is an easy affair to have a frame strong enough so as the stuff will roll or slide over with little obstruction, disturbing the arrangement of the particles as little as possible. The entering flour needs also to be directed on the top of the moving mass as much as possible. As the stuff in the inside of the hexagon resembles that on the top sieve of a sifter, how is it that sifting in the former is so much interfered with, while generations of practice has taught them to leave the almost mysterious arranging of particles in the latter alone. The gold-digger is so amazed at what it can accomplish that he often regards it as one of the mysteries of nature. The only reason I can imagine is, the tendency to regard it solely as a sizer. Looking at the top sieve of a sifter it will be seen that it needs no air currents, no blades, to direct the stuff outwards; nothing but the slight incline on the top of the stuff. Wind will only add injurious pressure; blades disturb the arranging of the particles; and I have always found that the simple hexagon, with the sliding balls inside to keep it clear, and the incline arranged so as to be varied at will, was by far the most efficient sifter. The chief difference noticed in good or bad dressing with the hexagon is

that when well done with equable ground stuff, there is a very small proportion of solid sharps, a considerable portion of them being composed of light brown dust. This is pulverized bran which no other process but careful sifting can separate from the fine flour, as it is as small in size as it—the remarkable effects of bran in deteriorating the color of the bread, much beyond its effects on the flour, attributed of late years to cerealine, is too well known to say anything about. Where there is bad sifting again, as is sometimes noticed, with the so-called improvements, the proportion of solid sharps is so great that the brown dust can be noticed no longer; and too often it is amongst the flour, or if amongst the sharps, the proportion of solid flour amongst them is so great as to disguise it; and from the pernicious effect of regarding the hexagon solely as a sizer, the miller too often thinks it is doing its duty well in taking out so large a quantity of sharps, which in too many instances is but deteriorating the flour.

As to the variation in cloth numbers, experience shows the great difference in numbers required, generally fifty or sixty threads an inch of difference for the fine flour between the extremes; this is well illustrated by the oatmeal sifters also, but in a superior way of working which is adopted by some mills for flour also, it would be noticed that in those each sieve has the holes all of one size, but the holes of each gets smaller as the stuff descends. Also the different modes of working them, such as grinding, the returns of one sieve only which is the best for good produce, others again grinding the returns of all the sieves which is the best for a neat cut. It would be observed also the one sieve return grinder arranges the depth on the top sieve, so as it is all a smooth motion, except a few inches at tail end, where he allows it to be so thin that it rolls in confusion on the rough edged holes, for the purpose of taking out as much dust as possible, this rolling motion has a great influence in hexagon dressing, and partly causes the variation in cloth numbers; so great is its influence combined with the decreased depth of stuff, that it will be observed in spite of the great difference in numbers, the most specks come through the finest sheets, the cause of this is the same rolling motion observed at the end of the sifter, the stuff as it travels along the hexagon gets less in bulk, and also sharper or rounder, from the loss of the smaller particles escaping, the variation in bulk, thus affects the depth when it would require to be getting deeper; for effective sifting, and the increased sharpness gives a rougher traveling motion, tending to roll the thin mass all through. After leaving the fine sheets, the bulk alters but little, and less variation in number is required for the sharps. For their efficient sifting a different system is required.

The increased fineness of the sheets, then, as the perfect sifting decreases, takes as much dust as possible out of it, as so much adheres to the larger particles that it needs more violent motion to disengage it; and as bran is tougher than the flour, the proportion of pulverized bran decreases as the size decreases; and as the sizing principle is more developed on the fine sheets, there is less liability to let bran through. As when the motion is too smooth, the sifting is very slow, this rolling motion is taken advantage of in many mills by returning a portion of the finest sharps to make it dress quicker, commonly having a shifting board with movable sides kept out by springs, so as they can return less or more, or none at all, as they wish; thus, when on soft tough stuff they will return a considerable portion, which has a great influence on the dressing speed, when on free dry stuff they will often return none at all. This difference in the dressing speed is caused solely by the sharps causing a rougher traveling motion. Some millers are difficult to convince on this subject, and certainly it looks a little odd to help the dresser by giving it more work; but when once they see its great effect, they seldom fail to take advantage of such a handy regulator.

This system of having all the numbers in one continuous line is much inferior for efficient sifting to that of the other sifters, having the different sizes under each other; but it is impossible to have the hexagon arranged similar. A glance at the products of the fine sheets shows how inefficient the highest numbers are in keeping out specks when the rough motion disturbs proper sifting, and still the depth necessary for proper sifting causes a heavy loss from the flour dust carried over with a smooth motion. The oatmeal miller who returns the product of the upper sieve alone for fanning and regrinding, gets over this difficulty in a most efficient and simple manner. The sizes of the sieve holes are ar-

ranged so that the bottom sieve has always sufficient quantity all over it for a smooth motion and as this is always returned direct to the sifter again, there is no loss. This mode can also be applied to the hexagon, as it is to a partial extent in some mills, by taking out the thirds and bran first, and having another hexagon for separating the sharps and flour; although the separation of the thirds and bran is purely a sizing affair, this mode may be said to resemble a sifter with two sieves; others again give it a third run through, thus resembling a three-sieve sifter; they may thus run it through as often as they choose, the advantage then of running it through several times is that each hexagon can have only one number of cloth, and, the rolling motion so little developed that the sifting will be far more perfect, and the extreme fine numbers of cloth avoided altogether, as there is less dependence on sizing. Such as when freed of the thirds and bran, it is run through a hexagon, covered with cloth of ninety; a rolling motion can be kept up at the end to free the large particles of the dust; the flour then enters another hexagon covered with cloth of a hundred, and it is dealt similar with, then 110 cloth; but instead of having any rolling motion with this, the last one, a smooth motion is preserved throughout, which will send over a little of the fine to keep the sifting perfect; and the sharps from which, will need different treatment, as the two former can be exposed to air currents at once, as the dust is taken out of them; whereas, the last will require to be sent up into the first hexagon again, similar to the oatmeal miller's practice; or sifted by itself to take the flour out before exposed to air currents, as separating by air is much inferior that the flour particles have to be a considerable size before they can be trusted to it. Although even this method is scarcely equal to the other sifters; as with them the thinnest and worst separated portions are always dropped at the tail end, and soon run over; this is impossible with the hexagons, but if the entering flour is dropped on the top of the moving mass as much as possible, it is the nearest approach to it that can be made. This system, besides the great saving it effects in doing away with the finest and most expensive of the silk sheets, is also much more effective for thorough sifting, or eliminating of bran dust, which acts injuriously both on the color and strength of the flour.

As to the cloth number and mode of proceeding mentioned, it is merely to illustrate the system. Oatmeal millers differ in their modes of applying it, influenced by surrounding circumstances; and the flour miller will need to vary still more; and the millers in each district will be the best judges as to the cloth numbers required, the difference between each, and the amount returned for the re-dressing; but the advantages of the system are great in whatever mode the details are carried out. The amount of bran dust that comes through the finest sheets shows that sizing should never be trusted to for efficient separation. If two or three numbers are used, an odd sheet each way makes a great difference, such as after having the proportion settled, and ninety proved too fine to commence with, eighty is substituted, and the highest number taken off; or if ninety is too coarse, it is put aside and a higher number put at the other extreme. Small mills especially should never be without the means of returning more or less sharps as they wish to help the dressing, and these as free of bran dust as possible, as it is a most convenient regulator. Such then is the hexagon in its simplest and most efficient forms. All the aid it requires is the smart vibration caused by the shock of the descending balls to keep it clear. What would an old miller, working with the other sifters, say if wind was applied to blow the stuff downwards? The answer would be, where the stuff is thin enough for the wind to have effect, there can be no sifting, and that the seeds would be still more readily blown down. Again, if wind was directed upwards, the answer would be as before, there could be no sifting where the wind had effect; and that wind is so inferior to sifting that, where there was dust, it would be blown up as well as the seeds (and flour dust is not always inferior flour, as is often imagined; some hard wheats can be made all dust apparently, and yet be strong, good working flour, with a very small proportion of felled stuff). As for conveyors again being employed, so as to supply the place of the incline, would say it was mischievous labor, breaking the uniformity of the depth, and interfering with the almost mysterious arranging of the particles.

As the separation of the bran and thirds is a mere sizing affair, they are better got quit of at first with a wire machine, whether inclined or vertical does not signify much, the brushes

cleaning the flour dust thoroughly off; but I shall mention more fully about them afterwards.

More in connection with the hexagon are the different sifting and wind appliances for cleaning the sharps; and what with the other sifters is a very simple affair, is with the flour ones often made a very complicated one, real sifting being often lost sight of altogether. It may surprise some, seeing that the returns of the other sifters were always fanned before being ground, how it never occurred to former flour millers to apply the same treatment to the sharps; but as mentioned formerly, there was always a good demand for them as they were at a high price; and with those who ground higher than ordinary making better flour, the increased loss with the bran alone made it unremunerative. Circumstances are greatly altered now. Bread from sharps has almost disappeared, while the consumption of fine and fancy breads has increased; and as long as injurious compression has to be avoided, and the bran to be cleaned, there must always be a considerable portion of pulverized bran, which sizing can never separate without heavy loss, and requires the most effectual modes of sifting, as that mode is proved to be gentle motion of the stuff in depth sufficient to allow the particles to arrange themselves according to their specific gravities, and keep the light particles clear of contact with the sieve, the weight above at the same time helping to force through the particles next it, the hexagon and flat sieve being only different modes of applying the principle. Still, circumstances connected with proper sifting requires another mode to be brought into action.

It will be observed that in sifting, a portion of the heavy stuff is always too large to go through the sieve; in short, it is impossible to get a clear finish betwixt the light and heavy stuff without destroying sifting, except by allowing the lighter stuffs to run over an elevation or ridge, to preserve sufficient depth, to keep the sieve clear of the light particles; but at this stage, the small particles of flour, which are the most difficult to separate, are got quit of, and the other mode, wind, which sometimes needs no arranging of particles, and is therefore more speedy, begins to be effective, and the rounder or larger the particles get, making sifting more difficult, from the increased violent motion in the hexagon, the more effective the wind. What then is the most efficient way of applying the two modes? The miller is bewildered by the numerous machines, each of which of course can beat all others; and, curious enough with some of them, sifting is lost sight of altogether, nothing being equal to suspension in air, which, if a miller, who knows what sifting is, reflects a little, will see is sheer nonsense, as sifting is continually demonstrating before his eyes that it can accomplish separation where wind totally fails; and if the sharps are very small, or any flour amongst them, wind should never be trusted to for effectual separation, however gentle.

They are generally hexagon or shakers, and the wind is used both before entering the fans and after leaving them. As to the hexagons, not much more can be said about them, except that, as the stuff is all sharper, it requires a greater depth if farther sifting is required to prevent the rolling through motion reaching the top and involving the lighter particles, which greater depth cannot be obtained with wind going through them either way, in which case it is size and wind alone which has any effect, and the hexagon gives it a large surface to act on with long continued action, although in rather an unhandy complicated manner.

As for the shakers, they are commonly narrow and light enough for being end ones, having only the one sieve, and are generally supported on short wooden springs, and driven with different sized cranks, and at various traveling rates, some having brushes below to keep them clear. Occasionally they are used solely as sizers, wind being applied in a variety of ways. The importance of smooth or violent motion should always be kept in mind, according as sizing or sifting is wanted. Surface wind traveling is the only method of getting both sifting and wind to act together before the stuff quits the shaker, and then only advantageously with the wind at the tail end, where the light particles are evolved on top.

As the shaker is equal in sifting power to the hexagon, it is not equally clear of disadvantages attending its working with cloth for perfect sifting. The cloth is apt to bend with a heavy covering of stuff, unless well supported, which again makes it readily choked up. If the stuff is kept thinner, it chokes more readily still, as a heavy body of stuff traveling has a great tendency to keep the holes clear,

as may be observed both on hexagons and sifters, where the stuff is deepest. More rapid or violent motion tends to keep them clear also, but at the same time makes the sifting more imperfect, so that, on the whole, as a cloth sifter it is much inferior to the hexagon. As a sizer, again, it is much superior to it, and more advantageously arranged for wind action. The thinness of stuff necessary for through currents of air is all the better for sizing, while violent motion can be applied to keep it clear almost without further aid.

As for wind appliances, tail-boards are of little or no account, the stuff being commonly either too small or dusty for them keeping clear, however steep. The air currents need to be as evenly and regularly diffused as possible, on such light particles; and as the fan-ners are generally at some distance, this is easily attained, the distance helping regularity and equal diffusion. As to catching the stuff with horizontal or vertical air currents, far too much importance is ascribed to the latter for superior effect, often described as weighing the particles and carrying them off, or letting them fall, according to their specific gravities. This sounds very well on a superficial view; but watching the practical effects makes one come to a different conclusion. As mentioned before, other circumstances have such an influence on separation by wind that it can never equal sifting when there is great irregularity of shape; and as bran is the subject to be got rid of in this instance, it and the sharps can be imagined on a vertical current; the flour is more globular in shape, and the bran is longer and thinner, its breadth being according to the number of the wire or silk which separated the broad bran, if the one end happens to be heavier than the other it presents the least possible resistance to the current immediately, its less specific gravity being often more than counterbalanced by the smaller resistance to the air pressure, and a very slight difference in size would make it descend through a current which would elevate the more globular one; while, if let descend on a horizontal current, it is struck and carried some distance at once before momentum has any effect, and long particles can never assume so favorable a position, presenting so little resistance to the current. It may be said this is only an imaginary instance; but from what I have observed, with wind currents, when the effects were plainly seen, it corresponds to what actually takes place in noticing the results on a large scale. And what is it but the irregularity of shape—not being in proportion to the current resisting surface—which makes wind a total failure in the separation of flour and bran, and letting the stuff fall on a horizontal current reduces these influences to a minimum.

NEW AND STALE BREAD.

The nature of the difference between new and stale bread is far from being known. It is only lately that the celebrated French chemist, Boussingault, instituted an enquiry into it, from which it results that the difference is not the consequence of desiccation, but solely of the cooling of the bread. If we take fresh bread into the cellar or into any place where it cannot dry, the inner part of the loaf, it is true, is found to be crummy, but the crust has become soft and is no longer brittle. If stale bread is taken back into the oven again, it assumes all the qualities of fresh baked bread, although in the hot oven it must undoubtedly have lost part of its moisture. M. Boussingault has made a fresh loaf of bread the subject of minute investigation, and the results are anything but uninteresting.

He took a round loaf one foot in diameter and six inches thick, and plunged a thermometer into it three inches deep, immediately on being taken out of the oven. When the thermometer was taken out it was found to indicate 78 deg. Reaumur (207.50 Fahrenheit). This might well appear surprising, seeing that the oven was heated to 240 deg. R. But we must consider that the inside of the loaf, on account of the water with which the dough has been mixed, the temperature cannot rise above boiling heat, that is 80 deg. R. (212 deg. F.), as long as the bread has not lost all its water and become perfectly dry. But it takes a long time to come to that on account of the protective thick crust. The loaf was then taken into a room heated to 150 deg. R., the temperature of the air. At this time it weighed 7½ pounds. In twelve hours the temperature of the loaf sank to 19 deg., in 24 hours to 15 deg., and in 36 hours to 14 deg. In the first 48 hours it had only lost 2 ounces in weight, which in a loaf of such a size and weight must be considered an insignificant loss. When after 6 days the loaf was again put into the oven, and the thermometer indicated that its temperature had again risen to 55 deg. R., it was cut and found to be as fresh and to possess the same qualities as if it had been taken out of the oven for the first time; but it had lost now, not merely 2 ounces, but 12 ounces in weight. M. Boussingault now made separate experiments with slices of the loaf, and also with the crumb, all of which showed precisely the same results, so that it may be considered fully established

that stale is distinguished from new bread, less by containing a smaller quantity of water than by a peculiarly altered molecular condition, which begins to manifest itself in the process of cooling, which continues to develop itself more and more, and lasts as long as the temperature remains essentially unchanged, but is annulled the moment the temperature has reached a certain height. The molecular condition is the form and the union of the smallest parts dependent upon it; it decidedly indicates a mechanical relation which undergoes changes in consequence of chemical processes. It is this mechanical relation also which makes the difference dietetically between new and stale bread. New bread, in its smallest parts, is so soft, clammy, flexible and glutinous (in consequence of the starch during the process of fermenting and baking being changed into mucilaginous dextrine), that by mastication it is with great difficulty separated and reduced to small pieces, and in its smallest parts is less under the influence of the saliva and digestive juices. It consequently forms itself into hard balls by careless and hasty mastication and deglutition, becomes coated over by saliva and slime, and in this state enters the stomach. The gastric juice being unable to penetrate such hard masses, and being scarcely able even to act upon the surface of them, they frequently remain in the stomach unchanged, and, like foreign bodies, irritate and incommodate it, inducing every species of suffering, oppression of the stomach, pain in the chest, disturbed circulation of the blood, congestions and pains in the head, irritation of the brain and inflammation, apoplectic attacks, cramp and delirium. —London Miller.

DOCTORING BARLEY.

Towards the end of September a man named E. P. Bigelow sent two car loads of barley to Milwaukee, from Lyle, Ia., one being consigned to Messrs. Wall & Bigelow, and the other to E. P. Bacon & Co. This barley, as it happened, fortunately, was sold by sample, was side-tracked and not inspected into the elevators, as a reckless contemporary asserts.

The man Bigelow then wrote two letters to Messrs. Wall & Bigelow, saying that he could supply several carloads of such barley from Osage, Ia., and marking the letter at the bottom "strictly confidential." The fact that the point named does not contain that amount of first quality barley, together with the injunction of secrecy, aroused Mr. Wall's suspicions.

Oct. 4, a man entered Mr. Wall's office, gave the name of E. P. Bigelow, and drawing the head of the firm aside, proposed to send to this market 20,000 bushels of such barley as they had received from him. He produced a box containing a sample and whispered to Mr. Wall that it was doctored; he and certain parties had a method of bleaching it by sulphuric acid and then deodorizing it. Meanwhile, it should be mentioned, Mr. Nat. H. Halderman, a gentleman who is connected with the establishment of Wall & Bigelow, who has an eagle eye for sampling grain (in its non-germinated state) had pronounced a sample that had been saved from that car-load "sulphured," but after submitting it to the heat test and failing to develop any odor, had abandoned his suspicion.

Mr. Wall met the scamp apparently half way, invited him to the theater, and told him to call again. When the man left the office, Mr. Wall went in search of the District Attorney. Before that official could be found the man had left town. A warrant and a requisition upon the Governor of Minnesota were obtained, and Deputy Sheriff Aldrich who was made State Agent, left at once for Iowa. Through some leaky vessel, in either the Sheriff's or the District Attorney's office, some intimation of what was on foot reached the ears of an inconsiderate reported of an evening paper, and although the game had not been heard from, and the State Agent could not have reached his destination before 9 o'clock last night, to the immense disgust of Sheriff Sanger, Mr. Van Vechten, Mr. Wall, and all persons concerned on the side of justice and the law, there appeared in print last evening enough of an account to warn the culprit and flush the game. The News having acquired full information of this case, through its private detective agency, something over a week ago and long before it came into the hands of the authorities, caring more to subserve the cause of justice than to produce an immature sensation, had withheld comments, intending to accompany them with an announcement of the capture of the criminal. —Milwaukee News.

THE STEAM WAGON —We learn from the Colusa Sun that the steam wagon, belonging to the San Joaquin Company, made a round trip from Princeton to Willows. The writer was at Princeton last Tuesday when it came in with a load of wheat. It was loaded with twenty tons of wheat by J. S. Wall, but the rods connecting the wagons broke just before it got to Princeton, and they had to come in with only two wagons. It was a day and a half getting in from Willows, but there was no heater on the boiler, and there were several other deficiencies noticed, but Capt. Roberts, who was with the wagon all the while, is entirely satisfied that it is a success, and he says the company will immediately invest \$60,000 more in the manufacture of the wagons, and in wagons to carry the freight. They took the wheat from Willows to the ship side at San Francisco at \$3 a ton, the same as charged by the railroad to Vallejo. —Mining and Scientific Press.



**THE PROBLEM OF MILLING AT THE PRESENT DAY.**

[Translated from Pappenheim's New Work on Milling, for the London Miller.]

From time immemorial it has been regarded as the problem of the miller to obtain the nourishing part of the grain, and so to prepare it as to make it the most easily digestible by the process of baking. In modern times, especially since Liebig, the great chemist, lifted the veil with which, up to that time, the chemical process of nourishment was almost totally hidden, this problem has been immensely widened by the demand upon the miller to render accessible to mankind all those nourishing matters of which it was believed corn was deprived by taking away the bran and using it as fodder for cattle.

Liebig, and the physiologists who adopted his idea, were actuated by the opinion that the layer of glutinous cells removed with the bran contained the most valuable nitrogenous substances, which, when mixed with the flour, afford the best material for human nourishment; but as millers declared that in the present condition of technical science they were unable to separate the bran from the layer of glutinous cells, Liebig and others thought that under these circumstances it was better to mix both the bran and the indigestible wood fibre in the bread, than to lose with the bran the most nourishing substance of the wheat, and thus deprive mankind of a source of nourishment of the annual value of millions of pounds. In consequence of this we began to make whole-meal bread, and even introduced it into sick chambers and hospitals. But science never stands still. The question raised by Liebig was further examined, and the nourishing properties of bran began to be disputed. Experiments, especially those of Poggiale, showed that bran is indigestible. He fed dogs with bran and meat soup, collected the remains of the bran voided with the excrement, washed it and gave it a second time to a dog, and lastly to fowls. The result was that the bran, after passing through the digestive organs of these three animals, still contained the third part of its nitrogenous contents. Experiments which were instituted some years since in the laboratory of Professor Voit, of Munich, showed further, that white bread furnished the least and brown bread the largest, quantity of excrement, a further proof of the indigestibility of the outer husk of corn. Moreover, Napoleon III. caused some experiments to be made in a Paris bakery, under the guidance of the celebrated chemist, Mege-Mouries, respecting the nourishing properties of bran. Mege-Mouries found that bran contains cerealin. As this in a high temperature exercises the effect of a ferment, and quickly brings on lactic acid and butyric acid, and decomposes the gluten, the bread made with bran is black and sour. True, this may be avoided by causing flour containing bran or cerealin to ferment with yeast and sugar before baking, which either decomposes the cerealin or destroys its efficacy. Mege-Mouries on this principle founded a new system of baking, with flour containing bran, which is still in use in France. But the Vienna bread, especially the imperial (Kaisersemmel), cannot be made of flour containing cerealin, and Vienna bread, which is being more and more diffused throughout the civilized world, cannot be produced with flour mixed with bran even if the latter were ever so digestible. According to the present state of science, however, the indigestibility and the presence of cerealin are not the only reasons why bran is worthless as a source of nourishment. Professor Schenk has shown that bran contains no gluten. This fact has given the coup de grace to the theory which main aims that with the bran the most nourishing ingredient in wheat is lost; but if anybody should still imagine that any other digestible substance is contained in the gluten cells let him read the account of the experiment undertaken by Professor Rathay in 1874, and he will soon be convinced of the contrary.

With respect to this experiment Rathay writes: "During the last Easter holidays, and in fact throughout the whole of the previous week, I have lived almost entirely upon the bread sold by Adolf Hagg, baker, of Vienna, which, as is known, is made without salt, of the coarsest meal, and without fermentation, consequently without either yeast or sour leaven, drinking besides only a little Russian tea. On examining the excrement produced by it, and in fact that of the fifth and seventh days from the commencement of the experiments, I found the grains, which were not much the worse for mastication, softened it is true, but nearly wholly undigested, and so perfect in every part that with little trouble I could have ascertained their anatomy. The outer husk was not in the least digested, neither was the layer of gluten cells, which cells, in respect to their contents, did not differ in the least from those of a raw grain of wheat. Viewed in glycerine under the microscope, the lentil-shaped kernel and the gluten flour grains were as plainly visible as in a grain of raw wheat, whilst the state of their contents, as opposed to the characteristic reagents for protoplasm and glair, showed that they had passed through the intestines without undergoing any change. Besides the totally undigested wheat grains, the greater portion of the matter consisted of pieces of husk, some small and others larger. They were evidently the undigested remains of the meal from which this particular bread is made, which contains a small number of grains either wholly unground or nearly so. On examining these pieces of husk I was made

aware of the interesting fact that they consist of the skin of the wheat and the layer of gluten cells, and that the latter, like those of the imperfectly ground wheat grains, leave the intestines in an undigested state. Probably the thick and undigestible cellular skin protects the contents of the gluten cells against the influence of the digestive juices.

"The first-named circumstance, that the imperfectly ground wheat grains were wholly undigested, shows how necessary it is that they should be ground into flour. The last-mentioned circumstance, that the fragments of gluten cells passed through the system without undergoing any change, contradicts the general belief in the nourishing qualities of whole-meal bread.

"Whole-meal bread is said to be more nourishing than bread made of fine flour, because, besides the glair of the inner part of the endosperm it contains also the glair of the gluten cells of the bran.

"But do these gluten cells ever get digested whilst, as in bran, they are enclosed in a thick cellular skin? We can, it is true, point to the circumstance that farmers feed their cattle and their pigs to advantage with bran, but that is no proof of their value to man; we must not conclude from this that they contain any digestible matter for him, because it is well known that cellular matter is digested in large masses by ruminating animals, but only in small quantities by man. When Liebig in his chemical letters writes: 'The separation of the bran from the flour is a matter of luxury, and is injurious rather than useful for nourishing purposes,' I don't know if besides the nitrogenous contents of unbolled flour, he also takes into account the digestibility of their respective glairs. Moreover we may imagine that the small particles of bran contained in unbolled flour—and it is of these only that Liebig speaks—contain digestible glair, but it is certain that the small branny particles which are mixed with the flour are a matter of luxury, at least for all those who possess digestive organs like myself, that for the purpose of nourishment they are not useful but pernicious, and that consequently the so much praised whole-meal bread does not possess greater nourishing properties than white bread for me and others like me."

The value of bran for cattle feeding must therefore chiefly consist in the starch cells of the flour grains so rich in glair which still cling to the bran, as neither with stones, rollers, nor brushing machines can the smallest particle be detached from it, and of the germs mixed with it, and not, as is supposed, in any glair belonging to the bran. It is possible also that if a substance containing nitrogen is really contained in the gluten cells, it is capable of being digested in the stomach of an animal, whilst the human digestive organs are insufficient to open the liguine of the integument of the gluten cells. If it should ever come to pass that we are able to peel wheat or rye so as only to remove the outer integument, this would be no advantage, but the contrary. We may remark, however, by the way, that it is inconceivable that with the anatomical condition of the grain, in consequence of the fissure, that we shall ever arrive at such a method of hulling by mechanical means.

A most interesting experiment which Prof. Kick made showed how much per cent. of those parts are separated in the process of grinding. He steeped a number of wheat grains in water, carefully separated the husks, the gluten cells, and the germ, and on weighing the whole the following was the result. The beautiful white wheat consisted of:

Outer rind	} (Bran).....18 per cent.
Integument	
Gluten cells	
Germ	
Starch cells	(Flour substance).....82 per cent.

This experiment proves that it is absolutely impossible to convert the whole of the nitrogenous ingredients of wheat into flour by hulling it.

As regards the germs they doubtless contain very valuable nourishing matter. But on account of the oil they contain, when mixed with flour they serve to discolor it, and in consequence of the ready liability to decomposition of the oil, the flour will not keep. As regards flour for commercial purposes, not only the bran but the germ must consequently be eliminated. For immediate baking and eating, that is, for purveying purposes, the germs, provided they are not rancid, might be left in. But the best use to which they can be applied is that of cattle feeding.

If, therefore, after these considerations we desire to arrive at the conclusion as to the real end and aim towards which milling should strive, the object may be summed up in the following words: "The problem of milling is, to separate in as simple and cheap a manner as possible the interior of the grain from the outer rind, the beard, and the germ; to thoroughly grind the cells of which the grain is composed, and by setting free the glair substances and starch grains from the outer integument in which they are enclosed, to facilitate a quicker and more intimate contact of the nourishing qualities contained in the wheat with the human stomach."

The Austro-Hungarian high milling, with its nicely exact elimination of even the smallest modicum of bran, and its fine and careful grinding, of all other methods approximates the nearest to this ideal, and the bread made of flour so treated is consequently the most nourishing and the easiest of digestion of any bread in the world.

Pure Flour.	Waste and Fodder.
Wheat 78 to 82 per cent.	18 to 22 per cent.
Rye 75 to 80 per cent.	20 to 25 per cent.

**HUNGARIAN WHEAT AND FLOUR.**

[Translated from the Pester Lloyd for the St. Louis Evening Post.]

A friend has sent us a proof copy of the "Annals of Chemistry and Pharmacy," in which are detailed the results of a very important investigation respecting Hungarian wheat and wheat flour flour, prosecuted by Herr O. Dempwolf. We reproduce below those portions of the essay which are of interest to a large circle of our readers. Herr Dempwolf writes:

According to the analyses of Von Bibra, Meyer, and others, the nitrogen and ashy contents of the wheat vary according to the season, and the quality and condition of the soil. Thus the proportion of nitrogen varies between 1.38 and 2.729 per cent, the ashy contents between 1.4 and 2.218 per cent. In the same way the composition of the ashy contents differs greatly, since in some cases no nitrate is to be found, while in others almost one-half of the potash is represented by nitrate. The same is true of the lime and magnesia contents. Phosphoric acid appears to be the ingredient least subject to difference, as this varies but slightly.

Much as the properties of wheat and the products obtained therefrom have been examined, I have never yet found an analysis of the complete flour produce of this grain.

On the suggestion of Baron Von Liebig, who very kindly placed the necessary materials at my disposal, I undertook an investigation of the flour and other products of the Pester Walzenmuhle.

According to the statement of the Directors, fourteen different products are obtained out of wheat at the Pester Walzenmuhle, and that which furnished the material for my investigation was composed two-thirds of Theiss and one-third of Banat wheat. The analysis of the same showed:

Water.....	10.511 per cent.
Ashy contents.....	1.505 "
Nitrogen.....	2.239* "
Starch.....	65.408 "

\*When dried at 100 deg., 2.503 per cent.

Proceeding upon the assumption that gluten contains 15.6 per cent of nitrogen, it would seem that there is of gluten in common grain 14.352, and in grain dried at 100 deg., 16.044 per cent.

As then the composition of the grain shows:

Water.....	10.511
Ashy contents.....	1.505
Gluten.....	14.352
Starch.....	65.407
There remains for fibre.....	8.225
	100.000

Woody fibre was found to the extent of 7.144 per cent. Sugar could not be directly detected.

When the wheat grain is examined by means of the microscope, three chief component parts are easily distinguishable, the first of which is the *pericarpium* or shell, the end of which is covered with a tuft of small hairs. This does not appear to be of cellular structure on the outer part, but contains within a series of little cells. Then follows a series of large cells, the *perisperm* or albumine portion; in this, however, no starchy flour is to be found. The innermost part is filled with large starch-holding cells, increasing in density towards the exterior.

When the wheat-corn is ground, the softest parts (the innermost portion) are first ground, and these give the whitest and softest flour. The other kinds get darker and darker, accordingly as they are obtained in a greater or less degree from the harder and colored portions of the grain. The outermost shells are separated as bran, since their toughness renders a complete grinding impossible.

Before the corn is ground, the very outside parts, such as hair, shoots, root fibres, and a portion of the outer husks, are removed as being rubbish and tailings. Out of the wheat so prepared are obtained groats (A and B), superfine flour (Nos. 000, 00, 0 and 1), fine flour (Nos. 2 and 3), bread flour (Nos. 4 and 5), dark flour (No. 6), and bran (Nos. 7 and 8). As far as possible the flour is ground by means of rollers, and the remainder, which resists the action of the rollers, is ground by millstones.

The percentage of the product is as follows:

Groats and superfine flour.....	18.724
Fine flour.....	32.682
Bread flour.....	22.224
Dark flour.....	3.576
Bran.....	18.516
Waste.....	1.290
Dust, etc.....	2.088
	100.000

In each 100 parts of flour are contained:

No.	Water.	Ashy contents.	Nitrogen flour dried at 100 deg.	Nitrogen in un-dried flour.	Starch.
A.....	11.050	0.398	2.089	1.858	69.983
B.....	11.545	0.386	1.874	1.658	69.530
000.....	11.077	0.380	2.011	1.808	72.145
0.....	10.618	0.416	2.071	1.851	71.017
0.....	10.492	0.452	2.087	1.868	68.867
1.....	10.142	0.481	2.122	1.907	68.3-6
2.....	10.421	0.586	2.242	1.981	67.302
3.....	10.544	0.611	2.435	2.178	67.176
4.....	10.748	0.764	2.611	2.329	65.631
5.....	10.674	1.176	2.788	2.491	61.773
6.....	9.427	1.549	2.570	2.325	61.031
7.....	10.690	5.240	2.518	2.249	45.838
8.....	11.159	5.690	2.513	2.233	41.453
9.....	9.235	2.648	2.616	2.375	Nil.

An examination was further made of a sample of flour which contained all the bran, and the composition of which was almost identical with that of the underground grain. There were found:

Water.....	10.743 per cent.
Nitrogen.....	2.506 "
Starch.....	64.475 "
Ashy contents.....	3.503 "

Another sample of flour made from the entire grain, but from which bran had been separated to

the extent of 13 per cent, showed the following composition:

Water.....	10.548 per cent.
Nitrogen.....	2.518 "
Starch.....	65.600 "
Ashy contents.....	1.032 "

If the analyses are compared, it will be found that the coarser the flour becomes, the more considerable is the increase of ashy contents, and (in almost the same proportion) the decrease of lime and potash contents, and the increase of magnesia. Nitrogen increases up to the bread-flour qualities, and decreases again in bran,—the greatest difference, however, is but 0.8 per cent. The water contents show but slight variations, and the grain is to be considered as well dried, otherwise the analyses would in most cases show more water.

Thus far Herr Dempwolf. Of especial interest, however, is the note appended to the end of the essay by Baron Von Liebig, which runs as follows:

"I am indebted to the kindness of the Directors of Pester Walzmuehle for the materials for this investigation, which was prosecuted in my laboratory by Herr Dempwolf (then my assistant), as also for the very interesting statement respecting the yield of the different flour products, as ascertained by the grinding of one hundred grains received in the course of a year's operations. I owe to the Directors of the Pester Walzmuehle my best thanks for their information and assistance in this investigation, which has afforded an opportunity of ascertaining the distribution of the component parts of corn on its being turned into flour. The analyses show that the flour products of the Pester Walzmuehle occupy the first rank in respect to their nutritious qualities; they are of the greatest fineness; all by far surpass in bread-yielding qualities and other descriptions of flour which have ever come under my notice."

**THE INCOMING COMMISSIONER OF PATENTS.**

The newly appointed Commissioner of Patents, Gen. Halbert E. Paine, brings to his delicate and responsible position an excellent record for capacity and efficiency.

General Paine comes of honorable stock; and from the days when his grandfather thrice removed fought in the old colonial wars, down to the present, there have not lacked men of his name who have served their country in the field and in responsible places in civil life. Born in 1826, he was graduated at the Western Reserve College at the head of his class in 1845, and admitted to the bar four years later. His military title was won by hard service in the war of the rebellion. Subsequently he was elected to Congress; first to the thirty-ninth, again to the fortieth, and yet again to the forty-first. In his Congressional service the high reputation he had won in the army for sterling capacity and integrity in the conduct of affairs was admirably sustained. He was at the head of the Committee on Militia, served on the Committee on Reconstruction during its whole existence, and was successively member and Chairman of the Committee on Elections, in which onerous and difficult position he compelled the admiration of political opponents as well as party friends. To him is credited also the perfection and passage of the Signal Service Act.

At the expiration of the Forty-first Congress, General Paine refused to stand again, preferring to return to the practice of his profession. He established himself at Washington, where he has since resided. A short time since he was offered the post of Assistant Secretary of the Interior, but declined. His acceptance of the Commissionership of Patents will, we trust, prove eminently satisfactory to himself and to the country.

Touching his plan of action in the new field, General Paine lately declined to speak further than to say that he had given the subject some thought and viewed his approaching duties without apprehension. He knew the position to be an arduous one to fill, furnishing work enough to keep the most ambitious incumbent busy; the arrangement of details he would leave to the observation and conclusions of occupancy. In view of General Paine's long acquaintance and professional association with the Secretary of the Interior, it is believed that his appointment will prove advantageous to the Patent Office, in insuring perfect harmony between it and the ruling department. Inventors, and all likely to have business to do with the Patent Office, will be pleased to know that promptness and thoroughness will characterize the working of the office under the new rule.—Scientific American.

A Virginian writes in praise of corn, not only as the best food for laboring men, but for domestic animals of all kinds. He states that the usual rations for a negro laborer, for a week, is one and a half pecks of corn, three pounds of bacon and a little molasses. They thrive on it and are healthy and strong. Southern horses and mules, as a rule, have only corn for grain, but they live longer and do more work than northern horses that feed on oats. In this part of the country dogs are fed almost exclusively on corn meal, and they not unfrequently eat corn in the ear, while wandering curs devour it on the stalk. Even cats eat corn meal stirred up with water, as is done in the case of chicken feed.

Mr. A. Kellogg, of Wrightstown, Wis., has put into his new grist mill a 45 horse power upright engine and will soon have in another run of stone, making three in all. Mr. Kellogg is also one of the proprietors of the new mill at Fort Howard, Wis.

EVERYBODY READS THIS.

NEWS OF THE WORLD.

Items Cathered from Correspondents, Telegrams and Exchanges.

CROP ITEMS—MILLING AND MANUFACTURING ITEMS—FINANCIAL ITEMS—CASUALTIES—ETC., ETC., ETC.

Reubens, Kan., has a fine new flour mill.

The Litchfield, Minn., mill is running on full time.

The mills at Depere, Wis., are all doing a good business.

The mill at Grantsburgh, Wis., is running day and night.

The new mill at Windom, Minn., started up on the 12th inst.

A new grist mill is to be built about a mile east of Trenton, Wis.

Ellsworth, Kan., has three grain elevators and one flour mill.

Ed. Paulson is building a large feed mill at Albert Lea, Minn.

The new mill at Montgomery, Minn., will soon be in running order.

W. C. Esler is to take charge of the grist mill at Beaver Falls, Minn.

Stephens & Bailor's mill at Osaka, Minn., is crowded with work.

Mr. Leaver's mill at Greenleaf, Minn., is hereafter to be run by steam.

Mr. Swanson's new mill at North Branch, Isanti Co., Minn., is nearly finished.

Paul Munch, of Franconia, Wis., is erecting another addition to his grist mill.

Mr. N. E. Brown, of Cedar Rapids, Ia., has been making some repairs in his mill.

Geo. Harshman's distillery at Harshmanville, Ohio, burned. Loss \$18,000.

Water is low at Dundas, Minn. The Archibald mills run about ten hours a day.

Daniel F. Lombard, miller of South Windham, Me., has retired from business.

A Green Mountain water wheel is the latest addition to the mill at Kingston, Minn.

J. T. Maybury & Co's flouring mill at New Orleans, La., burned. Loss, \$25,000.

Edward Thompson, of Hokah, Minn., has been getting up a diamond stone dresser.

The brick work on Mr. Hubbard's new mill at Mankato, Minn., is nearly completed.

The steam flouring mill at Shakopee, Scott Co., Minn., is fast approaching completion.

Dickson, Easton & Co's mill at Chatfield, Minn., has recently been thoroughly repaired.

Diamond & Reiser's flouring mill at Sister Bay, Door Co., Wis., is now in full operation.

Mr. R. Thompson, of Menominee, Wis., has rented the Winger Mills at Martel, Wis.

H. A. Jewett is repairing the mill at Cedar Mills, Minn., and will soon have it ready to run.

Messrs. Nye, Yager & Co., of La Valle, Wis., have put a new run of stone in their mill.

Mr. Alden will soon have his flouring mill near Alexandria, Minn., inclosed and under roof.

The firm of Gardner & Moore, of Cannon Falls, Minn., is succeeded by Stephen Gardner.

The town of Monument, Col., offers a suitable site to any one who will put up a grist mill there.

F. D. Keyes, of Lake City, Minn., is rebuilding his flouring mill which was burned last summer.

F. Harkee, of St. Peter, Minn., is building an addition to his mill to secure more storage room.

The Eldora, Ia., flouring mills have been thoroughly overhauled and are now at work again.

John T. Noye & Son have ordered Walker's Belt Tighteners for several of their milling patrons.

A two-run water power mill is to be built at once at Gary, Deuel Co., Dakota, by a Mr. Vicklin.

Sheafe's flouring mill at Elk Point, Dakota, grinds 500 bushels of wheat every twenty-four hours.

The flouring mills of Lanesboro, Minn., which have been undergoing repairs, are again at work.

The boiler in the Bachelor's saw mill at Foreman, Mich., exploded. Jesse Foreman was killed.

B. D. Sprague, of Rushford, Minn., is shipping 1000 barrels of flour per week to eastern markets.

A large flouring mill is in operation at Mazatlan, Mexico, and grinds wheat imported from California.

Mr. E. Newman, a Janesville, Wis., miller, has gone to Fox Lake, Wis., to take charge of a mill there.

A substantial new frame dam is being put in at the Warner mill, on Dobbin's creek, near Austin, Minn.

It is reported that Mr. J. M. Vincent has purchased a half interest in the flouring mill at Taylor, Wis.

J. D. Smith got caught in a belt in the Eau Claire, Wis., saw mill Oct. 12, and was instantly killed.

A new grain elevator at Beloit, Kan., is nearly completed. The wheat receipts at that point are large.

M. H. Thomas & Sons' grist mill, at Galveston, Ind., burned October 23d. Loss \$9,000. No insurance.

The Thompson mill at Hokah, Minn., commenced work last week under the new management of S. C. White & Co.

Edward Thompson, of Hokah, Minn., has invented a diamond mill stone dresser, which is said to work perfectly.

The water was drawn off from the pond at Hudson, Wis., last week, to admit of some repairs at the Willow River mills.

S. Mackey & Co., of Reedsburg, Wis., have increased the force of their mills by engaging the services of a St. Louis miller.

The Esdaile, Wis., mill company are making good progress with their new mill and dam which will be ready for next season's work.

A great conflagration in Riazan, a city of Russia, recently, destroyed property to the amount of 2,000,000 rubles, or about \$1,500,000.

Three hundred Icelanders emigrated to Canada during August, making 1,800 who have repaired thither during the past three years.

Nordyke & Marmon Co. of Indianapolis, Ind., have within the last six weeks shipped over fifteen of their improved 20-inch New Era mills.

During last month Nordyke & Marmon Co., of Indianapolis, Ind., have shipped nine complete 2 and 3-run mill-outfits to the State of Kansas.

E. J. May, of Lizton, Ind., is adopting the new process, and has ordered the necessary machinery of Nordyke & Marmon Co., of Indianapolis, Ind.

The baker who sings "Tell me where is fancy bread" has added "Good pie sweetheart, good pie" to his repertory. He kneaded another song badly.—Figaro

Nordyke & Marmon Co. of Indianapolis, Ind., are overhauling the mill at Elizabethtown, Ind., owned by Calvin Butler, and changing it to the new process.

William Chap's steam saw and flouring mill at Wallace, Mo., a few miles from Atchison, burned to the ground Oct. 21. The loss is \$2000; no insurance.

The Green Street Mills, at Richmond, Ind., are adopting the new process, and the machinery is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Arnold, Thomas & Co., of Huntingdon, Ind., are putting in a four-reel merchant bolt, which is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Messrs. Meek & Bros., of Bonapart, Ia., have contracted with the Richmond City Mill Works of Richmond, Ind., for a six-run mill complete, including water wheels.

S. H. Marten, of Milton Cabel Co., West Virginia, is putting in a 42 inch wheat burr. A two-run chest, etc., furnished by the Richmond City Mill Works, of Richmond, Ind.

New chilled iron rolls and new bolts have recently been put into the St. Croix mills at Stillwater, Minn., and there is some talk of building an elevator in connection with the mill.

Nunnemacher Co., of the Star Flour Mills, have ordered six pair of stone complete with iron husks, etc., and ten reel bolt chests, from Edw. P. Allis & Co., of the Reliance Works.

John B. A. Kern, of Milwaukee, has ordered two more of the Wegmann porcelain roller mills from Edw. P. Allis & Co. This makes eight of these machines that he has in all.

The New Free Press, of Vienna, complains that the export of Hungarian wheat is almost at a standstill, partly in consequence of the Americans underselling the Hungarian markets.

Jeffries Bros. of Cory, Ind., are making important additions to their mill and adopting new process machinery, which is being furnished by Nordyke & Marmon Co., Indianapolis, Ind.

Pierce & George, of Sulphur Springs, Tex., are building a two-run mill at that place. The Richmond City Mill Works, of Richmond, Ind., have the contract for burrs and machinery.

Nordyke & Marmon Co.'s summer importation of their favorite reddish cream-colored French burr stone arrived at Indianapolis, Ind., last week, and consisted of a train of fifteen cars.

Lewis Graham, Esq., of Alden, Minn., is enlarging his mill, and adding new burrs and necessary machinery, all of which is furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Edw. P. Allis & Co., of Milwaukee, have received an order for four Wegmann patent porcelain roller mills, six purifiers, and one bran aspirator, from S. Harvie & Co., Gault, Ontario, Canada.

Wm. Chap's steam saw and flouring mill at Wallace, Mo., was burned last Saturday afternoon. The fire is said to have originated from spontaneous combustion. Loss, \$2000, with no insurance.

J. W. Gordon of Litchfield, Minn., and his brother, W. B. Gordon, who has just finished his apprenticeship in the Forest City mill, have leased the Carville mill in East Kingston, Minn.

J. D. Ball & Co.'s large flouring mill at Ballville, Ohio, was totally destroyed by fire on the morning of Oct. 20; 5,000 bushels of wheat were stored in the mill. Loss, \$28,000. Insurance, \$7800.

Alfred Huntington, formerly head miller at the Empire Mills, Milwaukee, has recently purchased in partnership with Mr. Koch, the mill at Barton, Wis. The firm is known as Huntington & Koch.

It is estimated that the barley crop will fall short of the demand in this country to the amount of 10,400,000 bushels. The crop reports indicate an unusual shortage both in this country and in Europe.

Messrs. Vance, Parrott & Co. recently commenced building a fine 3-run flouring mill at Pierce City, Mo. The entire machine will be purchased of Nordyke & Marmon Co., of Indianapolis, Ind.

The Atlas Engine Works, Indianapolis, have contracted with Isaac Staples, Stillwater, Minn., for one of their 18 x 48 Atlas-Corliss condensing engines, with a battery of steel boilers, to be delivered Dec. 1.

Cawker City, Kan., advertises for some one to locate a steam grist mill there. For further particulars address Mayor W. C. Whitney, Cawker City, Kan. Here is a good chance to make money for some one.

Messrs. Settle & Burnley, of Woodville, Ky., have ordered of the Nordyke & Marmon Co., of Indianapolis, Ind., a 3-run mill and engine, with modern improvements, all of which is under construction.

M. L. Strickland, of New Marion, Ind., is putting in purifiers and otherwise fitting up his mill for the manufacture of new process flour. The machinery is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

A concession has been granted for the laying of a railroad from Jaffa to Jerusalem, and for the con-

struction of a harbor for ships at the former place. Gen. Mott, of the United States army is actively engaged in this enterprise.

The City of Glasgow Bank has failed. Liabilities said to be nearly \$50,000,000. One London East India house has failed for \$15,000,000, and other great and many small failures in Great Britain and her colonies are sure to rapidly follow.

Wm. Cook, of Harvard, Neb., is building a 2-run water mill, which is being manufactured by Nordyke & Marmon Co., of Indianapolis, Ind., which makes the sixth mill on it furnished by this firm during the last few months in Nebraska.

Messrs. Kellogg & Son have completed their new mill at Fort Howard, Wis., and are now at work. The mill has one run of stone for flour and one for corn and feed. The machinery is all of the latest make and the flour turned out is good.

Edw. P. Allis & Co. have completed the Niagara Mill, which they have been building for Messrs. Schoellkopf & Mathews, of Buffalo, N. Y., and it is pronounced by all who have seen it as the finest mill in the United States, if not in the world.

At the Coliseum Theater in Liverpool, Eng., on the night of Oct. 12, a cry of fire was raised, which caused a general stampede for the doors, in which thirty-seven persons were crushed or suffocated, many of them being strong, able bodied men.

Orlando Furnas, of Edinburg, Ind., is tearing out and remodeling his mill, and with the large amount of improved machinery ordered of Nordyke & Marmon Co., of Indianapolis, Ind., intends to make it one of the best new process mills in the State.

With respect to the present rice crop in Louisiana it is estimated that it will be the largest yet made in that State, and that the quality shows an improvement on previous crops. Present estimates place the yield at between 175,000 and 200,000 barrels.

Special telegram from Clinton, Mo., to the Sedalia Democrat dated Oct. 9th, reported the burning of Messrs. Riehl & Brannum's Tebo Mills and elevator, and the destruction of 22 bushels of wheat, and 100,000 barrels of flour. The loss is estimated at \$20,000.

A new style of crane has been fitted to the Eau Claire Lumber company's grist mill for the purpose of raising the upper stone when necessary. The improvement consists in carrying the chain round a pulley, and attaching it to a horizontal screw, instead of a vertical crank, as formerly.

John W. Benham & Co., of Pontiac, Ill., have ordered of Nordyke & Marmon Co., of Indianapolis, Ind., machinery for a first-class 4-run new process merchant mill, including a 60-horse-power engine. The machinery will be located in the building by Nordyke & Marmon Co.'s millwright.

At the county fair held at Portage, Columbia Co., Wis., the first premium for winter wheat flour was awarded to George D. Dates & Co., of Fort Winnebago, and the second to John McKenzie, of DeKorra. On spring wheat flour Mr. McKenzie took the first premium and Dates & Co. the second.

A new elevator is to be built immediately by Bowersock & Co., on the south side of the Santa Fe track, directly opposite the Douglas County Mills. The capacity of the new building will be 50,000 bushels, and the machinery will be of the latest and most improved style.—Lawrence (Kin.) Journal.

S. H. Bradley, of Mendon, Ill., who recently had their mill changed to the new process by Nordyke & Marmon Co. of Indianapolis, Ind., writes us that they are running eighteen hours per day, and are having heavy orders for their much improved grades of flour. They recently shipped 1000 barrels to Scotland.

During the last month the machinery for the large, handsome new process mill of Brose Bros., at Evanville, Ind., is being located by J. C. Bare, with a large force of workmen. This mill promises to be one of the finest and best in that part of the country, and every one looks forward to the time when it will be in full operation.

Messrs. Hudnut & Co., of Terre Haute, Ind., operators of the large honny mills, have added four portable mills and other machinery for increasing their capacity, all of which is furnished by Nordyke & Marmon Co., Indianapolis, Ind.; also J. B. Harris, Adams & Creal, and I. J. Bolton, all of same place, are fixing up their mills.

The work on the Washburn A mill progresses, the excavation having been about completed. The immensity of the structure which is to supplant the old big mill is already in a measure outlined, and it is clear that the reconstructed mill will cast its famous predecessor into the everlasting shades so far as proportions are concerned.—Minneapolis Tribune.

In the little city of Cohoes, N. Y., there are 20 knitting mills, whose combined production reaches upward of \$20,000,000 in value. The production is almost exclusively confined to underwear—shirts and drawers. One of the largest establishments is that of the "Diamond Knitting Mills," of Messrs. Hines & Vail, who employ 200 skilled operatives, and turn out annually over 22,000 dozen shirts and drawers.

One of the largest and best appointed oatmeal mills in the country is the North Star Mills, of Messrs. Stuart & Douglas, Cedar Rapids, Iowa. Though having a capacity of 600 barrels of oatmeal per day, so popular has their brand become, and so thoroughly has the public taste been cultivated for oatmeal by the excellence of the article, the North Star Mills are kept constantly running to their full capacity to meet the demand.

The San Francisco Call speaks of the California wheat crop as follows: The total is certainly enormous. Allowing 10,000,000 bushels for seed and home consumption, the table shows a surplus of nearly 1,000,000 tons. This may be in excess of the ultimate yield, but a careful analysis of the statement warrants the expectation of at least 750,000 tons surplus, even should the yield in the worst counties fall to bottom estimates.

On the Northern Central Railroad of Pennsylvania, recently, Engine No. 40, driven by Robert Burgeon, with Conductor Jarvis in charge of the train, drew from Clark's Ferry to Sunbury, a distance of thirty-one miles, a train consisting of 183 empty freight cars, one loaded eight-wheeler, two cabooses and a dead engine. It was up-grade work, but the trip was made at the rate of ten miles an hour. The train was 6200 feet long, or 920 feet more than a mile, and, it is claimed, was the longest ever drawn by a single engine.

There is a farm in Dakota in which a Boston man is interested, which has 13,000 acres of ground in

wheat this year, and yielded 325,000 bushels, worth \$300,000, more than one-half of which is said to be the profit. The intention of the owners of the farm is that the acreage and product shall eventually be trebled. When a million dollars in gold or silver is dug from the earth, there is great rejoicing, and men and women go wild for stocks in the mines, but the gain from such a farm as this is more valuable to the country, and attracts far less attention.

**TORPEDO PRACTICE ON SHARKS.**

Hunting the Vulture of the Sea in a Novel and Scientific Way.

[From the London Daily News.]

Not a year, indeed hardly a month, passes but a shark spoils a British ship of one or more of her hands. While the vessel is in the harbor, or riding in the offing, a man tumbles overboard, or is capsized from a boat, or attempts to swim ashore, and is torn in pieces by sharks within sight of help and sound of human voice. The Alice Davies, of Liverpool, has just returned to the Mersey, and in her "log" is duly recorded a terrible catastrophe of this kind. She was anchored off a small river known as the Probolinggo, on the coast of Java, and one of her crew, a Welshman, of the name of Owen, went with four others to bathe. They were all good swimmers, and Owen, who was the most skillful, had ventured some little distance from the vessel, when he was suddenly heard to utter a piercing shriek. A large shark, rising suddenly from the bottom, had bitten him immediately below the fifth rib, and literally torn him to pieces. A rope was thrown to him, but his injuries were so terrible that he immediately sank. His companions escaped uninjured, but of Owen's body no trace was recovered. The shark which attacked him was, we are told, judged to be fifteen feet in length. Such dimensions, although large, are yet not unusual in the Javanese Seas.

The shark is not so much the tiger as the vulture of the sea. Like the vulture, he hesitates to attack anything with life in it; but, if hungry, becomes for the time possessed with a courage not his own. We shall never exterminate him, and his presence in tropical waters must always remain a constant source of danger. Meantime he has at least this merit, that wherever he may be found he affords a certain rough species of sport. There is no better fun than fishing for a shark with a hook the size of a pitchfork, and a huge piece of pork by way of bait. Harpooning the creature is also an exciting amusement, although seldom practiced. Of late years, too, the shark has been hunted in novel and scientific ways. There is no better form of rifle practice than to shoot at him from over the stern, with explosive bullets. If you miss him he still follows on. If he is hit, a great hole is rent in him. He rolls slowly over on his back, displaying his cruel, gaping jaws and vast expanse of white under-surface, and his brother sharks, coming up from around, quarrel and dispute fraternally over the carcass. Best, however, of all modes of shark chase, because most scientific, and consequently most amusing, is that recently adopted in her Majesty's navy of combining torpedo drill with shark fishery. A miniature torpedo is inclosed in a bait of junk or pork, and lowered with proper care. The battery is duly charged, and at the moment that the huge fish seizes, and as a pike fisher would say, "pouches" the tempting morsel, the circuit is completed. The effect is instantaneous. The head and jaws of the monster are blown into fragments, and a bubbling circle in the water marks the spot where, a few seconds before, his dorsal fin was showing above the waves.

**HOW TO FILE AND SET A HAND-SAW.**

When a saw is in bad order, the teeth are irregular in length and pitch. This occurs through improper filing, and results in the saw working hard. The reason is that a saw irregularly filed, or set, cuts only with the longest teeth and those that have the most set. To remedy these defects, it should be pointed and filed until the teeth are all of even length, and are pitched so that the front of each tooth is at right angles with the back of the saw. The saw is fastened into a clamp, which consists of a pair of jaws fixed upon a stand, and moved by screws. The ends of the teeth are brought to a level by running a flat file lengthwise of the blade. The best form to give the edge is a slight curve from end to end of the saw, making the middle slightly rounding outwards, never hollow.

The handle of the saw when in the clamp should be to the left, and not be changed during the filing. The part held in the clamp should be filed completely before being moved, if the jaws are not long enough to hold the whole. On a rip-saw, the teeth will be filed square on a cross-cut, they are beveled upon alternate sides. Both sides should be filed without moving the saw, which may be done by changing the position and manner of holding the file. A beginner should provide a handle at least a foot long for his files; this will enable him to hold it steadily, which is very necessary for good work. The proper size for a file is 3 1/2 inches long for a saw having eight teeth to the inch. A saw is set before it is filed. The set given for easy cutting should be such as to make the cut as wide as twice the thickness of the blade.

Several good sets are sold at the tool shops which are self-regulating, and make even work. If only a few of the teeth are short, they need not be pointed, but may be touched with a few strokes at each filing, until the rest are worn down to them. If one has no clamp, a strip of hard wood may be laid upon each side of the saw, and the whole held tightly in a vice. In filing, the strokes should be made from the operator and not towards him. The file should be grasped firmly in the right hand, while the tip is held lightly between the finger and thumb of the other. A safe rule is to work slowly, and to test the teeth as the work progresses with a try square. As long as the faces are kept at right angles with blade of the saw, the backs must come out right.

## EDISON'S NEW LIGHT.

Mr. Edison came clattering down the stairs, glowing with a pleasant excitement and evidently just emerged from his wizard's caves. "Hello, is it you?" he said rapidly. "In a week or two I'll have my electric light ready for you to illustrate, if you care to do so." "You seem to be making a panic among the gas companies," said the Graphic. "Well, yes; those old fellows know what they are about. I've got 'em certain, and they are finding it out." "Is there really any good cause for this sudden tumble of gas stocks?" "It is a little precipitate, perhaps, but it was bound to come. The electric light is the light of the future—and it will be my light—unless," he added, with a conciliatory twinkle, "some other fellow gets up a better one. Still, the gas stocks need not decline. The companies can just adopt electricity instead of gas and run our wires instead of their pipes."

He led the way up stairs again, to the second floor of the laboratory, and paused before the bench where he first hit on the phonograph, and where he finished his telephone. Three small brass standards were there, six or eight inches high, each with a small glass globe or cylinder at the top, enclosing a curious nest of wires. From each standard a wire descended through the floor. "These are the lamps," said the inventor, relighting the pipe which had gone out, and laying it on the bench, where it immediately perished again. He touched a lever on the bench. "Now the current is on this lamp," he explained, touching the smallest; "it is lighted, but you do not yet see it." Presently the nest of wire at the top assumed a dull crimson glow. In another minute it was scarlet; then it turned to a fierce white heat. "Of course, there is no flame," he said; "the light is wholly from incandescence. That light is just about equal to one gas jet. I can increase or diminish to any extent. I can regulate it with mathematical accuracy." "What is that wire that glows?" "That is platina." "How long will it last?" "Forever, almost. It will not burn. It never oxidizes." Then he turned it down through all shades of red, till the light vanished. "You do not see it now," he said; "but it is lighted. It is invisible, and the electricity required is almost infinitely small, but it is there, and a touch will recall it—see!" and he tapped the lever and the illumination returned. "How's that for a sick room?" he asked with a broad smile of pleasure. He connected the circuit with two other lamps and showed their different patterns and capacities. Then he explained the peculiarity which rendered this electric light practicable and valuable. "Where does this electricity come from?" he was asked. "Down stairs. It is furnished by our engine. We use Wallace's machine—William Wallace, of Ansonia, a wonderfully ingenious man. We use his generator. It simply turns power into gas. In actual operation, one large engine would supply a whole town with light." "How much will your lights cost, Mr. Edison?" "They'll cost a good deal less than gas. How much less is not now certain, nor is it prudent to estimate it."

We returned to the electric lamps. "You light one of these," said Edison, "by just turning a thumbscrew. No lighting of matches, no fumes, no danger of suffocation or damage if you leave it turned on full." We followed him to the back window, where he called our attention to groups of workmen digging, and said, "I am putting up a new building there to perfect this electric light. It will be 135 by 35 feet, and will be equipped with two eighty-horse power engines, an immense hydraulic press, and much other machinery. We are going to put electric lights all over Menlo Park, and see how many one-horse power will feed. We want to know exactly all about it." The return train whistled unexpectedly, and the visitors rushed down across the field, followed by the warning voice of the Wizard, who shouted from the porch, "Don't give me away—till next week!"—N. Y. Graphic.

## BRUDDER JONES REPROVED.

THE FOLLY OF PUTTING ON STYLE ON A SMALL FOUNDATION.

"We doan' 'spect to fin' parfeshun in human natur," began Brother Gardner, as the Lime-Kiln Club came to order. "We realize dat it am human to take de wrong street kyar once in a while, an' dat none of us kin predict de wedder straight from de shoulder an' nebbber miss a hailstone. Nebbberdeless, de true man will praise whar' it am justified, an' criticise whar' it am needed, an' now Brudder Horseradish Shortcake Jones will please an' stan' up."

The brother, who resides on Watson street, was so surprised and amazed that he could hardly reach his feet. He had no suspicion that anything was coming, and his elbows trembled as he felt in his vest pockets for some watermelon seeds to brace his nerves.

"Brudder Jones, you were in de Poss Office last Tuesday an' Wednesday an' Thursday, 'bout 10 o'clock in de forenoon?"

"So I was," replied Jones.

"You had on a caliker shirt, a big stan'-up collar, long cuffs, an' you car'ied a cane an' walked wid de moshun of de biggest giraffe in de show. I saw you dar, Brudder Jones, an' dar kin be no mistake. It pained my heart to see you swellin' 'round in dat style, when I knowed dat you hadn't \$5 in de world; but swellin' 'round wasn't 'nuff for you. You waited till a crowd had neglected at de general delivery winder, an' den you pushed in an' called out: 'Am der a letter heah fur me from Noo Yawk wid a tree hunderd check in it?'"

You played dat game free days runnin', 'specting dat de crowd would take you fur de man who owns de City Hall. What has you to say, Brudder Jones?"

"Nuffin', sah. Ize mighty sorry, sah, dat I made such a fool of myself."

"So am I, Brudder Jones," kase de members of dis club has de general reputashun of bein' purty level on top de head. Now let me say to you dat de time you was inquirin' for dat check from New York I could see your hind patches, yer boots run down at de heels, a hungry look 'roun' yer mouth, an' such a spreshun in yer eyes as belongs to de chap who am dodging his washerman. All de older folks saw de same fings, an' dey laffed at you for pewterhead."

"I hopes I won't be frown outer de club, sah," replied the culprit.

"You am not on trial, Brudder Jones, I bring dis case up for your own good, an' to warn you dat de man who swells 'round under false colors am simply runnin' a race wid a fool. Be satisfied to be what you am an' nuffin' moar. If you git a check of free hunderd dollars from Noo Yawk, put it in yer vest pocket an' doan' emagine dat it's de fust check eber known. I doan' keer how well you dress, but take notiss dat de pussun who wars a stan' up collar shouldn't war black patches on ash-color'd pants at de same time. Kid gloves am all right, but dey doan' go well wid a pa'r of 50-cent bates. Long cuffs am a werry useful article o' commerce, but when dey trabble 'long wid a coat split out at de elbows de public will make remarks. Dat's all. Brudder Jones, take yer seat an' permit de reg'lar purreedin's to purreed."—Free Press.

## NOVEL PLAN FOR A MILL.

At the Mechanics' Fair in San Francisco, Cal., Mr. D. Bequette, a practical miller and millwright, had a plan for a flouring mill which is a wide departure from those upon which mills are generally constructed. His plan provides for the structure of a building which in general outline is like that of a pyramid, each story as it rises above the other, contracting its dimensions. The mill built on Mr. Bequette's plan would be a structure 130 square feet at the base, covering a superficial area of 16,900 feet. It would consist of eight floors, forming an aggregate elevation of 110 feet. The first and second floors of a flouring are always crowded more than those above them, the demand for space diminishing with each ascending story. According to Mr. Bequette's plan, the first or stone floor would be 130 feet square, the second 110 feet square, the third 90 feet, the fourth 70 feet, and the fifth 50 feet square. The three upper stories would each be 30 feet square, and on the apex of this pyramidal structure Mr. Bequette would place a water tank. The building is so designed that the roof forms the principal part of the sides, bracing the structure and giving it strength. On each floor a slanting roof rises from the outer edge of the flooring to the middle of the pillars sustaining the outer edge of the floor above. In this way, the upper half of the side of each floor is open and the lower half is wedge-shaped. With the exception of the roofing, the building is to be built of pillars, beams and flooring, and is practically without walls. The openings in the sides furnish abundance of ventilation for each floor, in order to prevent the accumulation of fine dust. With the aid of French tile, Mr. Bequette says that a mill could be constructed entirely fire-proof, the pillars, girders, flooring, etc., being made of iron. The power of the mill would be located in the basement, and would be transmitted to the upper stories by means of an upright shaft. Mr. Bequette would utilize the wedge-shaped sections under the roof of each floor

for the storage of screenings into hanging hoppers beneath. Mr. Bequette estimates the cost of a structure of this kind at only \$15,000.

**WHAT OATMEAL DOES.**—Liebig has shown that oatmeal is almost as nutritious as the very best English beef, and that it is richer than wheaten bread in the elements that go to form and muscle. Prof. Forbes of Edinburgh, during some twenty years, measured the breadth and height, and also tested the strength of both the arms and loins of the students in the university—a very numerous class, and of various nationalities, drawn to Edinburgh by the fame of his teaching. He found that in height, breadth of chest and shoulders, and strength of arms and loins, the Belgians were at the bottom of the list; a little above them, the French; very much higher, the English; and highest of all, the Scotch and Scotch-Irish from Ulster, who, like the natives of Scotland, are fed in their early years with at least one meal a day of good oatmeal porridge. Speaking of oatmeal, an exchange remarks that a very good drink is made by putting about two spoons of the meal into a tumbler of water. The Western hunters and trappers consider it the best of drinks, as it is at once nourishing, unstimulating, and satisfying.

**HIS EAR IN HIS POCKET.**—The Oil City Derrick relates the following: Yesterday a small boy with his head bandaged entered a bookstore and said he wanted to buy some school-books. As the clerk was waiting on him he inquired the reason his customer's head was tied up in such a shape.

"Oh," responded the boy, in a matter-of-fact way, "a horse bit off my ear this morning."

"No!" said the clerk doubtfully; "what was the trouble, anyway?"

"I tell you he did bite it off," the lad said, with some warmth, "and I can prove it, too. Just you look here now," and reaching down into his pocket he drew forth a wad of newspaper soaked with blood and slapped it down on the counter. A crowd formed around the little fellow, who with great gravity and a pardonable air of triumph proceeded to unwrap the unsavory mass. Then he pulled forth a ghastly relic in the shape of a human ear, evidently torn out by the roots. "There, didn't I tell you so?" he cried, exultingly. "He fetched it off at the first nip." The boy gave his name as Eagan, and said he lived on the Clapp farm. While working in the barn the horse reached his head over the side of the stall, caught the little fellows ear in his teeth and chewed it off. Having thus delivered himself, the lad carefully rewrapped his precious ear, thrust it in his pocket and departed.

**PRETTY COTTON-PICKERS.**—Not unfrequently young ladies, whose fathers and brothers or their laborers happen to be hard pressed with work, go into the fields and lend a helping hand. Among the latter class—is a young lady—the 15-year-old daughter of one of the oldest and most respected families on the Brazos—whom the correspondent met at the mansion of her father near Pattison. The conversation naturally turned on cotton-picking. The young Texan girl, blooming with youth, her dark hair floating over her fair forehead, matching her large dark eyes, that flashed at intervals, proceeded in her girlish way to give him all the information about cotton-picking desired.

"The most of my father's hands pick 150 to 200 pounds a day," she said.

"That seems excellent work," replied the correspondent.

She laughed, and her eyes flashed. "Why, I can do almost that well myself, and I am not used to it. I have gone out in pa's field and picked 150 pounds in a day."

"Didn't the sun burn your face to a crackling?"

"Why, no; I just put on this long sun-bonnet (exhibiting it) and a pair of gloves, with my fingers out at the top."—Texas Letter to St. Louis Globe.

An accident occurred recently at Stewart's mills, which might have proved fatal. The saw in the east mill was running through a large log, when some part of the feed works got out of order, and quicker than a flash the carriage was reversed, and the sawyer having no control over it, it was sent like an arrow out of the mill into the pond. The two men who were riding the carriage had a narrow escape, but fortunately escaped uninjured. It took nearly a day to repair damages.—Wausau (Wis.) Pilot.

Colorado wheat crop averaged from 25 to 30 bushels to the acre.

## YELLOW FEVER AND NEW ORLEANS TRADE.

The trade of New Orleans has suffered much by the yellow fever. The *Price Current* of that city of Oct. 9th says: "The present stagnation in all business is fully illustrated by a glance at our copious tables of receipts and exports which we give on our seventh page. It will there be seen that with the exception of wheat, rice and molasses, our shipments, consequent upon quarantine restriction, have been less than for the same period last year by such vast amounts, that the figures for the present season bear no comparison at all to those of the year previous. The receipts also indicate plainly what trade has been lost to New Orleans on account of the epidemic. We find that we have received since September 1st more dry salted meats, more rice, wheat and pork than for the corresponding period of last year; but most other articles, which go to fill the country demand for groceries, and other things of every day necessity, show an unprecedented falling off, even of our own country produce, such as hides, wool, moss, eggs, etc., which in the aggregate give employment to quite a number of persons. The arrivals have dwindled down to a mere speck, showing conclusively that the small as well as the larger industries have all been arrested in their regular occupations, creating suffering and want among our own people as well as among the country producers." There has also been a heavy falling off in the business of Memphis, Vicksburg, and in fact the whole fever district of the South. Thus to a large extent may be ascribed the dullness of the provision market the past two months and quietude in the produce market in St. Louis of which its merchants have been complaining.

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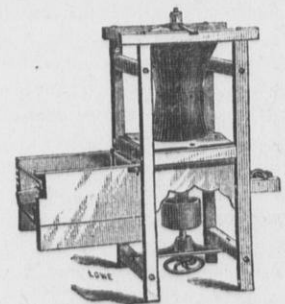
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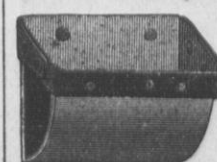
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These Buckets have a hardware (Japan) finish; are rust-proof, are light, durable and cheap; are of the latest and most approved pattern. Also Bolting, Bolts, Scoops, Iron Conveyors, and the SAFETY ELEVATOR BOOT. Special Bucket for Ear Corn. Liberal discount.

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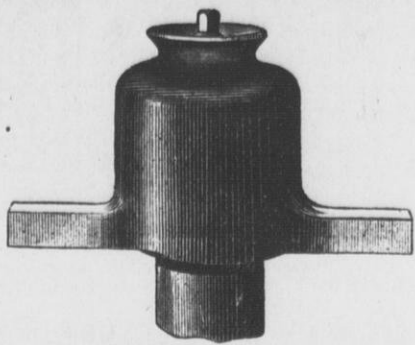
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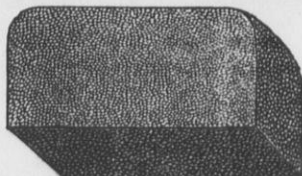
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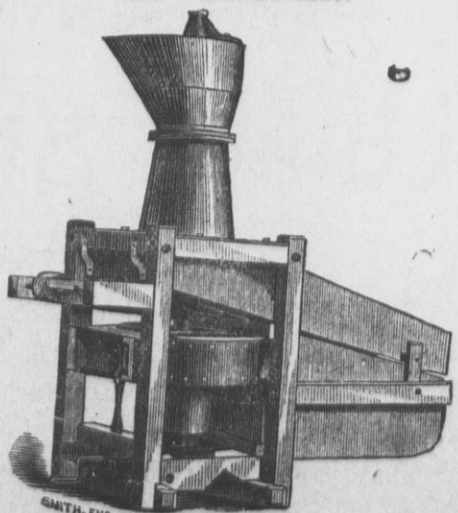


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We also publish a few letters from other parties. We get this kind of letters from millers in all parts of the United States, that use the Becker Brush.

We have used the Becker Wheat Brush now for over a year and we are very much pleased with it. It runs light, does its work thoroughly, and is entirely satisfactory to us. I am now convinced that it is one of the best machines made in the country, for the purpose. Very truly, GEORGE BAIN, President Atlantic Milling Co., St. Louis, Mo., Sept. 27, 1878.

Your Becker Wheat Brush Machine does the work well, is easy on power, and gives our miller little or no trouble. Have never seen a better machine; its work is beautiful; don't see how anything better can be wanted. HENRY C. YEAGER, President Yeager Mill Co., St. Louis, Mo.

We consider the Becker Wheat Brush equal in cleaning capacity to all the balance of our other cleaning machines, and are entirely satisfied with it. GALLATIN MILLS, Gallatin, Tenn.

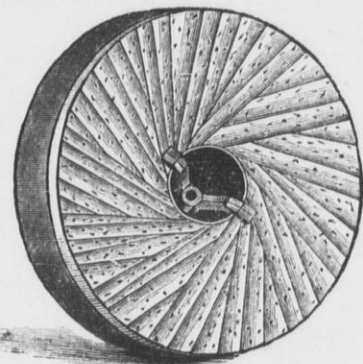
We must say that the Becker Brush suits us better from the very start than any other machine we have ever put in; it gave us the least trouble to get started and adjusted. In fact it gave us no trouble at all; but has done splendid work from the start. Our wheat is now much better cleaned than before. In regard to power required, can only say that the reason we had not put in a Brush long ago was that we thought we had not the power to spare to drive it, but now that we have got it, our engineer says he can see no difference in steam or fuel. Previous to using your Brush, we had frequent complaints that our flour was dark. Since starting it we have not had a complaint, so we feel confident it is doing us good in that way, as well as saving wheat in screenings. There may be better machines than yours but we have not seen them. OLIVER & BACON, Erie, Penn.

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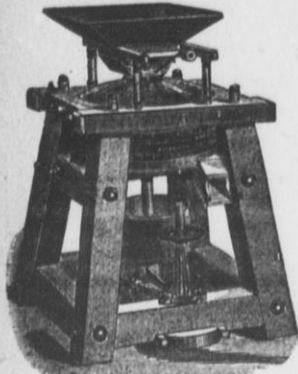
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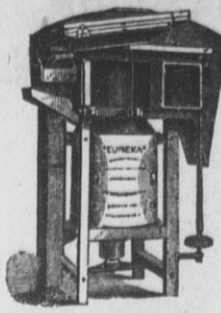
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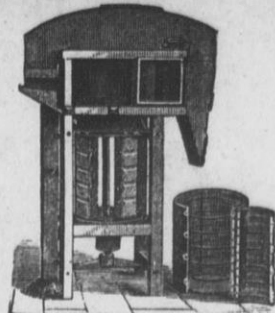
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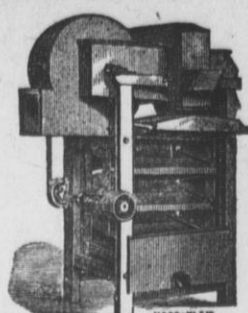
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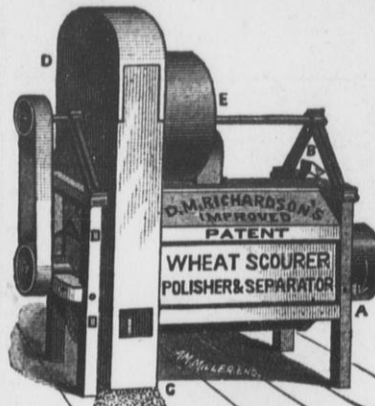
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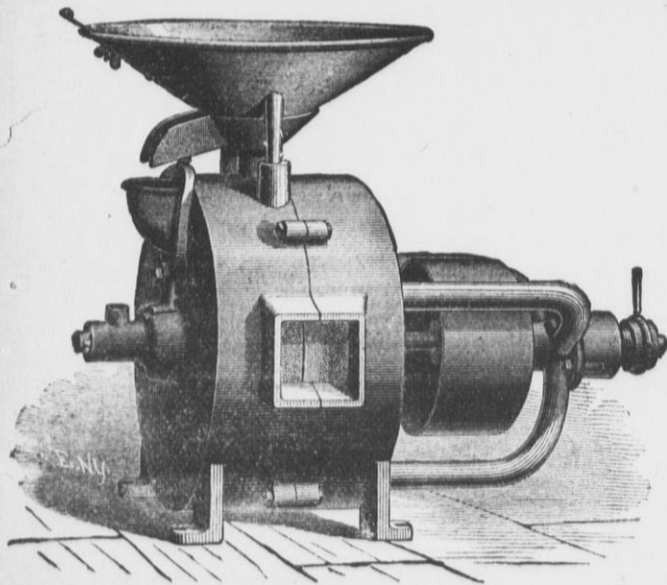
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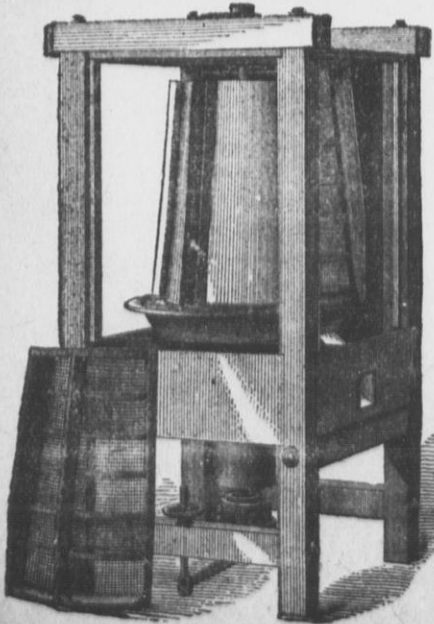
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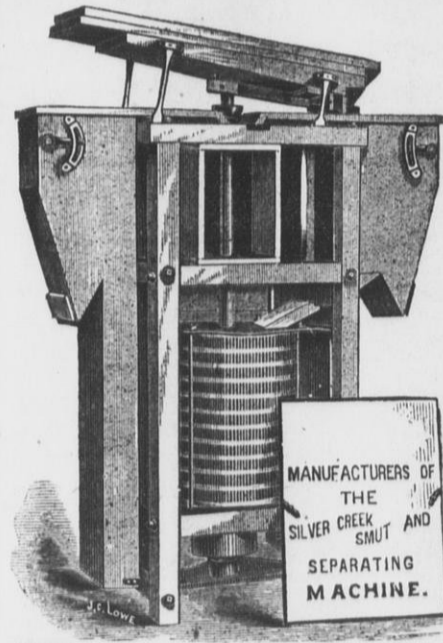
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With Adjustable Shaking Shoe and Changable Cockle-Screens, whereby all Cockle can be extracted from the Wheat. Will do thorough work, both as a Scourer and Separator.

Warranted not to cut or break wheat.

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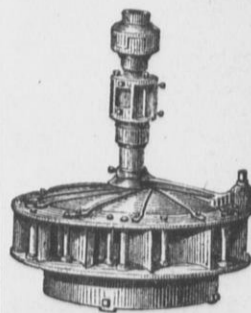
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Volume 6.—No. 2.

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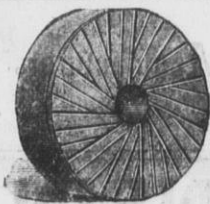
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Mill Furnishing, Foundrymen & Machinists. Established 1861. MANUFACTURE MILL STONES. Flouring Mill Contractors. Send for Pamphlet. Nordyke & Harmon Co Indianapolis, Ind.

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ONE-HALF INTEREST in a first-class three-run Steam Flour and Saw Mill. The sawmill is a double rotary, with gang edge, cut-off and bolt saws and shingle machine. It has been built but 18 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good country store in connection with mill. Would prefer to sell to a miller or a man that is well posted in store business who can command from \$6,000 to \$7,000 and furnish good reference. I will guarantee good margin in the trade. Address all communications to A. J. FULLERTON, Bonduel, Shawano Co., Wis.

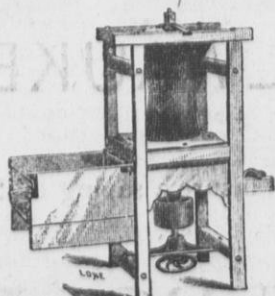
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2 1/2 x 2 1/2	6c
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4 x 6	17c
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These Buckets have a hardware (Japan) finish; are rust-proof, are light, durable and cheap; are of the latest and most approved pattern. Also Belting, Bolts, Scoops, Iron Conveyors, and the SAFETY ELEVATOR BOOT. Special Bucket for Ear Corn. Liberal discount.

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Adjustable While Running So as to shell corn of any size.

WILL also CLEAN the SHELLED CORN. Send for descriptive circular.

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MOST PERFECT In Construction.



THE ONLY First-Class Machine

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PERFECT SATISFACTION GUARANTEED

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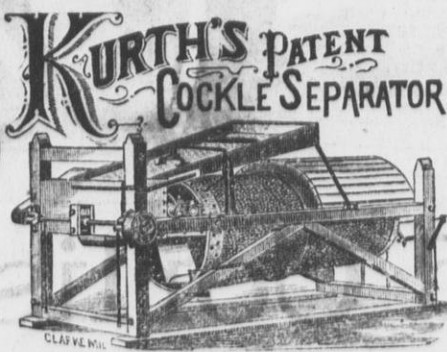
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### NOTICE.

We guarantee our machine to be unsurpassed for the purpose of removing Cockle from grain. It has stood the test in over 1,000 mills, and we have yet to hear of the first complaint. If desired, an Oat Separator and Wind Sucker can be attached.

### FOR RENT.

A MILL with four run of 4-foot burrs, at Kneisly, on Mad River, six miles above Dayton, Ohio. Water power unlimited. Mill has Smith's Middlings Purifier, and other improved machinery, and is in complete order. Is in a good wheat country and near the railroad depots. Also large dwelling, stable, etc. Will rent to a good party cheap. No one need apply unless having \$2,000 cash or more. Address JOHN HARRIES, Dayton, Ohio.

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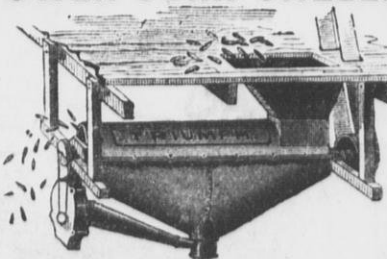
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Shells and Cleans 2,000 Bushels Ears per day.

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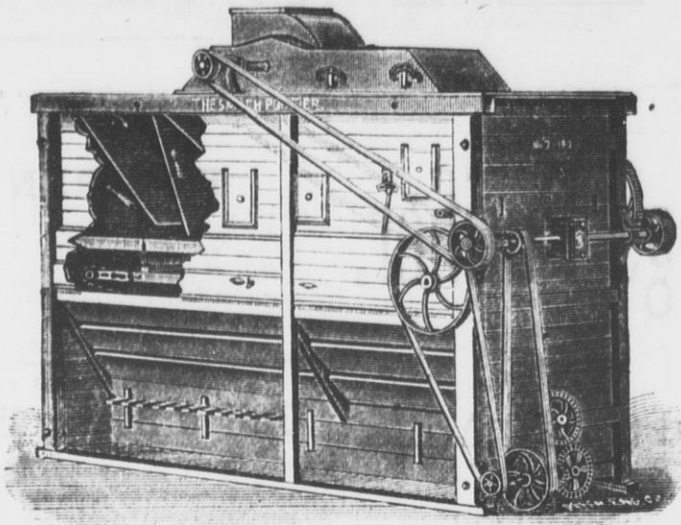
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**SIMPLE, DURABLE, ECONOMICAL,**  
AND REQUIRES BUT LITTLE POWER.



Purifies Middlings or Returns from Hard Spring or Soft Winter Wheat, thoroughly, and without waste.

HAS  
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We manufacture eight sizes, adapted to the smallest or largest mills. Our prices range from \$225 to \$600, and cover a license under all of the patents owned by the Consolidated Middlings Purifier Co.

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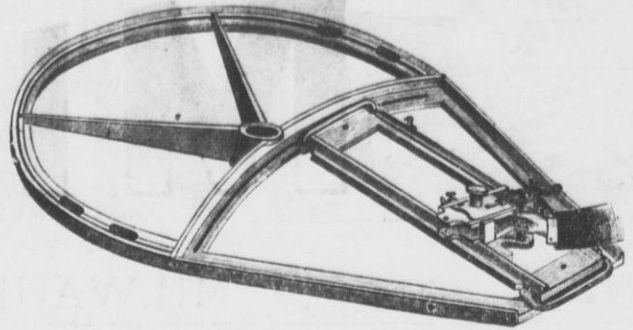
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Crack, Face, Furrow, and Take a Mill-Stone Out of Wind.

SIX STYLES  
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PRICES.



USED  
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Refer to E. J. Archibald & Co., Dundas, Minn.; Bennett, Knickerbocker & Co., Jackson and Albion, Mich.; Igleheart Bros., Evansville, Ind.; E. Sanderson & Co., Milwaukee, Wis.

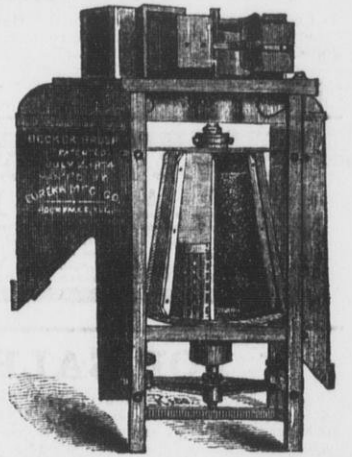
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# The Becker Brush!

Is now Receiving More Attention than any other Machine known to Millers, for Brushing and Polishing Wheat.

The superiority of the Becker Brush over all others consists in the following points:

- Conical Shape Brush.
- Combination Jacket of Punched Iron and Steel Wire.
- Raising and Lowering the Brush when in motion.
- An Adjustable Fan to run with or against the Sun.
- It Scours, Polishes and Separates at the same time.
- Takes the dust out of the crease of the berry.
- Takes the furze off the end of the wheat.
- It breaks no wheat.
- It does not disturb the bran. It greatly improves the color of the flour. Millers say it is a good Buckwheat Cleaner.



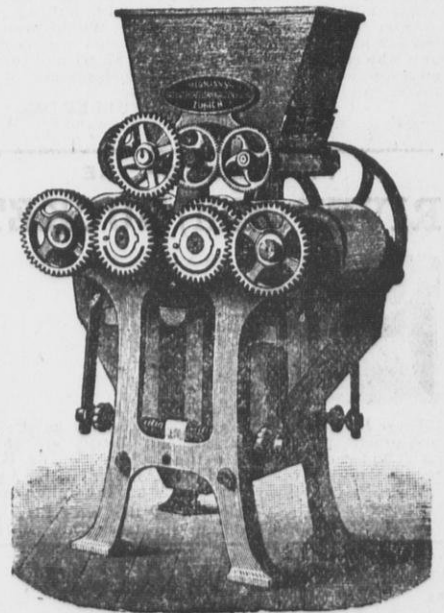
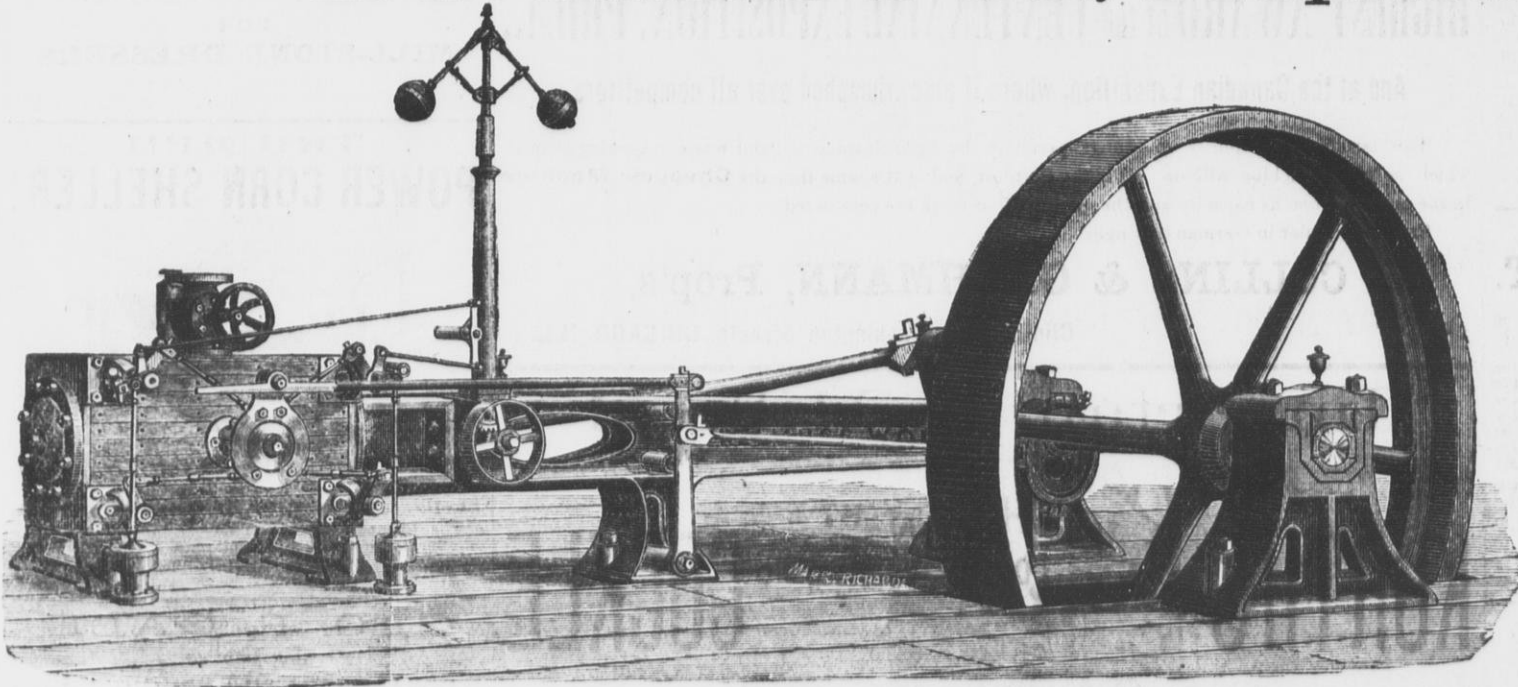
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WEGMANN'S PAT. PORCELAIN ROLLS.

# Improved Corliss Engine,

MANUFACTURED BY

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A saving of from 20 to 50 per cent. of fuel over all ordinary engines.

Improved condensing apparatus attached when desired, which effects a saving of from 25 to 33 per cent. of fuel.

Parties having engines of ordinary construction can have them fitted with new cylinder and valve gear, which will insure a saving of 25 to 40 per cent. of the fuel.

WE INVITE CORRESPONDENCE.

# WEGMANN'S PATENT PORCELAIN ROLLS

Fast superceding Metal Rolls; do far better work; have larger capacity and require only 1 1/2 horse-power. These machines are self-adjusting and easily operated, and over 5,000 of them now in use,—making the *best flour in the world*. Testimonials, description and price furnished on application.

FLOUR AND SAW-MILL MACHINERY OF EVERY DESCRIPTION.

PLANS AND ESTIMATES FURNISHED WHEN DESIRED.

**E. P. ALLIS & CO.**

# The United States

# MILLER

Volume 6.—No. 2.

MILWAUKEE, DECEMBER, 1878.

Terms \$1.00 a Year in Advance. Single Copies, 10 Cents.

### IMPORTANT TO BOILER MAKERS.

#### United States Steamboat Boiler Inspection.

Gen. James A. Dumont, Supervising Inspector General of Steamboats of the United States, has favored us with advance sheets of his report for the fiscal year ending June 30th, 1878, to the Treasury Department, from which we glean several items of general interest. There are now employed in this department 109 officers, clerks and messengers. During the year 4,137 steamboats have been inspected, representing a tonnage of 1,017,432.03, and 14,489 officers have been duly licensed. The receipts from inspection fees and officers' licenses have exceeded the expenses of this branch of the service by \$56,454.20.

The total number of lives lost on steamers inspected were 212, thirty-three of which were due to explosions of boilers.

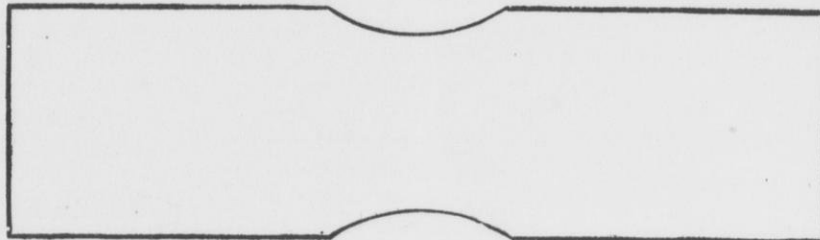
Gen. Dumont says in his report: The decrease of the fatal casualties in the last two years is no doubt due to the severer discipline that has been established during that period as compared with preceding years. Although the service is yet susceptible of improvement in that respect, I am proud to say that so thoroughly have its laws been administered, that in upward of two hundred million persons carried on American steamers during the last year, only one person and one-tenth were lost in each million. I do not hesitate to assert that travel by steamer under the existing laws of the United States is safer than in any other country. It gives me great pleasure to acknowledge the cordial acquiescence of the supervising inspectors in all my efforts to improve the service, and the same cordial support has been extended by the steam-vessel owners. It is true they complain that some of the statutes are unjust to them while affording no advantage to the public, and they are naturally opposed to being compelled to purchase worthless patents. It is not appropriate for me to discuss their wrongs here, but I hope justice may be done them, for as a class they are ready to comply with every wholesome provision of law.

No. 1 represents  $\frac{1}{4}$ -inch iron 1 inch wide at breaking point, and No. 2 the same iron,  $\frac{1}{4}$  inch, or the square of its thickness, at the point of fracture, the manufacturers giving preference to the latter over No. 1 as required by the old rule. Up to this date, however, experiments fail to show any material difference in the results obtained. Rule 8 was amended so as to compel a plate to be put on "all boilers hereafter built, \* \* \* on which shall be the name of the manufacturer of the iron, the place where manufactured, and the tensile strength of the iron, and also the name of the builder of the boiler, where built, and the year." Experience having demonstrated that the stamp required on boiler-plates became obliterated by corrosion after two or three years' use, the above amendment was adopted to secure a permanent record of the subject and to afford a guide to inspectors in certifying to facts which otherwise they must frequently accept on hearsay. The amended rules were submitted and approved January 31st, and they have been in operation since that date.

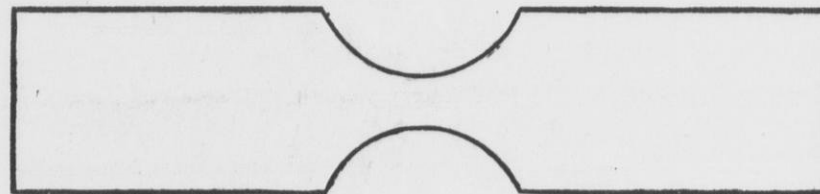
Many manufacturers of steam boilers complained to the Board of Inspectors that the method of testing iron and steel was unjust to them. Experience demonstrated that pieces from the same plate sometimes varied several thousand pounds in tensile strength, "the preparation and varying thickness of the test-piece, whether sheared or planed out, the placing in the machine and adjustment thereof, constituting some of the serious difficulties."

In consequence of these representations the Board altered the rule so as to test two pieces instead of one, as formerly required, making the samples to be tested different in form and providing two methods of testing. It was hoped to thereby secure opportunities for com-

paring the correctness of the two methods, and meanwhile the manufacturers were allowed the benefit of the sample that showed the highest tensile strength. It was believed that no injury could result from the double-test rule, for the results of tests of two pieces from the same plate would more surely indicate defects, if any existed, than were only one piece tested. Moreover, if any great difference in the results of two samples were noticed it would lead to a careful search for defects in welding and lack of homogeneousness, and other qualities required by statute. The object sought in the selection of two samples instead of one was not to give manufacturers advantage, but to settle the question as to whether the same sample of iron would show different results if prepared in different ways, illustrated as follows:



No. 1—PRESCRIBED BY OLD RULE.



No. 2—ADDED BY AMENDED RULE.

One of the most important subjects connected with the steamboat inspection service is contained in the statutes referring to the quality of the iron plates to be used in the construction of boilers, requiring the manufacturers of boiler-iron to guarantee its tensile strength, homogeneousness and toughness, as well as ability to withstand the effects of repeated heating and cooling, and imposing pecuniary penalties as well as imprisonment for placing false stamps upon the same. Section 4430, Revised Statutes, also makes it the duty of supervising inspectors to provide means for ascertaining that the law has been complied with before such iron can be used in the construction of marine boilers. Therefore the Board of Supervising Inspectors has established rules for ascertaining the tensile strength only, leaving the other qualities to be decided by the judgment of the inspector making the tests. Manufacturers assert the result of this has been to develop a disposition to secure the greatest possible amount of tensile strength at the sacrifice of homogeneousness and toughness, equally important elements, and the records show no instance of an inspector's rejecting boiler-plates except for deficiency in tensile strength.

The evils consequent upon such a course will be better understood when it is explained that all manufacturers admit that tensile strength can be increased by combinations of materials that tend so decrease the other qualities. In other words, the harder and more brittle the iron the greater the tensile strength. Many manufacturers assert that iron combining all the qualities required by law cannot be made to exceed 55,000 pounds tensile strength; yet, according to the table of pressures allowed by the Board of Supervising Inspectors, more steam is allowed to a hard, brittle plate  $\frac{1}{4}$  inch thick than to a plate 5-16 of an inch thick containing all the lawful qualities. This is decidedly wrong if the theory of the manufacturers is correct. In any event, it is evidently necessary that a positive and generally acceptable rule be established for deciding this important matter.

Dr. Charles Huston, of Messrs. Huston, Penrose & Co., of Coatesville, Pa., who has made many experiments and given me some

valuable suggestions, thinks the greater or less reduction of area by tension to ascertain tensile strength indicates the absence or presence of the required qualities, and that on the maximum and minimum percentage of such reduction might be based a rule for the rejection of such plates as were below the latter as being too hard for boiler purposes.

The Society of Railroad Administration of Germany has recommended its Government to adopt 25 per cent reduction of area as the standard of boiler-iron in that country on first quality iron of a minimum breaking strain of 51,213 pounds, from which information, and the experience acquired in testing iron of various American manufacturers, I consider it safe to assume that the desired purpose would be accomplished by adopting a uniform scale of reduction of area of 15 per cent, as the mini-

TABLE NO. 3.  
Tests made in the Treasury Department—English iron.

Sample No.	With the grain.		Across the grain.		
	Tensile strain per square inch of section.	Reduced area per cent.	Tensile strain per square inch of section.	Reduced area per cent.	
150	50,555	16	151	40,792	2
152	54,909	13	153	45,334	5
154	56,600	20	155	50,476	8
156	53,061	17	157	54,040	13
158	52,040	10	159	52,575	7

Samples of English Iron.—Nos. 150, 151, Staffordshire. Nos. 152, 153, Thorneycroft, B B B. Nos. 158, 159, Thorneycroft, S. Nos. 153, 154, Bradley, L F. Nos. 156, 157, Lowmoor.

Nos. 124, 125, and 148 were samples of  $\frac{1}{2}$  inch iron cut exactly the square of the thickness, and Nos. 131 and 132 are from the same iron whose area approximated one-quarter of one square inch. Nos. 128 and 129 were from  $\frac{1}{4}$  inch iron reduced to the square of its thickness, while Nos. 135 and 136 of the same thickness were nearly one inch wide. Nos. 126 and 127, from 5-16 iron, were small, and Nos. 133 and 134 of the same thickness were of the larger area. Nos. 146 and 147 were samples of  $\frac{1}{4}$ -inch iron cut the square of its thickness. I am particular in this description to prove that the change adopted by the Board last winter of allowing two pieces of different areas to be tested, instead of one as provided by the old rule, did not give the manufacturers any advantage. The average breaking weight of square inch of section is 59,621 pounds in the small samples and 59,818 pounds in the large ones, showing a difference of only 197 pounds in favor of the latter; the average breaking weight of the samples cut with the grain is 61,196 pounds to the square inch, and of those cut across the grain, 58,703 pounds to the square inch, a difference in favor of the first 2,493 pounds. Duplicate samples of the same iron, broken at the manufactory (see table 2), show nearly the same relative results, namely, 59,300 pounds with the grain and 56,057 pounds across it, a difference of 3,246 pounds in favor of the first. The iron broken on the scales at the Treasury Department shows an average of 2,271 pounds greater tensile strength than does that broken on the manufacturers' scales; which opens a question of the correctness of the scales, an important matter, for not only pecuniary penalties but imprisonment follow false stamping.

The samples number from 150 to 159, inclusive, are ten samples of English iron of various brands, showing an average breaking weight to the square inch of 51,038 pounds, with an average reduction of area of 15 per cent in the samples cut with the grain and of 5 per cent in those cut across it, showing inferiority to the American iron, for the latter exhibits a reduction of 38 per cent with and 15 per cent against the grain in the samples tested at the Treasury Department, and of 39 per cent with and 15 $\frac{1}{2}$  per cent against the grain in those tested by the manufacturers. This comparison again calls attention to the probable inaccuracy in the scales used, the uniformity of percentage showing an average inequality in the iron taken from different parts of the same sheet. The difference in tensile strain must be due to defects in the scales.

\*These two latter samples show a uniformity of texture not found in any other samples tested, either American or foreign, as evidenced by a difference of only 4 per cent in reduction of area with and across the grain, but both are below the German standard.

[To be continued.]

A new oat meal mill has recently been erected and put in operation in Joliet, by Messrs. Ford & Slater. The mill building is three stories in height and 40 by 60 feet in size, with a kiln attached 26 by 40 feet. Three run of stone are at present running, with provision for two more run. The works are driven by a 60-inch Stilwell & Bierce Eclipse Turbine water wheel.

mum for the lowest tensile strength used in boiler-making (which is about 45,000 pounds), increasing the reduction of area 5 per cent each additional 5,000 tensile strength above that.

Below I give the results of a series of tests made in conjunction with Dr. Huston, each experimenting on alternate samples from the same plates, the main object of the experiments being to ascertain the relative strength of boiler-plate with and across the grain, while other interesting results were also obtained. In order to illustrate the experiments to the best advantage they are presented in three tables, as follows:

TABLE NO. 1.

Tests made at the Treasury Department—American iron.

Lengthwise of the grain.			Crosswise of the grain.		
Sample No.	Tensile strain per square inch.	Reduced area per cent.	Sample No.	Tensile strain per square inch.	Reduced area per cent.
124	$\frac{1}{4}$ -inch iron. 61,481	30	125	$\frac{1}{4}$ -inch iron. 58,653	22
132	60,408	47	131	57,377	15
*148	56,270	25	*149	54,461	17
128	$\frac{1}{4}$ -inch iron. 61,538	36	129	$\frac{1}{4}$ -inch iron. 59,125	18
136	58,373	38	135	53,333	9
126	5-16 inch iron. 62,871	38	127	5-16 inch iron. 58,765	20
134	62,195	43	133	60,202	10
146	$\frac{1}{4}$ -inch iron. 61,918	33	147	$\frac{1}{4}$ -inch iron. 63,469	6

\*Samples 148 and 149 American iron, but of different manufacture from the other samples.

TABLE NO. 2.

Tests made by manufacturer.

With the grain.		Across the grain.	
Tensile strain per square inch of section.	Reduced area per cent.	Tensile strain per square inch of section.	Reduced area per cent.
$\frac{1}{4}$ -inch iron. 60,000	44	$\frac{1}{4}$ -inch iron. 61,800	22
59,000	42	57,300	13 $\frac{1}{2}$
$\frac{1}{4}$ -inch iron. 55,400	34 $\frac{1}{2}$	$\frac{1}{4}$ -inch iron. 52,300	17 $\frac{1}{2}$
60,100	34	54,600	11
5-16 inch iron. 57,000	45	5-16 inch iron. 56,800	20
63,400	44	55,900	21
$\frac{1}{4}$ -inch iron. 66,200	31	$\frac{1}{4}$ -inch iron. 53,700	6



UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, DECEMBER, 1878.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1879.

Table with 5 columns: 1 mo., 3 mos., 6 mos., 1 year. Rows include One inch card, Two, Four, One-half col. (8 inches), One-fourth page, One-half page, One page.

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employes, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion.

We have recently published a List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canada, which is of great value to those who desire to communicate by circular with American mill-owners. The price is \$5 per copy, post paid. Cash must accompany the order.

We have also lately published a Saw and Planing Mill Directory of the United States and Canada. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Kopp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

GERMANY proposes to put an import duty on grain.

HON. C. A. Pillsbury, the Minneapolis miller, is again elected State Senator.

THE Miller and Millwright for November perpetrates a biography of Bro. Hoppin, of the N. W. Miller. It don't hurt Hoppin any, but great snakes! it's rough on George Washington.

THE Minneapolis and Minnesota Millers' Associations have passed resolutions strongly condemning the use of wire binders. It was proposed that a difference of ten cents per bushel should be made on wheat containing any wire.

KENNET CHISHOLM, of Ripon, Wis., husked 140 bushels of corn standing in the hill, in 12 hours. The corn was put in baskets and piled in heaps of 15 to 20 bushels.—Ee.

This beats Chicago Sam in handling raw corn. The extract is good enough for him.

In England, 40 bushels of wheat an acre is not an unusual yield, and fifty or sixty bushels per acre is often realized as the result of high farming. Nevertheless, England is obliged to import each year about 100,000,000 bushels, in addition to her own crop, to feed her people.

RUMOR has it, and in this case we think the rumor is correct, that the St. Louis Post will absorb the St. Louis Dispatch. The Post is

one of, if not the best dailies in St. Louis, and we must confess that we enjoy reading it very much, especially the JOKES. The Post funny man is a good 'un.

MR. Oscar Oexle the well-known mill engineer of Augsburg, Bavaria, has been spending a few days in Minneapolis. He is blind, having lost his sight in the great explosion of the Tradeston mills in Glasgow, Scotland. Mr. Oexle is the general agent in the United States for the porcelain rolls.—N. W. Miller.

It is reported that a new national telegraph company is being organized in New York, which will break the present monopoly of the Western Union. We hope it is true. The Western Union has had its own sweet way long enough. A little good substantial opposition will be appreciated by the American people.

AFTER January 1st the Government will send, free of transportation, a thousand silver dollars for \$1,000 in greenbacks, to any part of the United States.—Ee.

Now, this is the way it ought to be. We have been waiting patiently for a long time to have the Secretary of the Treasury make this order. We intend to send on our \$1,000 greenback notes next week at 2 p. m., and the Secretary had better set his boys to work, counting out the "daddy dollars."

THE October number of the Millstone has an extended article with profuse illustrations on the subject of GIN. We had hardly expected to hear from any unless our British neighbors on this subject, but Brother Emery appears to be well posted. One of his illustrations shows Emery's Universal Gin. We suppose that is his favorite brand. He refers also to Cotton Gin. We infer from the article that the cotton makes its appearance after treatment with the gin.

WE have just received a copy of the new catalogue of Messrs. Griscom & Co., manufacturers of Millstone Dressers at Pottsville, Pa. The following has been said of these machines: "They will do as much work in an hour as can be done in a day with a pick. They will do a better quality of work than can be done with a pick. They save much tedious and hard labor. They save the time of the miller. They save the time of the millstone. They improve the quality of the flour. They are the best millstone dressers in the market."

WE have recently received a letter from Prof. Thomas Holloway of London, England, in which he charges one J. Haydock, of New York, of unlawfully representing himself to be the agent of the original Professor and his pills and ointment in this country, and he warns publishers against making advertising contracts with Haydock, expecting to get their pay from him (Holloway). We don't like to swallow pills or rub in ointments, Holloway's or anybody else's, but we will say that if any one is trying to steal Mr. Holloway's reputation or to swindle newspapers, they should be shown up loud.

THE ST. LOUIS MILLER.—Messrs. Wm. L. Thomas and K. H. Stone, the present proprietors of the St. Louis Commercial Gazette, one of the most valuable commercial publications in the Southwest, will issue in December the first number of a new milling paper called the St. Louis Miller. It will be published bi-monthly, and will be—like this journal—an independent milling paper, and not an advertising sheet published for the purpose of selling machinery handled by its publishers. Messrs. Thomas & Stone are experienced newspaper men, and we doubt not will publish a paper worthy of an extensive patronage.

THE New Orleans Price Current says: "Our river front, for a distance of about four miles, begins to have a crowded appearance. The tide of busy humanity on our streets swells day by day; by every avenue of travel they come, and the city now has almost fully recovered its regular business aspect. The wharves are lined for a distance of several miles by steamboats, either discharging or taking in cargo; other miles in length of the city front is covered with steamers and sailing vessels ready to take to foreign and domestic ports the produce freighted down our great natural highway, the Mississippi, and the number of ocean-going vessels is steadily increasing and bids fair to be sufficient for all possible demands. Great preparations to forward grain in bulk from the West to Europe via this port, the present season, are in progress, and we confidently expect a vast increase over the

already large shipments of last season. The facilities for handling the grain are here, the men who understand the business are on the spot, and, as every charge has been reduced to the lowest possible point, there can be no doubt that Western shipments to Europe can be handled here at as low if not lower rates than at any other seaport in the United States."

HARRIS-CORLISS ENGINE WORKS, PROVIDENCE, R. I.—These works are quite busy in building a large 350 horse-power engine for a large flouring mill at La Crosse, Wis., and other engines of smaller power for other Western States. They report some improvement in business in their line. Mr. Harris, the founder and mechanical head of these works, is a man of great force of character, thoroughly progressive, and has for some years been regarded as one of the best engine builders of our country. He has become very popular in the West through the great success of his engines, scattered as they are through nearly every Western State.

THE PROGRESS, a handsome new Philadelphia paper just out, concludes an article on the United States Patent system by saying: "That there are defects both in the character of the patent laws and in the administration of them, is hardly open to question, and we will have occasion hereafter to speak of some observed defects, and will labor to secure the appropriate remedies for their correction. No doubt a separate judicial tribunal, whose jurisdiction should be confined to the adjudication of controversies arising out of letters-patent, would go far towards remedying many of the defects of the present system. But whatever may be its defects, the patent system of the United States is probably simpler and better than that of any other country, and to our inventors, through the protection it holds out to them, our country is largely indebted for the progress that it has attained and the rank that our nation holds among the nations of the world."

THIRD ANNUAL MEETING OF THE WISCONSIN MILLERS' ASSOCIATION.

The following call for the third annual meeting of the Wisconsin Millers' Association has been issued by Secretary Seamans:

WISCONSIN MILLERS' ASSOCIATION, SECRETARY'S OFFICE, MILWAUKEE, NOV. 18, 1878.

The third annual meeting of the Wisconsin State Millers' Association will be held at the Newhall House, Milwaukee, Wednesday, December 4th, 1878. The meeting will be called at 2 o'clock p. m. sharp.

A full attendance is expected and desired, as important business will come before the association for consideration—the election of officers, organization of an insurance company, reports of committees, etc.

S. H. SEAMANS, Sec'y.

A WOMAN'S INVENTIONS.

Harriet Hosmer, the American sculptress, during her sojourn in Europe has been turning her mind to inventions. She has invented a neat instrument for turning the leaves of music for the musician while playing; also a new magnetic engine which is driven by power obtained from permanent magnets. It is said that this is a remarkable discovery, and is destined to make a great change in the power used for running light machinery. Miss Hosmer is having a four-horse power engine built on her principle, which she will exhibit in the United States on her return next spring.

Another important invention is of a process for converting ordinary limestone into beautiful marble through the combined influence of moist, heat, and pressure. A large manufacturing establishment in central New York has offered to purchase her patent for this latter invention at a good price.

SCIENTIFIC GHOULS.

As a result of the explorations of Indian mounds around Madison, recently begun by several students of the State University, several skulls and other parts of skeletons, and a number of specimens of ancient pottery have been exhumed.

We clip the above item from the Chicago Evening Journal. It is supposed to interest the general public. In the name of decency, in the name of humanity, in the name of justice, when is this infernal pandering to the morbid appetites of a certain class of men, who rob and despoil graves of the departed, going to be stopped? Great heavens, have not enough of these things been unearthed and placed in the museums of the world to

satisfy the student, or must every numbskull who attends a university have a few skulls and cross-bones, and filthy, uncouth pots and ornaments tarnished by human blood and the touch of age for the gratification of his own morbid appetite and the ghastly amusement of his guests?

If the bones of Lincoln, or Stewart, or Harrison, or anybody else, are disturbed, the cry goes through the land of "Shame! Death to despoilers of our sacred dead!" But lo, your scholars will go and pick out with their shovel and ax the revered remains of former generations. Let this disgusting work stop. Let the dead—whether white, black, red or brown—rest in peace, and let the desecration of the graves of the ancient dead be punished, as is the case of the ordinary modern grave robber.

AMONG other new inventions is one for giving warnings at sea, which, it is said, is now successfully employed in a most dangerous place upon the coast of Bretagne. It consists of a hollow cylinder, a few centimeters in diameter and three or four meters long, closed at the bottom, and containing a pump, worked by a huge fagot floating upon the surface of the sea, whose motion, caused by the rising and falling of the water, furnishes the force. The air is sucked into the pump, compressed and sent out through a whistle, and the sound thus produced can be heard even with the wind blowing against it at a distance of six kilometres, or between three or four miles away. The whole apparatus is secured by an anchor at the bottom of the sea, and has the advantage of being both simple and efficient.

WHEAT CROP OF THE WORLD.—The N. Y. Produce Exchange Weekly gives the following summary: "The English crop is fair; the German and central Europe wheat crop is an average. The American surplus of winter wheat is quickly available and large. A short period of sunshine in the United Kingdom depresses the English market against wheat. The French wheat crop is bad. The harvests of Italy, Spain, Algeria and southern Russia below estimates. The spring wheat crop in America was reduced by excessive heat. India has ceased to export wheat this year in any considerable quantity. Australia has but a limited surplus left for export to the United Kingdom or Europe, the neighboring colonies requiring her available surplus. The wheat producing area of France is estimated to yield 3-10ths rather under average; 2-10ths 20 per cent, short and 5-10ths 30 per cent deficiency, giving a net yield of say 80,000,000 hectolitres or 28,000,000 quarters, leaving importation to supply 564,000,000 quarters, with economy in consumption say 5,000,000 or 40,000,000 bushels, which will not all be wanted at once, but will be spread over the whole year. The wheat crop of the United Kingdom is estimated for 1878 at 11,500,000 quarters from a total acreage of 3,400,000 acres. The estimated requirements of foreign wheat and flour from September 1, 1878, to August 31, 1879, are 13,000,000 quarters of 104,000,000 bush."

THE Pioneer Press, in speaking of the milling improvements at Minneapolis, Minn., says: There have been or are being constructed the present year the following flouring mills, most of which are running or about ready for business:

Table listing flouring mills and their status: Washburn "B" (30 run), Pettit & Robinson (30), Anchor (12), Morrison (20), Humboldt (15), Pillsbury's additions (6).

Total.....103 run

In most of these the Hungarian process is being introduced in whole or part, which adds to the expense, so that an estimate of \$7,000 cost for each run of buhrs may be a safe one. This will bring the investment in flouring mills at that point alone for the present year up to the enormous amount of \$686,000. There are to be built the coming year at the falls the following flouring mills:

Table listing flouring mills: Washburn "A" (60 run), Morrison & White (25), Hardenburg (15), Warner (15), Fletcher (20).

Total.....135 run

Work on all but the Warner mill is already under way, and for this building arrangements have already been made in the wall of the big Washburn elevator, which it joins on the east. Nor are these all the mills to be constructed here. There are three entirely new enterprises which have never been mentioned in print, which are almost certain to go forward, and which will very largely add to the milling capacity of the city; but laying these aside, and figuring on those sure to be built, and we have, at \$7,000 per run, an expenditure in flouring mills alone, for next year, of \$945,000, or almost a round million.

PEARLING BARLEY.

BY H. S. NORTHUP.

My experience in manufacturing pearl barley has not been very large, but I have theorized a good deal, and practiced enough to demonstrate that my theory is right. I have found in the course of my experiments that in order to make white pearl barley without grinding off two-thirds of the inside or flour part of the berry, it is necessary to keep the barley very tight between the stone and case, so as to hold the grains flat against the scouring surface, thereby grinding off the sides of the berry before the ends get ground off. If the ends get broken or ground off, before the sides are sufficiently ground, there will be a yellow belt of the hull left on, unless it is ground very fine, which reduces the yield very much. In the common way of pearling with revolving case, the barley cannot be held uniformly tight, for the reason that when a given quantity is put in, it has to remain until finished, and, although it may be packed tight when first put in, it soon gets loose, and before the side of the berry is half done, the ends are off, and, being the softest, grind away the fastest. The facts above stated suggested to my mind the method I now use, which is as follows: I use a stationary case of sheet-iron (or steel, which is better), as thickly perforated as possible with holes or slots three-fourths of an inch long, with convex inside to prevent the barley from going round with the stone and to assist in hulling and discharging the offal. The following is the mode of operating: The stone runs vertically, and should be 20 to 24 inches in diameter, and 15 inches thick or more, according to the capacity required. The grain enters at the center of the stone near the shaft, and discharges at the opposite lower edge, fast or slow, at the operator's option, by the use of slides at the inlet and outlet. The hopper on the machine has a partition, which is so arranged that the feed can be let in from one side independent of the other, so that the barley run from one division through the mill, and is carried to the other by elevator, ready to be let in again as soon as the quantity first put in has passed through, thus going round and round until sufficiently pearled. Pearling barley is a slow operation at best, and there is no way to do it fast and well, without a good deal of power. The barley should be dry, well cleaned, and when partly hulled, should be sized, and each size finished by itself. Parties intending to go into the manufacture of pearl barley, would do well to have it kiln-dried before pearling, as that would not only enable them to use new or damp grain, but would facilitate the pearling of grain in any case. Should this communication prove of any interest to your readers, I may follow it with another in which I will say something in regard to the cause of the comparatively small amount of pearled barley used in this country, and will make some suggestions concerning the removal of the cause.

PROCELAIN ROLLER MILLS IN AMERICA.

The millers of this country, always on the alert for improvements in the art and science of milling, have presented to them for practical investigation the system of crushing wheat by means of porcelain rollers, a system having for its aim the superseding of the present way of treating middlings by the ordinary mill-stone. We present herewith an illustration of a machine which is being rapidly introduced in the flour mills of Europe, especially in those of Austria, Hungary, Germany and Great Britain. This machine was first made known to the millers of Hungary, in 1874, when its inventor, Mr. Wegmann, appeared in the great milling metropolis, Buda-Pesth, and where remarkable success attended its introduction. The inventor is a practical miller and owner of a large flour mill in Naples, Italy, and has spent much time experimenting with rollers for the gradual and final reduction of wheat.

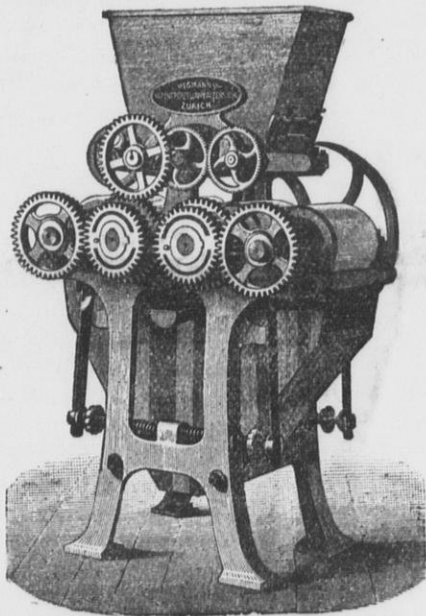
As far back as 1825, roller mills were erected, with more or less success in some portions of Switzerland, Hungary, Austria, Italy, etc., but in all, the cast-iron or steel roller was employed. None of these early experiments were permanently successful with the exception of a large flouring mill in Pesth (the Pesther Walz Muhle), which is to this day making flour entirely by roller.

It is not our intention to treat at length these early roller-mills, but to call attention to the improved machine of which the accompanying cut is a fair representation. There are two pairs of rollers, each having its own function. The two minor rollers have fixed bearings, while the bearings of the two out-

side rollers are movable. Two lever springs are attached to the latter, which can be regulated by hand wheels and screws at lower end of the machine. The middlings, semolina, etc., in passing through the hopper are equally distributed on the two feeding rollers, just above the squeezing rollers, by two adjustable slides attached to the hopper. The principle adapted is by no means new, but the efforts to arrive at the same result by using iron or steel rollers have not proven so satisfactory, not producing a perfect reduction of the middlings into flour. Various other drawbacks, such as continued heating of bearings, injury to roller surfaces by hard substances passing between them, great absorption of water, etc., brought the roller system somewhat into disrepute. The main objection seemed to be the necessity of coming back to the old mill-stone for the reduction of the middlings. Mr. Wegmann has solved the problem by adopting a slight differential speed on his porcelain roller.

The slight tearing action which the meal undergoes during the squeezing pressure of the rollers (the differential speed being only about two inches per second against forty inches under the mill-stone surface), helps greatly to the speedy reduction of the starchy and glutinous particles, and is still not so severe as to pulverize the woody bran particles, germs, and other foreign substances contained in the middlings, which ought not to be pulverized. The inventor claims for the flour thus produced, a very superior quality to that produced under the mill-stone, and that the baking quality is raised by the perfectly cool grinding and the granular shape of the flour. The peculiar, equally porous surface, and extreme hardness of the porcelain roller is of vital importance in producing these results; without them, it would be impossible to finish the grinding process entirely by roller.

The advantages claimed over the ordinary



WEGMANN'S PATENT PORCELAIN ROLLS.

mill-stone are: 1. Great saving of motive power—nearly 50 per cent of the power absorbed by the mill-stone. 2. Production of a superior quality of flour, both in color and strength; making it fit to stand any climate, and thoroughly fit for exportation. 3. Perfect self-adjustment and simplicity in all its parts. 4. Durability of the material (the diamond alone being able to cut it), and no perceptible wear for years. 5. Continuous working action, and no loss of time incurred by stone-dressing, etc. 6. Ability to obtain flour of a very fair quality from middlings which could not otherwise be advantageously ground by mill-stones, owing to their low quality. 7. Simplicity of erection and small cost in comparison with mill-stones. 8. Great safety as regards fire, as no heating occurs should the rollers run empty; even should a nail pass between them the self-acting springs would allow it to pass freely, and the rollers would right themselves immediately without being in the slightest degree injured.

The dimensions of the machine are as follows: Height, 5 feet 6 inches; width, 2 feet 10 inches; length, 3 feet 6 inches. Speed of driving pulley, 180 revolutions per minute; diameter of driving pulley, 23 3/4 inches; face of driving pulley, 3 1/2 inches. The capacity varies according to the quality of the middlings from 2 1/2 to 3 1/2 cwt. per hour. The power required to drive the machine is about 1 1/2-horse power. Total weight of machine about thirteen hundred pounds.

Many of these machines are now working satisfactorily in this country. Mr. Oscar Oxle, C. E., of Augsburg, Bavaria, introduced these roller mills into the United States. He also accomplished their successful introduction into Great Britain. Mr. Oxle has had large experience in roller mills, having built, and managed for some years, the new section of

the Pesther Walz Muhle in Hungary—the largest mill in the world, having a capacity of nearly 4,000 barrels per day. Besides having built other mills in Hungary, he has also erected a roller mill in Glasgow, Scotland, where 1,200 barrels are produced per day—entirely of American wheat. For further information address, E. P. Allis & Co., Reliance Works, Milwaukee, Wis.

RECENT PATENTS.

Patents have been granted, recently, as follows:

- Feed water heater and filter, W. J. Austin, Chicago.
- Valve gear, Dennis Ladd, Chicago.
- Governor and cut-off, Den. Ladd, Chicago.
- Corn-sheller, C. C. Burrows, Evansville, Ill.
- Corn-planter, W. M. Carriker, Irving, Ill.
- Corn-planter, A. Heckman, Sterling, Ill.
- Corn-harvester, C. K. Connor, Camp Point, Ill.
- Cultivator, F. W. Degen, New Athens, Ill.
- Sulky plow, S. Dixon, Roseville, Ill.
- Grain-binder, G. T. Gifford, Galesburg, Ill.
- Harvester, C. Gregory, Dixon, Ill.
- Grain-scourer, Geo. Moensch, Rushville, Ill.
- Wind-mill, E. S. Smith, Good Hope, Ill.
- Saw-mill, R. E. Gleason, Muskegon, Mich.
- Grain-thresher, A. J. Hoag, Battle Creek, Mich.
- Clover-thresher, L. V. Southworth, Newport, Mich.
- Saw-sharpener, Thos. H. McCrary, Evansville, Ind.
- Millstone-driver, J. W. Donnell, Muscatine, Iowa.
- Grain-binder, J. F. Appleby, Depere, Wis.
- Elevator bucket, W. J. Bennett, Fox Lake, Wis.
- Wind engine, J. H. Palmer, Lodi, Wis.
- Corn-planter, J. Wright, Delafield, Wis.

THE FALLS THAT WEBSTER PRAISED.

The beauty of the Upper Falls of the Genesee in this city has departed forever, and it has ceased to be an object of much interest to our citizens, except as a source of water power. But an event occurred at the falls, recently, that will awaken a temporary interest in the cataract. All who are familiar with the falls and the formation of the rock over which the water tumbles, know that while the surface rock is limestone of fair building quality, the underlying stratum is shaly and crumbles easily when exposed to the elements. From this cause the rock at the bottom is crumbling away faster than that at the top of the falls, and the latter projects in places twenty feet or more. In time the overhanging portion becomes so much undermined that it has no support and tumbles over in the abyss. Usually the amount of rock falling in this way seldom exceeds a few hundred pounds, but a fall took place last night worthy of mention from its magnitude. The mass that fell over must weigh many thousand tons, and now lies at the foot of the falls on the east side, directly under the building formerly occupied as a flour mill, but now devoted to various kinds of manufacturing. J. T. Cox, who occupies part of the building on the brink, says that the edge of the rock on the precipice for twenty feet back, and extending 100 feet along the face, went over. Its depth must have been forty or fifty feet, from the fact that it forms a pile rising thirty or forty feet above the surface of the river. Formerly the water fell directly from the brink of the falls to the water below in one unobstructed leap, but now it strikes on the mass that went over and flows down the rocks somewhat like the American falls at Niagara. Another large quantity of rock is expected to fall before long, and may carry over the buildings on the east side of the edge of the precipice.—*Rochester Union.*

RESOURCES OF ALASKA.

Instead of being a worthless territory, as was believed by many, Alaska is developing a numerous variety of riches. When California was inhabited almost wholly by Spaniards it was like Alaska, an unworked mine of wealth. The mineral treasures of both countries were unknown and unsought. They had little or no agriculture, and were almost in a state of natural wildness, thinly peopled and overrun by savage tribes. But when these territories passed into the hands of Americans a different condition prevailed,—their resources were brought to light. The streams of California were found to contain gold in limitless quantity. The mountains were discovered to be imbedded with precious ores to unfathomable depths, and in inexhaustible masses. The soil was the richest in the world, and adapted to every kind of production.

And now Alaska, which has been so long

the target for contemptuous darts by superficial writers, is being demonstrated by American enterprise to be a land endowed with solid elements of prosperity. It contains rich deposits of gold, silver, copper, graphite lead, iron, sulphur and coal. Its streams are filled with fish; salmon of the finest quality frequent its inlets and rivers in millions; there are halibut and codfish, and its coasts are the favorite resorts of countless seals. The mountains are densely feathered with pine and ship-building timbers, and there are most excellent prairie lands and pasturage near the coast. The climate is milder, less ridged in winter and less rainy than Scotland. Everything points to it as a future wealth producing territory of wonderful promise. In the hands of the Russians it would have remained for ages the dreary, unproductive and unknown region it was when we found it. But as part of the republic of the United States it will contribute much to our national power and wealth.

NORDYKE & MARMON'S MILLING MACHINERY.

The rapid growth of the grain industries of the West has elevated the milling interests into the realm of science, and necessitated a degree of improvement in machinery that would have been deemed impossible a couple of decades ago. This advancement in machinery and manufactures has contributed, together with its allowance of more complete growing facilities, more than any other industrial item, to the increased greatness and prosperity of this country as a nation. Of the many who have devoted their time, energy, skill and capital to the furtherance of this great object, none rank higher or are better known for the high grade and superiority of their productions than the Nordyke & Marmon Company, of Indianapolis, Indiana. The makes of this company are known, appreciated and used throughout the entire stretch of our country, and from Maine to California not a reputable miller can be produced but has a good word for the specialties of this company. Everything that comports to the necessities or comforts of the miller is to be found within the well-stocked block of buildings occupied by the works of this company. During the past thirty years the company has put into operation in every State and Territory of the country its milling outfits, and has deservedly won the confidence of the milling public. Wherever the miller's work is known the name of "Nordyke & Marmon" is a trademark of superiority and good workmanship. Among a long list of all a miller needs, and which can all be ranged as "specialty" work, when its excellence is considered, may be noted its iron husk mills, now being put into use everywhere; its middlings mills and purifiers; its flouring mills, complete; its grades of shafting, pulleys, hangers, gearing, etc.; its bolting cloths, and all the minutiae which goes into the make-up of a first-class establishment.—*Boston Journal of Commerce.*

The growing wheat in Jasper county, Ill., is being injured by insects.

Cut This Out.

"United States Miller" Subscription Blank.

N. B.—We shall consider all persons to whom this paper is sent by this office regular subscribers until notified by postal card, or otherwise, to discontinue sending it. Payment may be made at any time, or at the end of the year from the time such persons may have commenced to receive the paper regularly. In case of discontinuance we will make no charge for papers heretofore sent. We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year \$1, or two years and a half \$2. We shall be pleased to have response to this before January 1st, 1879. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail.

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Milwaukee, Wis.

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MILWAUKEE, DECEMBER, 1878.

THE Indiana Millers' Association meets at Indianapolis, Dec. 12th.

THE Illinois Millers' Association meets at Springfield, Ill., Dec. 4th.

THE North Pacific Round House at Fargo, burned November 30th. Loss, \$30,000.

A New England canning factory is now putting up 500 dozen cans daily of fish balls to fill French orders.

GEO. B. WRIGHT, of Fergus Falls, Minn., whose saw mill was recently burned, is now making arrangements to rebuild.

WE would like to have some of our readers furnish us with a good article on pearl barley and its manufacture for our January number.

Hulbert & Paige, Painesville, Ohio, are working full force on orders for mill machinery, engines and their Triumph Power Corn Shell-ers.

THE abundance and superior quality of the Kansas wheat is the cause of furnishing excellent flour at our Western markets at cheap rates.

SEVERAL grain warehouses in Minneapolis and along the railroad lines in Minnesota have been temporarily closed for want of cars to ship wheat.

ENGLAND has a couple of small wars on hand, "just to amuse the boys, you know." One is with Afghanistan, and the other with the African Kaffirs.

Kibbie, Maltby & Co., West Farmington, Ohio, have just started their new custom mill, the machinery for which was furnished by Hulbert & Paige, Painesville, Ohio.

THE total grain receipts at Buffalo, N. Y., from the opening of navigation to November 30th, were 84,423,700 bushels. Exports by rail, 26,938,800. By canal, 58,735,502.

THE case of the American Middlings Purifier Company, vs., the Haxall-Crenshaw Company, of Richmond, Va., has been dismissed. St. Louis and Minneapolis cases come next.

E. P. Allis & Co. report that from the increased sale of porcelain rolls, and the character of the work done on them, that they will ultimately entirely supersede stones in the manufacture of patent flour.

Hulbert & Paige, Painesville, Ohio, have recently shipped to Daniel & Whitcomb, Redwood Fall, Minn., engine, boiler, tanks and machinery, all complete, for their new wheat elevator.

Messrs. Hulbert & Paige, Painesville, Ohio, have just completed a five-run flouring mill, with one of their improved Corliss engines, for Burdick & Dynes, Owatonna, Minn. H. & F. L. Walters, millwrights.

OUR friend, Mr. A. L. Clarke, of Milwau-

kee, who has been more or less identified with the milling machinery interests for the past three years, leaves soon to accept a position with the new *St. Louis Miller*.

THE flouring mills at Prague, Bohemia, burned recently. Fire caused by flour dust ignited by friction on bearings in the upper story of the mill. Loss \$40,000. Mills will be rebuilt.

THE Marquis of Lorne, the new Governor-General of the Dominion of Canada, and his wife, the Princess Louise, have arrived at Montreal, and have been greeted by an enthusiastic reception.

RECENT tests on a Russian railway prove that tires shrunken in hot water possess great advantages over fire-shrunken ones. Only one per cent of the former needed overhauling, to forty-two per cent of the latter.

MERRY CHRISTMAS.—We wish our readers one and all a Merry, Merry Christmas. We hope they will all enjoy plenty of roast turkey and plum pudding, and that Santa Claus will not forget to call on them and theirs. So mote it be.

AUSTIN, EMMET, of Norwalk, Conn., has invented a method of propelling canal boats by "chain propellers," which do not disturb the water, and the cost of which, it is claimed, will be but fifteen cents per mile, against twenty five cents by horses.

THE Wisconsin Millers' Association meets in Milwaukee December 4th, so that it is impossible to have the report of their proceedings in this issue. We hope their future meetings will be so timed that their report may be published in papers issued on the first of the month.

Nov. 26th, the steamer Pommerania, bound from New York to Hamburg, came into collision with the bark Noel Eilian while on her way from Plymouth to Hamburg. Over fifty lives were lost. The steamer sank in twenty minutes. Cargo for Hamburg valued at \$250,000, and the mail, is a total loss.

WE would respectfully call the attention of our readers to the new advertisement of the Huntoon Governor, manufactured and sold by the Huntoon Governor Company, of Lawrence, Mass., and their authorized agents through the country. We shall at an early day publish a description of this perfect and reliable Governor.

THE Milwaukee saloon keepers have organized a "ring," now, and have commenced making demands on the brewers and for makers for reduction of prices to the ring, higher prices to private customers, and to shut off the supplies of the "2 glasses for 5 cents" dealers. The majority of the beer-drinking public are rather inclined to support this latter class in their efforts to sell beer at *hard-pau* prices.

IN the twelve months from the 1st of September, 1877, to the 31st of August, 1878, the imports of wheat and wheat flour into the United Kingdom amounted to less than 62,255,125 cwt.; of Indian corn, 40,746,135 cwt.; of barley, 14,201,373 cwt.; of oats, 12,286,354 cwt. Adding also peas and beans, the total importation of grain in the twelve months reached 134,430,348 cwt. In neither of the two preceding twelve months did the imports of grain reach 119,000,000 cwt.

H. A. CHITTENDEN, the founder of the Milwaukee *Journal of Commerce*, the *Daily Commercial Times*, and latterly one of the proprietors of the Milwaukee *Daily News*—the official organ of the city of Milwaukee and the leading Democratic newspaper—has sold out his interest here and is going to New York to enter a wider journalistic field. Mr. Chittenden has shown great energy and ability in his journalistic career in this city, and his numerous friends in this State will regret to have him leave. We wish him success in his new venture.

VOSE'S COURSE OF GEOMETRICAL DRAWINGS.—We have just received from the publishers, Messrs. Lee & Shepard, of Boston, Mass., a handsome copy of a new work entitled "An Elementary Course of Geometrical Drawing," by George L. Vose, A. M., Professor of Civil Engineering in Bowdoin College. The work is handsomely printed, and illustrated by 38 full page plates. It contains problems on the right line and circle, conic sections and other curves, the projection section, and intersection

of solids; the development of surfaces and isometric perspective. The work has been prepared for the use of classes in engineering schools, and also for those who intend to pursue this branch of study for themselves. We commend the work to civil and mechanical engineers, students and draughtsmen in general. The price of this valuable work is \$5, which is extremely low considering the nature of the work.

A CITIZEN of Brattleboro, Vt., has produced what is known as the "Curtis Screw Machine." As described by the inventor, it feeds itself, cuts off a piece of iron of the required length, trims it down to the proper size, cuts the screw, shapes the head, makes the slat, rims it, and throws it out a perfect screw, the operator having nothing to do but to look on and watch the process. The invention is patented here and in eight countries of Europe.

J. B. CROMWELL, of 480 Canal street, Milwaukee, has invented a millstone detachment so that one or more stones set in line may be disengaged without stopping the rest of them. It obviates the necessity of stopping the mill to put on a stone, and keeps the flour more uniform. It can be attached to any spindle without alteration, the pulleys and gear being split. This detachment is now in successful operation in E. Sanderson & Co.'s Phoenix Mills, Milwaukee, where it can be seen. No merchant mill should be without it. We congratulate our townsman on his happy invention. Mr. Cromwell is also patentee of an excellent wheat heater, of which we will speak at a later date.

## A NOVELTY IN MILLING.

IN our January issue we shall present to our readers a thorough description with illustrations of the new mill erected on the corner of Canal and Cherry streets, by the Milwaukee Milling Company. It contains 30 run of the Johnathan Mills' patent mills, and, when in operation, which will be in a few days, will be one of the neatest and most novel flour mills in the world. All the stones are 16-inch face.

KANSAS FLOUR.—The millers in Iowa complain bitterly of the course taken by Kansas millers in flooding the best markets in our State with their flour at such low prices. They would not object to straight competition at fair prices, but the millers of Kansas bid against each other so sharply in their endeavors to furnish this flour that they have put the price below living rates. The quality of Kansas wheat being so much superior to that raised in Iowa, and as the flour from it can be bought at even a lower price than the flour can be manufactured from Iowa wheat, of course it takes away a very large share of the home trade, as the wheat cannot be shipped from Kansas and ground at present prices, our millers are feeling rather blue about it. A few years ago a petition came up from starving Kansas for bread, and our millers generously ground, free of charge, all the wheat the farmers donated, besides sending many a barrel of their own. Their bread thus cast upon the waters comes back after many days, but not in a very acceptable way to them.—*Iowa Millers Registry*.

## REVIEW OF THE MARKETS.

WHEAT—Has ruled without material change since our last. The weather has been exceptionally fine for the season and advices from the northwest indicate that farmers are improving the opportunity for threshing and hauling. Receipts at the western stations are consequently large and promise to increase rather than diminish, but it appears unreasonable to expect a continuance of the present weather. Receipts at the western primary markets have again been large, footing a total for the week of 2,410,000 bushels, at Chicago, Milwaukee, Toledo, Detroit, St. Louis and Cincinnati—while the receipts at New York, Philadelphia and Baltimore for the same time have been 2,599,000 bushels. The movement far exceeds any previously recorded year, but despite the tremendous receipts for months, our accumulated supply is not without parallel and we note a reduction of the stock in sight the past week. Probably the greatest surprise to the trade during the present crop year has been the astonishing demand from the continent of Europe. For months past we have heard from the seaboard that France, in keeping with her past record as a buyer in the American markets, has been overstocking, and that it would be but a short time when we should be convulsed by resales for continental account. At each pause in the demand we have been told that the premonitory symptoms

of that convulsion were now apparent, and the speculative trade with much reason has been in constant dread of it. It has not come to pass and the mistaken prophets continue to wait and to watch for the event, while the tide of supply moves outward from Atlantic ports at the rate of over 2,000,000 weekly, and now at the close of the season of inland water transportation, New York, with nearly 7,000,000 afloat, in store and near at hand, gives symptoms of increased strength, and Europe sympathises by a tendency to rise, with the puzzling reports by cable of light stocks and moderate supply. It appears to us that the only conclusion to be deduced from the foregoing statements, is that we have greatly underestimated Europe's wants, and that wheat at 40s. commands buyers from such remote districts as Portugal, Spain and Italy, and that while the consuming capacity at home is increased by low prices, the avenues for export are more numerous and enlarged.

If our market should be tided over the adversities of December, holders will find in January lighter receipts, a clearer financial atmosphere at home and abroad, more confidence generally, and with the approach of spring, fears of the coming crop, and if not a European war, much talk of it. We shall have heavy stocks, but the price warrants a great accumulation, and it appears to us that diminished receipts are now the only thing needful to a decided change in current opinion regarding the future of the exports.

Corn has ruled somewhat stronger, and we note a growing feeling of confidence. Reports of disappointing out-turn in the crop of 1878 continue to multiply. One of the largest buyers of Iowa takes up the report we hear from so many points in Illinois and pronounces the crop of 1878 grossly exaggerated in quantity but exceptionally choice in quality. The foreign demand is reported disappointing by our seaboard correspondents, and we do not expect the growing feeling of disappointment regarding the crop to have any immediate effect upon values.

## EXPORT FLOUR INSTEAD OF WHEAT.

We have always claimed that it was for the interest of American millers to use every means to change the present practice of exporting grain into that of exporting flour, thereby giving our flour mills and millers the benefit of the labor and profit of manufacturing the grain into flour. We have even gone so far as to urge the putting on of an export duty on wheat and allowing flour to go out free, and we sincerely hope that at the next meeting of the Millers' National Association that they will take this subject under serious consideration, and take the necessary steps to secure an increase of our flour shipments and a corresponding decrease in our wheat shipments, thereby ensuring great benefit to our millers and farmers.

In speaking of this subject, a Pacific coast paper of extended circulation, called the *Resources of California*, says: "The present shipments of grain from California and Oregon lose all the benefit that is derived from their reduction into flour. With a prospective surplus of 600,000 tons of wheat for export from California during the current year, our milling capacity represents hardly more than one per cent of the amount, as available for foreign markets in the shape of flour, after deducting the requirements for home consumption. The remaining 540,000 tons will have to be exported in the form of grain. The advantages that would accrue to our farmers and merchants, and to the interests of the State generally, from the shipment in a more concentrated form of our chief agricultural staple, need hardly be dilated on. The saving of freight on mill refuse, and the abundant and cheap supply of feed for cattle which it affords, and which could be made available to a large and profitable extent, are benefits that must appear obvious at the first glance. If the bulk of our wheat crop could be exported as flour, there is probably no interest that would suffer by the change, while all of those dependent on its production would derive the most material advantages from it. Any reform that will enable us to land our bread-stuffs in Europe in a more compact shape, and at less cost than under the present system, is also most desirable for other reasons. We already find ourselves confronted with strong and growing competitors in the markets which until recently were almost exclusively dependent on this country for their grain supplies. Australia and British India are putting forth all their energies to secure a share of this lucrative trade, and with an amount of success which it would not be wise in us to ignore. It is also probable that recent political changes in Europe will lead to an extensive cultivation of cereals in the fertile districts of Asia Minor, which have for ages been excluded from commercial intercourse."

## MILWAUKEE MIDDINGS PURIFIER.

Manufactured by Smith Bros., Milwaukee.

We have the pleasure of presenting to our readers this month an illustration of the well-known Milwaukee Middings Purifier, manufactured by SMITH BROS., millwrights. This machine has been used for years by the leading mills of Milwaukee and elsewhere, and has given unqualified satisfaction. It may be described as follows:

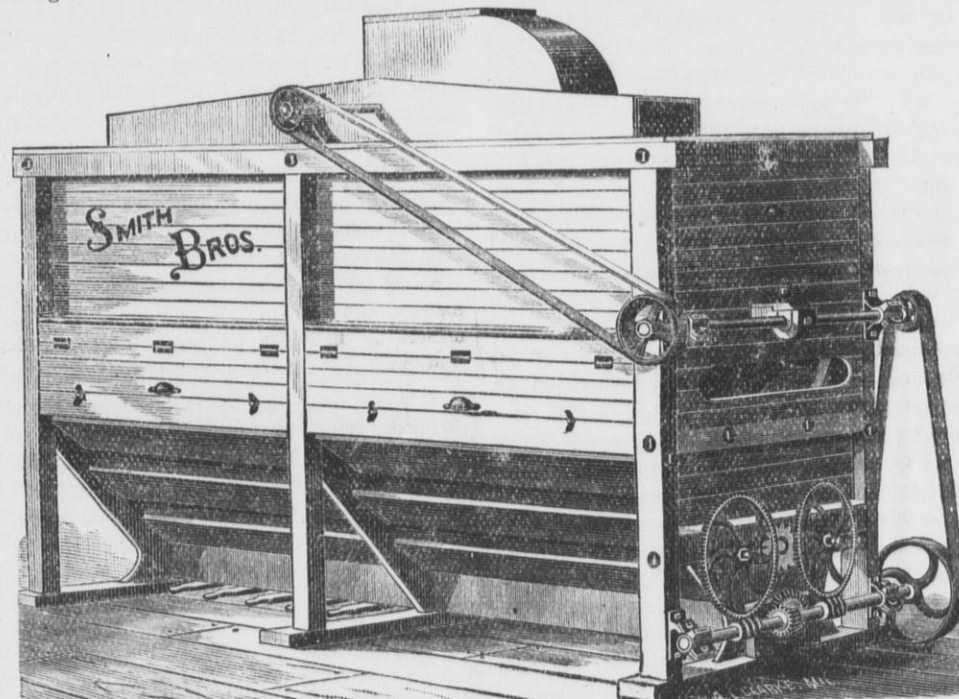
The interior of the purifier consists of a reciprocating shaker so constructed as to place therein sieve frames, four in number, to fill the whole length of the shaker. These frames can be taken out and others with different grades of cloth put in in five minutes' time; or if the grade of cloth should be too fine to suit the grade of middlings, one of the finest of the four sections can be taken out, the remaining ones shoved to the head and a coarser grade put to the tail, and vice versa if too coarse. This is a great saving of bolting cloth. By taking out one sieve, three-fourths of the cloth remain and the desired change is made, while in all other machines the whole of the cloth has to be discarded. A reciprocating brush traversing the under side of shaker from side to side to keep the meshes clear. By means of a suction fan a current of air is forced through the sieves which can be regulated to suit the grades of middlings, and is also equalized over the whole surface of the sieves by means of troughs, these being attached to the shaker above the cloth so as to increase the draught as it leaves the cloth to the upper edges of the troughs, where they form a vacuum, by which means the heavier particles of the suckings are deposited in them and conducted to the tail end into a hopper-spout leading from the machine; thus leaving this portion of the suckings comparatively clean and in a place where it can be got at, and manipulated as desired, while the lighter, browner and fuzzier particles are buoyed up and blown into the dust-room.

## THE HISTORY OF ART.

Sir John Lubbock recently distributed the prizes to the students of the Maidstone School of Art, and subsequently made the following remarks:

The history of art is one of the most important keys to the true history of man—the history, not of wars and conquests, but of peaceful development. It is really the true history of the human race. The earliest drawings we possess are scratched upon bone or stone, reminding us of the first sketches of Giotto, who, when a child some ten or twelve years old, was found by Cimabue drawing sheep on a piece of smooth slate with a sharply pointed stone; and in the same way the most ancient men of whom we have any certain knowledge, sketched outlines of the mammoth, of reindeer, bears and other animals on bone and stone, probably with a sharp pointed flint. These drawings, moreover, are of special interest, because the skill with which they are executed seems the more remarkable if we recollect that some existing savages are said to be unable to recognize delineations of natural objects when they are put before them. The ancient drawings, moreover, are of special interest, because I think we may fairly hope that just as the Esquimaux drawings of the present day, which, by the way, singularly resemble those found in the caves of Western Europe, represent and would give us a fair idea of their daily lives and avocations; and we may hope also that they will clear up much of the mystery of the past, on which even now they have thrown a bright thread of light. It is curious that, while in the Stone Age we have spirited representations of animal life, the ornamentation of the later Bronze Age, so far as it is known to us, is almost confined to lines, straight, curved and especially spiral. Whether this difference indicates an ethnological distinction we are, perhaps, hardly yet in a condition to predicate with confidence. That absence of representations of animal form under certain circumstances by no means necessarily implies any want of power, we may see clearly, from the fact that while striking representations of every day life illustrate the Egyptian tombs of one period, as for instance that of Ti, at Takkarah, and mystical allegories, those of the Kings at Babel Moulak, opposite Karnac, the minor passages and chambers of the earlier dynasties, as for instance, in the great pyramids, are left quite plain; while, on the other hand, the high pitch to which art even then attained, is shown by the statue of Cephren in the Boulak Museum, certainly one of the most remarkable which the world has yet produced. The tombs of Babel Moulak teach us another curious lesson. Among all the in-

teresting wonders of Egypt few things perhaps are more striking than the tomb of Sethi I. This King is said to have connected the Red Sea with the Nile by a canal. He was the predecessor of Rameses the Great, who again was succeeded by Menepthah—the Pharaoh of the Exodus. In excavating these rock-cut tombs, the first thing was of course to form the chambers, which were cut out one by one, then the walls were smoothed, after that the figures were put in roughly, then came a draughtsman, who drew them carefully in black chalk, then the master, who corrected with a red pencil any fault in drawing—I do not know if this is the mode followed in the art schools of the present day—and lastly the designs were carefully painted in. Now, in Sethi's tomb we see every stage of this process. The innermost room is quite rough and unfinished—being now probably just as it was when Sethi died. In another we find all the different stages of the drawing. In one part of the walls, even in the present day, you can see where the figures are merely indicated—the head, for instance, being a circle, the hands without fingers, and so on. Then in another you have the outlines carefully filled in by the pupils, and still showing here and there corrections made by the master hand. And lastly the complete work. Again, here is another illustration of the important light which art throws upon history. The students of Central American history, in seeking for the source of that remarkable civilization, owe much of what little light they have been able to obtain from the remains of the art of the period, in which some have thought themselves able to trace indications of Chinese, others even of Egyptian influence. It would be easy, if time permitted, to bring together many illustrations of the light which art throws on history; still



MILWAUKEE MIDDINGS PURIFIER.

more important, however, is the general influence which it exercises on the character of man.

*The excuses of idleness.*—Now, we often hear people say that they have not time enough to give attention to art, but this is too often rather an excuse than any indication of industry. At any rate, even if true in individual application (I have no doubt it is true in some cases—I might claim to be a case in which it is), as a general rule people—or I will at any rate say many people—are sorely in need of interesting occupation. One day last week, in walking from the city to the House of Commons, I found the Thames embankment crowded with men and women, who had come to look over the wall because it was expected that the tide would rise against the stones a few inches higher than had ever been known before. This showed that they had not much of interest to do. One characteristic of the present age is a certain restlessness and craving for excitement. Nothing, however, is more calming and soothing than art. One great master, indeed, has said that it is impossible to draw unless you are in peace. In words which no doubt are well known to you, he says: "Painting can only be done in calm of mind. That peace must be rendered habitual, as the waters settle themselves into clearness as well as quietness. You can no more filter your mind into purity than you can compress it into calmness. You must keep it pure if you would have it pure; and throw no stones into it if you would have it quiet." But, however this may be—whether calm be indispensable to true art or not—no one can deny that the contemplation of beauty tends to soothe the mind, and distract it alike from petty troubles and deeper sorrows. So much has public taste improved of late years, that there is now really

no reason at all why we should, any of us, even the poorest, have anything ugly in our houses. Beauty costs nothing. An ugly paint costs no less than a good one; a clumsy glass, or jug, or cup, or ugly table cover, is as expensive as a more graceful form and more beautiful design—nay, costs less really to produce, because the one is a product of mere slavish drudgery, and the other is a triumph of loving art, which can but raise and ennoble the artist who designed them. Now, while I wish to congratulate most sincerely those to whom I have just had the pleasure of presenting prizes, I am sure that I need not impress on those who have not yet been so fortunate that they should on no account be discouraged.

*Perseverance Conquers.*—Sir Joshua Reynolds, in his discourse to the Royal Academy students, was never tired of impressing on them the necessity of continuous, patient and devoted labor. In almost every one of the fourteen discourses which he delivered as President of the Royal Academy, he is most careful to impress this great truth on the attention of his auditors. Indeed, every page in the lives of the most eminent painters show us that no part of their lives was ever spent in idleness or dissipation. Even of Raphael himself—whom many think, perhaps justly, the greatest of them all—and Michael Angelo, perhaps the second, we were assured, did not possess their art from nature, but from long study. "To be convinced," says Sir Joshua, "with what persevering assiduity the most illustrious and highly gifted of them pursued their studies, we need only reflect on their method of proceeding in their most celebrated works. When they conceived a subject they first made a variety of sketches; then a finished drawing of the whole; after that a more correct drawing of every separate

Something more than this is required, or the result, even with these advantages, will, after all, be but a melancholy failure; as when Robespierre, at the so-called feast of the Supreme Being on the 20th Prairial (8th June, 1784), intending to burn down the symbolical statue of Atheism with its attendant vices, accidentally set fire to that of Wisdom instead. The object must be considered as well as the subject. "The difference"—and here I will conclude with one more quotation from Ruskin—"between great and mean art lies, not in definable methods of handling, or styles of representation, or choices of subjects, but wholly in the nobleness of the end to which the effort of the painter is addressed. It does not matter whether he paint the petal of a rose or the chasms of a precipice, so that love and admiration attend him as he labors and wait forever upon his work. It does not matter whether he toil for months upon a few inches of his canvass, or cover a palace front with color in a day, so that it be a solemn purpose that has filled his heart with patience or urged his hand to haste. And it does not matter whether he seeks for his subjects among peasants or nobles, among the heroic or the simple, in courts or in fields, so that only he behold all things with a thirst for beauty, and a hatred of meanness and vice." And with these words I will conclude the short address I have ventured to make to you this evening. Once more I must congratulate those who have carried away prizes. I would impress upon all the advice of the greatest English painter, that merit can only be arrived at by great labor and continued exertion. Also the noble words of Mr. Ruskin which I have just read: In whatever department of art you may toil, endeavor to do everything in a thirst for beauty and a hatred of meanness and vice.—*Scientific American.*

## THE FRENCH DAM BELOW PITTSBURG, OHIO.

Three years ago Congress appropriated \$100,000 for the construction of a Chamoin dam at Pittsburg, under the direction of the War Department. The construction was begun during the past summer. It is intended to form slack water to the two rivers which unite at Pittsburg and form the Ohio River, to create a harbor six miles long for the commerce of the city.

The peculiarity of the French dam is that it is the dam of low tides. That is, it is a dam which is set up against the stream when the stream is low, diverting the water into a lock, after the manner of a canal, and falling in ordinary time prone on the bottom of the river, allowing navigation to pass over it in its usual course. The dam is raised or lowered by means of a series of props which are handled by a simple process. The gate of the canal is opened and closed by hydraulic power operated from a gigantic tank at an elevation on the river bank. In detail, the French dam, which has received the name of Chamoin, after its inventor, is simply an extended series of wooden wickets from four to six feet in width, and from ten to fifteen in length, placed side by side on end on a stone platform, at an angle of eighty degrees (from the horizontal) across a river bed. Each wicket as it faces the stream has behind it a cast-iron prop, whose lower end is adjusted when the dam is up in a hurter or catch, at the head of a slide on the platform of the structure, along which it can be lowered at pleasure, the wicket falling with its prop; the whole dam being let down by degrees according to the necessity made by the rising water. Such is the character of the dam which is everywhere employed for the improvement of the low tide rivers of France; which converts the Saone, the Meuse, the Marne, the Yonne, and the Oise into navigable slack water, and the Seine from its head waters to Rouen into a canal.—*Scientific American.*

## ESTIMATED YIELD OF THE WHEAT CROP OF 1878

The yield of the last wheat crop, spring and winter, of the States mentioned is estimated as follows:

	Acres.	Av bus.	Yield bus.
Illinois.....	2,324,000	13	30,212,000
Missouri.....	1,700,000	11½	19,550,000
Kansas.....	1,600,000	14½	23,200,000
Nebraska.....	1,070,000	12	12,840,000
Wisconsin.....	1,780,000	9	16,020,000
Iowa.....	3,240,000	7½	24,300,000
Minnesota.....	2,360,000	10	23,600,000
Total.....	14,074,000		149,722,000
In 1877.....	11,048,055		160,294,000

This, as can be seen, is nearly 200,000,000 bushels less than a year ago on more than 3,000,000 acres greater area; and now that the harvest is over, and we have some reasonable data from which to estimate, these figures will be found to be more than 6,000,000 bushels less than the boasting articles that were published in many of our Eastern as well as our Western newspapers in June last.

### THE DELETERIOUS USE OF ALUM IN BREAD AND BAKING POWDERS.

Alum being Substituted for Cream of Tartar.

BY HENRY A. MOTT, JR., PH. D., E. M.

Having been appointed Chemist by the United States Government for the Indian Department, it became my duty to submit to chemical analysis, among other articles, the various baking powders offered the Department, and as a result of my investigation I found that at least 50 per cent of the baking powders offered were grossly adulterated. After making this discovery I determined to submit to analysis every baking powder I could find on the market, and to expose such powders as were adulterated, so that the public may be warned from purchasing them in the future. The number of baking powders I have examined amount to forty-two—twenty-nine of them from various sections of the country having been offered to the Department, and thirteen obtained from various grocery stores throughout the city of New York.

Instead of the baking powders of commerce being composed alone of those constituents which have been demonstrated to be perfectly harmless and wholesome, the public have imposed upon them powders largely adulterated with most injurious and hurtful compounds, put up in cans neatly labeled "chemically pure," as if that fact (?) had anything to do with rendering the powders wholesome. Scheele's green (arsenite of copper) is often "chemically pure," but it is always a deadly poison.

It, therefore, becomes necessary for the benefit of the public to examine into the powders on the market, and to denounce such of them as are composed of constituents detrimental to health.

The best powders are composed of bitartrate of potash (cream of tartar), tartaric acid, carbonate of ammonia, and bicarbonate of soda, held together to prevent decomposition by a little starch.

The injurious powders are composed of alum and bicarbonate of soda, and often contain terra alba (white earth), insoluble phosphate of lime, etc., etc. The effect of alum when taken internally has been shown by Wilmer and others to produce dyspepsia, constipation, vomiting, griping, and even inflammation of the gastro-enteric mucous membrane, as it is a powerful astringent acting chemically on the tissues. These serious effects will not of course be brought about immediately from the small quantity of alum used in one loaf of bread, but it is certain that persons continuing to eat bread containing alum, will, in time, suffer from its evil effects, and the weaker the constitution the sooner will the effects be noticed.

Duma speaks to the same effect when he says: "It is to be feared that this salt exerts a deadly action by its daily introduction into the stomach, especially in persons of a weak constitution." And other great authorities, such as Carpenter, Dundas, Thompson, Gibbon and Normandy, all agree that the continued use of bread containing alum will bring about dyspepsia and other troubles, and such was the opinion of the late Baron Liebig. The celebrated Pereira considered "that whatever may have been the effect in the case of healthy persons, sick persons did really suffer in that way. In the *Lancet* is mentioned a case in whom dangerous gastroenteritis was apparently induced by a single dose containing between ten to twenty grains of burnt alum. Dr. Parkes, in his work on Hygiene, states that from eight to forty grains of alum, and probably more, have been found in a four-pound loaf of bread.

The effect of alum on bread is to tend to whiten it, and to prevent an excess of fermentation (when yeast is used) when the altering gluten or cerealine acts too much on the starch; but while it accomplishes this object, it lessens at the same time the nutritive value of the bread by rendering the phosphoric acid insoluble.

Sufficient proof, I think, has been shown that alum is a most dangerous element to introduce in baking powders, and it now becomes necessary for the benefit of the public to expose such unwholesome and injurious powders as contain it. Having analyzed the Royal Baking Powder, I find it composed of only those elements which have been demonstrated to be perfectly wholesome and healthful, having for its active principle pure grape cream of tartar instead of the injurious alum used in the following powders. I do not mean by signaling the Royal Baking Powder, that it is the only properly made powder on the market, as there may be others equally

as good. I simply introduce it as I had to select one, and thought the one I had used in my kitchen for years, and which had always proved satisfactory, would be the best illustration.

Out of the many baking powders I have examined, I have selected the more prominent ones that are adulterated, giving in each case a quantitative analysis of the same. The following analysis are of "Dooley's Standard Baking Powder," "Patapsco Baking Powder," "Charm Baking Powder," and the baking powder manufactured by C. E. Andrews & Co., of Milwaukee. The analysis of the last three baking powders given in the first column was made by Professor Robert W. Schedler.

No. 1.			
DOOLEY'S STANDARD BAKING POWDER.			
Burnt alum	26.45	per cent	
Bicarbonate of soda	24.17	"	
Sesquicarbonate of ammonia	2.31	"	
Cream of tartar	None	"	
Starch	47.07	"	
	100.00		
No. 2.			
PATAPSCO BAKING POWDER.			
Smith, Hanway & Co., Baltimore, Md.			
Burnt alum	19.16	per cent	20.63 per cent
Bicarbonate of soda	23.36	"	22.80 " "
Cream of tartar	None	"	None " "
Starch	57.48	"	57.17 " "
	100.00		100.00
No. 3.			
CHARM BAKING POWDER.			
Rohrer, Christian & Co., St. Louis, Mo.			
Burnt alum	29.60	per cent	30.00 per cent
Bicarbonate of soda	31.13	"	31.82 " "
Cream of tartar	None	"	None " "
Starch	39.27	"	38.12 " "
	100.00		100.00
No. 4.			
BAKING POWDER MANUFACTURED BY C. E. ANDREWS & CO., MILWAUKEE, WIS.			
Burnt alum	22.53	per cent	
Bicarbonate of soda	21.79	"	
Cream of tartar	None	"	
Starch	56.86	"	
	100.00		

On reviewing the above analyses it will be seen that, in the "Patapsco Powder," about 20 per cent of burnt alum is used, over 22 per cent in Andrews', over 26 per cent in Dooley's, and about 30 per cent in the Charm. And the manufacturer of "Dooley's Powder" not only has the audacity to put on the market this injurious and unwholesome powder, but to put upon the labels the deceptive statement, "chemically pure."

Not one pound of these powders could be sold in England, as it is against the law to use alum for making bread. Why have we not such a law?

A case is reported in the English Law Reports of 1871-2, 7th Queen's Bench, 135, November 15th, 1871, where a baker was convicted for using alum in making bread.

I could furnish, if it were necessary, analyses of many other alum powders, as at least 50 per cent of the baking powders contain alum: but the above serves to illustrate their nature, and to show the importance of discriminating with a great deal of care when purchasing baking powders. It is far better to select only "standard powders," as the "Royal Baking Powder," for example, than to risk purchasing the many adventurous compounds which are sure to be put on the market by persons who have no higher motive than dollars and cents.

What would become of the above-mentioned baking powders containing alum if they were introduced on the English market? The answer is simple—they would be swept out of existence. It is to be hoped, then, that the public, by refusing to purchase them, will bring to them all the same fate.

By exposing these injurious and unwholesome baking powders, the public must not be frightened from using baking powders when properly made—of which I have already stated there are a number on the market. In fact, baking powders are a great convenience, as the constituents are so combined that their use is always attended with success; and there is no danger of biscuits made with them having an alkaline taste, or being impregnated with yellow specks or streaks, as is often the case when ordinary cream of tartar and soda are used. This results from the fact that the ordinary cream of tartar found in market is adulterated from 10 to 90 per cent with foreign substance; consequently it becomes necessary to change the proportion to be used with every new lot, which can only be correctly arrived at by a chemical analysis of the cream of tartar.

The advantages of using "baking powder" in preference to yeast are, that with the former none of the nutritive parts of the flour are destroyed, a larger yield is obtained, and the result accomplished with a great saving of time, which would otherwise be required to promote the fermentation when yeast is used.

The advantages of using "baking powder" in preference to the ordinary cream of tartar and soda found on the market are not only

that it is more economical, but the results are always attended with success, there being no fear, as stated, of producing an alkaline taste or yellow streaks in the product.—*Scientific American.*

### Items of Interest.

Not over one person in three has legs of equal length, and every man should be posted on the relative length of his limbs that he may know which one to use for short and which one for long kicking.

Chicago is now receiving broom corn, of the new crop, from the States of Missouri, Kansas, Texas, Nebraska, Iowa and Wisconsin, and handles more broom corn annually than any other city in the country.

Antwerp imports American barrel flour; this is put into sacks, leaded and designated by some brand, and sent into France without payment of duty. These masters are bitterly complained of by French millers.

The three great Bonanza Kings—John W. Mackay, James G. Fair, and J. C. Flood—were once poor Irish lads. The first is 53 years of age, and possesses an income of \$800,000 a month; the second is 47 years old, with an income of \$500,000 a month, and the third is aged 50 years, with an estimated fortune of \$40,000,000.

The Belgian correspondent of the *Ironmonger* writes in one of his last letters that American edge tools for husbandry and farm purposes are working steadily into that country, whereas the old Sheffield brands are almost totally disappearing. The metal trade in Belgium is dull at the present moment, but the prospects are looked upon as encouraging.

A Minnesota farmer being greatly annoyed by the ravages perpetrated in his garden by a number of pigs, consulted the Town Supervisor as to what he should do. "Shoot 'em—that's what you ought to do," said the Supervisor. A few days after the pigs reappeared, when the farmer proceeded to "shoot 'em" to the number of six good-sized grunners. When the ownership of the pigs was ascertained, it was found that they all belonged to the farmer himself! But he thus got rid of the nuisance.

According to recent reports, there is now great enthusiasm over educational matters in Japan. There are 24,000 common schools in the Empire, with an average attendance of 2,000,000. There are 216 high schools, with an average attendance of 18,000, and 90 normal schools, with an attendance of 8,000. The course of study in the common schools is similar to that in this country, and the schools, generally speaking, have been modeled on the American plan. The teachers number 45,000 and are licensed by the Government Board of Education.

A writer in a foreign technical journal expresses a decided preference for soapstone powder, in the form of dust, as a lubricant for the axles of machines. For this purpose it is first reduced to very fine powder, then washed to remove all gritty particles, then steeped for a short period in dilute muriatic acid, in which it is stirred until all the particles of iron which it contains are dissolved. The powder is then washed in pure water to remove all traces of acid, after which it is dried, and is the purified steatite powder used for lubrication. It is not used alone, but is mixed with oils and fats, in the proportion of about 35 per cent of the powder added to paraffine, rape, or other oil; or the powder may be mixed with any other of the soapy compounds employed in the lubrication of heavy machinery.

Reports from the Island of Jamaica to the 26th of October, report trade in a greatly depressed condition. There is also a perfect stagnation in agricultural business. Such a depression has not been known in the island for seventy-five years. The failure of Cottam & Norton's house in London has had the effect of sending several sugar plantations into ruin. They are now being abandoned, and the proprietors, in some instances, find it difficult to take other estates, burdened as they are with mortgages and other considerations. Sir Anthony Musgrave, the new Governor of this colony, is about to introduce a railway bill for the opening of the interior of the island, where there are no means of bringing the produce of the colony to a market. The Government proposes to buy out the Jamaica Railway Company, and to take the matter in hand by the payment of \$400,000 and extending the line first to Porus, at the foot of the Manchester Mountains, which is the great coffee producing district.

WHAT WINTER WILL BE.—Professor E. J. Couch, of Grand Junction, claims the predic-

tion made by him a year ago that the year 1878 would be the beginning of a series of years of unfavorable crops in this country, has so far proved true. He ascribes the failure to excessive rain during the blooming season of plants. Plants possess sex, and rains are unfavorable during the blooming season. He says the season of 1879 will be generally dry. The winter, with the exception of a cold spell from about December 12th, reaching its maximum about the 22d to 25th, will be moderate intensity of cold and snow until about January 22d, when the real winter will set in and continue late. In Northern Europe the cold will be intense. April will be moderate; May bad; June, July and August, hot and dry. Mr. Couch bases his predictions upon different principles than those of Tice, or other persons in this country, and claims to have solved the weather problem, so far as is possible with present knowledge of celestial bodies.

### GETTING IN THE BURRS.

The husk frame completed, the next thing in order is to get the bed-stone down in place. After the bed-stone has been placed in position, it should be leveled and centered about where it is expected, or really where it is actually to remain. It can then be fastened by the tightening screws around its periphery, or by whatever other appliances may be used for the purpose. After that is done, the curbing or facing can be fastened around the stone. This should be made of 1½-inch pine lumber, or other soft lumber, and from four to seven inches wide, according to taste. The whole circle requires to be neatly filled around the stone to prevent the meal from leaking through; the butt joints also require to be very neat, as a matter of looks, so that after it is finished it will have the appearance of being one solid circle instead of being constructed of six segments. The upper and outer edge of the circle must be chamfered neatly; the chamfer should be about three-fourths of an inch wide by about three-eighths deep. When this part of the plan has been completed, the bed-stone may be considered located and fixed. It will then be in order to set the spindles.

We may here remark that it is not really necessary to permanently locate and fasten the bed-stones before the spindle is set; it is not an absolute necessity that it should be placed at all for the purpose. The center of spindles can be established without any reference to the stone whatever. The tallow-pot can be fitted and fastened to its place, and the stone afterwards located to suit the center of spindle already established. It is merely a matter of choice or convenience, the one mode of operation being equally as good as the other.

After the bed-stone has been located and spindle set, the tramping must be done. It may be found that the spindle cannot be tramped exactly to the face of the stone; this will probably be proof that the stone is not in true face. To overcome this difficulty there must be assurance that the stone is as near level generally as it can be made. The spindle must be set exactly plumb; the stone can then be faced off as nearly as possible to the tram, care being used to get an even surface so that too much trouble will not have to be encountered in finishing off with the red staff.

The setting of the bush in the bed-stone is now most generally done by the manufacturers; consequently millwrights are now seldom troubled with the job. It is, however, of small importance, as the eye of the stone is prepared for receiving the bush; or otherwise, the bush is prepared to suit the eye, or mortice, in the stone. It is only necessary to fix it in place true and parallel with face of stone, and from three-fourths to one inch below the face. It can thus be temporarily fastened with wooden wedges to hold it in place while it is being permanently fixed, which must be done by pouring prepared calcined plaster around it; this hardens quickly and holds the iron firmly in its place.

Setting the balance rynd in the runner is now a somewhat more difficult job, as mortices have to be cut in the hard stones to admit the lugs of the rynd. After this has been done, and the rynd to its place, the spindle should be put in place and the tram used for fixing the location of the rynd, the center of which should be exactly in the center of the stone. The rim of the rynd ought to be dropped three-fourths to one and one-fourth inches below the face of the stone. After the balance rynd has been centered and fixed so as to bring the spindle in tram, it must be temporarily fastened—best with iron wedges; after which, either lead or brimstone can be melted and poured around it as a permanent fastening. Brimstone is preferable, as it is not poisonous, while the lead is, when ground down in the flour or meal.—*Grain Cleaner.*

## Correspondence.

## ABOUT THE COCHRANE CASE.

[Washington Correspondence.]

WASHINGTON, D. C., Nov. 8th, 1878.—*Dear Sir:* We see in your November issue a telegram without signature which is published elsewhere over the signature of Geo. Bain, saying "Judge Blatchford drove our enemies from Court and denounced them for seeking to make him a Moot Court." Judge Blatchford allowed the injunction, and did not denounce anybody. The defendants had gone into bankruptcy, and Mr. Harding informed the Court of the fact and withdrew opposition to the grant of an injunction. The Judge made the order, and the next time a case comes up on motion for injunction the Court will have an opportunity to decide whether an order by confession does not make as good a case as a decision by the Court. The Association attorneys tried the experiment of confessing judgment by default in the Denchfield case. We did not suppose that the success of that experiment would induce so early a repetition of it. We would suppose that intelligent millers would ask themselves why it is that they are constantly deceived as to what is going on. Who is it that is benefited by keeping them in the dark?

The profession regards this as a clear back-down, a smart dodge to escape a decision on the merits. The millers may congratulate themselves that they escaped a great danger. Judge Blatchford had before him the entire case of defendants, the defense having been closed before the case was argued. We were very confident of a favorable decision, and therefore wished to have our motion decided. Mr. Harding was just as much afraid of an adverse decision, and so went into Court and confessed judgment to prevent the Judge from expressing an opinion on the merits of the case. What we can't understand is why in dealing with grown up men they can't be told the truth. They have dodged a decision which they feared would be adverse, and have a right to congratulate themselves on an escape from danger for the time being; but to dance and throw up their hats and call this a victory, shows how imminent the knowing ones regarded the danger. Did anybody ever hear of an attorney consenting to an injunction where there was no case for it?

The same questions precisely which they were so much afraid that Judge Blatchford would decide against them, after a hearing as full as it can be possibly before the Court, will come up for final hearing during the current month. We are as confident now as we were that Blatchford would decide the case in our favor on the same testimony. Can any of your readers tell why there is such unbounded faith now on the part of those who were so apprehensive of an adverse decision in New York? It does seem to us that some persons are interested in keeping hope alive to the end. Is there any call for assessments just now? The trial is so near that it does seem they could afford to postpone the celebration until they have won the victory. Yours truly,

THE AM. M. P. CO.

## THE BREAD WE EAT.

## What a Philadelphian Thinks of It.

[Written for the UNITED STATES MILLER.]

An English writer has set himself to consider the kind and quality of bread the people of England eat. The subject is one of general interest. This writer proves undeniably that the "staff of life" is but a broken reed to lean upon, so far as England is concerned, in these degenerate days. When grain was ground by wind or water power it was ground slowly and in small quantities. Now it is ground wholesale, and the grinding is rapidly finished. It is said that England suffers a smaller evil from the fact of too much wheat being ground in the Autumn and too little in the Spring. Flour, like ground coffee, loses flavor, and tasteless bread begets a craving for condiments and stimulants.

Has it been noticed that in countries where peasants bruise their own corn and bake their own flour, bread is the staple food, even though fruit, vegetables, fish and meat be abundant? The reason is, that good bread supplies in itself the nourishing properties of many kinds of food. It contains albumen, fibrine and gluten; and these make bone, muscle, blood and tissue.

The wandering Arab lives almost entirely upon bread, with a few dates as a relish. This is not because meat is scarce in his part of the world, but he feels no need for it. The Arab, however, would soon have to alter his diet, if

an enterprising English wholesale flour producing company were to set up its mills in the desert.

Now-a-days the axiom that bread is not sufficient of itself to feed a young Christian, has penetrated into the most poverty-stricken quarters; so that one notices the unsightly mess of treacle, the quarter-inch of dripping, or the deadlier yellow grease, in the making of which no cow ever had a share, maternally doled-out for the gratification of little urchins who could bite at plain bread heartily enough, if it were made good and properly out of our excellently milled and nutritious American flour. All this heaps wasteful expense on the households of the poor, where bread, instead of being the chief article of diet, is being eaten less and less.

This important fact is being noticed particularly in France, which, until recently, has been a great bread-eating country. Workmen and servants have come to want meat twice a day; soldiers grumble at getting nothing but plain roast and boiled; a Staffordshire miner knocks down his wife for having served him roast veal three Sundays running, notwithstanding his statement that he was sick of that meat; and thus a cry being raised for a variety in food. There have been established schools of cookery with the intention of trying to teach women how to sophisticate honest joints with unwholesome sauces.

People overfeed themselves and drink too much, as a consequence, without deriving from their mixed diet a tithe of the sinew which their fathers drew from sound bread. Would it surprise the modern discontented workmen to hear that the yeomen of Queen Elizabeth's reign, who drew their bow-strings to their ears, and sent a cloth-yard shaft whistling through a barn door at eighty yards, ate meat about once a week, and lived the rest of the week on bread and cheese?

And as for servants, what would a Belgravian footman think of the Jeames of the last century—the Jeames who often had to do battle for his master with highwaymen, and who was a very tough and healthy fellow, though his nourishment was beef on Sundays only, and a thin mutton soup on other days, with bread—but good bread. A bread diet is not especially advocated, only the purification of the bread, that it may be restored to its proper function as the "staff of life" to those who can ill afford fancy props. Let those who please buy dear meat and bad butter; but also let those who would desire to live largely on bread be enabled to do so. It might be done if half the attention which is paid to checking the adulteration of beer were bestowed on stopping the poisoning of the loaf. Beer has become pretty fair from being constantly looked after. The great brewers have a character to lose. A prosecution would ruin them. Anybody can get good beer by purchasing it in the cask direct from the brewer, but anybody cannot obtain good bread from the large wholesale baking establishments. This is all wrong, and should be changed in some way.

The well-to-do who patronize fancy bread at fancy prices are treated to as much adulteration in their flour as the poor; their breakfast rolls are whitened with alum, which is an astringent, hindering the digestion, and which, also, acts as a corrosive on the tooth, causing the enamel to decay prematurely.

The sick, however, have only themselves to blame if their bread is not pure wheat, for pure wheat yields a grayish loaf, and, if whiteness and sponginess be insisted upon, they can only be obtained at the expense of quantity. Those who seek to escape from adulterated bread by eating brown bread, are very often cheated by admixtures of rye and pea flour.

In England it is the millers who are mainly responsible for adulterations. In America, the trouble lies entirely with the bakers. The bakers use inferior or damaged flour; deleterious substances are used to "docter up" poor and stale flour. The artful baker takes more pains for the appearance of the loaf than for the quality. Excellent Western flour, which would produce a superior and nourishing quality of bread, if used in its pure state, is ruined daily in the bake-houses of the great cities of the East, by the addition of poisonous compounds, which are used to give the bread a "fancy" appearance. The flour comes from the miller all right, but its purity and nutrition is killed by the bakers.

People who occasionally go into the country, where they get bread made from the freshly-ground flour by housewives who understand their business, are wonder-stricken at the difference between the farmer's bread and the baker's. But it must be admitted that the art of bread-making, even in the country, is in many places a lost art, and the traveler who

should undertake to subsist on bread alone would have rather a rough time of it.

It is too true that the arts of the town have, unfortunately, found their way into the country. All the deleterious compounds that supply the place of the old style yeast in securing fermentations and promoting whiteness are for sale in country stores, and find thousands of customers. It would be almost impossible to enumerate the names of the various chemical preparations that are offered for sale throughout the country, and which are intended to be used in the making of bread. It is almost too much to expect that, as a people, we shall ever be permitted to eat good bread again, notwithstanding the fact that America can boast of producing the best flour in the world. When bakers become honest, and chemical yeast powders and similar nostrums are dispensed with, Americans may look for true and healthy bread, which can be made from American flour.

## TOUGHENED GLASS.

## How It is Made Every Day in Brooklyn—A Poet Among the Glass Blowers.

It is not generally known that the new process of toughening glass, recently invented in France by M. A. de la Bastie, has already been introduced to this country, and is carried on every day in Brooklyn. Mr. William Cullen Bryant, the venerable poet and journalist, and a number of other gentlemen, recently visited the La Bastie Glass Works, in Delevan street, near Van Brunt street, South Brooklyn, at the invitation of Mr. A. de la Chappelle, the proprietor, to examine into the operation of the new process.

Up to the present time it has been applied in this country chiefly to the toughening of lamp chimneys. These are first made in the ordinary way, complete and ready for use, but as brittle as common glass. A workman then takes them, one by one, upon the end of a long iron rod, and plunged them into a furnace. The chimney is not allowed to fall from the rod, but is held upon it in plain sight. It grows redder and redder until it has assumed a tint which the skilled eye recognizes as indicative of the proper temperature—a temperature which the courteous and clear-headed foreman stated to be 1,500 degrees Fahrenheit.

The chimney, still upon the end of the rod, is now withdrawn from the fire and plunged into the oil bath close at hand. This is a circular iron vessel, perhaps three feet in diameter, standing upon the floor of the works and heated from below. It is nearly filled with melted tallow, at a temperature of about 420 degrees. Around the edge of the bath, and standing in the hot oil, are ten or a dozen small upright vessels, each with a horizontal handle, and all resembling high saucepans with flat bottoms. The lower part of each one of these vessels is pierced with large holes, so that as they stand in the bath the oil comes up to the same level in them as in the body of the bath. Each one is intended to receive a chimney fresh from the furnace.

As the chimney falls from the iron rod into the oil, a great flame goes up from the ignited fat, the chimney being so much hotter than the oil. This, however, is only instantaneous, and dies away, leaving the chimney invisible in the blackened contents of the bath. When a chimney has been placed in each of the high saucepan-like vessels, all are left quietly in the melted tallow some fifteen or twenty minutes, and are then taken out by the numerous small boys, who hover about like little fire-demons, to be by them conveyed to the boiling and washing room.

When they are thus removed from the bath, after having been treated with the hot oil, the chimneys look just as though they were made of gutta-percha. They are completely coated with a thick, brown, fatty substance. This is cleaned off, first by boiling them, and subsequently by hand-washing. The process of toughening is then complete.

The comparative cost of glass which has been subjected to the La Bastie treatment was stated to be about 40 per cent higher than that of ordinary glass. The comparative toughness and durability were illustrated by the written statements of two of our city railroad companies, exhibited by the manager, that since they had used the toughened lamp chimneys they lost but one by breakage where they had formerly lost eight and ten respectively. Further, illustrations were given by practical experiments in the presence of the visitors. Eight of the toughened chimneys were placed over burners and allowed to become very hot. An attendant stood by with a pail of cold water and a brush, and showered the chimneys with the water. Only one broke under this severe test. He did succeed in breaking

another, but not until he took it off the gas and plunged it hot into the cold water. The rest stood firm through all the shower.

A more striking experiment was performed by the foreman, who, with one of the chimneys as a hammer, drove a six-penny nail the whole length into a thick plank. It was repeated by one of the visitors, who doubted what he saw until he had done the same thing himself. As yet Mr. de la Chappelle has made nothing but chimneys of various sorts on a large scale; but he is testing the applicability of the process to other objects, such as plates of different sizes, saucers, bowls and window glass, with a view to their economical production. Specimens of these were shown in his store-room. Thin and delicate plates were allowed to fall to the floor, and even violently hurled upon it from the height of a man's head without breaking; a fall of ten feet or more on hard brick failed to fracture some little glass butter plates whitened with cryolite, so as to look like ordinary chinaware; and the severe shocks sustained by the panes of ground glass which were exhibited suggested the value of this glass for covering green houses. No ball could break it.

The La Bastie process is protected by several patents. The nature of the change it effects in the glass is not thoroughly understood—unless, indeed, by the inventor and a few highly-trained experts. One curious fact was mentioned by the foreman of the Brooklyn works—that fragments of the toughened glass have not the sharpened edges of ordinary glass when broken, and are much less likely to inflict bad cuts.—*New York Sun.*

## HOW MANY BUSHELS IN A BARREL?

We have lately been requested to give an answer to that antique conundrum, "How many bushels are there in a barrel of vegetables or fruit?" The subject is of but little present interest in connection with apples, which are so plentiful that a peck more or less in favor of either buyer or seller hardly makes any difference. But in the matter of potatoes or onions it may be worth considering, and we answer: There is no such legal measure as a barrel. The matter is regulated entirely by the agreement of buyers and sellers, either tacit or expressed. The general understanding in the produce trade at the present time is that a barrel contains two bushels and three pecks, and nearly all transactions in this vicinity are made with that understanding.

But many shippers of country produce, back in the country, if measuring produce by the bushel and paying for it by the barrel, require three bushels for a barrel. On the other hand, grocers, peddlers and other retailers in this vicinity, who are compelled to "round up" the pecks which they deliver to their customers, are seldom able to make their barrels yield more than ten pecks. Hence, "barrel" is hardly more definite than "box" as a measure of capacity.

Some years ago a number of produce dealers of Boston, New York, Philadelphia and Baltimore united and had a bill drawn up making the standard flour barrel which holds 196 pounds of flour and 112 quarts dry measure, the legal barrel. The design was to get the bill enacted in New York, after which it was to be urged into other States. After pressing the matter for two years at Albany and expending over \$1,000, the bill was passed but vetoed by the Governor.

It was unkindly suggested that the veto was due to the interference of the big barrel manufacturers in the upper part of New York State. But the matter does not appear to be of very much consequence any way. The custom of selling by weight merchandise which in former times was by measurement is becoming more popular every day even where it conflicts with old legal enactments, still upon our statute books and nominally in force, though practically as dead as the ordinance against smoking in the streets of Boston. Potatoes are now sold from the cars invariably by weight. The same is true of other articles; and it is urged with a good deal of reason, that it would be much more satisfactory to sell eggs by the pound rather than by the dozen.

SHE was a Boston girl. She was visiting her Whitehall country cousins. While walking out several butterflies passed her. "Oh, dear me! what charming little birds! They are perfectly exquisite." "They are not birds, my dear," said her country cousin; "they are butterflies." "O! you don't say so. Then these are the dear little creatures that fly from flower to flower and gather the sweet yellow butter that we use. They are too lovely for anything."

## AMERICAN GRAIN FRAUDS.

Under the above caption the *Corn Trade Journal* (London) publishes the following communication from an English grain buyer:

"LIVERPOOL, Oct. 17th, 1878.—To THE EDITOR.—Sir: Recent events have brought vividly to light certain deep frauds on the part of the Elevator Company of Baltimore, which, no doubt, will be the cause of completely altering the present system of buying *c. i. f.* on elevator's certificates. As every importer is aware of the loss in weight, quality, and condition of cargoes of grain from the States, the movement towards ridding the trade of such monstrous losses, now that rumors, since current, are shown to have been justified by facts, will no doubt be a strong and substantial one. Cannot the American trade be worked on the basis of the Danubian, etc., system, viz., delivered weight and condition guaranteed? Yours, etc., N. B."

Upon the same subject the *Liverpool Daily Courier*, of a late date, says:

"Rumors tending to cast discredit upon the Baltimore mercantile community with reference to its dealings with the grain elevators of that city have long been rife, but as the bare word of discharged workmen was deemed insufficient to warrant the impeachment of the directorate, it is possible that these irregularities would in substance have remained unexposed but for the persistence with which David M'Leod, ex-assistant foreman in the employ of the Baltimore & Ohio Railroad Company, pursued the authorities of the Corn and Flour Exchange, and thrust upon them the responsibility of an investigation which, now that it has been made, discloses a system of fraud as complete in its arrangement of detail as it is gigantic in its proportions.

"Grain in the United States, as it arrives at the seaboard, is passed through the elevator, a grain warehouse of considerable dimensions, which may be considered to act in the capacity of a public arbiter between shippers and original merchant or others. In this establishment weight and quality were supposed to be carefully investigated for the mutual benefit of the parties interested in the transaction. Bad out-turns latterly have, however, rudely shaken the implicit reliance which seems hitherto to have been placed in the integrity and virtue of the leading spirits of this Baltimore Company; the certificates and weight memorandums, regarded till now as reliable vouchers from trustworthy authorities—reliable, seeing that they were the guarantees of supposed entirely disinterested persons—awoke feelings of distrust, and, as the facts prove, well they might. It was admitted before the inquiry—which, by the way, was held with closed doors—that as each carload of grain (22,000 pounds) was run in the elevator, 100 pounds was deducted from the actual weight; whilst smaller draughts were to pay a toll of 70 pounds. Lighters were mulcted some twelve to sixteen bushels on the load.

"As much as 150 carloads of corn were run into the elevator in one day, and thus, by making a deduction of 100 pounds on each carload of 22,000 pounds, some fifteen thousand pounds more corn was received by the authorities than was placed to the credit of the depositors. This, a witness before the committee of enquiry, stated that the foreman instructed him to do, "to keep the elevator square," adding that this clever manipulator ordered him to retain all sweepings and screenings, and deliver the same for his account to a pig raiser of the former, named Douglas. Other charges were gone into, and amongst them one other especially grave, which our corn merchants will testify. It was that when a vessel came up for a particular class of corn a lower grade was delivered to her, and falsified certificates supplied; thus, in a sentence, are the arbitrations, troubles and losses which have fallen on unwary merchants explained away: and whilst accounting for the wide difference which we have supposed existed in the American ideas of prime corn of fair average quality and our own, also elucidates the mystery of the four and even six per cent loss in weight which grain cargoes are now frequently known to show. The sample falsifications we will not enter into; suffice it to say that the bulk, when compared with what was professedly a bulk sample taken from the elevator, was as a rule considerably more deteriorated in quality than could have been induced by the generation of heat on the voyage."

Such frauds as are spoken of in the above extracts are a disgrace to our whole grain trade, and we sincerely hope the guilty parties may be properly punished. The greatest care should be taken to preserve the confidence of our foreign customers, and any who from motives of cupidity defraud them should be severely punished. We have too much at stake to have our grain trade injured by unprincipled dealers. Milwaukee has honestly won a fair reputation for square dealing in the grain markets of the world, and we hope no such charge will ever be laid at our door as that in the above extract to Baltimore.

## THE RUSSIAN RAILWAY IN AFGHANISTAN.

The *Pall Mall Gazette* says: If distant rumors, founded, it would seem, on a common basis, can be trusted, the oft-mentioned and much-discussed scheme of a railway to the Russian possessions in Tustan has once more been brought forward. A Reuter telegram from St. Petersburg and the St. Petersburg correspondent of the *Independence Belge*

agree in connecting with this scheme the mission of General Abramoff to Cabul, and both assert that the Russian Government seeks permission from Shere Ali to continue the line up to and beyond the limits of Afghanistan. Here, however, the two authorities part company; one maintaining that the railway intended to connect Russia with Afghanistan is to run from the Russian possessions in Turkestan to Cabul; the other that it is to start from the shores of the Caspian Sea and go to Herat. The Russian Government has resolved to build the long-projected railway through Turkestan, and General Abramoff is commissioned to obtain the permission of Shere Ali to "extend the line as far as Cabul." The project of a railway from Turkestan to Cabul is one which, as soon as the mountainous frontier of Afghanistan was reached, would present engineering difficulties of a very formidable character indeed. According to Reuter's agent at St. Petersburg, the Turkestan Railway is to go to Herat by the route which a Russian army approaching Herat would undoubtedly take. It is possible, of course, that the Russian Government may have conceived the grandiose plan of building more than one railway in Turkestan—or rather one railway with several branches. But if one line only is to be made it will probably, as Reuter's agent suggests, run from the Caspian Sea to Herat. There seems, in any case, to be seriously a question of a railway for bringing the Russians into Afghanistan.

## THE FUTURE OF AMERICA.

The Rev. Joseph Cook at a recent lecture had for his theme the future of America. "Mr. Gladstone, who weighs all his syllables," he said, "has lately annoyed England by declaring that the census of 1880 will exhibit the United States as the wealthiest of all nations." Taking this as a central thought, the lecturer then compared the size of the United States with other countries. Physical size was opportunity, and opportunity applied is greatness, but at the same time is also temptation. With the size of our country come great political spoils and the temptations for greed and plunder. The men who rule under you dome and Executive mansion govern a far greater and richer domain than was ever the Roman Empire, which was the object of Caesar's ambition. In explaining at length the greatness of our country, Mr. Cook said: "For geographical reasons I am glad I am an American; for geographical reasons I am afraid to be an American, and yet for geographical, political and social reasons I would rather be an American than a Roman under Caesar, or Briton under Victoria." Passing quickly on, the speaker reviewed the labor question and communism. The five great railroads were the fingers of a hand reaching over this broad land, the smaller lines the arteries, while the great cities lay at the tips of the fingers and made the wrist and arm. When unemployed labor became incited to riot, and the connection between the producer and the consumer was cut off by lawlessness and insurrection there would be pain. But with five great powers, the parlor, pulpit, politics, press and police, marching in Macedonian phalanx, America is safe. By our geographical position this continent is better favored than Europe, Asia or Africa. We have more weight of arable land. The time may not be far distant when this side of the globe contains the majority of the world's population. We have now only fourteen persons to the square mile; our ultimatum is eighty. We may look forward to the time when our population is twelve hundred millions. America is young yet; her feet are tender, though bedewed with blood, and as she wanders through the continents of time the lips of eternity kiss them out of pity for their infancy.

Mr. Cook dwelt at length upon the probability of a great English-speaking alliance encircling the globe, holding in itself the power of making universal peace. He acknowledged that our large cities at present were bad exemplars of good government, but claimed that this could be remedied by allowing none to vote that could not read and write, and by abolishing rotation in office. By decreasing political spoils temptation would be diminished. To bring ultimate happiness we must diffuse liberty, intelligence, property, when it is earned, and conscientiousness.

ADULTERATED GRAHAM FLOUR.—Graham flour is rapidly coming to be as much an article of suspicion as ground coffee or spices, or any other of the thousand and one adulterations that are daily practised. The commonest form in which Graham flour is seen is that made from a "medium" or poor class wheat, and while not properly adulteration, it may be justly characterized as swindling of the meanest kind, for the reason that the product is largely used by dyspeptics, and others in imperfect health. The miller who palms off on his customers Graham flour made from anything but the choicest of wheat, is one of the meanest of all villains, and, if he is not aware of it, should be told so. Graham flour, properly made, is nearly as costly an article as bolted flour ground from the same wheat, and, therefore, when you are offered Graham at much less than than the best bolted flour, you are being victimized—it is either adulterated or it is made from inferior wheat. A common form of adulteration, and one that is practised by at least one retail flour dealer in this city, is to take a barrel of flour costing about five dollars, added to it about sixty pounds of bran, twenty-five pounds of middlings, and the same quantity of corn meal. The result of

the mixture is three hundred and sixty pounds of stuff costing about six dollars and forty-five cents, or a fraction over two cents a pound; while Graham flour, made from the best wheat, cannot be sold now at less than three and one-half to four cents a pound. And yet this vile stuff is being swallowed by people in search of better health, when they would do about as well on a diet of hot white biscuit.—*St. Louis Trade Journal*.

POPULATION OF SOME OF THE GREAT CITIES OF THE WORLD.—The Registrar-General of London, in one of his weekly reports, gives the population of the cities of the world having over a quarter of a million of inhabitants, as follows: First comes London, with its 3,577,304 people; next is Paris, with its 1,988,806; New York, with its 1,084,528, and its close neighbor or partner, Brooklyn, with 549,438; and then Berlin, with 1,019,620 inhabitants. Philadelphia has its 876,118; Vienna, 727,271; St. Petersburg, 669,741; Bombay, 644,405; Glasgow, 566,940; Liverpool, 532,581; Manchester, with Salford, 530,765. All these are above the half million. Then comes Naples, with its 457,407; Calcutta, with 429,535; Madras, 397,552; Hamburg (the State), 405,104; Birmingham, 383,117; Baltimore, 355,000; Buda-Pesth, 319,350; Dublin, 314,666; Leeds, 304,948; Rome, 282,214; and Breslau, with 267,000 population. He seems to omit the great Chinese and Japanese cities.

THE PROFITS OF MINING.—After all that has been said about the richness of ores in the Comstock lode, and the enormous wealth in that deposit, it is surprising to learn that the average yield of the ores has been only \$43 a ton. The "big strikes" of rich ore were all duly proclaimed, loud and long, for the purpose of selling the mining stocks, but the low yields of ore were passed by unnoticed, and this is the way in which the exaggerated idea of the richness of the lode was obtained. Some of the first ores did yield enormously, at times as high as \$4,000 a ton; but these cases were exceptional and rare. The whole quantity of ore from the twenty mines on the lode has been 6,324,210 tons, and the whole amount of bullion obtained from it \$271,874,842, being at the rate of \$42.95 per ton. At first view, \$271,000,000 in gold and silver looks like an enormous yield of money in ten years, but it is not half as much, after all, as the value of the California wheat crop in the same time. Besides, it has required a great expense to work the mines, so that the net profit of Comstock mining has not been nearly as large as might be supposed.—*St. Louis Republican*.

RUSSIAN RAILWAY.—Engineer John McFethries, for eleven years master mechanic of the Kursk, Charkoff and Azof Railroad in Russia, has returned to Springfield, Mass., and gives interesting facts about Russian railroading. This road is a single-track concern, 500 miles long, running from Kursk to the port of Taganrog on the Azof Sea. The gauge is five feet, with an equipment of 225 passenger and 4,500 freight cars, 200 engines and 4 locomotive and repair shops, with 1,500 to 2,000 employes, according to the season. The coaches, of continental manufacture, are peculiar in pattern, opening at the ends with a middle aisle as here, but only 34 feet long, and instead of having four or six-wheeled tracks, three single wheels on each side of the car, are attached directly to the car string-pieces, equi-distant, and not connecting with each other. Four wheels suffice for a freight car. American coaches are almost unknown, only one car, a Pullman, from England, having been run over the road on an exhibition trip. But palace cars are liked by the authorities, and Mr. McFethries thinks they will soon be in use, though the royal family may for a time monopolize them.

BRICK-MAKING BY STEAM.—There are two brick yards in the country, one at Washington and the other at Baltimore, with machinery for making bricks by steam, which is stated to be very rapid and economical in operation. Each of these establishments is said to have a capacity of 200,000 bricks per day. The clay, after it has been passed through iron rolls, which pulverize the small stones and reject the large ones, is carried to the top of the minding and thence falls into the disintegrator, which makes 450 revolutions per minute. Here it is reduced to a fine powder and passes off into a pipe, where, by the addition of steam, it is moistened enough to give to its particles the proper cohesiveness. This pipe feeds a wheel furnished with molds, which, in the two revolutions it makes each minute, turn out 232 bricks. As the wheel revolves the bricks drop out on to an endless belt which carries them to a shed some 50 feet away, where they are loaded by hand upon small cars, which are rolled over into drying ovens and allowed to dry there during five hours, the dampness in these ovens being constantly withdrawn by an exhaust fan. After this they are stacked in kilns and fired.

WONDERS OF AMERICA.—The greatest cataract in the world is the Falls of Niagara, where the water from the great upper lakes forms a river of three-fourths of a mile in width, and then, being suddenly contracted, plunges over the rocks in two columns to the depth of 165 feet. The greatest cave in the world is the Mammoth Cave of Kentucky, where any one can make a voyage on the waters of a subterranean river and catch fish without eyes. The greatest river in the known world is

the Mississippi. It contains 5,000,000 square miles, and is one of the most fertile regions on the globe. The greatest city park in the world is in Philadelphia. It contains over 2,700 acres. The greatest greatest grain port in the world is Chicago. The largest lake in the world is Lake Superior, which is truly an inland sea, being 430 miles long and 1,000 feet deep. The longest railroad at present is the Pacific Railroad, over 3,000 miles in length. The greatest mass of solid iron in the world is the Pilot Knob of Missouri. It is 350 feet high and two miles in circuit. The best specimen of Grecian architecture in the world is the Girard College for Orphans, Philadelphia. The largest aqueduct in the world is the Croton Aqueduct, in New York; its length is 40¼ miles, and it cost \$12,500,000. The largest deposit of anthracite coal in the world are in Pennsylvania, the mines of which supply the market with millions of tons annually and appear to be inexhaustible.

Seventy-three thousand bushels of wheat and 4,000 barrels of flour were shipped from Duluth, Minn., during the first week in November.

Sometimes the services of a civil engineer are cheap at twice the money. A Henderson county farmer worked four days, recently, digging a ditch to drain a bit of low meadow of his own into a big pond on another man's farm. And when the ditch was opened the pond just walked right into the meadow and located about twenty acres of swamp right where the hay used to grow, and the farmer was just the maddest man.

DEEPENING THE MISSISSIPPI.—Capt. John Cowden, of Memphis, an old Mississippi River navigator, was in attendance at the Commercial Convention, and has a scheme for the deepening of the Mississippi and the reclaiming of the swamps in its valley, and doing away with levees. He thinks that the surplus waters could be carried to the Gulf by a cut six miles long from the point just below New Orleans to Lake Borgne. This cut would only need to be a mile wide and twelve feet deep. In this distance a fall of twelve feet would be obtained. The Captain claims the same result would follow as in the opening of the Bonnet Carre Crevasse, by natural causes, in 1873, which was the discharge of one-twelfth of the water of the river into Lake Pontchartrain, the result of which has been a large diversion of sediment through this cut and the consequent deepening of the channel at the mouth of the river. A similar outlet below New Orleans would increase this good result. The Captain also advocates the turning of the surplus waters of Red River direct to the Gulf through the Bocuff and Calcasien Rivers. By these and other outlets which he names, Capt. Cowden says, at a cost of not to exceed \$10,000,000 the channel of the river would be permanently deepened, while engineers estimate the cost of the construction of levees at \$46,000,000, and the expense of building and repairing would be perpetual.

## NOTE ON "BLOWING OFF" STEAM BOILERS.

In a French essay on the care of steam boilers we find a note on the advantage of cooling off the arch after stopping and before "blowing off." It is as follows: Those who possess externally-fired boilers working only by day have all observed that the fire being covered at night, and the doors closed, the pressure rises during the night, often sufficiently to open the valves. This shows that the masonry, being at a much higher temperature than the boiler which it envelops, imparts to it some of its heat. The same effect of heating the boilers by the masonry is produced to a less degree, it is true, but, nevertheless to some extent on the outer jacket of internally-fired boilers. It is consequently injurious to empty boilers soon after having stopped them, because after emptying the plates would be heated by the action of the masonry. It is well to admit a current of air through the flue some hours after the stoppage of the generator, and not to empty it before the flues have become cooled to a temperature below 150 deg. When the flues are not too hot, no serious inconvenience is experienced in emptying the boiler under pressure. We do not say at high pressure, as for a boiler the pressure of which would be 5 kilogs., the temperature of the water being 152 deg., a great quantity of steam would be generated during the process of emptying; we think that at a pressure at one kilog. the boiler could very well be emptied.

In internally-fired boilers, as there is no masonry to cool in the furnace tubes, it would be preferable to admit the current of air intended to cool the masonry behind the boiler, as in this case the furnaces would not be cooled more rapidly than the jacket. We have sometimes seen owners empty their boilers almost immediately after the fires have been extinguished, clean them with cold water as soon as they were empty, and keep up a current of water so that the workmen might work there. Boilers of small dimensions sometimes resist this treatment, but in large boilers it will be seen that unequal contractions must take place which burst the rivets.

EVERYBODY READS THIS.

NEWS OF THE WORLD.

Items Gathered from Correspondents, Telegrams and Exchanges.

CROP ITEMS—MILLING AND MANUFACTURING ITEMS—FINANCIAL ITEMS—CASUALTIES—ETC., ETC., ETC.

Wamego, Kan., is to have a \$16,000 flouring mill.

Marfield & Babcock, millers, of Niles, Mich., closed.

Nathan Barlow, of Hastings, Mich., has sold his flour mill.

Geo. S. Stewart's planing mill at Bradford, Pa., has burned.

G. Pfeiffer of Newton, Iowa, has patented a mill-stone feeder.

J. W. Chatburn's new mill at Shelby, Iowa, is nearly finished.

Brownlee, of Mondovi, Wis., is pushing the work on his new mill.

Geo. Bodemich's shingle mill at Big Rapids, Mich., burned.

The winter wheat prospect in Indiana is unusually favorable.

Barnes, the Winnebago City, Minn., cooper has fallen heir to \$18,000.

Mr. Hughes has just completed his new feed mill at Somers, Wis.

Garst & Tinsley, of Big Lick, Va., millers, have dissolved partnership.

Elliott & Pool, millers, of Jackson, Mich., have dissolved partnership.

The Ottumwa (Iowa) Oatmeal Mill uses 1,000 bushels of oats per day.

Kirk Geissinger, of Ackley, Iowa, has bought a mill at Hardin City, Iowa.

Geo. Eckler, of Dayton, W. T., has purchased the saw mill at that place.

S. C. Buck, owner of the saw and flour mills at Falmouth, Mich., is dead.

Mr. Dessert, of Mosinee, Wis. has made extensive improvements in his mill.

Hyndman & Enfield, of Dundas, Minn., have added a feed run to their mill.

The Alexandria, Minn., flour mills are now turning out excellent new process flour.

John T. Milton has bought the grist mill of N. H. & B. Bean at East Canaan, N. H.

The Manchester paper mill, at Manchester Bridge, N. Y., burned. Loss, \$75,000.

Geo. Pratt, miller, at Mount Union, N. Y., is succeeded in business by Pratt & Morse.

The Morristown (Minn.) Mill has a large stock of wheat on hand and is running on full time.

Messrs. Coman & Morrison have started the feed run in their new flouring mill at Fox Lake, Wis.

Edw. P. Allis & Co. have closed a contract for one of their improved Corliss engines to go to Chicago.

Wm. Shacklett & Co., proprietors of the Pearl Mills, at Columbia, Tenn., have made an assignment.

The Phoenix elevator at Peoria, Ill., burned by incendiary November 3d, with 100,000 bushels of wheat.

Matt Hochstein, who was badly injured in Manegold & Co.'s mills, in Milwaukee, is able to be out again.

Both B. D. Sprague's and Valentine & Tew's mills at Rushford, Minn., are running day and night.

C. Van Orman and J. N. Hagenbaugh, of Athens, Mich., have taken out a patent on a grain separator.

Mr. Buttner's new grist mill at Carolina, Shawano county, Wis., is completed and is turning out good flour.

I. V. Ganze, of Richmond, Ind., has just put in a purifier, etc., furnished by the Richmond City Mill Works.

Hulbert & Paige, Painesville, Ohio, are shipping large numbers of their small engines and machinery for elevators.

Mr. S. M. Newton's mill at Independence, Wis., with Mr. Levi Heart for head miller, is running day and night.

The Reliance Mills, Milwaukee, are putting in a 28x48 improved Corliss cylinder, built by Edward P. Allis & Co.

Detwiler & Welch, owners of the Market street flour mills, Philadelphia, have failed. Liabilities about \$100,000.

David Narracong, of Pardeeville, Wis., has gone to Dellton, same State, to run the Dellton Queen Mills on shares.

One firm in Baltimore, Md., recently ordered

1,000 barrels of flour from B. D. Sprague's mill at Rushford, Minn.

A new saw and grist mill is to be erected at Vestaberg, Mich., by Mr. Donnell, of the late firm of Donnell & Purdy.

A. & O. Prickett, of Oakland Co., Mich., have added a new corn run, furnished by the Richmond City Mill Works, of Richmond, Ind.

A. H. Day & Co., of Columbus Grove, Ohio, have added a middlings run, furnished by the Richmond City Mill Works, of Richmond, Ind.

Edward P. Allis & Co. have contracted for a complete roller mill, no stone being used, the Wegmann roller machines supplying their place.

The Richmond City Mill Works last week shipped the machinery for a three-run new process mill to be located near Mineola, Texas.

The Minnetonka Mill Co. report that the 16 x 42 Corliss engine they bought of Edw. P. Allis & Co. exceeds their most sanguine expectations.

The Milwaukee Milling Co. are now erecting the 20 x 48 improved Corliss engine, with 18 foot band wheel, they purchased of E. P. Allis & Co.

Edw. P. Allis & Co. have closed a contract with Mr. Frank Clark, of Hamilton, Mo., for a complete four-run mill and improved Corliss engine.

The Richmond City Mill Works, of Richmond, Ind., have just furnished Smith Waite, of Medina Co., Ohio, an additional run of burrs for corn.

A. C. Braun, of Palmersville, has put in a 42-inch run old quarry burrs for wheat, built by the Richmond City Mill Works, of Richmond, Ind.

Hulbert & Paige, Painesville, Ohio, are overcrowded with orders from all parts of the country for their celebrated Triumph Power Corn Sheller.

The Florence Mills, at Stillwater, Minn., have contracted for two cars a day on the St. Paul, Stillwater and Taylor's Falls road, to ship their flour East.

Skinner & Crosby, Windsor, Ohio, have been putting in new machinery in their custom mill. Hulbert & Paige, Painesville, Ohio, furnishing the same.

Wm. Cook, of Havard, Neb., recently ordered a mill outfit of Nordyke & Marmon Co. He has also ordered an engine outfit of the above firm to drive the mill.

John Lee, of Sac City, Iowa, is making an extensive addition to his mill, the machinery for same is being made by Nordyke & Marmon Co., of Indianapolis, Ind.

R. M. Dye, of New Belleville, Ind., is engaged in building a complete custom mill, which is being furnished by the Nordyke & Marmon Co., of Indianapolis, Ind.

M. Moak, of Lawrence, Kan., is adding burrs and fixtures to drive, to his mill, all of which is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Hulbert & Paige, Painesville, Ohio, are building and furnishing the complete outfit for a first-class twelve-run mill for Mankato, Minn. H. & F. L. Walters, millwrights.

John Blinn, of Sheldon, Minn., is engaged in refitting his mill and is putting in new machinery, which has been purchased of Nordyke & Marmon Co., of Indianapolis, Ind.

Blue Springs, Mo., is to have a new four-run mill which will be first-class in every respect. The Richmond City Mill Works furnish the machinery complete, including power.

Jake Henry, of Sharpsburg, Ky. (near Cincinnati), has ordered of the Nordyke & Marmon Co., of Indianapolis, Ind., a water mill, for custom work, with the late improvements.

McKeen Bros., of Terre Haute, Ind., are adding burrs and additional machinery to their merchant mill, and the millwrights of Nordyke & Marmon Co. are putting up the work.

Thornburg & Small, of Martinsville, Ind., are engaged in thoroughly overhauling their mill, and the work is being furnished by the Nordyke & Marmon Co., of Indianapolis, Ind.

E. Done, of Pike Co., Ill., is overhauling his mill and putting in considerable additional machinery, including a middlings run. The Richmond City Mill Works have the contract.

Godfrey Pfeiffer, of Newton, Iowa, has purchased of the Nordyke & Marmon Co., of Indianapolis, Ind., machinery for a two-run new process mill, with all the late improvements.

A cargo of flour has recently been received at St. Louis by the steamer Nellie Peck from Fort Benton on the Missouri River. This is the first exportation of food ever made from that point.

The wheat crop of Pennsylvania for this year has been estimated at about 18,750,000 bushels. This is the best crop obtained since 1871, and averages a yield of about 15½ bushels to the acre.

Edw. P. Allis & Co. are making a shipment of three iron frame portable mills, three circular saw mills and two engines, consigned to parties in Oregon, which are to go around by steamer.

Edward P. Allis & Co. have orders for eight of

their improved Corliss engines. These engines are gaining great favor from millers, and are considered the best and most economical made.

Nordyke & Marmon Co., the extensive mill furnishers of Indianapolis, Ind., have been awarded the contract for an extensive steam flour mill, to be built at Parsons, Kan., by Wm. Hoke, Esq.

Fears are entertained that most of the water mills in this section will be compelled to lie idle the greater part of the winter for lack of water to turn their wheels.—*Sauk Center (Minn.) Herald.*

Mr. S. M. Newton, of Chippewa Falls, Wis., is interested in Mr. Brownlee's new mill at Mondovi, Wis., which is being rebuilt to replace the one which Mr. Brownlee lost by flood last summer.

Mr. J. D. Green, of Faribault, Minn., has contracted for a 16 x 42 improved Corliss engine and steel boilers with E. P. Allis & Co., of Milwaukee. This is the second Corliss engine he has bought of this firm.

Edw. P. Allis & Co. have now in operation a number of their improved noiseless belt porcelain and iron roller mills. These are a great improvement, being capable of much higher speed and increased capacity.

The mill of M. M. Taylor, of Mount Pleasant, Iowa, is undergoing a thorough overhauling, and is being fitted up with new process machinery, all of which is being furnished by the Nordyke & Marmon Co., of Indianapolis, Ind.

Edward P. Allis & Co report that several large mills are now using the Wegmann patent porcelain rolls on middlings, to the exclusion of stone, with the greatest success, and that they are far behind their orders for these machines.

The Austin (Minn.) Register says: The mill property and residence of Mr. M. Gregson, at Ramsay, is pleasantly situated. Since the new iron bridge across the Cedar river has been built there, it is more attractive than ever.

It seems that in Canada, also, the yield of wheat this year is greater than usual. One Canadian agricultural paper places the increase at 50 per cent, and says that flour will be cheap, and that the Dominion will have some wheat for export.

Mr. Ashley, formerly of the Marquesan Mills, will take charge of Coman & Morrison's Fox Lake flouring mills. Mr. E. Newman had been engaged to take charge of the mills, but owing to some other engagements was unable to do so. The mill is in splendid shape and will no doubt turn out excellent work.

The contract for the building of the Morrison & White twenty-five run flouring mill, including the excavation for the foundation and canal, is in the hands of O. A. Pray & Co., the enterprising mill builders. It's a big job, but if any body can carry it through they can. The structure is to be of Chaska brick.

Eastern millers are taking Horace Greeley's advice to "go West." The Richmond City Mill Works, of Richmond, Ind., have received half a dozen orders from Connecticut and Rhode Island during the past ten days or two weeks, and are shipping many portable mills, etc., to New York and Pennsylvania.

Jacob Phleger, of Dewitt, Mo., has purchased of Nordyke & Marmon Co., of Indianapolis, Ind., a first-class 3-run new process mill and engine. It is intended to make this mill one of the best in Missouri, and with the reputation of the mill furnishers, and the energy of Mr. Phleger, there is no doubt but that the mill will be a great success.

The grain elevator at Claremont, Minn., owned by George W. Van Dusen & Co., and occupied by the same firm and John Edmonds, was totally destroyed by fire November 25th, together with its contents, about 12,000 bushels of wheat. The elevator and wheat, which was owned by Van Dusen & Co., were fully insured, but Edmonds' insurance had expired only three days previous to the fire. The total loss is probably \$20,000.

Chicago is making certain progress in the business of her export trade. Our principal and largest exports are very naturally more noticeable in the foreign movement of flour, grain and provisions. Since January 1st, 1878, we have exported direct 114,274 barrels of flour, 5,282,412 bushels of wheat, 3,583,187 bushels of corn, and 124,595 bushels of oats. Of cured meats we have sent out 410,628 boxes. Lard has gone abroad to the extent of 191,070 tierces, and beef amounting to 11,243 barrels and tierces. Butter and cheese to extent of 195,228 packages have been shipped abroad, and 110,422 cases of canned meats; for the extent of manufacture and excellence of which goods Chicago takes the lead.—*Chicago Journal of Commerce.*

A letter to the Leavenworth Appeal from Cawker City, Kan., in speaking of the flour mill at that place, says: "One mile below the forks of the Solomon are the Junction Mills, the last on the river that have the benefit of the water from both forks, has the best water power in the county or on the river. This mill was built by T. F. Hersey, who came to Kansas from Illinois twenty-two years ago. He has lived nine years in this county, and built the first mill and constructed the first water power in the county, the foundation being solid rock. The mill has three run of stone and is now

grinding about 500 bushels per day, besides sawing 2,000 feet of lumber, and has power enough to spare to run a woolen or paper mill. In fact it is the most substantial improvement on the river, and Mr. Hersey, the fortunate owner, deserves to succeed with it. He is noted for his strict attention to business, his adherence to principles, and his fine sense of honor and integrity."

S. S. Kennedy & Co., of Greeley, Col., are enlarging their mill and improving their water power; the latter by a new Houston turbine, and the purchase of the balance of the water power to their canal, which was originally intended for two mills. They are adding one new run of stone, four new Garden City purifiers, dusting reels, and changing their mill generally with a view of adopting the new process, which Mr. Kennedy thinks will be a success in Colorado. They are among the first to adopt smooth surfaces and slow grinding in Colorado, and old-timers are looking on with one eye shut, wondering what will come next. Of the emery wheel mill stone dresser Mr. Kennedy and his head miller think it a great help in stone dressing, and the smooth, true surface it gives to face and furrow indispensable to good milling, and accordingly they gave our agent an order to be filled immediately. May the reputation of the Greeley "Snow Flake" ever keep in the lead of all brands of flour in the State, a place it has held ever since its manufacture was commenced.—*Northwestern Miller.*

**FIRES AND CASUALTIES.**

The flour mill at Gowrie, Iowa, burned on November 6th.

Park & Mears' barrel factory at Wheeling, W. Va., burned Nov. 8th. Loss, \$10,000.

Berger & Engels' brewery, in Philadelphia, burned Nov. 10th. Damages, \$50,000. Insured fully.

Jenkins & Bensing's flour mill, at Rochester, N. Y., known as the Pearl Flouring Mill, burnt Nov. 6th. Loss, \$30,000.

MEMPHIS, TENN., Nov. 14.—Fire last night destroyed L. P. Judd's grist mill, cotton gin, and twenty bales of cotton, at Raleigh, Tenn. The loss is \$7,000; no insurance.

RUSHVILLE, IND., Nov. 14.—A valuable sawmill owned by Miller Robinson, in the southern part of this county, was destroyed by fire last night. Loss, \$32,000; no insurance; incendiary.

PLANO, ILL., Nov. 17.—A conflagration occurred at Bristol Friday night, which resulted in the total destruction of McLain's mill, which had very recently been reconstructed and put in working order.

**JOSH BILLINGS.**

**Witty Sayings Culled from His Farmer's Almanax.**

I hav finally cum to the konklushun that if I kant prove a thing without betting \$3 on it, the thing haz got a dredphull weak spot somewhere.

Q.—What is the best religious kreed to hav?  
A.—Charity. If a man will swop off all the religious kreed he has got on hand, and invest the proceeds in charity, he will alwas be proud ov the job.

Q.—Will yu pleze define an Enthusiast?  
A.—An Enthusiast iz a party who believes about four times az mutch az he kan prove, and kan prove about four times az mutch az ennyboddy else beleaves.

Allmost enny phool kan prove that the Bible aint true; it takes a wize man to beleave it.

It iz a wize man who profits bi hiz own experience—but it iz a good deal wizer one who lets the rattlesnaik bite the other phellow.

Yung man, set down, and keep still; yu will hav plenty ov chances yet to make a phool ov yureself before yu die.

Take all the phools out of this world, and there wouldnt be enny phun nor profit living in it.

I would az soon think ov pulling the feathers out ov a peakok's tale az to interfere with inosent vanity of a man.

Married life iz a little game, in which the woman, if she iz called, iz allmost sure to have a strate flush.

The man who knows a thing, and can tell it in the fewest words, iz the hardest kind of a man to beat in a kross examinashun.

The things that i kant prove i beleave the most; i beleave that one apple iz sour and another sweet, but i will give enny highly eddikated man a span ov matched mules who will tell me what makes them so.

The smartest thing about enny man iz hiz conscience; he may outargy hiz reason or stultify hiz faith, but he kant beat hiz conscience.

The best thing i kno ov iz a fust rate wife, and the next best thing is a second rate one.

There aint nothing that a man will thrive so well on az abuse that aint merited.



## AUSTRIAN MILLERS.

As has been officially announced, the Society of Austrian Millers has been awarded one of the largest prizes at the Universal Exhibition at Paris. The Austrian millers naturally regard this as an event of no little importance, not, as the *Oesterreichische Ungarische Mueller Zeitung* observes, because it flatters their vanity, but because they regard the Paris Exhibition as marking a new epoch in Austrian milling industry in the event of their exhibition being crowned with success. The largest prize, as is known, is the *grand prix*, the number of which was fixed at 100. The French jurors, however, fearing that an insufficient number would fall to the lot of French exhibitors, proposed that the number should be increased to 150. To this the Government did not agree, instead of which 50 *diplomes d'honneur* were created, and these were to constitute the second rank of distinction. The order of rank is consequently as follows: 1, grand prix; 2, *diplome d'honneur*; 3, gold medal; 4, silver medal; 5, bronze medal; and 6, honorable mention. Of the 50 *diplomes d'honneur* 12 have been awarded to Austria, of which the Society of Austrian Millers have received one. The French milling industry has likewise been awarded one. With pardonable pride, a writer in the above-named journal remarks: "We have now shown the world what the Austrian milling industry is capable of, and although the jealousy of French milling industry disputed the *grand prix* with us, the jurors could do no other than award us the prize which was of equal value. Now that the most competent departmental men in the world have expressed their opinion, nobody will deny the rank which the Austrian milling industry occupies in the commerce of the world and will always occupy whenever the chance is offered it. . . . He who lags behind must find himself mercilessly crushed beneath the wheels of time, whilst he who joins the party of progress will participate in the success. Already, in consequence of the Paris Exhibition, extensive relations have been entered into with our mills, and the prospect of a large export trade is opened out before us. It is in the power of the Austrian millers themselves thereby to do away with the consequences of over production. They must assist the Society of Austrian Millers to bring about the introduction of an uniform type of flour, and, by joining the Society, assist in furnishing the means of making new markets accessible to its members."—*London Miller*.

## PROFITS AT THE PARIS EXHIBITION.

The *Rappel* of Paris undertakes to estimate the value to the capital of the world's fair of France now being held there. It says that the receipts for admissions, from the opening in May up to September 18th, were 8,665,054 francs, the rush in September being so large as to promise to swell the total to 10,000,000 francs. The *Rappel* estimates that the total receipts by the end of October will be 13,000,000 francs. There to be added the following sums in francs:

Alienation of materials from Champ de Mars.....	7,000,000
Contribution by the city of Paris.....	6,000,000
Reimbursement of the Palace of the Trocadero by the city of Paris.....	3,000,000
Tax on the cafes and restaurants in the park.....	4,000,000
Receipts from the Trocadero concerts.....	1,000,000
Total.....	21,000,000

This would make the total receipts of the Exhibition 34,000,000 francs. The total cost is fixed at 45,300,000. The balance sheet of the Exhibition therefore will show a deficit of 11,300,000 francs. But against this is to be set the fact that the revenue from indirect taxes has increased already 51,000,000 francs, and will in the course of the year increase 70,000,000, principally in consequence of the world's fair, whereas the increase was estimated in the budget at only 10,000,000 francs. This would leave about 60,000,000 francs to the credit of the Exhibition, to say nothing of the advantages which trade and commerce have derived from the fair.

## DECISION REGARDING OPTIONS.

Judge McAlister, of Chicago, has rendered a decision in the case of Tenney et al. vs. Foote, a case of interest to operators and speculators in grain. This suit was brought to recover against Foote as guarantor of a note for \$5,000 and interest, made by the trustees of the Couch estate payable to Foote and by him transferred to S. G. Hooker & Co., and by them to plaintiffs. The defense was that the consideration for the guarantee by defendant was an account of S. G. Hooker & Co. against Foote which arose out of an unlawful contract made by them, whereby Hooker & Co., as commission men, should deal on the

Board of Trade for Foote in options and settling upon differences, contrary to the statute against gambling. The Court held that if the real intention of the parties be that there is to be no sale of the article—no delivery or acceptance of it—but the transaction to be adjusted only upon differences, it is a gambling transaction within the statute. In the case at bar the intention of the parties that there should be no real purchase or sale or delivery or reception of any commodity is manifest by the terms of the contract.

It was immaterial whether the plaintiffs be bona fide holders of the note or not, if the contract between Hooker & Co. and Foote was a gambling transaction and within the statute against gambling, because the statute itself renders void all contracts, notes, bills, or other securities where the whole or any part of the consideration arises out of a gambling transaction. "Perceiving," the Court said, in conclusion, "no reason why this species of gambling, though wearing the more respectable aspect of business, should be looked upon with any less disfavor by the Courts than any other species, I am constrained by the facts of the case to sustain the defense."

## KANSAS CITY AS A WHEAT MARKET.

The past season has settled beyond a doubt that Kansas City is destined to be one of the first grain markets in the West. With the immense grain country west of us and its rapid settling up by immigrants has convinced the most skeptical that our grain interest must grow each year. Yet its rapid advancement this season has been a surprise even to those directly connected with it. From July 1st to November 1st, the first quarter of the wheat year, our receipts were 5,563,591 bushels, against 1,185,432 bushels same period in 1877, an increase of 4,378,159 bushels, or 369 per cent. The shipments for the same time were 5,277,887 bushels, against 903,737 bushels corresponding months last year—increase, 4,374,150 bushels, or 493 per cent. The receipts by the Kansas Pacific and Atchison, Topeka & Santa Fe railroads from January 1st to November 1st, have been 8,122,470 bushels, or nearly as large as the total receipts in Kansas City for 1877, which were 8,855,160 bushels. If now, with Kansas but partly and thinly settled our receipts are at the rate of 20,000,000 bushels per annum, what may we expect when it becomes a well populated State? The future of Kansas City as a grain center is one of unexampled brightness, and we can see nothing short of a pestilence to check its onward progress.

Receipts and shipments of wheat at Kansas City for the first four months of the wheat year as taken from the books of the Board of Trade, and comparisons for 1877:

RECEIPTS.			
	1878.	1877.	1878.
July.....	609,594	138,487	Inc. 491,107
August.....	1,840,724	347,219	" 1,493,514
September.....	1,415,765	315,705	" 1,100,060
October.....	1,697,510	404,030	" 1,293,480
Total.....	5,563,591	1,185,432	4,378,159

SHIPMENTS.			
	1878.	1877.	1878.
July.....	629,268	87,900	Inc. 542,278
August.....	1,731,411	295,118	" 1,436,293
September.....	1,417,441	276,525	" 1,140,916
October.....	1,500,767	334,104	" 1,171,663
Total.....	5,277,887	903,737	4,374,150

—*Kansas City Price Current*.

## SHIPPING A STEAMBOAT TO SOUTH AMERICA.

A complete steambot was shipped from Pittsburg, Pa., on the 19th of October last, by way of New York, to be delivered to the United States of Colombia, South America. It was shipped in sections, and will be put together when it reaches its destination by men who will be sent from Pittsburg for that purpose. The hull is 150 feet long, 29 feet 9 inches beam, 4 feet depth, 28 inches shear, and made of homogeneous and tensile strength of 70,000. The machinery consists of 15-inch cylinders, 5-foot stroke, two patent cut-off boilers, 45 inches in diameter, 16 feet long, with forty-one 3 1/2-inch tubes each, which were tested before leaving to 245 pounds. The boilers are also of homogeneous steel. The cabin was made something after the style of our Western river boats. The hull is all steel except the bulkheads and angle-irons; the cylinder "timbers" also being steel. The wheel is of iron. The cabin-stanchions are fastened to the hull and stern bulkhead. The name of the steambot is the "Francisco Montaya," and she is designed to run on the Magdalena River. Should any individual or transportation company of Mexico require a steamer for the navigation of any river of that country, they can have her constructed and shipped in sections, in the same way, and put together where needed. Steamboats of great

strength can be built in this way, at the foundries and machine shops much cheaper and stronger than on the bank of the river to be navigated, where all the machinery for construction has to be shipped from a distance, and put up for that special purpose.

## THE SUPPLY OF BREADSTUFFS.

The New York *Produce Exchange Weekly* says: The exports of grain from South Russian ports continue on a limited scale, although the railway companies have made large reductions in the cost of transportation from the interior; but from Russian Baltic ports considerable quantities of grain have been sent to Holland, Belgium and Germany, more especially of rye.

Prof. Newman Spallart, who has since 1870 annually published the statistics of the trade of the German Empire, gives the following for the three years, 1875, 1876 and 1877, from which it appears that that Empire is the largest importer of grain after Great Britain and France. On the other hand, Germany is also an exporter of grain, but the exports are less than the imports:

IMPORTS.			
	1875.	1876.	1877.
Flour, equal brls.....	1,505,536	2,133,731	2,053,877
Wheat, equal bus.....	15,525,988	25,448,433	35,189,090
Maize, ".....	4,525,235	7,889,318	7,188,511
Oats, ".....	16,392,296	22,504,144	25,039,433
Barley, ".....	11,525,925	12,614,446	23,219,490
Rye, ".....	27,846,854	43,842,014	47,139,072
Other grains, ".....	358,244	554,824	575,049
Total grain, bus.....	79,144,512	112,853,179	138,350,705

EXPORTS.			
	1875.	1876.	1877.
Flour, equal brls.....	1,332,883	1,450,986	1,819,357
Wheat, equal bus.....	20,943,700	14,356,413	26,251,692
Maize, ".....	832,730	763,756	808,061
Oats, ".....	3,046,186	6,048,247	10,251,380
Barley, ".....	5,677,252	3,858,050	8,428,005
Rye, ".....	6,121,702	3,936,785	6,899,897
Other grains, ".....	744,053	688,937	1,234,576
Total bus.....	42,880,503	30,152,168	53,874,622

The exports of wheat from South Australia from Jan. 1 to Sept. 7, 1878, have been 2,527,800 bus and 48,208 tons of flour, equal to 1,229,795 bus of wheat, or an aggregate of 3,757,595 bus wheat. There were on the 7th of September about 30,000 tons of surplus wheat available for export from the remaining reserves.

## A GOOD LETTER FROM A LIVE PENNSYLVANIA MILLING FIRM.

To the Editors:

We are still doing satisfactory work down here in our little mill, even doing better work than when we last wrote you. Our flour will stand second to none and at the same time we have a fine yield. From 25 bushels (1,500 pounds) clean wheat we have 287 1/2 pounds feed, 387 pounds "Patent," 741 pounds family, and 72 pounds low grade or extra and 12 1/2 pounds loss in milling, averaging 4 4-60 bushels to make a barrel of flour including all grades. We send you samples of 1st and 2d bran just as it comes from the reels (we have no bran duster) or we might get a little more out of the feed); we grind with smooth face and furrows, the same as when we wrote you last. Our flour has such a good reputation that it has brought us visitors (brother millers) from Chester, Delaware, Philadelphia and Montgomery counties to see how we do such good work. They can see the wheat we use and the flour we produce and some of them conclude it must be the "Garden City Purifier" and have since taken out some other machine and substituted the G. C. machine; but it is not the purifier alone that does the work, it is the miller who understands his business. Pennsylvania harvested a larger crop of wheat this year than it ever before produced. We have a list of some of the best yields. One farmer raised 12 1/2 bushels from two acres of ground, others have 55 bushels, and plenty have 50 bushels per acre of the Fultz variety. The fall sowing is looking very fine and prospects are good for the coming harvest.

Yours respectfully,

WM. PYLE & SONS.

Harrilton Mills, Bryn Mawr, Pa., Nov. 2.—*N. W. Miller*.

In New Mexico the colors of the grain of corn are numerous—blue, yellow, white, and even jet black. Blue seems to be the predominant color and is esteemed by the natives as the richest of all, being almost universally used by them in making the tortilla or corn cake. This is the only shape in which they prepare Indian corn for the table.

OUR ENORMOUS GRAIN TRADE.—The exports of grain from the United States during the harvest year ending September 1st, 1878, were the largest on record, notwithstanding the short crop on the Pacific Coast. The total amount sent abroad aggregated 117,638,806 bushels of wheat and flour combined, 85,373,885 bushels of Indian corn, and 4,098,035 bushels of rye. The total is 207,381,626 bush-

els, equal to 6,089,624 short tons. This vast amount of grain would load a fleet of 4,065 ships, averaging one thousand tons burthen each. The indications are that the present season even at these large figures will be exceeded, inasmuch as there is an enormous surplus east of the Rocky Mountains, and our State is marketing the largest crop ever harvested, while Oregon will not fall behind last season.—*San Francisco paper*.

The boiler blew up in Joseph Ent's mill at Savannah, Mo., Nov. 6th, killing two men and badly wounding two others.

St. Louis has twenty-six flouring mills with a capacity of 12,000 barrels a day. For the past six months the receipts of wheat have been 4,832,693 bushels, against 2,610,811 in the same time last year. When the Council Bluffs and St. Louis Short Line road is completed and direct connection is had with the market which has thus doubled in receipts in a single year, the same cause which brought about this condition of things will operate to increase the prosperity of Western Iowa also.—*Iowa Ec.*

OLD ENGLISH LAW AGAINST BEGGARS.—FOR an able-bodied man to be caught a third time begging was held a crime deserving death, and the sentence was intended on fit occasions to be executed. The poor man's advantages were not purchased without drawbacks. He might not change his master at his will, or wander from place to place. He might not keep his children at home unless he could answer for their time. If out of employment, preferring to be idle, he might be demanded for work by any master of the "craft" to which he belonged and compelled to work whether he would or no. If caught begging once, being neither aged or infirm, he was whipped at the cart's tail. If caught a second time, his ear was slit, or bored through with a hot iron. If caught a third time, being thereby proved to be of no use upon this earth, but to live upon it to his own hurt and that of others, he suffered death as a felon. So the law of England remained for sixty years. First drawn by Henry, it continued unrepented through the reigns of Edward and Mary, subsisting, therefore, with the deliberate approval of both the great parties between whom the country was divided. Reconsidered under Elizabeth, the same law was again formally passed, and it was therefore the expressed conviction of the English nation that it was better for a man not to live at all than to live a profitless and worthless life. The vagabond was a sore spot upon the commonwealth, to be healed by wholesome discipline, if the gangrene was not incurable; to be cut away with the knife, if the milder treatment of the cart-whip failed to be of profit.

## Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

THE MASONIC BOOK AGENCY.—We have received several inquiries concerning the Masonic Book Agency. Their place of business is on the southwest corner of Broadway and Warren streets, over Davlin's store, New York. They are all right, and we have no hesitation in recommending the company and their books to our readers.—*New York Weekly Sun, Sept. 4th*.

IMPORTANT TO MILLERS.—The necessity of the most positive uniform speed in the motive power of flouring mills is generally conceded. The unprecedented results in way of positive regulation of engine, durability and great economy in use, now guaranteed by the Huntoon Governor Company, are worthy the consideration of all who may use steam power. See advertisement.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or misarrange, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

THE MILLER'S TEXT BOOK.—By James M'Lean, of Glasgow, Scotland.—A descriptive and explanatory account of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation, including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

**The Eclipse**  
Combines more good points than any other in the market.  
**Water Wheel.**  
Illustrated Catalogues free. PRICES GREATLY REDUCED.  
STILWELL & BIERCE MFG. CO., DAYTON OHIO.



**Wind Mills.**  
We now offer to the public the  
**WARWICKS PATENT WIND WHEEL,**  
The best and safest manufactured in the United States. After years of building and operating Wind Power Mills the patentee of this mill has so improved upon all others that it may be considered a perfectly safe mill. We manufacture the Wind Wheels and necessary machinery to accompany them which no other company in the United States does at this time. We also manufacture Steam Engines, Water Wheels and Mill Machinery in general. Correspondence solicited.  
HULBERT & PAIGE, Painesville, Lake County, Ohio.

**Bennett's Patent Elevator Bucket.**  
Made from one piece of Metal.  
**CHEAPEST AND STRONGEST BUCKET**  
Manufactured.  
Made of either plain or galvanized iron. Send for Circulars and Price List to  
BROWER & BENNETT, FOX LAKE, WIS.



**ROPP'S Easy Calculator**  
Is used by thousands of farmers, mechanics and business men, who speak in the highest terms of its practical utility and convenience. Its wonderful simplicity enables even the most illiterate to calculate with a solute accuracy and speed; while its original and rapid methods delight and benefit the most scholarly. Its entirely new system of tables shows, at a glance, the correct value of all kinds of grain, stock, hay, coal, lumber and merchandise, of any quantity and at any price; the interest on any sum, for any time, at any rate per cent; measurement of lumber, logs, cisterns, granaries, wagon beds, corn cribs; wages for hours, days, weeks and months, etc. It is well and neatly gotten up, in pocket-book shape; is accompanied by a silicate slate, diary, and pocket for papers. It is unquestionably the most complete and practical Calculator ever published.  
Cloth, \$1.00; Morocco, \$1.50; Russia, gilded, \$2.00.  
Address E. HARRISON CAWKER, No. 62 Grand Opera House, Milwaukee, Wis.

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**MILLER'S PATENT COMPOSITION BURR RUBBER.**  
For Cleansing, Sharpening, and Facing Burrs, and Smoothing Furrows.  
Warranted to produce a better grinding surface than the Pick or Diamond and save 50 per cent of labor in dressing Burrs and expense for tools. Face Rubber, 10 x 6 x 3 in., weight 12 lbs., price \$3.00. Furrow Rubber, 10 x 6 x 1 1/4 or 1 1/2, 1 3/4 or 2 in., as required, price \$2.50 or both for \$5.00. Sent by express on receipt of price. Circulars free. Address all orders to the sole manufacturers,  
MILLER & McCARTHY, Mount Union, Penn.



**THE Northwestern Mill Bucket Manufactory**  
310, 312, 314 FLORIDA STREET.  
Is furnishing Mills and Elevators in all portions of the Country with their superior BUCKETS. They are UNEQUALLED for their SHAPE, STRENGTH AND CHEAPNESS. Leather, Rubber, Canvas Belting and Bolts at lowest market rates. Send for prices. Address  
L. J. MUELLER, 197 Reed St., Milwaukee.



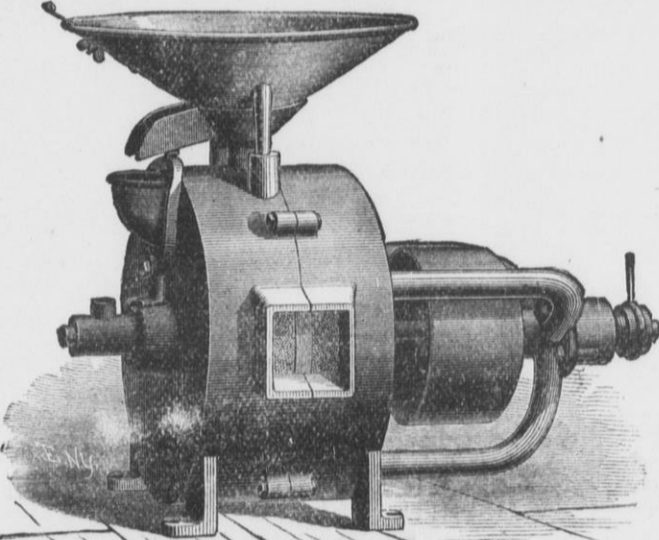
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**ASSOCIATED OFFICES**  
In all the principal cities in the United States, Canada and Europe, and correspondents in every organized county in the Union.  
Nearly every Business Firm in the Northwest subscribes to this Agency, to whom we refer. For terms of subscription, please apply to above address.  
**SPECIAL ATTENTION TO COLLECTIONS.**  
Our Motto—**BE PROMPT.**

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**HUNTOON STEAM GOVERNOR.**  
FOR STATIONARY AND MARINE ENGINES.

WARRANTED THE MOST PERFECT, DURABLE AND ECONOMICAL STEAM GOVERNOR IN THE WORLD.  
The Centrifugal, or Ball Principle is entirely abandoned in this invention, and the Valve Lever is sustained with the same velocity, in one position as another.  
ESTABLISHED 1866.  
CONVOYERS FULLY WARRANTED FOR FIVE YEARS.  
**GREAT REDUCTION IN PRICE!**  
RESPONSIBLE PARTIES ALLOWED A FAIR TRIAL BEFORE PAYMENT IS REQUIRED.  
Has the most Positive Safety attachment.  
OVER 5,000 NOW IN USE.  
MANY BY THE U. S. GOVERNMENT, at Treasury Department, State and Custom Houses, Navy Yards and on U. S. VESSELS. Also, by Leading Manufacturing Establishments, Rolling, Flouring, Saw & Paper Mills, Tanneries, &c. Where the most Positive, Uniform Speed is required. Address HUNTOON GOVERNOR CO., Lawrence, Mass., U. S. A.

**HARRISON'S NEWLY IMPROVED Wheat and Corn Grinding Mills.**



We also make a superior mill for Re grinding Middlings.  
Send for Illustrated Catalogue and Price List, before purchasing elsewhere.  
Address the estate of EDWARD HARRISON, New Haven, Conn.  
W. A. FOSKETT, Administrator

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PERFECTION ATTAINED AT LAST!  
Will ship to responsible parties on trial and warranted to give ENTIRE SATISFACTION OR NO PAY.  
**A CHALLENGE!**  
As all manufacturers of Bran Dusters claim their machines to be the best, we will agree to pay for any machine made in the world that will compete with ours, and be adjudged superior by competent judges, provided any other party will do the same with us.  
Send for circular to  
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**IMPORTANT TO MACHINERY DEALERS.**

**Cawker's Saw and Planing Mill DIRECTORY,**  
Containing the names and Post-office addresses of the Saw and Planing Mill Owners in the United States and Canada, is now ready for delivery this August 1, 1878. The Post-offices are arranged alphabetically, and the names of Saw Mill Owners and Planing Mill Owners are separate. This directory is invaluable to all dealers and manufacturers who desire to reach by circular or otherwise this class of trade. Sent by mail post-paid on receipt of price, Five Dollars. Address  
**E. HARRISON CAWKER,**  
No. 62 Grand Opera House, Milwaukee, Wis.  
Editor of the United States Miller.

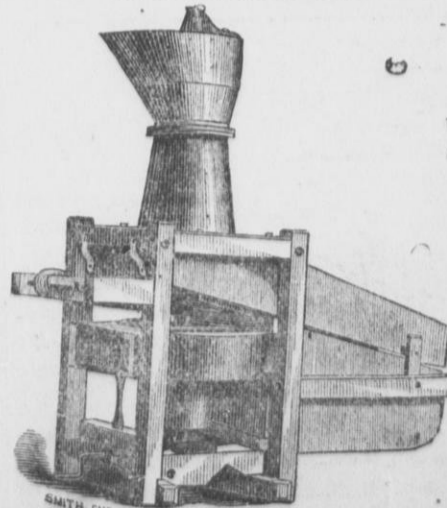
**BOOKS.**

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Hand-Book of Land and Marine Engines.....\$3 50  
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**FRENCH BURR MILL-STONES,**  
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ALL KINDS OF  
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**Mill Furnishing Goods,**  
Dealers in the Original Het Anchor Brand  
**BOLTING CLOTHS,**  
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57 to 63 South Clinton St., CHICAGO.  
Send for Circulars and Price List of Mill Machinery.

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**H. & J. HERZER,**  
Manufacturers and Dressers of  
**Mill Picks,**  
451 Third Street, MILWAUKEE, WISCONSIN.  
We desire to call attention to the durability of MILL PICKS made and dressed by us. We manufacture them of the best ENGLISH STEEL, and warrant all work to give satisfaction.  
We shall be pleased to receive your orders, as we always have a supply of New Picks on hand, and give particular attention to dressing Picks.  
We also manufacture all kinds of Manufacturers' Tools.

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**GENERAL MILL FURNISHER,**  
**COMMISSION MERCHANT,**  
AND CHICAGO AGENT FOR  
**GENUINE DUFOUR & CO. BOLTING CLOTHS.**  
I HANDLE NO OTHER BRAND.  
All numbers kept constantly in stock to supply the largest order at a moment's notice. Grit-Gauze Cloths equal in Mesh to 000 to number 6 inclusive always on hand.  
**Flour Mill Trimmings a Specialty.**  
Such as Rubber, Leather, and Solid Wove Cotton Belting, Elevator Buckets and Bolts, Bran Dusters, Wire Cloth, Plated Wire Cloth, Brass Wire Cloth, Water and Steam Gauges, Boiler Injectors, Pumps, Packing, Smutters, Corn Shellers, Portable Mills, &c., &c. And all necessary articles for Mills at prices to suit the times.  
Send in your orders.

**THE SILVER CREEK CORN SHELLER and CLEANER.**  
  
It is Adjustable while Running. It is Especially Adapted to Millers' Use. It has no Equal in the World.  
MANUFACTURED BY  
my **WARD & CO., Silver Creek, N. Y.**

THE CHARITY OF EXTRAVAGANCE AND LABOR-SAVING MACHINES.

BY ROBT. G. INGERSOLL.

Whenever the laboring men are out of employment they begin to hate the rich. They feel that the dwellers in palaces, the riders in carriages, the wearers of broadcloth, silk, and velvet have in some way been robbing them.

A rich man living up to his privileges, having the best house, the best furniture, the best horses, the finest grounds, the most beautiful flowers, the best clothes, the best food, the best pictures, and all the books that he can afford, is a perpetual blessing.

The prodigality of the rich is the providence of the poor.

The extravagance of wealth makes it possible for the poor to save.

The rich man who lives according to his means, who is extravagant in the best and highest sense, is not the enemy of labor. The miser, who lives in a hovel, wears rags, and hoards his gold, is a perpetual curse.

The moment hard times come the cry of economy is raised. The press, the platform, and the pulpit unite in recommending economy to the rich. In consequence of this cry, the man of wealth discharges servants, sells horses, allows his carriage to become a hen-roost, and after taking employment and food from as many as he can, congratulates himself that he has done his part towards restoring prosperity to the country.

In that country where the poor are extravagant and the rich economical will be found pauperism and crime; but where the poor are economical and the rich are extravagant, that country is filled with prosperity.

The man who wants others to work to such an extent that their lives are burdens is utterly heartless. The toil of the world should continually decrease. Of what use are your inventions if no burdens are lifted from industry—no additional comforts find their way to the home of labor; why should labor fill the world with wealth and live in want?

Every labor-saving machine should help the whole world. Every one should tend to shorten the hours of labor.

Reasonable labor is a source of joy. To work for wife and child, to toil for those you love, is happiness; provided you can make them happy. But to work like a slave, to see your wife and children in rags, to sit at a table where food is coarse and scarce, to rise at four in the morning, to work all day and throw your tired bones upon a miserable bed at night, to live without leisure, without rest, without making those you love comfortable and happy—this is not living—it is dying—a slow, lingering crucifixion.

The hours of labor should be shortened. With the vast and wonderful improvements of the nineteenth century there should be not only the necessities of life for those who toil, but comforts and luxuries as well.

What is a reasonable price for labor? I answer: Such a price as will enable the man to live; to have the comforts of life; to lay by a little something for his declining years, so that he can have his own home, his own fire-side; so that he can preserve the feeling of man.

Every man ought to be willing to pay for what he gets. He ought to desire to give full value received. The man who wants two dollars' worth of work for one is not an honest man.

EXPORTS.—During the seven weeks from Sept. 9th to Oct. 26th the United States exported gold and silver bullion to the value of \$804,788, and imported during the same time \$2,965,576, showing a balance in our favor of \$2,160,788. Our exports of breadstuffs for the eight months ending Aug. 31, 1878, were as follows:

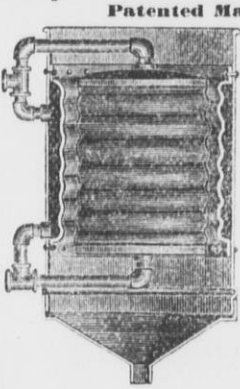
Table with 2 columns: Item and Value. Includes Barley, bread, Indian corn, etc.

KILBURN'S IMPROVED BOLTING REEL.—An improved bolting reel has lately been invented and patented by Mr. Thaddeus O. Kilburn, of Washington, Minn., which is well worthy the attention of all concerned in the milling interests of the country.

Alabama Flour Mill For Sale.

2-run Custom and Merchant Mill in Springville, Ala., complete. Excellent location. Good trade. Splendid climate. Mill close to a perpetual cold spring, furnishing water enough to run 15 or 20 horse-power turbine with 15 foot fall.

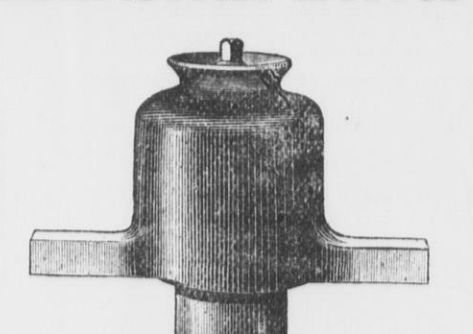
GRATIOT'S Improved Wheat Heater



THE ONLY Heater made of HEAVY COPPER THROUGHOUT; and standing 175 lbs. Hydraulic Pressure.

GRATIOT BROS., Platteville, Wis.

THE CHAMPION Mill-Stone Driver



The Only Practically Perfect Driver in the Market.

This Driver combines a cockhead of improved construction with a universal joint and equalizing drive. All the working parts are up above the accumulation of dirt about the spindle and are completely enclosed in the bail.

ALBERT CUNNINGHAM, PATENTEE, Milwaukee, Wis.

VAN DE WATER'S NEWLY IMPROVED Jouval Turbine Water Wheel.

83 PER CENT. GUARANTEED.

No wise man in want of a good 83 per cent. Water Wheel will hesitate in sending his orders for Wheels from 6-inch to 72-inch diameter.

REDUCED PRICE LIST, NOVEMBER 1, 1878. Table with 15 columns: Diameter of Wheel (6 to 72 inches) and Price (\$175 to \$1,025).

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Send stamp for 86 page catalogue. F. KEPPEY, Bridgeport, Conn.

SLATER'S IMPROVED Bolting Reel

Warranted the best in the world. The only Reel that will dust Middlings perfectly.

BOLTING CHESTS of any capacity at prices to suit the times.

DUFOR & CO'S BOLTING CLOTH.

Superior Wheat Scouring and Brush Machines. General Mill Furnishings. CHARLES B. SLATER & CO., Blanchester, Ohio.

WANTED.

A Miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis. dec

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is a new invention for the rapid production of facsimile copies of any Writing, Drawing, or other work which can be done with pen and ink. AUTOGRAPH LETTERS. Circulars, Music, etc., are first written upon a sheet of paper, in the usual way, and from this written sheet

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THE SCIENTIFIC AMERICAN is a large first-class weekly newspaper of sixteen pages, printed in the most beautiful style, profusely illustrated with splendid engravings, representing the newest inventions and the most recent advances in the Arts and Sciences.

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WALKER'S BELT TIGHTENER.

Indispensable for Safe and Economical Operation of Belts on Vertical Shaft and Spindle Pulleys.

Prices Reduced. Circulars Free. Address GEORGE WALKER, Box 222, Hamburg, Erie Co., N. Y.

THE ATLAS-CORLISS ENGINE, INDIANAPOLIS, INDIANA. The Best Designed and most Economical Corliss Engine Manufactured. Send for Illustrated Pamphlet and Prices to the ATLAS ENGINE WORKS, Indianapolis, Ind.

CONVERTIBLE MILL COMPANY.



**THE BEST MILL**  
In the market for grinding  
Feed, etc.



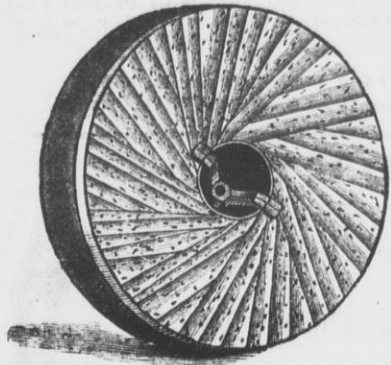
**WAGNER'S IMPROVED  
Turbine Water Wheel**  
Requires but 18-inch wheel  
pit, and giving more horse-  
power than any other Turbine  
Wheel manufactured for the  
money.



**VERTICAL MILL.**  
**Granulating Middlings Mill**—The Best Mill in the world for grinding Middlings, Tailings, Bran,  
etc. Manufactured by **C. B. OGLESBY & CO.,** Successors to A. G. WAGNER & Co.,  
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**Agents for Frick & Co. (the Reclips) Portable Steam Engines and Saw Mills. Send for circular and price list.**

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MILL BUILDERS, CONTRACTORS,**

General Mill Furnishers, Founders, Machinists.

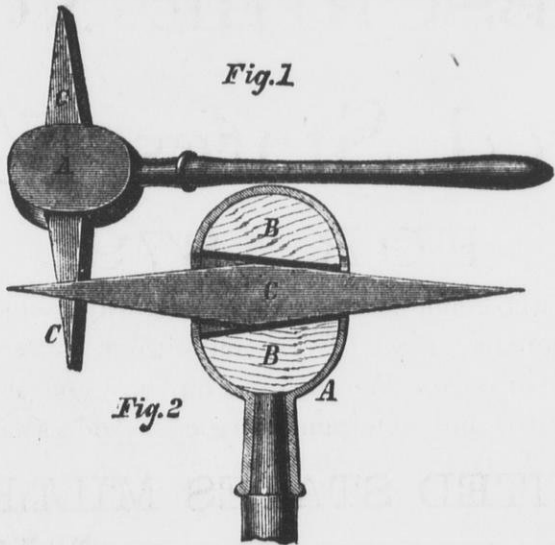


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**Triumph Power Corn Sheller.**  
Plans and specifications made by accomplished  
Mechanical Engineers and Millwrights.  
Send for Illustrated Catalogue "G."

**HULBERT & PAIGE,**  
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**Noye's Patent Pick Holder**



**The Only Holder Worthy of the Name.**

The Pick can be adjusted at will to strike the Stone at any desired angle. We have constantly on hand a large assortment of our celebrated

**Cast Steel Mill Picks**

AT PRICES TO SUIT THE TIMES.

**JOHN T. NOYE & SON, Buffalo, New York.**

**WHO WANTS MACHINERY!**

We have for sale the *Largest and Most Varied Assortment* of Machinery, both NEW and SECOND-HAND, to be found in the hands of any firm in the United States, and we offer at prices far below the market value. Send stamps for our No. 17 PRINTED LIST, fully describing over 1,200 machines with price affixed to each, comprising from one to a dozen machines of each of the following articles, with many others not named.

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| Anvils                | Clothespin Machinery  | Hay Presses              | Planers, Iron            |
| Ax Handle Lathes      | Dovetailers           | Horse Powers             | Planers, Wood            |
| Bellows               | Drop Presses          | Hub Machinery            | Portable Mills           |
| Belting               | Drill Presses         | Hoisting Engines         | Power Hammers            |
| Blowers               | Daniels Planers       | Hydraulic Presses        | Portable Engines         |
| Brushers              | Door Machinery        | Irregular Moulders       | Printers' Machinery      |
| Band Saws             | Edgers                | Jacks                    | Pipe, steam & water      |
| Buzz Saws             | Elevators             | Jig Saws                 | Planers & Matchers       |
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Shingle Mills, Skein Winders, Sash Machinery, Splicing Machines, Stationary Engines, Tenoners, Trip Hammers, Upright Engines, Upright Boilers, Vises, Veneer Saws, Victor Lathes, Variety Moulders, Whistles, Wire Rope, Water Wheels, Woolen Machinery, Yachts.

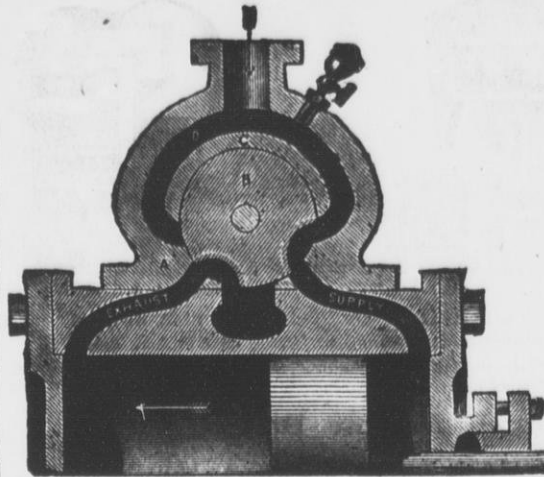
No matter what machine or machines you are in want of, do not purchase until you send for and read one of our LISTS, and see the prices at which we sell. State fully just what you want. Address:

**S. C. FORSAITH & CO.,**

**Machinists and General Machine Dealers,  
Manchester, N. H.**

N. B. Low special Through Freight rates obtained for our patrons to any section of the United States or Canada.

**MORE POWER WITH LESS FUEL.**



WITH OUR  
**IMPROVED ENGINE**  
AND  
**CIRCULAR BALANCED VALVE**

WE WILL GUARANTEE A

**Saving of from 25 to 50 per cent. in fuel,**

OR AN EQUAL GAIN IN POWER OVER THE

**Ordinary Slide Valve.**

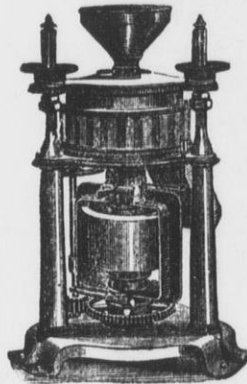
It can be attached to other Engines.

Portable and stationary Engines and Boilers, Saw Mills, and Tile Mills.

**BAYLIES, VAUGHAN & CO., RICHMOND, IND.**

Send for Illustrated Circular and Price List.

**JONATHAN MILLS'  
GRANULATING  
MIDDLINGS MILL.**



**BEST MILL IN THE WORLD; FOR GRINDING  
MIDDLINGS, TAILINGS,  
BRAN, ETC.**

**EVERY MILL GUARANTEED.**

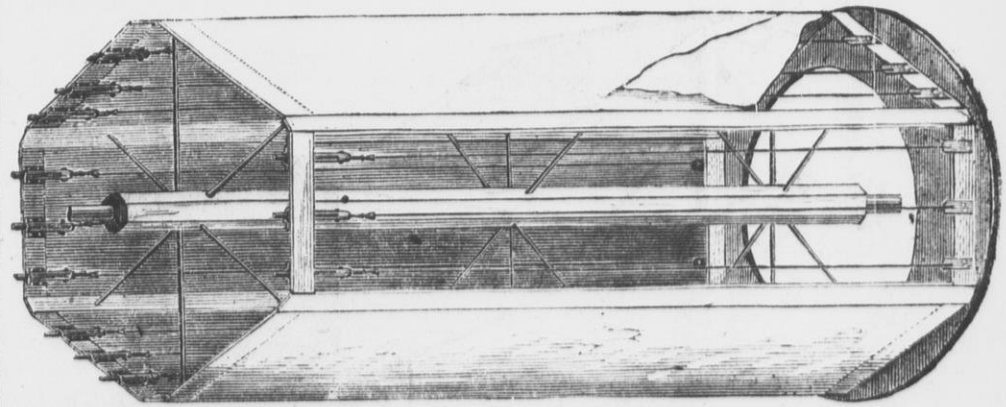
Needs no extra attention when once set to work Requires but little power. Can be set on any mill floor without extra foundations. No mill complete without it.

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Cream City Iron Works, Milwaukee, Wis.

**RATHBUN'S  
Flour Bolt Attachment.**



**FACTS.**

1. It is the best device for cleaning Bolting Reelsever invented.
2. It will keep any Bolt Cloth clean in re-bolting flour, regardless of how many or how fine cloths it has previously been through.
3. It will increase the capacity of any Bolt from 25 to 50 per cent.
4. It will make clearer and more uniform flour.
5. It will not wear the cloth.
6. It is simple, durable and effective.
7. It is under complete control, can be used or disengaged from use at pleasure.
8. Any ordinary mechanic can attach it to any reel in from five to ten hours, all ready for work.
9. The action is directly on the cloth, on the inside, and that while coming up or over, and unloaded
10. It is impossible for any cloth to clog with this attachment applied
11. It is the best thing ever used to keep bugs out of the reels.
12. Without it the bolt controls the miller. With it, the miller controls the bolt.

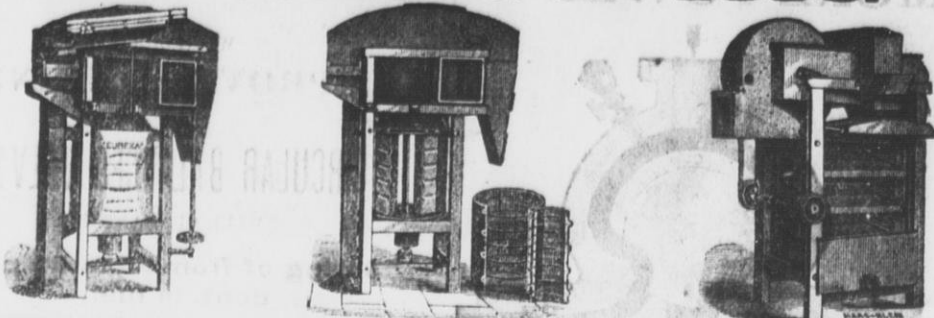
As we have used the Attachment in our own mill nearly three years for keeping our cloth clean in re-bolting (bolting three times), and knowing what they will do, we cheerfully make the following offer: To responsible parties wishing to buy them, if after thirty days trial they do not come up to guarantee, or do not prove satisfactory, they shall box and deliver to express office from which they took them, free of charge, and we will pay return express charges.

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Established in 1856.



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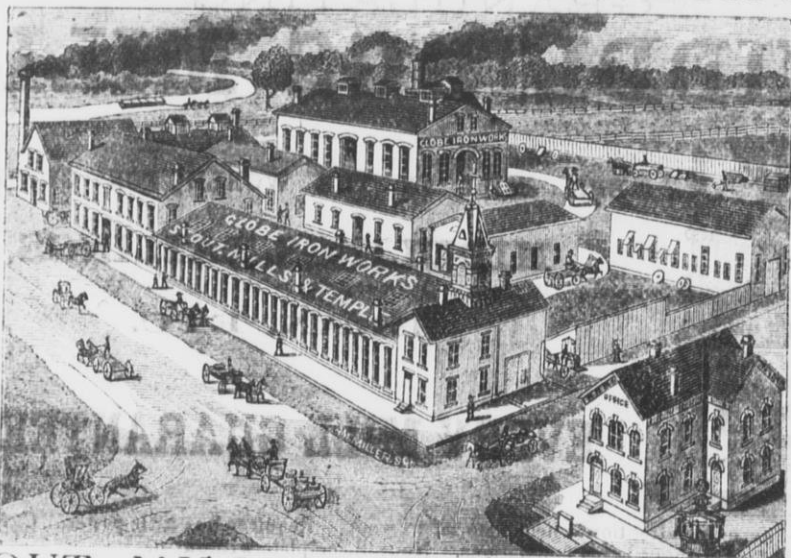
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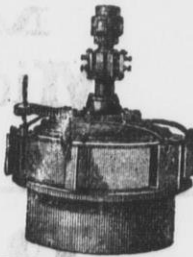
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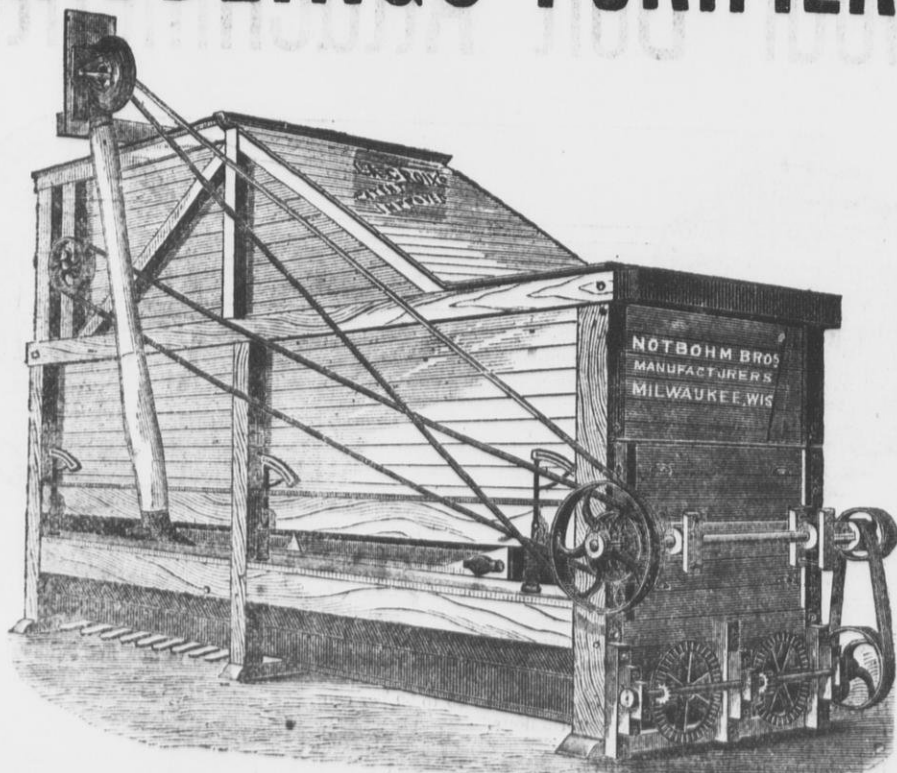
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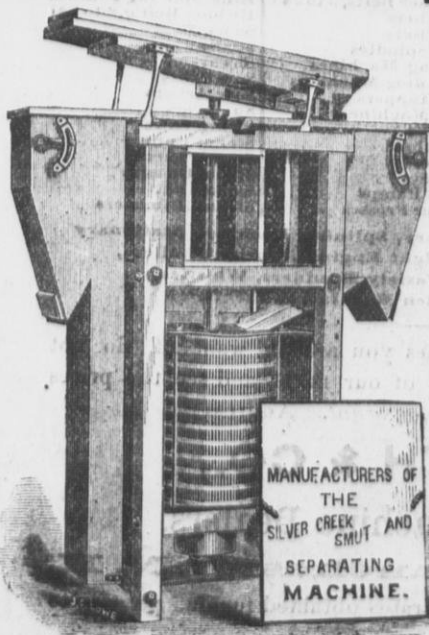
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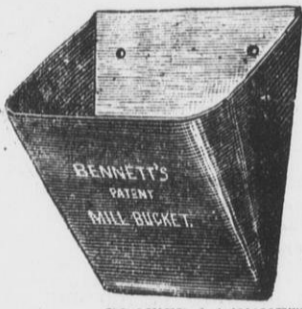
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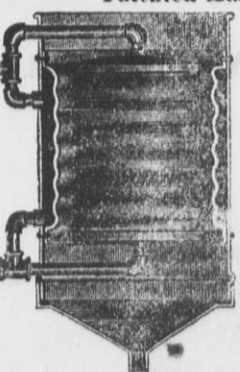


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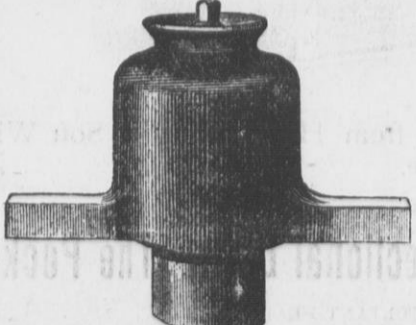
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The best and safest manufactured in the United States. After years of building and operating Wind Power Mills the patentee of this mill has so improved upon all others that it may be considered a perfectly safe mill. We manufacture the Wind Wheels and necessary machinery to accompany them which no other company in the United States does at this time. We also manufacture Steam Engines, Water Wheels and Mill Machinery in general. Correspondence solicited.  
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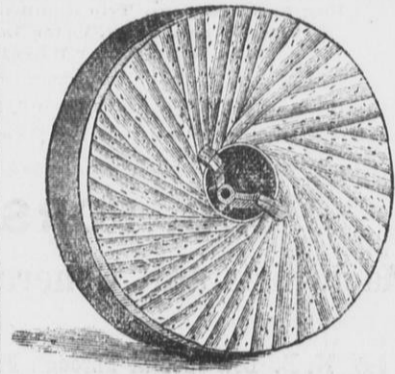
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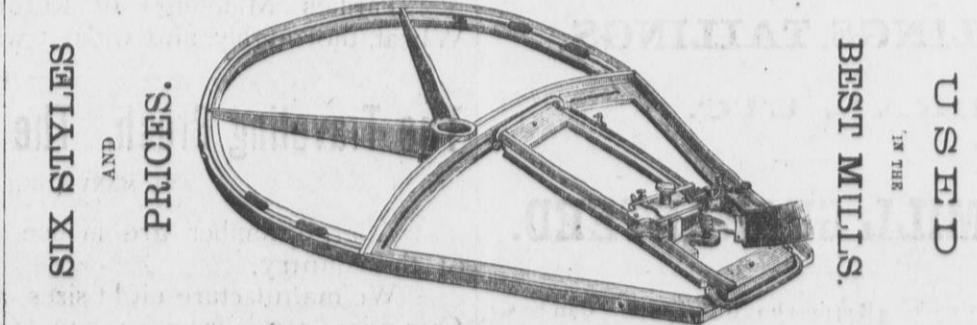
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4 x 6	17c
4 1/2 x 7	20c
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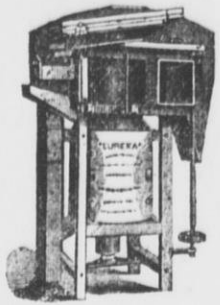
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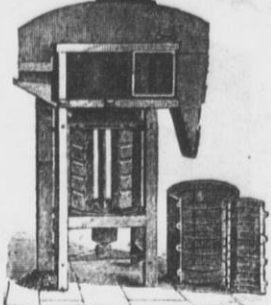
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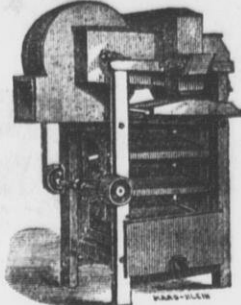
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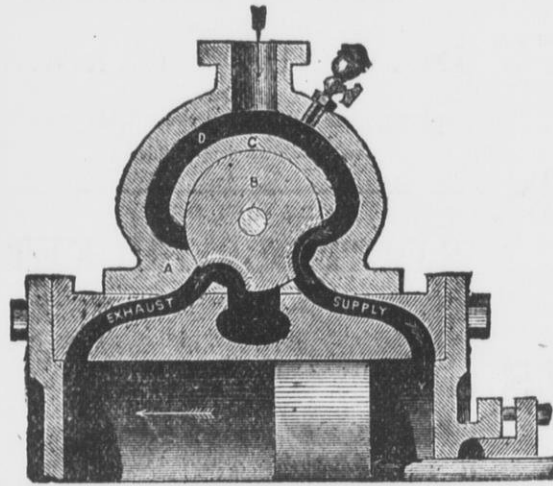
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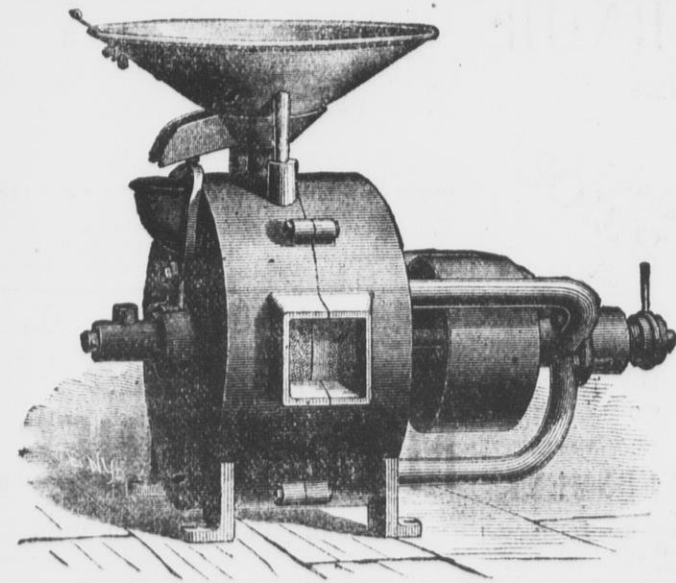
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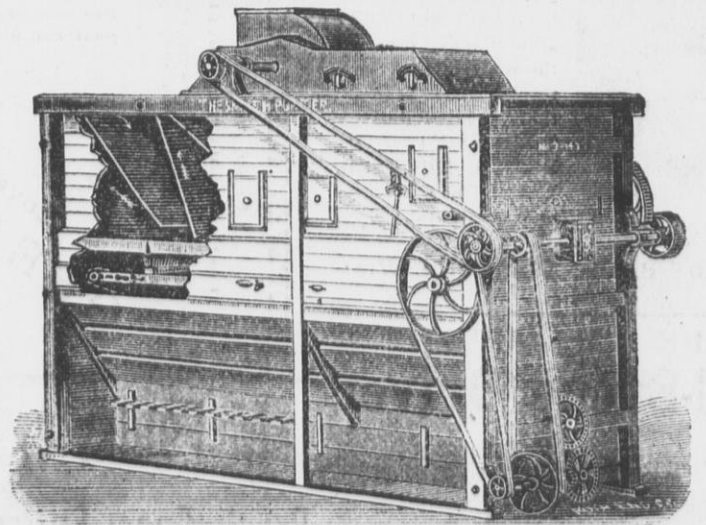
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SIMPLE, DURABLE, ECONOMICAL,  
AND REQUIRES BUT LITTLE POWER.



Purifies Middlings or Returns from Hard Spring or Soft Winter Wheat, thoroughly, and without waste.

HAS

The Traveling Brush, The Sectional Draft, The Pockets

AND MANY OTHER IMPORTANT FEATURES.

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We manufacture eight sizes, adapted to the smallest or largest mills. Our prices range from \$225 to \$600, and cover a license under all of the patents owned by the Consolidated Middlings Purifier Co.

Send for our circular and price list with references.

Address the Manufacturers,

Geo. T. Smith Middlings Purifier Co.,

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# MILLER

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Volume 6.—No. 3.

MILWAUKEE, JANUARY, 1879.

## EVERYBODY READS THIS.

### NEWS OF THE WORLD.

#### Items Gathered from Correspondents, Telegrams and Exchanges.

#### CROP ITEMS—MILLING AND MANUFACTURING ITEMS—FINANCIAL ITEMS—CASUALTIES—ETC., ETC., ETC.

##### Arizona.

Three-quarters of a million pounds of wool have been shipped from Arizona this season.

The late rich discoveries of silver ore in the Tombstone district have been the cause of erection of a 10-stamp ore mill and a steam saw mill.

##### California.

Twelve hundred Chinamen took passage for the "Flowery Kingdom" on the last mail steamer.

##### Colorado.

In the vicinity of Vermont wheat is worth \$1 per bushel, and corn \$1.10. Farmers feed their horses wheat instead of corn. Colorado will probably not have any more surplus wheat to ship this winter.

##### Dakota.

A colony of Russians has just settled in Dakota.

##### Florida.

Wm. Miller, owner of the flour mill at Fernandina, is dead.

##### Georgia.

Over \$500,000 has been invested in cotton mills in the State during 1878. Massachusetts cotton factories are moving South.

##### Iowa.

The Elkport flour mills have been purchased by Wm. Feide, of Elkport, for \$5,500.

##### Illinois.

Water in the Fox River is so low that the mills run by water power are severely affected.

##### Indiana.

The Hessian fly is feared in Indiana. Smysers & Milton, mill-owners, of Jeffersonville, have suspended.

Nordyke & Marmon Co., of Indianapolis, have just closed a contract for a 5-run new process mill in Kentucky, and another 2-run mill in Texas.

To keep up with the times, Messrs. S. Hazlehurst & Son, 17 Spear street, Baltimore, are improving their mill, and have placed the order for supplies therefor with the Nordyke & Marmon Co., of Indianapolis, Ind.

The large elevator owned by Fred. Rush & Co., of Indianapolis, which recently was destroyed by fire, entailing great loss, is being built on a grander style than before by the Nordyke & Marmon Co., of Indianapolis, who have the contract for the machinery.

Many of our readers who remember the old "Carlisle Mill" in Indianapolis will be surprised to learn that a fine 9-run new process mill is about to take its place. This mill was one of the first built in that city, and since it passed into Mr. Jay Voss's hands has been, to some extent, remodeled to make flour on the new process system. The location being such a good one and the demands of trade have grown so as to necessitate an almost entirely new mill as above. The contract for the entire work is in the hands of the Nordyke & Marmon Co., of the same city. The burrs will be placed in improved iron husks, driven by reel belts, and purifiers, middlings, rolls, etc., are used in profusion. We predict that this mill will become known as one of the leading mills in the West.

##### Indian Territory.

Corn is worth 30 cents per bushel at Eufaula. But little fall wheat sown.

##### Kansas.

Reports from almost all portions of the State speak in the most encouraging terms of the condition of the growing winter wheat.

Messrs. Skinner & Co., of De Sota, are building a first-class flouring mill in that city, which is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind., including a 40-horse power engine.

##### Louisiana.

Fifty cases of leprosy are reported in the village of Lafourche.

##### Michigan.

Another flour mill will shortly be erected at Saginaw City.

The new four-run flouring mill just completed at Vassar, cost \$17,000.

The State Agricultural Association will meet at Kalamazoo, January 15th, 1879.

Muskegon reports say that more logs will be put in this winter than for many years heretofore.

A grist mill is badly needed at Marquette. For further particulars address the editor of the *Mining Journal* at Marquette.

Mr. J. O. Hudnut, formerly the chief surveyor of the Union Pacific Railroad, and who spent four years in the Rocky Mountains surveying the passes, has launched into the milling-business at Big Rapids, and to keep up with the times is having his mill remodeled to the new process by Nordyke & Marmon Co., of Indianapolis, Ind.

##### Minnesota.

Minnesota has 2,500 miles of railroad. A new elevator is being built at Sherburne. A two-run mill at Rush City is to be built soon. A Mr. Hill, of Quincy, has purchased the steam mill at Elgin.

F. H. Pratt is building a 25,000 bushel elevator at Rush City.

Duluth has shipped during the past year 300,000 barrels of flour and 1,000,000 bushels of grain.

Jackson has just got a railroad, and the *Jackson Republic* feels jubilant over the prospects of the young city.

Western Minnesota is rapidly filling up with settlers. The immigration of the present year has been unparalleled.

Minneapolis elevators all full, mills all full. Supply of Schlitz's bottled Milwaukee lager run out or the millers would be all full too.

The coming wheat field of this country seems to be the valley of the Northern Red River in Northwestern Minnesota. Its wheat commands the highest price.

##### Missouri.

The great St. Louis bridge has been sold at trustees' sale for \$2,000,000.

V. Stocke, miller, of St. Louis, is succeeded by the Star Milling Company.

The East St. Louis elevator was recently sold at public sale to meet the demands of first mortgage bond-holders. It was bid in by Mr. Aug. Geye, of the firm of Meyer & Geye for the sum of \$200,000. Improvements will be made at once, and the elevator kept running.

The Hannibal & St Joe railroad elevator, a large structure in the bottoms, not far from the Union Depot, in Kansas City, literally burst to pieces Dec. 9th, and is now a total wreck. The loss on the building will amount to \$35,000; on grain, \$10,000. No one was injured.

##### Maine.

Some prominent flour men of Newport, contemplate the erection of an extensive flour mill in that town sometime early next year. About \$100,000 has already been subscribed towards the enterprise.

##### Maryland.

J. T. Sangston, miller, at Greensboro, has taken benefit of insolvent laws.

##### North Carolina.

Todd & Jacobs' saw and grist mill effects are advertised for sale.

##### New Jersey.

The silk mills at Paterson are all running over time.

John Otto, of Bound Brook, has purchased the old Jute Mill at New Market, and, having supplied it with new machinery, has started an extensive flour manufacturing establishment.

##### Nevada.

The Yellow Jacket mine, the deepest on the Comstock lode, is 2,400 feet deep. Why shouldn't stocks go down?

##### Ohio.

A new mill is being built at Leetonia. The Mohawk flouring mill, two miles south of Tiffin, burned on the night of December 17th. Loss, \$6,000. Insured for \$4,000.

##### Pennsylvania.

Ramsay & McLain, millers at Tynne, have shut down.

A party of wealthy capitalists have organized a stock company for the building of an immense flour milling establishment, to be located upon the shore of Cat Fish Creek, near Washington, Washington county. A large number of shares of the stock have been taken, and sufficient money has been paid in to warrant the commencement of building operations some time in January. It is expected that this will be the largest flour manufacturing concern ever built in the Keystone State.

##### South Carolina.

The artesian well at Charleston is 1,940 feet deep and has cost \$20,000.

Improved business and agricultural prospects are reported from all parts of the State. The people are all hard at work. Two good years for farmers have come together. Debts are being paid and confidence is returning.

##### Texas.

German immigrants are arriving in large numbers.

At Fort Worth, Mr. Walcott has withdrawn from the milling firm of Ashford, Walcott & Blandin. Firm name now is Ashford & Blandin.

##### Utah.

A million dollar Mormon Temple is being erected at Manti.

The Horn silver mine in Beaver county is reported to be wonderfully rich.

There were 241,675 acres of land taken up during the year under the homestead and timber culture acts.

##### Wisconsin.

Shawano county has five flouring mills. The Menasha paper mills are crowded with work. James Anderson, of Dallas, is building a new mill on Pine Creek.

S. P. K. Lewis & Sons, of Beaver Dam, shipped 2,500 barrels of flour direct to Liverpool during November.

The flouring mill of Messrs. White, Nash & Co., of La Crosse, was totally destroyed by fire on the morning of December 20th. A defective chimney was said to be the cause. Loss, \$40,000. Insurance, \$17,000.

##### Milwaukee Items.

A delegation from Yankton, Dakota, have recently visited this city to secure the extension of the Milwaukee & St. Paul railroad to Yankton. The company have ordered a preliminary survey to be made.

##### Canada.

The millers of Canada propose an insurance company on the mutual plan for the insurance of flouring mills only. Many underwriters predict unfavorable results. A like movement on the part of proprietors of New England cotton mills proved a grand success.

##### Mexico.

The Tacuba & San Bartolo Nancalpan railroad was opened for business November 22d.

The jail at Belem is being repaired. Chicago excursionists should keep away from Belem.

A commander of the Custom House Guard, at Nuevo Laredo, was stoned by the inhabitants. Is this the customary way of treating custom officials?

The new Governor of Michoacan has changed the Prefects of all the districts of his State. He don't take any stock in civil service reform. "To the victor belongs the spoils."

"The question as to whose is the best algebra, that of Mr. Terrazas or that of Mr. Contreras, is causing a heated discussion in several of the papers of this city."—*Two Republics (Mexico)*. By jove! can they do that in Spanish, too?

A Mexican editor was recently compelled to pay for his drinks at the skating rink in the City of Mexico. If they don't suspend that rule before Chicago and St. Louis editors get down there, there will be something hot enough said to melt the ice.

You can't make us believe any more of those romantic stories about Mexican gambling houses that have semi-occasionally gone the rounds of the press. The fact is they are just like gambling houses in this country where the police are just as liable to "Keno" as anybody else, in proof of which we clip the following item from the *Two Republics (Mexico)*: "A gambling house in Cocheras street was surprised by the city police a few days ago, and fifteen gamblers arrested, the money found on the table being seized."

We have just received in exchange the *Two Republics*, a newspaper published in the English language in the City of Mexico. (*Geo. W. Clark is the editor and publisher. Subscription price, \$13 per year by mail.*) This paper is able and willing to encourage the movement now on foot to open up commerce extensively between the United States of America and the Republic of Mexico. The coming of the American visitors from Chicago, Milwaukee, St. Louis, New Orleans and other places is anxiously looked for, and the following programme is announced for their entertainment:

*First Week.*—First day—Visits to the President, Cabinet Ministers, and Government officers. In the evening, to the theatre, or a grand concert in the Zocalo (in front of the National Palace). Second day—Visit to the Art Gallery "San Carlos," and to Tacubaya (site of the Military Academy). Third day—Visit to the Mint and several schools. In the afternoon, Grand Paseo. In the evening to the theatre. Fourth day—Visit to Cuautitlan, Toluca, or some other neighboring town. On the fifth day an official banquet will be given to the visitors. Sixth day—Visits to the National Montepio and to other noteworthy establishments. Seventh day—Visit to the Castle of Chapultepec, where an elegant breakfast is to be provided.

*Second Week.*—Trips to the noteworthy and picturesque surroundings in the capital, and to the lakes.

*Third Week.*—Trips to various parts of the country, as to Cuernavaca, Pachuca, etc.

##### Foreign.

A new 14-run mill is being built in Sheffield, England.

Millers' wages in South Australia range from \$12 to \$15 per week.

Cholera of a sporadic character has made its appearance in Japan.

Chas. Hopkinson is building a new 12-run mill in Retford, England.

A diamond weighing 9-4 carats has recently been found in South Africa.

A \$25,000 flour mill in Randalstown, Ireland, burned November 29th.

Small pox is raging in Rio Janeiro, Brazil. The mortality has reached over 400 per month.

Swiss exports of silk ribbons to the United States have fallen during the last five years from \$5,000,000 to \$1,000,000.

The sequestration of the estate of Henry Taylor & Sons, grain and flour merchants of Glasgow, is announced. The liabilities are \$6,500,000. William Taylor, the imprisoned Director of the City of Glasgow Bank, is the senior partner of the firm.

The suspension of the Cornish tin mining industry in England has now become almost total. The few mines still working, with three exceptions, have largely reduced their hands. Wholesale emigration has but partially mitigated the distress, and thousands of penniless women and children are left behind.

A serious revolt of 50,000 troops has occurred in the province of Kwangsi, China. There are fears of its extension. Bad pay and rations are complained of throughout the army. There are reports of disasters to the Chinese forces occupying the conquered Western Territory. Complications with the Russian authorities are also feared.

A. Wehausen, of Two Rivers, Wis., has recently had his new flouring mill completed. It contains six run of stone and all sorts of modern cleaning and bolting machinery. It is furnished with power by an 80-horse power Corlies engine manufactured by E. P. Allis & Co. The main building is 42 by 68 feet with an addition for office, engine room, etc., 24 by 68 feet. The main building is 57 feet high from basement floor to the roof. The chimney is built of brick and is 78 feet with opening for smoke-flue 3 feet square. It is built with a stone foundation and the mill superstructure of brick, with metallic roof and is as near fire-proof as can be made. The plan of building was made by and the entire erection and construction thereof, and the placing of the machinery, was under the superintendence of Henry Smith, Esq., our well-known Milwaukee millwright. The mill is now in active operation and turns out good flour, and gives entire satisfaction to the proprietor.

A CURIOUS machine has been invented by Professor Balsamo, of Lecce, Italy, by means of which vessels are to be propelled at will in any given direction without resource being had to a screw or rudder.



UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

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MILWAUKEE, JANUARY, 1879.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery.

ADVERTISING RATES FOR 1879.

Table with 6 columns: 1 mo., 2 mos., 3 mos., 6 mos., 1 year. Rows include One inch card, Two, Four, One-half col. (8 inches), One-fourth page, One-half page, One page.

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employes, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion.

We have recently published a List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canada, which is of great value to those who desire to communicate by circular with American mill-owners.

We have also lately published a Saw and Planing Mill Directory of the United States and Canada. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms.

Address all communications to the UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

A wet winter is predicted in Great Britain.

The Turkish Ministry has been dismissed. Say, Mr. Beecher.

The prosperity of Canadian banks has been steadily on the decline since 1874.

The Weights and Measures Act is now being discussed in the various British trade journals.

Reports from all the lumbering districts indicate that an unusually large amount of logs will be harvested.

At noon Dec. 17th, 1878, gold sold at par in New York for the first time since the suspension of specie payments in 1862.

The English Gen. Roberts is reported to have captured a lot of Afghans. Send us one (with yellow stripes) for our new cutter.

The Millers' Mutual Insurance Companies of Europe advertise. Similar insurance companies in this country would do well to follow their example.

The editor of the Bath (Me.) Commercial had a roast of beef and mince pies sent to him on Thanksgiving. He ought to be thankful and pious.

The Czar of Russia has read H. Herbert Emery's article on cotton, gin, etc., and has

put a duty on it. He considers it a duty to receive it.

The Corn Trade Journal and Millers' Gazette, a weekly publication published at London, Eng., is valuable to millers and grain dealers generally. Subscription price 12s. 6d. post-paid.

English bakers are compelled by law to use furnaces that consume their own smoke. A baker who had just put in a new oven that did not fill the demands of the law was arrested and fined £1 30s. and costs.

The Pacific Mills in New York, recently burned, were said to be worth \$100,000, and the grain and stock therein destroyed \$40,000 more. The cause of the fire is unknown, but is supposed to have originated from over-heated shafting.

Ross H. Wallace, the author of the "Sword of Bunker Hill," was brought up before a New York Police Court, the other day, on a charge of intoxication, but was discharged. The Sword of Bunker ought to have been run in instead of being discharged.

A severe rain-storm occurred in the New England States, New York, Pennsylvania and New Jersey, Dec. 9th and 10th, causing the destruction of much valuable property. Railroads, mills and manufacturing institutions run by water power were the heaviest losers.

The St. Louis Miller has made its appearance. It looks well and reads well. We cordially welcome it to our exchange table. We wish it a long and prosperous career.

It is one of the conditions of the Mutual Millers' Insurance Co., of Great Britain, that policy-holders shall keep at least three pails filled with water to each run of stone in the mill at all times, to be ready for use in case of emergency.

The U. S. Circuit Court decision on trade marks, recently given in this city has excited much comment. It has been decided that the general government has no constitutional right to make or enforce laws on this subject.

The Porcelain Roller Patent case, in England, between Messrs. Wegmann, of Zurich, Switzerland, and Corcoran, Witt & Co., of London, is now on trial.

Sow HARD WHEAT.—It will be seen, by reference to the proceedings of the various Millers' Associations, that there is great objection to soft wheats. Farmers should bear this in mind and raise the wheat which the market demands.

Chicago pork-packers complain that country shippers are too careless in their shipments. They say that if the shippers would have their hogs shipped in clean and comfortable cars they would get enough more for them to pay for the trouble.

We acknowledge with thanks the receipt of Prof. F. Kick's new German Millers' Text-Book from the publisher, Mr. Arthur Felix, of Leipzig, Germany. The book is designed for the use of students and practical millers, and is probably the most thorough work on milling extant.

Dec. 5th we had the pleasure of a call from Col. Gratiot, of Platteville, Wis., the inventor of the well-known Gratiot Wheat Heater.

are now just shipping an invoice to Messrs. Brown Bros., Cork, Ireland. Mr. Chas. Gratiot will sail for England to effect the extensive introduction of Heaters in Europe about Christmas. We wish him a safe and prosperous journey.

A miller in one of the Northwestern States, to whom several copies of a milling paper had been sent, recently wrote to the editor: "I don't want to subscribe now or ever. Gratuitous papers are thicker than hairs on a dog."

"Do hogs pay?" asks an agricultural correspondent. We know some that don't. They subscribe for a paper, read it for a few years for nothing, and then send it back to the publisher with the P. M.'s inscription, "refused." Such hogs pay nothing to nobody, if they can help it.—Newton Journal.

Bro. Hoppin, of the N. W. Miller, has been throwing some of his cross-eyed jokes at an individual bearing the euphonious name of Jones. Jones threatens to joke back practically, i. e. he says he will sue Hoppin's paper for libel.

The Wisconsin millers at their last meeting showed their appreciation of Sec. Seaman's labors by voting him a salary of \$250 per annum to date back from the organization of the Association. If any man has ever earned \$250 a year Sec. Seaman has.

That "awfully" reliable paper, the Chicago American Miller, in its November issue reported J. L. Wheeler, of the "Valley City Mills," Grand Rapids, Mich., dead. Wheeler himself writes to the American Miller and denies that he is dead—that he is not that kind of a man, and asks the editor to retract, and now the impudent manipulator of the scissors and paste-pot rather insists upon Wheelers taking a sort of "iron-clad oath" that he ain't dead.

The Eureka Manufacturing Co., of Rock Falls, Ill., manufacturers of the Becker Brush, has been sued by the Throop Grain Cleaner Co., of Auburn, N. Y., for infringement of the original Becker Patent which had a contracting case. We are reliably informed that the Eureka Manufacturing Co. has not made any wheat brushes with contracting case since 1875.

We are pained to announce the death of Alpheus Babcock, which occurred at his residence in Silver Creek, N. Y., Dec. 11th, 1878. Mr. Babcock was a member of the firm of Howes, Babcock & Co., well known in milling circles throughout the world as manufacturers of the Eureka wheat cleaning machines.

WHAT STOUT, MILLS & TEMPLE, OF DAYTON, OHIO, ARE DOING.—Messrs. Stout, Mills & Temple, of Dayton, Ohio, have recently furnished the following parties with machinery, burrs, bolting cloth, etc.:

James Kankinson, Carlisle, Ohio; Ashton & McGraw, Columbia, Tenn.; J. D. Wade, Wayland, Springs, Tenn.; J. A. Thompson & Co., Edinburg, Ind.; Laura Davis, Florence, Ala.;

AMERICAN FARMING.—American farming is now equal to any in the world. Our farms generally are cleaner and freer from weeds than foreign ones—with some exceptions—and if we would use our native fertilizers, such as bones and meat refuse and fish guano;

LIGHTING MILLS.

The question of a suitable light for flour mills is rapidly becoming one of the utmost importance. The Anchor mill was destroyed by the careless use of a lantern, and other serious accidents and losses have been occasioned by the same means.

THE MILLING INDUSTRY IN HUNGARY.

[Translated from Die Muehle, especially for the UNITED STATES MILLER.]

The milling industry in Hungary, which country has been so greatly favored with abundant water-power, has of late been wonderfully encouraged by the increase of the consumption of flour in Western Europe.

Table showing flour production in Hungary from 1871 to 1876. Columns: Year, Barrels.

Besides the fourteen large steam mills, all owned by stock companies with a total capital of 11,000,000 florins (about \$5,500,000), there are 13 large private steam flour mills in the Buda Pest district.

Notwithstanding the great capacity of these large establishments, a considerable amount of flour is brought in from the smaller mills of which the Budapest district in 1870 had 4,608, 1,907 of which were driven by water power, 545 by wind-power and 2,093 by horse-power.

## WISCONSIN MILLERS.

## Third Annual Meeting of the State Millers' Association.

Progress of the Cochrane and Other Suits—  
Report of the Secretary—Important  
Action Regarding Soft Wheat and  
Freights—Miscellaneous  
Business.

The State Millers' Association of Wisconsin convened December 4th, at the Newhall House parlors, Milwaukee, a good attendance being present from the interior of the State. The topic principally discussed was the necessity of putting some check upon the introduction of the different varieties of soft wheat into the Milwaukee market, which was having a tendency to lower its grade as it had done in Chicago. The rise and fall of the Cochrane suits against the Association was also touched upon, and the project of the formation of a National Insurance organization, which was rejected at the last meeting, was laid over again.

The following members from different portions of the State were in attendance: William Albrecht & Co., Newburg; Bodendorfer & Zaun, Cedarburg; A Phelps, Delavan; B. F. Heald, Sheboygan Falls; A. Crowfoot, Hartford; John Schuette, Manitowoc; Joseph Trottmann, Cedarburg; C. W. Hodson, Janesville; W. S. Green, Milford; E. R. Hoyt, Beaver Dam; F. M. Allen, Fort Atkinson; S. R. Willy, Appleton; A. Symes, Menasha; D. L. Kimberly, Neenah; Theo. Conkey, Appleton; Ed. Sanderson, C. Manegold, Jr., & Co., Gerlach & Dittmarsch, and S. H. Seamans, of Milwaukee.

The meeting was called to order by Ed. Sanderson, the President, who briefly stated the objects of the meeting, after which the reports of the Secretary and Treasurer were in order. The monetary exhibit was as follows: Receipts for six months, \$430.17; disbursements, \$4,206.77; balance, \$95.30.

Secretary Seamans then submitted the following, containing an interesting account of the progress of the suits against this and other Associations:

*Mr. President and Gentlemen:* Since my report in June we have only added five run of stone to our membership. We had then unpaid assessments as follows: First assessment, 3 run; second assessment, 17 run; third assessment, 34 run. Of these last, assessments have been paid upon 20 run, leaving total unpaid, the first three assessments upon 34 run, out of a total number of 424 run. Some of those delinquent upon the third assessment have promised to pay at an early day. On the fourth, assessments have been paid upon 314 run. I have since called upon 12 run additional, leaving about 64 run still unpaid that may be counted upon in due time. Our State has paid promptly all the assessments called for by the National Association to meet the expenses of defending the Cochrane suits, and had all other Associations done as well, there would be no lack of funds; but inasmuch as the winter wheat States have proved delinquent the spring wheat States have been obliged to advance funds to meet pressing demands, until such time as the delinquents can pay up. Our State was called upon to advance \$1,000, but having only \$700 the Treasury could only respond to this amount.

So far the Cochrane party have only met reverses in all their suits. It is expected that the St. Louis cases will be tried this month, when we may expect to get a definite decision upon the merits of the Cochrane claims. Since our June meeting the claims of Cochrane, Smith and Burton and others have been consolidated under the name of the Consolidated Middlings Purifier Company, hoping in the multiplicity of claims there may be some show to yet bleed the milling fraternity of the country. They have brought one suit against parties in New York, and will undoubtedly bring others in other parts of the country. The sharks look upon the millers as good subjects to pluck, and seem determined to make the most of the opportunity, which should be sufficient warning to us that instead of relaxing our vigilance we should redouble it. For it is only too evident that there will be no rest until these claims are settled by the Courts. In order to meet and settle these demands, once for all, every member of the Association must do his part in furnishing the sinews of war. Those that can pay and don't pay, must be made to pay; we cannot expect to add much to our membership until the Smiths and Cochranes come and do a little missionary work among us.

The claimant of the Denchfield device met with your Executive Committee and stated his case. Your committee failed to be convinced by his arguments, and consequently entered into no arrangement with him looking toward a settlement of his claims. He has commenced several suits in Illinois, which are being contested, and it is confidently expected that new evidence, lately procured, is sufficient to put a quietus upon this twin of Cochranes.

I believe but few of our members realize the immense benefit they have derived from organized effort. Thus far the assessments have amounted to only \$30 per run of stone. The demands upon us during this time have been as follows: Geo. T. Smith demands to be paid "insurer" \$250 per run; Cochrane demand, "Pay up or shut up your mill," \$1,000 per run; Denchfield claim, \$100 per run. Total, \$1,350 per run as against \$30. Beside the

above we can safely conclude that other claims would have sprung up amounting to at least half as much more. While the members of the Association by organizing and paying their assessments have reaped all these benefits, it is to be regretted that there is no way to compel those who have stayed outside and paid nothing, and reaped the same benefits, to bear their just share of the burden.

The committee appointed on wheat for milling purposes not being ready to report, the Chair appointed a new one to bring in a statement after the meeting adjourned, consisting of S. H. Seamans, Dr. G. R. Hoyt and W. S. Green.

Mr. Schuette said that as Mr. Horton, the Assistant Secretary of the Millers' National, was present, he would be pleased to have him inform the convention in regard to the company's work the past year.

The President remarked that he was a policyholder in the company, and his insurance had cost him much less than it had in other companies. He then introduced Mr. Horton, who spoke as follows:

*Mr. President and Gentlemen:* On behalf of the Millers' National Insurance Company, I am happy to be able to report that the past year has been of success and prosperity. In compliance with the statute of Illinois, our regular annual statement will be published at the close of the year, and a full report cannot be made until then, but expecting to meet many of our Wisconsin members here to-day, and perhaps others who may wish to become such, I have made a memorandum of some facts and figures which show the growth of our business, our present condition, and what we have accomplished, which I will submit to your consideration.

The company commenced business and issued its first policy May 1st, 1876. In the short space of little more than two and a half years which have elapsed, we have secured a membership that embraces a large share of the best millers of ten Western States, and are now at work in New York and Pennsylvania with the most encouraging results. We have obtained personal surveys and reports on nearly 2,000 mills, which give us information which will enable us to secure nearly all that are desirable risks and to avoid those which are not. The expense attending this work has been very great, but it has been fully compensated for by our comparative exemption from loss. While we have lost 12 mills which we had accepted, 20 that we had rejected have been destroyed, and most of them well insured in other companies.

From the first we have considered that expense incurred in obtaining all information to enable us to secure the best risks and to avoid losses was the truest economy, and our experience has demonstrated it to be a fact. Some have feared that as we got older we would become more careless in our selection of risks, and extended our business by increasing our hazards on a poorer class of mills, but the reverse is the case. As we grow stronger, we become more independent. We are now in a position where we can and do exercise greater care than ever. We are gradually weeding out the less desirable risks, and promptly cancelling all policies where the holders will not comply with our requirements for the protection of the property insured, or who do not pay their assessments promptly. It is our aim to reduce the cost of insurance on good mills to the minimum by saving losses on poor mills which are operated without profit to the owner and in a shiftless, hap-hazard way that invites the destruction that is almost certain sooner or later to come. The moral hazard we consider the greatest in mill insurance. We agree with the miller who, when asked where an underwriter should look for the greatest danger to a mill, answered "in the account books of the owner." We believe that if a mill is paying the owner there is little probability of its burning, and if it does burn it will be from an unavoidable accident, and the loss will be an honest one. Hence we scrutinize carefully the financial and moral standing of applicants as closely as we do the physical hazard of their risks, and do not hesitate to avail ourselves of our right of cancellation of our policy whenever we find the holder is seriously involved.

The Millers' National Insurance Company has realized the most sanguine expectations of its founders. It has saved its members nearly \$100,000 directly by giving them perfect indemnity at about one-half the rates charged by all first-class companies when it commenced operations, and tens of thousands of dollars more indirectly by its influence in forcing other companies to make great concessions in their rates. This indirect benefit has been shared by the entire milling fraternity to an extent which it is impossible to estimate, but we can safely say that it could be calculated only by millions of dollars, when we consider that there are 25,000 mills in the United States.

Having been so largely instrumental in forcing a reduction in the rates of mill insurance, we can hardly deem it fair for those who have shared the benefit of our labors without assuming any of the responsibilities of the organization, to use, as some do, the current reduced rates of the cash companies as an argument against us, when they are in fact the strongest argument in our favor. Upon the continued success of our company depends a continuance of the present cash rates, or even of reasonable rates on mill risks. So long as the millers have an organization of their own, giving them the best of indemnity at cost, other companies must take mill property at but a small advance above cost, or not take it at all when it can be placed in the Millers' National. This is so evident that every miller

should see that it is his interest to support his own company if possible, rather than the cash companies, who would, if they could, drive us from the field.

We now have at risk over \$2,000,000, representing the best mill property of the United States, while our assets are nearly \$400,000, or nearly 20 per cent of our liabilities, a proportion of assets to liabilities such as few, if any, of the cash companies can show. On the 30th of November we had:

Cash in bank.....	\$ 1,626 99
United States bonds.....	10,000 00
Premiums in course of collection.....	165 00
Assessments in course of collection.....	16,978 77
Deposit notes.....	363,413 83
Total.....	\$392,184 59

The income, since January 1st, eleven months, has been:

Cash premiums.....	\$ 12,526 11
Assessments collected.....	35,676 26
Interest.....	164 45
Deposit notes.....	95,687 50
Total.....	\$144,054 32

During the year 1878 the following losses have been sustained by this company, and promptly paid from the permanent fund thereof:

March 18, 1878, Fargo, Lord & Co., Grass Lake, Mich.....	\$4,111 75
May 2, 1878, C. C. Washburn, Minneapolis, Minn.....	2,550 00
May 9, 1878, G. C. Dellinger, Pearl Rock, Iowa.....	3,000 00
May 13, 1878, D. A. Barrows, Galena, Ill.....	4,123 90
May 13, 1878, J. H. Walsh & Co., Galena, Ill.....	510 20
June 17, 1878, Pursel, Earl & Co., Schoolcraft, Mich.....	8,659 79
July 30, 1878, A. E. Spalding, Huntley, Ill.....	3,916 00
Total.....	\$21,871 64

The amount of losses since organization, May 1st, 1876, has been \$46,134.33. All of which has been paid promptly, and aside from some items of office expenses, the company owes no man a dollar. At your last annual meeting, a gentleman stated that his insurance in the Millers' National had cost him more than it would have done in cash companies.

His error was in charging to the first year of his policy the entire membership fee, then adding the annual assessment. Though I understand that the error was corrected at the time by some one better informed as to our plan, unfortunately the statement appeared in the published report of the proceedings, while the correction did not.

The cash payment made on the issue of a policy is the membership fee for the term of five years, and in estimating the annual cost of one's policy, only one-fifth of the amount is properly chargeable to each year of the term.

For the past year, ending December 1st, the cost of no policy has exceeded one-half the rates as established by the National Board of Underwriters, and which all first-class companies strictly adhered to when our company commenced operations. First-class water-power mills have cost with us 1½ per cent for the last twelve months, and for the last six months only three-tenths of 1 per cent, while the best class of steam mills have cost the past year only 2 per cent, and for the last six months only four-tenths of 1 per cent.

The largest amount which the company has exposed to loss by one fire is \$10,000, while the average is a little over \$4,000. With its present assets it could pay an average loss every ten days for more than two years without exhausting its capital.

The company is no longer an experiment. It occupies, and deservedly, too, a position that must command the confidence of the milling fraternity and the respect of its competitors. It offers the surest indemnity at actual cost, which it has demonstrated to be much below even the reduced rates now offered by the cash companies, who so recently could see no profit in mill insurance except in rates which ranged from 3 per cent on fire-proof water mills up to 8 per cent on frame steam mills.

Experience has demonstrated that its fund of deposit notes affords as ample security to the policy holder as do the miscellaneous assets forming the capital of most of our so-called reliable cash companies. These notes are the contracts of the best and most responsible millers of the country. They are good for every dollar called for to meet the obligations of the company, but valueless to any one who would attempt to steal them or to appropriate them for any unlawful purpose.

The control of the company is in the hands of mill owners, whose names are a guarantee of the faithful performance of their trust, and the watchful care for the interest of all policy holders, among whom they are themselves the largest.

We have already a large membership in Wisconsin, but there are still many others that we would be pleased to place upon our books and receive their aid and co-operation in making the company a yet greater power in the land.

Considerable discussion followed upon the soft wheat evil, Ed. Sanderson remarking that quantities were now lying in the elevators uncalled for, and there must be some reason for it. The only reason why Milwaukee wheat brought more in the markets of the world than Chicago wheat was that there was a larger admixture of hard wheat. Further miscellaneous discussion took place, several members desiring to know whether the Russian variety was not the same as "The Lost Nation"—the soft kind.

S. G. Shirland, Chairman of the Committee on Machinery, then submitted a practical and suggestive report.

It called attention to the trouble and expense which had been caused by the practice of each miller making his own experiments at his own risk. The National organization was considering the proposition to establish an institution to ascertain the value of the milling inventions. In regard to cleaning of grain

the old practice of using beaters is gradually being abandoned, as having a tendency to break the grain. There is an effort being made to remove the germ previous to grinding, but as yet it is not a success. In regard to purifiers the committee concluded that a simple sieve properly clothed, enclosed and operated with a suction air blast, is all that is required. There is a machine used for the purpose of collecting the dust from the exhaust, and depositing it into the meal elevator which is coming into use. It does away with a large dust room, and saves the labor of collection. In conclusion the Chairman regretted that those appointed on machines at the last meeting were not present, and that in trying to get information from manufacturers there had not been sufficient data as to performance to enable him to form a judgment except as to engine boilers.

The report was adopted, some discussion being raised as to the comparative advantages of small and large mill stones.

The Association here indulged in some general remarks about the necessity of filing letters patent with the Secretary of State, by which the organization could be legalized, and if need be, sue and be sued. The subject was left in the hands of last year's committee having it in charge, with instructions to bring the matter to a speedy conclusion. Mr. Seamans thought that all that would be needed would be for each member to enter into a written compact, as was the way in New York.

The President offered the following resolutions:

Whereas, The railroads now classify all kinds of mill feeds as fourth-class freight, and charge freight to Eastern markets at the rate of 5c. per 100 pounds above the rate of grain and flour; and

Whereas, The mill feeds are the cheapest of almost all commodities transported by the railroads, are loaded always by the shippers, unloaded by the consignee, and are taken in full car loads of from ten to thirteen tons, thereby affording railroads a more remunerative car service than grain and flour; and

Whereas, Such classification of 5c. per 100 pounds over grain and flour is an unjust discrimination against the Western millers who furnish the East-bound rolling freight, and is in favor of Eastern millers who obtain their grain at the cheaper rates of freight; therefore

Resolved, That we earnestly protest against the further classification of feed as fourth-class, and at any higher rate of freight than that charged on grain and flour;

Resolved, That as a matter of equity and business, we demand that the East-bound freight lines take from the millers and shippers of feed all kinds of mill feeds, at the same classification and rate of freight as that charged on grain and flour;

Resolved, That the Secretary of the Millers' Association be and is hereby directed to forward a copy of the foregoing preambles and resolutions to the general freight agents of the several East-bound freight lines.

The resolutions were adopted. A resolution was then offered and adopted fixing the Secretary's salary at \$250 per annum.

This being the next order—the election of officers—the Chair then appointed a committee of five to report the nominees, whose action should be passed upon by the Association. They reported the following names:

President—E. Sanderson.  
Vice-President—Theo. Conkey.  
Secretary and Treasurer—S. H. Seamans.  
Executive Committee—W. S. Green, D. L. Kimberly, J. B. A. Kern, John Schuette, C. W. Hodson.

The report was unanimously adopted.

The meeting was now thrown open to a general and promiscuous discussion, the Chairman calling attention to the immense business growing up in bag flour. Others spoke on the same subject.

There being no other regular business the members of the committee appointed to examine into the "soft wheat" matter retired for consultation and soon brought in the following:

Your committee to whom was referred the subject of wheat for milling, and particularly in reference to the soft varieties known as Lost Nation, Russian Fife, Austrian Fife and May wheat that have been introduced into the Northwest within the past few years, would say that it is our belief that one of the remedies is in a change of inspection at the great wheat markets, by making a grade of No. 2 soft wheat, and to this end would suggest that this Association request the Chamber of Commerce of Milwaukee to establish a grade of No. 2 soft wheat.

And we would further suggest that the millers in the country make an effort to furnish the farmers in their vicinity with suitable seed at cost, and to encourage the introduction of only the best variety of Fife wheat.

Your committee would particularly call the attention of the farmers and dealers in wheat to the fact that the value of the wheat crop of the Northwest is being materially reduced, by the growing of these soft varieties, and we believe it only a question of very short time when the flour business of the Northwest will be irretrievably damaged, and the future grade of wheat will be reduced in value unless a change is brought about, and the harder varieties are grown exclusively. The argument commonly used that the yield of Lost Nation, etc., is much greater than that of harder varieties, is only good as far as can be produced by any other change of seed.

There being no other business the Association adjourned.

## UNITED STATES MILLER.

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Secretary—Frank Little.....Kalamazoo, Mich.

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THE NATIONAL ASSOCIATION OF BRITISH AND IRISH MILLERS—President, Mr. Alderman Hadley, City Flour Mills, London, England; Secretary, J. H. Chatterton, London, England.

MILWAUKEE, JANUARY, 1879.

We call the attention of our readers in need of buckets to the advertisement of W. J. Clark & Co., of Salem, Ohio.

Angus Smith, our well-known Milwaukee elevator man, is about to erect another one with a capacity of 1,000,000 bushels.

The Court of Appeals at St. Louis, Mo., has decided that option deals are not wagers, but are legitimate commercial transactions. The point is pretty fine, but it seems to be there.

American cattle arriving in England are to be exempted hereafter from the operation of the law requiring the slaughter of imported animals immediately on landing, provided they are furnished with a Government bill of health.

Mr. Kelner, of Kelnerville, Manitowoc Co., Wis., has recently improved his mill by adding some new wheat cleaning machinery. Messrs. Smith Bros., of Milwaukee, Wis., placed the machinery.

The *St. Louis Miller* in its last issue presents an editorial description of Cromwell's new wheat heater with the illustrations of the machine bottom side up. We infer, therefore, that the new paper is starting in boldly to revolutionize the "present system of milling."

The Pennsylvania Millers' State Association will meet at Lancaster, Pa., Jan. 14th, 1879. As Pennsylvania has more flour mills than any other State in the Union, it is expected that the attendance will be large. The proceedings will be duly reported in our February number.

John T. Hope, a leading New York underwriter, says that the annual losses by fire in the United States aggregate nearly \$100,000,000. The sum is startling, and the accompanying statement that the number of fires is nearly 180 each day, shows how necessary insurance companies are to the world at large.

An interesting experiment has been made to determine whether the headwaters of the Danube found their way through subterranean passages into the Aach. Some fluorescein was placed in the water of the Danube, and in three days the splendid green color and golden reflections were quite distinct in the waters of the Aach.

The *Real Estate Review*, published at Washington, D. C., is designed to be the universal organ of real estate dealers throughout the country. It not only contains letters and advertisements from every State, but takes especial pains to publish *real estate law*. B. H. Warner is the editor. Subscription price, \$1.00 per year.

No flour mill adds its busy hum to that of the manufactories of the growing and enterprising city of Joplin, Missouri. It is claimed that no more than two or three cities in Missouri demand more flour and feed annually than Joplin, and yet there is not a mill in the town. A great deal of flour is hauled there in wag-

ons. A good mill would be one of the most certain institutions of that place. Good wheat-growing territory is now tributary to that city by rail, and the manufacture of flour would certainly pay handsomely on the investment.

THE MILWAUKEE MILLING COMPANY'S NEW MILL.—In our December number we announced our intention of giving a description of this handsome new mill, with illustrations, but on account of delay in obtaining cuts to illustrate it properly we are obliged to postpone it. The mill has commenced running and is an acknowledged success.

The Geo. T. Smith Middlings Purifier Company, of Jackson, Mich., report very heavy sales of their machines in all parts of the country. They have just got out a new and handsomely illustrated circular, and millers should send for a copy. A new cut of their machine will embellish their advertisement in our February number.

The fifth annual meeting of the Iowa Millers' State Association will be held at the Aborn House, Des Moines, Ia., January 15th, 1879. A full attendance is desired. The Mill-Owners' Fire Insurance Co. and the Patent Right Association will meet at the same time and place. The proceedings will be fully reported in our next issue.

THE COCHRANE SUITS.—The Cochrane suits against the St. Louis millers has been set for trial February 10th. This is probably the last delay. Both sides have had time enough for thorough preparations, and the contest will be a strong one. We hope to be able to announce the decision in our March number, but decisions "hang fire" a good while sometimes.

A Prussian offers to throw a dam across Niagara Falls for \$5,000.—*Ec.*

There have been a good many dam(s) thrown around promiscuously everywhere in the vicinity of the Falls, especially when the hack-drivers were being settled with, but we believe no one ever succeeded in getting one clear across the Falls. If this Prussian can do it he will prove that he has a d—n strong pair of lungs.

Mr. Charles Galigher, of Cairo, Ill., has just patented an improved mill-curb and chop-conveyor. In this contrivance the meal cannot choke up or become clogged, but falls freely from the vicinity of the stones as soon as it comes out from between them. Access of air is thus permitted to the stones and the flour is not injured by detention between the grinding surfaces or by friction against the stone and curb.

SPECIAL NOTICE TO THE MILLING PUBLIC.—From Howes, Babcock & Co., manufacturers of the Eureka Snut and Separating Machine, Silver Creek, N. Y.:

In accordance with the demand of the times, we shall on and after January 1st, 1879, discount from our present prices of the EUREKA, the EUREKA BRUSH and the BOOTH SEPARATOR fifteen (15) per cent, with an additional discount of ten (10) per cent if cash is paid within thirty days from date of shipment of machines.

HOWES, BABCOCK & CO.,  
Silver Creek, N. Y.

A State organization for contesting the drive-well robbery was completed in St. Paul recently, with T. B. Wilson as President and L. P. Finke as Secretary. An Executive Committee was appointed consisting of J. W. Emory, Farmington; J. W. Wiswell, Mankato; S. Doughty, Lake City; R. Reves, Minneapolis; F. B. Clark, Benson; J. H. Walterstony, St. Paul; and V. Simpson, Winona. An address will shortly be issued. Each town which shall become a member of the association is to be entitled to representation on the Executive Committee. The association has no other purpose than to secure the highest judicial decision on the validity of the patent.

The tendency of millers to "keep dark" on milling subjects is by no means confined to this country. It is almost universal amongst the milling fraternity in Europe. Few of the leading mills will allow sketches to be made of, or allow visitors to go through, their mills, but we are glad to know that this feeling is giving way to a better one and that millers generally are getting to be more communicative, and they will find that it pays to exchange ideas and experiences with one another. The great Pesth Roller Mill, of Buda Pesth, Hungary, consented to having sketches made of the in-

terior work and arrangement of their machinery, which has been given to the milling public through the columns of this journal and copied therefrom into numerous foreign and domestic newspapers. Other mills are beginning to follow the fashion set, and we doubt not but that the various arrangements and contrivances necessary to produce the most desirable results in flour manufacture in modern mills will be shown up plainly through the columns of this and other enterprising journals. It is bound to result in good.

Ice in the rivers and lakes in the vicinity of Milwaukee is now 16 inches thick. The brewers and ice dealers are making extensive arrangements to lay in an immense stock.

## GRAIN METER.

We have just received a description of an automatic grain meter. Its object is to measure and weigh grain and seeds in the running stream into or out of cars, boats, elevators, etc. It can be made of any size and capacity, and is of the highest service for bagging purposes as well as for the delivery of grain in bulk. Information can be had concerning this patent grain meter by addressing Theo. Bourne, room 10, No. 162 Broadway, New York.

## THE CARR-TOUFFLIN DISINTEGRATING MILL.

The UNITED STATES MILLER, always having the interests of its readers at heart, presents in this issue the complete description of the above-mentioned mill and patents thereon, as it appeared at a recent date in *The Miller* (London). The cuts have been made by our engraver in this country after designs from the *London Miller*. This novel milling apparatus excited great interest at the Paris Exhibition among all persons interested in milling. The novelty of the process of making flour by percussion, and without the use of millstones or rolls, we consider well worthy of the attention and study of the milling fraternity this side of the Atlantic.

## DENCHFIELD PATENT SUITS AGAIN HEARD FROM.

A special telegram to the *Chicago Tribune*, Dec. 24th, from Springfield, Ill., says: "The 'Denchfield' litigation, which has become familiar to the public through the reports of its progress received from other sections of the country, was transferred to this district to-day by the filing of a bill in the United States Circuit Court, in which Philo D. Mickles, of Syracuse, N. Y., appears as complainant, and Fitzsimmon's & Kreider, of Jacksonville, who are alleged to be infringers of the Denchfield patent, are made defendants. The patent is described in the bill as an arrangement of means for cooling and drying meal. It is alleged that a patent for the device was issued to John Denchfield in April, 1858, and re-issued and extended for seven years in 1872, and that complainant is the owner of the patent for the State of Illinois. Also, that its validity has been declared by the United States Circuit Court for the Northern District of New York. The Millers' Association, at a recent meeting in this city, decided to resist the claim. A representative of Mr. H. B. Hurd, of Chicago, attorney for complainants, who has been in the city in reference to this matter for some days past, says that it is intended to bring suits and contest them vigorously against all infringers, among whom he includes nearly all the merchant millers. The suits in the northern part of the State are being vigorously pushed, he says, and the millers in New York are generally effecting settlements without litigation."

## CARBON EXPLOSIONS.

Ever since the Minneapolis horror, people have been hunting up explosive substances until the list is now almost endless, and one begins to wonder if anything and anybody is safe. Carbon is the last one on the list. Scientists have now discovered that finely divided carbon will explode with awful force, and four cases are cited where accidents resulted from explosions of this kind in blast furnaces. In one case the blast furnace was shut down for repairs, and workmen began shoveling out. When all the loose stock was removed, leaving the scaffold hanging against the sides above the boshes, and workmen were cooling the suspended mass by means of a stream of water from below, it suddenly fell with an explosion, burning eight men, three of whom died.

In the opinion of experts, finely divided carbon became ignited and caused the explosion. This opinion is sustained by the fact that after the explosion the air was full of carbon, which

settled on everything. It is said that the explosion in many particulars was like that of the mill explosion at Minneapolis and that of the Barclay street candy factory in New York city. We hope that insurance companies will appreciate these carbon explosions as well as they have those of flour mills. Perhaps after a lapse of ages they will discover that flour mills are not the most dangerous risks in the world.

## COMPRESSING THE BULK OF FLOUR.

A French chemist some few years ago conceived the idea that it would be practicable to compress flour so as to diminish the bulk and yet not injure its quality. An experiment was accordingly made. Flour subjected to a hydraulic pressure of 360 tons was reduced in volume more than 24 per cent. On close examination it was found to possess all the qualities it had previously to its violent treatment. It was then put into zinc boxes and sealed up. At the same time other flour manufactured from the same wheat, but not compressed, was sealed up. About three months after several boxes containing both kinds of flour were opened and examined. The pressed was pronounced to be the best. Twelve months after this another examination took place, and with the same result. The two kinds were kneaded into loaves and baked. The pressed flour made the best bread. In another year after the boxes were opened and examined, and while the loose flour showed moldiness, the pressed was sweet, and retained all its qualities. Made into bread the same difference was observable.

PAINLESS OPERATIONS.—The new antiseptic method of surgery which has recently been introduced into this country has been twice successfully tried at the Alexian Brothers' Hospital, Chicago, during the past two weeks. In each case a leg was amputated, and the patient rapidly recovered, experiencing no pain whatever from the use of the surgical instruments. The method of operation is as follows: The surface of the limb to be amputated is first sponged with a solution of one part carbolic acid to twenty parts water. The instruments are placed in a solution of one part carbolic acid to 40 of water. While the operation is going on, a spray atomizer throws a stream of solution of carbolic acid, one part to forty of water, into the wound. This makes the operation perfectly painless, and does away with the necessity for using chloroform or ether. The wound is then dressed with oiled silk saturated with sulphate of lead, which indicates the presence of sulphate of hydrogen by turning black, and shows whether the wound is suppurating. Six layers of medicated gauze are then placed over the wound, and the whole is covered with Mackintosh cloth.

## Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT TO MILLERS.—The necessity of the most positive uniform speed in the motive power of flouring mills is generally conceded. The unprecedented results in way of positive regulation of engine, durability and great economy in use, now guaranteed by the Huntoon Governor Company, are worthy the consideration of all who may use steam power. See advertisement.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or misarrangement, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

NOTICE.—The milling public are hereby notified that we have discontinued all suits against Messrs. E. P. Allis & Co., for infringements of patents on the Cooke Separator, manufactured by us, and the said firm of E. P. Allis & Co. will hereafter sell our machines on same terms as other mill furnishers, or the undersigned.

COOKE SEPARATOR MFG CO.  
Milwaukee, Dec. 27th, 1878.

THE MILLER'S TEXT BOOK.—By James M'Lean, of Glasgow, Scotland.—A descriptive and explanatory account of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working millstones, rollers and disintegrators contrasted. Also the different modes of separation, including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

## CAWKER CITY, KANSAS.

Its Location—Its Advantages—Streams—The Surrounding Country—Immense Trade—Fine Buildings—The Division Terminus of the A. S. V. & D. Railway—Population—Kansas People and Kansas Pluck—etc., etc.

Cawker City is located in the heart of the Solomon Valley, about two miles from the Forks of the Solomon River. The North Fork of the Solomon, and also the South Fork, all along the northwest and westward are well settled for a distance of over eighty miles. The natural amount of trade from these two great feeders, has always, more or less, been directed to this city, as also other portions of the neighboring counties through which they run. Cawker City is in the northwest corner of Mitchell county, and as a consequence has the trade and business of the southwestern part of Jewell, the southeastern part of Smith, and the northeastern part of Osborn counties. This, combined with the immense trade coming down both of the Forks of the Solomon, gives us the advantages of a business center of magnitude that is seldom seen in other towns in this part of the State. As will be seen this gives us a location favorable to a rapid and permanent growth, and one which will in the future, as it has in the past, attract business and capital from abroad to this point.

Good water is in our city and surrounding country. Wells in abundance are in town, and the water is pure and cool. Mitchell county has abundance of springs, and water can be procured everywhere at an average depth by digging thirty feet. Oak Creek is situated two miles west of Cawker City, is heavily timbered, and has a good thrifty class of farmers, whose well-improved farms and immense yield the past year illustrates what can be done by experienced farming in this beautiful valley. Carr Creek is situated south of this place, and is also well timbered and thickly settled. Walnut Creek is situated southeast of Cawker City, and is also well timbered and settled. Grannet Creek is situated east of Cawker City, and some of the finest farms in the State can be found in this part of the country. The trade of the farmers on these creeks all center at this place, and it is a large one. There are numerous other creeks, but they are not of sufficient magnitude for special mention. The water question is well settled in this part of the county, and we have yet to hear of one instance where any one has been disappointed in this particular necessity. The Great Spirit Medicinal Spring, located about two miles from this place, is the source of wonderment to new comers who are suffering from various ailments in the East, who come here to be cured by its magic waters. It is one of the curiosities of this part of the State, and, combined with its beauty and strange history, including the healing properties of its water, must be seen to be appreciated.

The Atchison, Solomon Valley & Denver Railroad Company have made arrangements to extend their line of road to this city this winter, being now but twenty miles distant. The Company propose to make this city the division terminus of the road, and will erect a round-house, and also put in machine shops at this place within the next year. The Kansas Pacific road, now at Minneapolis, will also extend its line through this county to intersect the Union Pacific road in Nebraska, via Cawker City. The upper road of the Union Pacific, now at Red Cloud, directly north of us, we are informed will extend their road southward through our town to reach Wichita, in order to gain the immense cattle trade at that point, of which that road has little or no part in at the present time. Cawker City will have plenty of railroad facilities, and our people are railroad men, who have the best interests of our beautiful city ever at heart. With the Atchison & Solomon Valley road in operation at this place, also the competing south line of the Kansas Pacific, combined with the not improbable north road of the Union Pacific, would give our city four roads. It will easily be seen that the Kansas Pacific road will reach this place to compete with the immense trade that the Atchison road will get by its extension, and the necessity will then arise of one or both roads pushing out in search for more trade. If the Atchison road takes the North Fork of the Solomon, the Kansas Pacific will undoubtedly extend its road up the South Fork, and thus both Forks will have roads terminating at this place. It is not necessary for us to say how much benefit this will be to our town and country, and also to the great business these competing

lines will build up for our people. Our position as a city, and also as a business center is favorable to all these acquisitions, and extremely fortunate both in its location and its class of citizens, who spare no means to give our beautiful city all the facilities that surround her.

Cawker City is located on a high eminence, a position which commands a view of the country surrounding, and on clear days our town can be seen by parties fifteen miles distant. "A city on a hill cannot be hid." applies to us, and with the many fine buildings erected here, the hiding part is impossible. The atmosphere is clear and bracing, and testimonials can be procured of parties who come from the East suffering from lung affections being entirely cured by no other remedies than the pure air of this locality.

The population of Cawker City is now (Dec. 1st, 1878), 655, and is rapidly increasing. It is not a city of premature growth, for buildings are going up all over the city, and other improvements of permanent character are going up everywhere. The town is crowded with new comers every day, and buildings go up with extreme rapidity. Some of the finest business blocks in the State have been erected at this place, and others are being erected. The Magnesian Limestone, Wacondite and red sandstone are the finest building rock that any State can boast of, all the colors from snow-white to brown, pink, yellow and deep red, being sufficiently soft when first quarried to be easily dressed or cut with an ordinary saw, and hardening by exposure to the air.

Cawker City is surrounded on all sides by as beautiful a farming country as the sun shines upon. No poor or worthless lands are to be found in this vicinity, being entirely without surface stone, but limestone for building purposes abound in almost every bluff or swell on our prairie. The land is a black loam intermixed with sand, and the soil is from two to ten feet deep, and no richer or stronger soil can be found anywhere. No soil in other States excels it for the production of wheat, rye, corn, oats, barley, Irish and sweet potatoes, vegetables, and all concede that Kansas produces the best apples, pears, peaches, and small fruits of any State in the Union. Northwestern Kansas is destined to be the most densely populated portion of the States, from the very fact that it has a much larger proportion of good land and fewer poor acres than any other part of Kansas, and the climate is the healthiest. Today good lands are comparatively cheaper here than any other portion of the State, and the reason why this is so is because it has been isolated and so far from market for produce. Farmers heretofore have had to cart their grain from sixty to one hundred miles to the railroad, but now our portion of the State is to be more highly blessed with railroads.

One hundred and sixty acre farms are selling at all prices, from five to twenty-five hundred dollars apiece, owing to location, improvements, etc. Farms are now changing hands rapidly, and farm lands are increasing in value and must necessarily for years to come. Capitalists and farmers can find no better investment than in farms here. They are finding that out and are coming from every State in the Union.

The business of the town is comprised in the following statement: Grocery stores, 6; dry goods and clothing stores, 7; hardware stores, 2; drug stores, 2; furniture store, 1; restaurants, 2; hotels, 2; jewelry establishment, 1; blacksmith shops, 3; wagon shops, 2; tin shops, 3; barber shops, 2; boot and shoe shops, 3; millinery stores, 3; photographic gallery, 1; livery stables, 3; dairy, 1; churches, 2; town hall, 1; a large fine school house; 2 house and sign paint shops; 3 harness shops; 2 lumber yards; 2 meat markets; 1 pawnbroker's shop; 1 brewery; 1 real estate office; 1 circulating library, etc. We have a number of physicians, lawyers, mechanics, and various business enterprises not necessary here to enumerate. Town lots are in active demand, and on an average no less than ten lots have been bought each day for the past two months.

Our city presents a lively appearance every day in the week. The city is daily crowded with teams and strangers, and thanks to our broad avenues, there is none of that blocking of teams, as is seen in other towns that have small and narrow streets. Our city has averaged in the last three months a house a day, and not shanties either, but fine one and two-story stone and frame buildings.

Our people are steady, sober, energetic, enterprising and open-hearted, who have always had faith in the future of our city, and have helped without stint every enterprise that was intended for the progress and welfare of the town. Kansas people are not drones,

neither are they of the Texas class, who only care for self and leave other obligations to take care of themselves. Kansas is no place for egotism or big-head. It is a state of facts, and the dreamy and foppish characters are sadly out of place when they come in contact with the average Kansas man. Business first, pleasure last, is the working motto of this State, and we see it no more verified in literal fact than at this place. Cawker City is made up of Kansas people, everything is progressing, and no idle man stands in the road to block progression.

Christian influence is felt here, in the air—everywhere, and "neighbor help neighbor," is the maxim of the day. Our churches are well attended; our school has nearly one hundred and fifty scholars; our town is blessed with a library that goes to nearly every home; the day laborers have all the work they can attend to, and the business men are increasing their various business callings each successive month, and on every hand can be seen amid the bustle of trade, of new buildings, or on crowded thoroughfares, contentment on every countenance. If any one is discontented here, it is his own fault, for everywhere and on every hand can be seen some employment or enterprise that pays by careful attention or industry. To strangers abroad who have not been in our midst, we would advise them to give our city a call, note the improvements going on, the growth and position of the city, and our word for it, we will guarantee satisfaction every time. Cawker City will be the largest city in Northwestern Kansas at an early day, and on every hand we see the spirit and presence of progression and thrift in our midst.—Cawker City Free Press.

[Parties contemplating settling in Kansas will do well to visit Cawker City. Hon. John A. Seger, of Cawker City, will be pleased to attend to the wants of those desiring to purchase business or residence lots. For information apply to him personally, or address with stamp for reply.]

## IMPORTANT TO BOILER MAKERS.

## United States Steamboat Boiler Inspection.

[Continued from first page of December number.]

The January number of the London *Engineer* contained a report of a series of experiments made by Chief Engineer Schock, of the United States Navy, which shows different results from those given here regarding the strength with and across the grain of iron, but the fact that his results are contrary to all previous experience seems to indicate that the iron used was of uncommon quality and that it would be difficult to repeat such results. Safety seems to require that boiler-makers should work their plates so that the greatest tensile strain shall be with the grain of the iron.

Manufacturers would benefit themselves and render valuable assistance to the Board of Supervising Inspectors if they would confer with each other and unite in recommending some standard for determining the lawful qualities of boiler-iron, and submit it to the Board at its next annual meeting in January, so that a uniform method of testing through the United States may supersede that now existing, which allows a prejudiced officer to exclude certain brands of iron from certain markets, to the injury of the manufacturers thereof and without benefit to the public.

It is believed that the efforts now being made by this office, and supported actively by manufacturers generally, will introduce into the market iron of American manufacture for marine-boiler use equal if not superior to that made in any part of the world. But whatever be the qualities of new iron, the eccentric manner of its wear under steam is yet unexplained. Some plates oxidize as soon as used; others of identical texture and position wear for years without material deterioration; and others, again, after wearing for several years without apparent damage, suddenly oxidize and are destroyed in a few months. This last condition was forcibly illustrated by the steamer *Magenta*, which exploded the outer shell of her steam-chimney, March 23, near Sing Sing, on the Hudson. In May, 1877, the boiler being then about four years old, a new lining was put in the chimney; at the same time the inner part of the outer shell of the chimney was thoroughly sealed with a hammer, and the experts who examined it and the boiler-makers who repaired it, swore that it had not materially wasted at that time. A few months later the inspectors inspected the vessel, and there is every reason to believe that the boiler then was in good condition; the *Magenta* was then used for three months and then lay idle for

six months. A few days after resuming work the outside shell of the steam-chimney exploded under pressure lower than that lawfully allowed her, revealing the iron at the point of rupture decreased by oxidation from  $\frac{1}{2}$  of an inch thick to a knife's edge. It is known by persons experienced in such subjects that had the iron been in this condition nine months previous, no such repairs as the vessel then underwent could have been possible, for the outer shell of the chimney would have been torn to pieces by the taking out and putting in of the socket-bolts connecting the two parts, and while all the experts who testified in the case agreed that the corrosion had been as sudden in its commencement as rapid in its progress, they could not agree on its cause; some attributing it to the felt covering used on the outside of the boiler, others to a mineral paint put on the inside of the boiler when it was repaired. Such disasters can be averted by frequent and careful inspection; there are places, however, in all boilers where personal inspection is impossible and where the hydrostatic test must be relied upon. I recommend to all steam-boat owners the importance of demanding such tests frequently, especially when after a season of inactivity work is resumed, for experience proves that boilers deteriorate more rapidly while idle than while continuously used. To enforce my suggestion I need only to cite the case of one of the large North River steamers, which, after undergoing thorough repairs to every part accessible to personal inspection, applied the hydrostatic test the day before beginning her regular trips last spring. Before the lawful pressure was reached several flues burst, and nearly all had to be replaced by new ones. This steamer carries from 1,500 to 2,000 passengers on a trip, and the possibility of an accident under such circumstances should be enough to convince every one of the necessity of such precaution; had the *Magenta's* boilers been subjected to the hydrostatic test last spring there is no doubt their defects would have been discovered, remedied, and the sacrifice of human life avoided. I dwell upon these details minutely because Congress has been importuned by some persons to abolish the hydrostatic test entirely, a measure the above incidents should prevent.

The *Magenta* explosion disclosed that inspectors when inspecting vessels did not remove the felt covering from the boilers, which this accident proved to be absolutely necessary. Suggestions on this point were immediately made from this office to the supervising inspectors, and generally adopted in the salt-water districts, which will prevent, if carefully followed, disasters from such omissions. Should cases of individual neglect occur, I shall recommend that the department deal vigorously with the offender.

The greatest loss of life during the year from a single accident resulted from the wreck of the steamer *Metropolis*, on Currituck Beach, North Carolina, January 31. This steamer was originally called the *Stars and Stripes*, but when she was lengthened in 1871 her name was changed. She was last inspected in December, 1877, at New York, by assistant inspectors Craft and Blake. She was then a freight steamer, but in January, 1878, she was chartered by Collins Brothers, of Philadelphia, to carry freight and passengers to Brazil, at which time Mr. Craft, assistant hull inspector, without consulting his colleague, indorsed on her certificate permission to carry two hundred and twenty-eight passengers and signed it with his own name only, in violation of rule 61, rules and regulations, which declares that "certificates of inspection signed by one local inspector only shall not be considered valid." There is no evidence to show that the owners of the steamer were aware of this fact, nor is it for me to decide in how much they were to blame for this ignorance; but in this connection I subjoin an extract from a letter written October 20, 1863, by Mr. Chase, then Secretary of the Treasury, to the supervising inspector at San Francisco:

"It is the duty of the ship-owner to discover what officer of the government may give a legal certificate, and to know how many passengers their vessels may lawfully transport; and the responsibility of failing to procure a legal certificate or to comply with its requirements rests properly with them."

The *Metropolis* sailed from Philadelphia January 29, and next day sprung a leak, which no efforts could stop, and at 6.30 a. m. on the 31st she was beached four miles below Currituck light. Of the passengers and crew, numbering two hundred and forty-eight persons, one hundred and fifty-seven were saved by the officers of the life-saving station and the citizens of the neighborhood; the remaining ninety-one were drowned. A special investigation of this disaster was made by the local inspectors at Philadelphia.

## THE CARR-TOUFFLIN DISINTEGRATING SYSTEM.

There is a proverb which affirms that threatened lives last long, and if millstones had ears as well as eyes, they might, from the number of vaticinations that have been made within the last few years with regard to their speedy and complete extinction, comfort themselves with the anticipation that a far different fate was in store for them. The advocates of rollers have threatened and are threatening them with annihilation, and, oblivious of the benefits they have conferred upon the race in all parts of the world and from time immemorial, they have declared in effect that such rude contrivances for the manufacture of so delicate a material as flour ought never to have existed. The advocates of the New, are, however, always more or less ungrateful for the services performed by the Old. The New, of course, would have a better chance for securing a perfectly clear stage, had the Old not quite so much to say for itself as it generally has. Thus it frequently happens that the innovator, although originally the mildest and best tempered of human beings, has the milk of human kindness soured within him because the institution or machine he desires to replace by something much better, can give very sturdy reasons why it should not be summarily improved off the face of the earth.

Venerable although millstones are as regards their years, associated as they are with human use in a highly important sense, and surrounded as they are with an atmosphere of poetry the sources of which can be traced both to sacred and classical inspirations, it is not for a moment to be supposed that they have any prescriptive right to continued existence apart from their adaptability for the performance of the specific work assigned them. If innovation is not invariably synonymous with improvement, as the innovator would have us believe, neither is it always that hideous and dangerous thing which people with strongly conservative instincts declare it to be. In the nature of things the old must give place to the new, and, as art and science are in their very essence progressive, it need not be surprising that it has been found that under certain conditions and circumstances some arrangement of rollers may not be more suitable for the manufacture of flour than the time-honored millstone. But if the advocates of rollers have threatened extinction to the millstone, a new king has arisen which knows not either. The name of this potentate is Percussion, and his prime minister in France is M. Toufflin, Rue de Constantinople, Paris.

The Paris Universal Exhibition has now brought percussion into cosmopolitan prominence, thanks to M. Toufflin, who in his pavilion has demonstrated the practicability of manufacturing flour of a very superior quality by percussion. But although M. Toufflin has contributed materially to the improvement of the system of which he is the exhibitor and exponent at the Paris Exhibition, the inventor of the system is an Englishman, the late Mr. Thomas Carr, of Bristol, member of the Institute of Mechanical Engineers, and the history of the system is certainly not the least interesting in what may be termed milling mechanics.

In the year 1859 Mr. Carr patented a disintegrating machine, March 20th, No. 778, for the purpose of pulverising unfibrous materials of different kinds, used chiefly in the manufacture of artificial manures, without grinding, crushing, or stamping. In consequence of super-phosphate of lime, for example, containing some combined moisture, it was liable to get into a pasty condition when crushed. It was found, however, that when a lump of this material was thrown up into the air and struck a rapid blow with a stick, it became completely shattered into minute fragments as though it had been subjected to some explosive force. The stick and the blow it imparted to the flying substance contained the germ of the idea of Mr. Carr's disintegrator. The principles embodied in the machine were a combination of centrifugal force and percussion. The pieces of the material, whatever its nature might be, were caused to fly through the machine by the powerful impetus communicated

to them by centrifugal force resulting from rapid rotation, and the flying pieces were struck in mid-air with rapidly reiterated blows delivered in alternately opposite directions by a succession of rotating beaters, being shattered by collision against the unarrested beaters which encountered them in the opposite direction to that in which they were moving. As the particles struck could offer no resistance but that which was due to their own inertia, without the aid of any solid abutment to support them on the reception of the blow, it followed that no friction or compression was produced, and that the moving power of the beaters was not unnecessarily neutralised and absorbed by any such unyielding abutment. Originally, the disintegrator was used for the granulation of super-phosphate of lime when it had conglomerated into a pasty mass after having been partially dissolved by vitriol. It was, however, subsequently applied to the

a better and whiter flour is obtained. And my improved wheat flour consists of wheat reduced to flour by percussion while it is free in the air, by any suitable beaters, though I prefer to use my patent disintegrator described in the letters patent, No. 778, A. D. 1859, and No. 3,235, A. D. 1868, suitably arranged, balanced, and driven at sufficient speed, as the best and most suitable machine for the purpose."

By the 1870 patent, No. 1,895, referred to above, the modifications and alterations necessary for adapting the original disintegrator to the grinding of wheat were provided. The annexed engraving (fig. 1) is an elevation of Carr's original disintegrating flour mill.

Fig. 2 is a section of the machine. A B show the discs and the beaters; C C show the annular ring carrying the cage; D E are two shafts running in the same line; G is the feed pipe, and H is the worm for discharging the

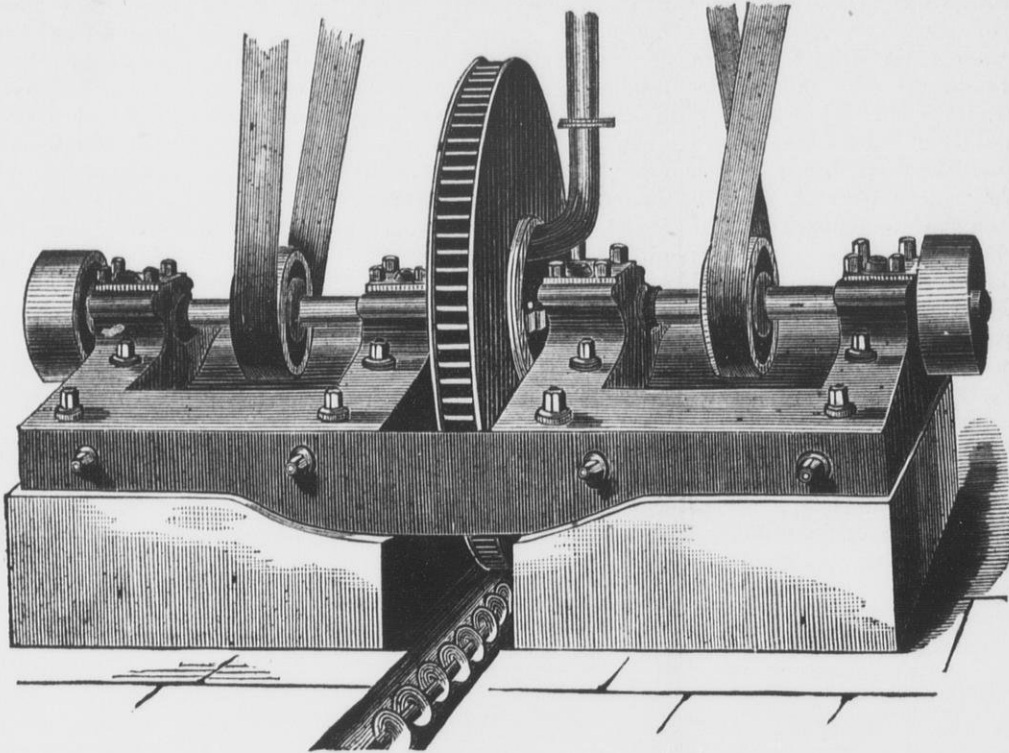


FIG. 1.—CARR'S ORIGINAL DISINTEGRATING FLOUR MILL—ELEVATION.

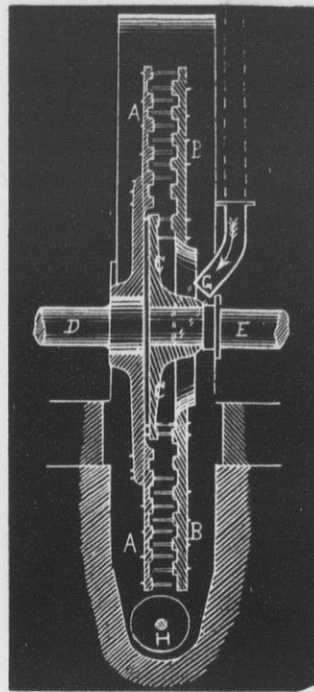


FIG. 2.—CARR'S DISINTEGRATING FLOUR MILL. SHOWING PEG BEATER.

granulation of clays, the ores of various minerals, and other substances. It is important to notice that in his provisional specification Mr. Carr says: "It is not, however, necessary that every two continuous cages should move relatively in contrary directions, but that they may move in the same direction at different speeds, or one cage may be stationary while another is in motion."

In 1868, 27th October, No. 3,235, Mr. Carr took out further patents for improvements on the original machine, but up to this time no thought had been given to the adaptability of the disintegrator to the manufacture of flour. The idea, however, of converting a mill originally designed for the granulation of unfibrous materials, such as minerals and ores, into a means for the granulation of wheat subsequently suggested itself, and in 1870, 5th July, No. 1,895, the first disintegrating flour mill was patented along with a modification of the system for wheat-cleaning.

In the same year, viz., 1870, 2d Aug., No. 2,149, Mr. Carr took out a patent for flour manufactured by percussion. In his provisional specification he says: "I have discovered that wheat may be reduced to flour by percussion while it is freely falling or projected through the air, and that the flour so produced has peculiar and superior qualities different from that of the flour of wheat produced by the ordinary process of grinding between two rubbing surfaces, or that produced by crushing or pulverizing between two surfaces. By my improved mode of manufacture the bran is separated more effectually and in larger scales, and not being pulverized or reduced the flour is purer and the particles of the flour are of a more perfect granular character, and, being suspended in the air in the process of reduction, there is no tendency to heat injuriously, and the 'cerealine' or other deleterious matter is more easily and fully extracted, and thus

meal from the machine. The machine, as described by the inventor in a paper read at a meeting of the Institution of Mechanical Engineers, in 1872, consisted of a pair of circular discs rotating in contrary directions upon two shafts situated in the same line. The opposite faces of the discs were studded with a series of short projecting bars or beaters arranged in successive concentric rings or cages, and the rings of beaters fixed in one disc intervene alternately between those fixed in the other, and revolve in the opposite direction. The solid circular disc keyed upon the left-hand shaft carried the third cage or ring of beaters counting outwards from the centre, and also the fifth, seventh, and eleventh cages, all of which rotated in the same way. On the

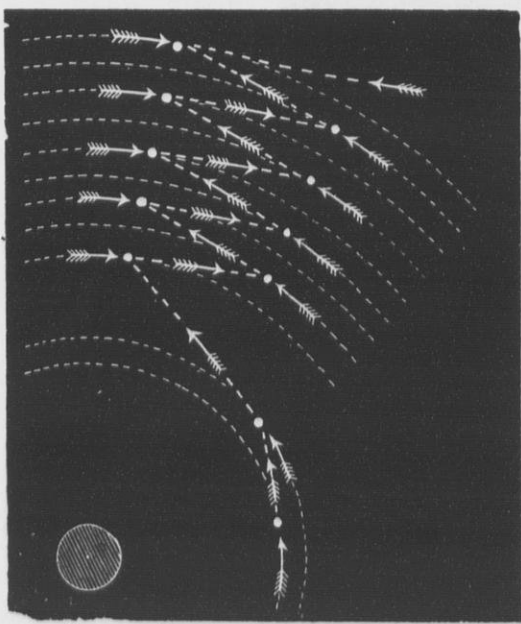


FIG. 3.—CARR'S ORIGINAL DISINTEGRATING FLOUR MILL—COURSE OF WHEAT IN PROCESS OF DISINTEGRATION.

right-hand shaft was keyed an inner disc, into which were riveted the bars of the two innermost cages of the two innermost cages of the beaters, their other ends being riveted into the right-hand annular disc, which is thus carried by them. This annular disc carries the fourth, sixth, eighth and tenth cages, which, with the two innermost, all rotate in the contrary direction to the cages carried by the left-hand disc. The two innermost cages are fixed in the same disc, so as to rotate in the same direction, in order the more effectually to secure the distribution of the grain by centrifugal force. The cages of the beaters are of successively increasing diameters, and consist of half-inch round steel bars, with clear spaces between, of about two inches in each direction. The outer ends of the bars in each cage in the original machine were fastened together by a ring, an arrangement which, however, does not exist in the more recent machines.

The grain was delivered through a fixed shoot, shown in the engraving, through the centre opening of the outer casing into the innermost cage, from which it was instantly projected through the machine and delivered

in a radiating shower from every portion of the circumference into the outer casing in the form of meal, similar to that thrown out by ordinary millstones. To this mealy condition the grain was reduced almost instantaneously by its being dashed to the right and left alternately by the bars of each of the successive cages revolving in opposite directions at a very high rate of speed. At its fall to the bottom the meal was continuously removed by the worm shown in the engraving, and was subsequently passed through silk dressing machines to separate the fine flour from the semolina, the latter being purified by an exhaust current of air in a machine adapted to the purpose, to free it from all bran specks previous to its being ground by millstones.

The course of a particle of grain through the disintegrating flour mill is illustrated by fig. 3. The circular arrows show the reverse direction in which the alternate cages rotate,

and the straight arrows at different angles show the zig-zag course of a particle of material as it flies off at a tangent from each cage, being struck alternately to the right and left and projected at a speed equivalent to that at which the bars of the cage last striking it were rotating. The force of each blow was thus measured by the momentum of the material which in each case is moving in an opposite direction to that of the beaters it next meets with. The machine was driven at the rate of 400 revolutions per minute, and the outermost ring having been 6 feet 10 inches diameter, the last beaters had a velocity of 140 feet per second or about 100 miles per hour. This was double the velocity, and consequently gave four times the force of the blow of the innermost ring of beaters, the force of the blow being proportionate to the square of the velocity. In

the patent of 1870, provision was made for applying to the machine a chamber or dome and an exhaust fan or an outlet leading to an exhaust fan, "so that," says the specification, "as the fine flour is falling the exhaust fan will have just sufficient strength to draw away the lighter part of the grain or what is termed cerealine, blue powder, or other deleterious matter which is discharged into a suitable chamber."

The inventor's claims in this patent, so far as they related to the manufacture of flour, are, "1st, the processes or means of reducing wheat and other seeds into coarse or fine flour by the application, to the purpose of my patent, disintegrators; 2nd, the construction of the machine for reducing wheat and other seeds to flour with two or more of the first inner cages all rotating in the same direction, and with distributing cylinders and counterbalancing fly-wheels; 3d, the combination of an exhausting draught within the casing or chamber in which the reducing machine works, to draw away the cerealine or other deleterious matter."

"The object of the fan," says the inventor, "is two-fold. First, it is to direct the current of air produced by the mill so as to prevent its rushing along the trough which contains the screw, and to cause it instead to take an upward course. Secondly, it is to remove from the flour, while the meal is being dispersed through the casing, the lighter dust called cerealine which is unsuited for a first-class flour. This cerealine deposits itself in one of Pengesitt's exhaust chambers, after traversing the passages of which the current of air, now free from all flour or dust, is allowed to escape into the open air. The first disintegrating mill had a disc diameter of seven feet, the beaters being bars; subsequently a machine five feet diameter was adopted, with a corresponding decrease in the width of the cage, in which pegs only a quarter of the length of the bars in the original machine, were substituted for the bars.

In a patent, dated 4th September, 1871, No. 2,334, but not proceeded with, Mr. Carr provided for exhausting the air from the machine, to reduce the friction and minimise the driving power. The improvement patented by Mr. Carr in 1871 consisted in arranging the whole machine, or the cage part of the machine only, to work in a box chamber or casing from which the air is exhausted, the shafts passing through stuffing boxes in the sides of the

chamber when the cages only are enclosed, the said box chamber or casing having a capacity sufficient to contain the machine or cages of the machine, and a supply of grain to be operated upon, and also the flour produced from such supply of grain, and with arrangements for feeding the grain placed in the chamber by screws or elevators to the machine

if required, and for introducing fresh supplies of grain to and removing the flour produced from the chamber. The chamber may be supplied with grain by pipes or shoots, which may be divided into two or more compartments; and while one compartment is discharging its grain into the casing of the machine the other is being filled, the valves between the two compartments being arranged and operated so that one valve is always shut when the other is open.

The flour may also be removed from the casing or chamber by a similar arrangement of two or more compartments and valves. After filling each compartment for supplying the grain, the air may be exhausted from it, and after emptying each compartment for discharging the flour the air may be withdrawn from such compartment. The air is exhausted from the casing

by pumps or other suitable means, and it is drawn by preference from the upper part of the casing up a vertical pipe of sufficient height, and may be arranged to pass through fine silk to keep back any flour, the silk being stretched on a disc frame, and made to rotate in front of the exit opening so as to constantly present a fresh surface, that part of the silk when not opposite the opening being acted upon by a brush to remove any flour which may adhere to the face of the silk, or the air might be made to traverse serpentine troughs or chambers to give time for the air to deposit the flour carried along with it before being finally discharged into the atmosphere.

Another patent was taken out by Mr. Carr in 1873, 19th April, No. 1,417, the main object of the invention patented being to arrange and construct the disintegrator so that its set of cages, which rotated in one direction, might, by simple means, be easily separated from those that rotated in the reverse direction whenever the bars or cages required to be conveniently got at for cleaning and repairing. This the inventor accomplished by ingenious arrangements which are fully set forth in the specification of the patent, and a series of elaborate drawings (see fig. 2). In 1873 an extension of six years was granted for the original patent.

In 1872 Mr. Carr wrote, "though the machine itself has been happily brought to that nude state of elementary simplicity which indicates that little or no margin is left for further genuine improvement in it, yet the knowledge of how, under all varying circumstances, to turn its powers to the best practical advantage in the treatment of its products, is obviously susceptible of developments and improvements to an extent of which we are as yet but little conversant."

The disintegrator was the creation of Mr. Carr's genius, and its improvement, from its invention in 1859, was a task to which he devoted the best energies of his life. Its application to the purposes of a flour mill was a development of his original idea, which long seemed an impossibility to himself. How could a material like wheat, which is entirely destitute of anything to serve

as an abutment, which was invariably provided in any kind of flour mill, to be pulverized by percussion while flying through the air? It was not deemed possible that wheat, with its low specific gravity, the minuteness of its particles, and the tough and fibrous nature of its outer covering—the bran—could, by its mere *ris inertia* present sufficient resist-

Mr. Philip Triggs, Bristol, and Mr. Benson, solicitor, of the same city, were appointed Mr. Carr's trustees by the will of that gentleman, Mr. Triggs being invested with the management of the patent. Prior to Mr. Carr's demise, he assigned his patents in France and Belgium to M. Toufflin, 25 Rue de Constantinople, Paris. Subsequently Mr. Carr's trustees

of the patent, 9th February, 1878, No. 546. No further description of the general principles and mechanism of the machine is required than we have given above. All that is now necessary is to explain the annexed engravings of the machine, which we shall do in the patentee's language. Fig. 1 is partly a longitudinal section and partly the elevation. Two shafts, B, B1, are employed, placed end to end, supported on frames A, A1, and rotating in opposite directions in bearings C, C1, of peculiar construction, enabling the shafts to be regularly and constantly lubricated, even when rotating at high rates of speed. The ends of the shafts, which are in juxtaposition, carry discs, D, D, upon which the cages or beaters, *d, d*, are fixed in concentric rows rotating in a case, E, strengthened externally by angle irons and made to fit as closely as possible over the said discs. The shafts are passed through stuffing-boxes, *e, e1*, in the sides of the case.

The shafts are driven by pulleys, F, F1, which are keyed upon them and caused to rotate in opposite directions by a belt carried over the main driving shaft. The case, E, is connected to a hopper, L, for containing the substance to be treated by means of a tube, G, bifurcated at the end within the case, so as to deliver the substance at the centre of the cage, and provided with an apparatus for excluding air at the other end where it is connected to the hopper. This apparatus consists of a cylinder, H, divided into several approximately air-tight compartments by radial partitions, M, attached to a shaft passed through the centre of the cylinder, and caused to rotate by a pulley, O, driven by a belt connected to the main driving shaft.

As each compartment is presented in turn to the aperture at the bottom of the hopper, L, it is filled with the grain or other substance to be pulverized or reduced, and as it continues to rotate it carries the same round to the aperture on the top of the feed pipe, G, into which its contents are discharged, while all air except that which is contained in the interstices of the grains or granules is effectually excluded. A similar arrangement is provided for the discharge of the flour or pulverized substance through a pipe, *i*, at the lower part of the case for excluding air at this point, this apparatus being likewise actuated by a belt and pulley, O1, fig. 2, driven by the main driving shaft.

A more or less perfect vacuum is maintained within the case by means of a pump, J, fig. 2, on what is known as Greindl's system, connected to the case by a pipe, *j*, and actuated by the main driving shaft; or an ejector, K, fig. 2, provided with a check valve may be employed for effecting the same object by means of a jet of steam obtained either direct from the boiler or from the exhaust pipe of the engine. The air within the case being continually exhausted and rarefied by the action of the Greindl pump or ejector, the injurious resistance hereinbefore referred to is considerably reduced, if not completely obviated.

It is evident that air may be exhausted from the chamber in which the cages rotate by means of apparatus other than those herein-before specified, such for example as ordinary air pumps; the air may also be exhausted through hollow shafts, or the outlet or outlets for the air may be situated at any part of the case

at any part of the case

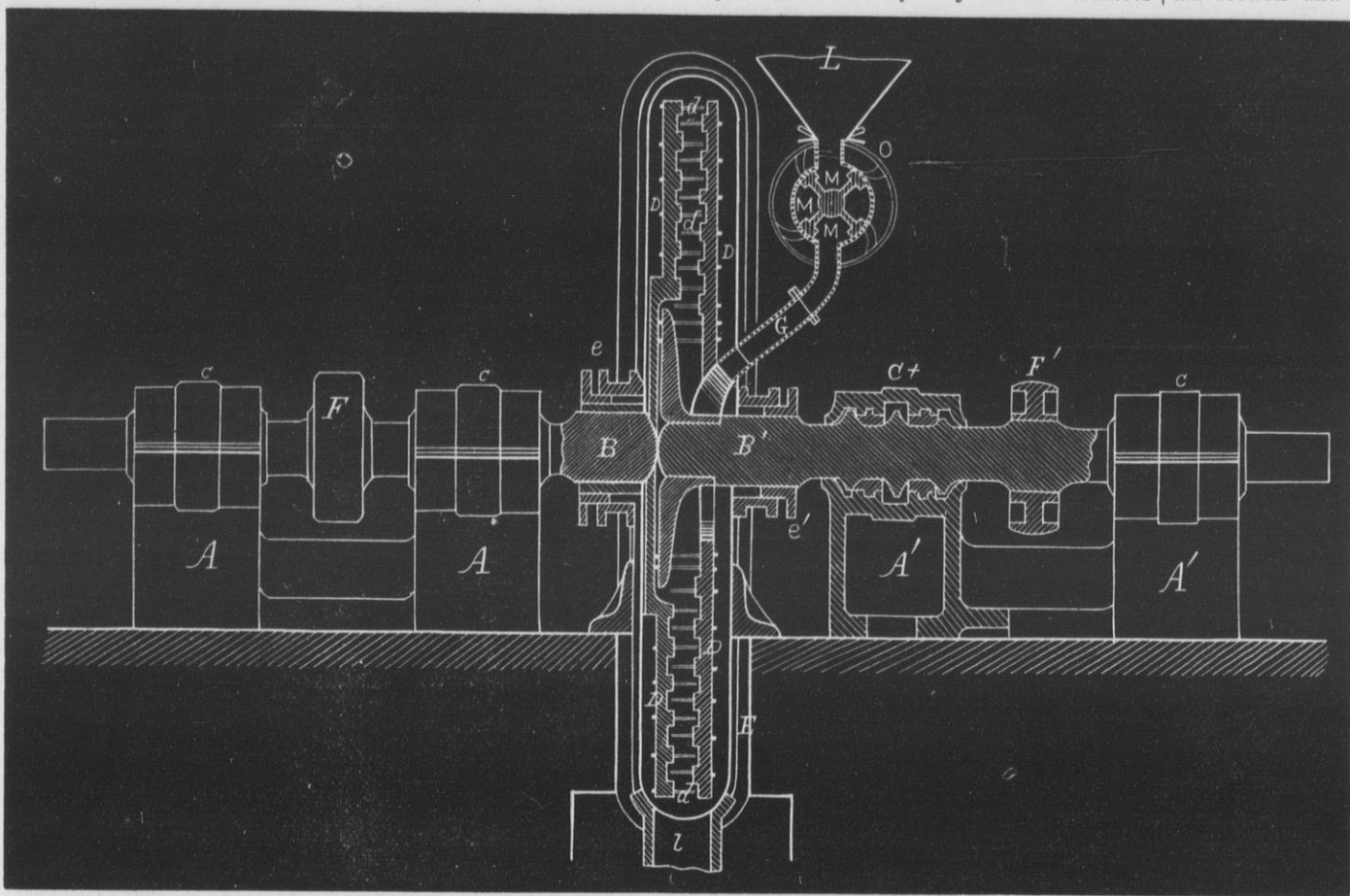


FIG. 1.—CARR-TOUFFLIN DISINTEGRATING FLOUR MILL.—PART SECTION AND PART ELEVATION.

ance to beaters to enable them to reduce it into flour while it was unsupported and flying freely through space. This seeming impossibility, however, was made possible and a machine which had been invented for the treatment of such gross materials as ores, minerals, clays, and manures, was so to speak, sublimated by the mechanical genius of its inventor into a machine for the manufacture of the exquisitely delicate material of which our daily bread is composed. Had Mr. Carr lived longer it is quite possible that several questions connected with his machine which still wait for solution would have been solved, but the inventor died in 1874, and the further improvement of his invention, if improvement there was to be made, was left for other hands.

entered into further arrangements affecting the countries just named with M. Toufflin. The disintegrator flour mill of both sizes, viz., 7 feet and 5 feet diameter respectively, were adopted by some millers in the United Kingdom. It took a large amount of courage to adopt a novelty of such an extreme and even startling stamp as that which Mr. Carr had provided, and great credit was due to those gentlemen who had the intelligence to perceive that, in the means of a revolution in the mode of flour manufacture that had been effected by Mr. Carr, there was at least something that was worthy of a practical investigation.

We come now to a description of the Carr-Toufflin disintegrating flour mill, exhibited at the Paris Exhibition, and which is the subject

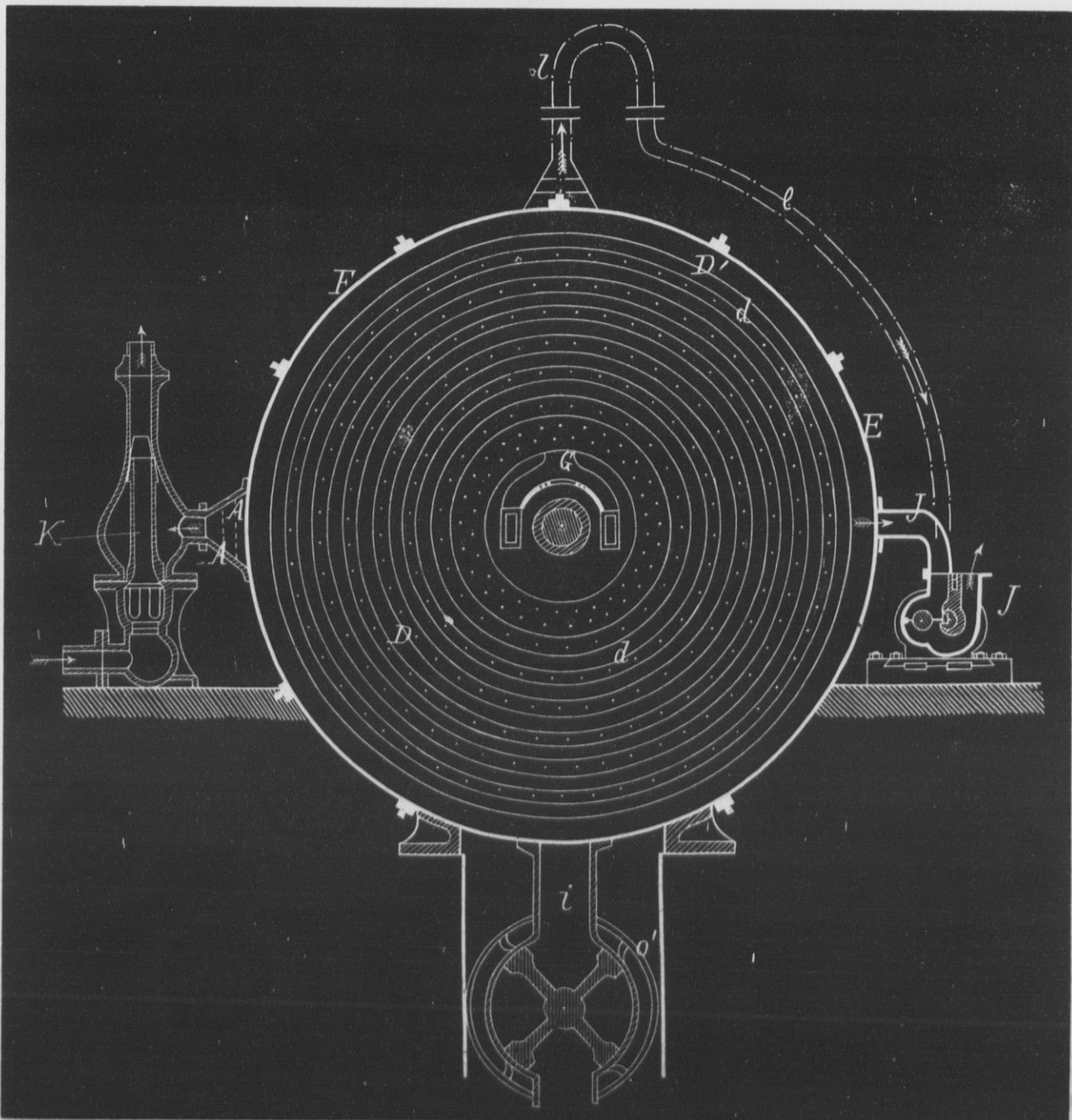


FIG. 2.—CARR-TOUFFLIN DISINTEGRATING FLOUR MILL.—SECTION SHOWING BEATERS OF DISC, ETC.

which may be found most convenient according to circumstances, and the said outlets may be provided with wire gauze diaphragms, as shown at A, A, fig. 2, in a conical chamber which will not impede the passage of the air, whilst the wire gauze prevents the escape of the flour, and for the same purpose the pipe through which the air is exhausted may be made of a syphon form, as shown in dotted lines at I, I, fig. 2, or the apparatus described for the discharge of the flour may be replaced by a powerful fan, exhausting the air within the case, and delivering the flour to a bolting apparatus, which will thus be enabled to work easily and economically under pressure.

This improved pulverizing or disintegrating apparatus working in a rarefied atmosphere possesses other important advantages besides the great saving in motive power. The rarefaction or exhaustion of the air in the chamber in which the cages work has the effect of considerably reducing the temperature in the said chamber, and maintaining it at a very low degree, which in the production of flour or meal in general, and corn or wheat and flour in particular, is a most important object. This rarefaction or exhaustion of the air also has the effect of facilitating the free fall or projection of the grains or granules, also of promoting the evaporation of the water contained in the grain, so as to greatly facilitate its decortication.

Moreover, this last-named effect of the rarefaction or exhaustion of the air enables dry meal or flour to be obtained direct from the mill, and consequently in the best possible condition for its transport or preservation.

The said invention is applicable to disintegrators generally constructed upon the principle of that hereinbefore described and illustrated in the accompanying drawings, whether with vertical or horizontal axes, either solid or hollow, and with any required modifications in the details of construction.

Having now described and particularly ascertained the nature of the said invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion that what I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited letters patent is, reducing grain and other substances in a vacuum or partial vacuum, substantially in the manner and by the means hereinbefore described.

Such is the description of the form of the machine shown at the Paris Exhibition, and which has attracted a very large share of attention from milling visitors and experts. The discs of the Toufflin machine are one metre (about 40 inches) diameter, the diameter of the beaters being about half an inch, and three-fourths of an inch long, arranged in circles about one inch apart, from one beater to another is about one centi-metre (four-tenths of an inch). The orifice of the feed pipe is about four inches diameter, and the speed is 1,152 revolutions per minute. The chief practical questions that remain to be solved are the driving power of the machine and its quantitative results. With regard to the first, there are various statements, but so far as can be judged from the conflicting estimates, the power is greater than that required for mill-stones. On the other hand, the advocates of the system say that, supposing the power to be slightly in excess of that required for mill-stones, the disintegrator still has economic advantages because the cost of mill-stone dressing is dispensed with, and the flour produced is superior in quality. From personal observation we are prepared to admit that a certain quantity of the flour produced is of a very excellent grade, but we were unable to ascertain, on independent grounds, the exact percentage of flour to wheat produced. The following statement which we have received is the nearest approach to exactitude we have obtained:

CHARONNE February 13, 1877.—Result of bolting 1,044 kilos. (1 kilo.=2 lbs. 3 oz.) of meal from French wheat (high grinding):

Table with 2 columns: Item description and Kilos. Items include First quality of flour, Semolina, Re-ground middlings, etc.

Rate of production, 2,000 kilos. per day. Diameter of machine, 70 centimetres (28 inches). Width about 4 centimetres (1.6 inch).

SUMMARY table with 2 columns: Item and 54 parts per 100.

CHARONNE, February 14, 1877.—Result of bolting 868 kilos. (1,750 lbs.) of meal from French wheat (low grinding):

Table with 2 columns: Item description and Kilos. Items include Fine flour, Semolina.

Table with 2 columns: Item description and Kilos. Items include Semolina, Re-ground middlings, French silk, etc.

Tare of 15 sacks, etc. say 883 15 868

SUMMARY table with 2 columns: Item and 54 parts per 100.

Rate of production, 1,000 kilos. per hour. Diameter of machine, 70 centimetres (28 inches). Widy about 4 centimetres (1.6 inch).

RICE EXPERIMENT.—Notes of an experiment on 1,000 kilos. of broken rice at Charonne, October 1, 1878:

Diameter of machine, 1 metre (40 inches). Length of beaters, 0.16 millimetres (0.64 of an inch). Speed, 1,150 revolutions per minute. Estimated actual horse-power required to drive the disintegrating mill and requisite dressing machinery, 22-horse power.

The silks were coarser than was desirable for the experiment, the numbers for flour ranging from 120 to 160, inclusive, and for semolina from 80 to 110.

Table with 2 columns: Item description and Kilos. Items include First passage, Second passage, Third passage.

Table with 2 columns: Item description and Kilos. Items include Weight of samples, Semolina not reduced, Waste from tail of dressing silks, etc.

With regard to the quality of the flour, Professor Kick says he compared Toufflin's No. 1 flour, according to Pekar's method, with No. 3 flour according to the Prague numbers, and the result was such as would induce no Austrian miller to adopt Toufflin's process.

Toufflin's assertion that 200 lbs. of flour would furnish 300 lbs. of bread, was not borne out by the experience of Professor Kick.

There can be but one opinion as to the ingenious way in which the original inventor of the disintegrator applied his invention to the purposes of a flour mill.

FROM PENNSYLVANIA.

PHILADELPHIA, Pa., December 17, 1878.—Since the slight lull in the flour manufacturing trade, the latter part of last month, there has been a grand revival in the business throughout the city and State.

The "dusty millers," believing that much of their prosperity, this season, is due, in a great measure, to the interest taken in the Pennsylvania Millers' State Association, which was organized last January, are projecting arrangements to more further extend the sphere and usefulness of the organization.

The next gathering of the association will take place at Lancaster next month. While the membership is already large, efforts are being made to bring all the representative merchant millers in the State within the fold of the association, and it is anticipated that, at the January meeting, a large number of millers will be received as members.

winter, by the association, requesting some modification or abolition of high and unjust freight rates exacted by the transportation companies whose lines of railroad traverse the great flour manufacturing districts of Pennsylvania.

In a pilgrimage among the Philadelphia flour makers and dealers, THE UNITED STATES MILLER correspondent has discovered the trade to be in a very fair state, and, in many respects, much more prosperous than other branches of business which are usually supposed to lead in the busy world of mercantile and commercial interests.

The well-known, old establishment, and reliable firm of Detwiler & Walsh, who are located on Market street, near Thirty-first, are in financial trouble, but it is expected that a satisfactory arrangement may be effected with the creditors, so that the establishment will be able to resume the even tenor of its way by the first of January.

The enterprising proprietors of the Harriton Mills (at Bryn Maws, just outside of Philadelphia city limits), Wm. Pyle & Sons, are attracting much attention to their establishment by the extraordinary production they get from ordinary-sized machines.

A local paper says: "The late explosions in flour mills in the Northwest have excited considerable scientific discussion, and the general conclusion reached is that they were caused by the dust taking fire. As such explosions have occurred only within the few years since new processes have been employed in the manufacture of flour, it is now charged by some of those who have given the subject thought and investigation, that they are due to the things, or whatever term may be appropriate, used by the Northwestern millers for the purpose of "bleaching" their flour.

tenced to prison and to pay a fine of £5,000. Would it not be well for those who have been engaged in scientifically investigating the Minneapolis explosions to analyze the flour produced there, and by that means determine this important question? Large quantities of flour come to us from the Northwest, and if, as is intimated, it is drugged, consumers should know it.

MARYLAND LETTER.

BALTIMORE, Md., Dec. 11, 1878.—Maryland and Virginia are celebrated for being two of the largest grain and flour producing States of the Union, and both States rank high in name for the excellence of the flour manufactured within their borders.

The good and profitable results of their business during this season has so inspired the grain-growers and millers with confidence in a still better condition of things in the future, that they contemplate redoubling their efforts upon the advent of the New Year, to secure an increase of their business.

In both Maryland and Virginia are located numerous large producing flour milling establishments, which furnish good and remunerative employment to many industrious and deserving hands. Prominent among these mills may be mentioned the "Patapsco Flouring Mills," of which C. A. Gambritt & Co. are the proprietors.

"The Germania Flour Mills," Myer & Brulle, proprietors, and the "Bridgewater Mills," J. B. Ficklen & Sons, proprietors, are located at Fredericksburg, Virginia. These establishments occupy a high position in the trade for the superiority of their manufactures.

The Haxall Mills, the Haxall-Crenshaw Company, proprietors, and the Gallego Mills, of Richmond, Virginia, are among the celebrated institutions of the "Old Dominion State." Among the standard brands of high medium and low grades of flour produced at the Haxall Mills are: Patent Family, Haxall Family, Crenshaw Family, Rosario Family, Padeiro Extra, Roseneath Extra, Tremont Super, and Orange Mills Super.

-INDIANA MILLERS.

The Indiana State Millers' Association held their regular semi-annual meeting at Indianapolis, Ind., December 12th, 1878. President N. Ellis in the chair, and H. Herbert Emery Secretary.

President Ellis regretted the apathy of millers generally in joining and maintaining the Association; said he had used his utmost endeavors to increase the interest and membership, and felt encouraged at the result and hoped all the members would do their best to make the Association one of the leading ones of the country. In speaking of modern milling he said:

I find that a great many millers are now craving for the so-called new process of grinding, and many are going into it without first thinking what has to be done to profitably carry out the system. From my own experience I find you must either mill in the new style exclusively or follow the old. No half-way will do, for by running your burrs slow and grinding high, for the purpose of making a greater amount of middlings, you are compelled to leave your bran heavy, and by so doing you waste more in your bran than your profit in your flour; and the result naturally will be that at the end of the season's business your profit will be on the wrong side of your ledger. I would recommend to those wishing to make a so-called patent flour that they should consider well before they attempted high grinding when they are not fully prepared to carry it out thoroughly. I find that in order to get the best possible result in making a patent flour with the old system of milling (that is, if you have middlings purifiers) that you must grind close enough to clean your bran, and then make the best you can of your product.

There are many other points in milling that should not be overlooked, as they are also of much importance. The first of all is to be sure and have a steady and uniform speed, for without it you can not have uniform and good work. This being right, see that your burrs are in good, or I might say, perfect balance, but at the same do not forget that they must have a true face and be properly and truly furrowed out. This done, you should have the proper bolting facilities to carry through your work and make both your flour and bran clean.

I would here say that I have blundered for years, and until recently was of the opinion that close and fast grinding was the way to work, but have given up this old fogy idea because convinced by my actual experience that I was wrong, and you will also see it if you give it a sober thought. Let me illustrate: If you grind fast and close you will naturally grind hot, consequently your flour will be depreciated in color and bring less money, and your middlings will be fine; consequently not so easily dusted and will not work over a purifier. On the other hand you give the burrs their proper speed, that is, do not crowd them so as to make them grind hot, and you will then find that you can grind higher, at the same time get your bran clean; your flour will be whiter, of better body, and will sell for more money in the markets. Besides this, your middlings will be better dusted and will naturally work better over your purifiers, and your dust room will not be filled up with what should be in your flour. This may probably not meet the views of every one present, but experience teaches me that it is correct, and I assure you that if you will try it you will agree with me. Another important feature in milling is the cleaning of wheat before it goes to your stock hopper. This matter should not be overlooked, for you certainly can not get a clean, white flour if you do not first clean your wheat.

He then referred to the Cochrane patents, and others, and predicted that the millers would come out victorious in the contest, and concluded by earnestly asking the hearty support of the millers of the State for the Association and its objects.

The report of the Secretary showed an addition of 10 new members. The present membership represents 60 milling firms, representing 240 run of stone, 200 of which are run in connection with purifiers, 25 without, and 15 not heard from. The report then referred to the patent suits, and, in conclusion, Secretary Emery read a portion of Secretary Seaman's report made at the meeting of the Wisconsin Millers in Milwaukee, Dec. 4th. (See proceedings of Wisconsin millers in another column.) The Secretary concluded his report by reminding members that \$5 dues were due all around, as another year had about come to a close.

Insurance, transportation, and inspection matters were informally discussed, and further time extended to committees to prepare reports. Joseph G. Gent, the Chairman of the Committee on Milling Machinery and Methods, then read a carefully prepared paper on that subject. Mr. Gent was warmly praised for his able paper, and the thanks of the Association were voted him for his labor in preparing the article.

In lieu of a report from the Committee on Grain for Milling, Mr. Gibson made a few remarks to the effect that he thought it the peculiar duty of the millers of our State, both for their own and the farmers' benefit, to impress upon the latter the importance of turn-

ing their attention and energies to the cultivation of the bearded red wheats, which experience has shown to be the best adapted variety for this soil and climate, and to this end he recommended that the millers should pay a higher price for this particular variety, and instruct the farmers as much as possible how to bring up their yields to something like the English, and thus get the markets of the world. He stated that there were over 100,000,000 bushels of wheat used annually in England more than they raised, and which our country could and ought to furnish, either in the shape of wheat or flour, from the surplus of our 400,000,000 bushels of annual production. He said the reason we have not heretofore sold flour in England was because we were not manufacturing as good an article as they could make from the same or even inferior wheat by the slower process there in vogue, but now we are sending a great deal, and their merchants and bakers are finding it out. We can manufacture cheaper than they, and all the time, and while our facilities for so doing are constantly becoming better, their's are growing less. He stated that he was refusing to purchase Fulse wheat, but pay more for bearded red wheat, if necessary; however, we can use Fulse wheat, and make money out of it, but only by paying ten cents per bushel less, by properly improving our mills. We can, one and all, make flour of a quality which will enable us to pay an A No. 1 price for such wheat as we require.

Mr. Eglehart thought it well that this Association should recommend farmers to discontinue the use of wire binders; he has experienced a great deal of annoyance and damage from this source, as short pieces of the wire so used frequently pass through his stones and into the bolting chests, where it creates sad havoc with his cloths.

Mr. Ellis stated that he had endeavored to induce the farmers in his section to plant Mediterranean wheat, by selling them Mediterranean seed wheat, and had succeeded in disposing of some 300 bushels in his locality for that purpose.

Mr. Gent moved that a committee of two be appointed to have samples of the different varieties of wheat analyzed; said committee to report at the next meeting of the Association. Motion adopted.

Whereupon the President appointed as such committee Mr. David Gibson and Joseph F. Gent.

Mr. Gent offered the following resolution in relation to the admission of new members:

Whereas, The patent right suits brought against millers of this and other States are now in a manner settled, by being decided against the ring, or by them withdrawn, and the necessity of increasing our membership for the purpose of defending ourselves against this gigantic fraud being thereby removed; therefore be it

Resolved, That a fee of \$100 be charged for membership, in place of \$5 as heretofore, this to go into effect immediately on the assembling of the Association in June next, and that the Secretary be and is hereby instructed to notify all who are in arrears that if such arrearage is not paid by the June meeting their names will be stricken from the roll of membership.

Considerable discussion ensued in regard to the proposed resolution in which Messrs. Iglehart, Gibson, Callendar and others participated, some objections being made, but when the object of the resolution was more fully explained and understood it was unanimously adopted.

Mr. Ellis having directed the attention of the millers present to the recent loss the Association has sustained by the removal from their midst by death of Mr. John J. Brose, one of the original founders of the Association, and who has ever been one of its warmest friends and most active co-workers, several members spoke feelingly of the deceased and their appreciation of his character and worth, and on motion of Mr. Gibson it was resolved that the Chair appoint a committee to draft suitable resolutions of respect and condolence, and that the Secretary forward a copy thereof to the relatives of the deceased.

The Chair appointed as such committee Mr. David Gibson, Chairman, and John A. Thompson and J. R. Callendar.

The committee reported suitable resolutions which were unanimously adopted.

The Treasurer's report showed a balance of \$1,462.45 on hand to apply to balance due on assessments of the National Association. The meeting adjourned to meet at the same place June 19th, 1879.

Gamblers nor infidels hav'n't faith enuff in their professions to teach it to their children.

Whenever yu cum akrost a man who distrusts everyboddy, yu hav found one whom it is safe for everyboddy to distrust.

DOES THE MODERN SYSTEM OF MILLING PAY ?

A Subject that will Bear Considerable Discussion.

[Special correspondence of the UNITED STATES MILLER from Scotland.]

Noticing in your September number the report of the Michigan millers' meeting, I was much interested with the various opinions expressed there as to the best style of milling and at the unsatisfactory answer given to the question: Do you find your profits to correspond with these improvements? This is the clincher—does it pay? and it certainly seemed rather hard for old Twombly to be ridiculed by a contemporary journal for expressing his opinions frankly and honestly, the said journalist seeming to forget that the United States is a very wide country, and a mode of milling which will pay in one district will sometimes not pay in another, and it seems far from settled yet which mode will suit the greatest quantity of wheat produced by the States; although it is evident that the advancing wave of cultivators are raising wheat in the extreme Western States stretching from Manitoba to the far South, which seems eminently suited for the Hungarian or new process of gradual reduction, as one principle rules both, viz., lessening the proportion of bran, which has a risk of being pulverized as the particles are reduced in size; and as shown in your October number, even the most elaborate reduction as carried out in the Pesth Roller Mill shows but a small proportion of the high class flour which has given the Hungarian mode such importance. While circumstances in many of the States forbids the chance of getting an equal price for inferior flour to that obtained where there are large rye-bread consuming populations; while with fair grinding wheat, such as produced by many of the old States, practical experience in Britain proves that the Hungarian cannot compete with the slow or old British mode of grinding for payable results on the whole; and as to having straight or different grades, surrounding circumstances must always have a ruling influence, and in some districts it might even be knocked through at such a rate as to deteriorate the flour and yet pay the miller best from the superior profit on the extra quantity. Now the question occurs, Is the new process in reality more scientific, as is often boasted, than other processes? My opinion is—it is not. It is the same old story. A very simple mode in its origin can be made a very complicated one if you wish it so. The miller of Vienna in old times made the best flour in Europe with hand sieves, and in fact the Hungarian miller of the present day is allowed to be, as a general miller, rather an indifferent one, when he has to contend with the various wheats in British towns. The ancient Egyptians practiced exactly the same mode, gradual reduction in a mortar, now and then sifting out the flour and blowing out the light bran. All the sciences needed careful labor, just as the products of the illiterate cashmere weaver are unsurpassed at the present day by that of the most ingenious loom. And I have not the least doubt that the ancient Egyptian would be forced by a vast expenditure of manual labor to make as good flour for the King's household as any produced by the most elaborately constructed mill of the present day.

What after all is the process that effects the chief improvement? Nothing more than simple sifting either by cloth or wind. All the efforts of science cannot get over the difficulty; the more the regrinding, the more expense for sifting required. The careful slow grinding of the old British could do with a very small separating surface. The Americans with their higher friction rate, commonly used over double the amount, but the Hungarians with their hard wheat far outstrip the Americans, having an amount of cloth that would frighten many British mill masters; and the more regrinding is practiced, the less need to guard against bad or irregular grinding, so that a smaller stone face suffices, which improves the flour, by avoiding polishing which acts so injuriously on its strength. Elevators, conveyors, carrying bands, and other scientific appliances for saving labor, were used long before these new process scientists saw the light. Now it is generally admitted that no man requires a sound scientific education more than the physician, and yet the cleverest of them admits that they are almost useless without practice. How, then, does the experience of the miller with long practice count for nothing in a trade were science, at least science as taught in universities, has effected nothing? I imagine the truth is that the wonders of scientific milling is described by those who know very little of milling or real science. I will now proceed to give the views of an

old miller in regard to some pet theories of the new school, and having no prejudices in favor of one district or process over another, with no particular center of attraction to keep me within a fixed orbit, they will be impartial to any process, and appeal to the judgment influenced by both reason and practice.

[To be continued.]

FIRES AND CASUALTIES.

Dunbar's flouring mill at Comstock, Mich., burned Dec. 28th. Loss, \$8,000. Partially insured.

George West's cotton mill at Ballston, N. Y., was burned Dec. 5th. Loss, \$60,000; insurance \$30,000.

John M. Cole's flour mill at Rochester, Minn., burned on the night of Dec. 21st. Loss, \$40,000. Insurance, \$21,500.

The Santee flouring mills, at Baltimore, owned by Sam'l H. Hazelhurst & Sons, burned on the morning of Dec. 23d. Loss estimated at \$50,000.

On Christmas day the Globe flouring mills and Niagara flouring mills at Black Rock, near Buffalo, N. Y., burned. Loss, \$76,000. Insurance, \$40,000.

The City Flouring Mills at Logansport, Ind., were burned Dec. 4th. Solomon Jones and Robert Ray were owners. The loss is \$15,000, insurance light. Incendiary.

A fire on Dec. 4th, destroyed the Pacific Flour, Grain and Feed Mills, and grain elevator and drier attachment, situated on Columbia street, between Pacific and Amity streets, Brooklyn, N. Y. Loss, \$200,000; insured.

C. C. Comstock's saw-mill in Grand Rapids, Mich., known as "the upper mill," was totally destroyed by fire early on the morning of Dec. 3d, with all of its contents. Loss about \$10,000, on which there was no insurance. It is supposed that the fire was the work of an incendiary.

Valentine Oberley, father of Peter C. Oberley, had one of his arms so badly crushed in the flouring mill of Howard & Davis, at Neenah, Dec. 1st, that amputation at a point between the elbow and shoulder was necessary. Mr. Oberley was head miller of the establishment named. Though 55 years of age, he is of such sound constitution that his friends are hopeful of his recovery from the shock and the effects of the surgical treatment.

A large boiler used at Hayden's Rolling Mill, Columbus, O., exploded Dec. 5th, while a number of workmen were standing around it. The explosion killed Richard Berry, aged 16, his head being blown from his body; Richard Freeman, a boy aged 18, was terribly scalded and bruised, and died in a few moments after being taken from the ruins of the boiler house. William Lewis, aged 17, was badly, and it is feared, fatally injured. George Bell had his head cut open by fragments of the boiler, but may recover. John Trainor was terribly scalded and otherwise badly injured; Mich McCarty, a furnace boy, was also badly injured. The boiler was made of quarter-inch iron and was about thirty feet long, and had been in use for some years. No reason was given for the explosion, and it is claimed there were three gauges of water in it when the explosion occurred. The explosion burst the boiler at the steam drum, tearing the metal in strips. A twenty-foot section was thrown through a frame building, thence across a wide street and through a ten-inch brick wall, and finally struck a large apple-tree and fell in a yard about 300 feet from its starting point. All the mill buildings in the neighborhood of the boiler house are wrecks.

HOW TO MEET A DOG.—A gentleman gives the following advice in relation to dogs: "If," says he, "you enter a lot where there is a vicious dog, be careful to remove your hat or cap as the animal approaches you; hold the same down by your side between yourself and the dog. When you have done this you have secured perfect immunity from an attack. The dog will not bite you if this advice is followed. Such is my faith in this policy that I will pay all doctors' bills from dog bites and funeral expenses for deaths from hydrophobia."

At the marriage of a rich corn merchant of 72 in Southport, Eng., to a woman of 67, the wedding guests were bidden to two taverns, where each received a basin of porridge, a potato pie, a bannock and cheese and a pint of ale. Then both houses were thrown open to them to order what they pleased at the bridegroom's expense.

A man's food is bolted when his wife locks the cupboard door against him.



## TRICKS OF THE GRAIN TRADE.

[Translated from the German from Dr. Herman Kleneke's late work entitled Lexicon der Verfälschungen (Dictionary of Adulteration) for the UNITED STATES MILLER.]

The grain trade is one of the most important branches of the world's traffic, and only those who are thoroughly posted should meddle with it, as the inexperienced run the risk of being defrauded by unscrupulous sellers.

In examining grain the weight is generally and foremostly taken into consideration, and it should not be forgotten that the grain should be entirely dry. Dry, heavy grain gives more flour and less bran than dry, light grain. In order not to be misled by the varying contents of water, that is to avoid taking moist grain for heavy and valuable, the weight of various kinds must be ascertained by experiments in an equal space of time under uniform external influences. The samples must be dried in an equal space of time and temperature after which it is weighed. If the grain is moist, either naturally or if it has been purposely moistened, it first swells and expands and then dries with a wrinkled surface, but occupies a greater space and brings less in proportion, because of its wrinkled and uneven surface. It often happens that grain becomes moist on account of the condition of the atmosphere, through being stored in damp storehouses or elevators, or on account of floods, etc. Should it remain in this condition for any length of time it will ferment and decompose—the flour producing elements will change into germ and sugar—the gluten changes likewise, and the ground grain gives a slimy, loose flour. If such grain is brought into market it is easily detected by its loose and softened bran. Dishonest grain sellers used to moisten their grain the night before market-day, so as to make it swell and measure more, by putting a stick of very soft wood into each sack, by means of which a small quantity of water was fed down and soaked through the grain. If such treatment is suspected, take a handful of it out of the sack, give it a tight grip, then open the hand suddenly. If it has been moistened the grain will stick together ball-shaped and not readily fall apart. It is not necessary that the hand should feel the moisture. Dry grain has the following qualities: though the eye nor the sense of feeling does not discern moisture, it is necessary to observe that the bran lays tightly and smoothly on the kernel—that if dropped on a table a certain ring is heard, and if broken its structure shall be brittle and not tough. If the grain is too dry the gluten cannot be ground out sufficiently, and the flour will be yellowish.

Grain should be entirely ripe in order to produce good and rich flour. If it is not sufficiently ripe the gluten portion predominates, and the flour will be slimy and have an unpleasantly acrid taste. Ripe grain is known from its perfectness in form and through its yellowish color. In damp, cold summers grain grows lightly,—the kernels are small and the straw heavy. Though such grain may lay for a long time to dry it always gives poor flour, and little of it. Grain raised on a rich, fatty soil is not as good as that from a sandy soil or mountainous country, where the soil contains a sufficient quantity of lime and silica. Though the berry may be smaller, its cover is thinner, and it will yield a greater quantity of flour agreeable to the taste. If farmers continuously use manure from pigs and sheep on their grain-fields, the grain will ultimately make very poor flour. Grain loses value by long exposure to the air, and if such exposure has caused the bran to grow darker it is a sign that a certain amount of decomposition has taken place, and that the gluten and sugary portions of the berry have been materially injured. Such grain grinds easily—the flour has a sharp taste, and the necessary fermentation to make good bread will not take place.

Occasionally grain has been found containing copper. Its origin therein was for a long time unknown to the trade, but it was finally discovered that farmers in some portions of the country in order to keep worms away from the grain sprinkled it with a solution of vitrol of copper (blue vitrol). This was found to be in some places a regular custom and readily explained the presence of copper in the flour.

**Wheat** (*Triticum vulgare*).—There are several varieties of wheat, such as common wheat, bearded wheat, spring and winter wheat, hard and soft wheat, etc. It can be raised as far north as 60 degrees, and at altitudes varying from 2,000 to 2,500 feet. In the general European markets only two kinds are generally considered—hard and soft.

**Hard wheat** is hard and brittle, and includes such varieties as Odessa, Polish, Danish, African and Egyptian. The soft or white,

half hard wheat is almost exclusively cultivated in France.

We may say there are seven kinds of wheat:

*Triticum hibernum*—common wheat.

*T. turgidum* (Poutard)—the half hard and soft kind.

*T. alatum*—bearded wheat.

*T. durum*—hard wheat.

*T. polonicum*—semi-transparent and long kernels.

*T. spelta*—spelt or German wheat.

*T. amylenum*—rich in starch.

Wheat contains from 75 to 76 per cent. of gluten, albumen, oily matter, glucose, dextrine and salts. The harder varieties of wheat are richest in gluten and nitrogenous substances, but also generally contain more oily matter, inorganic salts, cellulose, and less starch than the soft varieties.

Ordinary wheat as raised in America, England, Germany, Sweden and Holland, when burned yields from 1.50 to 1.75 per cent. of ashes. French and Egyptian (and other foreign wheats) are often adulterated with other seeds, such as barley, mustard seed, plantain seed, cockle, darkspur, etc. Some wheat looks good at the top of the sack, while that lower down may be of poor quality, which has been slightly oiled so as to give it a good appearance and thus obtain a higher price. The practice of oiling wheat became so common in France at one time that in 1851 a law was passed prohibiting the practice, the violation of which was severely punished. To ascertain if wheat has been oiled, lay some of it between sheets of blotting paper and press it firmly. If it contains oil, yellow spots will appear upon the paper; or shake up a small quantity in ether, and the oil will readily be seen. To make an accurate test of wheat suspected to have been oiled, take a small quantity thereof and place it in a perfectly cleansed vessel and mix with it a little curcuma (turmeric) powder. If the wheat has been oiled the powder will adhere to every grain, will especially fill in the seam and hang on to the beard. If it is not oiled, the powder will remain entirely separate even though the grain is moist. Another very reliable manner of detecting the fraud is as follows: take a very clean vessel; (be sure it is perfectly free of any greasy substance); fill it with pure water; now sprinkle some camphor dust on the surface of the water. The particles of camphor must be so fine as to enable them to float on the surface. Part of this camphor will dissolve in the water and part evaporate. During this a rotary motion of the particles of camphor will ensue, although the glass is kept perfectly still. Now drop in a portion of the suspected grain. If it has been oiled the rotary motion will cease immediately, and the dust will form into little balls floating on the water. If the camphor continues to rotate, the grain can be safely considered free from oil.

Wheat coming from Egypt has frequently a peculiar taste, something like licorice, called in France "Gout de Reglisse." It is caused by the miserable manner of threshing in that country, which is done by treading of oxen. Their excrement becomes mixed in with the straw, and remaining there too long an ammoniaical vapor rises therefrom which penetrates the bran of the wheat kernel and injures its flour.

In buying wheat, observe that if it is entirely ripe, dry and of a bright yellowish color, it is rich in flour. It should be uniform in size and free from all mixture with seeds—without dust, mould, soot or smut, and have a thin skin. The average weight of a hectolitre of good wheat is 150 pounds. The "Wunderkorn" so-called by German farmers (equivalent to No. 1 hard in America), is the best wheat, its kernels being short, thick, roundish, bright yellowish in color, heavy, thin-skinned and rich in flour producing substance. The Polish wheat is very large and is more adapted to a warm climate.

The aforementioned oiling swindle has been extensively practiced in Germany. The process is every simple. A shovel is greased on both sides, and the wheat is worked over with it. The gain for the seller and loss to the uninitiated buyer from this trick is great. Eight ounces of oil worth from 10 to 20 cents is sufficient to oil a ton of wheat. Wheat so prepared is often so deceiving in appearance that the eye of an expert will fail to detect the slightest trace of oil. In buying wheat, the specific weight is generally the standard to go by. A hectolitre (150 pounds measure) of oiled wheat weighs from 5 to 6 pounds more than a hectolitre of unoiled wheat, and will bring about \$6 per ton more than it ought to, which is a handsome profit on the small sum paid for oil and the trouble of mixing. The increase of the specific weight is caused by the smooth-

ness of the surface of the grain, enabling them to lay close together and giving consequently more weight to the measure. It is our duty to call the attention of millers to this fraud, and warn them of the danger of using such wheat. The danger to which a miller's trade is exposed through worthless oiled wheat are manifold.

**Rye** [*secale cereale*]. This specie of grain has been cultivated in Europe from a period at least 200 B. C. Good rye is indicated by kernels of medium size, good length, and should be dry and thoroughly ripe, and of fresh bright color. Take a kernel; bite it in two. It should break easily and show a thin shell. The buyer should note that it is free from straw and foreign seeds, and in measuring or shovelling it a peculiarly sharp and fragrant smelling dust should rise. There is a kind of rye, having a glassy surface, which contains much flour, but it never gets white and is generally very tough. Poor rye is indicated by being dark, tough and of a reddish color, having thick skin or black pointed points. Such rye will make a yellowish flour and not much of it.

Rye sometimes comes into the market that is worm-bitten, germinated, dusty and very light. Let it alone. Rye which has been harvested when wet or that has lain in a damp place too long will have a soft and loose skin, and can almost be hulled by simply gripping it in the hand.

Unripe rye is of a dull color, and is generally soft with a wrinkled skin. It makes poor, weak flour. If rye is good it matters not whether it be summer or winter rye, nor of what particular specie it may be. When floured it will give satisfaction to the consumer.

**Barley** [*Hordeum vulgare*]. This grain is sown either in the spring or fall. Barley grows in the Himalaya Mountains at an altitude of 14,000 feet above sea level. According to Plinius it is the earliest specie of grain known. The ancient Hebrews and Egyptians cultivated it. In buying barley look for a clean article, free from chaff and foreign seeds. The kernels should be of uniform size and weight, and of a bright straw yellow color. The outside of the berry with exception of the edges should have a smooth appearance. The skin should be thin and the inside consist of a tasteless, white, hard, flour-producing substance. Avoid purchasing light, flat, germinated, grey or dirty green, damp, mouldy, wrinkled or worm-bitten barley. It makes worthless yellow flour. Thin shelled barley, large and heavy, is good. Brewers, buying barley for brewing purposes, must be sure to observe that it is thoroughly ripe. If not entirely ripe it will not germinate, and consequently cannot be malted. Barley should not be stored in large quantities. If it is, it will be damaged. The color will change and it will emit a damp, musty odor, and is practically useless for brewing purposes.

## HUNGARIAN SYSTEM OF MILLING.

BY JAMES M'LEAN, AUTHOR OF THE MILLER'S TEXT BOOK.

[Copied by permission.]

This system, which has been tried in various British mills with indifferent success on the whole, seems to have been perfected about Vienna chiefly, the inhabitants of which would appear to be rather epicurean in their tastes, it being almost the only city in Europe where geese livers are selected as a favorite dish, and in their division of flour they show the same fastidiousness, even though it entails enormous labor, as the hand-sifting men seem to have existed there some generations after they had disappeared from Britain. The chief benefits of this system are the removal of the bran from the destructive pulverization of heavy pressure grinding necessary with hard wheats. Californians, Australians, and Hungarians thus differ most widely in their practice; while the two former work with an extreme pressure to save the bran, the latter grinds it down in from four to seven stages, removing the bran each time, thus requiring a much more extensive separating surface. As experience shows, the milder the pressure is applied, the better the flour for baking purposes. The flour of hard wheat, which requires heavy pressure to save the bran, must be better on this account alone; with soft tough wheat, when no crushing on the face is necessary, the average furrow incline is sufficient for the gradual breaking down, therefore no benefit can result to it on this point. With soft wheat, also, the bran is but little injured during a long stone passage, or rather both flour and bran require it; but the stone would be much more efficient if both were separated, as the bran clogs the motion of the flour much

more than the seeds in the sheller. Keeping always in view the adaptability of the wheats for cutting or crushing, the harder they are the more will be splintered off at each crushing, or keeping heat out of view, as some wheats will grind three times faster than others with the same freeness, so will the subdivision of such wheats be three times greater at each crushing, so that with soft tough wheats going beyond two or three grindings will cause enormous labor and expense. Two grindings may be considered to be almost universal in town mills already, as most of them grind their sharps; but certainly some of them might much improve their flour by doubling their stone-feed, keeping always the average crushing power that the experienced grinder knows suits the baker, and if the loss with the bran is too much, it is easily ground over again. Also, what is the benefit of sticking so firmly to clean bran at one grinding, when it and the sharps are so much nearer each other in value than they used to be. The good results to the flour from the high grinding of some wheats was well known and practised occasionally long since when loss of flour was a much more serious affair than now, and when there is danger of shortness the dressing can be finer, more being sent to be ground over again, and the other grinding gives it the finishing touch for handy baking, there being less danger of bran pulverizing if sifting and blowing have been properly used. The advantages of regrinding are thus according to the hardness of the wheat, and likewise as the advantages increase the difficulties decrease.

## ANOTHER EXPLOSION.

The Anchor Mill of Pillsbury & Co., at Minneapolis, Destroyed.

On the evening of the 9th of December, another disaster occurred at Minneapolis, which resulted in the destruction of the Anchor Mill, C. H. Pillsbury & Co., proprietors. About 8 o'clock Nels Munson, one of the millers, discovered that one of elevators which conducts the flour from the lower basement to the middlings purifiers in the upper story of the mill was clogged. He took a lantern and proceeded to the basement for the purpose of removing the obstruction. Arrived in the basement, he took the precaution to place his lantern some fifteen feet removed from the elevator, where the difficulty was, but placed it directly in front of the door opening into the elevator. Removing the obstruction he started the elevator once more, when a great puff of flour dust came out of the open elevator door, reaching to the lantern, when "whiff" and there was an explosion similar to the great one last spring, only smaller and unaccompanied with its disastrous effects. Munson was badly burned about the head, hands and face, but not dangerously. He immediately stopped the mill and he, together with Theo. Barthoff and W. W. Smith immediately turned on the water and tried to put the flames out with the hose. It was no use, however. The flames ran up all the elevators and then the entire interior of the mill was soon on fire. The alarm was immediately sounded and the entire fire department of the city were on the ground with all speed, but with all their efforts it was impossible to stay the flames.

The fire was confined to the mill which was completely destroyed on the inside. The mill was worth \$75,000, and the wheat and flour on hand \$12,000 more. There was an insurance of \$49,000 on the mill and stock, Mr. Pillsbury says the mill will be immediately rebuilt.

A FORMER "CORN KING" IN PENURY.—One of the saddest and most complete financial wrecks of the day is that of the great Sullivant estate in Gibson Co., Ill. The assignee's sale of the personal property took place last Thursday and Friday, the lands having been surrendered to the mortgagees. Everything was disposed of and to-day M. L. Sullivant, the great corn king of the world, is without lands and without a roof to shelter his family he can call his own. Under the enforced sale and foreclosure, we learn, the estate failed to realize enough to pay the indebtedness by \$100,000. The melting away of his once kingly estate is a remarkable example of "how riches take to themselves wings." Mr. Sullivant's farming operations were on the most colossal scale in the country, and his failure only emphasizes the lesson taught by repeated smaller failures on the part of others, that large farms do not pay in this country. It is not likely that farming on the scale carried on by Mr. Sullivant will ever again be attempted in this State, and his magnificent domain of 40,000 acres will doubtless be cut up into numerous small farms. And while we sympathize with Mr. Sullivant in his failure, we cannot but regard this as the best disposition to be made of these fine lands. They will furnish homes for several hundred happy families.—Gibson (Ill.) Courier.

ILLINOIS MILLERS.

Fifth Annual Meeting of the State Association.

Officers Elected—Status of the Patent Suits—Official Reports, Etc.

The fifth annual meeting of the Illinois Millers' State Association was held at Springfield, Ill., December 4th, 1878. The meeting was called to order in one of the Leland parlors at 10:15 a. m., by President D. R. Sparks. Secretary C. H. Seybt was ably assisted by Col. W. L. Barnum, of Chicago.

The following members were present: D. R. Sparks, Alton; C. B. Cole, Chester; James Gordon, Sparta; A. Stubbs, Delevan; Wm. Sears, Rock Island; Wm. Broecker, Springfield; H. G. Fahs, Olney; S. H. Bradley, Mendon; Conrad Eisenmayer, Summerfield; Geo. Postel, Mascoutah; Wm. H. Davis, Glassford; John Schultz, Beardstown; Theodore Reuter, Nashville; W. T. Crow, Cotton Hill; F. W. Brickey, Prairie du Rocher; Wm. Fischer, Red Bud; John Ault, Olney; Benj. Ironmonger, Mason City; E. C. Kreider, Jacksonville; C. H. Seybt, Highland; L. W. McMahon, Griggsville; Nathan Underwood, Dixon; J. B. Eames, Carlyle; J. P. Edwards, Waterloo; E. P. Barker, Sparta; M. J. Adam, Joliet, and a number of visitors.

On motion of Mr. Seybt, the Chair appointed a committee of three to nominate officers for the ensuing year as follows: Messrs. Davis, Brickey and Eisenmayer, who subsequently reported as follows:

President, D. R. Sparks, Alton; Vice-Presidents, James Gordon, Sparta, and B. F. Hill, Paxton; Secretary and Treasurer, C. H. Seybt, Highland; member of Executive Committee, vice Martin Hickox, deceased, Nathan Underwood, Dixon.

The report was unanimously adopted. At the afternoon session Hon. F. N. Judson, of St. Louis, was present by invitation, and fully explained the present status of the famous Cochrane suits, saying that the Millers' Association were fully prepared; that the evidence was all in; and early in February next it is expected that the case will be finally decided. His address was listened to with much interest by all present.

N. C. Gridley, Esq., of Chicago, attorney for the Association, also fully explained the status of the Denchfield claim for a milling device now being prosecuted against the millers of this and other States.

On motion of Secretary Seybt the President appointed Messrs. Halliday, Kreider and Postel, a Committee to examine the report and books of the Secretary and Treasurer, who return the following report:

We, the undersigned committee appointed to examine the report of C. H. Seybt, Secretary and Treasurer of this Association, have to report that after a thorough examination we find that the books and reports are correct and satisfactory in every particular.

A communication was received from the Minnesota Millers' Association condemning the use of wire binders as now used in binding wheat, showing the damage done thereby to the mill-stones, bolting cloth, bran dusters, purifiers and other mill machinery.

The following resolution was adopted almost unanimously, after some debate, several millers giving their experience with wire-bound wheat, showing pieces of wire taken from different machines, found in the wheat, in the burrs, in the chop, in the bolting chests, in the flour, and in the biscuit:

Resolved, That we consider the use of wire binders as injurious to our mill machinery, and that we strongly recommend a discontinuance of the wire binders in favor of cord or other material which will work no damage to our machinery.

When the Association assembled in the evening, Mr. Seybt offered the following resolutions, which were unanimously adopted:

Resolved, That by the death of our esteemed brother miller, Martin Hickox, of Springfield, we have lost one of our most faithful members of the Association, to whose efforts we owe much of the success of its organization.

Resolved, That a copy of these resolutions be furnished to his aged mother.

Col. W. L. Barnum, Secretary of the Millers' National Insurance Company, of Chicago, which is managed by the National Association, and insures only mill property belonging to members, submitted his annual report, as follows:

Gentlemen of the Illinois Millers' State Association: Three years ago you organized what is now the Millers' National Insurance Company of Chicago, and I have the pleasure of submitting the following report showing its financial standing on December 1st, and the good it has accomplished:

Cash on hand and in bank.....\$ 1,625 99 U. S. bonds..... 10,000 00

Table with financial data: Premiums in course of collection 165 00, Assessments in course of collection 16,978 77, Cash on hand and subject to draft \$ 28,770 76, Office furniture and fixtures \$ 408 90, Deposit notes subject to assessment 363,413 83, Total assets \$392,593 49, Unpaid losses None. LIABILITIES None.

The following losses have been sustained by this company and promptly paid from the permanent fund thereof during the year 1878:

March 18, 1878, Fargo, Lord & Co., Grass Lake Mills.....\$4,111 75, March 2, 1878, C. C. Washburn, Minneapolis, Minn..... 2,550 00, May 9, 1878, G. C. Delinger, Pearl Rock, Iowa..... 3,000 00, May 3, 1878, D. A. Burrows, Galena, Ill..... 4,123 90, May 13, 1878, J. H. Walsh & Co., Galena, Ill..... 510 20, June 17, 1878, Pursel, Earl & Co., Schoolcraft, Mich..... 3,657 79, July 30, 1878, A. E. Spalding, Huntley, Ill..... 3,916 00

Amounting in all to \$21,871.64, which includes all losses reported during the year and up to this date.

Amount of losses paid since organization, May 1, 1876, \$6,134.33, and this without litigation, or contesting a single claim.

We have paid all losses and expenses, and accumulated a cash fund of over \$28,000, at an expense of only a trifle over one-half the board rates charged by stock companies.

Our first policies were issued May 1st, 1876, and to this date—31 months—a comparative cost of insurance in the Millers' National and in stock companies for the same amounts, pro rata, is as follows:

On a brick or stone water power mill where stock companies charged 3 per cent a year, its cost has been 1/2 per cent. On a stock rate of 4 per cent, it has cost 1.80 per cent. For a mill rated at 3.50, it has cost our members 2.10 per cent. On a 4 1/2 per cent stock rate, it has cost 2.71 per cent, making a direct saving to our policy holders of \$93,405.95, and in causing the board companies to reduce their rates on the mill property, where this company have risks of at least ten times as much more, or in round numbers, a saving to the whole flouring mill fraternity of this country of fully one million dollars. The success of this company has exceeded our most sanguine expectations, and, with the increased membership, the cost to each is decreasing in the same rate, so that now our annual assessment drafts are only for two-fifths of the old stock rate, being equal to a return dividend of 60 per cent a year. Our policies have increased 200 during the past year, so that now we number 742, representing the best flouring mills in the United States and covering property to an amount which exceeds \$2,000,000, and so scattered that the burning of one mill will not endanger another.

When this Association, Mr. President, first formed this company for their own protection, they builded better than they knew. They have saved in reduced rates of premium, many, many times the expense of organization, and have the satisfaction of knowing that they have a company of their own on so solid a basis that in its ratio of assets to liabilities, which is the only true test of solvency, it stands to-day the peer of any other company in the United States.

The following resolution was then unanimously adopted:

Resolved, That the above full and complete report speaks for itself, and that further recommendations or special laudations are unnecessary.

Mr. Atwood, Secretary of the Illinois Millers' Fire Insurance Association, of Alton, Ill., presented a most satisfactory report of the condition of that organization, showing that it had not sustained a single loss in fourteen months. The following resolution was then unanimously adopted:

Resolved, That we hope the good luck which has so far favored our modest home institution may long continue, and that we have good reason to anticipate favorable results for the future, knowing that the management of it is in proper hands.

Mr. W. J. Adam, of Joliet, and the President, made some interesting remarks, reviewing work of the Association, and comparing its present prosperous condition with that of former years.

After an informal talk on subjects of interest to the fraternity, the meeting adjourned, to meet at Springfield on the first Wednesday of December, 1879.

FOR SALE—A two-run water power merchant flouring mill. For information and particulars, call on or address J. H. HARTWELL, Deputy, Jefferson county, Ind.

MILLING PATENT—To be sold cheap—A fourth share in a valuable Patent in Flour Mill Machinery. Thirty per cent guaranteed. Address PATENTEE, 39 Dryden Road, Edge Lane, Liverpool, Eng.

FOR SALE—A modern two-run steam mill in Western Iowa, on the line of the Chicago, Rock Island & Pacific R. R. New mill with all improvements. Apply to R. J. CORY, Council, Bluffs, Iowa.

FOR SALE—A steam custom and merchant mill, with three run of 3 1/2 foot stone. In good running order, and has a good trade. Will be sold cheap. For particulars, address WM. CROZER, Elizabethtown, Hardin county, Ill.

FOR SALE—Merchant Mill—A valuable steam flouring mill, situated at Claremont, Ill., 125 miles east of St. Louis, on the O. & M. R. R. This mill has six run of stone, capable of making 1,200 barrels of flour per week, together with all modern improvements. Machinery all first-class. Plenty of storage and an abundance of good soft water. Fuel cheap; railroad switch to the mill door. Good cooper shop, with 16 berths. New office in mill yard, platform scales, stock pens, etc. Good dwelling house, etc., with 17 acres of land. Property stands high in New York, Boston and Baltimore markets. For further information, address ROBERT BYERS, Olney, Ill., G. W. BOODY, Vincennes, Ind., or the undersigned, JAS. L. BYERS, Leavenworth, Kan.

FOR SALE OR EXCHANGE.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—A Steam Grist Mill, two run of stone and all other necessary machinery in good order. German neighborhood. Or I will sell a half interest to a Practical Miller. Address JOHN SPINDLER, Jan\* P. O. box 21, Woodland, Barry Co., Mich.

FOR SALE—Two-run Steam Grist Mill, at North Union, Montgomery county, Ind., on L. C. & G. W. R. R. Will sell cheap for cash, or trade for land. Call on or address J. H. ARMANFROUT & CO., Jan\* North Union, Ind.

FOR SALE—A Steam Grist Mill, with two run of stone, a Steam Saw Mill, two Houses, Barn, Shop, and 3 acres of Land, on Lake Shore Railroad, 15 miles from Buffalo, N. Y. Will be sold at a low price to close an estate. Address SELLEW & POPPLE, Jan\* Dunkirk, N. Y.

WANTED—Water Mill Wanted to rent by a first-class miller—a two or three-run water power flouring mill, with privilege of buying. Will pay cash, rent, or give share of profits. Address FRANK A. MAINES, Georgetown, Williamson Co., Texas.

WANTED—To Exchange—Good fresh stock of general merchandise, best location in growing country seat, for a first-class custom flouring mill in a good location for permanent business. Kansas preferred. Give full description and cash valuation. Address W. H. WALLACE, Newton, Jasper Co., Ill.

FOR SALE—Mill Property for Sale or Exchange. A three-run Grist Mill and Saw Mill, all driven by water. Price, \$6,000. Would take part of the purchase price in Iowa, Nebraska or Kansas lands. Address BENJAMIN DEY, Worcester, Otsego Co., N. Y.

FOR SALE OR RENT—Cherokee Mill—A three-burr, 40-horse power, steam flouring mill, with all the modern improvements; situated in a wheat-growing country, with railroad connections and cheap fuel. Terms easy. Address S. ALBERTY & CO., Cherokee, Crawford county, Kan.

FOR SALE—Circular Saw and Grist Mill; bench saw; run of 40 foot stone; large pond; 20 feet head; good house and barn, and four acres of land. Located in West Northfield, Mass., three miles from South Vernon. Would take a good portable engine, 25-horse power, for part pay. Address E. O. FELTON, Jan\* Bernardston, Franklin Co., Mass.

FOR SALE—The best Steam and Gin Mill in Texas; two-run of Burrs, Bolts, Smutter, etc. Two Gins and a Cotton Press; 40 horse-power engine and boiler; Wagon Scales; Good Buildings; Constant Work; Delightful Country. A bargain is offered. Address F. W. CARTER, Iredell, Bosque Co., Texas.

FOR SALE—A Wind-power Grist Mill with 60 foot wheel, three run of stone, cleaning and bolting machinery complete. Located in one of the best wheat-growing sections of Minnesota. Railroad will be built to the place next summer. Will be sold cheap and on easy terms. Address JOHN MANUEL, Eliota, Fillmore Co., Minn.

FOR SALE—Cheap for Cash—A Circular Saw Mill; water-power never failing; all modern improvements; mill in good order; plenty of timber, and good wheat land surrounding. Parties need not apply unless they have at least \$2,700 to invest. Address for further particulars, G. F. BLASHECK, Maiden Rock, Pierce Co., Wis.

FOR SALE—One of the best mill properties in Michigan, consisting of flouring mill with three run of large millstones, saw mill, cooper shop, warehouse, store (with or without goods), light dwelling houses all in good repair, with barns and about 27 acres of land, 100 miles west from Detroit, on the Michigan Central R. R. Address JOHN EVANS, Marengo, Mich.

FOR SALE—One of the best two-run Custom and Merchant Mills in Hancock county, Ill. The mill is situated in the town of Hamilton, Ill., at the east end of wagon bridge leading into Keokuk, Iowa. Decidedly one of the best locations for a Custom Mill in the State. Can now run all the time on custom work, and is new, having been built the present season. Price extremely low. Address S. L. HOBART, Hamilton, Hancock Co., Ill.

FOR SALE—Mill—At a bargain—A first-class mill, cottage with five rooms, 1 1/2 acres of ground, out-buildings, fruit, etc. Mill heavy frame 70x30, four stories high, in good repair and doing a good business. Cost eight years ago \$13,000 to build. On a never failing stream, 12 feet head. Dam kept up by State. Boats land at mill door. Three run of best quality French burrs. Three water wheels. Grocery kept in mill. Terms \$7,000, cash \$2,500, balance on easy time. Write Jan\* J. FRAZIER, at Devol's Dam, Marietta, O.

FOR SALE—Alabama Flour Mill—Two-run Custom and Merchant Mill in Springville, Alabama, complete. Excellent location. Good trade. Splendid climate. Mill close to a perpetual cold spring, furnishing water enough to run 15 or 20 horse-power turbine with 15 foot fall. Mill now uses steam power. Satisfactory reasons given for selling. Terms, \$1,500 down and \$500 in 12 months. Must be closed out soon. For further information address A. J. ABERHOLD, Springville, Ala.

FOR SALE—A 3-story frame Water-power Mill, with two-run of burrs. The machinery is in good order, improved purifier, mill arranged for both merchant and custom mill. The mill property includes barn, sheds and cottage, young orchard, 500 Acres of Land, 100 acres under cultivation, and the rest in hay and wild land. The undivided half of the above will be sold for \$4,000, part down, and the balance on time. Address I. W. DICKINSON, Sabula, Jackson county, Iowa.

FOR SALE—A steam grist and saw mill, located at Morton, Ind., 12 miles northwest of Greenscast, Putnam county. Mill in good running order; 1 wheat and 1 corn run—both in operation at present time, with a good run of custom work. Capacity of saw mill 10,000 feet per day. Timber plenty and of easy access, mostly poplar—with some walnut. For particulars and terms, apply at once to HATHAWAY & HATHAWAY, Greenscast, Putnam county, Ind.

FLOUR MILL WANTED—In Exchange—I have the exclusive right of 20 Counties in the State of Michigan to manufacture and sell ELLIOTT'S IMPROVED or CENTENNIAL HARROW, with \$1,000 worth of Harrows on hand ready for the Spring Market, which I wish to trade for a good Custom Mill. Would be willing to take property with some encumbrances. The Harrow mention is the best one yet manufactured, sells readily as every farmer wants one, and yields a net profit of 200 per cent on cost of manufacture. Being a practical miller I prefer to confine myself to that business. Address J. M. SHACKLETON, Plainwell, Allegan Co., Mich.

FOR SALE—Flour and Saw Mill—One-half interest in a first-class three-run Steam Flour and Saw Mill. The saw mill is a double rotary, with gang edger, cut-off and bolt saws and shingle machine. It has been built but 18 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good country store in connection with mill. Would prefer to sell to a miller or a man that is well posted in store business who can command from \$6,000 to \$7,000, and furnish good reference. I will guarantee good margin to the trade. Address all communications to A. J. FULLERTON, Bondou, Shawano Co., Wis.

SITUATIONS WANTED, ETC.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. (Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis.)

WANTED—By the first of January, 1879, a situation in a good Merchant or Custom Mill. Satisfaction guaranteed or no pay. Address J. B. WOOD, Jan\* Janerville, Chester Co., Pa.

WANTED—A situation by a young man that can grind all kinds of grain, dress the corn burr, and who is a good hand with horses and will work cheap. Address Jan\* J. ELLIS, Earlville, Ill.

WANTED—A miller who is capable of running a Merchant and Custom Mill. Must be a good stone dresser and able to grade flour. Apply, stating terms and giving reference, to R. F. SOADY, Columbus, Miss.

WANTED—A first-class custom miller, one who has made grist grinding a success, and can come recommended as such. To the right man a steady situation either on wages or shares will be given. Address F. DICKSON, Whiteland, Ind.

WANTED—To operate a mill on shares. Young man, 24 years of age, energetic, of steady habits, with best of reference from present employers. Indiana or Ohio preferred. Address B. C. MILLER, Jan\* 280 N. Mississippi St., Indianapolis, Ind.

WANTED—Miller—One who thoroughly understands the German system of High Milling and the New Process American Milling. Address if convenient in the German language. FRED AMENDT, Abbeyville, Medina, Ohio.

WANTED—A situation by a Practical Miller and burr dresser who understands both old and New Process, dressing and balancing burrs a specialty. Any firm in need of a miller will do well to address H. M., Box 139, Storm Lake, Buena Vista Co., Iowa, stating terms. Jan\* 2t

WANTED—A situation by an Engineer. Learned the trade thoroughly in Germany, and am competent to act as Chief Engineer in any miller manufacturing establishment. Situation wanted in the Western States. Best of references given. Address J. SOEDER, Jan\* P. O. box 491, Keokuk, Lee Co., Iowa.

WANTED—A situation as engineer in a large or small mill. Have had 22 years' experience running high-pressure engines of different kinds, and 6 years operating Corliss engines. Can give best of references as to ability and character. Can go any time. Address dec3t J. F. STRAIT, Box 1109, Kalamazoo, Mich.

WANTED—A situation as helper or second miller, by a young man who can grind corn and wheat, and make himself generally useful. Of temperate habits and can give good reference, etc. Correspondence solicited. Address N. P. COTHAN, care of D. B. Williams, Elkton, Ky. Jan\*

WANTED—A situation by a thoroughly practical miller (German). First-class St. Louis reference. Satisfactory reasons given for leaving present situation, where I have been working for the past six years. Address ADOLPH BRENNER, 1913 Jackson St., St. Louis, Mo. Jan\*

WANTED—A situation in a custom or merchant mill, for reasonable wages, by a miller who has had long experience in the business. Can run a mill and take charge of it. Can come immediately, and will guarantee to give satisfaction. Address J. C. WEISS, Princeton, Wis. Jan\*

WANTED—A situation in a Merchant or Exchange Mill by a practical miller and stone dresser who thoroughly understands the new process in both spring and fall wheat. Good references furnished. State terms and capacity. Address J. M. BELL, Jan\* Pittsburg, Iowa.

WANTED—A situation by one who has had a life-long experience in operating and superintending mills. Can come immediately and furnish the best of references if required. New Process preferred. Steady employment must be given or no one need apply. Address Jan\* V. G. HAAG, Ewing, Franklin Co., Ill.

WANTED—A situation in a Merchant or Custom Mill by a young miller of fifteen years' experience. I am a good stone dresser, and understand the New Process. Have worked in some of the best mills in Michigan and Ohio. Would take position of second miller. Would prefer to go to the northern part of Ohio, or to Manitoba. Address M. J., Box 349, Jan\* Springfield, Ohio.

WANTED—A situation by a miller who is competent to take charge of a first-class Merchant Mill. Have had from 25 to 30 years' experience in the business, and can give good reference from first-class city and country mills. Also understand New Process as well as old. A situation in the Western States preferred. Address THOS. GREASLEY, Jan\* corner Ferry and Main Sts., St. Louis, Mo.

WANTED—A situation in a Merchant Mill by a young married man, who is sober and industrious. A practical miller and good stone dresser. Understands both old and New Process. Good reference given if required. A permanent situation desired if satisfactory to all parties, and good work guaranteed. Address Jan\* S. H. BLACKBURN, Box 275, Pittsburg, Ill.

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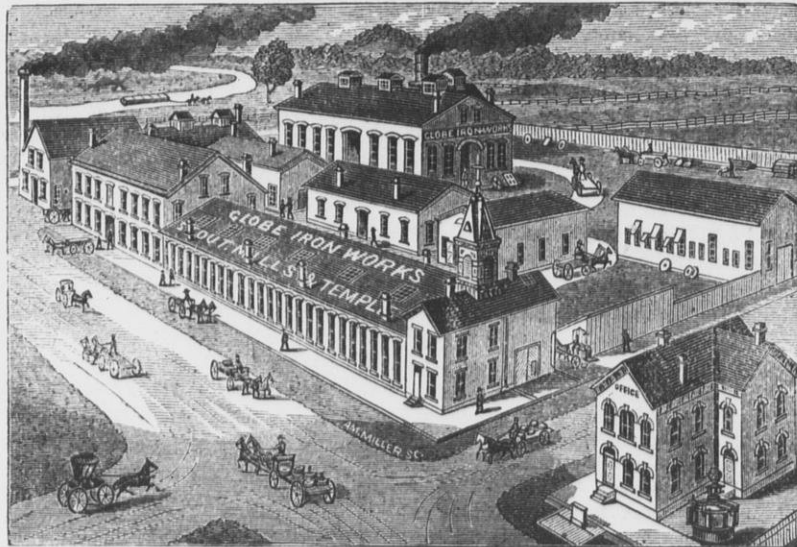
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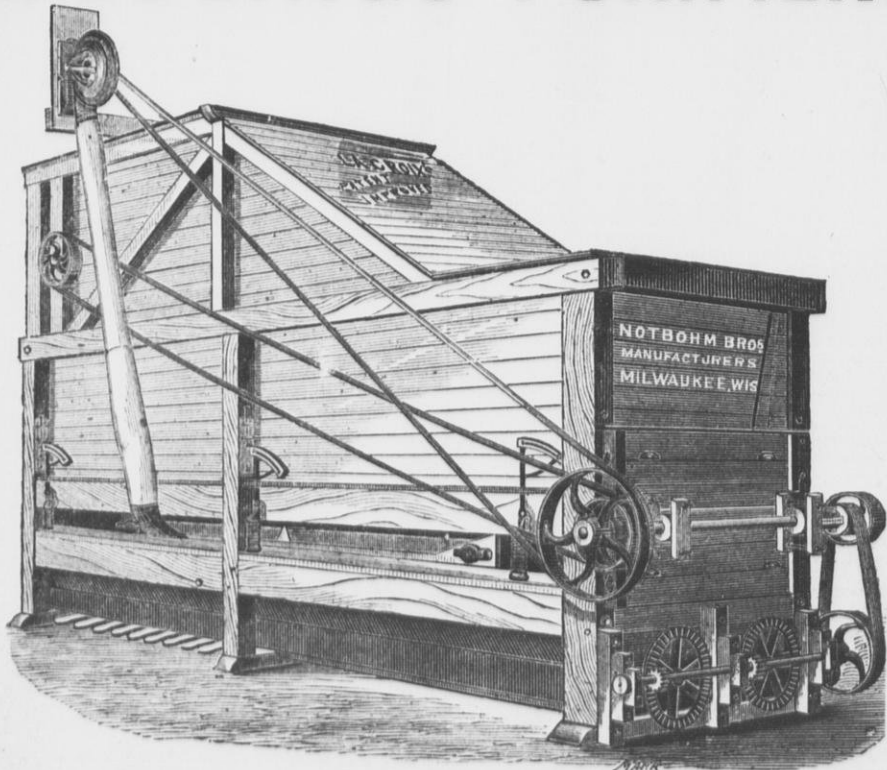
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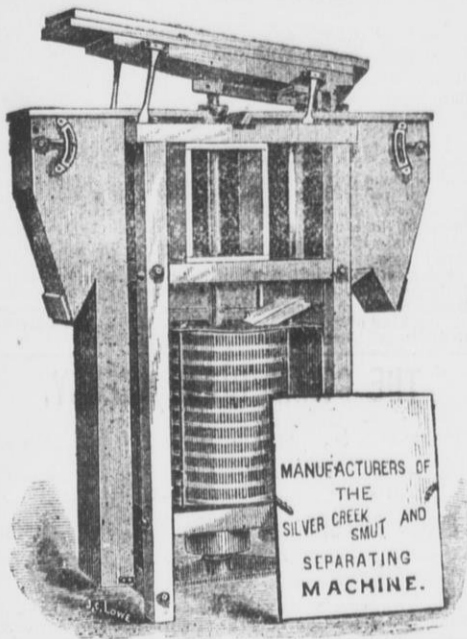
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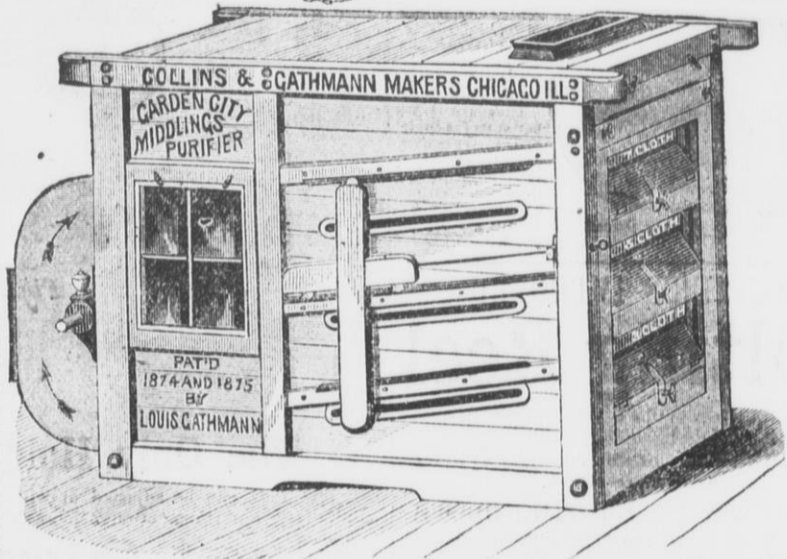
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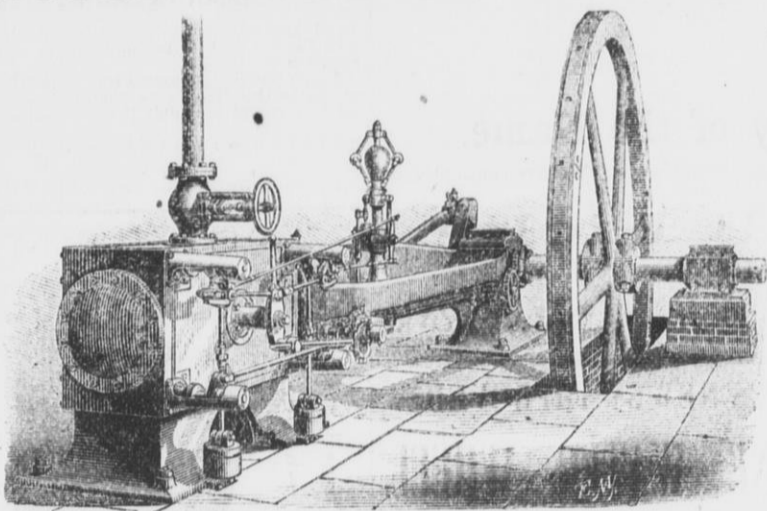
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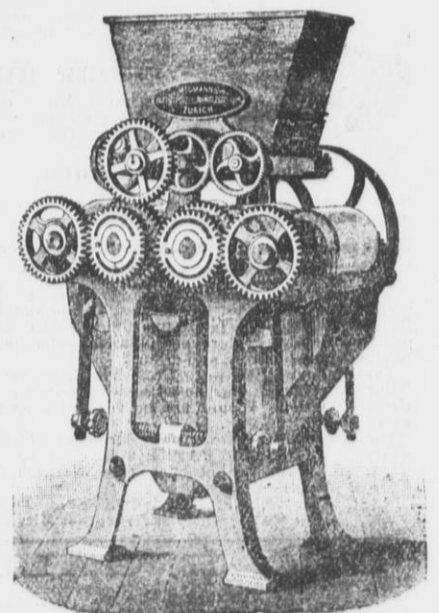
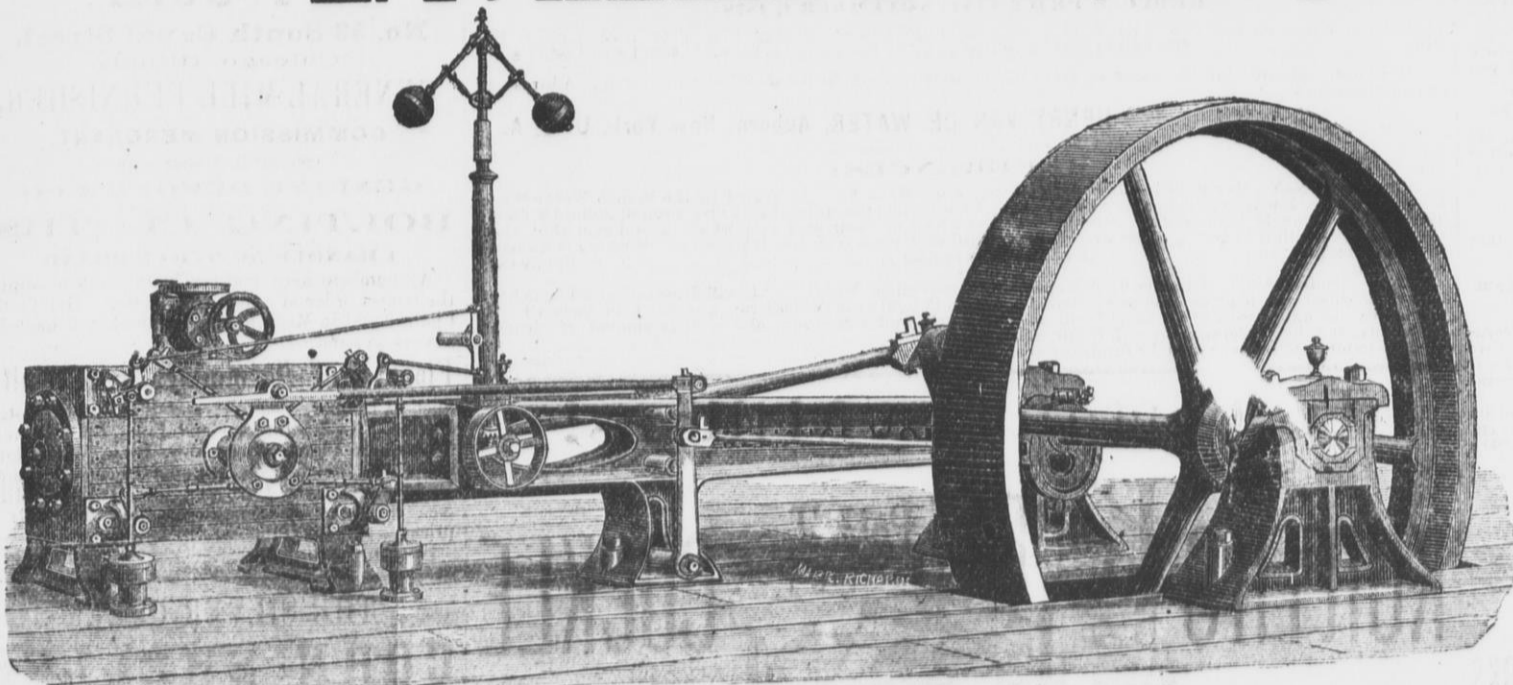
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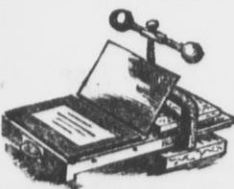
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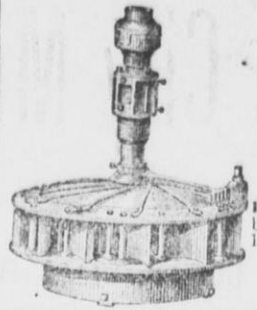


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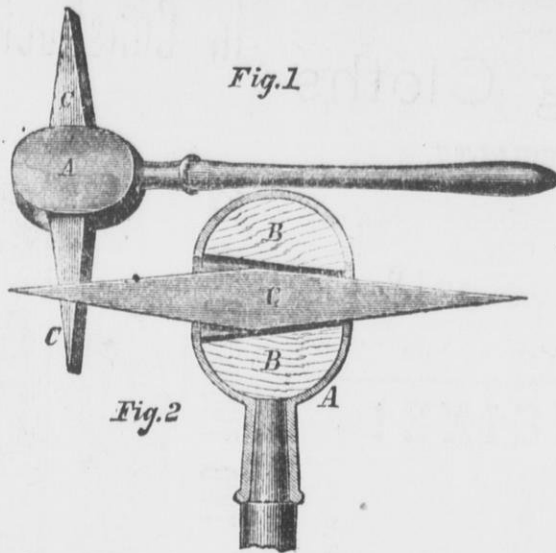
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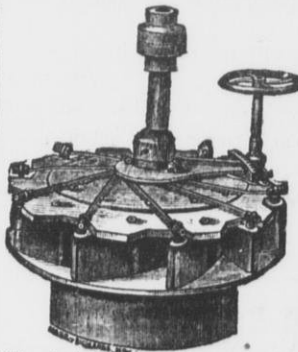
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It is optional with the purchaser to take Wheel tested or not, for the above price from shop. Address all communications to

HENRY VAN DE WATER, Auburn, New York, U. S. A.

### REFERENCES:

ROCHESTER, N. Y., May 28, 1874.—H. Van De Water, Esq.—DEAR SIR: In regard to the 16-inch Water Wheel I bought of you I will say, that under a 28-foot head I am told by the miller that it runs 2-run of stone 4 1/2 feet in diameter, grinding 16 bushels of feed and 10 bushels of wheat per hour, at 1/2 gate, which the old over-shot wheel never could do with that amount of water. I am satisfied that yours is the best Wheel made. Wishing you success I am, yours respectfully, N. S. FULLMAN.

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## GENERAL MILL FURNISHER, COMMISSION MERCHANT,

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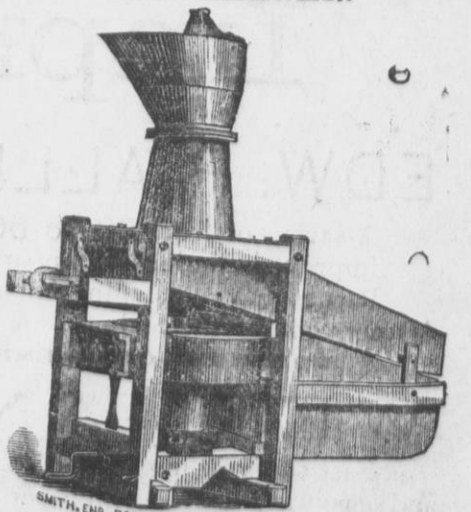
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All numbers kept constantly in stock to supply the largest order at a moment's notice. Grit-Gauze Cloths equal in Mesh to 000 to number 6 inclusive always on hand.

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Such as Rubber, Leather, and Solid Wove Cotton Belting, Elevator Buckets and Bolts, Bran Dusters, Wire Cloth, Plated Wire Cloth, Brass Wire Cloth, Water and Steam Gauges, Boiler Injectors, Pumps, Packing, Smutters, Corn Shellers, Portable Mills, &c., &c. And all necessary articles for Mills at prices to suit the times. Send in your orders.

## THE SILVER CREEK CORN SHELLE and CLEANER.



It is Adjustable while Running. It is Especially Adapted to Millers' Use. It has no Equal in the World.

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# The United States MILLER

Volume 6.—No. 4.

MILWAUKEE, FEBRUARY, 1879.

Terms: \$1.00 a Year in Advance. Single Copies, 10 Cents.

## THE MILWAUKEE MILLING COMPANY'S NEW MILL.

In our January number we congratulated our readers on the fact that the old idea of secrecy in milling was rapidly becoming a relic of the past, and that in this age of progress millers have at last become willing to make public those things which they have discovered by experiment to be of value to the fraternity. After months of correspondence and effort on our part, we were able to secure from the proprietors a complete description with illustrations of both the exterior and interior of the great Pesth Roller Mill in Hungary, which we published in October. This was entirely a new departure for them, as their mill is kept constantly guarded, and no one unless an employe is allowed to go through the mill; much less to publish a description of its interior. This departure from old established customs on the part of our Hungarian friends is exceedingly gratifying, and we doubt not but their generous example will be followed by the owners of model mills in this and other countries, as it is by the Milwaukee Milling Company in this article. It will certainly prove beneficial to all. As anticipated in our January number of the UNITED STATES MILLER we have now the pleasure of presenting to our readers a description illustrated by two views, Fig. 1 representing the outside view, and Fig. 2 a view of the grinding floor of the new mill recently erected in this city by the Milwaukee Milling Company on the corner of Canal and Cherry streets, on the bank of the Milwaukee River, which is navigable to the mill for the largest class of steam and sailing crafts that navigate the great chain of American lakes. The great desideratum in milling is to discover an easier, simpler, cheaper and consequently better method of reducing wheat to flour than by the old system with the old fashioned great cumbersome mill-stone. This has been accomplished by the Milwaukee Milling Company by the use of the Jonathan Mills' patent grinding mills, in which the under stone is the runner and is held rigidly to the spindle. These mills are manufactured solely by the Milwaukee Middlings Millstone Company of this city. In other respects it is very similar to other modern built new process flour mills. Jonathan Mills has long maintained the theory that small stones with more perfect construction would produce better results than the ordinary four-foot stone, and in the early part of 1876 commenced a series of experiments to ascertain what the proper size of a millstone should be. His first experiment was with a finely-built 5½ inch rigid under-runner. The result was so gratifying that no difficulty was found in organizing a stock company with ample capital to carry on the experiments to perfection. This having been accomplished, the Milwaukee Milling Company has constructed the mill here illustrated.

The mill is a handsome and substantial five story brick structure, 50 feet wide by 60 long, surmounted by a cupola 12 feet wide, 40 long and 10 high. The annex for engine and boiler is located on the north side of the mill building proper, and 30 feet wide by 60 long with a brick chimney 100 feet high. Both water and steam power is used. The engine is an improved Corliss with 20 x 48 inch cylinder with condenser, and the steam is furnished by two 64-inch boilers 16 feet in length, having 39 four-inch flues and a steam dome extending across them.

The line shaft is driven by the engine from an 18-foot band fly wheel weighing 9 tons and

carrying a 24-inch belt to a 77-inch pulley. All of the 33 mills and 4 sets of chilled iron rolls are driven from this line shaft. The rest of the machinery is driven from the engine shaft and an upright shaft geared from the engine shaft.

The basement 40 x 60 and 13 feet 7 inches in height contains the wheat cleaning machinery, consisting of oat separator, smutter and wheat brush machines.

The grinding floor presents a scene of great interest to the visitor. There are thirty-three run of finely built and handsomely finished grinding mills set in three rows, two of which extend clear across one end of the mill from wall to wall, as closely as they can be set to each other, all running as regularly and quietly as so many clocks,—each one doing quite as much work as a 4-foot stone; turning out 400 barrels of flour per day, and could as easily

twelve middlings purifiers, of Smith Bros. make, all large size, being 12 feet in length, and using cloth 40 inches wide. Three of these purifiers are on the first floor above the grinding floor, four on the second and five on the fourth floor.

The grinding mills were made by the Milwaukee Middlings Millstone Company, who are the owners and sole manufacturers of the patent for the United States and Europe. Four pair of chilled iron rolls, 12 by 24 inches, are all built in one strong wooden frame. These rolls were all manufactured, ironed and mounted by Filer, Stowell & Co., who also manufactured all the other machinery of the mill. The stock hoppers for wheat, also the middlings bins, are on the second floor. The wheat storage bins also start from the ground floor and extend up through the two next floors.

On the third floor are located two chests of

floor showing the grinding mills, the manner of driving them by reel belts, location of packers, etc. Throughout the mill the modern appliances for successful milling have been everywhere introduced, and this model institution will surely attract the attention of progressive millers throughout the country. Geo. Smith, of the firm of Smith Bros., the well-known Milwaukee millwrights, planned and superintended the millwright work, and it is a credit to his ability as a millwright. William Kuecker is the head miller.

The mill has now been running over two months, and gives entire satisfaction. The flour sells readily as fast as made at the highest market prices. These results, considering the starting up of an entirely new mill, are really wonderful.

The Milwaukee Milling Company are so well satisfied with the operation of these patent grinding mills, manufactured by the Milwaukee Middlings Millstone Co., that they are already having plans drawn with a view to the early construction of an addition to their mill, which will more than double it in size and in number of runs of stone. It appears to be now a settled fact that the use of these small stones in the manufacture of flour is a great improvement on the old-fashioned large stone. It is claimed that these mills will produce a greater quantity of middlings and consequently of high grade flour from the same grade of wheat more quickly and by a less expenditure of power than by any process yet tried. The mills require little attendance, and are not liable to get out of order. The proprietors of this mill cordially invite mill-owners visiting this city to visit their mill and we doubt not but many will avail themselves of their invitation.

The *Bakers' Record* (London), in its annual review, says: "Side by side of the baking trade, the millers have made a determined effort to amend their condition, which, of the two, is worse than the bakers. They had succeeded in forming a Central Association, and likewise several provincial branches, but their first official document proved a very crude affair, and soon came to grief. Still there is no reason why they should be disheartened. They made a false step by thinking too much of their own interest and too little of the bakers'. A little sober thought, however, will soon rectify the blunder, and if they confer with those who must be a party to the development of any grand measure of reform for the mutual protection of the two sections of the trade, we may expect something of greater promise. It is much to know the millers are casting aside those jealous feelings they have hitherto entertained towards each other, and more to think the time is not far distant when the combined intelligence of a wealthy class of commercial men will devise some common plan of action, which shall be both prudent and practicable. The Weights and Measures Act has been most minutely reviewed by the millers, and it appears to be their desire to amend the present measure; but, on the other hand, the bakers seem quite satisfied with the present standard, and are inclined to think that an alteration would cause much inconvenience. Whether an interchange of opinions upon this subject between the millers and bakers would lead to a mutual arrangement, we are not in a position to say—it is enough for us to perceive the spirit of inquiry is aroused and, when once investigation proceeds upon her task, we need not fear that some work of utility will be the result."

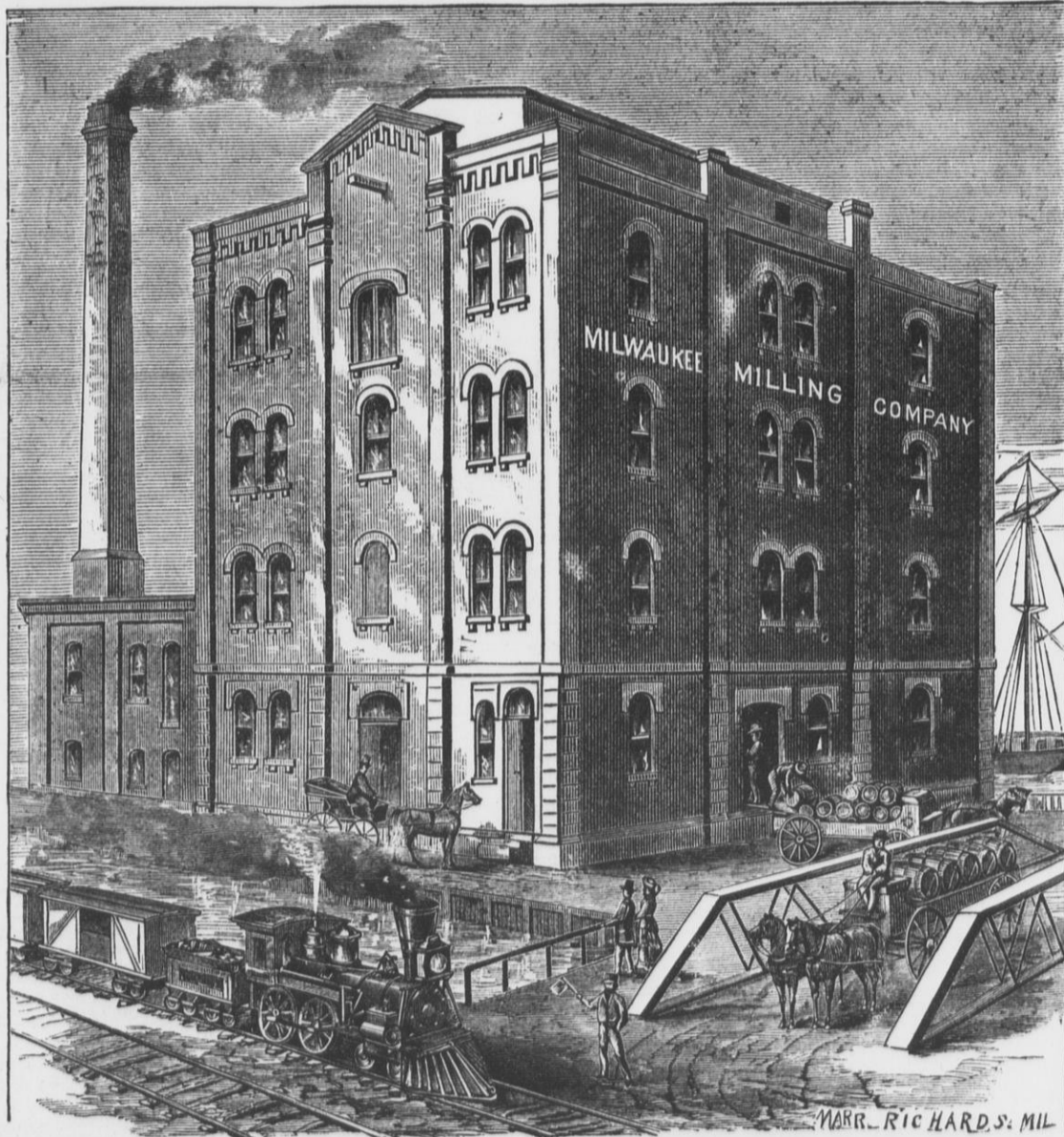


FIG. 1. MILWAUKEE MILLING COMPANY'S MILL, MILWAUKEE, WIS.

turn out 450 to 500 if they had sufficient bolting and purifier capacity. There are four packers on this floor, one for bran and the remaining three are flour packers. A very important fine feature in the mill is the fact that no low grades of flour are produced,—making but two grades: a very large percentage of a choice patent and a straight extra grade, coming up to the highest standard in all the markets. No red dog flour is made in the mill.

Here are also suitable scales for weighing flour and receiving scales for weighing wheat from wagons.

As above stated, the mill contains 33 of Jonathan Mills' small grinding mills, with rigid under-runners. Twenty-two of these have stones 16 inches in diameter. All the wheat is passed through steam heaters and ground on fifteen of the 16-inch mills. Two 16-inch mills grind the shipstuff, and five 16-inch mills grind middlings, as also do five of the 20-inch mills. Three of the 24-inch mills are used in grinding bran, two grind middlings, and one grinds shipstuff. There are

bolts with 8 reels, each 18 feet long which pass up and extend through the fourth floor. The bran middlings and wheat storage bins extend up through the third floor. There is one bran duster on the third floor. The fourth floor has one large receiving separator. The two light reeled bolting chests are on this floor. The cupola is hopped off to a long conveyor and is used as a dust room for all the 12 purifiers to blow into. The conveyor under the cupola conveys all the dustings therein gathered out and empties them into a reel on the fourth floor, where they are bolted and disposed of. There is also a short reel on the fourth floor 7 feet long and 32 inches in diameter, covered with wire cloth. This reel handles the bran from the bran duster, separating the shorts from the bran. From this reel the bran goes direct to the bran bin over the bran packer.

There are 16 elevators in the mill, nearly all of which are placed near the walls so as to prevent as few obstructions as possible. The reader can gain almost a perfect idea by looking at the cut illustrating the grinding

## UNITED STATES MILLER.

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MILWAUKEE, FEBRUARY, 1879.

**THE UNITED STATES MILLER has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill furnishing establishment.**

**AN INVITATION.**—We cordially invite all millers, millwrights, millfurnishers and inventors of milling machinery to call on the UNITED STATES MILLER when visiting this city.

## IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. To those who will send us One Dollar in thirty days from date of this notice we will send THE UNITED STATES MILLER from Feb. 1st, 1879, to May 1st, 1880. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address  
THE UNITED STATES MILLER,  
Feb. 1st, 1879. Milwaukee, Wis.

We have received a copy of *The Farm*, an agricultural paper published by Messrs. Thos. M'Kenzie & Sons, of Dublin, Ireland. We cordially welcome it to our exchange table.

We recently received the first number of the new French milling journal *Le Meunier*, published in Paris by L. Vigreux, civil engineer, 16 Rue de Birague. The subscription price to subscribers in this country is 15 francs post paid. This new journal presents many commendable features and it has a good field to work in. We wish Monsieur L. Vigreux and his new journal success.

MESSRS. HERZER BROS., the well-known mill pick manufacturers of Milwaukee, inform us that "a party by the name of Brown" is traveling around through Wisconsin representing himself to be connected with their firm, and is taking orders for sharpening mill picks. He was last heard from at Arkdale, Wis. Messrs. Herzer Bros. have no traveling agents out. Their advertisement can always be found in the columns of this and other reliable milling journals, and their work is well-known to be first-class. Millers are requested to be on their guard.

THE Edw. P. Allis Company are now building a 28 x 60 improved Corliss engine for the St. Louis cotton mills, also a 20-inch cylinder and regulator for the Springfield, Mo., cotton mills, where they guarantee a saving of 33½ per cent of fuel. They are also building a 28-inch cylinder for the Reliance Mills of Milwaukee, and a 40-horse power engine for the *Evening Wisconsin* new building. They have also closed a contract for the new 20-run mill of E. V. White & Co., at Minneapolis, Minn., and have sold over fifty roller mills during the month of January.

IN this number we commenced the publication with illustrations of a very interesting article on grain and its manufactured products. This article has been translated for us from the German with the personal permission of the author, Dr. Herman Klencke, of Hanover, Germany, a very distinguished authority. Our readers should preserve files of these papers for future reference. It will be to the interests of all our readers to keep their subscriptions paid up so as not to miss any numbers, as we will not promise to supply back numbers. Those not already subscribers will do well to begin at once.

## LEGAL NOTES.

Several suits for alleged infringement of the patent rights of the Birdsell Clover Huller and Separator Company, of Fort Wayne, Ind., have been brought in the United States Court in Milwaukee, Wis., and will be tried during the present term. Testimony will be taken before

Edward Kurtz, Master of Chancery, to whom the suits have been referred for that purpose, on Wednesday, the 15th of January. Bills in equity were served on a large number of defendants in Calumet, Fond du Lac and Green Lake counties. The complaints apply for injunctions against the use of the machine claimed by the Birdsell Company to be an infringement on their own.

THE celebrated Woodbury planing machine patent case was brought to a conclusion in the United States Court in Boston January 28th. The Court held that the patent could not be sustained. This case has been in litigation for 30 years. The patent covered nearly all the planing machines in the United States, valued at from thirty to forty million dollars.

## THE COCHRANE CASE.

## Will There Be a Compromise?

The case of the American Middlings Purifier Co. vs. the Empire Milling Co. and other St. Louis millers is set for hearing on February 10th, at St. Louis. Some of the members of the committee of the National Association who have the defense in hand declare that in view of the fact that such a large proportion of the millers have held aloof from joining its association and aiding to carry on the defense, that they are willing to make a compromise. They are tired of the fellows that have been sitting on the fence so long. For this reason alone they may be willing to effect a compromise for members of the association which they could have undoubtedly done a long time ago if they had wanted to on the most favorable terms. Of course, if a compromise is made, the testimony which the association has spent so much time and money in preparing would be turned over to be locked up or used by the prosecution. From the foregoing views expressed warmly and openly to us by a member of the committee, it looks to us as if millers who have not joined the association before February 10th will have to, as the saying is, "either fish, or cut bait."

## SHALL OUR MILLERS MAKE ADULTURATED FLOUR?

Some time since an article was published in this journal, written by Dr. Henry A. Mott, an eminent New York chemist, declaring many of the baking powders used in this country to be injurious to the health of consumers, more especially for the reason that they contained a large percentage of alum. Dr. Mott mentioned the name of one baking powder which he claimed to be pure, and gave the component parts of others which he claimed to be injurious. Of course this startled the baking powder manufacturing companies all over the country, and they each have been endeavoring to show that their powders were not injurious. Their position is maintained by the statements of Mr. Henry Pemberton, another eminent chemist.

The four baking powders singled out as being especially deleterious, upon analysis were found to be composed nearly altogether of burnt alum, bicarbonate of soda and starch. The alum and bicarbonate of soda are the active ingredients, and are present in nearly equal quantities. The combination, according to Mr. Pemberton, produces a reaction, during the process of baking, that completely neutralizes two substances, so far as harmful properties are concerned, alum and soda, as such, being removed, and replaced by "carbonic acid gas, sulphate of soda, and precipitated and insoluble ammonia." Mr. Pemberton's views are fortified by results of actual experiments made by Dr. Doremus, of Bellevue Hospital, New York, who states that in biscuits made with a baking powder containing 26.45 per cent. of alum, he failed to find any trace of alum or other deleterious substance.

After referring to the foregoing conflicting views of eminent chemists on the subject, the *American Miller* says: "The statements of Mr. Pemberton and Dr. Doremus place the use of alum in a new light. If, when used in about equal quantities with bicarbonate of soda, the alum is rendered harmless, and the two substances are entirely neutralized, there is no good reason why millers should not use the two substances, when they can do so with advantage. We shall always advise millers to rely on good milling to produce good flour. But sometimes it is difficult for the miller to produce a white flour, and a fastidious public is very exacting on that point. Under such circumstances there could be no harm in enhancing the color by a little harmless bleaching, by means of alum and bicarbonate of soda."

We are decidedly opposed under any consideration to adulterating flour under any pretext whatever. No honest miller, we think, can consistently mix alum and carbonate of soda with his flour. It is, to say the least, adulteration, and mixing chalk, gypsum and other base stuffs with flour can be called by no

harsher name. Millers must furnish pure unadulterated flour. If the consumers want to adulterate it with any substance, they can do so easily enough, and those that want pure bread unadulterated can have it. We confess surprise that our Chicago contemporary should under any circumstances recommend millers to turn on the market adulterated flour. Already the newspapers are teeming with accounts of adulterations in sugars, syrups, candy, coffee, tea, and a thousand other articles. If we can stand all these, perhaps we might stand a little adulterated flour, but if possible, we prefer to be excused.

## DOES THE MODERN SYSTEM OF MILLING PAY?

A Subject that will Bear Considerable Discussion.

[Special correspondence of the United States Miller from Scotland.]

One of the most common terms used in relation to the new process is the word granulating. As to the origination of the term they appear to think that gradual reduction causes an improvement in the baking qualities of the flour, by being less destructive on the natural granules of the kernel, which shows their limited acquaintance with milling, although boasted of as a scientific idea. Experience shows that this supposition has no influence whatever; thus soft tough wheat, which requires the cutting quality well developed to make it good working flour, is totally spoiled by rollers or a slow blunt stone for good baking qualities, except kept a long time afterwards. This injurious compression cannot be avoided except the speed or keenness of edge is such as to chip the particles off with a mild pressure. As illustrated in an extreme degree by a cannon ball carrying a man's head off without affecting the body much, surely the integrity of the granules cannot be respected in this instance. Take the opposite extreme again, grinding weak hard: Experience shows that quite an opposite course is necessary; it is hard and brittle, and attempting to cut it would cause a heavy proportion of dust, from the violent contact with an article too hard to cut, except with such a high friction rate that the bran would be badly cut up. Now, say it was crushed only so small as to make very sharp flour,—what is the baker's experience with such? He has the greatest difficulty in getting it to adhere, and in spite of all he can do it makes short, harsh, badly-raised bread; the particles break off with a clean, glassy splinter, causing bad color and bad adherence. Now, the smaller you break an article the less it inclines to make a clean splinter, till once a stage is arrived at that the splintering or tearing asunder assumes more of a bursting character, causing rough, irregular white surfaces, from the numerous small projections or torn-out filaments from the extra crushing required to disintegrate it. In this state it is an easy working flour with the baker. It needs little pounding to make the rough edges adhere; in fact, too much pounding spoils it, the tender, torn-out filaments or projections being readily torn away from the particles by too much pounding; carefully dealt with, the exceeding smallness of the particles make a fine white, tender, delicate loaf. Can the granules be saved any by this minute tearing asunder beyond the clean splintering process? Most assuredly not. Again, some of the granulating theorists talk of the bran being rolled off the wheat. What is the miller's experience in reality? Quite the opposite. Any machines that can skin wheat are extremely destructive to the bran, as it needs friction surfaces at a destructive speed, or excessive rough surfaces or sharp edges to save pressure flouring the kernel. In fact, the miller's main object has been entirely mistaken by them. They seem to assume that it is the bran that has to be taken off the kernel so as to get them ground separate. Now, the miller's main object and difficulty is to get the flour detached from the bran. He knows the bran is always tougher than the kernel, and his object is always to keep on the borders of injurious pressure or crushing to avoid cutting the bran as much as possible. In short, he either crushes the flour entirely off by pure crushing, as some few Hungarian millers do, or, as nearly all millers do, he varies the cutting and grinding power so that the flour is torn off between the application of those two modes; and if some of the large flakes have the appearance of being rolled off, they are not so; it is simply the flour crushed, torn, or cut off; the bran being in all cases much the toughest, must be the largest.

[To be continued.]

## PENNSYLVANIA MILLERS.

## Third Semi-Annual Meeting.

The Pennsylvania State Millers' Association held their third semi-annual meeting January 12th, at the Stevens House, Lancaster. The meeting was called to order by President Chas. A. Miner, of Wilkesbarre. About 100 representatives of milling firms were present. Secretary A. Z. Schoch, of Selinsgrove, made his report, showing that 26 new members had been added since last meeting, making a total membership to date of 56. He deplored the apathy of millers in regard to joining the association; it was certainly to their interest to do so. Pennsylvania having more flour mills than any other State, should have the largest association. He thought that the prevalence of the opinion that the purposes of the association was solely for defense against patent right extortions was the cause of mil-

lers holding back. This he considered but a small portion of the uses of an association. He recommended that the association should pay the requisite admission fee and join the Millers' National Association. Thirty new members joined during the sitting of the association.

The Committee on Patents in their report also advised joining the National Association, and earnest efforts to increase the membership of their State Association. H. B. Horton of the Millers' National Insurance Company appeared and read a report of the condition of the company, which was endorsed by the Secretary. Mr. Thomas Wright, Chairman of the Committee on Mill Machinery and Processes, read his report, in which he stated that a machine capable of weighing and measuring grain in the running stream would be desirable if not complicated and costly, and desired inventors to give their attention to this matter. He said that American grain cleaning machinery surpassed all others, making special mention of the cleaning machines manufactured by Howes, Babcock & Co., of Silver Creek, N. Y.; Geo. W. McNeil & Sons, of Akron, Ohio, and others. He also recommended the Caldwell & Watson conveyor as possessing great merit. He said Pennsylvania millers generally used too much face and too little furrow surface on their burrs. The utmost care should be taken to keep the furrows and face perfectly smooth, and yet preserve the natural grit of the burrs. He advised the use of the corundum or emery wheel for this purpose. For keeping the face perfectly true he recommended the use of a metal staff; advised also the use of rolls. He said that the time was not far distant when every miller would be obliged to use purifiers. The bolting apparatus should be so arranged that the product of each operation could be treated separately if desirable. In conclusion, he asked millers to make reports in writing at the next meeting of the processes and machinery in use in their mills.

Jacob Walters moved that the members of the association using middlings purifiers subscribe and pay \$10 per run to the National Association as an admission fee to that body. Carried. Fifty-two members present using purifiers answered to their names when the roll was called, and others signified their intention of paying if the National Association accepted their proposition. After considerable discussion the following resolution was passed:

Resolved, That this society will discourage the growing of Fultz and Clawson wheat. For milling purposes they are not desirable, and have been the cause of much of the complaint of our flour. We suggest Lancaster, old Mediterranean, Boughton, Shoemaker, Deal, Vick and Canada White be grown in preference.

In the course of the arguments on above resolution, A. C. Freck, of Millersburg, said that he had no difficulty in making good flour from Fultz wheat. He passed it through a Gratiot Heater, heating it to 98 degrees summer and winter before grinding. The moisture was thus taken out and light, clean, broad bran was taken out. He thought the Gratiot heater was the advantage which he and others had over those who did not use it. An election of officers was held and the present incumbents re-elected. The Secretary was voted \$100 yearly salary. Several gentlemen being present representing patented machinery were invited to exhibit and explain it, which they did. The meeting adjourned to meet again July 8th, 1879.

[The foregoing is a synopsis of the proceedings which is all that we are able to give on account of space. The report was delayed in coming to hand, and only reached us on the eve of going to press.]

## GRATIOT'S WHEAT HEATER.

The following letter explains itself:  
MINNEAPOLIS, Minn., Jan. 14th, 1879.—  
Messrs. Gratiot Bros., Platteville, Wis.—  
Gentlemen: We are conversant with the different kinds of steam wheat heaters on the market, and have no hesitancy in pronouncing yours the most simple, inexpensive and effective of any. Of late we tried a heater which seemed to promise some advantage over yours, but its use proved its uselessness, and yours had to be substituted. We cheerfully recommend your wheat heater to the public. Yours truly,  
J. A. CHRISTIAN & Co.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or misarrangement, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

NOTICE.—The milling public are hereby notified that we have discontinued all suits against Messrs. E. P. Allis & Co., for infringements of patents on the Cackle Separator, manufactured by us, and the said firm of E. P. Allis & Co. will hereafter sell our machines on same terms as other mill furnishers, or the undersigned.  
COCKLE SEPARATOR MFG CO.  
Milwaukee, Dec. 27th, 1878.

MILL PICK WORKS OF HENRY HERZER, No. 456 Canal street, Milwaukee, Wis.—To the Milling Public: Having this day dissolved partnership with the firm of H. & J. Herzer, I hereby respectfully announce that I have removed to No. 456 Canal street, where I am ready to receive orders for manufacturing and repairing mill picks, tools and all specialties in my line. My work is well-known through the country, and I do not hesitate to guarantee perfect satisfaction to all parties favoring me with their orders. Address  
HENRY HERZER, No. 456 Canal street, Milwaukee, Wis.

OUR NEW JERSEY LETTER.

**Milling Down in Jersey—Probability of a New Jersey Millers' Association—Important Mills—New Elevators Being Built—Prospect of the Trade, etc.**

[Special Correspondence United States Miller.]

BURLINGTON, New Jersey, Jan. 13th, 1879.  
—The State of New Jersey, while being much smaller in dimensions than the two adjacent States, Pennsylvania and New York, is not very far behind her large sister States in the production of flour-making grains, and in the manufacture of flour itself. The principal wheat-raising sections of New Jersey are in Camden, Gloucester, Salem, Cumberland, Atlantic, Monmouth, Mercer, Burlington, Middlesex, Somerset, Union, Hunterdon, Warren, Sussex, Essex, Morris, Passaic and Hudson counties, while Mercer, Burlington, Camden, Somerset, Warren, Morris, Essex and Union counties is where the greatest portion of the flour that is produced in the State is manufactured, but hardly a county in the whole commonwealth has within its boundaries more or less extensively producing flour mills.

The flour manufacturing establishments of New Jersey have not, as yet, done much in the way of sending flour to the markets of the outside world, the millers contenting themselves with the small and sure profits that are always obtainable for a local trade in Jersey towns, but it is understood that several enterprising and wealthy Essex county millers contemplate the manufacture of "the staff of life" in immense quantities, with the object of exporting their product next spring or summer.

The Burlington, Trenton, New Brunswick,

manufacture of "Trenton crackers," which are celebrated all over the world for their excellence. Much flour from other parts of the country is likewise consumed in the manufacture of crackers. The Trenton flour mills, situated on the romantic and historical Assanpink Creek, are propelled by water power and old style machinery, but the spirit of enterprise is getting to be gradually infused into the milling business, and, estimating from current reports, THE UNITED STATES MILLER correspondent would not be the least bit surprised to learn of some wonderful revolutions in the processes employed in the manufacture of flour, and the method of handling and marketing it in Trenton, in the early future. If there was the same interest manifested in the making of "the staff of life," as there is in that of pottery, the great manufacturing municipality of Trenton would be one of the leading flour centers of the country.

While there is a want of activity among the flour factors, the railroad companies, whose lines of railroad gridiron the very heart of the grain-growing sections of the State, are busily engaged in the erection of grain elevators for the easy and rapid manipulation of the vast quantities of wheat, rye, oats and corn that is shipped on their lines, and which has to be changed to other methods of transportation upon its arrival at the docks of the companies at Jersey City, on the North River. Besides the floating elevators, the Starin Company has several great elevators of large capacity. The Pennsylvania railroad, the Delaware, Lackawanna & Western railroad, the New York Central railroad and Hudson River railroad all

back, but just what was needed, or what to do, to bring about the successful accomplishment of their idea, does not seem to have been thought of or mapped out in the minds of the slow-moving projectors. It has been left to a new comer, in the upper part of the State, to suggest the establishing of a Millers' Association similar to those that have existence in all the principal flour milling districts of the country. The suggestion appears to have been received with much favor by the leading millers of the State, and THE UNITED STATES MILLER correspondent, basing his belief upon the statements that have been made to him by prominent flour manufacturers in different parts of the State, during conversation in interviews upon the subject, thinks that a "New Jersey State Millers' Association" is among the possibilities of the near future. That such a movement may be inaugurated, and speedily perfected, is the earnest hope of all persons in any way interested in the flour interest of New Jersey.

Youngblood's Mill, at Hackettstown, is one of the famous institutions of that town, which is so replete with Revolutionary incidents. The mill has been doing an excellent business all winter, and the present prosperity is destined to be continued for a much longer period. If the rest of the Jersey millers were as enterprising as the people of Youngbloods old mill, they would soon have a rushing business, handsome bank accounts, and the establishment of a State Millers' Association would be a positive and established fact. However, THE UNITED STATES MILLER correspondent hopes, that by the next time he calls upon the

owns 25,600 acres of as good farming land as there is in the United States. The proposition of the managers of the association is to divide this land into small farms, so that they may be suitable for, and purchasable by, the laboring classes of small means. The working people who have hitherto been unable to buy farming property, in consequence of the prevailing high prices, have this opportunity afforded them of securing cheap and permanent homes. The lands are in a climate of a mean temperature of about sixty-eight degrees, ranging from thirty-six degrees in January to eighty-six degrees in August. The association's property, which is in a superior condition, is located in Northern Texas where stock of all kinds grazes all winter, and field work can be done at all seasons of the year. The lands are easily accessible by railroad communication, and the association will furnish free passes to actual settlers.

The National Farmers' Association should receive the support of all Americans who can understand and appreciate its usefulness, and who have a desire to hasten the development, prosperity and wealth of the country. The projectors of the organization (which is destined to become *National* in its scope and influence), desire to interest the attention of all the people of America in the enterprise, as it is of *National* importance and value, and correspondence, as to the association's plan of operations, is invited from all persons who take an interest in anything that pertains to the present and future welfare of the industrial affairs concerned. The office of the National Farmers' Association is at No. 7 E-



FIG. 2. INTERIOR VIEW OF THE GRINDING FLOOR OF THE MILWAUKEE MILLING CO.'S NEW MILL, MILWAUKEE, WIS.

Elizabeth, Newark and Jersey City millers have, for some time past, been considering the advisability of manufacturing flour for the export trade, and some of the manufacturers of those cities are now negotiating with parties in South America and European cities to accept consignments. It is believed the correspondence will result in the conclusion of satisfactory arrangements to the New Jersey millers.

A close survey of the general situation of the grain, and flour-making business, in New Jersey, finds it in a fair and comparatively profitable state. The grain growers are delighted with the excellent returns from their last year's crops, which were particularly good and abundant, and the opinion is general, on all sides, that, judging from the present outlook, the crops this year will be equally as fine, if not better, than those of 1878. The farmers of Burlington, Mercer, Hunterdon, Somerset, Warren, Sussex, Union, Essex and Morris, did particularly well with their grain crop last year, and much more ground will be used this year than last in the planting of wheat, rye, oats and corn, because the people are finding these products much more profitable to raise than "garden truck," which has always been cultivated in great quantities for the New York and Philadelphia markets.

Trenton, the capital of the State, and one of the chief manufacturing centers of the country, has a number of large and heavily producing flour mills, but the product of these establishments mostly finds its way into the

have elevators of immense elevating capacity. Now, the Erie railway (which is now called the New York, Lake Erie & Western railroad), whose managers will never allow themselves to be outstripped in the game of enterprise, is soon to have a new grain elevator, and extensive store-houses for the holding of grain in bulk. These buildings are to be erected on the Hoboken basin, in Jersey City. It is the purpose of the company to have the elevator completed in the coming summer. The contract for the work has not been signed yet, but Vice-President Blanchard says that it is closed. The elevator will have a capacity of 1,000,000 bushels of grain. It will be on one side of the basin, and the store-houses on the other. These improvements will largely increase the facilities of the road for moving grain. The Philadelphia & Reading railroad, in conjunction with the North Pennsylvania and Baltimore & Ohio railroads, also contemplates the erection of a great grain elevator at Port Richmond, on the Delaware River. The Pennsylvania Railway Company has one of the largest elevators in the country, and the quantity of grain (which mostly comes from the West) handled daily, is actually immense.

I had almost overlooked the fact, in writing this correspondence, that some of the New Jersey farmers have conceived the idea of starting a Millers' Association. The idea is not an entirely new one, for the millers have been thinking that some interchange of opinion, and co-operation of interests among them, would be a very good thing, for some years

New Jersey millers that they will have advanced to a position of prominence in the flour exporting trade, that their State Association will be a thing of life, and everything else will be in apple-pie order and operating *flourishingly*.

**THE NATIONAL FARMERS' ASSOCIATION.**

An association under the above name has been organized in Boston, Mass. The object of the organization, which is set forth in article fourth of the constitution, is as follows: "The object of this association shall be to encourage emigration to, and settlements upon, railroad, national, State, and other lands, that the farming, agricultural and horticultural interests of the country may be promoted, the wealth of the nation increased, and the laboring classes benefited."

The capital stock of this association, covering its first purchase of twenty sections of subsidy railroad lands, at the State price of \$1.50 per acre, having been all subscribed, and the purchases having been duplicated, the books are now open for subscriptions to the second twenty sections. The *minimum* price is soon to be fixed at *three dollars* per acre, and upwards, according to its proximity to railroad depots and town sites. As these purchases were made by the association before the advance in the price of land was decided upon, the benefit arising therefrom will accrue to the stockholders of the association in proportion to the stock owned by each.

The association has purchased and now

change Place, room 5, Boston, Mass., and the President, I. W. Alden, or Secretary, I. P. Snow, will furnish all information that may be requested by inquirers. Success to the National Farmers' Association, and all similar organizations, as they improve and enlarge our great *National* resources, and are of incalculable advantage, value and benefit to our people. W. A. E.

**Cut This Out.**

"United States Miller" Subscription Blank.

We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year \$1, or two years and a half \$2. We shall be pleased to have an early response to this. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail.

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Editor of the UNITED STATES MILLER, Milwaukee, Wis.—Sir: Send one copy of the United States Miller for \_\_\_\_\_ year \_\_\_\_\_ for which find enclosed \$\_\_\_\_\_

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UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.
Subscription Price.....\$1 per year in advance
Foreign Subscription.....\$1.50, or 6s. per year in advance
All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.
Bills for advertising will be sent monthly unless otherwise agreed upon.

MILWAUKEE, FEBRUARY, 1879.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1879.

Table with 6 columns: 1 mo., 2 mos., 3 mos., 6 mos., 1 year. Rows include One inch card, Two, Four, One-half col. (8 inches), One-fourth page, One-half page, One page.

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page. Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employes, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion.

We have recently published a List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canada, which is of great value to those who desire to communicate by circular with American mill-owners. The price is \$5 per copy, post paid. Cash must accompany the order.

We have also lately published a Saw and Planing Mill Directory of the United States and Canada. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

THERE were 101 patents granted to Thos. Edison from Jan. 1st, 1872, to Jan. 1st, 1878.

THERE were eighty-seven mills burned in the United States during the year 1878. Eight of these were in Minneapolis, Minn.

THE Western Shoe and Leather Review, of Chicago, is doing good work in opposing convict labor in shoe making.

A FRENCHMAN has invented an electric process that he claims will do away with the work of the engraver. Verily this is an age of progress.

THE Washington Review concludes an editorial by saying: "Mr. Postmaster General, lend us your ear." We would amend by saying lend us your stamps.

LAWRENCE KLEMM, of Terre Haute, Ind., is the latest inventor of an improved apparatus for cleaning middlings by means of a force and suction draught.

A VALUABLE manual for engineers and steam users' use by John W. Hill, M. E., can be had by sending address and ten cents in postage stamps to Wm. A. Harris, Providence, R. I.

DURING eleven months of the past year, the receipts of grain at the Atlantic ports have been 235,071,618 bushels, which is more than 50 per cent greater than those of any previous year, the largest previous receipts for any one

year being 154,932,011 in 1876. The West has an interest in these figures, the great bulk of this grain having been shipped from this region.

THE wheat receipts in Milwaukee during the year 1878 were 21,900,913 bushels; flour, 2,265,931 barrels. The shipments of wheat were 17,037,807 bushels; of flour, 2,620,588 barrels.

THE Cincinnati Miller and Millwright for January comes out in new type and is printed on handsome paper. Happy New Year and success to the Miller and Millwright for 1879, say we.

WE call attention to the change in the advertisement of Messrs Howes, Babcock & Co., of Silver Creek, N. Y. It will be seen that they offer very favorable terms to purchasers of their well-known wheat cleaning machinery.

ONE thousand laths will cover seventy yards of surface.—Ez.

Fact, and the surface might be twice as great and still be dissatisfied if the lath were applied in the good old-fashioned way well known to all the boys.

MESSRS. Collins & Gathmann, of Chicago, Ill., manufacturers of the Garden City Middlings Purifier, are crowded with orders for their machines. Orders come from all points of the compass. Their machine is a good one, and millers have found it out.

JAN. 24th we had the pleasure of a call from our friend R. L. Downton. He is looking wonderfully well, fat and hearty. He informs us that the taking of testimony in the Roller case has been closed and his case will soon be adjudicated. M. Downton was on his way to St. Louis from New York.

TEN years ago Russia and the United States stood on nearly an even footing as regarding grain shipments to England. Then Russia shipped to England 10,719,000 cents and America 10,594,000 cents. Now America has shipped during the last year 48,169,000 cents while Russia has shipped only 11,169,000 cents.

MESSRS. Hulbert & Paige, the well-known mill furnishers, of Painesville, Ohio, have opened a branch house for the accommodation of their growing Western trade. We are glad to note this thrift in their business. All communications for their Western department should be addressed to Messrs. Hulbert & Paige, P. O. box 2,026, Kansas City, Mo.

AMONG the January shipments of the Milwaukee Middlings Millstone Company, was one 24-inch mill for the Los Gatos Manufacturing Company, of Los Gatos, Cal., and one 24-inch mill for M. G. Gordon, of Los Vegas, New Mexico. The mills manufactured by this company give absolute satisfaction wherever used. In construction and finish they are models of perfection.

A CORRESPONDENT writes to the Scientific American suggesting that some one get up a portable hand loom for the market. He thinks the demand would be good. Amateur lathes, fret saws, drills, printing presses, etc., are already abundant. We would also make a suggestion: Let some one invent a little pocket flour mill. When this is done, he that runs may grind.

DAN. TALMAGE'S SONS & Co., the great New Orleans rice dealers, send us the present quotation of this cereal, as follows:

Table with 2 columns: Item, Price. Rows include Broken, Common, Fair, Good, Prime, Choice, per lb.

THE Miller takes much pleasure in saying that Mr. A. L. Clarke, late of Milwaukee, Wis., has pitched his tent in St. Louis for the future. He may be found at the office of this paper by his Northwestern and other friends hereafter.—St. Louis Miller.

Yes, that's so; but there is a load-stone here that will continue to draw Al. to Milwaukee pretty often unless said loadstone makes him everlastingly happy by moving to St. Louis. Send us a piece of cake, Al., when that good time comes.

THE Cincinnati Chamber of Commerce, which includes a membership of 1,200 of the wealthiest citizens, having hired quarters for its accommodation for several years, now propose to build an Exchange of its own. A lot 160 feet front and 100 feet deep has been

secured at a cost of \$140,000, and the proposed building will be six stories high, and cost \$160,000, making the total expense \$300,000. The association has now a surplus of \$40,000, and it is proposed to raise the remaining sum by requiring every member to take one share of the stock, and to issue bonds at 7 per cent. for whatever remains.

HOPPIN, of the Northwestern Miller, in his last number gets off a good joke at our expense. We set 'em up, on the occasion referred to, and everybody from landlord Becker down to the boy that digs the fish-bait declared he wouldn't give it away. Delafield, Wis., is really one of the nicest, cosiest places we know of in the country to enjoy fishing and fun in general, and if Hoppin will join us next summer on an excursion we will get landlord Becker to tell his fish story which discounts all the yarns about fishing yet told.

THE ENGLISH ROLLER PATENT CASE—WEGMANN VS. CORCORAN, WITT & Co.—The above entitled action has recently been brought to a close in England. The Court held that the invention was not set forth in the specification of the patent with sufficient clearness to enable an ordinary skilled workman to construct the machine specified, and therefore found for the defendants. Mr. Wegmann has filed an appeal and the case will be carried up for further argument. The question of the real merits and value of the invention were scarcely considered. The proceedings were very lengthy, and have attracted great attention in English milling circles.

THE Maciato or Italian grist tax is two centimes per kilogram on wheat, and one centime on Indian corn; that is, about 2-5 of a cent to 2 1-5 pounds of wheat or 1-5 of a cent to 2 1-5 pounds of corn. In the cities and towns this falls hardest on the laboring classes. In the country, though bread forms a portion of the dietary, it is not the main constituent. In Tuscany, kidney beans supply the use of flour, but in Upper Italy polenta made of Indian corn is the main article of diet. This tax, in a family of ten consuming wheat and Indian corn, produces 19 shillings of taxation annually, or between four or five dollars in United States money.

A DISCOURAGED MILLER.—Among our sample copies of papers sent out last month we sent one to a miller "way down in Jersey." He writes us as follows:

Editor United States Miller—DEAR SIR: I must decline taking your valuable paper, as I feel that I am too old to enter upon the great work now of modern milling. I have a good old-fashioned mill that I have run for over 30 years, and it grinds quite well. I have been much exposed to cold and wet in my time, and seriously afflicted with rheumatism, which with my years pretty well subdues the energy I once had. I believe your journal is well worth the attention of all millers of the rising generation, but when I look at the changes which have taken place in milling in the last decade of years I confess I feel discouraged at the task of undertaking the making of the great changes now considered necessary for good milling. While I yet linger in the land of the living I shall try and be content to watch the old wheel go 'round and 'round, and turn out my grists in the old-fashioned way. Wishing your journal prosperity, I have the honor be, GEORGE A. M.

WIRE-BOUND WHEAT.—A simple and ingenious invention does away at once with all the trouble experienced with wheat bound with wire, and the merits of the wire-binder will long be enjoyed by the farmers. The invention consists simply in placing a row of ordinary horseshoe magnets at any place on the wheat-cleaning machinery where the wheat passes in a thin stream, and whenever a piece of wire comes along it is immediately drawn to the magnets. Occasionally these pieces of wire should be scraped off from the magnets. Wherever this is done there need be no complaint of wire in wheat. The invention, we believe, is not patented. J. T. Graham, of Rickford, Iowa, has also discovered a remedy and writes to the N. W. Miller as follows:

I have made a discovery which will interest every miller. Not wishing to get a patent or to let others have the chance, I wish you to publish this in your paper. My discovery relates to taking out all the bits of wire from the wire-binders before the wheat goes to the stones. It is done the same way that we used to take out gold in California. Just make little riffles on the sieves straight up and down on the upper side and it will catch them all.

Senator Thatcher has introduced a bill in the State Legislature to "ascertain the true grade of wheat." It is proposed to abolish the "little brass tester" about which so much has been said.

GEO. R. GALE, CLEVELAND, OHIO.

On passing through Cleveland, Ohio, a short time since, we called at the establishment of Mr. Geo. R. Gale, known as "The Hayward Mill Furnishing Works," one of the oldest mill houses in this country, having been established in 1824, by the Hayward Bros., and the activity here shows that Mr. Gale must be fully sustaining the wide reputation earned by the house for supplying the best quality of French burrs. There were a large number of men employed building stone, and we found he had orders from all parts of the country. Every stone sold here is built under the personal supervision of a man of long experience, and no cheap built stone or inferior material allowed to go from his establishment. Among late sales were three pair for the mill of I. N. Daxie & Co., of Massillon, Ohio; one pair for M. F. Schumachen, Aron, Ohio; one pair for Fish, Storm & Davis, Shelby, Ohio, and many others throughout the country, while he has been sending cloths almost everywhere. Millers soon find out where they can buy the best quality of cloth—and Mr. Gale handles only the celebrated cloth made by Du Four & Co., and H. Bodmer, so that he never fails of suiting those who favor him with an order. He says if he has an opportunity of sending a cloth to a mill once, that there is no trouble after that, as the millers are sure to send again. Besides he is selling a large amount of mill machinery, such as smut mills, middlings purifiers and portable mills.

IOWA MILLERS' ASSOCIATION. Fifth Annual Meeting

The fifth annual meeting of the Iowa Millers' Association was called to order at 11 A. M., in the Council room, at the city of Des Moines, on January 15th, by President J. J. Snouffer, of Cedar Rapids, and at once proceeded to business.

The minutes of the last—the semi-annual meeting held at Oskaloosa—were read and approved.

The calling of the roll of members was dispensed with.

On motion, Wm. Milligan, of St. Louis, was elected an honorary member of the association.

On motion, the following named gentlemen were elected members of the association: Replogles & Brown, Farragut Iowa; Consigny, Worth & Kinney, Avoca, Iowa; Henry White, Voiga City, Iowa; upon signing the constitution and paying the membership fee.

The report of the Secretary and Treasurer of the association was then read and approved. This report showed that sixteen new members had joined the association during the past year.

On motion, Mr. J. G. Sharp, Mr. R. Nicholson, and Mr. C. A. Bryan were appointed a committee to investigate the financial condition of the association and report the amount of assessment necessary to carry the association through the year 1879.

The report of the committees appointed at the last meeting were then called for. The first being upon our present Constitution and By-Laws, to report any changes that may seem to them advisable. Chairman J. R. Serrin of that committee, submitted a lengthy report, which after due discussion was adopted.

The committee appointed to investigate the financial condition of the association, reported as follows:

MR. PRESIDENT: Your committee to whom was referred the matter of assessment to meet the necessary expenses of the association, would report that \$1.00 for each member will be sufficient at this time, there being now in the treasury \$20.14 and \$62.50 yet due on last two assessments, part of which may be collected. J. G. SHARP. C. A. BRYAN. ROBT. NICHOLSON.

Adopted, and assessment ordered to be made. The committees upon flour dust explosion, and upon the best varieties of wheat for milling purposes, made no report.

The association then proceeded to the election of officers for the ensuing year, resulting in the election of—

President—J. J. Snouffer, of Cedar Rapids. Vice-President—J. Jones, Algona. Secretary and Treasurer—J. H. Reed, Boone. Executive Committee—D. B. Knight, Boone; J. R. Serrin, Ladora; S. D. Nichols, Panora. Upon motion it was resolved that a vote of thanks be tendered the city of Des Moines for the use of the City Council rooms.

Adjourned to meet in the evening at Aborn House.

Meeting called to order at 11.30 P. M. in the parlor of the Aborn House and immediately adjourned to meet at Marshalltown, Iowa, on the second Wednesday in June, A. D. 1879. J. H. REED, Sec'y.

## IMPROVED MILLING AND METHODS.

A Valuable Paper Read Before the Indiana Millers' Association, Dec. 12th, 1878.

BY JOSEPH F. GENT.

To the President and Members of the Indiana Millers' Association:

GENTLEMEN: It again becomes my duty, as Chairman of the Committee on Mill Machinery and Methods, to submit to you for your consideration a few thoughts on the subject of Improved Milling and Methods, which, at present, seem to occupy the minds of that class of millers who believe, as I do, that milling, or more properly the manufacture of flour in the United States, is destined to become one among the greatest interests of our country, and who are striving, by every available means at their command, to improve the products of their mills in yield, strength and color.

The first thing to be looked after in the mill is the yield, not only the amount of flour made from a bushel of wheat, but in mills where more than one grade of flour are taken off, the percentage of each grade so taken becomes a matter of as much importance as that of the total yield per bushel. This point settled, the strength and color are the qualities which alone must make for the brand or grade its reputation, and establish its value in the different markets where it is offered for sale.

We were told, a few years ago, that strength and color could not go together, and I am sorry to say there are some millers yet who, if shown a very white sample of flour, will doubt its strength. This notion was no doubt derived from the fact that, under the old process of grinding, flour which was ground high and on a sharp stone, and bolted in the ordinary way on a coarse cloth, seemed to have more strength than that which had been ground on a dull or smooth stone, and heated sufficiently in the operation until all the gluten was destroyed, but the latter had the best color, hence the conclusion among millers that white flour does not possess sufficient strength. This, like other false theories, is fast being laid aside, as new and improved methods are being introduced.

There is at least one miller yet living who, if a resident of New York, would be prosecuted for cruelty to animals; I refer to the gentleman who, at the last meeting of the Michigan Association, said he did not believe there had been any improvement in milling by the adoption of the new process of making flour—that they made just as good flour 25 years ago as now.

There seems to be an impression among millers that to pulverize the flour too fine destroys its strength. This may be true of hard spring wheat, for in order to pulverize it to the same degree of fineness as winter wheat, by the same methods, it being harder, more heat would be generated, and consequently the greater liability to injury by too close grinding, and from the reasoning we are able to account for the fact of millers in sampling flour feeling the grain of the flour and choosing the coarsest samples as the best. From my experience I am thoroughly convinced that it would be impossible to reduce it to such a degree of fineness, by the ordinary methods of pulverizing, as to injure its strength, provided the temperature was not raised too high by the process by which it was reduced.

The temperature should, I think, be increased as little as possible by the process of grinding, and the bolting should be performed as nearly as possible at 65 to 70 degrees. This however, in many mills, can not be regulated. Any mill so situated or constructed that the temperature can not be brought up in winter or cold weather, can not produce an even grade of flour, no matter what their facilities may be for controlling the process of bolting.

Grinding, granulating, or pulverizing wheat for the purpose of producing flour, middlings and offal, is a subject which requires great study and the exercise of our best judgment. To grind well is the grandest accomplishment a miller can possess, for in this he is called upon to decide some very close questions. I am well satisfied that no miller can grind high and grind correctly, with different varieties of wheat, by simply feeling the chop as it comes from the stone, and in most cases if you venture to express a doubt upon the matter, you are told by the miller that he grinds by the offal. If this is correct, just imagine yourself seated in the bran bin, trying to determine which stone was doing the bad grinding, two or three stories below, having worn your fingers to the quick setting and regulating the stone, before entering upon this last and final test. If you are asked to examine a sample of bran, and decide whether it is sufficiently

scoured and free from flour, do you pour it through a spout with one hand, close your eyes, and feel of it with the other? No, you first look at it closely, then measure and weigh it. Yet, you could as readily determine whether or not the sample of bran was well cleaned by feeling, as you could whether a stone was doing perfect grinding by the same method, when grinding as high as is necessary to make first-class work.

Let us do away with all such imperfect and impractical methods, and procure an accurate pair of scales and a set of small sieves, clothed with proper cloths, take them into the mill, and weigh exactly one pound of chop from each run of burrs, and separate it by means of the sieves, and figure out the percentage of each part; by this means we can readily determine which stone in the mill is doing the bad grinding, and introduce the proper remedy at once. This method once adopted in the mills in Indiana, and our flour will gain a reputation for evenness, strength and color, never before thought of.

My word for it, gentlemen, you may introduce new machinery and new processes without number, but unless the grinding and bolting is thoroughly and systematically done the new machinery will amount to nothing.

There is one matter of which I desire to speak—that of driving stone by means of a loose spindle and self-adjusting driving-irons. I look forward to the time when the running stone will no longer be allowed to swing at random over the bed-stone, but will be rigidly fastened to the spindle and put in perfect tram with the bed-stone before starting, and so arranged as to be kept so. Then, in my opinion, we will have approached perfect granulation.

By the old process of low grinding, where the running stone was expected to lay on the grain with its full weight, or nearly so, it was then, perhaps, necessary for the runner to have the means of adjusting itself to the bed, in order that the whole of the kernel might be as nearly as possible pulverized to the proper fineness at the first grinding, which, however, seems to my mind so clearly an error that it is unnecessary for me to produce any argument in favor of the stiff spindle.

But, while speaking on that subject, I will simply mention one or two instances where they have been successfully used for purposes identical in their nature to that of the granulation of wheat for the purpose of making middlings. For instance, a stone hung on the spindle in the ordinary way, nicely adjusted and balanced, was tried for the purpose of hulling oats before being made into oatmeal, but was pronounced a failure, thrown aside, and new machinery introduced. But after trying the new methods the stone was again taken up, mounted on a stiff spindle and found to be far superior to anything else for hulling oats, preparatory to making oatmeal. The same may be said of stone used for hulling barley; also stones used in some mills for the purpose of treating wheat before grinding, called ending stones. They were of necessity mounted on stiff spindles, because those hung on loose bails ground a part too fine, while a part was allowed to escape untouched.

I am so thoroughly convinced of the correctness of this theory, that should we build a new mill, which we expect to do, I should adopt them for all purposes, wheat and middlings. I should, however, put in a different dress to that now used in most mills. As a general thing I am of opinion that most mills, milling soft winter wheat, are using too much grinding surface; there does not seem to be any one dress that will exactly suit the wheat grown in any two sections, where there is any very material change in the climate, or where different qualities of wheat are grown. But my experience with hard Mediterranean and some of the softer qualities of winter wheat, such as white bearded, gipsy, and other smooth wheats raised in this State, has proven to me very clearly that there is one rule which may be universally adopted by millers, namely, the softer the wheat the less surface required on the face of the stone to granulate it. And I find, by reducing the grinding surface, the same proportion of middlings may be obtained from the softer varieties of wheat that can be had from the Mediterranean; but the flour does not seem to have the same strength as that made from hard wheat middlings.

I shall now speak of the process of bolting, and the purification of middlings. There is the same lack of system in bolting that is found on the grinding floor of many good mills; I think partly owing to the system followed by many millwrights and mill furnishing houses. When the millwright or mill furnishing house is called upon and consulted about building a mill, they talk of the number

of stone the party wants—3, 4, 5 or 6 run; one smut mill, one flour packer, one middlings purifier, and four to six reels, for bolting purposes, with one or one and a half conveyors under each. They get them together, send them out and put them up, and have the audacity to call this a new process mill, while in reality they are simply making the coffin and digging the financial grave of their customer, who loses his money and sells out at a discount, disgusted with the business. I do not say this to injure any millwright or mill furnishing establishment, but I say it in the interest of the millers of Indiana.

I do not desire to be understood that a small mill cannot be built to make new process flour, but if a small mill is to be built, put in just the number of stone to do the work properly and in proportion to a large mill doing first-class work. By building the mill right, with the proper number of stone, custom work can be done and one dollar more per barrel can be had for all the flour made by the mill and sold on the market. It is a mistaken idea that if a small mill is built it cannot do good work—it can, and should make the very best of flour, provided the wheat is of good quality. But to do this it must have, first, sufficient bolting surface to bolt out all the clear flour made by the first grinding; second, sufficient bolting capacity to rebolt all the returns and dustings from middlings; third, sufficient bolting capacity to bolt out all the flour from the ground middlings; fourth, sufficient bolting capacity to dust and rebolt dustings from second middlings; fifth, sufficient bolting capacity to bolt out all the flour from reground bran, and separate any fine middlings from it, if any should result from each bolting and grinding; sixth, at least one set of rolls and sufficient bolt to bolt and separate their products. This any mill must have to do good work. No less will accomplish the work. And my advice to you who contemplate building or refitting, do not allow any man to build it for you, unless the performance of these several separations are expressly stipulated in the contract. Then, if you cannot place these several parts together, so as to make a mill out of them as herein described, each in its regular order, then you should consult some one who can arrange them for you, and that man is the one who should build your mill. Where you buy your machinery is a matter of little importance, so the best is selected. And finally, I will say, that unless the same system is carried out in bolting, as is done in grinding, but little will be accomplished.

I shall now speak of the separation and purification of middlings. Middlings, in my opinion, should be separated or graded by means of bolts for that purpose, clothed with suitable cloth, and two sizes or grades thrown on to machine No. 1; two grades on machine No. 2; two grades on machine No. 3, and two grades on machine No. 4. The head of each of these machines may be taken for clean middlings. The middle of the two first machines should be put on machine No. 5, and the middle of machines Nos. 3 and 4 should go on machine No. 6.

Now throw the tail and cut-off from machine No. 1 on the head of machine No. 2, and the tail and cut-off from machine No. 2 on the head of machine No. 3, and the tailings and cut-off from machine No. 3 on the head of No. 4, and the cut-off and tailings from machine No. 4 to rolls.

Now take the cut-off from machine No. 5 and throw it back on machine No. 2, and the cut-off from machine No. 6, to the head of machine No. 4; the tail of machines Nos. 5 and 6 to roll with tailings from No. 4.

In my report last spring I expressed myself in favor of purifiers using a blast, or blast and suction combined, and my experience with blast machines since that time has confirmed my opinion as then expressed. I am of the opinion that a machine using both blast and suction, so combined as to throw the middlings on the machine in such a manner that the blast would raise the whole body of middlings in a chamber, and allow the suction to carry away all the soft, fuzzy matter from the middlings, before they come in contact with sieve, thus having them free and round and in such a condition that a suction could have free passage up through the sieve and the middlings thereon, thus carrying away any remaining portions of foreign matter, or keeping it on top of the middlings, and passing it over the tail and away from the machine, would clean middlings with much less waste than any suction machine.

I have been a close observer in this matter of cleaning middlings, and I have invariably found that wherever the cloth is covered with middlings on a suction machine, as is always

the case at the head of the machine, the middlings are not properly cleaned. The reason of this, I think, is plain. The fiber and fluff not being previously removed by means of the combined blast and suction applied before the middlings fall on the cloth, clog the meshes of the cloth as well as the small openings between the particles of middlings, thus allowing the middlings to fall through the cloth, and beyond the control of the suction, without being thoroughly cleaned.

I present these thoughts, gentlemen, not that you shall accept them as facts beyond dispute, but for your consideration, and ask that all of you give your views and experience upon the ideas and suggestions presented, and I hope that as many of you as can spare the time will be prepared to read an article on milling at our annual meeting in June next.

## SENATOR DAVIS ON PATENTS.

Senator Davis of this State is not much given to speech-making, especially on strictly political questions. During the ante-holiday session he was entirely silent on the subjects which drew party lines. He had something to say, however, about the patent system in connection with a bill introduced by the Committee on Patents. He is peculiarly competent to discuss that subject intelligently and fairly. As a member of the Supreme bench of the United States for quite a number of years, he had frequent occasion to sit in judgment upon litigation growing out of infringements of patent rights. A large per cent of the business in the Federal Courts relates to patents. No other member of either house of Congress has had so thorough a training in that line as Judge Davis, or is entitled to so much consideration in the discussion of the question of patent-law reform.

The advantage to the country from the patent system is great beyond all calculation. The superiority of American machinery, as compared with that of any other country in the world, is largely due to the protection afforded to invention. Ingenuity is encouraged and stimulated. But there are evils of a great magnitude incident to the system, evils so great as to seem almost overshadowing. Monopolies growing out of it lay heavy burdens upon production. Often, if not generally, the advantages of the patent inure to the benefit of some one besides the patentee. Many a man has become rich out of the invention of another who remained poor. Then, too, where patents affect large interests which can easily combine, their concentrated power is sufficient, as Judge Davis remarks, to ruin any patentee who attempts to bring them to account for infringement. The weak are nowhere more at the mercy of the strong than in patents. Judge Davis conceded that the general purport of the pending bill is well calculated to counteract, as far as they can be counteracted, the evils of monopoly. But he suggested several amendments. The most important part of his speech is the position that the difficulty in reaching fairly and fully the evils of infringement and monopoly could be best met as follows:

In taking an account of profits for the use of an invention secured by a patent where the patentee or his assignee shall elect to demand profits, the whole, or such portion of the actual profit or saving derived from such use, shall be allowed to the patentee or his assignee, as the Court may deem just in order to secure a fair compensation for such use, having regard to what would be a fair royalty therefor in view of the skill exhibited in making such invention and the value thereof to the parties using the same and to all circumstances of the case; and the master, in taking and stating such account, after stating the amount of profit or saving actually made by such use, shall give and state what portion thereof would, in his judgment, be such fair compensation as aforesaid, to be subject, however, to the modification and judgment of the Court; but when a patentee or his assignee shall elect to demand an account of profits against any person for an infringement of his patent, he shall not be entitled to recover damages for the same infringement.

Every farmer, every mechanic, and all industry down to the laundry, is interested in this matter. Judge Davis shows his great common sense in the foregoing suggestions. This Congress ought not to expire without securing patent reform. The Senate has shown an earnest disposition, and will probably do something. The danger is that the House will be manipulated by the monopolists, and actual results be defeated thereby.—Chicago Evening Journal.

It is the surprises of life that add most to our pleasures; one man is surprised with a legacy from a rich uncle, another that the old speckled hen has just cum off the nest, with 27 chickens.

## THE IRON TRADE.

## INTERESTING LETTER FROM PENNSYLVANIA.

[Special Correspondence United States Miller.]

BETHLEHEM, Pa., Jan. 1st, 1879.—The extent to which the iron industry of the country is now, or is likely to be hereafter, relieved by the export of any of its products is a question to which the associated industries of the United States has for some time past given close attention. With the view of obtaining a definite and authoritative answer, the Secretary, Mr. Lorin Blodget, has made a personal inquiry among a large proportion of the manufacturers of minor articles of iron, and he has now presented his conclusions, in the form of a report, to the American Iron and Steel Association. Mr. Blodget declares that the development of the export trade in iron articles is of the most striking and remarkable character, and that it already represents fully one-fourth, and in some instances as high as three-fourths, of the entire product of the Philadelphia manufacturing establishments.

These conclusions are also fully verified by the statements in the report. Three local houses engaged in the manufacture of steel forks, hoes and rakes have been compelled of late to increase their working force, and three-fourths of their productions have been taken up in England and Central Europe. A large demand for their articles has come from Sheffield, and English manufacturers are exporting them to the colonies as English wares. Five establishments are full with foreign orders for steel and iron tools, while six others are exporting shovels, spades and coal hods to Europe, South America and Australia. One local firm has made a fair commencement in the way of exporting table cutlery. Disston's saws, files and levels are being made to order from every part of the world, and three other establishments are doing a large foreign trade in the same class of articles. Nails and spikes are being taken in liberal quantities for South America and the West Indies, and this trade, according to the reports received by the manufacturers, is capable of very considerable extension.

The closing months of the year 1878 has developed an export demand for bolts, nuts and rivets. Six establishments have received large orders for England, the Continent, Australia and South America, and the whole are actively employed. Several iron mills outside of the city of Philadelphia have sent large quantities of fencing and other iron to Brazil, the River Platte and Australia, and an order for a system of suspension bridges in Peru is anticipated by a Pennsylvania firm some time this month. Several large orders from Peru and Chili for sheet and roofing iron have been filled, and a practicable opening exists for competition with England in the supply of the enormous quantity of galvanized and other sheet iron constantly required in South America. Foreign orders for merchant bar iron have recently appeared in the market for the first time, and two shipments have been made to Callao. Twelve establishments are receiving frequent foreign orders for galvanized pipes, railings, fences and cemetery inclosures.

The export trade in hardware has of late advanced in a most remarkable manner, and the business is already assuming enormous proportions. The largest demand is from England, and the next from Germany, while Australia and South America are calling directly for quantities never until recently thought possible to be sent out. Brass work and castings have participated in the export movement to England, the Continent and Australia, the more novel and elaborate forms in plumbing and gas and water supplies being especially in demand.

In addition to these articles Mr. Blodget gives a list of manufacturers who are filling foreign orders for railroad supplies and machinery, sugar machinery, agricultural implements, mining shaftings, and last, but not least by any means, grain and flour mills. Altogether not less than two hundred local establishments are engaged on orders for foreign markets. Many of these have their whole working force employed in this direction, and are compelled to refuse home orders. A list of the various classes of iron and steel goods for which a market exists outside of the United States would fill a page of THE MILLER.

A tour of inspection along the Lehigh, Schuylkill, Susquehanna, Wyoming and Lackawanna valleys by the UNITED STATES MILLER correspondent, shows the great and important iron manufacturing industries to be enjoying a degree of prosperity that has not been noticeable in the business for a long time. From here to Easton in a southeastern direction, and

to Mauch Chunk—the entry of the Lehigh coal region—in a northern direction, is where is located the extensive iron producing country of Northern Pennsylvania, and in this district reside many of the iron kings of the State. To ascertain the state of the interest the correspondent of the UNITED STATES MILLER interviewed one of the millionaire iron masters, and this is what he said, with an energy that exhibited his enthusiasm and pleasure about the subject:

"Well, Mr. correspondent of the UNITED STATES MILLER, at no time since the panic of 1873 have the prospects been as bright for a general revival of business. I think we ironmasters can resume now with some chance of making a little money. The sheet iron mills throughout the State are working to their fullest capacity, and many orders are being given out for oil well tubing, as well as for plates for bridges and ships. The Catarauqua Iron Company, which has a capacity of thirty tons of plate iron per day, are far behind with its orders. Pennock & Sons, of Coatesville, are running two mills night and day, while the Chickier Company is turning out orders so fast that it cannot get enough cars for transportation. The Chester Rolling Mills are making a large quantity of ship plates. Tank iron is also selling in large lots. The market generally is firm, and manufacturers are hoping that the quotations will soon show a favorable advance in prices."

The resumption of work is almost general in the Lehigh region. The Philadelphia and Reading Coal and Iron Company's Rolling Mills, at Reading, are running double time on iron rails. Several iron companies are about to put up additional mills and the fires of a large number of furnaces, which have been cold all summer, are soon to be lighted.

A Sheridan firm is filling orders for pig iron for San Francisco and Montana, while Hay & Co., at Mauch Chunk, have received in two weeks orders for 70,000 pounds of wire. Hon. Wm. L. Scott, of Erie, who has had his rolling mill idle for several months, is about to begin operation for a six-months' run, with a full force of 150 men. The Pottsville spike and bolt works are running day and night on orders from Mexico, Cuba and Canada.

The improved condition of affairs began in the West, and even the Eastern manufacturers are already feeling the good effects. The steel rail mills are employed to their fullest capacity, and the manufacturers report numerous inquiries for large lots, with the prospect of large orders being secured. During the past month a demand for old rails for the West has sprung up, and other calls are anticipated during January and February from the same direction.

The revival in the Schuylkill region is very perceptible. At the vast establishment of the Phoenixville Iron Company (Clark, Reeves & Co., proprietors), at Phoenixville, there is unusual activity, and to better the condition of things for the corporation and its large number of industrious and deserving operatives, a contract has just been concluded for the construction and erection of one solid section of four miles of the Metropolitan Elevated Railway in New York City, besides a number of scattered sections, which will bring the whole contract up to about five miles of railway. This contract will keep the Phoenix works in full operation during the entire winter. About 12,000 tons of iron will be required in the manufacture of the railway sections.

The Glendover Iron Company's works, at Danville, have been running to their greatest capacity for the past four months, and enough orders are on file to keep the establishment running until next March or April. The run is being made upon rails for the Shenandoah Valley Railway and the Pittsburgh, New Castle & Lake Erie Railroad. The company has also on hand a large amount of work for the plantation trade and is doing extra night work on rails. W. A. E.

ITALIAN METHOD WITH DIPHTHERIA.—The two methods of treating diphtheria—with chlorate of potash and hydrate of chloral—have been combined by Dr. Cesare Ciattaglia, of Rome, and, as he claims, with remarkable success. He dissolves a drachm of hydrate of chloral in five drachms of glycerine, and applies it to the false membranes three or four times a day, by means of a camel's-hair brush. Of the chlorate of potash he gives from two and a half to four drachms a day, dissolved in four and a half ounces of water, to children of from 3 to 6 years, and an ounce to adults. With these medicines he always combines a tonic and restorative diet.

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Adin Mill Co., Adin, Modoc county.  
Falk, Chandler & Co., Arcata, Humboldt Co.  
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Fordyce Roper, Bakersfield, Kern county.  
W. C. Percival, Bloomfield, Sonoma county.  
Lefingwell & Sons, Cambria, San Louis Obispo county.  
John M. Russell, Cedarville, Modoc county.  
John Bidwell, Chico, Butte county.  
Clark & Shand, Chico, Butte county.  
Wolford & Neal, Cloverdale, Sonoma county.  
J. D. Goge, Colusa, Colusa county.  
E. Nichols, Cottonwood, Tehama county.  
J. Piper (mwt.), Coulterville, Mariposa Co.  
Tyler & Newby, Dixon, Solano county.  
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C. M. Jones & Sons, Fresno, Fresno county.  
Rector & Lyndon, Fulton, Sonoma county.  
Cuthbert Burrell, Gilroy, Santa Clara Co.  
J. Chauvet, Glen Ellen, Sonoma county.  
Tyner & Thom, Grangeville, Tulare county.  
G. W. Gridley, Gridley, Butte county.  
A. D. Bayliss, Hayfork, Trinity county.  
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F. C. Hall & Co., Ione City, Amador Co.  
Peter Burtnett, Kelsey, Lake county.  
J. Stevens, King's River, Fresno county.  
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Lemoore Mill Co., Lemoore, Tulare county.  
Brigham & Bro., Linden, San Joaquin Co.  
Aliso Mill Co., Los Angeles, Los Angeles Co.  
Los Gatos Mfg Co., Los Gatos, Santa Clara.  
John Mather, Lower Lake, Lake county.  
M. K. Langdon, Mattole Valley, Humboldt Co.  
Dudley & Miner, Mattole Valley, Humb't Co.  
Nelson & Son, Merced Falls, Merced county.  
J. M. Steinberger, Milford, Lassen county.  
Wilkinson & Ross, Millville, Shasta county.  
W. R. Cooper, Napa City, Napa county.  
W. F. & A. Laumedster, Niles Station, Alameda county.  
A. N. Bell, Oak Creek, Inyo county.  
B. E. Hickok, Oakland, Alameda county.  
Samm & Co., Oakland, Alameda county.  
Weston & Welch, East Oakland, Alameda Co.  
A. J. Sanders, Orange, Los Angeles county.  
Max. Brooks, Oroville, Butte county.  
W. J. Ireland, Pacheco, Contra Costa county.  
Geo. P. McNear, Petaluma, Sonoma county.  
A. R. Henry, Portersville, Tulare county.  
Edw. Aldersly, Princeton, Colusa county.  
Wm. Williamson, Rio Vista, Solano county.  
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Neubourg & Sager, Sacramento.  
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H. G. Smith & Co., Sacramento.  
J. B. Chiles, St. Helena, Napa county.  
Joseph Mecklenburg, St. Helena, Napa Co.  
Toby & Hudson, Salinas City, Monterey Co.  
Goff & Co., San Benito, San Benito Co.  
W. Davis, San Bernardino, S. Bernardino Co.  
B. F. Mathews, S. Bernardino, S. Ber'dino Co.  
Irwin Barnard, San Buenaventura, Ventura Co.  
I. Lankershein & Co., San Diego, S. Diego Co.  
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C. Clayton & Co., San Francisco.  
F. D. Conro & Son, San Francisco.  
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Deming Palmer & Co., San Francisco.  
Dohrman & Co., San Francisco.  
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James Simpson, Santa Cruz, Santa Cruz Co.  
Blanchard & Bradley, Santa Paula, Vent. Co.  
Baker & Hewitt, Santa Rosa, Sonoma county.  
Nowlan & Stoddard, Santa Rosa, Sonoma Co.  
M. O. Ellis, Sesma, Tehama county.  
Daniel Click, Sheridan, Placer county.  
J. G. Anthony, Smith River, Del Norte Co.  
W. H. Harrison, Snellings, Merced county.  
Chas. Murray, Snellings, Merced county.  
Jaques Chauvet, Sonoma, Sonoma county.  
James Bell, Sonora, Tuolumne county.  
Hampton & Smith, Sonora, Tuolumne Co.  
T. G. Campbell, South Fork, Siskiyou county.  
Starr & Co., South Vallejo, Solano county.  
J. Hatch, Spanish Town, San Mateo county.  
J. Padderson, Springfield, Tuolumne county.  
Springville Mill Co., Springville, Humb't Co.

R. B. Lane, Stockton.  
Sperry & Co., Stockton.  
E. P. Hilborn & Co., Suisun, Solano county.  
Hall & Snyder, Susanville, Lassen county.  
O. F. Cook, Sycamore, Colusa county.  
W. Baker, Tehichipa, Kern county.  
Jasper Cleveland, Ukiah, Mendocino Co.  
J. D. Hillman, Ukiah, Mendocino county.  
Wm. Isbell, Ukiah, Mendocino county.  
Huntley & Cooks, Valley Ford, Sonoma Co.  
Chas. R. Beale, Visalia, Tulare county.  
Nathan P. Dillion, Visalia, Tulare county.  
Chas. L. Thomas, Wasonville, Santa Cruz Co.  
Wheatland Mill Co., Wheatland, Yuba Co.  
E. Ayers, Willits, Mendocino county.  
Morgan & Perkins, Willits, Mendocino Co.  
Farmer & Burkett, Woodbridge, San Joaquin.  
J. M. Rhodes, Woodland, Yolo county.  
Nutting & Forsyth, Yolo, Yolo county.  
F. W. Ellis, Yountville, Napa county.  
Chas. Schlischt, Yreka, Siskiyou county.  
John Wilkie, Yuba City, Sutter county.

## OREGON.

J. H. Foster, Albany, Linn county.  
Thomas Montieth, Albany, Linn county.  
Farnham Flour Mill, Ashland, Jackson Co.  
Wagner & Anderson, Ashland, Jackson Co.  
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Peter Gerkin, Aurora, Marion county.  
Wm. Keil & Co., Aurora, Marion county.  
D. A. Levine, Canyonville, Douglas county.  
Marks, Siderman & Co., Canyonville, Douglas.  
T. McKinzie, Central Point, Jackson county.  
R. H. Hazleton, Cottage Grove, Lane county.  
Vaney & Vaughn, Cottage Grove, Lane Co.  
S. G. French, Cove, Union county.  
Geo. Tillotson (mwt.), Dallas, Polk county.  
J. Waymire, Dallas, Polk county.  
Brooks & Humasen, The Dalles, Wasco Co.  
Thos. Standley, Dayton, Yamhill county.  
Drain & Johnson, Drain, Douglas county.  
Patterson, Edris & Co., Eugene City, Lane Co.  
O. Parsons, Forest Grove, Washington, Co.  
Smith & Briggs, Harrisburg, Linn county.  
J. & P. Brugger, Hillsboro, Washington Co.  
J. Milne & Bro., Hillsboro, Washington Co.  
Panther, Bacchus & Co., Iowa Slough, Coos.  
Caviness & Sterling, Island City, Union county.  
Corbitt & McCleay, Jefferson, Marion county.  
McCullum & Norman, John Day City, Grant.  
J. B. Sifers, Kirbyville, Josephine county.  
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Eagan, Barlow & Co., Monitor Mills, Marion.  
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Jas. D. Miller, Oregon City, Clackamas Co.  
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G. Wright & Sons, Union, Union county.  
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J. C. Davenport, Colfax, Whitman county.  
Lang & Scrumb, Dayton, Columbia county.  
Canody & Bro., Ellensburg, Yakima county.  
A. J. Chapman, Ft. Colville, Stevens county.  
R. H. Douglas, Ft. Colville, Stevens county.  
L. B. Fenwick, Ft. Colville, Stevens county.  
L. W. Meyer, Ft. Colville, Stevens county.  
Geo. W. Miller, Goldendale, Klicet county.  
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Isaac W. Buzby, Seattle, King county.  
Stetson & Post, Seattle, King county.  
T. M. Chambers, Steilacoom, Pierce county.  
Pineus & Packscher, Steilacoom, Pierce Co.  
Geo. Gelbach, Tumwater, Thurston county.  
Lewis Love, Vancouver, Clark county.  
A. S. Marble, Vancouver, Clark county.  
Preston, Powell & Co., Waitsburg, Walla Walla.  
H. P. Isaacs, Walla Walla, Walla Walla Co.  
A. McCally & Son, Walla Walla, Walla Walla.  
J. M. Welch & Co., Walla Walla, Walla Walla.  
A. D. Barker, Yakima City, Yakima county.

## AMERICAN GRAIN TRADE.

Very little of the annual production of breadstuffs of the United States found its way to European markets till 1836-7-8. It was an era of protection, when baby industries were fostered by the agricultural interest in the hope that some time in the indefinite future the manufacturers of looms, plows and shovels would be able to consume the surplus products of the tillers of the soil. This forced industrial prosperity was suddenly checked by successive failures of crops in 1836 and 1837. Blight, mildew, and the fly took the crops of almost the entire Atlantic Slope, and for once in the history of the United States, Europe was resorted to as a granary. There were many firms in New York which had been factors of the corn growers in the State, as well as the intermediaries of those further West. When the drift of commerce became import instead of export these merchants chose to store their granaries for a rise instead of distributing cargoes as they were received. Under their manipulations the price of wheat sprang from a gold dollar—around which it had shifted for 100 years—until it had touched the highest point that it has yet reached up to this year of grace, namely, \$18 a barrel for flour, or nearly \$4 a bushel for wheat. Eli Hart & Co., and E. & J. Herrick were among the heavy grain factors of the city in those days, and their warehouses were fairly groaning under the burden of foreign corn which they had imported from England and were holding for the rise. It is within the memory of members of the Produce Exchange now living that New York artisans and laborers became restive, held indignation meetings denouncing the men who were trading upon popular famine, and at last organized a mob which attacked the warehouses in South, West and Front streets, and helped themselves to the contents. The violence to person extended only to threats of tar and feathers and of summary lynching, which the old leather-head police, inefficient as they were, found themselves able to suppress. The riot bore the good fruit of immediate concession to the hunger-stricken mob, and it was found that all the hungry could be more than supplied by the stores of grain that had been contracted for, and there was no more need for riots (unless of producers) for a full decade. Wheat had a steady ratio to gold during all those years. Any variation was an advance caused by spasmodic differences of European consumption. Strange as it may seem old Exchange men say that those were the days of wilder and more speculative speculation than any that produce men have known since the day of the Atlantic cables. The only mail between New York and England was carried by the Cunard steamers, which reached port only twice a month. Latest advices among produce men were traded on as eagerly as reverses and victories during the war, only that the effects of success or reverse lasted a fortnight at least in the old times. Europe was the market for a surplus that could find no other market, and scarcity or plenty there was the stock in trade.

The year 1847 became notable because of the failure of the Irish potato crop. That season of almost uninterrupted rain opened with corn at 50 cents and wheat at 90 cents a bushel. Flour was a drug at \$4.50. The rise of that year was a legacy of 1846, which had been almost as wet and disastrous to the Irish staple. The speculative rise in the breadstuffs continued onward and upward until on July 2d, 1847, wheat was worth \$2.25; corn, \$1.10 and \$1.15, and flour \$9.50. The docks of New York were crowded with ships and the money center was crowded with men of money from the interior, who had come East to buy or sell the grain upon the margins which then for the first time began to enter into American speculation. The history of New York houses which were prominent in that speculative period is not without instructiveness. Dows, Carey & Co., progenitors of the house which this day is known by the name of the senior of that firm, was saved from bankruptcy by the rise in values and established itself on the prosperous plane which it has since occupied. The bankers of the period finding deposits heavy, sought the produce bourse for profitable investment, and shipping merchants took shares as well. Prime, Ward & King, then the most considerable bankers of the money center, dipped into wheat and lost. Hicks & Co., also lost a fortune made in shipping in trying to sustain a falling market in breadstuffs.

The trade held the even tenor of its ways hereafter until the fall of 1849 and the early month of 1850. Suydam, Sage & Co., who

had been sufferers by the riots of 1837, but had recovered their fortunes in the other prosperous years, felt themselves strong enough to try a corner in flour. They bought right and left, until their holdings aggregated 400,000 barrels. They had advanced the price a few points, but good European crops more than destroyed any counterbalancing advantage, and their venture was disastrous.

Thereafter speculation was conditional upon scarcity in the foreign markets which handled America's surplus. In 1852 the crop of France turned out poor, and under the impulse of orders from English factors prices advanced from 95 cents for wheat in the early spring to \$1.35 in the following autumn. That, however, was a steady rise produced by natural causes, and was used as a help to fortune by the greater part of New York merchants. There was no startling decline in prices until the latter part of 1854, when European crops regained their normal standing. The custom of dealing in futures had become a recognized method of speculation, but business men were conservative in speculating and managed to shift the burden upon their French correspondents, so that any losses were borne by them, even though flour had declined from \$9.50 a barrel, the highest point that it touched between '37 and '54. The year 1857 was marked by a decreasing value of cereals that was unprecedented up to that time. For various reasons bankers' and money changers lost credit and suspended, and the produce men were unable to place exchange and so shipments of grain and flour were almost at a standstill. Even '73 did not produce as universal bankruptcy, inasmuch as there was not a house dealing in the Produce Exchange, then five years old, that was not found to ask for concessions from creditors.

The first year of the war brought the same difficulty as to the placing of exchange. When some medium of exchange had been established the prices of grain preserved their ratio to gold until some rash capatilists endeavored to force a corner in cereals by force of money and left their project bankrupt. The speculative features of the trade have confined themselves mainly to the depository centers of the West since the cables have brought these depots as near the European markets as New York is. Even at the best that capital can do, produce men feel easy in the belief that no "corner" in Milwaukee, Chicago or Buffalo can advance prices in New York beyond a few cents.—*N. Y. World.*

## THE TRANSMUTATION OF METALS.

A correspondent of the London *Daily News* writes: "Large as have been the drafts of late upon our scientific credulity, there has hardly been one which makes so heavy a demand upon our powers of faith as is involved by the statement that Mr. Norman Lockyer has realized the alchemist's dream, the transmutation of metals. Strange, incredible as this may appear, there is sufficient evidence of its results having been effected to make us at least suspend our judgment and await the results of further experiment before absolutely refusing to believe. What seems certain is as follows: On Monday last in the presence of a small party of scientific men, Mr. Lockyer, by the aid of a powerful voltaic current, volatilized copper within a glass tube, dissolved the deposits formed within the tube in hydrochloric acid, and then demonstrated by means of the spectroscope, that the solution contained no longer copper, but another metal, calcium, the base of ordinary lime. The experiment was repeated with other metals and with corresponding results. Nickel was thus changed into cobalt, and calcium into strontium. All these bodies, as is well known, have ever been regarded as elementary, that is, as incapable of being resolved into any components, or of being changed one into another. It is on this basis that all modern chemistry is founded, and should Mr. Lockyer's discovery bear the test of further trial, our entire system of chemistry will require revision. The future possibilities of the discovery it is difficult to limit.

"The great object of the old alchemists was, of course, to transmute base metals into gold, and so far as our knowledge goes there is no more reason why copper should not be changed into gold as well as into calcium. The means at present employed are obviously such as to render the process far more costly than any possible result can be worth; but this is necessary the case with most scientific discoveries before they are turned into commercial facts. I am not, of course, holding out any probability that such will ever be the case; but an attitude of mere incredulity is by no means justifiable in the matter.

"Mr. Lockyer is one of our best living spec-

troscopists, and no man with a reputation such as his would risk the publication of so startling a fact as he has just announced to the scientific world, without the very surest grounds. He is known by his friends as somewhat sanguine, and he does not pretend to be an accomplished chemist, but he was supported on Monday by some of our leading chemists, all of whom admitted that the results of his experiments were inexplicable on any other grounds but those admitting of the change of one element into another, unless, indeed, our whole system of spectral analysis is to be upset, the other horn of a very awkward dilemma. He has already made a communication to the Paris Academy of Sciences on the subject, and he is about to read a paper before our own Royal Society, in which we may hope to learn the results of his latest experiments, made since the paper was read at Paris. For this full account of his researches we shall look with no small interest, for, since a hundred years ago, Priestly discovered oxygen and founded modern chemistry, there has been, there could be, no discovery made which would have such an effect on modern science as that the so-called elements were no longer to be considered elementary."

## CLEANLINESS OF STABLES.

## An Essential to Healthy Horses—A Fact Not Appreciated.

We frequently come across remonstrances against keeping harness in stables, the reason given being that the ammonia prevalent there rots the leather and soon destroys the harness. Now this is beginning at the wrong end to remedy an evil. We may talk and advise "year in and year out" about this matter, but harness will be kept in the stable in spite of all. Where else can the majority of people who keep horses hang these trappings? A rich man may have a closet in which the harness may hang safely from fear of ammonia and other dangers; but the average horse owner will have his peg behind the beam, because he can have no other way of disposing of the harness. But the trouble would end if the production of ammonia was prevented. Enter an ordinary stable at any period, but especially in the winter, when every cranny through which the wind can come in is carefully stopped, and what an offensive odor offends the nostrils and irritates the eyes! Is this odor of ammonia, strongly alkaline and irritant, injurious only to the harness? What of the horses, and the tender membranes of the eye, the throat and the nasal passages? Do you think they are less sensitive than oak-tanned harness leather, well greased and preserved as it is? By no means. If the prevalent odors injuriously affect the leather, you may be sure the eyes suffer; the throat and lungs are irritated, and the nasal passages become inflamed. Then occurs the frequent moon blindness; ophthalmi, weeping of the eyes, followed by inflammation, white specks, clouded cornea, and finally loss of sight; then followed coughs, bronchitis, pneumonia, heaves, catarrh, nasal gleet; and by and by, when the blood has become poisoned by the absorption of diseased matter from inflamed and suppurated membranes, farcy and glanders—dreadful and fatal to man and beast, to result. And while we think of saving the harness and removing it to a purer place, the beast which is worth a dozen set of it, is left to rot from these pungent gases without any help. Clean the stables, and the harness may hang in them safely; and be sure, if the stable is not a fit place for the harness, it is no place for the horse. A barrel of plaster can be procured for about one dollar. It is worth that as a fertilizer. It is worth ten dollars as absorbent of ammonia, and a hundred as health-preserver for the horses, not counting the saving to the harness. Sprinkle it everywhere and be liberal with it.—*Rural New Yorker.*

## MILLERS IN THE WEST ARE EXCITED.

The millers in the great milling States of the West are making opposition to farmers, binding grain with wire. They claim that short and small pieces of the wire get into the stones and bolting cloths, seriously injuring both. The Minnesota millers have passed a resolution that the price of wheat be degraded 10 cents per bushel under corresponding grade in purchase of any wheat containing wire. The Wisconsin Millers' Association, held recently at Milwaukee, did not take any active measures against wire binding, though the subject was discussed. At a late session of the Illinois Millers' Association a resolution was presented by the Secretary to the effect that the use of wire bindings is injurious to mill machinery, and, therefore, millers, as a

class, recommend a discontinuance of the wire binders in favor of cords or other binders that work no injury to the machinery.

The *Prairie Farmer*, while earnestly advising every wheat-grower not to allow the wire to pass through the thresher (a careful supervision of the work will prevent this), says that the damage to the grain for millers' use could never under ordinary circumstances amount to anything like the price stated by the Minnesota millers, and a fair inference is that they have prescribed this acute remedy with a view to driving wire-binding machinery out of use. This they will never do until the twine and other binders are made to work successfully, though it may result badly for the millers of the State by causing the best grades of wheat to be carried out of the State for milling. When labor is scarce during harvest, the farmers will bind with wire until some other economical means are provided them. If the great wheat fields of the West should be compelled to go back to the old system of binding by hand, the crop would rot in the fields. The journal quoted from recommends millers generally, rather than make the onerous discrimination of the Minnesota millers in regard to wire-bound wheat, to use their inventive faculties in discovering some means to free the wheat from the wire, if it will be cheaper than wearing the stones and the bolting cloths. The *Iowa State Register*, commenting on this opposition, says the binding wire is smooth, soft iron, easily mashed, and cannot possibly do the damage claimed; but that, being unrestrained in their toil, now when the farmer sees a plan of escape from the exorbitant charge of harvest hands, the millers are moving to take the last item of profit in the production of grain.—*N. Y. World.*

## ROACH OR RAISIN?

The great Napoleon once sat down to his breakfast, and, breaking in two a roll, saw in it a roach. Closing it again he laid it down, and sent for the Marshal of the Palace to inquire from whom the bread for the imperial household was procured. He learned that a "Baker of the Palace" was kept, who drew a large salary for himself and a proper number of journeymen bakers; that he did not work himself, but merely looked over his subordinates.

The Emperor ordered him to be called, and soon the baker, very greatly astonished, and also very uneasy at the honor, made his appearance.

"Are you the Baker of the Palace?" said the monarch, with a look that bode no good.

"I am, sir," was the answer.

"What is this, then?" continued Napoleon, holding up to him the roll, and pointing at the roach.

But the baker was a man of wit and presence of mind; taking the bread from the hand of the Emperor, as if he was short-sighted and wanted to look at it closely, he quickly bit off the part that contained his guilt, the roach, and swallowed it, saying: "It is a raisin, your majesty."

The Emperor could not help admiring the answer, and contented himself with telling him "very well, but never put any raisins into my bread again."

TWENTY-FIVE YEARS' WARS.—The following figures have been carefully compiled by a contemporary from the official statistics of the various nations concerned, and include, in addition to the troops slain, a portion of the deaths occasioned by the ravages of the wars among the civil population: (I.) Lives lost, 1852-77—Killed in battle or died of wounds and disease—Crimean war, 750,000; Italian war (1859), 45,000; war of Schleswig-Holstein, 3,000; American civil war—including both North and South—800,000; war between Prussia, Austria and Italy, in 1866, 45,000; expeditions to Mexico, Cochín China, Morocco, Paraguay, etc., 65,000; Franco-German war of 1870-71: France, 155,000; Germany, 60,000—215,000; Turkish massacres of Christians in Bulgaria, Armenia, etc. (1876-77), 25,000. Total, 1,948,000. (II.) Cost, 1852-77—Crimean war, £340,000,000; Italian war of 1859, £60,000,000; American civil war; the North, £940,000,000; South, £460,000,000—£1,400,000,000; Schleswig-Holstein war, £7,000,000; Austrian and Prussian war, 1866, £66,000,000; expeditions to Mexico, Morocco, Paraguay, etc. (say only), £40,000,000; Franco-Prussian war, £500,000,000. Total, £3,813,000,000.

A man was boasting that he had an elevator in his house. "So he has," chimed in his wife, "and keeps it in the cupboard in a bottle."

## WINDMILLS.

Windmills do not seem to have been known to the Greeks and Romans. The earliest traces of them are found in Holland, and the fact that they are still in use there (many of the mills being of large size) combined with the known habits of thrift of the Dutch, prove that there are strong reasons for their universal use there that may be derived from the flat conformation of the country. They have been found profitable and safe investments, and so they could in the United States as well, but of course on a still larger scale. In the construction of the windmills of Holland the usual form is a square or round tower of wood, stone or brick. Many of such can be seen on Long Island, where the Dutch originally settled in this country. There is one in a good state of preservation in Flatbush, King's county. The main shaft, at or near the top, is inclined at an angle of about ten degrees, and carries four arms with widening vanes or sails. The arms are formed concave toward the wind, and the sails or slats should be set at an angle to arms of seventy-two degrees at the extremity nearest to the shaft, and eighty-three degrees at the outer circumference. These proportions have by many experiments been found to be most effective. Since the velocity of the different parts of the sail is in proportion to their distance from the axis, it follows that in order to produce the greatest effect, every elementary portion of it ought to have a different angle of weather, diminishing from the center to the extremity of the sail. Smeaton found by a series of experiments that when the sails were weathered concave to the wind, and the angle of inclination was greater toward the circumference, the effect was much better than when weathered in the common way. But the effect was greatest when the sails were largest at the outer rim, so that the length of the latter was equal to one-third of the length of the arm from axis to circumference.

It appeared from Smeaton's experiments that the most efficacious angles at the different parts of the sails were as follows:

Arm of axis to circumference divided into six equal parts.	1.	2.	3.	4.	5.	6.
Angle with the axis.....	72°	71°	72°	74°	77½°	83°
Angle of weather.....	18°	19°	18°	16°	12½°	7°

From this it will be seen that the surfaces of the sails should be helical, or nearly so, while in action.

As the sails are twisted somewhat by the action of the wind the surface is more helical when in motion than when at rest. In the best forms of mills the thin venetian slats, of which the sails are composed, are made so as to open partly by the increased centrifugal force when the mill runs at too high a speed. The velocity when unloaded is considerably quicker than the wind. Those mills have caps bearing the main shaft, large cogwheels and sails, and the cap or dome revolves horizontally by means of friction rollers on an iron bed. The cogwheel working into a pinion on an upright shaft below gives motion to all the machinery. In some cases where slow motion only is wanted, the pinion is on the main shaft, and works into a large cogwheel. In the more modern mills the cap is made to revolve, and the sails to face the wind by a wheel opposite the sails, and not unlike a screw-propeller with straight vanes, but little inclined to the axis of rotation, so that when the wind is directly in front the wheel is motionless, but revolves to one side or the other as the wind changes, and by a small pinion working into a larger cogwheel turns the cap so that the sail always faces the wind.

Horizontal windmills are almost unknown in the United States, although several patents for them have been obtained, and they are in little use to any country save Spain and Persia. Their effective force is less than the vertical mill, being about one-eighth. It is probable, however, that this form of mill could be improved if attention were bestowed on it, and the same principles applied in directing the wind on the vanes and the exit therefrom as has been the mode of applying water to the turbine.

The windmills of Holland are of great importance to the existence of the dykes and the sanitary condition of the land. From the high cost of fuel there it is doubtful whether without them there would not be a most unfavorable revolution in all the business of the country, as they are used for a multiplicity of purposes.

The general appearance of the large grain mills of Holland is as follows: The basement is of stone or brick, supporting a tall superstructure of wood, capped with the revolving hood which carries the main shaft and sails. The outside is handsomely thatched with straw. In the first story the granary and

meal rooms, into which the seven or eight kinds of flour and feed come from above through spouts. The second floor is for bolting and separating. The third is the grinding room, where there are usually about three pairs of five-foot stones. In a strong wind all these can be run, but almost the lightest breeze is sufficient for one pair. The Dutch mode of using a regulator to set the stones close together is not to be commended. There is a hoisting apparatus by which all the grain to be ground is elevated through the trap doors to the fourth story, from whence it descends to the stones. This room contains the cleaning machinery, and just above is the ponderous main shaft, which, with a slow grunting movement through cogwheel, pinions and bevel-wheels, turns all the heavy machinery throughout the mill. Some attention to this subject has impressed on us the belief that an important productive force might be developed here by advancing the windmill from being little more than an agricultural implement until it shall approximate to a machine of first-class power.

## THE POPPY AS FOOD.

BY ALEX. FORSYTH.

"My bane and antidote are all before me." This subject cannot be too often insisted on, for no one will believe that anything good could possibly come out of a poisonous poppy head. The milk is a deadly poison if taken in large doses, but the seed is a valuable article of wholesome food, and besides being used as bread, a clear oil may be expressed from it, fit for domestic use, much after the fashion that we use butter. In reading up some very old books, I lately came across this article, and the author gave extracts from those before his time, to the effect that people mixed poppy seed with their bread; and as this view of the subject was so very simple and practicable, I thought I could do my friends some service by getting them first to grow poppy seeds, and then get them mixed with bread, as this half measure would take away all ideas of cooking the article for home use. A friend, who had lived some time in Hindostan, told me of the immense quantities of poppy seed that changed hands in some of the markets there. The juice of the husk, or, so to speak, the poppy head, is the deadly opium of commerce, but the naked seed is wholesome food, and the oil when expressed fetches a high price; surely, then, a plant of such easy culture and so marvelously prolific need not be neglected any longer. How often has the tale of the grain of wheat cast into the earth been told by agriculturists in every age, and yet we see it cropping up now and then in the form of some theory to mend its condition, either to increase the quantity or improve the quality, such as by some early variety to catch our best days of summer, or some new manure suited to one locality, yet indifferent to another; yet it is but the grain of wheat after all, the old, old story—but nothing is trivial that brings sustenance to either man or beast. Some plants have inherited a bad name and richly deserve it, whilst others, meritorious, suffer and keep still until their virtues find them out. The poppy is a notable example of having both these characters—one good, the other bad. It is quite beyond the state of the question here to say anything either for or against the poppy, for it has been a bugbear to nations for the last 100 years, on account of the deadly drug opium obtained from its husk; but here the tune is changed, and the poppy seed comes to the front, quite able to justify its introduction into agriculture. Over and over again have I advocated the culture of this rampant annual. It suits our climate, as it has plenty of time to flower and ripen seed in our Northern summers, and grows freely in all soils and situations. Its seed is cheap, and it is never adulterated, always true to name. It is a plant of rapid growth, strong in the stem and branches, needs no stakes or props. The ripe seed has a fine nutty flavor, and is eatable from the husk or head, and it needs no miller to grind it before using. But this plan of the ancient growers, to mix it in the dough with the batch of bread, is an easy way to get it introduced into the household economy. The prolific character of this plant, the *Papava somniferum* of the botanist, is something almost incredible. A good full-sized head, such as we see in druggists' windows, will contain not some sixty and some hundredfold, but several thousands. I have counted them to see what an acre of ground would take at nine plants to every square yard, and find that one plant would carry 50,000 perfect seeds, and if this yield is to go for nothing scientific farming is a failure. Moreover, the seeds are protected

from the weather in harvest time, and this in our hilly ground and northern countries is a thing of considerable moment.

"FORGET THEE?" wrote a young man to his girl, "forget thee? When the earth forgets to revolve; when the stars forget to shine; when the rain forgets to fall; when the flowers forget to bloom; then, and not till then, will I forget thee." Three months later he was courting another girl, with a squint and ten thousand pounds.—*Figaro*.

ALUM IN FLOUR.—A French scientist, M. Buchner, has discovered that a single drop of alcoholic extract of Campeachy wood, placed upon pure flour or bread, will cause a brownish-yellow stain. If the flour contains alum, in the proportion of 1 per cent or 2 per cent, the color will turn to a greyish-blue or violet grey. With 1½ per cent of alum, the tint is reddish-yellow with a border of grey-blue, and small blue spots can be discovered by examining it with a lens; ¼ per cent of alum is the limit of reaction, when the blue border disappears, although the small spots are faintly discernible.

EXPERIMENTS IN WHEAT CULTIVATION.—Experiments have been made in Michigan in cultivating wheat, and the results are not only satisfactory but astonishing. A committee was appointed to oversee the experiments and make the report. Sixty-eight pounds of seed per acre were sown in drills 16 inches apart, and 90 pounds per acre were drilled in the usual way. That in 16-inch drills was cultivated with a horse wheat hoe once in the fall and twice in the spring; the other of course was not cultivated after sowing. The report says that the 16-inch lot did not lodge or crinkle, while the 8-inch lot did so badly. The average yield was 60½ per cent greater in the 16-inch drills than in the 8 inch drills. The *Agriculturist* remarks: "It is as reasonable to believe that grain crops should be benefited by cultivation as that potatoes, corn, cabbages and other crops should be. Hoeing wheat in Europe is not an uncommon practice, and farmers in this country have begun it with marked success."

IMPORTANCE OF THE CORN CROP.—The importance of the country's corn crop is hardly understood by the general run of readers, since they do not know what a wide basis of prosperity it constitutes. It is the basis of an annual pork crop, comprising at least 10,000,000 head of hogs; its consumption as human food is very large and increasing in both hemispheres; it is more universally fed to stock of all kinds than any other cereal, and is, in a word, one of the most valuable of agricultural products. The acreage of last year in corn reaches 50,369,000, and the yield probably not less than 1,500,000,000 bushels. The exportation of corn has increased from a little over 7,000,000 bushels per annum ten years ago to nearly 90,000,000 at the present time. At this rate of increase corn promises to become the king of commerce. In this connection it is interesting to know that the production of grain of all kinds in the United States is forty bushels per capita against only sixteen bushels for all Europe.

BRAN AS A FERTILIZER.—Mr. Kern, of Lehigh county, Pa., tried bran as a fertilizer for potatoes last year, and reported that it increased the yield one-third. Another experiment on corn is recorded, where it produced marked results, the rows on which the bran was used soon being six inches taller than the other rows. As seed will not germinate in dry bran, it would be well to compost it before using it. Mix it with two or three times its bulk of rich mould from the woods, sprinkle enough manure water on it to make it heat, and then shovel it over until thoroughly mixed. If this is done two or three weeks before using, it will partially decompose it so that in contact with the seed it would not injure it. We read that tobacco growers of the Connecticut Valley use bran in large quantities, importing it from Iowa and Minnesota for this purpose. There is a rich field for experiment in home-made fertilizers, which farmers should work up. There is a fascination in the work of conducting these experiments which pays for the trouble itself, besides the useful knowledge obtained.

December 30th, 1878, the contract was let for extending the Atchison, Cawker City & Denver Railway from Beloit to Cawker City. The end of the division will be at Cawker City, and round-house and machine shops and elevators will be erected. Cawker City is now the liveliest town in the West, and buildings are going up like magic.

## ENGLISH ARTIFICIAL CATTLE FOOD.

Dr. Voelcker, in an interesting paper on the *Influence of Chemical Discoveries on the Progress of English Agriculture*, makes the following remarks upon the articles of food used for feeding and fattening purposes:

"Linseed and rape-cake, especially the former, are largely used for feeding and fattening purposes, and, if pure and in good condition, no food is considered to equal linseed cake for rapidly fattening sheep and oxen.

"Earthenut-cake is occasionally sold in England to the farmer, but more frequently it is bought up by cake-makers, and used for adulterating linseed-cake.

"There are two varieties of cotton-cake. One is made in England from Egyptian cotton-seed, shell and kernel crushed together, and the other is principally imported from New Orleans, and made in America, from the decorticated seed. Decorticated cotton-cake has also been manufactured in Liverpool to a small extent the last year or two from the kernels of cotton-seed imported from America. Both descriptions of cotton-cake are largely used by English stock-feeders. Whole seed cotton-cake has been found very useful to store sheep and oxen out on grass, at periods of the year when they are apt to become affected by scour; and it is also given with much advantage to stock fed upon abundance of succulent food, which has a tendency to keep the bowels in too loose a state. In these cases the astringent principle contained in the husk of cotton-seed acts medicinally as a never-failing corrective. Decorticated cotton-cake, being made from the kernel in which all the nutriment resides, is a much more concentrated food than cake made from the whole seed. On an average it yields about 40 per cent of nitrogenous matters, and possesses high manuring qualities, but it is too rich in nitrogenous compounds to suit by itself the health of herbivorous animals. It is rather indigestible, and requires to be broken up finer than linseed-cake ordinarily is; it should be given to fattening stock more sparingly, and mixed with about twice its weight of Indian corn or barley meal, or meal rich in starch and comparatively poor in nitrogenous compounds.

"Experience further has shown that, when sheep are put on rough poor pasture, on which they are obliged to ramble over much ground in order to pick up sufficient food, the very best means of making the most of the wiry herbage, and to keep the sheep in good condition, and at the same time to materially improve the grass land, is to allow them from one-half to three-quarters of a pound of decorticated cotton-cake per head per day. In that case it is essential, for maintaining them in good health, to give the sheep free access to water.

"Cocoanut-cake and palmtree-kernel cake and meal are produced at Liverpool and other places in England, and are much appreciated for their fattening properties. These cakes contain from 14 to 15 per cent of albuminous compounds, and variable proportions of oil, and are better adapted for fattening stock than for young growing animals or store stock.

"Locust beans in the shape of meal, containing on an average from 50 to 54 per cent of sugar, are much relished by horses, oxen, and sheep, and are used in England to a considerable extent, and with advantage, as an addition to other and less palatable food. Locust bean meal is also a favorite addition to almost all compound cattle foods, compound feeding-cakes, and cattle-spices sold in England.

"Rice-meal, obtained in preparing rice for consumption, is rich in starch, the better qualities generally containing from 7 to 8 per cent of oil, and about the same proportion of albuminous substances. It is largely employed in England for fattening pigs.

"Another good fattening grain which is seldom seen on the Continent, dari or durra grain, the seed of the *Andropogon Sorghum*, is occasionally imported into England, and sold at a cheap rate.

"Indian corn, foreign beans, oats, and barley complete the list of the concentrated foods most frequently employed in England for feeding or fattening purposes."

Maine's once prominent industry, ship-building, gives employment to a constantly decreasing number of persons, not half the work that was done in the season just closing that was done in the previous year. Indeed, only eleven ships were built in the State, and of the ninety-six vessels constructed, the average tonnage was only 425, or, taking out the ships, less than 300. The prospect is that less ship building will be done in 1879 than in any single year in the last thirty.

GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Klencke expressly for the UNITED STATES MILLER.—cuts reproduced by our special engraver from the original.]

GENERAL REMARKS.

Those plants which belong to the botanical family of cereals we call grain, or, speaking more generally, they belong to the grasses and furnish flour in their seed. Of these, Germany produces especially wheat, rye, barley, oats, maize or Indian corn, and consumes rice in the granular form and as meal. As is well known, the meal of these plants is obtained from the seeds which are ground. According to the finer or coarser grinding, the number of times it passes through the mill, the bolting, and other well-known methods, white and gray, fine and coarse kinds of flour are distinguished; but by these terms the real quality and nutritiousness is not exactly expressed. They are only the characteristics which are of importance for the mode of application and the technical purposes of the kitchen and the bakery, for we shall soon find that the coarser and gray flour, when it is unadulterated, is by far more nutritious than the finer and whiter flour. Grain consists of two kinds of ingredients, which in a double way give it importance for nutritious purposes, and at the same time its value in commerce, namely, of such substances which contain no nitrogen, and such as do contain it. This distinction is not only of chemical interest, but is also of great importance for the value of grain as a nutriment, since it has been ascertained by physiological experiments that the process of organic life of animals as well as of men necessarily and indispensably requires both kinds of substances to sustain it, those which contain nitrogen as well as those which do not, or the albuminates and carbonic hydrates in suitable proportion (1: 4 to 5), and that those ingredients of all food which do not contain nitrogen merely pass through the organism as fuel, sustaining breathing, producing heat, and in the form of carbonic acid and water, that is as substances consumed by the oxygen, are removed from the organism, while all those ingredients of the food which do contain nitrogen serve for the formation of blood and enter the structure of the organism. Those ingredients which contain the nitrogen are always the most valuable and are present in a suitable quantity, for which reason it is correct to estimate the value of a nutriment according to the amount of nitrogen it contains, that is to say of that substance which will produce blood. We find in grain according to the different kinds of it, different proportions of such ingredients as do not contain nitrogen and such as do; the former present themselves as starch meal, cellular substance, the latter as gluten and albumen. These substances are located in a kernel of grain in such a way that those which contain the nitrogen form the more external layers. For instance, let us look at a perfectly ripe grain of wheat or rye, and we shall find that it consists in the first place of a husk, which is generally formed by three rows of oblong, closely-layered cells. Below this there is a second so-called inner seed-shell, usually formed by a row of oblong thickly-walled cells, the inner cavity of which is only very small. Then follows a layer of large, dark, strong cells, which contain the gluten; and now at length follow the large, six-sided cells which form the bulk of the seed, and enclose particles of starch besides albumen. By grinding, the harder husk and gluten cells are separated from the softer starch-cells. They resist the finer disintegration by the mill-stones and form the bran. The more the flour is freed from its bran, the less of gluten will it contain—that is, of such substances as will produce blood; for while the cells of the husk contain from about 3 to 4 per cent of gluten, the third (gluten-cells proper) layer contains from about 14 to 20 per cent of it. Moreover, there is a proportion of gluten distributed in the starch-cells also, but in comparison to the glutinous contents of the separated bran, in only a very small quantity. By a very simple method the two principal components of grain,

the starch and the gluten, may be separated. To a certain quantity of flour so much water is added that the former is thoroughly moistened, and a dough can be made of it; this dough is kneaded with both hands until it presents a uniform, elastic and soft mass; it is then placed over some vessel that is covered with a hair-sieve, or has a muslin cloth spread over it, and is kneaded so long on this filter, while a fine jet of water is poured over it, which, as it were, washes out the dough, that the water which is filtering through ceases to have a milky color. On the sieve or cloth there will only remain a sticky, gluish, whitish mass which had before rendered the dough tough. It is the gluten. The milky water that has been filtering through is allowed to stand for some time; it becomes clear and forms a white pulverized sediment which consists of starch. Good flour must furnish from about 8 to 10 per cent of dry gluten and 65 to 70 per cent of starch by this process.

The quality of flour is injured not only by the admixture of sand, gypsum and cawk which are fraudulently mixed with it, but also by vegetable and animal substances, which have either accidentally found their way in it or which are the result of the decay of the grain or flour. It is of great importance to discern whether the flour is injured by the admixture of germs of fungi, so-called sporules, or of other components of diseased forms of the ear of grain, since diseased grain is very often ground and sold, and then produces poisonous bread. The microscope most readily discloses such admixtures, when suspicion has once been aroused by the outer appearance of the flour, or when diseases of the grain are especially frequent and general. Among the vegetable admixtures ergot, smut and dust are of special importance.

A fungus called *Uredo caries* or *sitophila*, (Canker) is developed in the seed-bud of the different kinds of wheat; it may already be discerned, before the ears emerge from the sheath by its bluish color and it renders the later lighter grains speckled. It grows exuberantly in the substance of the corn with rather large sporules, which are black, globular, and have a greasy touch, disagreeable odor, soil the mill-stones, and not only give the flour which is mixed with them an unnatural color, but they also have an injurious effect upon the health of the consumers. Although a good, honest farmer should separate such diseased corn from the healthy by sifting, winnowing and washing (whereby the diseased grain will float on the surface of the water) yet there are a number of dealers who allow it to remain and be ground into flour. By the use of the microscope one is enabled to discern and point out the sporules of these fungi immediately among the particles of starch. Fig. 1 represents these sporules magnified 420 times. Smut (*Uredo segetum*) is a parasitic fungus whose sporules are smaller, globular, and look like soot. On the leaves of the different kinds of grain it forms a blackish dust which rubs off and falls off easily and will therefore rarely be mixed with the flour, but it adheres to the straw and is injurious to cattle. Fig. 2

shows it magnified 420 times. Ergot, *Sclerotium clavus*, or also called *Secale cornutum*, is a crooked, sporule-like excrescence, which is furrowed lengthwise, from 14–18 min. long, which is externally of a purple-black hue, internally is white, reddish and pulpy, and makes its appearance in wet seasons, especially in rye, wheat and cockle. This excrescence is a morbid degeneration of the seed-bud, a parasitic development of the fungus, which suppresses the full growth of the healthy seed. Ergot is found very often in flour, and when present in considerable quantity it gives rise, when partaken of, to a dangerous disease, which in some years and countries becomes epidemic. It is called raphania, *Morbus cerealis*, affects the nervous system in particular, and its principal symptoms are convulsions, painful itching and paralysis. A very careful separation of the ergot from the grain is of great importance, but still there are some unconscientious farmers who allow considerable quantities of it to remain in the grain. The microscope will also disclose the presence of an admixture of this kind in flour that seems suspicious, for it will discover the peculiar cells of sporules, which are characteristic of ergot among the starchy particles. Fig. 3 represents the surface of a cross-incision of ergot magnified 420 times. In *a* the rows of colored cells with the sporules which are developed in them may be seen, in *b* the reddish-colored parts, in *c* the cells which contain oil. These three parts are much more magnified (670 times) in order to give a clearer idea of their character, and of how the ergot when ground is distributed in the flour. According to Jacoby ergot can be perceived in flour when 10 g. of the suspicious-looking flour are treated with 30 g. of boiling alcohol, is then allowed to settle, the liquid poured off, and the residuum treated again in exactly the same manner; then the residue out of which by the above-named process all the greasy substances have been taken, is poured out, put into a test-tube with 10 g. of alcohol of 90 deg. and shaken therein; then when the flour below the colorless alcohol is settled, from 10–20 drops of sulphuric acid are added, the mixture is well shaken and then again allowed to settle. A liquid is then obtained which will be more or less red according to the amount of ergot contained in the flour. But if the liquid remains colorless, the flour is pure and free from ergot. According to Elsner and Wettstein, 1 per cent of ergot in flour is sufficient to turn it red when it is sprinkled with water.

19,000,000 bushels annually. This vast wheat product mostly finds its way into the manufacture of the "staff of life," and helps to constitute the second largest industry in the Keystone State. In Pennsylvania there are 2,985 flour mills, which are supplied with 8,019 run of stone. The valuation of the annual product of these establishments is over \$50,000,000, while employment is furnished in and about them to between 12,000 and 15,000 industrious and deserving operatives.

The members of the Pennsylvania State Millers' Association while mingling together at the Stevens House, Lancaster, on their meeting-day, Tuesday, January 14th, had many private discussions outside of the regular business of the conference. It seemed to be the impression of all that a new era is dawning upon the milling industry of Pennsylvania, and the really enterprising millers of the State are preparing to take advantage of the anticipated good times that are approaching. There has for many years existed a proverbial and strong spirit of old-fogyism in the flour milling districts, and many of the otherwise worthy "dusty millers" have allowed themselves to be contaminated with its influence. There are some things that, after once becoming settled upon any class of people, are extremely difficult to eradicate, and one of these peculiar things is old-fogyism. This incubus has been allowed to twine itself around the important flour milling industry of Pennsylvania, which is centered in what is known as the "Pennsylvania Dutch" region of the commonwealth, where a strangely peculiar, superstitious and shrewd and sharp-bargaining burghers are large mill owners.

Unfortunately for the flour manufacturing interest the "Pennsylvania Dutch" millers, while occupying, and almost entirely monopolizing, the very heart of the flour-producing country,—Lancaster, Montgomery, Berks, Lehigh, Bucks, Northampton, Dauphin, York, Franklin, Northumberland, Lebanon, Columbia and Montour counties,—have always been highly instrumental in retarding the growth, improvement and prosperity of what, had it not been for this checking influence, would have been the foremost industrial interest in this State. Undoubtedly the "Pennsylvania Dutch" element, while very thoroughly practical, competent, and honest in the manufacture of flour, has been an impediment to the enterprising, actively-moving and more go-ahead millers. The members of the Pennsylvania State Millers' Association having, at last, apparently discovered what may result in possible defeat to some of their plans, are endeavoring to inculcate new and more intelligent and promising ideas among the slow-moving, suspicious and too economical "Pennsylvania Dutch" millers. To change the opinions of the old-style, stolid and peculiar-thinking grinders of wheat, rye, corn and oats, will be a hard matter, indeed. If the millers accomplish the conversion of their sturdy, uncultured "Pennsylvania Dutch" brethren to their ways of thinking, it will take them a life-time to get them to adopt the new processes for manufacturing flour. However, the gentlemen who have undertaken the work of civilizing the "Pennsylvania Dutch" millers, have the heartiest wishes of the UNITED STATES MILLER correspondent for their success. There is no doubt that a much more powerful State Millers' Association could be established in Pennsylvania than the present one,—which is, however, very excellent and influential,—could the majority of the millers in the districts previously enumerated be persuaded to become members of the organization.

The good work of the exportation of American manufactured flour and mill machinery for the manufacture of the "staff of life" is still pursued with an activity, and corresponding profit, that must, eventually, result in the accumulation of fortunes to the parties who are engaged in the shipment of the flour and machinery. It is understood that a prominent iron-ware-goods manufacturing house of Philadelphia will, in the spring, construct for erection, at Para, South America, an entire iron building to be devoted to the business of flour manufacturing. The building will be shipped in pieces, and workmen will go to the place of its destination and put it up. This novel flour mill will be fully supplied with improved machinery, and will have 150 run of stone. A practical miller will be sent from Philadelphia, by the company who are interested in the enterprise, to take charge of the establishment after it is in working operation. A New York flour mill machinery firm are also contemplating the construction of an extensive flour mill on the line of the new Madeira and Manore railroad, in South America, and it is expected that the contract for the material and work will be completed within a month or so. From all this, it can certainly be concluded that America is destined to lead in this particular enterprise, which must bring prominence and affluence to the projectors. T.



FIG. 1. SPORULES OF CANKER (*UREDO CARIES*) FOUND IN UNHEALTHY FLOUR, MAGNIFIED 420 TIMES.

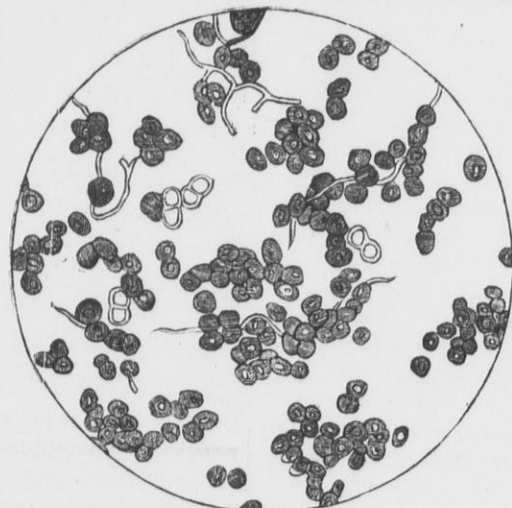


FIG. 2. SMUT SPORULES (*UREDO SEGETUM*) MAGNIFIED 420 TIMES.

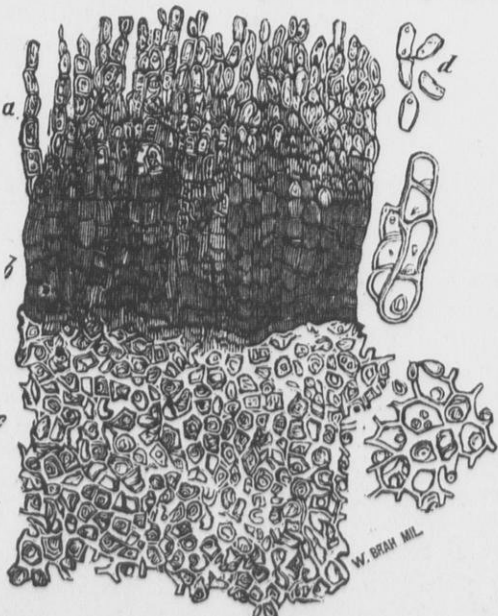


FIG. 3. SURFACE OF A CROSS INCISION OF ERGOT (*SCLEROTIIUM CLAVUS*), MAGNIFIED 420 TIMES.

[To be continued.]

FLOUR MILLING IN PENNSYLVANIA.

[Special Correspondence United States Miller.]

HARRISBURG, Pa., January 20, 1879.—The flour milling interest of Pennsylvania still continues to improve in its different departments, but there has been no particular augmentation of the flour product since my last letter. According to the statistics, as gathered from official and trustworthy sources, by the UNITED STATES MILLER correspondent, it is found that the wheat crop of this State is on an average

## EVERYBODY READS THIS.

## NEWS OF THE WORLD.

## Items Gathered from Correspondents, Telegrams and Exchanges.

## Alabama.

One miller has been elected to the Legislature in Alabama.

## California.

The oil well at Los Angeles is flowing at the rate of 100 barrels per day.

The last day of 1878 was a rainy one throughout California. The rain-fall in the southern portion was heavy.

## Delaware.

T. R. Smith's mill at Lincoln, burned. No insurance.

## Florida.

Cedar Keys shipped 840,000 pounds of fish last year.

Ice formed in Jacksonville Jan. 8th, for the first time in 30 years.

## Iowa.

Iowa Falls is to have another oat meal mill.

H. Hanchild, grain dealer and elevator owner at Belle Plaine, has failed.

A stock dealer at Le Mars, recently purchased 10,000 bushels of corn for 8 cents per bushel.

It is estimated that rats have done a million dollars worth of damage in the State during the past year.

## Illinois.

Chas. Alken, a Chicago mill-owner, died recently.

Asa Dew was elected President of the Chicago Board of Trade January 6th.

Receipts of wheat at Chicago for the year were 30,000,000 bushels; of flour, 3,120,000 barrels.

The Honore block in Chicago was partially burned January 4th. It contained the Post-office, military headquarters, railroad and law offices. Damage, \$100,000 to \$150,000. Fully insured.

A summary of the manufacturers of Chicago foots up, in round numbers, 2,617; the number of workers is 67,504; the aggregate wages paid is \$31,007,000; capital employed, \$85,782,000, and the value of the product, \$227,560,000.

Chicago city mills manufactured last year 300,000 barrels of flour. The direct exports of flour from that market during the year were about three times as large as in 1877, and indications are favorable for a growing business.

## Indiana.

Nordyke & Marmon Co., of Indianapolis, are shipping burrs, gearing and bolts for a model little custom mill to W. A. Adams, of Greenville county, South Carolina.

The following letter to Nordyke & Marmon Co., explains itself: "Office of Attica Mill Co., Attica, Ind.—I inclose N. Y. draft for full amount of your bill, and accept our thanks for favors shown us. Since we replaced the purifier with the Smith we are doing excellent work. Yours truly, J. C. Aylesworth, President."

## Kansas.

New flour mill at Topeka soon.

The State Treasurer at Topeka paid off all claims for salaries, December 31st, in gold.

Verling & Hale, proprietors of Pioneer Mills, at Florence, have dissolved partnership.

The Atchison, Topeka & Santa Fe road has reduced its passenger rates to four cents per mile.

Thermometer indicated 18 degrees below par during New Year's week in different localities in the State.

Work on the railroad to Cawker City has commenced. Cawker City is the liveliest town in the State just now. A corner lot just sold for \$1,000.

Kansas is a growing State. In 1860, says the *Atchison Champion*, she had only 8,600 inhabitants, and now her population is no less than 750,000, with the prospect, in another year, of having 1,000,000. In 1860 she raised but 194,173 bushels of wheat; in 1878 she raised 32,000,000 bushels. In 1860 Kansas raised only 6,150,727 bushels of corn; in 1878 she raised over 100,000,000 bushels, and from present indications next year's crop will far exceed this.

As an example of the extent to which the

milling interests have grown in the State of Kansas this last season, we will state that the Nordyke & Marmon Co., mill furnishers at Indianapolis, Ind., have shipped to the above named State complete flouring mills, which were erected at Burrton, Wichita, Pawnee Rock, Washington, Cawker City, Parsons, Lane, De Soto, Abilene and Sun City, making ten complete mills, which will add 240,000 barrels of flour to the annual production. Nebraska has improved greatly also in the same line; orders for complete mills being received by Nordyke & Marmon Co., from that State, and built at Gibbon, St. Paul, Seely, Central City, Clarksville, Harvard, York, Valparaiso, Norfolk, Glen Rock and Roca Station, making eleven new mills, all of first-class machinery, turning out the best of flour.

## Kentucky.

Charles Long, of Nicholasville, recently attempted to light a fire from a coal oil lamp. The lamp exploded, fatally burning Longly and one child, and seriously burning another child. The house caught fire and was entirely destroyed. He built the fire though.

## Louisiana.

The yellow fever investigating committee have completed their labors at New Orleans and have returned to Washington to prepare their report.

At New Orleans a project is under discussion for the establishment of a gigantic cotton warehouse, capable of containing 2,000,000 bales each season. The site has been selected, and has a river frontage of nearly half a mile. There will be eight presses each with a compressing capacity of 2,000 bales every 24 hours.

The New Orleans papers speak of an important revolution in sugar making in Louisiana, the old system giving way to what is now called the central factory system. The former plan was for each planter to be his own sugar maker; the new one is for the planters to take their cane to a central sugar factory, leaving them to manufacture it into sugar and molasses. The merits of this system are that it renders it unnecessary for every planter to own a large and costly sugar mill; that it enables small farmers to have a local market for their cane crop, and that by concentrating the sugar making for a district into one large establishment, supplied with improved machinery, it insures a more perfect expression of the juice from the cane, greater economy in the manufacture, and a better quality of sugar.

## Minnesota.

Archibald mill, at Dundas, is being greatly improved.

A company has been formed to build a flour mill at Media, Benton county.

Red Wing millers want the Legislature to change the law relating to grading grain.

It has been concluded to rebuild the Dundas steam flouring mills larger and better than before.

A stock company has been formed for the purpose of building a flouring mill at Minden, Benton county.

The New Ulm steam flour mill uses bran for fuel. It will only sell for \$5 per ton and wood costs \$4 per cord.

The millers of Red Wing are offering 300,000 bushels of Northern Pacific wheat of the crop of 1878, to farmers, at cost.

A Bohemian at Owatonna recently fell off a load of bran and broke his neck. He might better have fallen on to a load of bran.

The new mill being built at Mankato by R. D. Hubbard & Co., will have 12 run of stone, with a capacity of 500 barrels per day of 24 hours.

Many mills in Minnesota have stopped doing merchant work and confine themselves to custom work on account of the poor quality of wheat in their section of the country.

The *Rochester Post* says it is undecided whether Mr. John M. Cole will rebuild his mill or not. Including the original purchase money, the mill and elevator cost \$75,000.

A company has been formed who will build a new grist mill in Benton county during the coming year at Minden. The men who have this enterprise in hand are Messrs. D. S. Burns, J. G. Brennan and Wm. Brennan.

B. F. Paul purchased at his mill at Henderson, on January 7th, 3,000 bushels of wheat. Over one hundred wagons were at the mill during the day. Seven thousand bushels of wheat were taken in at the mill in three days.

The *Winnebago City Press* says: "Bran is now being used exclusively at the Winnebago City mills for fuel. It is worth about \$3.50

per ton for fuel. From a day's burning there is about a bushel-basket-full of clinker results."

The *Red Wing Advance* gives some business statistics, showing a grand total of 190 business houses, companies and corporations, giving employment to 1,110 persons, whose total sales or business transactions amounted to the sum of \$9,351,724 during 1878.

Messrs. Griggs, Johnson & Foster, of St. Paul, are about to build a large flouring mill at Duluth. The location is a favorable one; 200,000 bushels of wheat are now in the Duluth elevators awaiting opening of navigation. The total elevator capacity is said to be 360,000 bushels.

L. F. Hodges in his report to the St. Paul Chamber of Commerce highly condemns the "little brass kettle" used in testing wheat, and promises to submit evidence of a startling nature before a Legislative committee of investigation. He contends that it is a great swindle on the farmers.

The proprietors of the new Diamond flouring mill at Owatonna, give notice that after January 1st they will confine their business to custom work, it being impossible to make from this year's crop a brand of flour which shall successfully compete in outside markets with that made from the better grades of wheat in the northern parts of the State.

Strait, of Minnesota, has introduced a bill to promote and improve the navigation of the Mississippi River, which provides that the sum of \$150,000 be appropriated, to be expended under the direction of the Secretary of War, for the purpose of testing the practicability of improving the navigation of the Mississippi River at such point or points as he may deem best for the interest of the Government, by the use of the "Adams patent flume;" provided, however, that the patentee, M. I. Adams, shall have the full control, supervision and management of the laying of said flumes.

## Missouri.

Kansas City is attempting to organize a Chamber of Commerce.

H. Euler's new 2-run flour mill at De Soto has just been completed.

It is reported that I. M. Cannon & Co., mill-owners, of Neosho, have failed.

St. Louis Beef Canning Factory burned January 5th. Loss estimated from \$75,000 to \$100,000. Insured.

J. R. Hamacher, at Richmond, is putting up a new mill which is a model in its way. It is three-stories high, including stone basement, frame, 32 by 36 feet, three runs of stone, and motive power of steam. There is an addition 20 by 36 feet for a carding machine. When this mill is fully completed it will be an addition to the business interests of Richmond.

A St. Louis correspondent says: "Our manufacturing establishments continue active. The iron and metal trade remain unchanged, with satisfactory results for the year. Machinery and hardware dealers do not complain, yet at present are quiet—in fact, winter stillness prevails in all trades except in holiday goods. We are rich in cotton, grain and provisions of all kinds, at bed-rock prices. It does seem as though a magnificent prosperity must rise from our enormous surplus of farm products."

The *Chicago Journal of Commerce* says that Mr. Charles Francis Adams has bought lots at Kansas City worth \$40,000, and will build on them a cotton mill and cottages for workmen. Items of this kind are valuable, inasmuch as they indicate the fact that Kansas City is a growing and prosperous place, and a new industry of the kind contemplated will add to her importance. That mills of this kind will pay well in that locality there can be no doubt. Kansas City can obtain her cotton by river from the South, and by rail from Texas, at reasonable freight rates, and the distribution of manufactured goods will extend to all points directly tributary to her. Wherever cotton mills have been erected in the South or West, they have flourished and proved a source of wealth to their proprietors.

## Massachusetts.

Gov. Talbot inaugurated January 1st. Total debt of the State, \$33,020,404, all funded.

The Knowles Steam Pump Works, of Warren, have a large contract with Salt Lake City parties to furnish two huge pumps for emptying silver mines. One pump is to have a forty-four inch steam cylinder and a pumping capacity of 3,000,000 of gallons daily, while the second will be larger yet. As the first machine must be ready in six weeks,

extra machinists are to be hired and the shops run day and night.

## Maine.

Some 2,500,000 bushels of grain passed through the Portland elevator during the past year. Of this amount 900,000 were wheat, 950,000 corn, 350,000 peas, 200,000 barley, and 100,000 oats.

## Michigan.

Samuel Shattuck of Shattucksville, has sold his mill.

John Soners, of Hillsdale, has sold his mill to D. B. Kingon.

Price & Carroll, millers, at Monroe, have dissolved partnership.

Chas. Smith, whose saw mill at Davison was recently burned, is now rebuilding it.

G. E. Dunbar & Co., mill-owners, at Kalamazoo and Comstock, have been burned out.

One hundred and forty barrels of flour were recently shipped from Constantine direct to France.

## New York.

Humphrey & Fraley, millers, of Mt. Morris, are reported to have failed.

Peter Fonda, of Humphreysville, has sold his mill to John M. Felts.

D. T. Wyman has bought out and is running the grist mill at Crown Point, formerly run by D. Wyman.

The *Buffalo Commercial* prints its annual statement of the lake trade of that city, showing that the receipts of flour have been heavy, reaching nearly 1,000,000 barrels, but that they were not so large as in several preceding seasons. The arrivals of grain, however, were far ahead of anything on record. Last year's totals reach 83,547,233 bushels, or nearly 11,000,000 bushels in excess of the best previous year. The lumber trade also shows a marked improvement over the two previous years, the aggregate receipts being 175,820,899 feet, to 139,731,000 in 1877, and 114,582,000 in 1876. But, outside of grain and lumber, the down lake movement shows a general decline, which accounts for the low rates of freights that prevailed last season.

## Nebraska.

The Buzile flour mills, at Buzile, are turning out first-class work. Additional machinery is being put in. The capacity will be 100 barrels of patent flour per day.

## North Carolina.

North Carolina has in two years increased the number of her live stock 800,000, and their value \$4,500,000.

Arrangements have already commenced for a grand agricultural and mechanical fair at Wadesboro, in November, 1879. We are glad to notice such enterprises in the South.

## Ohio.

S. Hughes & Co.'s flour mill, at Hamilton, burned January 4th. Loss, \$18,000. Insurance covers loss.

Levi Runkle's distilling and flouring mill, at St. Paris, burned January 3d. Loss, \$17,000. Insurance, \$13,000.

The Buckeye Engine Company, of Salem, have now in course of construction one pair of 24 x 36 engines which they are building for the Merrimack Manufacturing Company of Lowell, Mass., which will receive much attention, as they are to be connected direct to the line shaft and are to run at 160 revolutions, dispensing with all belts and gears. Each cylinder is to develop 500-horse power.

## Pennsylvania.

On January 4th 700 coal miners near Pottsville struck for higher wages.

Philadelphia boasts that she exported 27,000,000 bushels of grain during 1878.

Philadelphia is to have a line of Dutch steamers to Mediterranean and Baltic ports, the vessels belonging to the Royal Netherland Steamship Company. The pioneer steamers will be the "Stad Amsterdam" and "Stad Haarlem."

The Wingohocking steam flour mills, at Wingohocking Station, are doing an excellent business. These mills are among the oldest and most celebrated in Pennsylvania, and the owners are well deserving of the good patronage received.

The rapid increase in the trade of Philadelphia may be inferred from the fact that in 1878 were received here 970,781 barrels of flour, against 749,330 barrels last year, an increase of 230,451 barrels. Our receipts of corn were 20,261,675 bushels, against 13,926,300 bushels in 1877, the increase this year

being 6,335,375 bushels. Our receipts of wheat were 4,485,000 bushels, against 4,107,400 bushels last year; increase, 378,600 bushels. The receipts of oats were 4,484,000 bushels, against 2,505,300 bushels last year; increase 1,879,700 bushels. The receipts of barley increased from 962,400 bushels in 1877, to 1,346,200 bushels in 1878. Of petroleum 1,900,310 barrels were received, against 1,102,928 barrels last year; increase, 797,482 barrels. We exported (in round figures), 75,400,005 gallons of petroleum, against 49,167,000 gallons in 1877.—*The Press*.

**South Carolina.**

The Union Cotton Press warehouse with contents at Charleston, burned January 1st. Loss, \$575,000.

Jas. Scott, of Greenville county, is building a custom mill of medium capacity, the burrs, machinery and bolts having been ordered of Nordyke & Marmon Co., of Indianapolis, Ind.

**Texas.**

The San Marcos (Texas) *Free Press* says: "Major Nance's new mill and gin is run by a Bookwalter engine, and is very complete. It is three-stories high, and cost altogether between \$25,000 and \$30,000. Major Nance himself has some 10,000 bushels of wheat stored in it, and various other parties have also large quantities, yet there is room for more. The mill is run on what is called the new process, by which the yield is increased and the flour made livelier, stronger and whiter."

The Star flour mills, now being erected in Galveston, will be of four stories, containing five runs of stone now, and four more to be put in by and by, making nine in all, with one pair of steel rollers. The engine will be 125-horse power. The upright of the structure will be heavy frame, weatherboarded, and then covered with corrugated iron, and all surmounted by a fire-proof slate roof. The entire building is to be completed, and the machinery in it and running, on or about the last of February.

**Wisconsin.**

M. Graham, of Oil City, is going out of the milling business.

Counterfeit silver quarters are plenty in La Crosse and vicinity.

Geo. Bruce, of Milwaukee, has bought the Johnson mill at Omro.

Messrs. Mayers, Paepke & Co. have just started their new saw mill at Neenah.

Vraren & Starwell's saw mill, at Green Bay, burned January 5th. Loss, \$6,000. Insurance, \$3,000.

Anson Eldred & Son, proprietors of the saw mills at Oconto and Little Suamico, are talking of moving their mills to Fort Howard.

At Hiner's foundry in Fond du Lac, recently, a young man named Bissex got his arm caught in a belt while slipping it on, and was thrown down and his arm broken.

The Waupaca merchant flouring mills complain that the little custom mills in the neighborhood capture most of the wheat in the vicinity, by making extra offers to the farmers.

Sheboygan county shipped 5,827,476 pounds of cheese during the year of 1878, of which 2,000,000 was shipped directly to Liverpool. S. H. Conwer, of Sheboygan, is the leading shipper.

The Eclipse Windmill Company, of Beloit, have recently shipped five mills to Cuba, and are now making a number on an order from France—as a result of their display at the Paris Exposition.

**Milwaukee Items.**

Madam Elizabeth Puliva Schilz died January 1st, aged 104 years.

The best St. Louis winter wheat flour is being sold extensively by some grocers in this city for \$5.75 per barrel. Many say they prefer it to the best patent.

The Milwaukee brewers and ice houses have been laying in an immense stock of ice of excellent quality. Most of these institutions this year have been supplied with a patent ice elevating machine, which greatly facilitates the work. The horse and pulley have been exchanged for steam power and elevating machinery.

Voechting, Shape & Co., sole bottlers of Schlitz celebrated lager beer, have built up so large a business that they have found it necessary to move into more commodious quarters on the corner of Second and Galena streets. They ship beer not only to all the States and Territories and Canada, but very extensively to Central and South America, the West

Indies, Australia, and even to the *Vaterland* itself. Among their customers for this celebrated beverage they have a few hundred of "ye jolly millers" in different parts of the country. The baker, brewer and miller have always been good friends.

**Canada.**

Marlmen's saw mill and factory at St. Roch, Quebec, burned January 5th. The watchman was suffocated by the smoke.

**Mexico.**

A barrel of flour which costs \$6 in New York City before it can reach the City of Mexico is subjected to charges amounting to \$23.03, so that in order to cover cost it must sell for \$29.03.

**Foreign.**

Prussia has 25,724,404 inhabitants. The plague has broken out in Astrachan.

Juan Moncasi was executed at Madrid, Spain, Jan. 4th. He attempted to assassinate the King.

R. Hudson & Co., seed crushers, of London, have failed, with liabilities amounting to £105,000.

At the census taken last September, the city of Tokio, Japan, was found to contain 1,036,771 inhabitants and 276,961 houses.

Steam plowing has been successfully introduced into Algeria. It is said to have increased the wheat yield 50 per cent.

The price of wheat is so low in England that an agricultural paper advises farmers to feed it (wetted and allowed to ferment) to stock.

There were \$300,000,000 worth of quicksilver taken from the mine at Almaden, Spain, since the year 1564, being an average of about a million dollars per year since it was opened.

The Grand Duchess of Hesse-Darmstadt, Princess Alice of England, died at Darmstadt at 7:30 a. m., Dec. 14th, of diphtheria. The Court generally will be in mourning for twelve weeks.

A Magasaki (Japan) paper tells us that wheat grown in that country from American seed is magnificent, averaging a far finer yield than the same wheat at home, or the Japanese wheat grown from native seed.

The Cornish bank at Truro, Cornwall, suspended January 4th. The bank had an authorized issue of £49,000. Deposits about £5,000,000. The Cornish traders will suffer greatly. Many failures will be caused. Work in the mines has or will be suspended and the outlook is gloomy.

A remarkably large specimen of French burr mill-stone was exhibited at the Paris Exhibition. It was from the Fontaine quarry, and was made from a single block measuring five feet in diameter and twenty-five inches thick. It has been purchased by a Birmingham, England, miller.

The Hungarians are greatly alarmed at American competition in breadstuffs; they see that America can supply the English market with all the grain required at rates which would leave them but little profit, notwithstanding the high reputation of Pesh flour; the occupation of Bosnia has had a depressing effect upon trade.

The United States Consul at Barcelona, Spain, Mr. Schenck, announced to the Washington authorities, recently, the arrival of the first cargo of wheat that ever was imported to that place from America. The cargo consisted of 72,000 bushels of Minnesota wheat, was carried in an English steamer, and the freight cost \$18,000. There was great excitement at the place, and the grain was pronounced equal in quality to any ever received in that market. The Consul reports that one firm at once engaged three English steamers to bring three cargoes of American wheat to Barcelona, and it was thought that about thirty-five cargoes would arrive during the season, all in English steamers.

**FROM BUDAPEST, HUNGARY.**

[Special Correspondence United States Miller.]

BUDAPEST, Hungary, Jan. 15th.—In addition to or rather as rectification of the two articles about milling in Budapest, and especially about roller mills, contained in the last two monthly editions of the UNITED STATES MILLER, I beg to give you the following statistics concerning the present state of milling with rollers in Budapest.

The most experienced millers of the Capital of Hungary have easily availed themselves of the eminent services the roller mills would render to them and have introduced them the

first time in Europe, on the largest scale in their renowned high grinding system. In this way high grinding on stones is quite supplanted by grinding on rollers, and this to the great benefit of the mill-owners as well as of their customers.

By this time the application of mill-stones is here confined to finishing off soft middlings, whilst all other intermediate operations, the consecutive crushing of grain as well as the grinding and finishing of pure semolina being done entirely by roller mills.

In ten of the most prominent mills at Budapest, 505 roller mills from Ganz & Co. are now working (in Ofenpest mill alone 149, Concordia mill 73, and so on), the excellent and finished make of the machines as well as the indestructibility of their famous chilled cast-iron rollers having proved them to be superior to all other kinds of roller mills, and has favored their introduction into the most important mills of the world. The "Pester Walz Muehle" at Budapest, the oldest and one of the largest flour mills in Hungary, a description of which you gave in your October number and mentioned also in your November number, delivered the following testimonial, which seems interesting enough to be inserted here:

"Budapest, July 16th, 1877.—Messrs. Ganz & Co., Budapest—Gentlemen: The most satisfactory results which, on testing the different crushing (wheat-breaking) machines, we obtained from your fluted rollers induced us to adopt your system and, in consequence, we already provided our mill with a great number of your breaking-rollers. In consideration of the experience derived from use of these rollers we beg to point out as particular advantages of your wheat-breaking system that extremely little crushed flour is produced, provided the rollers are used as directed; that your rollers most satisfactorily do detach the semolina from the bran, and thoroughly separate the germ particles; finally, that they are of an astonishing durability, and that it requires no skilled laborer to manage them. Moreover it must be stated that your system suits perfectly well any process of breaking wheat. It affords us so much more pleasure

to give you the above account, as we are inclined to think that by the construction of these rollers you have achieved an essential progress in the milling industry. Yours truly, PESTER WALZMUEHL-GESELLSCHAFT.

Riedle, m. p. Burchart, m. p."

Believe me, gentlemen, with service at your command, to be yours truly,

PROF. M. GRUENBAUM.

**FIRES AND CASUALTIES.**

Irvine mill at St. Paul burned January 23d. Loss about \$10,000.

J. Westley & Sons mill at Blisworth, England, burned January 2d. Loss, \$15,000.

December 31st, 1878, Charles Smith's saw and grist mill, at Flint, Mich., valued at \$12,000, was destroyed by fire. It was insured for \$3,000. The fire was said to be incendiary.

CHARLESTON, S. C., Jan. 17th.—News is just received here of the burning on Wednesday of the Keithfield rice mills, on Black River, Georgetown county. Total loss, \$38,000. The mills were owned by Robert Adger, of Charleston, and insured for \$10,000.

Friday morning the large grist mills three and a half miles south of Stevens Point were destroyed by fire, also a dwelling and cooper shop with about 1,000 bushels of grain. Loss, \$10,000; insurance, \$5,000. The farmers lose about 500 bushels of grain which was to be ground.

GENESEE, Ill., Jan. 21st.—The flouring mills of W. Kidder were burned last evening. The fire caught in the debris around the corn sheller, at 6 o'clock, and by 8 o'clock the walls had fallen in. These mills were among the finest in the State, costing originally \$37,000, and had a capacity for 200 barrels of flour per day. They had been running at full capacity for some time, and the shipments of flour for 1878 amounted to 25,000 barrels. There was \$12,000 insurance on the building and stock, of which amount \$4,000 worth was burned. The property was fully insured. Over twenty men are thrown out of employment.

**THE LATEST IMPROVED HUCHES BRAN DUSTER.**

Pat. Aug. 14, 1877.

PERFECTION ATTAINED AT LAST!

Will ship to responsible parties on trial and warranted to give

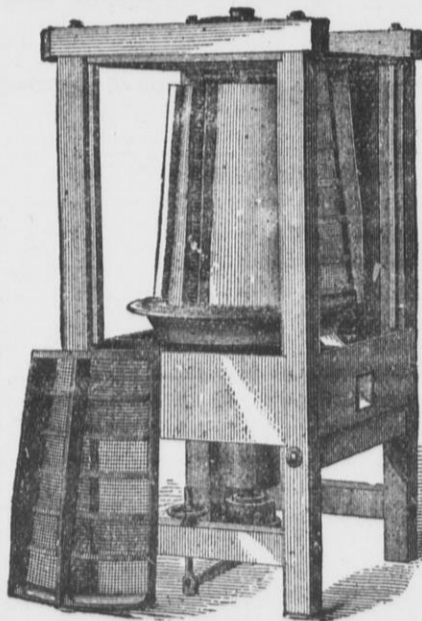
ENTIRE SATISFACTION OR NO PAY.

A CHALLENGE!

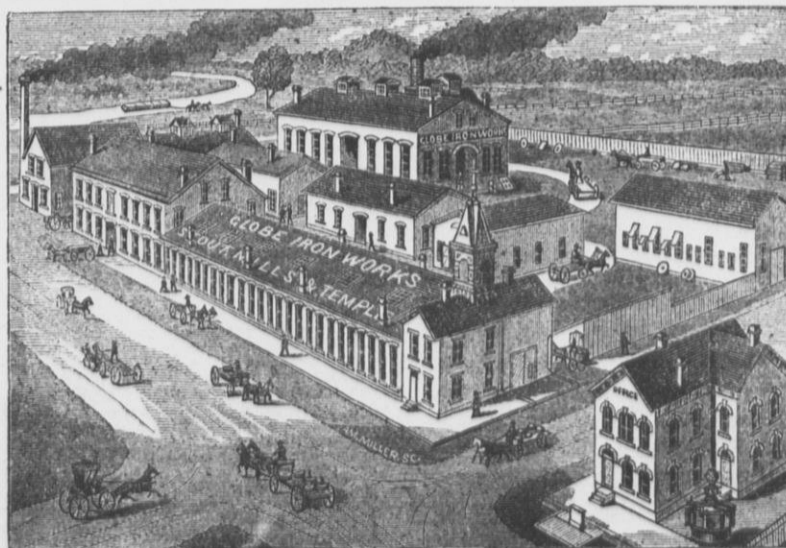
As all manufacturers of Bran Dusters claim their machines to be the best, we will agree to pay for any machine made in the world that will compete with ours, and be adjudged superior by competent judges, provided any other party will do the same with us.

Send for circular to

STEPHEN HUGHES & CO., HAMILTON, OHIO.



**GLOBE IRON WORKS.**



STOUT, MILLS & TEMPLE, DAYTON, OHIO

MANUFACTURERS OF

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BEST QUALITY FRENCH BURR MILLSTONES,

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The AMERICAN TURBINE, as recently improved, is unequalled in the power utilized from a given quantity of water, and is decidedly the BEST PATENT Water Wheel ever known. It has also been otherwise greatly improved. Large Illustrated Catalogue sent free on application.





Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis. dec

WANTED—By the first of January, 1879, a situation in a good Merchant or Custom Mill. Satisfaction guaranteed or no pay. Address J. B. WOOD, Janville, Chester Co., Pa. jan\*

WANTED—A situation by a young man that can grind all kinds of grain, dress the corn burr and who is a good hand with horses and will work cheap. Address J. ELLIS, Earville, Ill. jan\*

WANTED—A miller who is capable of running a Merchant and Custom Mill. Must be a good stone dresser and able to grade flour. Apply, stating terms and giving reference, to R. F. SOADY, Columbus, Miss. jan\*

WANTED—A first-class custom miller, one who has made grist grinding a success, and can come recommended as such. To the right man a steady situation either on wages or shares will be given. Address F. DICKSON, Whiteside, Ind. jan\*

WANTED—To operate a mill on shares. Young man, 24 years of age, energetic, of steady habits, with best of reference from present employers. Indiana or Ohio preferred. Address B. C. MILLER, 280 N. Mississippi St., Indianapolis, Ind. jan\*

WANTED—Miller—One who thoroughly understands the German system of High Milling and the New Process American Milling. Address if convenient in the German language. FRED AMENDI, Abbeyville, Medina, Ohio. jan\*

WANTED—A situation by a Practical Miller and burr dresser who understands both old and New Process, dressing and balancing burrs a specialty. Any firm in need of a miller will do well to address H. M., Box 139, Storm Lake, Buena Vista Co., Iowa, stating terms. jan2t

WANTED—A situation by an Engineer. Learned the trade thoroughly in Germany, and am competent to act as Chief Engineer in any miller manufacturing establishment. Situation wanted in the Western States. Best of references given. Address J. SODER, P. O. box 491, Keokuk, Lee Co., Iowa. jan\*

WANTED—A situation as engineer in a large or small mill. Have had 22 years' experience running high-pressure engines of different kinds, and 6 years operating Corlies engines. Can give best of references as to ability and character. Can go any time. Address J. F. STRAIT, Box 109, Kalamazoo, Mich. dec3t

WANTED—A situation as helper or second miller, by a young man who can grind corn and wheat, and make himself generally useful. Of temperate habits and can give good reference. Correspondence solicited. Address N. P. COTHREN, care of D. B. Williams, Elkton, Ky. jan\*

WANTED—A situation by a thoroughly practical miller (German). First-class St. Louis reference. Satisfactory reasons given for leaving present situation, where I have been working for the past six years. Address ADOLPH BRENNER, 1913 Jackson St., St. Louis, Mo. jan\*

WANTED—A situation in a custom or merchant mill, for reasonable wages, by a miller who has had long experience in the business. Can run a mill, and take charge of it. Can come immediately, and will guarantee to give satisfaction. Address J. C. WELLS, Princeton, Wis. jan\*

WANTED—A situation in a Merchant or Exchange Mill by a practical miller and stone dresser who thoroughly understands the new process in both spring and fall wheat. Good references furnished. State terms and capacity. Address J. M. BELL, Pittsburgh, Iowa. jan\*

WANTED—A situation by one who has had a long experience in operating and superintending mills. Can come immediately and furnish the best of references if required. New Process preferred. Steady employment must be given or no one need apply. Address V. G. HAAG, Ewing, Franklin Co., Ill. jan\*

WANTED—By a young man wishing to make himself a home, a situation in some custom mill as second miller, or would take a custom mill on shares. Can come well recommended as to custom work. Will come on most any terms for a steady job. Any one owning a mill, and not a miller himself, will do well to address W. LEE, Racine, Wis. feb2t

WANTED—A situation by a miller of long experience in milling in both Germany and America. Has filled responsible positions in several well-known mills in this country. Will guarantee satisfaction. Is married, of steady habits, and can furnish reference as to ability and character. Address at once J. M. B., care United States Miller, Milwaukee, Wis. feb1t

WANTED—A situation in a Merchant or Custom Mill by a young miller of fifteen years' experience. I am a good stone dresser, and understand the New Process. Have worked in some of the best mills in Michigan and Ohio. Would take position of second miller. Would prefer to go to the northern part of Ohio, or to Manitoba. Address M. J., Box 349, Springfield, Ohio. jan\*

WANTED—A situation by a miller who is competent to take charge of a first-class Merchant Mill. Have had from 25 to 30 years' experience in the business, and can give good reference from first-class city and country mills. Also understand New Process as well as old. A situation in the Western States preferred. Address THOS. GREASLEY, corner Ferry and Main Sts., St. Louis, Mo. jan\*

WANTED—A situation in a Merchant Mill by a young married man, who is sober and industrious. A practical miller and good stone dresser. Understands both old and New Process. Good reference given if required. A permanent situation desired if satisfactory to all parties, and good work guaranteed. Address S. H. BLACKBURN, Box 275, Pittsfield, Ill. jan\*

WANTED—A situation by a miller of twenty years' experience in both Custom and Merchant Mills. Am an American, temperate and held my last situation eleven years. Am a good stone dresser and have the best of recommendations. Would prefer a country mill, either on salary or shares. Can come at once. Address W. H. B., Box 114, Saratoga Springs, N. Y. jan\*

WANTED—A situation by a first-class miller and stone dresser who understands the old and New Process of milling. Have been in the business fourteen years, and have worked in Merchant and Custom Mills. Am a married man, thirty-four of age, strictly temperate, honest and not afraid of work. Parties about to make a change will do well to correspond with me at once, stating terms, describing mill, etc. Address WM. POWELL, Lyndon, Whiteside Co., Ill. jan\*

WANTED—An experienced miller and salesman desires a situation with some large milling and grain shipping firm as miller or salesman. I have had sixteen years' experience in this business, and now command a large cash trade in flour, wheat, corn, oats and mill feed. Can influence a trade of from two to three cars per day in these articles at market prices. For honesty and ability the best of reference will be given. As a miller, I have Ohio and Pennsylvania references. Address MERCHANT MILLER, Chester, Delaware Co., Pa. jan\*

WANTED—A good custom and merchant mill, three stories high, built of stone, with three runs of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid one and business, and will be sold very cheap. For particulars call on or address E. G. GILBERT, Raubsville, Northampton Co., Pa. feb\*

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—The Paris City Mills, with a good custom trade. For particulars, call on or address BOWEN, LAUGHLIN & CO., Paris, Ill. jan\*

FOR SALE—Cheap—A two-run merchant mill in a good wheat country, on the Illinois line. For particulars, address W. GILBREATH, Elkville, Jackson Co., Ill. feb\*

MILLING PATENT—To be sold cheap—A fourth share in a valuable Patent in Flour Mill Machinery. Thirty per cent guaranteed. Address PATENTEE, 39 Dryden Road, Edge Lane, Liverpool, Eng. jan\*

FOR SALE—A modern two-run steam mill in Western Iowa, on the line of the Chicago, Rock Island & Pacific R. R. New mill with all improvements. Apply to R. J. CORY, Council Bluffs Iowa. jan\*

FOR SALE—A steam custom and merchant mill, with three runs of 3 1/2 foot stone. In good running order, and has a good trade. Will be sold cheap. For particulars, address W. M. CROZIER, Elizabethtown, Hardin county, Ill. jan\*

FOR SALE—A Steam Grist Mill, two runs of stone and all other necessary machinery in good order. German neighborhood. Or I will sell a half interest to a Practical Miller. Address JOHN SPINDLER, P. O. box 21, Woodland, Barry Co., Mich. jan\*

FOR SALE—Two-run Steam Grist Mill, at North Union, Montgomery county, Ind., on L. C. & W. R. R. Will sell cheap for cash, or trade for land. Call on or address J. H. ARMANTROUT & CO., North Union, Ind. jan\*

FOR SALE—A whole or a half interest in a good three-run steam mill in a good wheat country. Mill doing a good business. Half will be sold very cheap. Address ROGERS & RAMBACH, West Liberty, Iowa. feb\*

FOR SALE—A mill site for a first-class water-power, 80 rps from the lake shore, on Pike River, three miles from Bayfield, Wis. The water-power will do the work of a 50-horse power engine. Address for further information E. PIKE, Bayfield, Wis. jan\*

FOR SALE—A good saw and grist mill, driven by 20-foot overshot wheel and abundant water-power, with 100 acres of choice land 1/4 of a mile from Brevard, Transylvania county, N. C. Price, \$5,500. Address DAWSON & CO., Charlotte, N. C. jan\*

FOR SALE—Steam power saw mill for sale cheap, and on reasonable terms. Mill is in good location, and is doing a good business. Satisfactory reasons will be given for selling. Call on, or address SMITH & TUCKER, Cawker City, Kan. feb

FOR SALE—A Steam Grist Mill, with two runs of stone, a Steam Saw Mill, two Houses, Barn, Shop, and 3 acres of land, on Lake Shore Railroad, 15 miles from Buffalo, N. Y. Will be sold at a low price to close an estate. Address SELLEW & POPPLE, Dunkirk, N. Y. jan\*

WANTED—Water Mill Wanted to rent by a first-class miller—a two or three-run water power flouring mill, with privilege of buying. Will pay cash, rent, or give share of profits. Address FRANK A. MAINES, Georgetown, Williamson Co., Texas. jan\*

WANTED—To Exchange—Good fresh stock of general merchandise, best location in growing county seat, for a first-class custom flouring mill in a good location for permanent business. Kansas preferred. Give full description and cash valuation. Address W. H. WALLACE, Newton, Jasper Co., Ill. jan\*

FOR SALE—Mill Property for Sale or Exchange. A three-run Grist Mill and Saw Mill, all driven by water. Price, \$6,000. Would take part of the purchase price in Iowa, Nebraska or Kansas lands. Address BENJAMIN DEY, Worcester, Otsego Co., N. Y. jan\*

FOR SALE OR RENT—Cherokee Mill—A three-burr, 40-horse power, steam flouring mill, with all the modern improvements; situated in a wheat-growing country, with railroad connections and cheap fuel. Terms easy. Address S. ALBERTY & CO., Cherokee, Crawford county, Kan. jan\*

FOR SALE—The best Steam and Gin Mill in Texas; two-run of Burrs, Bolts, Smutter, etc. Two Gins and a Cotton Press; 40 horse-power engine and boiler; Wagon Scales; Good Buildings; Constant Work; Delightful Country. A bargain is offered. Address F. W. CARTER, Iredell, Bosque Co., Texas. jan\*

FOR SALE—Circular Saw and Grist Mill; bench saw; run of four foot stone; large pond; 20 feet head; good house and barn, and 100 acres of land. Located in West Northfield, Mass., three miles from South Vernon. Would take a good portable engine, 25-horse power, for part pay. Address E. O. FELTON, Bernardston, Franklin Co., Mass. jan\*

FOR SALE—A Wind-power Grist Mill with 60 foot wheel, three runs of stone, cleaning and bolting machinery complete. Located in one of the best wheat-growing sections of Minnesota. Railroad will be built to the place next summer. Will be sold cheap and on easy terms. Address JOHN MANUEL, Eliota, Fillmore Co., Minn. jan\*

FOR SALE—Cheap for Cash—A Circular Saw Mill; water-power never failing; all modern improvements; mill in good order; plenty of timber, and good wheat land surrounding. Parties need not apply unless they have at least \$2,700 to invest. Address G. F. BLASHECK, Maiden Rock, Pierce Co., Wis. jan\*

FOR SALE—One of the best mill properties in Michigan, consisting of flouring mill with three runs of large millstone s, saw mill, cooper shop, washhouse, store (with or without goods), light dwelling houses all in good repair, with barns and about 27 acres of land, 100 miles west from Detroit, on the Michigan Central R. R. Address JOHN EVANS, Marengo, Mich. jan\*

FOR SALE—One of the best two-run Custom and Merchant Mills in Hancock county, Ill. The mill is situated in the town of Hamilton, Ill., at the east end of wagon bridge leading into Keokuk, Iowa. Decidedly one of the best locations for a Custom Mill in the State. Can now run all the time on custom work, and is now, having been built the present season. Price extremely low. Address S. L. HOBART, Hamilton, Hancock Co., Ill. jan\*

FOR SALE—Mill—At a bargain—A first-class mill, cottage with five rooms, 1 1/2 acres of ground, out-buildings, fruit, etc. Mill heavy frame 70x30, four stories high, in good repair and doing a good business. Cost eight years ago \$13,000 to build. On a never-failing stream, 12 feet head. Dam kept up by State. Reasonable land at mill door. Three runs of best quality French burrs. Three water wheels. Grocery kept in mill. Terms \$7,000, cash \$2,500, balance on easy time. Write J. FRAZIER, at Devo's Dam, Marietta, O. jan\*

FOR SALE—Alabama Flour Mill—Two-run Custom and Merchant Mill in Springville, Alabama, complete. Excellent location. Good trade. Splendid climate. Mill close to a new cold spring, furnishing water enough to run 15 or 20 horse power turbine with 15 foot fall. Mill now uses steam power. Satisfactory reasons given for selling. Terms, \$1,500 down and \$500 in 12 months. Must be closed out soon. For further information address A. J. ADERHOLD, Springville, Ala. jan

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 80 acres of timber land one mile from town. Terms: \$2,000 cash down, and balance in store goods or on 6 months time. Address for full particulars, WM. SKINNER, Mount Morris, Waushara Co., Wis. feb1t

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—A two-run water power merchant flouring mill. For information and particulars, call on or address J. H. HARTWELL, Deputy, Jefferson county, Ind. jan\*

WANTED—A good steam flouring mill at Cawker City, Kansas. The location is exceptionally good. The best of wheat and other grains produced in great abundance. The investment will surely make heavy returns. The Atchison, Cawker City & Denver Railroad will be completed to this point on or before June 1st, 1879. Parties desiring to secure a good location may address for any further information EDMUND C. GARRETT, Cawker City, Mitchell Co., Kan. feb1t

FOR SALE—A superior mill site in southern part of Illinois, suitable for a custom and merchant mill. The location is in one of the best wheat-growing sections of the State, and enjoys railroad facilities to all points East and South. All one engine and two 4-flued boilers in perfect condition. All will be sold at a bargain. For full particulars, please address IMBES, MEYER & CO., 120 & 122 S. Main St., St. Louis, Mo. feb\*

FOR SALE—A flour mill on Pawpaw Creek, in Mecklenburg Co., N. C. Mill is a three-story building, first-story rock, second and third wood. Rock dam. Two runs of stone, one for wheat and one for corn, with other machinery, run by 17-foot overshot water-wheel. Also saw mill with improved circular saws, etc. 194 acres of land go with the property. Price, \$4,100. This is a fine opportunity for an enterprising miller to make a fortune. Address DAWSON & CO., Charlotte, N. C. jan\*

FOR SALE OR RENT—One of the best steam flouring mills in the State. Four stories, brick and stone, slate roof, four runs of burrs. Adapted to new process. Everything new. Best wheat region of the State. Fuel cheap, water plentiful. Near depot and has side track, cooper shop, wagon and stock yards. Pleasant town of 2,000 inhabitants. Satisfactory reason given—neither of us know anything whatever about milling. Terms easy. Fine bargain. Address C. H. HEALD & SON, McLeansboro, Ill. feb\*

FOR SALE—A 3 story frame water-power Mill, with two-run of burrs. The machinery is in good order, improved purifier, mill arranged for both merchant and custom mill. The mill property includes barn, sheds and cottage, young orchard, 300 Acres of Land, 100 acres under cultivation, and the rest in hay and wild land. The undivided half of the above will be sold for \$4,000, part down, and the balance on time. Address I. W. DICKINSON, Sabula, Jackson county, Iowa. jan\*

FOR SALE—A steam grist and saw mill, located at Morton, Ind., 12 miles northwest of Greencastle, Putnam county. Mill in good running order; 1 wheat and 1 corn run—both in operation at present time, with a good run of custom work. Capacity of saw mill 10,000 feet per day. Timber plenty and of easy access, mostly poplar—with some walnut. For particulars and terms, apply at once to HATHAWAY & HATHAWAY, Greencastle, Putnam county, Ind. jan\*

FLOUR MILL WANTED—In Exchange—I have the exclusive right of 20 Counties in the State of Michigan to manufacture and sell ELLIOTT'S IMPROVED or CENTRAL HAWK, with \$1,000 worth of Harrows on hand ready for the Spring Market, which I wish to trade for a good Custom Mill. Would be willing to take property with some encumbrances. The Harrow mentioned is the best one yet manufactured, sells readily as every farmer wants one, and yields a net profit of 200 per cent on cost of manufacture. Being a practical miller I prefer to confine myself to that business. Address J. M. SHACKLETON, Plainwell, Allegan Co., Mich. jan2t

FOR SALE—Flour and Saw Mill—One-half interest in a first-class three-run Steam Flour and Saw Mill. The saw mill is a double rotary, with gang edger, cut-off and bolt saws and shingle machine. It has been built but 15 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good entry store in connection with mill. Would prefer to sell to a miller or a man that is well posted in sore business who can command from \$6,000 to \$7,000 and furnish good reference. I will guarantee good margin to the trade. Address all communications to A. J. FULLERTON, Bonduel, Shawano Co., Wis. nov

FOR SALE—Mill—Cheap and on easy terms—A Water Flouring Mill, 1 1/2 miles from the depot at the city of Muncie, Ind. It is on Buck Creek, a never-failing mill stream; the same being fed by springs. The mill house is a two-story frame. There are two runs of burrs, two for wheat and one for corn. There are 40 acres of land belonging to the premises, having thereon both plow-land and pasture-land; a good orchard, a variety of small fruits; a frame dwelling with six rooms and a hall, and a cellar to it. For particulars, refer to J. H. & S. E. HURST, proprietors, Muncie, Ind., or to C. W. MOORE, Attorney at Law, Muncie, Ind. jan\*

FOR SALE—Merchant Mill—A valuable steam flouring mill, situated at Claremont, Ill., 125 miles east of St. Louis, on the O. & M. R. R. This mill has six runs of stone, capable of making 1,200 barrels of flour per week, together with all modern improvements. Machinery all first-class. Plenty of storage and an abundance of good soft water. Fuel cheap; railroad switch to the mill door. Good cooper shop, with 16 berths. New office in mill yard, platform scales, stock pens, etc. Good dwelling house, etc., with 17 acres of land. Property stands high in New York, Boston and Baltimore markets. For further information, address ROBERT BYERS, Olney, Ill., G. W. BOODY, Vincennes, Ind., or the undersigned, JAS. L. BYERS, Leavenworth, Kan. jan\*

FOR SALE—Best Mill in Southern Pennsylvania—This mill, situated in a small village within 7 or 8 miles of Broad Top coal fields, was recently rebuilt with all modern improvements and is in good repair. Mill is on a never-failing stream, with 30 feet head and is propelled by two turbine wheels. Has three runs of burrs and one run of choppers. Building is framed 42 by 50, and four stories high. Machinery is suited for making either merchant or custom work. Belonging to the mill are a good saw mill, 180 acres of farm land, 100 acres of valuable bark-timber land, three dwellings and a store-room. The owner of the above property will also sell three separate tracts of good bark and fine timber land, containing 400, 280 and 72 acres. For further particulars call on or address WILSON BERGSTRESSER, New Grenada, Fulton Co., Pa. feb\*

FOR SALE OR RENT—A five-run steam mill, located at Manchester, St. Louis Co., Mo., eighteen miles west of the city of St. Louis. It is located in a never-failing wheat country and is supplied directly by the farmers at reasonable figures. The mill has been run profitably for the past sixteen years. Was rebuilt on a thorough and convenient plan six years ago. Good reasons for wishing to sell or rent. Mill is running to its full capacity and is doing a good business. No competition, no railroads. All of the old sold at the mill, and a large trade established for the flour. Will be sold to parties having part cash; long time given for remainder at a reasonable rate of interest, or will rent on reasonable terms. Address or call on the proprietor, JACOB SCHREINER, Manchester, Mo. feb\*

FOR SALE—A four-run steam flouring mill, all in first-class running order. Three 3 1/2 foot burrs for wheat and one 3 1/2 foot chopping burr, one Eureka wheat cleaner and a Eureka smutter, Garden City middlings purifier, Excelsior bran duster, Eureka flour packer and all other machinery necessary to complete a first-class mill. Two 28-horse boilers, 65-horse power engine. Still-well heater. Frame building and seven desirable town lots belonging to the property. Side track of A., T. & S. railroad close by the mill, which is located in the city of Sterling, Rice Co., Kansas, in the midst of the best wheat district in the Arkansas valley. The parties owning the mill are not practical millers, and are engaged in other business. They will sell the property low and on easy terms. Address LANDIS & HOLLINGER, Sterling, Rice Co., Kan. feb\*

Subscribe for the United States Miller. \$1.

A Pittsburgh company, of large capital, are soon to start an extensive flour, grist and saw mill, on the head waters of Cherry Creek, on the vast tract of land known as "The Rights of Man," in Maryland. The mill will be located near the old Hostetter farm, and a tram road laid to Swanton on the Baltimore & Ohio railroad, some ten miles distant.

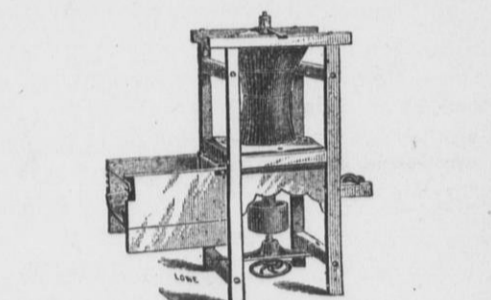
Nordyke & Marmon Co., of Indianapolis, have shipped, this month, portable mills to the following persons: Council Bluffs Iron Works; George Manning, Center Point, Penn.; S. C. Rankin, Pittsburg, Penn.; John Fox, Lenox, Ohio; L. C. Linning, Dowds Station, Iowa; J. G. Freeman, St. Paul, Minn.; Lefterich & Wilson, St. Paul, Neb.; C. C. White, Valparaiso, Neb.; Westminster Manufacturing Co., Westminster, Md.; Hammond & Delaplane Brothers, La Crosse, Kan., and J. E. Brewer, Troy, Ala.

The Millers' Text Book.

By Jas. McLean, of Glasgow, Scotland.

A DESCRIPTIVE AND EXPLANATORY ACCOUNT of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to R. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

R. P. WARD, MANUFACTURER OF THE IMPERIAL Corn Sheller



Adjustable While Running

So as to shell corn of any size.

WILL also CLEAN the SHELLED CORN.

Send for descriptive circular.

R. P. WARD, SILVER CREEK, CHAUTAUQUA CO., N. Y.

GRATIOT'S Improved Wheat Heater

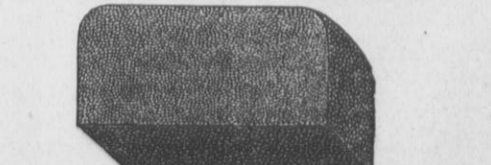
Patented March 5, 1878.

The ONLY Heater made of HEAVY COPPER THROUGHOUT; and standing 175 lbs. Hydraulic Pressure. The ONLY Heater that EVENLY heats EACH and EVERY grain of wheat; and draws the moisture from the berry to the outside or bran; thereby THOROUGHLY TOUGHENING THE BRAN ON THE HARDEST or DRIEST Spring or Winter Wheat.

Send for descriptive circular.

GRATIOT BROS., Platteville, Wis.

GET THE BEST.



MILLER'S PATENT COMPOSITION BURR RUBBER.

For Cleaning, Sharpening, and Facing Burrs, and Smoothing Furrows.

Warranted to produce a better grinding surface than the Pick or Diamond and save 50 per cent of labor in dressing Burrs and expense for tools. Face Rubber 10 x 6 x 3 in., weight 12 lbs., price \$3.00. Furrow Rubber, 10 x 6 x 1 1/2 or 1 3/4 or 2 in., as required, price \$2.50 or both for \$5.00. Sent by express on receipt of price. Circulars free. Address all orders to the sole manufacturers, MILLER & McCARTHY, Mount Union, Penn. dec

# The United States

# MILLER

Volume 6.—No. 5.

MILWAUKEE, MARCH, 1879.

Terms: \$1.00 a Year in Advance. Single Copies, 10 Cents.

## A HIGHWAY TRACTION ENGINE.

The attention of inventors not only in Wisconsin but of the whole country has been called to the subject of road engines by the liberal offer of the Wisconsin State Legislature of \$10,000 prize money to be given to any person who should invent and build a road engine which should possess certain qualities. It should be cheap in cost and be able to haul a considerable amount of freight at a reasonable rate of speed over ordinary highways. Two competitors made the trial trip last summer, but it was the opinion of the commissioners of award that neither possessed sufficient merit to be entitled to the award. Other trials will be made next summer, and no doubt many inventors are quietly at work endeavoring to solve the problem and gain the coveted prize, as well as the subsequent fortune that surely awaits the fortunate winner by the manufacture and sale of road engines so endorsed. The accompanying illustration represents an improved traction engine now in use in California. This engine has three traction wheels all propelled by beveled gearing.

The following are the principal dimensions: Boiler—length over all, 10 feet; boiler, diameter of shell, 48 inches; boiler, thickness of shell,  $\frac{1}{2}$  inch; boiler, fire box sheets,  $\frac{3}{8}$  inch; load on driving wheels, 2,300 pounds; steam cylinders, diameter, 8 inches; stroke of pistons, 12 inches; revolutions of crank to one of driving wheels, 10; driving wheels, diameter, 72 inches; driving wheels, breadth of tire, 12 inches.

The boiler is a new and peculiar multitubular arrangement, which makes steam as fast as required, from a comparatively small amount of water, doing away with considerable bulk and weight. There are two engines mounted on top of the boiler; the crank shafts are coupled and the cranks are set quartering to avoid the possibility of ever stopping on the center; the bed plates have the cross-head guides cast solid with the bed; and the cylinders are secured in sliding bearings fastened by flanges to boiler-brackets; by this means the expansion and contraction of the boiler is accommodated, avoiding a considerable strain on the engines. The driving gears or angle shafts, are on each side of the machine as shown, and are driven by the beveled pinions on each end of the engine shaft. The angle-shafts run in angle bracket boxes, so that one pair of shafts having beveled pinions run the forward wheel-gears, and the other pair of angle-shafts also have beveled pinions that drive beveled wheels secured to the rear traction wheels. The forward driving gears are keyed to the outer ends of the forward axle, or driving shaft, more properly speaking, as the latter drives the forward or steering wheel, but at the same time allowing it to be moved in an arc of a circle sideways at any angle desired for steering the machine. This is accomplished by means of a ball and socket joint in the hub of this wheel.

This ball and socket joint is the most ingenious part of the whole machine, and to accomplish the work of driving the wheel in all positions, a number of steel keys are fitted in the ball, and projecting to work in slots cut in the shell or casing of the ball.

This casing has projecting faces with revolving rings on each side of the wheel, and to these rings are bolted arms on each side running back to a gear segment, operated by a pinion on the end of an upright spindle or shaft with a hand-wheel at the top, just in front of the steersman's seat; here the man

piloting the machine has control of the throttle valve and reverse lever.

This is the first instance in which the steering wheel has been made to propel the machine; and it can be made to do the work independent of the hind wheels, in case of necessity; as for instance when both hind wheels become mired, or get into quicksand, or deep ruts in the road. This is accomplished by having self-adjustable clutches on the hind wheel shaft, also for backing, etc.

In all of the traction engines heretofore built, only two wheels have been employed to propel the machine, but in this invention all of the wheels on which it runs are traction wheels, and more than three may be employed if desired. This machine was used for a considerable length of time in the State of Nevada, hauling ore and other freight from mines to mills, etc., running up mountainous roads (where mule teams had been used); the grade being in some instances 530 feet to the mile, and hauling ten tons on wagons at a speed of

plow his ground, and at the proper time haul away his grain or other freight, running in any direction without reference to depots or tracks that at present are so necessary for the transportation business of the country.

From the recent trial of this engine, the constructing engineer deduced the following conclusions: A traction engine, or road locomotive, may be constructed upon this plan, so as to be easily and rapidly manoeuvred, hauling a long line of freight wagons on the ordinary roads, and turning without difficulty on a circle such as are common at all cross-roads.

A locomotive weighing six tons is capable of hauling 25,000 pounds up a grade of 525 feet to the mile at a speed of 3 $\frac{1}{2}$  miles an hour. The traction power of the machine tested was equal to 30 horses.

The coefficient of traction was shown to be about 0.5; the weight that could be drawn on a perfectly smooth and level road was 175,000 pounds; this is exclusive of the weight of the

was considered at the time a good quality of flour, but to-day they are standing monuments of the progress of the age, modern improvements having rendered them wholly worthless for the purpose to which, until recently, they were devoted.

"Patent process machinery is expensive and so radically different from the other, that remodeling old mills but poorly meets the requirements of the system. Therefore, only a few millers in this State have as yet availed themselves of the latest improvements, and since the tendency of all large manufactories is toward concentration in cities, where supplies are easily obtained, and distribution more readily effected, country millers having no railroad competition will be slow to invest another fortune in a mill, since, in any event, they must probably at an early day, restrict operations to neighborhood and custom work.

"The present, therefore, is an opportune time for the construction of one or more patent process mills, at this point. A large portion of the 5,600,000 bushels of wheat brought here in 1878 should have been manufactured into flour before leaving the city.

With such a supply of the best wheat the quality of flour and magnitude of the trade would give us first rank in the markets of the world.

"The early shutting down of these old mills curtailed production last year, but in no other respect have we fallen behind. The year was fairly profitable, notably so to manufacturers of patent process, the product of one firm alone since harvest reaching 72,000 barrels, which sold on its merits in Eastern cities at 25 to 75 cents per barrel higher than any winter wheat flour made west of the Alleghanies. Orders from Great Britain and Europe are regularly filled, and direct shipments to foreign parts cut no small figure in our trade.

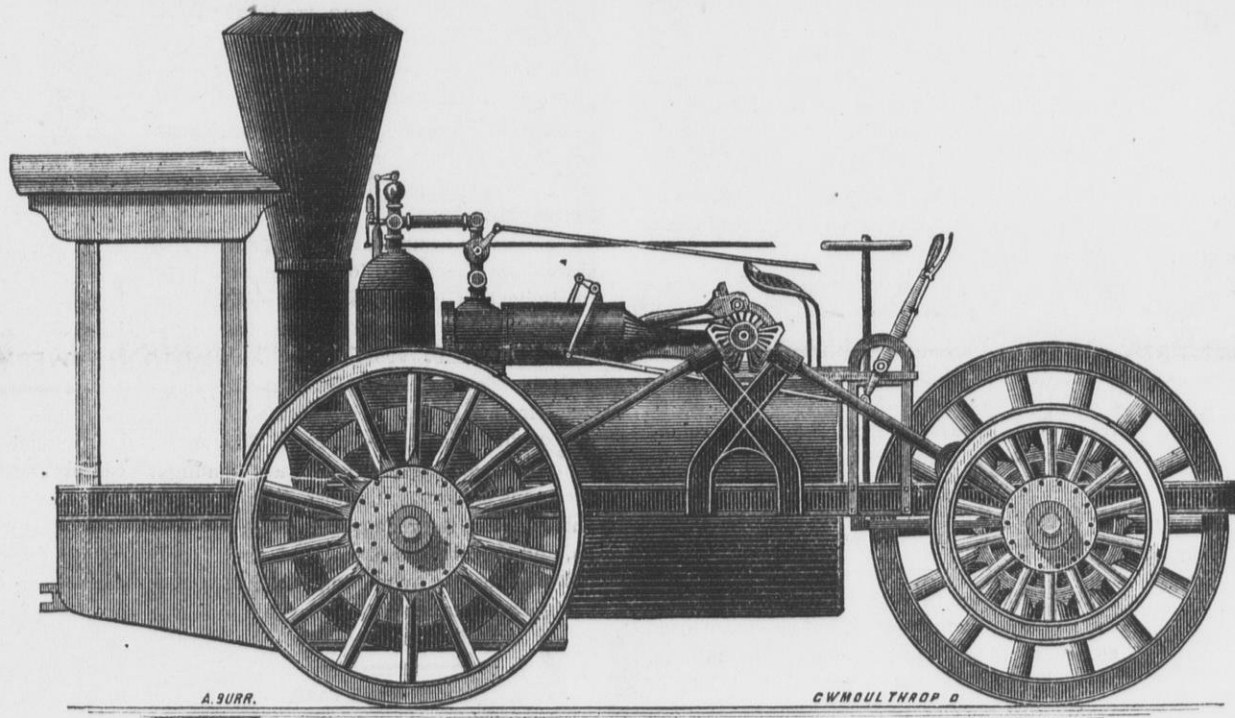
"Our millers make a point of grinding none but the first quality of wheat, and generally the hard winter varieties of this State, the flour from which brings the highest prices at the seaboard and in foreign markets.

"Table showing the receipts and shipments of flour at Indianapolis, and number of barrels manufactured in this city, for three years:

	1876	1877	1878
Received, bbls.....	1,113,232	907,950	1,051,300
Made here, bbls.....	146,922	203,533	192,000
Total.....	1,260,154	1,111,483	1,243,300
Shipped.....	1,197,110	1,201,150	1,176,200
Consumed here and unaccounted for.....	62,644	91,333	67,100

**NOVEL EXPERIMENT**—Another instance of Transatlantic enterprise is the presence at Geneva of a locomotive brought expressly from America to test its capacity for producing steam from the anthracite coal found in the Valais, and which Swiss and French locomotives, as at present constructed, are quite unable to use. The furnace arrangements of the American locomotive are admirable. It can run with fuel which would bring the ordinary Continental locomotive to a standstill; and the system, if adopted in this country, as it doubtless will be, cannot fail to effect an important saving in the working of railways.

**A NEW ROTARY ENGINE**—Mr. Babbitt, the well-known soap manufacturer, of New York, has invented a rotary steam engine, which is said to develop extraordinary power, with a very small steam supply. A correspondent of the *American Machinist* reports having seen one, four inches in diameter, running 20,000 revolutions a minute, with steam supplied by an one-eighth inch pipe, which defied the efforts of the heaviest men to stop it by throwing their weight upon a good lever.



CALIFORNIA ROAD ENGINE.

two and one-half miles per hour. After working for one company until their mines gave out, the machine was brought to Sacramento, where it was employed in house moving and other heavy work.

The Sacramento Wood Co. have recently bought a Pacific coast interest in this invention, and have put the machine to a very severe test, showing its ability to haul heavy freight in a successful manner. Captain J. Roberts, the leading spirit of the company, took this machine up the Sacramento River on one of their steamers, and landing in Colusa county, where they run regular trips back into the country, a distance of 16 miles, taking freight from the steamer, and bringing wheat back, they loaded six Bain header wagons with 300 sacks of grain, also hauling one extra Bain header wagon containing a tank in which they took 615 gallons of water, besides 1 $\frac{1}{2}$  tons of coal, making over 24 tons total freight in wagons; the machine also carried tanks secured at each side of the boiler; these holding 250 gallons of water. Five miles of the road was very dusty, and full of ruts, and several sloughs to cross, making a very severe test of the traction power of the machine. But if the roads are level, hard and free from ruts, the machine is capable of hauling 35 tons at a speed of three miles per hour.

The machine works admirably as to pulling or traction qualities. The machine weighed on the scales—having steam up and 250 gallons of water in the tanks, also coal in the cab—11 $\frac{1}{2}$  tons total weight.

This traction engine will run over any kind of ground; it can enter any farmer's field,

and the amount of fuel required is estimated at 1,500 pounds a day. In handling the machine the most experienced and skillful men are required. The difference between the performances of the same engine in different hands was 12 per cent.

It is estimated that the expense in heavy hauling by steam is 25 per cent less than the cost of horse-power on an ordinary road. A much larger and more powerful machine is now being built for the company by Root, Neilson & Co., Sacramento. The inventor is Mr. R. R. Doan, who commenced many years ago to study the problem of substituting steam power for animal power on the highways and for farm use.

We are under obligations to Messrs. Root, Neilson & Co., of San Francisco, Cal., for the accompanying illustration.

## INDIANAPOLIS FLOUR INDUSTRY.

From the report of the Secretary of the Indianapolis Board of Trade, just made, we make the following extract:

"The process of manufacturing flour has undergone great changes within the past few years, and the successful miller finds it necessary every year or so to expend large sums of money to meet the competition created by the number and variety of improvements introduced into modern milling, the adoption of which is necessary to the manufacture of a grade of flour to command a remunerative price and ready sale in the markets of the world.

"Our old city mills, remodels of the 'mill by the willow brook,' manufactured what

## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.  
 Subscription Price.....\$1 per year in advance  
 Foreign Subscription.....\$1.50, or 6s per year in advance  
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 Bills for advertising will be sent monthly unless otherwise agreed upon.

MILWAUKEE, MARCH, 1879.

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READ the new advertisement of Smith Bros.

CHISHOLM'S last describes a building as "50 by 60 feet square."

JONATHAN MILLS has now invented a bran-cleaning machine, and still he is not happy.

W. R. BACON, a prominent miller of Sherwood, Wis., called on us during the month.

J. SHORT, Esq., of Oswego, N. Y., called a few days since. He came to see the new flouring mill.

M'LEAN'S Millers' Text Book and the UNITED STATES MILLER, for one year, for \$1.25. Order now. Send money or postage stamps.

It is said that one-tenth of all the sheep in the State of North Carolina were killed by dogs in 1878. *Dj-on* such a state of affairs.

POSTAGE stamps taken in payment of subscription to the UNITED STATES MILLER and the Millers' Text Book. \$1.25 pays for both for one year.

A. M. HOBBS, Esq., of Waupacca, Wis., agent for Barnard & Leas' Manufacturing Company, of Moline, Ill., called and reports prospects good.

WE regret to announce the death of Belle Clifton, wife of Albert Hoppin, editor of the *Northwestern Miller*, which occurred January 11th, 1879, at Lacrosse, Wis.

WE call the attention of our readers to the interesting essay on *grain for milling* read by the author before the Pennsylvania Millers' Association January 15th.

COL. GRATIOT has dropped in on us several times during the past month, and is almost half persuaded to move to the Cream City. We shall do our best to get him to locate here.

A MILLION franc telescope is to be built in France for the purpose of discovering whether the moon is really inhabited. If it is then we must have a moon-o-phone to talk with the man in it.

A STOCKTON, Cal., engineer screwed down the safety valve on his engine and swore he would make the thing "work or bust." It busted and the engineer and a score of victims went up "the golden stairs."

IN our March number we shall commence the publication of an article on steam boilers which will be embellished with 14 illustrations. It will be interesting to all users of steam. Subscribe now, \$1 pays to May, 1880.

ST. LOUIS has 27 flour mills having a united daily capacity of 11,750 barrels of flour. The flour product of St. Louis for 1878 was 1,916,290 barrels; for 1877, 1,617,921 barrels, and

for 1876, 1,441,944 barrels. During 1878 St. Louis mills also manufactured 348,695 barrels of corn meal; 20,121 barrels of rye flour, and 19,853 barrels of hominy and grits. This record shows St. Louis to be the largest flour-producing city on this continent.

W. LEE, of Racine, Wis., who advertised for a situation last month, in the UNITED STATES MILLER, has secured thereby a desirable one at Sherwood, Wis., in W. R. Bacon's flour mill.

We will send a copy of the MILLERS' TEXT BOOK, by J. M'LEAN, of Glasgow, Scotland, and the UNITED STATES MILLER, for one year, to any address in the United States or Canada, for \$1.25. Price of Text Book alone, 60 cents. Send cash or stamps.

IN this number we continue our article on grain and its products. In March number the author will take up the subject of wheat-flour and discuss it thoroughly. Every miller should study it carefully. Subscribe now, \$1 pays to May, 1880.

WE are pained to announce the death of Mr. John Temple, of the widely-known firm of Stout, Mills & Temple, of Dayton, Ohio. Mr. Temple was a highly-respected citizen, loved and honored by all who knew him best, and leaves behind him countless friends to mourn his loss.

LOOK HERE.—Every mill-owner, miller, millwright and apprentice should have a copy of the Millers' Text Book, by J. M'Lean, of Glasgow, Scotland. Price 60 cents; or the UNITED STATES MILLER, for one year, and a copy of the Text Book for \$1.25. Postage stamps taken.

IN Siberia you can buy beef for two cents a pound, a goose for twelve cents, a chicken for four cents, a horse for \$5, and three hundred and sixty-one pounds of corn for six cents.—*Ec*

Goose for twelve cents! Very cheap, but then its Siberian goose, and there are many objections to the climate, customs, and jaw-breaking language of the country.

THANKS are hereby extended to Geo. H. Morgan, Esq., Secretary of the St. Louis Merchants Exchange, for a copy of the St. Louis trade and commerce for 1878. The report shows an excellent trade notwithstanding the unusual depressing effects of the yellow fever scourge in the South and the subsequent low water in the river.

THE invention of Wm. Lehmann for truing the grinding surfaces of mill-stones has caused considerable excitement among our millers. It is so simple and yet so perfect that lots of them wonder that they never thought of it before. It is generally used in our Milwaukee mills and we predict will spread. Good things are "catchin'" amongst millers.

Advertisers will consult their own interests by patronizing the UNITED STATES MILLER, which circulates almost exclusively amongst the flour milling class. It has the largest circulation of any milling paper published in America, and was the first independent milling journal started in the United States not being connected in interest with any patented machine or milling supply house.

QUITE a number of mill-owners from different parts of the country have visited Milwaukee to see for themselves the Milwaukee Milling Company's new mill described in this journal last month, and are astonished at the wonderful success of the little patent mills. The Milwaukee Middlings Mill-Stone Company are receiving orders from all points of the compass.

O. L. PACKARD, of 87 West Water street, Milwaukee, reports quite an improvement in business and the receipt of numerous orders for supplies, for several engines, also for a saw mill, a 2-run mill, a portable mill and iron and wood working machinery. He has recently shipped an outfit to Missouri and a large planer and matcher to Arkansas. Included in the last order was some mess beef.

THE TOLL BILL.—A member of the Wisconsin Assembly, from the "rural deestreeks," desiring to make himself popular with his neighborhood-grangers, has introduced the usual bill to change the present rate of toll from one-eighth to one-tenth. There seems to be no objection to the present rate, it being generally satisfactory to both farmers and millers. A few winters ago a similar bill was

introduced, and a member voting against it said: "I am opposed to increasing the rate of toll from one-eighth to one-tenth. I think the millers get enough now, and therefore vote No." And his example was followed by a majority of the House. The bill will undoubtedly be killed.

M'LEAN'S MILLERS' TEXT BOOK is no advertising clap-trap. It contains no advertisements at all. It is a book of instruction, written in simple, plain language, that anybody who can read English can understand. The apprentice with this for a pocket companion can learn more in a month than without it in a year. Price 60 cents, or the UNITED STATES MILLER, for one year, and a copy of the Text Book for \$1.25. Cash or postage stamps taken. Address UNITED STATES MILLER, Milwaukee, Wis.

THE FINEST MILL IN SOUTHERN MINNESOTA OWNED BY MILWAUKEEANS.—The fine new steam mill at Peterson, Minn., has passed into the ownership of Filer, Stowell & Co., and is soon to be remodeled after the style of the Milwaukee Milling Company's new mill, in Milwaukee, unless they sell it soon. It has eight run of four-foot buhrs, and is in all respects a modern mill, having cost some \$33,000. All the machinery of the mill, except a part of the cleaning machinery, having been built by this Milwaukee firm, is an assurance that the mill is thoroughly well built.

MR. ANGELL has of late been making some pretty tough statements about the great amount of adulteration of food, for which a great number of papers take him to task and soundly abuse him. While Mr. Angell may have drawn the picture a little too strong, we think the attention of the public has been called to the subject through his statements, and that nothing but good results will follow the investigations sure to be made. Adulteration, cheating, and selling goods under false brands are too frequent. The *New England Grocer*, which criticises Mr. Angell strongly itself, says: "There is much complaint among grocers that the brand on a barrel of flour has ceased to be a true indication of its contents and of the maker." This state of affairs demands a remedy, and it must be provided soon. We frequently see flour branded HAXALL (the celebrated Virginia brand) being carted through this city which was made here in Wisconsin. Of course, there are some rogues amongst millers, and the using of false brands is one of their tricks. Law should be made for such cases, and our legislators would serve their constituents better by making it than wasting their time and the people's money in buncombe speeches and toll-regulating bills.

## THE COCHRANE CASE.

This case which has been so long before the milling public came to trial at last in St. Louis before the United States Circuit Court, Feb. 10th. Three Judges, Nelson, Dillon and Treat, sat on the cases; the St. Louis cases to be decided by Judges Dillon and Treat, and the Minnesota cases by Judges Dillon and Nelson. Both sides have been preparing for this contest for a great length of time, and the testimony taken filled two large printed books. The Court room was filled with drawings and models of mills and milling machinery and samples of flour, middlings, etc., supposed to bear on the case. The prosecution was represented by Rodney Mason, of Washington, D. C.; Chas. F. Blake, of New York; W. K. Gibson, of Jackson, Mich., and Chester H. Krum, of St. Louis. The defense was represented by Geo. Harding, of Philadelphia; Gordon E. Cole, of Minnesota, and Frederick N. Judson, of St. Louis. The Court room was constantly filled by parties interested in the case. We had prepared a full and complete report of the case for publication, which would fill many pages of this journal which would make interesting reading if the case was not concluded, but the trial was concluded Feb. 26th, and the matter submitted to the Judges who will not give their decision until the next term of Court. Under these circumstances the reading of the report of the trial would be a good deal like eating "dead crow," and we feel satisfied that not one miller in 500 would wade through it. Suffice it to say, all was said and done on each side that money or brains could do or suggest, and the matter is now in the hands of the Judges from whose decision we think there will be no appeal taken, be it as it may.

At about the close of the trial Mr. Rodney Mason, of counsel for the plaintiffs, moved to dismiss the case against Messrs. E. O. Stanard & Co., one of the St. Louis parties against whom

one of the suits was brought. Subsequently J. B. M. Kehlor & Co., also of St. Louis, effected a settlement on the basis of \$100 per run of stone. These announcements fell like a thunder-clap on other millers, and the gentlemen who saw fit to settle were roundly scored by their irate brethren, and the Missouri Millers' Association hastily called a meeting of what members could be quickly brought together, and expelled the gentlemen above-mentioned from the Missouri Association.

To us it looks like poor policy for these gentlemen, who have persistently fought the case so far, to settle at such a time, even if in their judgment the case was doubtful, as in all probability the measure of damages would be put at a low figure if the patentees should succeed in winning, which the counsel for the millers claim there is no danger of.

Be it as it may, there is now the satisfaction that the trial of the most important milling case ever before the Courts is concluded, and we look for the decision in the early part of May. If it is in favor of the millers there will be a big jubilee at the next meeting of the Millers' National Association; if against—why—well, we suppose the other fellows will have the jubilee.

## THE GRATIOT WHEAT HEATER.

Judging by the subjoined letter we should say that the Gratiot Wheat Heater fully and perfectly meets all the requirements:

WASHBURN B MILL, MINNEAPOLIS, Minn., Jan. 30th, 1879.—Messrs. Gratiot Bros., Platteville, Wis.—GENTLEMEN: I have been absent or should sooner have answered your favor of the 11th of January. In regard to your Wheat Heaters I am able to say that I use no other. The first set up in this city were put in this mill some three or four years since, and yours were the only heaters in the Washburn Mill A at the time it was destroyed in May last. The new mill erected by me since the great fire has nine of your heaters, and I believe that it is the judgment of nearly all the millers here that your heater is the best one in existence, and I think it is now in use by most of the mills here, several of which have discarded other heaters to give place to yours. My experience is that your heater does its work perfectly and cannot be improved upon.

Truly yours, C. C. WASHBURN.

## BRITISH BUSINESS CRISIS.

The present business revulsion in Great Britain recalls former periods of financial and commercial disturbance, during the present century, besides corroborating the soundness of the assumption that an undue expansion of credit and over-trading are sure to be followed sooner or later by commercial panics and periods of business demoralization and depression. The British panic of 1816 was caused by the enormous expansion of the various forms of credit which followed the restoration of peace after protracted wars. Hardly had the effect of the panic of 1816 disappeared before another swept over the country. This was ten years later, in 1826, and was brought about by substantially the same causes, aggravated, however, by an inflation of the currency. At the next session Parliament made provisions for the certain contraction of the currency, and by adhering to this policy a healthy condition was restored to business and industry, aided by several years of abundant harvests. The next financial crisis occurred in 1839. New banks had been organized and the currency largely inflated, credits extended, joint stock mining and all sorts of speculative companies had sprang into existence, and over-trading was the rule. In this as in all other instances, the panic was followed by bankruptcy, shrinkage of values, fall in prices, and prostration of business. A period of recuperation followed, after which, in 1857, came another revulsion, and in 1866 there was also a semi-panic. But probably none of them were more serious than the present disturbance. They were all the results of a violation of the immutable laws of economy, for which our country has for several years been paying the penalty.

ADULTERATED FLOUR IN LONDON.—Some flour was recently discovered for sale in London (an imported article by the way) which upon examination was found to contain over 70 per cent of plaster of Paris. Dr. Saunders the Medical Health Officer made due report thereof to the Lord Mayor, but from some technicality the case was dismissed. The doctor took some of it and moulded a pretty good donkey's head therefrom by way of experiment. A baker mixed some good flour with it and made bread therefrom, but on being informed that he would probably get into trouble if he sold it fed it to his pigs. Dr. Saunders said "it was rough on the pigs."

## BOTTLED BEER.

Messrs. Vochting, Shape & Co.'s Mammoth Beer Bottling Establishment, Milwaukee, Wis.

It has been but a few years since the trade in bottled beer assumed any very great importance, beer generally being sold by the keg, but after practical experiment it was found that in all cases where not consumed in large quantities and immediately upon being tapped as in some of the fortunate metropolitan saloons, that beer properly bottled was better and more convenient than in the old-fashioned way. Families—instead of ordering a keg of beer for use, which with the best of care will soon get stale, flat and unpalatable—now order by the case (two dozen bottles), and, when beer is desired, pull a cork and have the article in suitable quantity, always fresh, and perfect in condition.

Realizing the important trade that might be built up in this branch, Messrs. Vochting & Shape selected Jos. Schlitz's celebrated Milwaukee lager beer, which they believed to be the best for the purpose, and Jan. 1st, 1877, erected an establishment and commenced business. In September of the same year the firm was increased by the addition of Mr. Charles Uihlein as partner, and since then has been known as Vochting, Shape & Co. The sales for 1877 amounted to about a million bottles, and in 1878 the sales were much more than doubled, showing a very happy increase in business. The premises then occupied (46 by 150), on the corner of Third and Galena streets, being too small to accommodate their rapidly increasing business, they moved their building one block east to the corner of Second and Galena streets, and built a basement under it full size (46 by 150 feet), and 14 feet in height, and a large addition for the boiler, engine, and steaming tubs, and a new office. Passing through the office (warmed by steam), we come to the bottling house proper, and see filling apparatus and corking machines—two of each. Beer constantly runs from full barrels (31 gallons), hoisted on platform and remaining suspended until empty, into a trough with five sieves in it, through which it is strained, and thence passes into a lower trough, from whence it runs through twelve syphons into the bottles. One man is engaged at each filling apparatus putting on and taking off bottles. Full bottles are placed on the table of the corking machine, and are corked instantaneously. A full barrel is bottled and corked in the remarkable short time of 4½ minutes.

On one side of the building we see a tub for washing new bottles only; four girls attend to it. We next find floor covered with boxes full of freshly filled and corked bottles. A large number of boys are busy putting on wire; others with nippers are twisting wire and nipping off the ends.

We at once pass into first side room, where three large steaming tubs stand, and see boys carrying the same beer we saw on the floor, in boxes, into the steaming tubs, piling box upon box. Water is then turned on, then steam, until water and beer is heated to near boiling point. The water is then let off, and when the beer is sufficiently cooled off it is taken out and placed upon long tables in the center of the bottling house, where each bottle is tin-foiled and labeled by girls. Going towards the rear we see a number of men busy winding straw around bottles, and packing them in barrels, for the Southern trade principally.

On the other side of the building beer is placed in boxes for shipping. In winter the bottles are packed in saw-dust to prevent freezing. In this way the firm ship their beer throughout the whole winter.

Passing down stairs, we find the boiler and engine room in an addition adjoining the main building. Entering the basement, we find boxes and bottles returned from customers, new bottles in great piles, three great tubs for washing old bottles, a cork washing machine (invented by one of the firm), also bottle washing machines and a machine for branding corks (the invention of Mr. Vochting). Here also is a carpenter-shop, where old boxes are repaired. The vault underneath the sidewalk adjoining the basement is filled with bottles which might be measured by the cord.

Stepping on the elevator, we ascended to the upper floor, which is used as a store-room for new boxes, band iron, corks, and other necessary supplies. The establishment employs over 50 men, many girls, and several teams. Agencies have been established all over the United States, Canada, Cuba, Brazil, and Mexico. The bottled beer is shipped from here in car-load lots to the various agencies,

and orders are filled direct to parties not living convenient to agencies.

The capacity of the establishment is now 100,000 bottles per day, and the prospects are that it will be run to its full capacity during the coming season. Beer bottled by them keeps in any climate and for any length of time. It is warranted pure and is pronounced to be of the best quality and flavor by thorough judges of beer. Judging from the showing of this firm, we predict that the time is not far distant when more bottled beer will be sold than keg beer, on account of the manifest advantages it possesses.

## GRAIN FOR MILLING.

AN ESSAY READ BEFORE THE PENNSYLVANIA STATE MILLERS' ASSOCIATION, AT LANCASTER, JANUARY 14TH, 1879, BY ANDREW M. GARVER, ESQ., OF SALUNGA, LANCASTER CO.

[Revised by the author for the United States Miller.]

This is a subject of noble import, as the milling business occupies a large and respectable portion of our National industries, and gives employment to a large investment of capital in all the principal wheat-growing States of the Union, and which contributes largely to the benefit of our American farmers in making a home market for wheat, the principal American staple product. It embraces an extensive field of labor for the scientist, the agriculturalist and the practical miller. It is a subject of more than ordinary interest to the wide-awake American miller, for it is as important for the miller to have a theoretical knowledge of the quality of the grain he buys and grinds, as it is for the physician to know what to prescribe for the alleviation or cure of a certain malady or disease. The quality and quantity of grain should, at all times, maintain a price that would produce the results, both for the manufactured article, and to leave the best margin for the miller.

As there is no country on this globe which is so well adapted to the cultivation of wheat as the fertile soil of America,—the quality of which seems highly impregnated with those nutritious substances so necessary to the production of this grain,—consequently the high reputation which American breadstuffs sustain in foreign markets enables the millers of this country to out-rival all competition in the manufacture of flour, either in quality or quantity, as the surplus amount of grain annually grown in the United States bids fair to exceed the entire product of all the European dependencies. Not many years ago (and as late as the year 1839), large quantities of grain were imported from Europe to the United States, and sold to good account.

Wheat, the article from which the principal breadstuffs of America and most of the European countries is manufactured, takes precedence over all other grain, and comes to us from the East, as well as all other cereal grasses, but it has been so much changed and improved by culture, that its connection cannot be satisfactorily traced to any species of the genus now known to be growing wild. The wheat that produces the largest amount of flour and of the best quality is certainly the most profitable for the miller, but at the same time he must know for what trade he is making flour—whether for the baker, family use, the starch factory, or the paste-pot. As wheat is composed of water, gluten, starch, gum, sugar, oil and other substances,—gluten and starch forming the two principal elements of flour,—wheat that contains the largest per cent of gluten and starch proves to be the most profitable both to the miller and consumer. The baker will always buy the flour that contains the largest per cent of starch, as this element in flour is the one that expands, and, by its nature, is dry; more water can be added, and the result is more pounds of bread to the barrel.

As the yield of flour depends on the species and quality of wheat (which millers are all, more or less, acquainted with), the wheat that weighs the heaviest does not always make the most or best flour. As a general thing wheat known as the Mediterranean exceeds in weight all others except the Fultz, and that yields well enough in quantity, but not in quality, as flour from this wheat is darker, which, consequently, makes darker and rougher bread, and, therefore, is not advisable to grind alone, either for baker's or family use. In my experience in grinding wheat, I find that by taking the following proportions: one-third Fultz, one-third Red and one-third Amber, we are able to make a good quality of flour and also an excellent yield. These are the principal kinds of wheat raised in our section of the country. I would not recommend the grinding of the Fultz alone. It would be to our in-

terest as millers to encourage the farmers to raise the Red and Amber, or such other species as yield well for the farmer, and at the same time produce a good quality of flour. Again, to be a fair judge of grinding wheat for flouring, the miller must be endowed with one of the five blessings or senses with which nature has bestowed upon mankind generally, that is, an acute sense of feeling, for, without this sense, the miller is destitute of a guide to grind wheat for merchant work in such a manner to realize the greatest possible amount of flour from the wheat. As it requires but an alteration of two degrees to make a difference of from one to three pounds of flour in the bushel, so it is in the different qualities of wheat which the miller may have to grind, as some qualities of wheat will grind from one to five degrees closer than other kinds, owing first, to the order that each sample may be in when ground, and secondly, to the particular species of wheat. All these causes must be examined by the miller, and he will then be prepared to form a correct judgment as to how close the stone requires to be set on each kind of wheat.

The purchase of wheat is another subject of importance both to the miller and farmer. The standard weight of wheat is held at sixty pounds per bushel of thirty-two quarts, but, so frequently does it lack in weight, that, to remedy this defect, the farmers have learned to give the bushel measure an extra shake or two, or believe they can make good measure by pressing down and striking and running over, so that the weight compares more favorably with the measure. This so frequently causes disappointment to both miller and farmer, that some plan is rendered necessary for the protection and benefit of both parties. In some of our milling establishments a rule of dockage is practiced. For every pound that the measured bushel falls short of sixty pounds, one pound is added to make up the shrinkage. This plan of dockage I should not recommend, because it frequently causes dissatisfaction among farmers wherever the system prevails. To prevent the difficulty, I would recommend the miller to deal in this respect as the merchant does in the articles of cloth, calico, or any other kind of goods whose value is fixed according to its quality. This I would deem the true and only rule that merchant mills should follow.

The last, but not least, fact, that stares us in the face, is that wheat is frequently worth more in the market than flour is. This fact is one that is very forcibly brought to the minds of millers in all sections of this country. We are at present passing through an ordeal of this kind, wheat being worth from \$1.06 to \$1.08 per bushel, while flour is quoted at \$4.50 to \$4.75 per barrel in our market. Considering the expense of grinding, shipping, commissions, etc., the margin in the miller's favor is very slim. Many of the flour mills have run down, some have stopped altogether, and others are only busy a few months in the year. We raise millions of bushels of grain every year, and it is exported in an unmanufactured condition, while the mills and millers in foreign countries perform the labor and make the profit which ought to be ours, and, by the passage of proper laws, can become ours. At present there is no export duty on breadstuffs of any kind, either in a manufactured or unmanufactured state, and the consequence is, that the large amount of breadstuffs shipped to Europe are in an unmanufactured condition. Foreigners buy our wheat in preference to flour, not because they are making a better article of flour, but because they want to reap the benefit of manufacturing it themselves.

What is the remedy? I suggest that the quickest and best way to change this state of affairs would be to put an export duty on wheat, and let flour go out from American ports duty free. This would give employment and profit to American millers in manufacturing our own wheat into flour. This would not only be to the interest of the miller, but the whole American continent would be benefitted by it. This is a matter of great importance to American millers, and a subject that should be discussed and acted upon by our various milling associations, and, if after due discussion, it should be considered prudent and advisable, our members of Congress should be urged to secure the passage of a law putting on the export duty.

The produce statistics of Nebraska for 1878 are given as follows by Professor Wilber: 26,000,000 bushels of wheat, 46,000,000 bushels of corn, 9,000,000 bushels of oats, 3,000,000 bushels of rye, 3,000,000 bushels of barley, 3,000,000 bushels of potatoes; 500,000 cattle, valued at \$7,000,000; 600,000 swine, valued at \$5,000,000.

## DOES THE MODERN SYSTEM OF MILLING PAY?

A Subject that will Bear Considerable Discussion.

[Special correspondence of the United States Miller from Scotland.]

In relation to a heavy percentage of middlings one wonders at the ideas often put forth by those so-called scientific millers. One favorite idea with them is that soft requires less fare than hard wheat, which shows that the difficulty of bran cleaning or flour detachment from the bran with mild pressure has never entered their heads. It is all very well on a superficial view to say: take off the bran first, making as little flour during that process as possible, and then the remainder will all be first-class. They seem to forget that the grand difficulty with the miller is the detachment of the flour from the bran, without cutting the latter too much up or injuring the flour by too much compression. The necessity of having a certain medium of cutting and crushing must always be taken into consideration with the flour miller, however high or low the grinding, as he cannot get quit of the difficulty of bran cleaning; and whether wheat is reduced to flour by one or several regrindings, the same consideration must always prevail at the end, for produce and quality combined. The larger and cleaner the bran is, the less loss and difficulty in separation; and the more the bran is pulverized at the end of one or several regrindings, the more expense will be incurred for sifting or separating surface to attain a certain standard purity for a straight grade, or the average of several grades, and local circumstances must always have a ruling influence as to whether clean or heavy bran, or one or several flour grades will pay best.

Now, experienced millers know that as the wheat gets softer, the more difficulty they have in cleaning the bran and at the same preserving a necessary freeness of flour for handy baking and good fermentation. The softer the wheat, the larger the larger the granules have to be and the greater the distance between the stones to preserve the necessary freeness, and with such wheat the miller aids the cleaning as much as possible by keen-edged cracking, so that he gets clean bran and free flour at the same time; but except he has extensive face rubbing, this cool light-pressure grinding won't clean the bran. This cool grinding with large stone face had to be carried to the extreme in Britain with its humid climate and damp wheat.

As a type of the other extreme of grinding the ancient Egyptian is a fair sample, as his wheat was harder than that of California, Kansas, or Colorado. Nearly all his wheat could be reduced to flour and the bran cleaned without any rubbing at all, as by simply striking it repeated blows it breaks off without compression. Some Hungarian mills also crush the most of the flour off without any differential speed of rollers. Then say the British or North Europeans had attempted the Egyptian mode of reduction! They would have just pounded the greater part of the flour and bran into an inseparable mass, totally spoiled for immediate fermentation. A gentle rub over a 9-inch face, with lands and furrows about equal in breadth was reckoned sufficient by the British for good flour and produce, but the Egyptian could do without any rubbing at all. His wheat could be broken nearly as small as the thickness of the bran without compression of the particles taking place.

It will be evident, then, the harder the wheat the more violence can be employed to crush it down on a smaller face, and one of the inexorable laws of nature likewise aids him in this with stones. It has been found from long experience that the damper the grain the lower a kiln heat requires to be, all of the earth's productions seeming to rebel and change faster on a sudden combination of great heat and excessive moisture, and a stone heat which would affect the Egyptian but little would spoil the British for good fermentation from the suddenness of the application of heat in the stone. Now, hard wheat can be broken or ground down to very small particles and yet feel sharp and gritty, or sandy, although many times smaller than the flour of soft wheat which feels quite soft. It thus requires an exceeding true stone face, with skillful designed furrowing, to prevent irregular grinding in grinding down at once. As the closer the stone the quicker is the bran cleaned. With a large number of hard wheats the flour particles have to be so small to prevent over freeness or grittiness, that bran cleaning has never to be taken into account and no stone cracking or artificial edges required at all. And the more unskillful the miller the more face required, and the more the bran is unnecessarily rubbed and pulverized, and the flour polished deteriorating its strength. And the skill of the miller is shown when he attains the best results with hard wheat with the least grinding or rubbing surface, and those who require a larger face for hard than for soft wheat must be unskillful millers.

## UNITED STATES MILLER.

PUBLISHED MONTHLY.

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MILWAUKEE, MARCH, 1879.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

THE UNITED STATES MILLER has now entered upon its sixth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country. We do not deal in machinery ourselves, and consequently have no "axes to grind." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

## ADVERTISING RATES FOR 1879.

	1 mo.	2 mos.	3 mos.	6 mos.	1 year.
One inch card	\$ 2 00	\$ 4 00	\$ 5 50	\$10 00	\$20 00
Two "	4 00	8 00	11 00	20 00	40 00
Four "	6 00	12 00	16 50	30 00	60 00
One-half col. (8 inches)	10 00	20 00	30 00	60 00	100 00
One fourth page	20 00	40 00	60 00	120 00	200 00
One-half page	40 00	80 00	120 00	200 00	350 00
One page	100 00	150 00	200 00	400 00	800 00

Size of page, 12x18. Length of column, 16 inches. Width of column, 2 1/2 inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employes, 50 cents.

MILL FOR SALE advertisements, \$2 each insertion.

We have recently published a *List of Names and Post-Office Addresses of the Flour-Mill Owners of the United States and Canadas*, which is of great value to those who desire to communicate by circular with American mill-owners. The price is \$5 per copy, post paid. Cash must accompany the order.

We have also lately published a *Saw and Planing Mill Directory of the United States and Canadas*. Price, \$5.

Subscription price to the UNITED STATES MILLER, \$1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, \$1.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the  
UNITED STATES MILLER,  
62 Grand Opera House, Milwaukee, Wis.

EVERYTHING seems to be adulterated now-a-days except oysters and eggs and limburger cheese, and they often outlive their usefulness.

A MINNEAPOLIS baby born last Sunday had five teeth, a fine head of hair and weighed with its wrappings just one pound and a quarter.—N. W. Miller.

New process—eh, Hoppin'?

AN INVITATION.—We cordially invite all millers, millwrights, millfurnishers and inventors of milling machinery to call on the UNITED STATES MILLER when visiting this city.

WE hereby return thanks to Hon. S. D. Fisher, Secretary of the Illinois Department of Agriculture, for copies of his report for the year 1878. It has been prepared with great care and labor, and is a work of value.

THE UNITED STATES MILLER has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill-furnishing establishment.

WE publish in another place a communication from the Executive Committee of the Millers' National Association. Messrs. Collins & Gathmann, the well-known Chicago manufacturers of the Garden City Middlings Purifier, well deserve the compliment therein conveyed. All manufacturers of middlings purifiers, except the Geo. T. Smith Company of Jackson, Mich., are to a certain extent interested in the success of the millers in the present St. Louis cases, and this timely liberality on their part is highly commendable. Other manufacturers

who seek the patronage of millers would do well to follow their example. No expense should be spared to secure a final and just result.

AMERICAN plumbers generally know how to charge enough for their services, but here is an extract from a French plumber's bill that deserves their attention:

To searching for leak in gas pipe....2 francs  
To finding it.....3 francs

MR. J. B. MCFAIL, of Vassar, Mich., has sent us his circular describing his compound and method for patching bolting cloths and specimens of work done. It is a good thing and will no doubt soon be in use universally for the purpose intended.

## THE PLAGUE AND GRAIN TRADE.

The effect of the Russian Plague on the American grain trade will undoubtedly be considerable. Commerce is practically stopped between Russia and the rest of the world for the present, and such being the case, America must necessarily make up the deficiency caused by the sudden stoppage of the usual large exports from Russia. The meager reports which the press is able to obtain of the true condition of affairs in Russia indicate that this visitation is truly dreadful. The ravages of the yellow fever in our own Southern States during the summer of 1878 are said to be insignificant in comparison with the frightful fatality of the plague in Russia. If these reports are true, there is no doubt of a steady advance in the price of wheat.

## FISHWAYS.

We have just received a copy of the report of the Wisconsin Fish Commissioners in which they call special attention to the absolute necessity of having fishways in mill dams. They ask the State Legislature to enact laws to compel mill-dam owners to construct fishways with a penalty for neglect of so doing within a reasonable time, or if this is not deemed advisable they urge that the law should provide for their being erected at public expense, as the successful culture of fish is otherwise impossible. We believe most mill-dam owners are willing to put in fishways without being compelled to do so. The Commissioners have a plan of an efficient and cheap fishway. The result of the labors of the Wisconsin Fish Commission since its organization in 1873 is highly satisfactory.

## IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. To those who will send us One Dollar in thirty days from date of this notice we will send the UNITED STATES MILLER from March 1st, 1879, to May 1st, 1880. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address

THE UNITED STATES MILLER,  
March 1st, 1879. Milwaukee, Wis.

## ORDER AND CLEANLINESS IN FLOUR MILLS.

If there is any manufacturing place in the world that ought to be kept absolutely sweet and clean and everything therein in order, it is the flour mill, and yet we confess to having seen many mills which were totally the opposite. Bags, bran, offal, tools, old coats, horse blankets, flour and many other things lying about in universal confusion, the miller and his help probably smoking their pipes or chewing tobacco and spitting in the place that came handiest. These same millers would feel themselves outraged and imposed upon if their wives should keep their kitchens in such a deplorable state of dirtiness and confusion. There is as much sense in keeping one in order as the other. This fault is most frequent in custom mills, although we have seen some merchant mills which could bear a wonderful amount of improvement in this respect. The flour mill should be always kept perfectly clean, and tools and material always in their places except when in actual use. No smoking or chewing of tobacco should be allowed, and employes should keep their hands and clothing as clean as the baker is supposed to. The manufacture of flour is a

neat, clean, pleasant business, if properly carried on, and cleanliness is of pre-eminent importance. In a well ordered mill it is scarcely necessary to get the clothing soiled even with flour dust.

## AN INTERESTING COMMUNICATION.

Editor United States Miller:

The Executive Committee of the Millers' National Association acknowledge the receipt of \$500 from Messrs. Collins & Gathmann, of Chicago, proprietors and manufacturers of the Garden City Purifier, as a voluntary contribution towards defraying the expenses of defending suits brought against the millers by Cochran and others, and we take pleasure in publicly thanking these gentlemen, because it is due to the millers to know their friends among the vendors of mill machinery.

Their liberality while doubtless prompted by a recognition of the fact that while we are defending ourselves we are also fighting their battle to some extent certainly strongly recommends them to the liberal patronage of millers everywhere, besides the fact that their machines have undoubted merits and are offered at moderate prices, and last, not least, because they are reliable, responsible and liberal gentlemen.

J. A. CHRISTAIN,  
ALEX. H. SMITH,  
J. A. HINDS,  
S. H. SEAMANS,  
Sub-Executive Committee.  
GEO. BAIN, President.

St. Louis, Feb. 14th, 1879.

## ALWAYS TURN THE CRANK THE RIGHT WAY.

Years ago, when the Connecticut Legislature used to hold May sessions, a member of that body invented a "shad boning machine," which was operated by means of a crank. When the weary members had awakened from their morning nap, brought on by the monotonous debate, a grand rush was made for the dinner table, and each member provided with a shad and a machine, seized the crank and as it turned, the bones flew over the eater's head, and the toothsome portions of the fish were nicely deposited within his distended jaws. The machine was voted a success, and a large subsidy was talked of in the lobby. But the course of the "shad-boner" was not destined to run smooth. One day an unsophisticated member turned the crank the wrong way, the fish flew over his head and the bones filled his mouth and throat till he resembled a living pin-cushion for a few moments, and he finally took his departure from Connecticut to the better land. The inventor was ruined, the machines sold for old iron, and the primitive mode of eating shad with the fingers prevails unto this day.

## INCREASE OF THE RUSSIAN EXPORT TRADE.

—According to the Moscow correspondent of the *Cologne Gazette*, the Russian export trade, with all the disadvantages of the recent war, has more than doubled during the last ten years. In 1868 Russia exported to the value of two hundred and nine and a half million roubles to Europe; in 1877, 508,000,000—viz., corn, 264,000,000; flax, 63,000,000; linseed, 22,500,000; wool, 22,000,000; wood, 31,000,000, etc. The export of gold during the same period was 19,000,000, and the import 11,000,000; the total imports, including Asia and Finland, being 321,000,000.

## Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT TO MILLERS.—The necessity of the most positive uniform speed in the motive power of flouring mills is generally conceded. The unprecedented results in way of positive regulation of engine, durability and great economy in use, now guaranteed by the Huntoon Governor Company, are worthy the consideration of all who may use steam power. See advertisement.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nurdyke & Marmon Co., Indianapolis, Ind.

NOTICE.—The milling public are hereby notified that we have discontinued all suits against Messrs. E. P. Allis & Co., for infringements of patents on the Cackle Separator, manufactured by us, and the said firm of E. P. Allis & Co. will hereafter sell our machines on same terms as other mill furnishers, or the undersigned.

COCKLE SEPARATOR Mfg Co.  
Milwaukee, Dec. 27th, 1878.

MILL PICK WORKS OF HENRY HERZER, No. 456 Canal street, Milwaukee, Wis.—To the Milling Public: Having this day dissolved partnership with the firm of H. & J. Herzer, I hereby respectfully announce that I have removed to No. 456 Canal street, where I am ready to receive orders for manufacturing and repairing mill picks, tools and all specialties in my line. My work is well known through the country, and I do not hesitate to guarantee perfect satisfaction to all parties favoring me with their orders. Address  
HENRY HERZER, No. 456 Canal street,  
Milwaukee, Wis.

## NEW PATENTS.

The following patents were issued from the United States Patent Office for the week ending January 7th, 1879:

Barrel-truck, Elvin D. Sterling, Rock Falls, Ill.  
Pump-valve, Geo. S. Bartlett, Leon, Iowa.  
Bag-fastener, Thomas Cleary, New York, N. Y.  
Steam-motor, Thomas B. Fogarty, Brooklyn, N. Y.  
Barrel, Garder & Butterfield, Milwaukee, Wis.  
Grain-binder, James F. Gordon, Rochester, N. Y.  
Middlings - separator, Lawrence Kleunn, Terre Haute, Ind.  
Boiler-attachment, George Kratz, Evansville, Ind.  
Straightening millstone face, Wm. Lehman, Milwaukee, Wis.  
Crushing-roll, Peters & Gardiner, Brooklyn, N. Y.  
Oatmeal-machine, George W. Severance, Ravenna, Ohio.  
Steam-generator, Geo. B. N. Tower, Cambridge, Mass.  
Grinding-mill, A. H. Wagner, Chicago, Ill.  
Bag-fastener, John H. Wilhelm, Denver, Colo.

The following patents were issued the week ending January 14th, 1879:

Roller apparatus for crushing and grinding grain, Wilhelm Braun, Carlsbad, Austria.  
Grinding-mill, Christiau Custer, Philadelphia, Pa.  
Feed-water heater, Horace C. De Torres, Turin, Italy.  
Wind-mill, Wm. Frazier, Centralia, Ill.  
Feed-water purifier, Sam. J. Hayes, Chicago, Ill.  
Barrel-machine, Sam. P. Hodgen, Martling, Mo.  
Stuffing box for steam engines, C. C. Jerome, Chicago, Ill.  
Engine-governor, Chas. S. Locke, Chicago, Ill.  
Steam-boiler, Josiah M. Simpson, Oshkosh, Wis.  
Grain-conveyor, Wm. T. Smith, New Lots, N. Y.

The following patents were issued January 21st, 1879:

Corn-planter, Jarvis Case, Dayton, Ohio.  
Middlings-separator, G. H. Doane, Detroit, Mich.  
Corn-planter, Ezra Emmet, Franklin Grove, Ill.  
Grain-separator, Jas. F. Hatfield, Dublin, Ind.  
Bran-duster, Chas. A. Lawton, Depere, Wis.  
Repairing bolting cloths, John B. McFail, Vassar, Mich.  
Wind-mill, Henry M. Underwood, Kenosha, Wis.  
Machine for sorting and cleaning semolino, Jacob Werner, Budapest, Austria.

The following patents were issued January 28th, 1879:

Middlings-separator, William P. Anthony, Chambersburg, Pa.  
Feed-water heater, Chas. F. Barrett, New York, N. Y.  
Wind-mill, Julian R. Dixon, Fresno, Cal.  
Barrel-hoop machine, John B. Dougherty, Rochester, N. Y.  
Engine-oiler, Edwin M. Humstone, Edgeville, Tenn.  
Grain-register, L. C. Ives, Indian Creek, Va.  
Rotary-vacuum engine, Lor. B. Lawrence, Monticello, Cal.  
Feed-water heater and boiler regulator, James Pool, Friendsville, Ill.  
Middlings-separator, Wm. A. Reimers, Manakato, Minn.  
Cut-off, Wm. Sims, Ripley, Ohio.  
Wind-mill, Geo. W. Sword, Lanark, Ill.

The following patents were issued February 4th, 1879:

Turbine water wheel, Albert Ball, Clasement, N. H.  
Grinding-mill, Teman Bowman, Alum Wells, Va.  
Hulling - machine, Norman Hutchinson, North East, N. Y.  
Barrel-trussing, Horace W. King, Aiden, N. Y.  
Grain-separator, Henry H. May, New Albfon, Iowa.  
Mill-staff gage, John Miltenberger, Peru, Ind.  
Threshing machine and separator, Robt. H. Montieth, Eau Claire, Wis.  
Yeast substitute, Wm. Stewart, Portsmouth, Ohio.  
Grinding-mills, A. H. Wagner, Chicago, Ill.

IMPROVED METHOD OF MANAGING STEAM BOILER FIRES.—When the furnace door of a steam boiler is opened, there should be a simultaneous partial closing of the damper to prevent sudden chilling of the boiler and flues. To accomplish this with certainty for every opening of the doors, Mr. William Weightman, of Powers & Weightman, has had arranged and applied a system of levers and rods, connecting the furnace doors with the damper, so contrived that whether there be one or more doors to one furnace, or to which one damper is supplied, the act of opening any one door will invariably close the damper. Whether this application of simple and ingenious devices is new or not, every engineer will regard it as one of the good things for aiding the better management of steam boilers.

## OUR PENNSYLVANIA LETTER.

## Something About Oil.

[Special Correspondence United States Miller.]

OIL CITY, Pa., Feb. 15th, 1879.—Probably no other important industry of the United States has undergone so many remarkable transitions as that of petroleum production, manufacturing and transporting. Ever since the day when Col. Drake discovered the oleaginous compound oozing from the rocks in the ravine, near the present beautiful and metropolitan-like city of Titusville, up to this date, has there been more or less commotion in the interest which now ranks third in importance, extent and value of American commodities. Owing to the speculation, that is always certain to become connected with the discovery of anything new and of universal and manifold usefulness, enterprise after enterprise, and combination after combination has been originated by shrewd and calculating capitalists to grasp and monopolize the various interests that are a part and parcel of petroleum and its products. The first of these schemes to control the production, storing, transporting, refining and marketing of oil, was the organization of the South Improvement Company, which occurred in the early days of the discovery of petroleum. All of these associations and corporations for the manipulation of the oleaginous product soon, however, met with disaster and crumbled to pieces. The only corporations which managed to hold out against all odds were the "pipe-line" companies, whose lines of pipe carried the crude oil from one point to another in the producing centers, and then finally conveyed it to the railroads, which traverse the regions, for shipment in iron tanks mounted upon platform cars. The pipe-line companies also erected many great iron tanks of immense capacity for storing oil. The principal pipe companies are the Pennsylvania Transportation Company,—of which Cook & Harley were the originators,—the United Pipe Line, the Union Pipe Line, and the Columbia Conduit Company's Line. The latter concern was originated by Pittsburgh capital and the oil was mostly carried, and still is shipped to the seaboard, by the Baltimore & Ohio railroad, it being taken via the Pittsburgh & Connellsville route to Baltimore. Some of the crude material also goes to Parkersburg, West Virginia, where it is refined at the works of the B. & O. R. R. Co.

The petroleum operations have frequently jumped from one place to another, in consequence of the exhaustion of the greasy compound. The Crawford county "oil belt" soon depreciated after its finding, and the mushroom cities and towns, which had sprang up as if by magic in the times when Crawford county was the scene of busy petroleum operations, rapidly fell into insignificance, and finally disappeared from existence altogether. Perhaps in no other section of the country can the foot-prints of time be so readily recognized by the changes which are everywhere apparent. On the twenty-eighth day of August, 1859, Col. Drake first struck oil near Titusville. This was twenty years ago, and yet in that comparatively short space of time colossal fortunes have been realized and lost by some of the "oil kings and princes" no less than a dozen times. Men have retired at night almost penniless and awoke in the morning millionaires. Others have come here with large fortunes and squandered them in opening what proved to be nothing but "dry holes," and unremunerative business ventures. It has been alternately up and down with them, and no one could reasonably ask for more variety. Some of the original land-owners, who sold out to the oil seekers at the inception of the petroleum excitement, occasionally returned. As they visit the homely and dilapidated old log cabins, now deserted and unused, but which, in days of yore, were their places of abode,—places in which by far the happiest days of their lives were passed,—their feelings are such as can hardly be expressed.

As is generally known the original oil field was in Venango county, between Titusville and Oil City, along the banks of Oil Creek, a miserable, winding stream, and one of the feeders of the Allegheny River. The oily scum that floated upon the surface of the creek led to Col. Drake's discovery, although the compound was known to exist during the days when the aborigines inhabited that section of Pennsylvania. The Seneca tribe of Indians and the soldiers of the revolution were in the habit of anointing their wounds with oil which was found oozing from the crevices of the rocks, they finding the curative powers of the material excellent and infallible.

For several years it did not occur to anybody that petroleum could be found in any other locality. As soon, however, as the importance of Col. Drake's discovery became known, as but a natural consequence, the development on Oil Creek was rapid, and oil towns sprang up rapidly. When the Oil Creek railroad was built, nearly every man across whose land it passed demanded that, in consideration of the right of way, a depot be built upon his farm. This was productive of the formation of numerous towns. Thus in going south from Titusville, the traveler and oil prospector found Miller Farm, Staffer Farm, Foster Farm, Funkville, Egbert Farm, Petroleum Center, Storey Farm, Tan Farm, Rynd Farm, Rouseville, McClintockville, and others, all in a distance of less than twenty miles. Some of these places have now wholly disappeared and only a few old, tumble-down, and deserted buildings remain to mark the locality of others. For an illustration, take Petroleum Center; fifteen years ago it was, as its name implies, the center of the petroleum business. There were numbers of houses, machine shops, hotels, stores, a handsome opera house, churches, etc. The population in 1866 was about 6,000 or 7,000 persons, and at night (which is always the busiest time in many places in the oil country) it was almost impossible to pass through the streets in consequence of the great crowds of people seeking different kinds of amusement. What an extraordinary change! Nothing can be compared to it except the destruction of war or a scourge. Instead of the locale of fine residences, the ground is now used for potato patches, but crops of any kind are never very large, as the ground is rocky and unsuitable for raising any kind of produce. The churches, in some instances, yet stand, but nobody remains to attend them. The population is now less than one hundred.

A short distance north of Petroleum Center, where Dublin, a town of 600 inhabitants was, not a house remains. Pithole is another place remarkable for its rapid rise and fall. At one time it had a population of between 10,000 and 15,000. This fair number has fallen to about fifty persons, all told. To more strongly show how Pithole has depreciated, a single illustration will suffice. The place during its palmy days supported mammoth and elegant hotels, a large and beautiful opera house, printing offices, churches, and similar institutions for secular and religious purposes. Recently \$25,000 was bequeathed to the Pithole church by Mr. C. B. Duncan, who died in Glasgow, Scotland, but who amassed an immense fortune in oil operations when the petroleum business was at its zenith in Venango county. During the litigation which followed, a committee was sent to Pithole to find the church, but found upon investigation that not a vestige of the edifice remained to mark the spot where it had once stood. There was no one left to take care of the building, and it had gone to decay. This is but one authentic illustration of how the hand of demoralization has wrecked other institutions and establishments that originally cost fortunes to construct.

It is the same throughout the entire lower oil field. The towns of Cash-Up, Dead-Broke, Plumer, Slambang, Black Hills City, Modoc, Greece City, Turkey City, Devil's Rancho, Buzzard's Roost, and other hard-named places, are either totally obliterated or remain shadows of their former greatness. Passing down Oil Creek the scene presented is one of desertion and loneliness. THE UNITED STATES MILLER correspondent was connected with a daily newspaper published here during 1870-71, when Oil City and the surrounding oil centers were in their prime. Everything was in a flush, lively and busy condition then. The transition since then is wonderful. Where was once life, business ambition, and excitement, now remain only old derricks, tumble down engine houses, and wasted dwellings. Widow McClintock's son, Johnnie Steel, known throughout the United States as "Coal Oil Johnnie," lived near here, and I was well acquainted with him. He awoke one morning the possessor of over a million and within a year's time squandered it all. Johnnie acquired the name of the "great American spendthrift." He visited hotels, purchased them, and presented them to some of the loungers hanging around; he bought the Grand Opera House, at Meadville and the whole elegant granite block of buildings in which the establishment was, one day, and gambled the entire property away the same night. Johnnie also organized Skiff & Gaylord's minstrels, gave each member a \$6,500 diamond bosom pin, and went traveling through the country. Shortly after this he became ruined, and then acted as door tender for the troupe. Yet with

all these extravagant things, Steel did not spend nearly so much money as was stolen from him by the parties with whom he associated.

As the petroleum became exhausted in Crawford and Venango counties, the operators began to drift down Oil Creek, but as nothing very rich was struck at any of the points visited, the Butler county region was tapped. Here the oil men struck a bonanza for a time, and Parker's Landing, a tie-up place for flat boats, on the west side of the Allegheny River, soon grew into Parker City, and such places as Millerstown, Petrolia, and other towns, soon became largely populated, and all was life for a time, but as the oleaginous fluid ran out, the operators, seeking for "fields more green and pastures new," got into Clarion, Armstrong, Warren and Foster counties. Some very rich strikes were made at several of the new oil towns, a number of 2,000-barrel wells being opened, and, in one instance, in the Bullion district, a 5,000-barrel spouter was struck. The "Great Medicine" and "Big Chief" were also large producing wells. These immense strikes were only made about two years since, but, while production is still going on, the product has very materially diminished. But the greatest bonanza was left for the petroleum producers in the McKean county or Bradford oil districts. This region is the most prolific of any yet opened, and as the oleaginous compound appears to be inexhaustible, it looks as if the business was going to be a permanent thing in McKean county. This section of the State was, a year since, a wild-cat country, and the smallest populated. Now it has a vast permanent and transient population, and is blossoming like a rose.

On the first of this month there were 361 well-rigs up in the Bradford district, as many more scattered through McKean county, besides 249 wells which were in various stages of drilling. Many of these have nearly reached the petroleum, and will, in all probability, be in operation when this is published. The daily petroleum production of the entire region is about 38,275 barrels, the pipe-line runs being about 25,000 barrels per day. The entire product of all the regions, embracing the middle oil field of Venango, Crawford, Warren and Forest, and the lower field of Butler, Armstrong and Clarion, is put at 45,000 barrels per diem. The reports of the different pipe-line companies show the daily average of shipments in the past month to have been 21,103 barrels, and the total shipments of the month to have been 654,221.95 barrels, a decrease of 124,219.95 barrels from the shipments of the same month last year. The amount of stock on hand at the end of January was 5,064,693 barrels, and the average daily runs at the same time were 44,719 barrels. The reports also state that the amount of oil in the United States at the close of January represented by outstanding certificates and other vouchers was 2,153,768.83 barrels. The value of the accumulated stocks is estimated at between \$15,000,000 and \$20,000,000.

A bitter war is in progress between the individual producers, shippers and refiners,—who are, apparently, backed by some insignificant railroad companies,—and the Standard Oil Company, of Cleveland, Ohio, for supremacy in the petroleum trade. The producers have formed what is called the American Petroleum Company, an organization which is intended to start a warfare with the Standard Oil Company. A paper published in the region estimates that there is sufficient oil held and controlled outside of the Standard Company to manage the demand and supply beyond any effect that this corporation might have. It is claimed that the grand total held by the producers, etc., is 8,830,000 barrels, while it is also said that certain dealers, who carry from 1,000 to 1,500 barrels, would swell the purchasing capacity to at least 10,000,000 barrels.

This entire statement is very much doubted by your correspondent, as from what he has learned by a close investigation in circles that are supposed to be well and reliably informed upon the subject, it would seem the supply of the crude material held, owned and controlled by the Standard Oil Company and its connections is considerably over and above the quantity in the possession or handled by other parties, whether their product is inside or outside of the regions. I think that I am sufficiently well acquainted with the people of the oil country to know the fact that, in their greed for gain, they have, unfortunately, overreached themselves in troubling the Standard Oil Company.

This corporation, with John D. Rockefeller, as President, is one of the wealthiest, most influential and enterprising concerns in America.

The Standard has a capital stock of \$3,500,000, and transacts a heavier business than any other American oil firm. The principal refining works of the company are located at Cleveland, and the superior and celebrated products of the company are sent to all parts of the civilized world where oil is used for illuminating, lubricating and other purposes. The Standard Company have their regularly appointed agents in all parts of the country, and their daily transactions are enormous. The old established, reputable and highly honorable firm of Warden, Frew & Co., of 305 Walnut street, Philadelphia, Pa., are among the representative agents in this State of the company. The Messrs. Warden, Frew & Co. have an extensive petroleum refining establishment at Point Breeze, near Philadelphia, while the Brilliant Oil Works, at Pittsburgh, Pa. (Lockhart, Frew & Co.), besides other concerns, are operated by the same firm. The Atlantic Petroleum and Storage Company is also a first-class and reliable connection of Warden, Frew & Co. As all the principal oil men and refiners of the country are working in the favor of Mr. John D. Rockefeller, and the Standard Oil Company, it would certainly seem that those parties who have assailed that gentleman and his corporation have made a serious, if not fatal, mistake. Without preference or prejudice I do not regard the Standard Oil Company as a monopoly by any means, but, on the contrary, rather consider that, by the enterprise and distribution of ample means among a large number of operatives and the systematizing of an excellent manufacturing business, and the production of an entirely indispensable article of light and heat, Mr. John D. Rockefeller, the members of the Standard Oil Company, and Messrs. Warden, Frew & Co., and the other representatives of the corporation, are public benefactors to the people who can understand and appreciate the benefitting influences that have been conferred upon them. No, the Standard Oil Company is no more of a monopoly than your journal is. The paper occupies an influential sphere, and wishes to secure the largest circulation and influence that can be obtained by legitimate, honest, and respectable means, and that is the same way with Mr. John D. Rockefeller, his associates, and the Standard Oil Company, and, just so long as a legitimate, conscientious and upright course is pursued by the gentleman, his corporation and connections all over the country, just so certain is the favor of the people to be obtained. Yours truly,

W. A. E.

## MACARONI.

This nutritious and wholesome article of food is little used in this country. In Italy, however, its use is universal, often constituting the principal food, and taking the place of fish, vegetables, and the meat generally in the regular dinner. It is also sold and eaten in the streets as freely as fruits are with us. Its use is extensive in France and Germany.

It consists of pure gluten, which element constitutes only three and one-half per cent of wheat flour, and is wholly wanting in rye and oatmeal. The gluten when wet, is a tough, elastic mass, of a yellowish brown color, and is obtained by dissolving out the starch and other constituents of the flour with cold water. The process is as follows:

The flour, having been made up into a soft dough, is placed on a fine sieve, over a vat of water, and is kneaded—in Italy with the feet—as long as the water which falls on it in a spray, runs through milky. The tenacious nature of the gluten, prevent its passing through. Starch is manufactured from the contents of the vat.

The long, hollow tubes are formed by pressing the gluten through a peculiar-shaped opening in a metallic plate; and this tubular form, so important to it in cooking, is indispensable to its drying, as gluten, when moist, rapidly tends to decomposition.

Counterfeit macaroni is made from flour, instead of from its gluten. It has, moreover, a starchy appearance; is more smooth and glossy than the genuine; is apt to be mouldy inside; is not as elastic; when broken, does not show the glossy fracture of the former, and in cooking becomes pasty, and does not preserve the tubular form. The genuine also—as the counterfeit does not—swells up to more than double its original thickness.

It would be a gain to our cookery if macaroni were in more common use among us.

A PAINTER'S apprentice fell off a scaffold with a pot of paint in each hand. He was taken up insensible, but as soon as he was restored to consciousness he murmured, "I went down with flying colors anyhow."

## KURTH'S PATENT COCKLE SEPARATOR.

In order to make a good flour it is of course absolutely necessary to have all foreign seeds separated from the grain before it is ground. Some few years since Kurth's Cockle Separator was patented and introduced for this purpose, and has since been improved in many respects as experience showed to be necessary, and is now unquestionably the best machine in use for this purpose and is in practical use in all the best mills in this country and many in Europe. The patents on this well-known machine are the sole property of the Cockle Separator Manufacturing Company of Milwaukee, Wis. We present herewith a description with illustrations of this machine, which is now considered a necessary adjunct of every flour mill.

Fig. 1 shows an interior view of the cockle separator and the manner in which the cockle and other foreign seeds are taken from the grain.

The grain falls on to sieve "A," the large wheat passing over the tail, and thence by spout "B" "B" to hopper "C," while the small wheat and cockle fall through sieve "A" into spout "D," thence through spout "E" "E" "E," and fall into bottom of indented cylinder "F," the cockle fitting into the indentations, and thus, by the revolving of the cylinder, being carried up past the apron "G" "G," then being forced out of indentations by brush "H" "H," falling on apron "G" "G," and into cockle spout "I" "I" conducting from machine, while only the ends of the kernels of wheat being able to stick into the indentations, they consequently fall out before reaching apron "G" "G," slide back to the bottom, and at the same time are impelled by the motion and inclined position of the cylinder toward the hopper "C," where they mix with the large wheat from tail of sieve "A." The size of indentations in cylinder are varied according to the size of grain and impurities to be separated.

Fig. 2 shows the plain machine in general use. It separates perfectly cockle, wild peas, wild buckwheat and all similarly shaped seeds from wheat without waste. Four sizes of these machines are built, Nos. 0, 1, 2, 3, varying in capacity from 15 to 110 bushels per hour.

Fig. 3 represents Kurth's Patent Cockle Separator and Richardson's Dustless Oat Separator combined. This machine has two suction, the first of which operates on the wheat as it enters the machine, and the second as it leaves it, thus removing all foreign matter rubbed off the berry by the scouring process of passing through the cylinder. Each suction is independent of the other and is easily regulated.

The Cockle Separator Company are also manufacturing a separator especially for the use of oat meal mills, so as to free oats from all foreign substances. These machines should be in every mill, and those who have not yet introduced them should lose no time in writing to the company for their new illustrated circular giving full particulars, dimensions, capacity, prices, etc. Address Cockle Separator Manufacturing Company, Milwaukee, Wis., U. S. A.

## EGYPTIAN CORN IN CALIFORNIA.

Experiments with Egyptian corn have proved signally successful in various parts of the San Joaquin valley, California, and we perceive that Mr. Jefferson of Healdsburg reports that he has just harvested eighty bushels to the acre from an Egyptian corn field. He plants sixteen to eighteen inches apart, not leaving over two grains in the hill. He gets three to six good heads which he cures on the ground before putting away or threshing. He planted in the middle of May. The yield of Egyptian corn is usually double that of Indian corn, while the meal is said to make delicious bread, which is generally preferred by those who have eaten it to that made from Indian corn meal. The white variety is preferred for table use. We

are inclined to believe that Egyptian corn will soon become a popular grain in San Joaquin valley.

## OUR NEW YORK LETTER.

[Special Correspondence United States Miller.]

BUFFALO, N. Y., Feb. 13th, 1879.—While New York State has not as many flour milling establishments as her sister State Pennsylvania, her flour manufacturing interest is as large, if not larger, than that of the adjoining commonwealth. This fact, although not generally known, is nevertheless a decided and stubborn fact. That New York is a greater flour-producing center than the Keystone State is ac-

fine, large, and heavily producing flour mills, is considered "quite some pumpkins" in the districts where he is located. But, then, a miller is one of nature's noblemen wherever he is found, and however humble his position in the business.

The flour manufacturing establishments throughout the State, so far as have been discovered by an extended ramble among them, and in interviews with the millers themselves, by THE UNITED STATES MILLER correspondent, have been kept busily running right through the season. Many of the mills in the interior of the State, being situated upon shallow streams, have been compelled to sus-

New Yorkers manifest the same spirit and notable enterprise in seeking an export trade as they do in other movements that have made them famous and filled their coffers with wealth, they will soon supercede the more cautious, slow-moving, and less enterprising Pennsylvanians in those localities where the latter have already created a demand and built up a trade for their products.

But, then, dear UNITED STATES MILLER, every miller in the country has the very same opportunity to get the foreign trade that is now so eagerly sought after, and, therefore, the most liberal, and shrewdest and sharpest flour manufacturers of America can do something in that direction if they put in a bid for it, either in the way of correspondence, or by dispatching agents to Europe and South America, and having the matter properly "talked up" and manipulated.

There is a fine chance for our Western millers to make fame and fortune in the export flour business, and the UNITED STATES MILLER correspondent would sincerely like to hear that some enterprising and influential Milwaukee or Wisconsin flour-producer or producers had started a scheme that would render either him or them celebrated in trans-Atlantic countries and enriched him and them also. I am sure that the Milwaukee or Wisconsin millers would be remarkably successful if they undertook anything of the kind. The field is still open, gentlemen, and it only remains for you to put in your bids to secure a portion

of the export trade at least. Well, I have gone a long distance on these sheets, from Buffalo, New York, to Milwaukee, Wisconsin, and, now, I will go back to where the start was made. The New York State Millers' Association, with its prominent officials, is in prime condition, and while much good work has been done for the benefit of the flour business and the milling fraternity, the association is destined to do much more in the interest and for the welfare of its members and the flour manufacturers of the State for whose guidance and benefit it was originated. The Secretary of the association, Mr. I. A. Hines, of Rochester, reports every thing in a pleasant and flour-ishing condition. Mr. Hines is a fine, genial and courteous gentleman in every respect, and very popular among the millers of New York. Success to Mr. Hines and the entire milling fraternity of New York, is the heartfelt wish of

THE DUSTY MILLER.

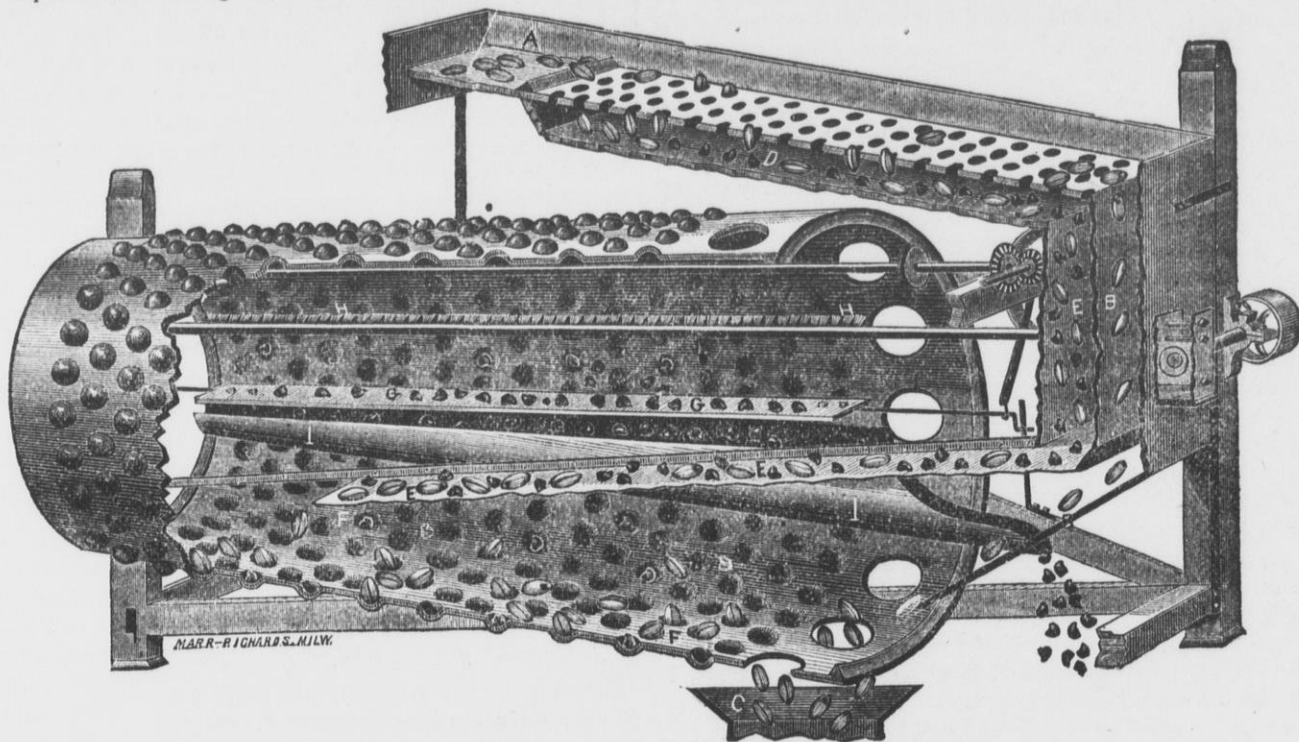


FIG. 1. COCKLE SEPARATOR—INTERIOR VIEW, SHOWING PROCESS OF SEPARATION.

counted for by the fact that while there are fewer mills within her borders than in Pennsylvania, the most approved methods and improvements in mill machinery necessary to increase the quantity and improve the quality of flour are appreciated and adopted by the wealthy, enterprising and liberal-minded mill-owners and millers.

The flour-making regions of this State are not connected, but spread out over a wide range of territory. This immediate section of the State, Syracuse, Rochester, Oswego, Albany, Troy and Utica, are large flour manufacturing places. In New York City there are also many vast flour mills where large quantities of the "staff of life" are produced weekly. Among the latter establishments

pend operations on account of the ice-bound condition of the streams, but now, since the thaws have set in, the mills have started, and are grinding away at the liveliest rate imaginable.

Outside of the wheat-flour manufacturing industry, New York is known as the headquarters of two of the largest corn starch and meal works in the world. The extensive establishment of Kingsford & Co., at Oswego, and that of Duryea & Co., at Glen Cove, Long Island, have gained the widest and highest reputation for the quality of the goods produced. The annual product of these works is actually immense. The city of Oswego is almost entirely devoted to the manufacture of this delicious and nutritious food, while the

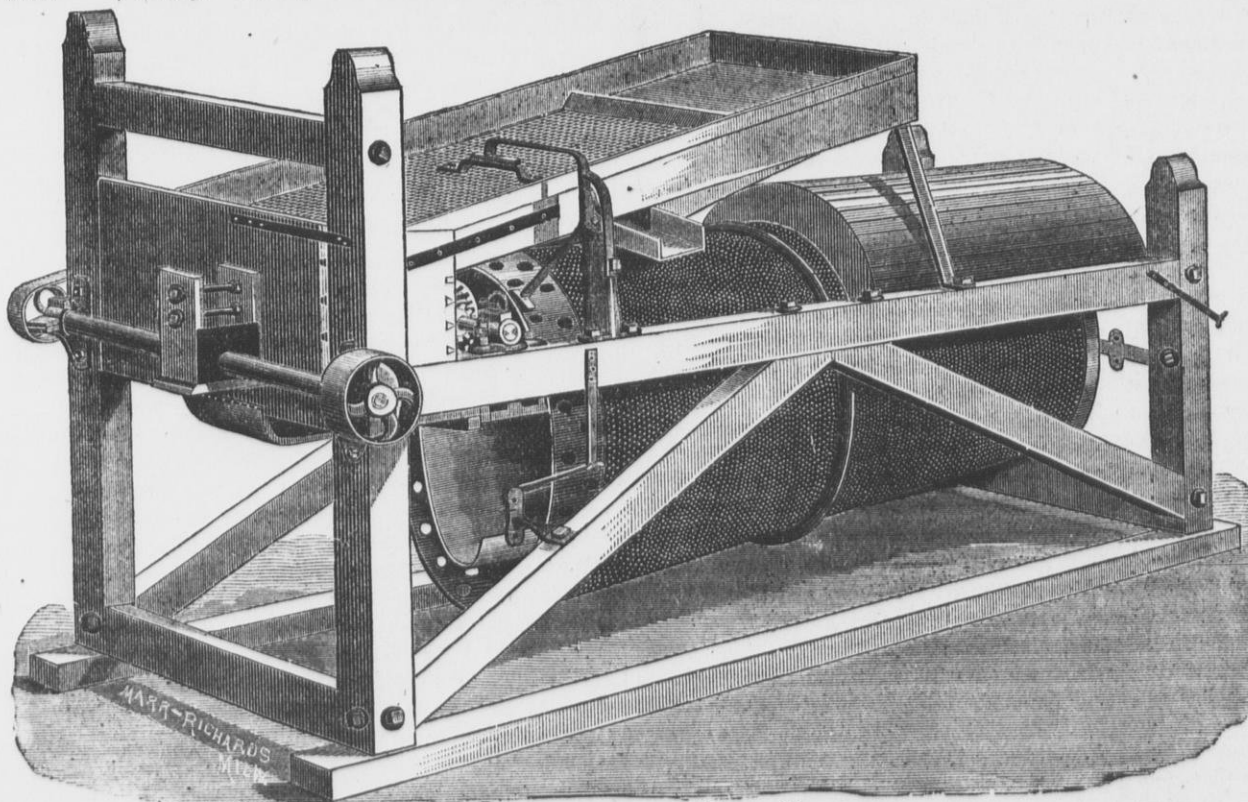


FIG. 2. COCKLE SEPARATOR—PLAIN MACHINE.

may be mentioned that of Geo. V. Hecker & Co., whose patented brand of "self-raising flour" is known to the trade in all parts of the country. There are many millions of capital represented by the merchant millers of New York, and the amount paid out weekly in wages to the army of mill operatives is a good, round sum.

While the flour manufacturers of the metropolis are a pushing, money-making class of business men, the "dusty millers" of the country districts are equally as thrifty, prosperous, and just as desirous of accumulating a goodly share of this world's goods. The millers of Buffalo, Rochester, Troy, Albany, Syracuse, and other places, represent the very best class of people, and the proprietor of a

number of hands employed in the factories is very large, and the amount of money disbursed as wages weekly is considerable. The flour factors of New York State are preparing, like their Pennsylvania brethren and competitors, to secure a European and South American trade, and arrangements are now in course of completion between several prominent manufacturers and flour operators in Europe and South America to undertake and manipulate a trade in the previously named countries. It is believed the millers of this commonwealth can secure about as much trade in the European and South American business centers as the Pennsylvania flour men. In fact,—without any preference or prejudice one way or the other,—I am of the opinion that, if the

multiply that product by the number of feet the piston travels per minute, then divide by 33,000. This will give the horse-power of the engine. Another rule is as follows: multiply the area of the piston by the boiler pressure, and this product by the travel of the piston in feet per minute; divide this last product by 33,000, then deduct 13 per cent for friction and condensation.

Professor Leone Levi, of the University of London, says that the aggregate earnings of English workmen are \$1,500,000,000 annually, out of which they could easily save \$75,000,000, while in point of fact they save only \$20,000,000, the balance being wasted, mostly in drink.

**IMPORTANT COMMUNICATION.**

*To the Millers of the United States:*

The undersigned, of the Executive Committee of the Millers' National Association, having charge of the defense of the suits brought by the American Middlings Purifier Company which are now being tried in St. Louis, avail themselves of this opportunity of conference with each other to unite in calling your attention to the fact that, while this defense is for the common protection of all, the necessary expense and individual time devoted to the defense is very unequally distributed, a very large majority of the millers of the country having failed to connect themselves with the State or National Associations, or otherwise contribute toward defraying the necessarily heavy expenses of preparing and conducting the defense of these suits, has left the liberal minority to bear the whole burden.

At the Toledo meeting of the Executive Committee, held November 21st, 1877, the authorized representatives of the several State Associations then organized assented to an assessment of \$15 per run on the numbers of burrs, such representatives thought could readily be brought into the local organizations; in many instances the apportionment was made on less than one-fourth of the total number supposed to be in use, and it was reasonable to expect that by energetic efforts of State officers their membership would be so large that considerably less than \$15 per run would make up the amount each State had agreed to contribute to the National Association, but instead of this several of the States failed to pay in any considerable percentage of the very moderate contributions promised, and it became necessary, at the Annual National Convention, held in 1878, at Indianapolis, to make another assessment of \$10 per run, making a total of \$25, the last assessment to be apportioned to the several States, on the basis of the Toledo agreement, producing sufficient funds, if fully paid, to pay all the expenses of these suits, and leave a balance for future contingencies. Maryland, Missouri, Minnesota, Wisconsin and New York have paid in full, and some of them in advance, besides which individual liability has been assumed on the belief that delinquents would ultimately pay.

Indiana and Illinois have paid to the extent of about three-fifths, and we feel assured, from conference and correspondence recently had with representatives of these States, that they will not long remain in arrears. Illinois has had to devote a considerable fund to local defense, the expense of which will equitably have to be allowed by the National Association to some extent. Ohio and Iowa will probably arrange to pay in full soon. From other States we have no sufficient assurances on which to base financial estimates.

Under these conditions it will be apparent to all interested that if the Executive Committee should abandon the hope of equal contributions from equal joint beneficiaries, they would require no excuse for relieving the paying members of unequal burdens by compromising on nominal terms with the owners of the Cochrane patents, and also of other recently re-issued patents, on the basis of full protection to all members who have, through their State Associations or direct covered into the National Treasury the full assessment of \$25 per run, leaving all who have not paid to take care of themselves. The committee would, however, prefer to fight and defeat unjust claims for wholesome effect on similar combinations which will otherwise harass the millers of the country, from which only the thorough and equitable organization proposed will afford mutual protection, and will delay this righteous means of getting even with the delinquents, believing that their failure to share the expenses so far arises from inattention rather than indisposition.

At the next annual convention—time and place not yet appointed, but probably to be held in Chicago early next May, if not sooner—the Executive Committee will propose and urge:

First—That the Millers' National Association be re-organized on a strictly legal basis for the defense and protection of its members.

Second—That only such members as have by that time fully paid, through their State organization, or direct from States where no organization exists, to the National Treasury the assessment of \$25 per run, shall participate in such proposed re-organization.

Third—That new members shall be eligible only on payment of the same assessment per run which may have been paid by old members up to the date of the proposed new members' admission, putting all on equal terms.

Fourth—That representation shall corre-

spond with payments, one vote for each full paid run, or its equivalent—as in stock companies.

Fifth—That failure or refusal to pay or secure assessment equitably and legally made, shall cause a forfeiture of interest in the association.

Sixth—That suits now being prosecuted against members of the National Association, notably the Denchfield and the Griffin suits, shall be defended by the National Association, as also all other patent suits that the Executive Committee may decide are defensible.

Seventh—That all patents considered by the Executive Committee to be valid and useful should be compromised for the benefit of all full-paid members of the National Association who may choose to avail themselves of the terms of such compromise, that the fullest possible encouragement should be accorded honest inventors, whose machinery will improve our manufacture, by arranging for moderate terms, alike bearable to users, and remunerative to inventors; but that all fraudulent claims should be fought to the bitter end regardless of expense.

Eighth—That they deem it expedient to recommend the appointment of one person (centrally located) to hold both offices of Secretary and Treasurer, and while pleased with the

Secretary of the National Association full lists of all members who have paid or secured the full assessment, with the numbers of burrs used by each, and from time to time additional lists weekly of those who pay and of new members who join, with also a remittance to the Treasurer of the National Association, including previous payments, to equal the \$25 per run due thereon. Members in States not organized, or millers in such States who desire to become members, will please remit direct to the National Secretary or Treasurer, and if such States subsequently effect organizations then such payments will equitably be credited against the proportion due from that State.

While the Committee have too much respect for the high tribunal before which the suits now pending are being ably and impartially tried to express any opinion as to the result which may be reached and announced before many weeks, we have no hesitation in the unqualified assertion that our attorneys and experts one and all have done and are doing their whole duty faithfully and intelligently, and whether they win or lose the cases in hand, we are certain that they will have done all that could be expected. We who are familiar with the immense labor and thought required in preparing the cases for trial, the thousands of pages of printed evidence, doz-

**THE ICE BRIDGE AT NIAGARA.**—Niagara river below the falls is spanned by a bridge of ice one mile long and 60 feet wide. The river has been spanned in this way before, but seldom, if ever, so early as now. The other day the ice "jammed" beneath the upper suspension bridge. Says the Buffalo Courier: A vast quantity of water had accumulated behind the ice and made a desperate effort to get free. The enormous body of snow and ice was raised up by the water and tossed about in all directions. Large blocks, weighing hundreds of tons were lifted into the air. Boulders were torn from the shore and swept into the stream, and a solitary fir tree, which ordinarily stands three feet above high water, was carried away. The ponderous strength of the enraged waters was so apparent that it seemed as if they would rend the great gorge in twain, and in that way escape from their imprisonment. As they could not break the mile-wide dam in two, they lifted it bodily into the air and rushed away beneath it, leaving a span of ice above and behind them. The formation of the ice in this bridge is not the same on both sides of the river. On the American side it is chiefly composed of snow formed into rounded boulder shapes, and looks like white coral. As one approaches the center of the river the ice fragments become larger, and near the Canadian shore huge cakes of water-ice are formed into a solid mass. In some places there are crevices 25 or 30 feet in depth, but water is not seen through them.

**SOUNDED LIKE A JEWELLERY STORE.**—It was a weather-beaten sailor we overheard the other day kindly giving a few reminiscences of travel to some lady friends he was treating to corned beef and cabbage. "Talking about lions," he went on to say, "they are the intelligentest animal what is. A cur'us thing happened once when we were on the east coast last cruise. One of our officers went out hunting deer, and the next morning his body was found bit clean in two, but with his watch missing. Nobody understood it. Next day the quartermaster's body was found in the same condition, with his watch gone. Seemed as though a lion and pickpocket were kinder going snaeks, as it were, only the lion didn't eat nothing. Next day two middies disappeared—same result. None of the sailors were hurt—had no watches, you see. Of course the old crew turned out for a grand hunt, and at last we killed a lion sixteen feet long. In his stomach we found all the watches, still running. Cold fact, I assure you. The ship's surgeon, who cut the beast open, said he wasn't in good health—had a torpid liver. So we seed at once that the animal had killed all the officers just to swallow their watches—sorter like pills, you know. The lion must 'a thought the wheels and things would kinder tickle him up inside. When we shot him he was lying with his eyes shut and mouth open, listening to the works going inside of him. Sounded like a whole jewellery store. Fact, ma'am. Take some more cabbage."

**GREAT SHRINKAGE IN VALUES.**—The shrinkage of manufacturing property in New England is unprecedented. A paper mill built and run by the Valley Falls Paper Company at New Boston, N. H., was sold at auction a few days since under foreclosure for \$5,000; it originally cost \$50,000. It was built in 1867, is well appointed in all respects and has a fair water-power. The Littleton, N. H., woolen mill, which has been idle for three or four years, was recently sold for \$7,000 cash. The purchase includes the mill, machinery, water-privileges, boarding-house, two acres of land at mill, and five acres of woodland about two miles from village. The property was bought in 1862 for \$92,000, and used for the manufacture of woolen blankets until 1870. Nor is the shrinkage confined to New England. Two furnaces and other buildings of the Mingo Iron Works at Steubenville, Ohio, were bought in by the first mortgage bondholders for \$67,000; the second mortgage was \$75,000; other debt, \$185,000. The buildings of the New York Steam Sugar refinery, covering 24,000 square feet of land in fee, and four leasehold lots, each 23 x 70 feet, on South, Water, Cherry and Montgomery streets, Brooklyn, together with machinery, were sold by auction for \$42,250. This was the only bid made. The property originally cost \$202,000; the improvements afterwards made bring it up to \$500,000.

The steam boiler exploded in Isenmayers flour mill at Little Rock, Ark., Feb. 7th, killing the engineer, Horace Burns, and entirely demolishing the engine house and machinery therein.

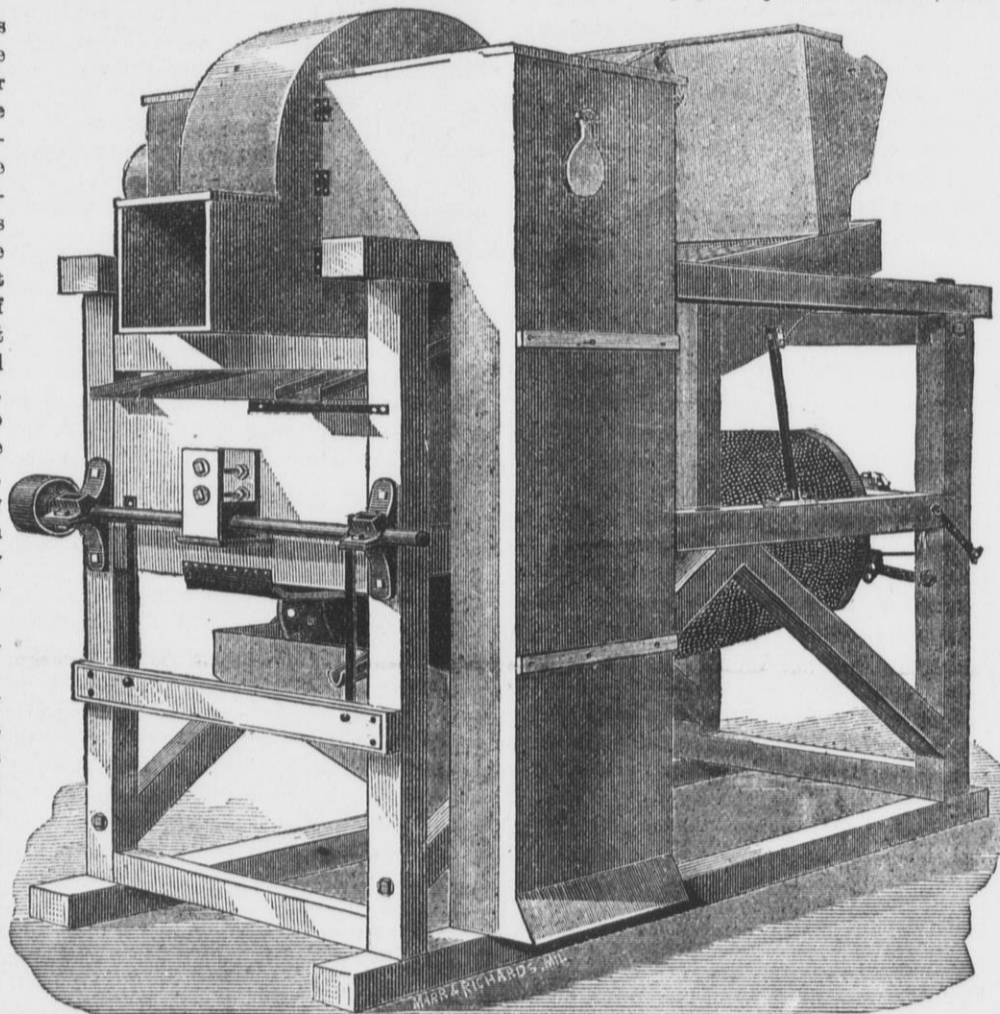


FIG. 3. COCKLE SEPARATOR AND RICHARDSON'S DUSTLESS OAT SEPARATOR COMBINED—(TWO SUCTIONS).

services of the gentlemen who have held these offices in the past, they believe it necessary to the success of the organization to have some person who can devote a greater amount of his time to the objects of the association, and who can attend the meetings of the Executive Committee and of the different State Associations from time to time, and push the membership of the association up to a maximum.

Ninth—They will also insist on the appointment of a competent patent attorney, to whom all claims against millers shall be submitted, and whose judgment, and the decision of the new Executive Committee shall be submitted to each member of the association, and it shall be required of each member to furnish within thirty days to the Secretary any information he may be possessed of in regard to the matter under consideration, and should the Executive Committee then decide that it should be for the interest of the association to compromise or fight the claim, such decision shall be final and binding on the members of the association.

Tenth—Officers of State Associations are urged to hold early meetings for re-organization on a strictly legal basis, which will bind members to equal legal assessments, and with sufficient authority to participate in the proposed re-organization of the National Association. Prominent millers in States which have not yet organized should also be active in effecting an organization. The Executive Committee will have a proper legal form prepared, copies of which will be furnished on application to any of the undersigned, who will also take pleasure in furnishing any other aid in their power to that end.

Eleventh—Secretaries of the several State Associations are requested to furnish to the

ens of working models, resulting from immense research, ransacking foreign libraries, preparation and duplication of drawings of intricate machinery, and the thousand and one details which have had to be worked out, and the complications arising from the Supreme Court decision which were successfully cleared off preparatory to the trial, now progressing, feel a pardonable pride in the fact that all the expenses far incurred is less than one-fourth of the confiscatory demand of three hundred thousand dollars made against only one mill soon after the Supreme Court decision, on which the ring estimated its claim against the millers of the country at the modest sum of thirty-six millions!

However the case may be decided, the defense made will have saved the millers of the country millions, for under the measure of damages recently fixed in similar cases, they can only be insignificant in comparison with former pretensions which have been lowered at both ends, fewer ciphers at the "right" and lower numerals at the "left." In any case, we advise millers not to get frightened, make no settlements or compromises—"millions for defense, not one cent for tribute." Rally to your State and National organizations; do not wait for somebody to come and talk you into doing your duty; see it and do it promptly for yourselves. We rely on a free, full and hearty support from every miller in the land who has not already been scared into bleeding to the ring.

J. A. CHRISTIAN,  
S. H. SEAMANS,  
J. A. HINDS,  
ALEX. H. SMITH,  
GEO. BAIN, President.

St. Louis, Feb. 17th, 1879.



## THE POWER OF NIAGARA.

Dr. Siemens, some months ago, in an address which he then gave, referred to the immense quantity of power which flowed ready-made over the Falls of Niagara. In his Glasgow address he again referred to the subject, in order to show how this gigantic source of power might be utilized to produce action at a distance. "When," he says, "little more than a twelvemonth ago I visited the Falls of Niagara, I was particularly struck with the extraordinary amount of force which is lost as far as the useful purposes of man are concerned. 100,000,000 tons of water fall there every hour from a vertical height of 150 feet, which represent an aggregate of 16,800,000 horse-power, producing as the effect no other results than to raise the temperature of the water at the foot of the fall

150 1 deg.  
—Fahr.  
772 5 deg.

In order to produce the power of 16,800,000 horses, or, in other words, to pump back the water from below to above the fall, would require an annual expenditure of not less than 266,000,000 tons of coal, calculated at an average consumption of four pounds of coal per horse-power per hour, which amount is equivalent to the total coal consumption of the world. In stating these facts in my inaugural address on assuming the Presidency of the Iron and Steel Institute, I ventured to express the opinion that, in order to utilize natural forces of this description at distant towns and centers of industry, the electric conductor might be resorted to. This view was at that time unsupported by experimental data such as I have been able since then to collect." Dr. Siemens then shows what had been done in conveying the electric light to a distance; and he states that "if mechanical force is required to be distributed, the arrangements are in every respect similar to those for the distribution of electric light; and it has been proved experimentally that the amount of power recovered at the distant station is nearly equal to half the power employed at the central station." Even as regards the consumption of coal, were that article used, Dr. Siemens shows that the magneto-electric machine is cheaper than the gas or steam engine. But he rightly says: "It would not be necessary to seek on the other side of the Atlantic for an application of this mode of transmitting the natural force of falling water, as there is perhaps no country where this force abounds to a greater extent than on the west coast of Scotland, with its elevated lands and heavy rain-falls. You have already conducted the water of one of your lochs to Glasgow by means of a gigantic tube; and how much easier would it be to pass the water, in its descent from elevated lands through turbines, and to transmit the vast amount of force that might thus be collected, by means of stout metallic conductors, to towns and villages for the supply of light and mechanical power."

## THE NEW GRIST SYSTEM.

Of late years the practice of grinding grists for individuals has been losing favor, both with millers and with individuals. The customer goes to the mill in the morning with no assurance that he can return the same day. He takes an early start, perhaps leaves business of importance at home, and after wasting the entire day loitering about for his "turn" returns home at night, hungry, cold, tired and cold, and often without his grist, necessitating a return trip the next day. Or if he succeeds in making the trip in one day, he returns with a quality of flour on which he has to take his own chances. He has part of his own grist and part of the grist of the man who was just ahead of him. If it is good flour, all well and good; if it is poor it is supposed to be from his own wheat and he has no opportunity to complain.

We are led to these remarks from a conversation with Mr. H. Brinck, of this place, who claims that there is neither reason nor justice in the old system. He claims that the exchange system, now in operation in his mill and in all the city mills, is the only proper and satisfactory one to all parties. He claims that he gives better, more uniform and a larger quantity of flour, in one year, than any farmer can get in the same time from a toll mill. A man takes his grist to the mill, it is weighed and he receives in exchange an article of flour which is warranted to him the same as though he had purchased it for cash at the stores. The transaction occupies about five minutes, often less, and he drives home in a far better humor with himself, the miller and the world generally than if he had passed the day in idly waiting for his grist. We suppose there are

arguments on both sides of this question but until we hear from the other side we are forced to the conclusion that there is economy in time, money and quality of flour in the exchange system which is now coming into such general use.—*West Point, Iowa, Appeal.*

## ENORMOUS CROPS IN 1878.

The December report of the Department of Agriculture shows that the corn crop for 1878 is some 30,000,000 bushels larger than that of 1877. The oat crop is somewhat in excess of that of 1877, making it the largest ever raised in this country. The average yield per acre is, however, less than in 1877, and the quality in most of the States is inferior. There is no material change in the barley crop from 1877, except that California increased her acreage from 450,000 to 650,000 acres, and almost doubled her yield per acre. The total product for the year will be, in round numbers, 42,000,000 bushels against 34,500,000 bushels in 1877. The rye crop is about one-sixth larger than in 1877, but the quality of the crop is inferior in the New England (except Connecticut) and Southern States, while in the States of the West, Northwest, and Pacific slope it is superior, except in Illinois and Nebraska. The potato crop shows a large decline as compared with 1877, though the average was about the same, the difference being less than 1 per cent. The average yield of the whole country will be 69 bushels per acre against 94 bushels in 1877, making a total product in round numbers of 124,000,000 bushel for 1878, against 170,000,000 in 1877. The hay crop is 20 per cent greater than last year. Sorghum is receiving increased attention, especially in the trans-Mississippi States and Territories. In Stearns county, Minnesota, a variety called amber cane is reported as yielding as high as 300 gallons of syrup per acre. Delaware county, Iowa, manufactured 100,000 gallons of syrup during the year, and found a home demand for the whole. The tobacco crop is larger and exceptionally good.

DEATH OF A CELEBRATED FARMER.—Mr. W. L. Sullivan, of Burr Oaks, Ford county, Ill., for many years known as the "Farm King" of the West, died on the steamer James Guthrie, en route for Louisville, Ky. His illness came on a mile below Owensboro, Ky., and he died before the boat reached the wharf. The body was taken to Henderson, Ky., and arrangements made to convey it to the home near Burr Oaks. Mr. Sullivan's great farm of 40,000 acres, comprising nearly the entirety of Ford county, has been one of the wonders of the agricultural world. For many years its master operated the mammoth farm on the most expensive scale, its 10,000-acre corn fields being the pride of their owner and the surprise of sight-seers. There were headquarters on the place from which all orders were issued, and laborers sent out with teams, tools and dwellings—drawn on wheels by horses and oxen—to put in grain or attend to harvesting, the time occupied in the work sometimes detaining the detachments of laborers for weeks away from the central depot of supplies. But the venture proved a failure in the end, and only a year or two since the great farmer went into the bankruptcy, his farm passed into the control of money-lenders, and was cut up into small farms and offered for sale in the market. It is not known that Mr. Sullivan saved intact any of his fortune, and the probability is that he died a poor man, and in his death proved that it is not possible for one person to successfully manage 40,000 acres of land in one batch. The deceased was an aged man, but had enjoyed excellent health all his life, even to his last day on earth. He was a man of native sagacity, and one with the qualifications and inclinations to grapple with great projects. His funeral will do doubt be the most largely attended of any ever known in Central Illinois.

LONGEST TUNNEL IN THE WORLD.—The Gothard tunnel is now the longest tunnel in the world, the length, bored from both sides, reaching a total of 13,481 yards—twenty-three yards longer than the Mont Cenis. Very nearly 3,000 yards still remain to be excavated, and if the work goes on as rapidly this year as it went on last the navies from Göschen and those from Airolo may expect about this time twelvemonth to shake hands in the heart of the mountain. This, however, is far from being a certainty, for according to the calculations of the geologists, the workmen will find directly under the Kastelhorn a thick mass of serpentine and schist, which may prove a considerable hindrance. Most of the laborers employed in the galleries are Italians. They work night and day in the shafts of eight

hours each, and their work is described as being terribly severe. The heat is so great that they can wear no clothes whatever. They return to the mouth of the tunnel steaming with perspiration, their faces are yellow and ghastly, they cannot bear the light of the sun, they walk with bent shoulders, and stagger as if carrying burdens too heavy for their strength. They are nevertheless said to be cheerful and even merry. They support their hard lot without repining, and save money. It is satisfactory to know that the contractors by whom the men are employed treat them with every consideration. A surgeon is always on the spot, accidents being frequent, and ample hospital accommodation is provided for the ailing and the hurt.

COATING BOILERS.—Mr. Franz Beuttenback gives the following recipe for the preparation of a coating for the inside surface of boilers to prevent the formation of scale: Gradually dissolve five pounds of a mixture of 25 parts of colophonium, two and one-half parts of graphite, and two and one-half parts of lamp black in 40 pounds of boiling gas tar, adding about one pound of tallow. The solution is diluted with about 50 per cent of the petroleum and applied in a warm state. It has a pungent smell and should be put on rapidly, the precaution of using closed lanterns being necessary. Its effect is to cause the scale to come off in large flakes when picked.

MAKING PENCIL MARKS INDELIBLE.—Paper marks are made indelible, says the *Papier Zeitung*, on paper prepared as follows: Any ordinary drawing paper is slightly warmed and then rapidly and carefully laid on the surface of a bath, consisting of a warmed solution of bleached colophonium in alcohol until the entire surface is moistened. It is then dried in a current of hot air. The surface of the paper becomes smooth, but readily takes the impression of a lead pencil. In order to make the lead pencil marks indelible, the paper is warmed for a short time on a stove. This method may prove valuable for the preservation of working drawings when a lack of time will not permit the draftsman to finish them in ink.

THE BANK OF ENGLAND.—The Bank of England will be 185 years old on the 27th of the coming July, having received its charter of incorporation at that date, and having been projected by William Paterson, a Scotchman. Constituted as a joint stock company, with a capital of £1,200,000, the whole sum was lent at interest to the Government of William and Mary, then much embarrassed. At the outset it was a servant of the State and has ever since continued such more or less. The charter, granted at first for eleven years, has been from time to time renewed, the last renewal, subject to modification or revocation, having been in 1844. For a while the business was done in one room; now the bank occupies, as everybody knows, a large building in Threadneedle street and employs some 800 men. Nothing less than a £5 note is ever issued, and no note issued a second time. The average amount of notes in circulation is £25,000,000.

HOW TO SMOKE A PIPE.—A correspondent of the *New York Sun* gives the subjoined information: "To those who are attached to the pipe, it may be a matter of interest to know how their last puff or draft of smoke may be as fresh as the first. It is well-known that smoking in the usual manner the last portion of the tobacco becomes damp by presence of oil or nicotine drawn from the heated tobacco above, which causes a sickening and nauseating effect, bitter to the taste, unpleasant and unhealthy, as compared to the first half of a well-filled pipe. The following I have found to be effectual in giving me a good, fresh smoke from first to last: Place a small quantity of tobacco in the bottom of the bowl, light it, and when well afire, fill the pipe and before each draft give a light puff outward through the stem, which causes the tobacco to burn upward, all below being consumed. This is a sensible way of smoking the time-honored pipe.

THE GREAT FAMINE IN BRAZIL.—Mr. Herbert H. Smith, who is now in Brazil, collecting material for a series of papers on that interesting empire to appear in *Scribner's Monthly*, writes as follows: "People in the United States know little about this great famine that is raging in the northeastern part of Brazil; I myself had no idea of its importance until very lately. It is enough to state that it affects at least one-fourth of the whole population of the empire; that hundreds are dying of starvation, and thousands of disease in-

cident to exposure and insufficient food. In the city of Ceara, which will be my principal point of study, the normal population of 30,000 has been swelled to 80,000 by fugitives from the drouth-smitten interior country; and among this 80,000, the death rate has reached the enormous figure of 300 per day. These drouths are periodical, occurring once in twenty or thirty years. It seems to me therefore, that a study on the spot will be of very great importance; it is entirely another side of Brazil from that which I have before seen and written of."

A CLOTHER has excited public curiosity by having a large apple painted on his sign. When asked for an explanation he replied: "If it hadn't been for an apple where would the ready-made clothing stores be to-day?"

TO MAKE IRON TAKE A BRIGHT POLISH-LIKE STEEL.—Pulverize and dissolve the following articles in one quart hot water: blue vitriol, one oz.; borax, one oz.; prussiate of potash, one oz.; charcoal, one oz.; salt, one-half pint; then add one gallon linseed oil, mix well, bring your iron or steel to the proper heat and cool in the solution. It is said the manufacturers of the Judson governor paid \$100 for this recipe, the object being to case-harden iron so that it would take a bright polish like steel.

SAYS the Dodge City, Kan., *Times*, of January 11th: "Mr. May, one of the owners of the flouring mill at Deatur, Ill., was in Dodge City Monday, and purchased a mill site. He returned East the same evening. The shipment of the mill will take place immediately. Sixteen cars will be required to furnish transportation for this immense structure. We do not consider this project inopportune. There will be more than a sufficient quantity of wheat raised the coming season to keep a mill running. In Ford county alone about 17,000 acres have been sown in wheat."

MR. GEORGE JENNISON, a millwright, has adopted a very simple and readily applied apparatus which can be used without the usual level boards and without regard to obstructions. Mr. Jennison takes an ordinary  $\frac{3}{8}$  or  $\frac{1}{2}$  inch gum tube, say from 16 to 20 feet long, and to each end secures a stout glass tube 10 or 12 inches long. The gum tube is then filled with water to within about four inches of each end of the glass tubes. A cork is placed in each end and the apparatus is complete. To use it, hold each glass vertically at the bearings, and withdraw the corks. The water will soon find its level and show how the bearings stand with regard to the level line.—*St. Louis Miller.*

In perusing our statement of the general business outlook at the South, our readers will notice a difference in the tone of feeling in the different States. The most complaining is Virginia, the most hopeful and prosperous is Georgia; the others resemble Georgia rather than Virginia. The cause of this difference is easy to find. Virginia is still running in her old ruts, the raising of tobacco being her chief industry and the partition of land remaining very much as before the war. But the great plantation States could not go on by their old methods. It has been found expedient to diversify their crops. They raise their own wheat, corn, vegetables and pork, and are not dependent solely on cotton, as the owners of the great plantations used to be when they engaged their expected cotton crop in the beginning of the year for money to purchase their supplies.—*New England Grocer.*

INTERNATIONAL EXHIBITION OF THE UNION OF GERMAN MILLERS IN BERLIN, 1879.—It has been decided that on the occasion of the next general meeting of the above society, to be held in the building of the Society of Brewers, "Tivoli," there shall be an international exhibition of machines, confectionery, baking, and cutting machines, which is to be opened on the 22d of June, and to remain open until the end of July. The space at the disposal of the society consists of about 8,000 square metres, so that there will be ample room for the display of a great many objects. Many applications for space have already been received, and some even from Holland, Switzerland, etc., etc. The latest time at which applications can be entertained is the 1st of March, 1879, and they must be addressed to "The International Exhibition of German Millers, Jos. I. Van den Wyngaert, Potsdamerstrasse, 95, Berlin, W.," where forms of application and every other information may be had.

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GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Kleneke expressly for the UNITED STATES MILLER.—cuts reproduced by our special engraver from the original.]

[Continued from last number.]

Rust, *Puccinia graminis*, which covers especially the stalks and leaves of grain, is only communicated to the berry in threshing, and it is known by its translucent, cylindrical utricles of sporules, which have rather long petioles. It injures the corn greatly by its influence on the life of the grain-plant, causing the grains to shrink. In Fig. 4 we give a picture of this fungus in the different stages of its development, magnified 500 times. Fig. 5 represents wheat-flour which has been damaged by the sporules of rust, magnified 420 times. Poor, muggish flour which has been wet, is not unfrequently infected by mold, *Penicillium glaucum*, *P. sitophilum*, and *P. roseum*, and assumes (different as to the kinds of the fungus) a greenish, brownish or reddish hue in some of its parts. Fig. 6 represents a picture of the mold (*Penicillium glaucum*) in the highest stage of its development and sporule formation. Flour, especially wheat-flour, can further be of an inferior quality by having an admixture of the seed of common weeds, es-

pecially of the dough which can be detached from the spoon is cut in two with a knife. If on the inner surface of the cut spots or streaks of a reddish-violet hue can now be found, these will be the places where the flour of the weed is. The more of these are seen, and the darker their color is, the greater is the admix-

animals, which are especially apt to be found in old flour. If the presence of such is suspected, it is only necessary to resort to the microscope. As in sugar, so in flour, there lives a mite, which has been called the meal-mite *Acarus farinae*, and which is often to be found in enormous numbers in old flour. It is necessary though to mention that this mite is to be found much more rarely in wheat flour and rye flour than in the flour of the legumes; and when the flour of grain has been fraudulently mixed with the latter, the mite is also transferred with it.

Fig. 8 is a picture of the meal-mite magnified 220 times. The feathered mite *Acarus plumiger* is also to be found in flour. It is wholly covered with feathery bristles (fig. 9). Besides these the caterpillar of the meal-moth, *Asopra farinalis*, exists in flour, especially in May and September, and by its numbers renders the flour unwholesome; it is transformed to a pilsner with dark-brown front wings, which have a lighter-colored wide middle spot bound on each side by a white line, and ash-colored hind-wings. An animal is further found in flour resembling the infusoria, which has been called *Vibrio tritici*; they live in the seed, and hinder the formation of starch, give the kernel a pepper-like shape and find their way into the flour. According to Prof. Henslow's observations, this *Vibrio* is said to occur frequently in England and be known to millers by the mere appearance of the corn and flour. In Fig. 10 it is represented magnified 100 times. In general all impure and damaged

Section 4,944 of the laws governing patents and trade marks provides that "any person who shall procure the registry of any trade marks, or of himself as the owner of a trade mark, or an entry respecting a trade mark in the Patent Office, by making any false or fraudulent representations or declarations,

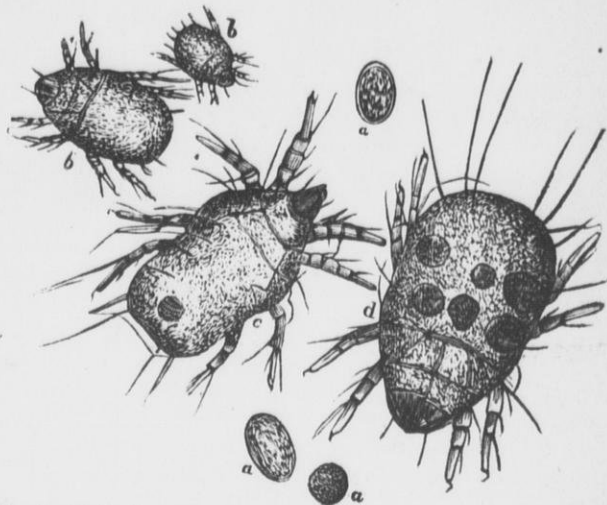


Fig. 8. Meal-mite (*Acarus farinae*). a a, eggs; b b, young mites; c, male mite; d, female mite. Magnified 75 times.



Mould (*Penicillium glaucum*) in the highest stage of development and formation.

ture. Even the meal of the so-called perennial dandel or madwort (*Lolium temulentum*) has been found in flour. Such flour can have the most injurious effects upon the health. The way to discover this deception is by dissolving the suspicious flour in alcohol of 35 deg. (specific weight 0.847), for the stronger the alcohol is, the less will it become colored; the purer the flour is, the clearer will the alcohol remain, and will then at the utmost become straw-colored, namely, from the husky particles of the corn, which the bolting process

verbally or in writing, or by any fraudulent means, shall be liable to pay any damages sustained in consequence of any such registry or entry, to the person injured thereby, to be recovered in an action on the case."

Now, while it can not be doubted that the sale in Eastern markets of flour covered by a lying brand is a damage to St. Louis millers, individually and collectively, it would be an impossibility to form a reliable approximate even of the amount in dollars and cents.

The remedy is a simple one, and consists solely in making it a penal offense to brand a barrel of flour with a locality other than the actual point of manufacture or to alter or



Fig. 4. Rust (*Puccinia graminis*) in different stages of development, magnified 500 times.

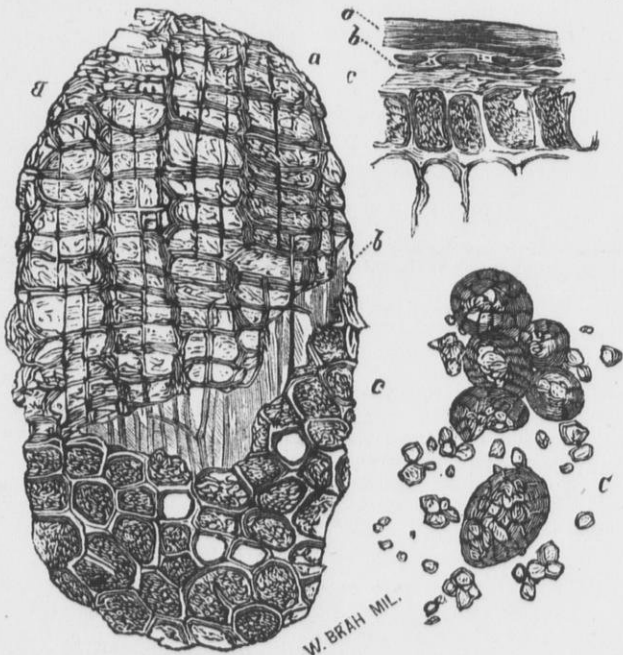


Fig. 7. Structure of the covering of a grain of darnell (*Lolium*), magnified 500 times.

has not separated; at the same time it dissolves a peculiar rosin which is contained in the husks, and its taste is thereby rendered sweetish, but by no means disagreeable. If the alcohol is allowed to evaporate (on a porcelain plate), a resinous, yellowish green substance will remain, which has the same qualities but now even more discernible as the alcoholic solution. It is also of importance to find out by the aid of the microscope, the presence of the seed of the perennial dandel (*Lolium*) which has been ground into the flour. It is therefore necessary to be familiar with the microscopic structure of this seed.

Fig. 7 represents a length and cross incision of the seed; A the length, B the cross incision, magnified 200 times. The structure of its husk is very different from that of the kernels of grain. The husk is composed of three layers of membranes; the external layer a is only formed by a simple cellular substance, and therein differs from the arrangement of the cells in a grain of oats, while the longitudinal axis resembles somewhat the structure of a grain of rice, but still differs widely from it in other particularities of its form. The cells of the second layer b, consisting of two sections, differ from the seed of all cereals with the exception of that of rice. The cells of the third layer c form a single row, and resemble that of the grains of wheat. In C the starch particles of darnell (*Lolium*) are represented magnified 500 times. Flour may not alone be mixed with and damaged by the seeds of fungi and weeds, but may also contain living

flour has a peculiar odor and appearance which distinguish it from the good; one may definitely judge it to be of a suspicious quality, when it forms hard and sometimes large lumps, has a musty odor, a disagreeable, acrid, bitter, sweetish or bad taste, and leaves a feeling of acridness in the throat. If it is even in a state of putrid fermentation and of a dull, white dim or reddish color, it is totally unfit for use.

[To be continued.]

DISHONEST TRADE MARKS.

Whenever Congress may in its wisdom deign to make improvements in our existing laws, we would respectfully direct its attention to the necessity and common justice of a law which shall protect Western manufacturers of flour against the swindling devices of their knavish brethren whose product does not bear the high reputation held by St. Louis millers. It is well known that because of the fine quality of the wheat grown in this section, and the superior method of milling in vogue here, St. Louis flour everywhere commands the highest prices paid for any winter wheat product. This reputation is a valuable property to St. Louis millers, and anything in the form of dishonesty which tends to rob them of the natural result of their labor, whether under the protection of law or because of the lack of law, is a wrong which the law-makers ought to redress at the earliest opportunity.

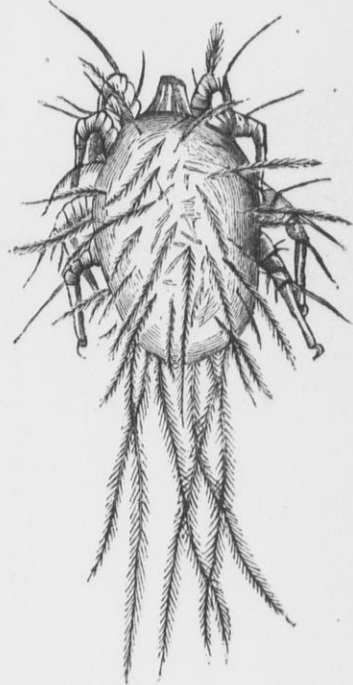


Fig. 9. The feathered meal-mite (*Acarus plumiger*), magnified 100 times.

efface the original brand. St. Louis millers ask no more than a fair chance, but in simple justice they have a right to and should demand that the law protect them from the dishonesty of others.—*St. Louis Post and Dispatch*.

Angus Smith will commence the erection of the new elevator next spring. The brick work of the old Sweet elevator will be removed and the frame and its bins rolled over to the west side of South Water street, where the wood work will be re-bricked and fitted up for further service.—*Milwaukee Sentinel*.

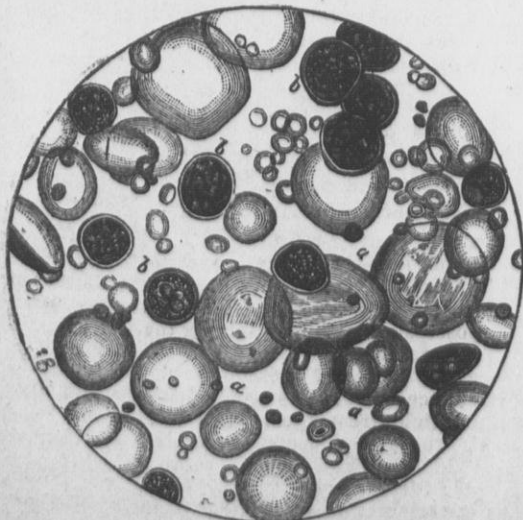


Fig. 5. Wheat flour damaged by sporules of rust, magnified 420 times. a, starch parts; b, sporules of rust.

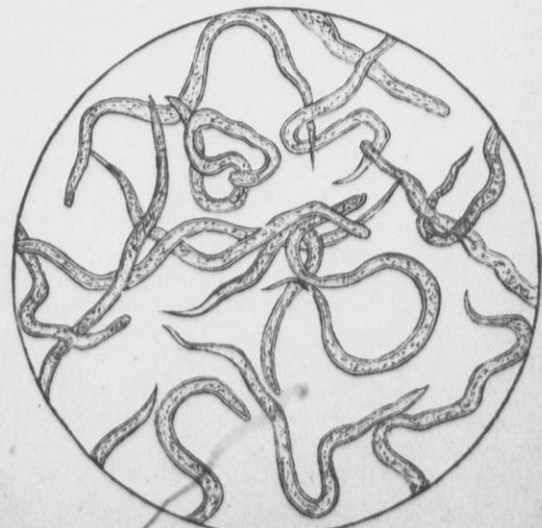


Fig. 10. *Vibrio tritici* found in wheat flour, magnified 100 times.

## EVERYBODY READS THIS.

## News of the World.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

## Arizona.

The people are using their best endeavors to have a United States mint located in the Territory.

The mining troubles have become quite alarming and have almost assumed the character of a revolution. The Legislature has conferred unusual powers on the Governor, and militia will be used to quell the disturbance.

## California.

The new overshot wheel at the Murchie mine, built by J. B. Flack, is 7 feet breast, 125 feet in diameter, and runs, with 150 inches of water, a 50-stamp mill. It cost \$2,000, including housing; and as the company has its own water for eight months in the year, it will effect a saving of \$25 per day.

## Colorado.

The production of silver from the Leadville mines is great. Large fortunes have been made and new locations are made daily.

A. J. Hager, of Canon City, has ordered of Nordyke & Marmon Co., of Indianapolis, Ind., new process machinery for remodeling his mill.

A favorite Denver brand of flour is called "Four-Ace," and the trade mark on the bags and barrels represents a hand holding four aces. Best flour from Kansas winter wheat retails in Denver for \$2.75 per hundred.

## District of Columbia.

The Commissioner of Internal Revenue reports that 1,905,063,300 cigars were consumed in the United States, and 25,312,438 pounds of tobacco otherwise used.

## Florida.

Wheat and rye will yield from 20 to 50 bushels to the acre. Oats bear from 20 to 70 bushels to the acre, small grain bringing a high price like that of cotton. Rice is receiving more attention in the State than formerly, and its cultivation might produce handsome results, and yield from 40 to 60 bushels per acre.

## Illinois.

The Ottawa Starch Factory is running night and day, and has consumed during the past year 750,000 bushels of corn.

## Iowa.

W. R. Derby, of Burlington, is remodeling his mill to the new process.

Jacob Hefflinger, of Pleasant Plain, will rebuild the Keota mill burned last summer.

Messrs. Schofield & Britton have built a steam flouring mill the past season at Reasnor, Jasper county. They have two run of stone in operation with room for three. Reasnor is a new town on the Newton & Monroe railway.

## Indiana.

The Encaustic Tile Co., of Indianapolis, is putting in burrs and machinery furnished by Nordyke & Marmon Co., of Indianapolis.

At Deputy, Feb. 3d, a young man named Graston was caught by machinery in a flour mill, tearing the head from and breaking every bone in his body.

The Atlas Engine Works, of Indianapolis, have just furnished an 18 x 42 Atlas-Corliss engine to Messrs. Harmon, Holmes & Co., of Minneapolis, Minn.

Mathew Lynn, of Belden, who has successfully run a mill built for him by the Nordyke & Marmon Co., of Indianapolis, several years ago, has ordered additional burrs and machinery of the above firm.

The sales of the Atlas Engine Works during the week ending Feb. 8th, embraced fourteen engines of their make of various sizes, most of which were to parties owning flouring mills which are under reconstruction and repair.

New Harmony will soon have the third flouring mill which has been erected in that town by the Nordyke & Marmon Co., of Indianapolis, Ind., Mrs. H. M. Phillips of that place having contracted with the above firm for a three-run steam mill, which will be in operation inside of sixty days.

William Ruyon and wife and Granville Orent and four of his family at Queensville, were poisoned eating buckwheat cakes. It seems a farmer named Hall had put arsenic in the barn to kill rats and a portion of it became mixed with the buckwheat which was afterwards sold to the parties named. Ruyon is quite ill; the others will probably recover.

## Kansas.

L. D. Williams, proprietor of the Valley flour mills on the Solomon River, below Beloit, has put in new process machinery and makes patent flour, which is the first patent flour made in the Solomon valley.

## Louisiana.

Exports of flour from New Orleans to Havana for 1878 were 34,432 barrels, against 159 in 1877.

## Minnesota.

Elliott & Hunter's mill at Dassell started up. Long Prairie, Todd county, wants a flour mill.

Plenty of water yet at Hokah to run the mills.

A Mr. Furman has purchased a flour mill at Mankato.

R. Rood's arm was badly crushed by the

machinery in the flour mill at Stillwater recently.

Frank & Bentzine are building a 2-run mill at New Ulm.

Filer, Stowell & Co., of Milwaukee, now own the 8-run mill at Peterson.

A. Seebeck has purchased C. Betchner's interest in the Diamond Mills at Red Wing.

The cooper shops at Red Wing have closed. Barrels are being superseded by linen sacks.

The Minneapolis Millers' Association profess themselves satisfied with the magnetic process of removing wire from wheat.

Work has been commenced on the excavation for C. M. Hardenbergh's new flouring mill. The building will be 145 by 115 feet.

There is universal complaint about low water throughout the State. Millers having steam power are consequently unusually happy.

A two-run steam mill is about to be erected by John H. Past, of French Lake, who has ordered the outfit of the Nordyke & Marmon Co., of Indianapolis, Ind.

Hon. W. D. Washburn has retired from the firm of Washburn, Crosby & Co., of the B mill. The style of the firm is not changed, the members being Messrs. C. C. Washburn, John Crosby, W. H. Dunwoody and Charles J. Martin.

## Missouri.

J. S. Maitland & Co., millers, of Weston, have made an assignment.

Joplin is a good location for a flouring mill. Millers seeking for a favorable location will do well to visit Joplin.

St. Louis has been full of millers from different sections of the country during the progress of the Cochrane suit.

Gallatin citizens want a flouring mill at that place. They are willing to give a reasonable bonus to some one to build there.

The Downton Purifier Co., of St. Louis, have sold ten sets of rolls to Chas. A. Pillsbury & Co., of Minneapolis, Minn.

The Mexican excursion party returned to St. Louis and Chicago Feb. 16th. They had a grand time and did considerable business, besides having heaps of fun.

A complete new process mill is being erected by Craig & Coster, of Memphis. The entire machinery is being manufactured by Nordyke & Marmon Co., of Indianapolis, Ind.

## Michigan.

The Mayflower Mill at East Saginaw has 7 run of stone.

A. C. Cary & Co., millers, Grand Rapids, have dissolved partnership.

Saginaw City has two flour mills. J. F. Brand has 3 run and Johnson's mill 2 run.

## Maine.

Colburn, Emery & Co., millers, at Bucksport, have gone out of the business.

## Montana.

The white settlers are very much excited over the threatened return of Sitting Bull, with a following of 5,000 warriors. At this time there is but one company of troops between the savages and the white settlements. Mr. Bull, you had better stay in the dominions of your friend John Bull.

## Nebraska.

Since the Union Stock Yards were established in Omaha, about five months ago, they have handled 45,000 head of cattle.

The citizens of Omaha and vicinity have shipped a carload of flour to Glasgow, Scotland, for the relief of the unemployed and distressed in that city. Free transportation was furnished to New York by the railroads, and by the Anchor Line steamships thence to Scotland.

## New York.

Wm. R. Ham, miller, of Madalin, died recently.

Halleck & Co., millers, of Oriskany, have dissolved partnership. S. P. Halleck continues.

A corn mill is being erected by H. Van Derbeck, of Hoboken, who has purchased burrs and bolts of Nordyke & Marmon Co., of Indianapolis, Ind.

Vanderbilt has purchased the Tift elevator, Buffalo, capacity 300,000 bushels, elevating 800 per hour. Reported price, \$255,000.

The Buffalo Board of Trade has adopted the report of the Committee recommending the buying of and selling of grain, flour, etc., by the central when adopted by the New York Produce Exchange.

## Ohio.

Comp Bros., millers, of Navarre, have made an assignment.

Henry Coombs, of Roseville, is building a two-run mill furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

A two-run steam mill has been ordered by Henry Coombs, of Roseville, of the Nordyke & Marmon Co., of Indianapolis, Ind.

## Pennsylvania.

Kemble & Coleman, millers, at Tidionte, have failed.

Wm. Mellon & Sons, of Beaver Falls, have ordered of Nordyke & Marmon Co., of Indianapolis, Ind., a large bill of machinery for the purpose of remodeling their mill.

## Texas.

The annual cattle crop of Texas is estimated

to be worth \$10,000,000; hides, \$1,800,000; beef in barrels, \$2,000,000, and wool, \$1,500,000.

## Tennessee.

Tennessee raised 350,000 bushels of peanuts last year. There's nuts for you.

## Utah.

An immense deposit of native paraffine or mineral wax has recently been discovered in Southern Utah, which exceeds anything of the kind in the world. This deposit occupies an area 60 miles long by 20 miles in width, and in some places forms a bed 20 feet thick. It contains more or less clay in seams or layers, but this is easily eliminated by melting, the earthy matter settling, leaving the paraffine nearly pure. It is quite black in the mass, but in sections is translucent. It is said to be readily soluble in ether, and melts at 60 degrees Centigrade. This immense deposit is thought to be an evolved product, the distillation of beds of cretaceous lignite, and the residue of a petroleum unusually rich in paraffine.

## Wisconsin.

Steinberg's paper mill, at Weyauwega, burned Feb. 24th. Insurance, \$14,000.

A manufactory of paper bricks has commenced work. They are made from wood pulp.

The wife of Gustav Koepke, a journeyman miller living in Milwaukee, has secured a divorce on the ground of cruelty and inhuman treatment.

The residence of J. M. Stowell, of the firm of Filer, Stowell & Co., in Milwaukee, was seriously damaged by fire on the evening of Feb. 17th. Damage covered by insurance.

The Indian Ford dam case is still actively going on in Rock and Jefferson counties. This case is a fight principally between some Janesville millers and farmers along Rock River whose lands have been overflowed by the raising of the dam at Indian Ford.

## Milwaukee Items.

The Eau Claire Lumbering Company is having a large steam engine furnished by the Cream City Iron Works of this city.

A great many millers from all sections of the country have visited Milwaukee during the past month to examine the Milwaukee Milling Company's new mill with its system of Jonathan Mills' small grinding mills.

## Alaska.

There are no flour mills in the Territory, and but two saw mills.

Two salmon canneries are in operation in Alaska, each employing 150 persons.

The United States Court will probably put a revenue cutter in Alaskan waters soon.

Rich discoveries of gold have been made. Emigration to Alaska will be heavy in the spring.

Eight hundred ounces of placer gold has been received at the San Francisco mint from Alaska.

## Canada.

Cyrus S. Clark's steam saw mill, near Sterbroke, Quebec, burned. Loss, \$30,000; insurance, \$10,000.

An order in the council has been passed prohibiting the importation of cattle from the United States for three months from the 1st of February.

## Foreign.

Russia has 500,000,000 acres of forests.

An insane man in London has been committed for threatening the life of the Queen.

The only railroad in Mexico is from Vera Cruz to the City of Mexico, a distance of 503 miles.

Wm. Day has been arrested in London for selling paper bags. So says the *Bakers' Record*.

Bread sells now in England for the same price as in 1770, while the price of beef and butter has advanced 300 per cent.

Fifty-three per cent of the population of France are engaged in agriculture. Of this number one-fifth cultivate their own property.

## FIRES AND CASUALTIES.

Lange Bros.' flour mill at New Memphis, Ill., burned.

Hampton & Bolings' elevator at Winterest, Iowa, burned. Loss, \$6,500.

The Barbour flour mills at Jersey City burned Feb. 13th. Loss, \$40,000.

Jan. 20th, W. L. Ridders' mill at Genesee, Ill., burned. Loss, \$13,000; insured.

The Southern Tier flour mills at Corning, N. Y., burned Feb. 22d. Loss, \$40,000.

John Brown & Sons' woolen mill at Philadelphia, Pa., burned Jan. 20th. Loss, \$150,000. Fully insured.

A fire destroyed the saw mill, grist mill, cheese factory and distillery of M. E. Ellsworth, near Hudson, O. Loss, \$10,000. No insurance.

Feb. 10th, Charles Hazen's flouring mill at Eau Claire, Wis., containing about 1,000 bushels of grain was destroyed by fire. Loss, \$7,000; no insurance.

St. Paul, Minn., Feb. 8th.—A special to the *Pioneer Press* says the mill of Frank Nicollin, at Jordan, Minn., burned this morning. Loss on mill and elevator, \$70,000; insured for \$40,000. Among the companies are the Underwriters' and Home, New York, \$7,500,

and \$5,000 in the St. Paul Fire Marine; Hartford, Springfield, American, Central, St. Louis and German, \$2,500 each. Thirty thousand bushels of wheat in the elevator. Fully insured.

QUINCY, Ill., Jan. 23d.—Thomas Jasper & Co.'s elevator was burned last night. The loss is placed at \$12,000; uninsured. The fire was of an incendiary origin.

A terrible boiler explosion occurred at Secor, Ill., Jan. 30th, in L. Gasner's grist mill. The mill was instantaneously destroyed and four persons killed.—Wm. Collins, engineer, Henry Brann, Wm. Wheeler, foreman on the Toledo road, and young Mahlstick, Joseph Horn was probably fatally injured. The Coroner's verdict was negligence.

Messrs. Herman Co.'s flouring mills and starch works in the Town of Milwaukee, five miles north of Milwaukee, were completely destroyed by fire on the night of Feb. 9th. The fire was caused by the heating of a spindle on a pearl barley run of stone setting fire to the adjacent woodwork. All the buildings, four in number, were reduced to ashes, together with a large portion of the stock, but little of the latter being saved. In three hours from the time the fire was discovered—at about 8 o'clock—the mills were a smouldering ruin. The plant comprised a flouring mill of four runs of stone, a pearl barley mill, a starch factory and five drying kilns, a starch works and a farina factory. The starch works were built six years ago and the mill about thirteen years ago. Last year between \$5,000 and \$6,000 were expended in an improvement of the property by the addition of new machinery. At one time the works were devoted entirely to the manufacture of pearl barley, but of late flour and farina were the specialties of the firm. The buildings were of wood and were uninsured. The stock, both raw and manufactured, were valued at several thousand dollars, and upon this there was an insurance of \$1,000, and that in the Northern Insurance Company, of Watertown, N. Y., had been allowed to lapse. Altogether the loss of Hermann & Co. is \$30,000. Though this proved a severe blow to the manufacturers, they talk of rebuilding the works as early as possible, in order that the business they have created by their superior products may not suffer any undue delay. The employees are to be kept in pay and will assist in an early reconstruction. Parties acquainted with milling of the kind predict that the loss on machinery will be but 33 per cent, and that a large portion may again be rendered serviceable.

## ANOTHER PATENT GHOST.

## ITS NAME IS BARKEE.

Another phase has been reached in the contest of the millers against the claimants of patents for the process by which the "patent" flour is made by purifying the hitherto almost valueless "middlings." The millers had scarcely got over the scare caused by the attempt of Cochrane and others to enforce their re-issued patent, when an attempt was made to obtain a re-issue of another patent obtained some years since by one Barker, with claims almost as broad as those of their former adversary. A thorough search was made to find machines that would ante-date Cochrane's, and has brought to light some containing every principle claimed in the new miller's scare-crow. While these are not old enough to meet the Cochrane case, they are said to go three years back of the Barker patent. A gentleman who is here in the interest of the Millers' National Association, states that they will have no difficulty in defeating the claims of the new aspirant for a patent bonanza. Few millers do not now make use of the process, so the importance of the matter to the trade, and indirectly to the public, may be easily imagined.—*Washington Post, Feb. 8th.*

It is asserted by a reliable gentleman, who is here in the interest of the Millers' National Association, that another raid is about to be made on the millers by the owners of a re-issued patent, which was originally granted to one Barker, in 1869, and which was the first middlings purifier patent issued in this country. There is the same authority for the assurance that there is not the least danger from this new "ring," as machines embodying the same elements as the Barker invention were in use for three years before the issue of the Barker patent, and that one of them is still in existence, and will be brought forward in case there should be any attempt to collect royalty under this re-issue.—*National Republican, Washington.*

It is stated by Col. Collins of the firm of Collins & Gathmann, manufacturers of the well-known Garden City Purifier, that the millers have had a narrow escape from another series of vexatious and expensive lawsuits which would have followed close after the decision in the Cochrane case now on trial in this city. He claims that, but for the enterprise and foresight of his firm in obtaining possession of and preserving the old machine referred to above, the millers would have been at the mercy of these new claimants, whose chances of success would have been a hundredfold greater than those of Cochrane et al. If these statements are correct the millers evidently owe a debt of gratitude to the Garden City Purifier folks for saving them from the tribulation and trouble incident to all patent lawsuits.—*St. Louis Republican.*

Subscribe for the United States Miller. \$1-

TRANSMITTING POWER.—The plan of transmitting power from the engine to the shaftings by means of ropes, has found much favor with mill owners and engineers abroad, the system of arrangement commonly adopted being as follows: The fly wheel is made to serve as driving drum also; it is twenty-two feet in diameter, weighs about twenty tons, and is grooved for the reception of twelve hempen ropes, each six inches in girth, six of the ropes being intended to drive one line of shafting, and six the other. The rope drums or pulleys on the shafting are five feet in diameter, the rims being made heavy and grooved, as is the driving drum, but of course for only six ropes. The width of the grooves is 2 7-16 inches; total depth, 3 1/2 inches; radius of the bottom curve, one-half inch, and the inclination of the two sides to each other about forty-nine degrees. Thus, the ropes do not, even when pressed somewhat out of shape while doing full duty, rest upon the bottom of the grooves, but on the sides, and the wear is, therefore at the points of contact. The wear is found to be tolerably uniform all around the section—thus indicating that the ropes do not, as might be apprehended, present the same parts of their circumference to be continuously gripped to the grooves.

Cut This Out.

"United States Miller" Subscription Blank.

We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year \$1. or two years and a half \$2. We shall be pleased to have an early response to this. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail. Address all communications to the UNITED STATES MILLER, Milwaukee, Wis.

Editor of the UNITED STATES MILLER, Milwaukee, Wis.—Sir: Send one copy of the United States Miller for year for which find enclosed \$.

Name Post-Office County State

THE New Mill-Stone Rubber. Manufactured by the Lehigh Valley Emery Wheel Co., WEISSPORT, PA. Is the best in the market. Try it and be convinced. Price, \$2. mr

The Millers' Text Book.

By Jas. McLean, of Glasgow, Scotland.

A DESCRIPTIVE AND EXPLANATORY account of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the mill, vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price six cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.

Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis. deo

WANTED—A situation as engineer in a large or small mill. Have had 22 years' experience running high-pressure engines of different kinds, and 6 years operating Corliss engines. Can give best of references as to ability and character. Can go any time. Address dec3t J. P. STRAIT, Box 1109, Kalamazoo, Mich.

WANTED—A situation by a thoroughly practical miller (German). First-class St. Louis reference. Satisfactory reasons given for leaving present situation, where I have been working for the past six years. Address ADOLPH BRENNER, Jan\* 1913 Jackson St., St. Louis, Mo.

SITUATION WANTED—I have had two years practical experience in a good flour mill, and want a situation where I can finish learning the trade. I can furnish first-class reference. Address mr3t GEO. P. WANDER, 512 Spring St., Buffalo, N. Y.

WANTED—A situation by a miller of long experience in milling in both Germany and America. Has filled responsible positions in several well-known mills in this country. Will guarantee satisfaction. Is married, of steady habits, and can furnish reference as to ability and character. Address at once, feb1t J. M. B., care United States Miller, Milwaukee, Wis.

The large flouring mill of Sparks & Best burned at Springfield, Ill. It was the largest mill in that section, and the loss is estimated at \$50,000; \$29,000 of this amount is covered by insurance.

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—Cheap—A two-run merchant mill in a good wheat country, on the Illinois Central R. R. For particulars, address W. GILBREATH, feb\* Elkhville, Jackson Co., Ill.

FOR SALE—A two-run water power merchant flouring mill. For information and particulars, call on or address J. H. HARTWELL, Deputy, Jan\* Jefferson county, Ind.

FOR SALE—Three-run water mill and 63 acres of land; good house and barn; plenty of custom. Cheap for cash, or half cash. JNO. F. MCGUIRE, mrlt Clinton, Iowa.

FOR SALE—Two-run steam mill; best run of custom in the county; two houses and barn. Pays 10 per cent on \$8,000. Cheap for cash, or half cash. JNO. F. MCGUIRE, mrlt Clinton, Iowa.

WANTED—To buy or rent a mill, by a practical miller thoroughly versed in merchant and grist work. Talks both English and German, and can give best of references. Address, S. KAMERER, mr\* Fountain City, Buffalo Co., Wis.

WANTED—A good steam flouring mill at Cawker City, Kansas. The location is exceptionally good. The best of wheat and other grains produced in great abundance. The investment will surly make heavy returns. The Atchison, Cawker City & Denver Railroad will be completed to this point on or before June 1st, 1879. Parties desiring to secure a good location may address for any further information, EDMUND O. GARRETT, feb1t Cawker City, Mitchell Co., Kan.

FOR SALE—A superior mill site in southern part of Illinois, suitable for a custom and merchant mill. The location is in one of the best wheat-growing sections of the State, and enjoys railroad facilities to all points East and South. All one engine and two 4-flued boilers in perfect condition. All will be sold at a bargain. For full particulars, please address, feb\* LMBS, MEYER & CO., 120 & 122 S. Main St., St. Louis, Mo.

FOR SALE—A flour mill on Pawpaw Creek, in Mecklenburg Co., N. C. Mill is a three-story building, first-story oak, second and third wood. Rock dam. Two run of stone, one for wheat and one for corn, with other machinery, run by 17-foot overshot water-wheel. Also saw mill with improved circular saws, etc.; 194 acres of land go with the property. Price, \$4,100. This is a fine opportunity for an enterprising miller to make a fortune. Address, feb\* DAWSON & CO., Charlotte, N. C.

FOR SALE OR RENT—One of the best steam flouring mills in the State. Four stories, brick and stone, slate roof, four run of burrs. Adapted to new process. Everything new. Best wheat region of the State. Fuel cheap, water plentiful. Near depot and has side track, cooper shop, wagon and stock yards. Pleasant town of 2,000 inhabitants. Satisfactory reason given—neither of us know anything whatever about milling. Terms easy. Fine bargain. Address, feb\* C. H. HEARD & SON, McLeansboro, Ill.

FOR SALE—A 3 story frame Water-power Mill, with two-run of burrs. The machinery is in good order, improved purifier, mill arranged for both merchant and custom mill. The mill property includes barn, sheds and cottage, young orchard, 300 Acres of Land, 100 acres under cultivation, and the rest in hay and wild land. The undivided half of the above will be sold for \$4,000, part down, and the balance on time. Address, feb\* I. W. DICKINSON, Sabula, Jackson county, Iowa.

FOUR MILL WANTED—In Exchange—I have the exclusive right of 20 Counties in the State of Michigan to manufacture and sell ELLIOTT'S IMPROVED or CENTENNIAL HARROW, with \$1,000 worth of Harrows on hand ready for the Spring Market, which I wish to trade for a good Custom Mill. Would be willing to take property with some encumbrances. The Harrow mentioned is the best one yet manufactured, sells readily as every farmer wants one, and yields a net profit of 200 per cent on cost of manufacture. Being a practical miller I prefer to confine myself to that business. Address, feb\* J. M. SHACKLETON, Plainwell, Allegan Co., Mich.

FOR SALE—A good custom and merchant mill, three stories high, built of stone, with three run of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid home and business, and will be sold very cheap. For particulars call on or address, feb\* E. G. GILBERT, Raubsville, Northampton Co., Pa.

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour, and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold \$0 cash down, and balance in store goods or on five year terms. Address for full particulars, WM. SKINNER, feb1t Mount Morris, Waushara Co., Wis.

FOR SALE—Best Mill in Southern Pennsylvania—This mill, situated in a small village within a few miles of Broad Top coal fields, was recently rebuilt with all modern improvements and is in good repair. Mill is on a never-failing stream, with 30 feet head and is propelled by two turbine wheels. Has three run of burrs and one run of choppers. Building is frame, 42 by 50, and four stories high. Machinery is suited for making either merchant or custom work. Belonging to the mill are a good saw mill, 180 acres of farm land, 100 acres of valuable bark-timber land, three dwellings and a store-room. The owner of the above property will also sell three separate tracts of good bark and fine timber land, containing 400, 280 and 72 acres. For further particulars call on or address, WILSON BERGSTRESSER, feb\* New Grenada, Fulton Co., Pa.

FOR SALE OR RENT—A five-run steam mill, located at Manchester, St. Louis Co., Mo., eighteen miles west of the city of St. Louis. It is located in a never-failing wheat country and is supplied directly by the farmers at reasonable figures. The mill has been run profitably for the past sixteen years. Was rebuilt on a thorough and convenient plan six years ago. Good reasons for wishing to sell or rent. Mill is running to its full capacity and is doing a good business. No competition, no railroads. All of the offal sold at the mill, and a large trade established for the flour. Will be sold to parties buying part cash; long time given for remainder at a reasonable rate of interest, or will rent on reasonable terms. Address or call on the proprietor, feb\* JACOB SCHREINER, Manchester, Mo.

FOR SALE—A four-run steam flouring mill, all in first-class running order. Three 3/4 foot burrs for wheat and one 3/4 foot chopping burr, one Eureka wheat cleaner and a Eureka smutter, Garden City middlings purifier, Excelsior bran duster, Eureka flour packer and all other machinery necessary to complete a first-class mill. Two 25-horse boilers, 65-horse power engine. Still-well heater. Frame building and seven desirable town lots belonging to the property. Side track of A., T. & S. railroad close by the mill, which is located in the best wheat district in the Arkansas valley. The parties owning the mill are not practical millers, and are engaged in other business. They will sell the property low and on easy terms. Address, LANDIS & HOLLINGER, feb\* Sterling, Rice Co., Kan.

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—A steam custom and merchant mill, with three run of 3/4 foot stone. In good running order, and has a good trade. Will be sold cheap. For particulars, address W. M. CROZER, Jan\* Elizabethtown, Hardin county, Ill.

FOR SALE—Two-run Steam Grist Mill, at North Union, Montgomery county, Ind., on L. C. & G. W. R. R. Will sell cheap for cash, or trade for land. Call on or address J. H. ARMANDROUT & CO., Jan\* North Union, Ind.

FOR SALE—A whole or a half interest in a good three-run steam mill in a good wheat country. Mill doing a good business. Half will be sold very cheap. Address, feb\* ROGERS & RAMBACH, West Liberty, Iowa.

FOR SALE—A mill site for a first-class water-power, 80 rods from the lake shore, on Pike River, three miles from Bayfield, Wis. The water-power will do the work of a 50-horse power engine. Address for further information, E. PIKE, Bayfield, Wis. Jan\*

FOR SALE—A good saw and grist mill, driven by 20-foot overshot wheel and abundant water-power, with 100 acres of choice land & a title from Brevard, Transylvania county, N. C. Price, \$5,500. Address, Jan\* DAWSON & CO., Charlotte, N. C.

FOR SALE—Steam power saw mill for sale cheap, and on reasonable terms. Mill is in good location, and is doing a good business. Satisfactory reasons will be given for selling. Call on, or address, SMITH & TUCKER, feb\* Cawker City, Kan.

FOR SALE—A Steam Grist Mill, with two run of stone, a Steam Saw Mill, two Houses, Barn, Shop, and 3 acres of Land, on Lake Shore Railroad, 15 miles from Buffalo, N. Y. Will be sold at a low price to close an estate. Address, SELLEW & POPPLE, Jan\* Dunkirk, N. Y.

WANTED—To Exchange—Good fresh stock of general merchandise, best location in growing county seat, for a first-class custom flouring mill in a good location for permanent business. Kansas preferred. Give full description and cash valuation. Address, Jan\* W. H. WALLACE, Newton, Jasper Co., Ill.

FOR SALE—Mill Property for Sale or Exchange. A three-run Grist Mill and Saw Mill, all driven by water. Price, \$6,000. Would take part of the purchase price in Iowa, Nebraska or Kansas lands. Address, BENJAMIN DEY, Worcester, Otsego Co., N. Y. Jan\*

FOR SALE OR RENT—Cherokee Mill—A three-burr, 40-horse power, steam flouring mill, with all the modern improvements; situated in a wheat-growing country, with railroad connections and cheap fuel. Terms easy. Address, S. ALBERTY, A. CO., Jan\* Cherokee, Crawford county, Kan.

FOR SALE—The best Steam and Gin Mill in Texas; two-run of Burrs, Bolts, Smutter, etc. Two Gins and a Cotton Press; 40 horse-power engine and boiler; Wagon Seales; Good Buildings; Constant Work; Delightful Country. A bargain is offered. Address, F. W. CARTER, Iredell, Bosque Co., Texas. Jan\*

FOR SALE—Circular Saw and Grist Mill; bench saw; run of four foot stone; large pond; 20 feet head; good house and barn, and three acres of land. Located in West Northfield, Mass., four miles from South Vernon. Would take a good portable engine, 25-horse power, for part pay. Address, E. O. FELTON, Jan\* Bernardston, Franklin Co., Mass.

FOR SALE—A Wind-power Grist Mill with 60 foot wheel, three run of stone, cleaning and bolting machinery complete. Located in one of the best wheat-growing sections of Minnesota. Railroad will be built to the place next summer. Will be sold cheap and on easy terms. Address, JOHN MANUEL, Jan\* Elliott, Filmore Co., Minn.

FOR SALE—Cheap for Cash—A Circular Saw Mill; water-power never failing; all modern improvements; mill in good order; plenty of timber, and good wheat land surrounding. Parties need not apply unless they have at least \$2,700 to invest. Address for further particulars, G. F. BLASHECK, Jan\* Maiden Rock, Pierce Co., Wis.

FOR SALE—One of the best mill properties in Michigan, consisting of flouring mill with three run of large millstone s, saw mill, cooper shop, warehouse, store (with or without goods), light dwelling houses all in good repair, with barns and about 27 acres of land, 100 miles west from Detroit, on the Michigan Central R. R. Address, JOHN EVANS, Marengo, Mich. Jan\*

FOR SALE—A flouring mill, saw mill and 265 acres of land; 55 acres improved at a price to suit the times for one-half cash; balance long time. The water power is unsurpassed; two run of burrs with necessary machinery. Mill thoroughly repaired last season. Good wheat country. Situated at Orange, Juneau Co., Wis., on the M. & St. P. R. R. Address, J. G. EVANS, mrlt Orange, Juneau Co., Wis.

FOR SALE—One of the best two run Custom and Merchant Mills in Hancock county, Ill. The mill is situated in the town of Hamilton, Ill., at the east end of wagon bridge leading into Keokuk, Iowa. Decidedly one of the best locations for a Custom Mill in the State. Can now run all the time on custom work, and is new, having been built the present season. Price extremely low. Address, S. L. HOBART, Jan\* Hamilton, Hancock Co., Ill.

FOR SALE—Alabama Flour Mill—Two-run Custom and Merchant Mill in Springville, Alabama, complete. Excellent location. Good trade. Splendid climate. Mill close to a perpetual cold spring, furnishing water enough to run 15 or 20 horse-power turbine with 15 foot fall. Mill now uses steam power. Satisfactory reasons given for selling. Terms, \$1,500 down and \$500 in 12 months. Must be closed out soon. For further information address, A. J. ADERHOLD, Jan\* Springville, Ala.

FOR SALE—A grist mill with two run of stone, on one of the best and clearest water powers in the country. Two houses—one a hotel—barns, sheds, hog pen, ten lots with fine fruit trees, in the village of Bird, Oceana Co., Mich. The whole can be had for the give away price of \$4,500, or one-half for \$2,500. Being in other business the subscriber feels compelled to sell. Address at once, J. PALMITER, mr\* Hart, Oceana Co., Mich.

FOR SALE—Flour and Saw Mill—One-half interest in a first-class three-run Steam Flour and Saw Mill. The saw mill is a double rotary, with gang edger, cut-off and bolt saws and shingle machine. It has been built but 18 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good country store in connection with mill. Would prefer to sell to a miller or a man that is well posted in store business who can command from \$6,000 to \$7,000 and furnish good reference. I will guarantee good margin to the trade. Address all communications to, feb2t A. J. FULLERTON, Bonduel, Shawano Co., Wis.

FOR SALE—We offer for sale the steam merchant flouring mill located at Peterson, Fillmore county, Minn., one of the finest wheat growing counties in the State. The mill is situated on the Southern Minnesota railroad, with side track to the door of the mill, thus giving the best of facilities for grinding wheat in transit. This road is being rapidly extended westward into the best wheat growing section in the Northwest, so that the facilities for obtaining choice milling wheat are growing better each year. This mill was built in 1878; is 40 x 60 feet; three and one-half stories high above the basement. Contains eight run of burrs, with all the modern machinery; brick boiler and engine rooms, practically fire-proof, adjoining the mill 30 x 40 feet; two boilers and 22 x 26 inch cut-off engine built by us. The mill has a capacity of 160 barrels per day, and has a well established trade, the flour commanding the highest price in the market. This property will be sold cheap as we have no use for it. For further particulars inquire of, feb2t F. LEBER, STOWELL & CO., Cream City Iron Works, Milwaukee, Wis.

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R. P. WARD, MANUFACTURER OF THE IMPERIAL Corn Sheller. Adjustable while Running. So as to shell corn of any size. WILL ALSO CLEAN THE SHELLED CORN. Send for descriptive circular. R. P. WARD, SILVER CREEK, CHAUTAUQUA CO., N. Y.

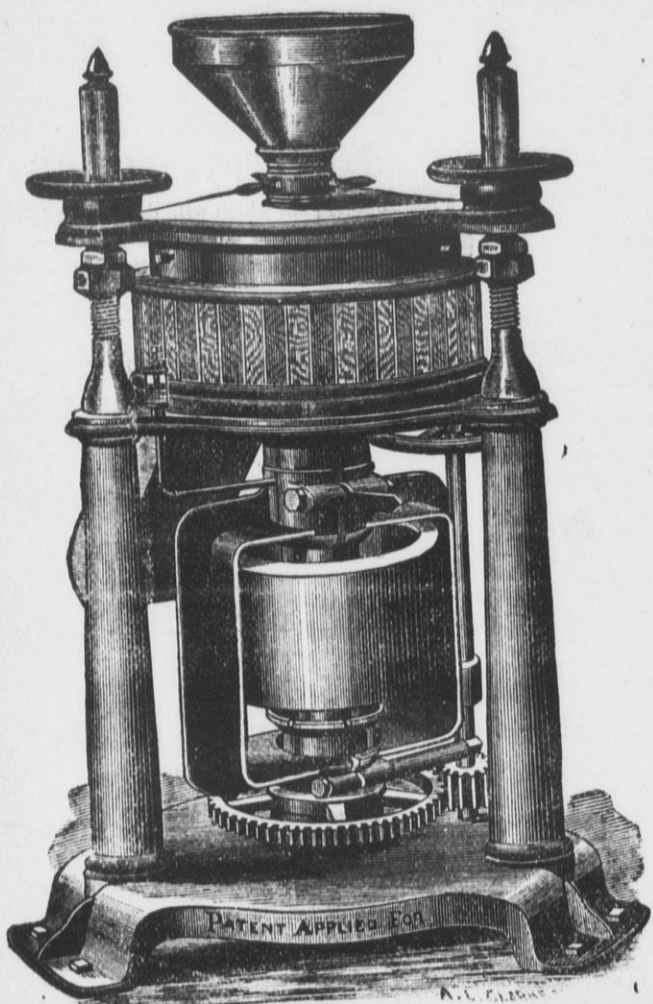
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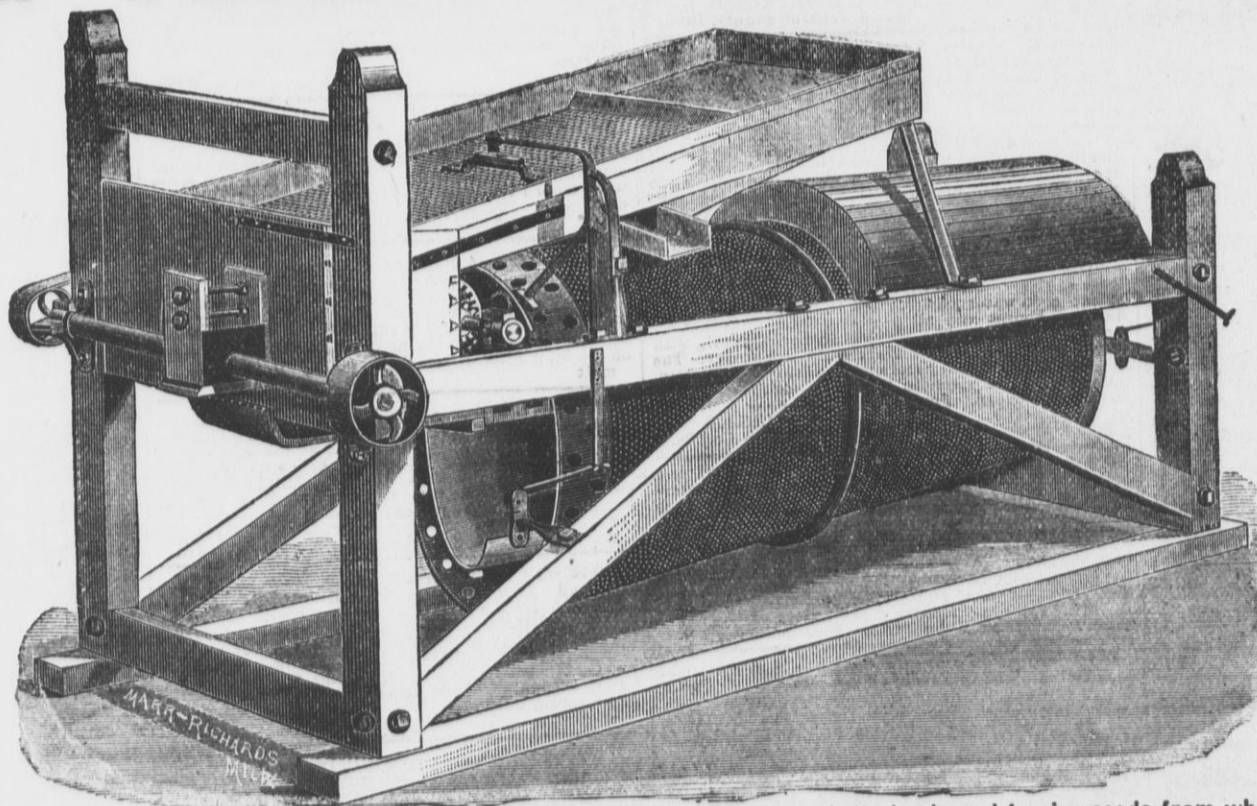
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The above illustrated machine separates perfectly cockle, wild peas, wild buck-wheat, and other similarly-shaped foreign seeds from wheat. Requires but little power to run it. We also manufacture an

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Which is fully equal to any manufactured. This is made in two styles, and is in combination with Cockle Separator. One style has two suction, one operating on grain as it enters the machine and the other as it leaves it, each being independent of the other and easily regulated. The other style has one suction, which may be either first or second. Among our references we respectfully call attention to the following:

MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Company—Gents: We have used your Cockle Separator for the past three years, to our entire satisfaction. We commend them to all in want of a perfect machine. Yours truly,  
 J. A. CHRISTIAN & CO.

MINNEAPOLIS, Minn., Jan. 16, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: In answer to your favor, would say that we have in use four of your Cockle Machines, and find them to be the only machines that we have yet seen that will separate the cockle from the wheat. The improved machines give us no trouble in any way. We shall want two more machines soon, to replace those burned in our Anchor Mill. Yours truly,  
 CHAS. A. PILLSBURY & CO.

MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Co., Milwaukee: We are using two of Kurth's Patent Cockle Separators, and while they work somewhat to a disadvantage on the present crop, we know of nothing that will do the work as well. We consider them the best machine made. Yours truly,  
 BULL & NEWTON.

AKRON O., Jan. 27, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gentlemen: Having three of your

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 FERD. SCHUMACHER.

OSWEGO, N. Y., Jan. 29, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: We are pleased to say that our use of your machines for the last two years, has been highly satisfactory, and especially do we like the new double suction machine, which does its work so perfectly that we would not like to do without it. Indeed we deem the machines indispensable in good milling, particularly with spring wheat. Your friends,  
 PENFIELD, LYON & CO.

WHITEHALL, Wis., Dec. 11, 1878.—Cockle Separator Manufacturing Co., Milwaukee—Gentlemen: Allow us to say that the machine works to a charm, and that we calculate our flour is worth fifty cents more per barrel for the use of it. Respectfully yours,  
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Volume 6.—No. 6.

MILWAUKEE, APRIL, 1879.

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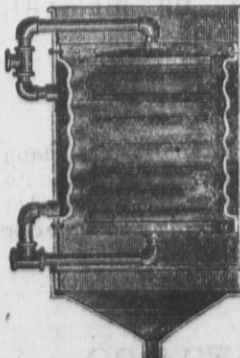
2 1/2 x 2 1/2	6c
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3 x 3 1/2	8c
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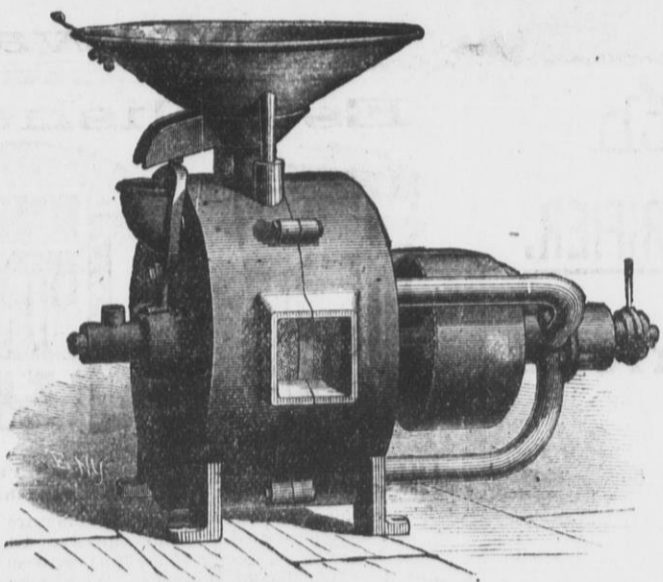
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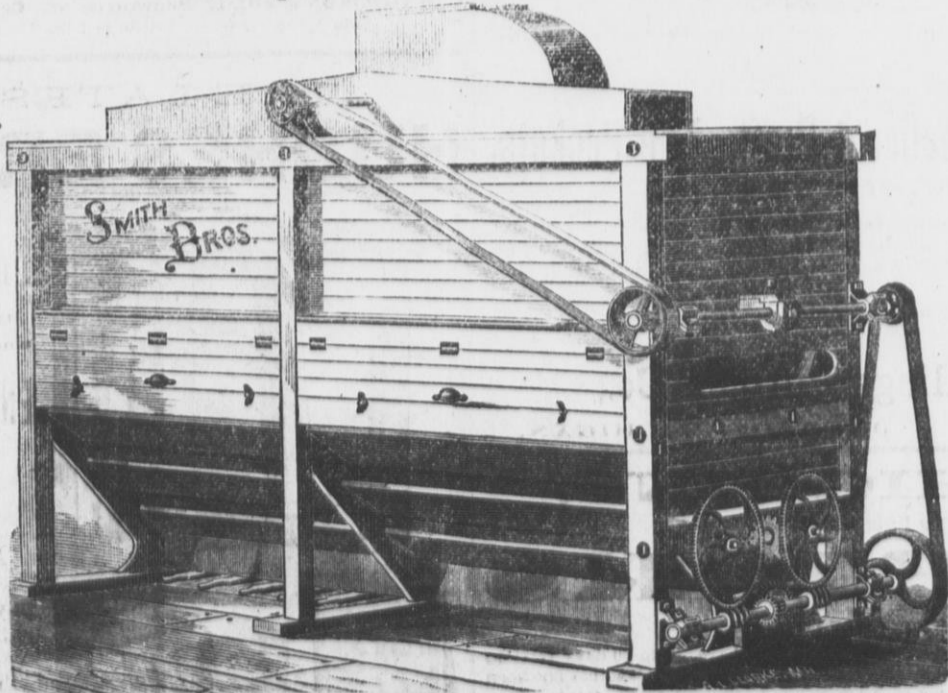
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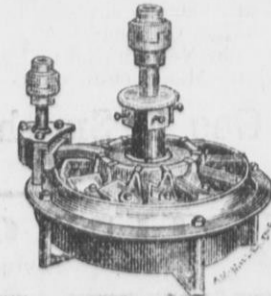
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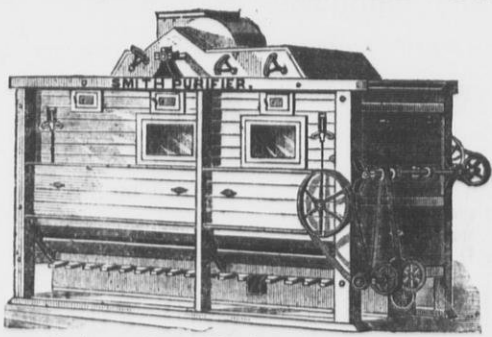
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Send for our New Circular and price list with references. Address the Manufacturers,

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JACKSON, MICHIGAN.

**JOHN C. HIGGINS,**

MANUFACTURER AND DRESSER OF

**MILL PICKS**

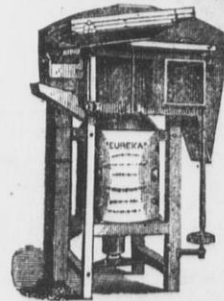
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All work fully guaranteed. Responsible parties can have 30 to 60 days' trial on my new work, also on dressing where the Steel is of good quality, and has not been destroyed by working; and if not superior to any work produced in this country, there will be no charge for the same. A stronger warranty is unnecessary for any purpose.

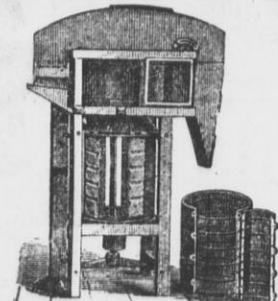
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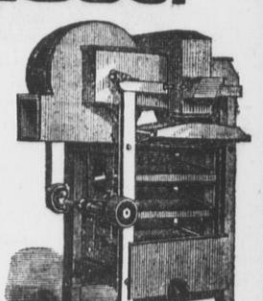
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THE "EUREKA" Smut and Separating Machine.



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We continue, as heretofore, to manufacture in the best possible manner, the Wheat Cleaning Machinery here illustrated. On and after Jan. 1st, 1879, we will discount from our former prices of all our wheat-cleaning machinery 15 per cent, with an additional cash discount of 10 per cent if cash is paid in thirty days from date of shipment. We also keep full stocks of

**Genuine Dufour and Dutch Anchor Bolting Cloths.**

Send for Illustrated Pamphlet. Address

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**HUGHES BRAN DUSTER.**

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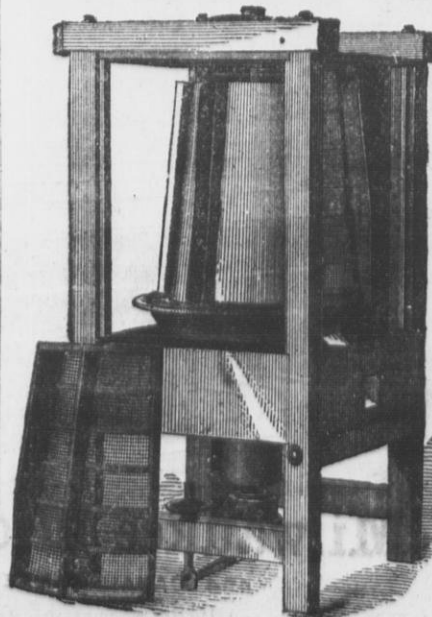
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As all manufacturers of Bran Dusters claim their machines to be the best, we will agree to pay for any machine made in the world that will compete with ours, and be adjudged superior by competent judges, provided any other party will do the same with us.

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# The United States MILLER

Volume 6.—No. 6.

MILWAUKEE, APRIL, 1879.

Terms: \$1.00 a Year in Advance.  
Single Copies, 10 Cents.

## REJOICE YE MILLERS!

For that "party by the name of Cochrane" has been defeated.

The American Middlings Purifier Company  
vs. the Atlantic Milling Co. and  
Others, of St. Louis.

St. Patrick's day (March 17th) was a day of great interest to the millers of the United States, as the decision of the above entitled case commonly called "The Cochrane Case" was to be decided. Accordingly many millers and their representatives, attorneys and members of the press were in attendance upon the opening of the United States Court on the morning of March 17th. The Court, having fully considered the case since the close of the trial, rendered the following decision, every word of which will be read with interest by the now happy fraternity of millers:

### THE DECISION.

On the 6th day of January, 1863, letters patent, numbered 37,317, were granted by the United States to Wm. F. Cochrane, for "A new and useful method of bolting flour." The claims in the patent were as follows:

"First. Bolting the meal over a series of reels covered with cloths of increasing fineness in combination with a blast, substantially in the manner described.

"Second. Running the offal through the entire series of reels, substantially in the manner described for the purpose of making the flour bolt more freely.

"Third. Rebolting the 'white middlings' flour after regrinding, and mixing them with offal, substantially in the manner described.

"Fourth. Conducting the flour made upon each reel into a separate compartment, substantially in the manner described, for the purpose of making a variety of grades, or of mixing them in any proportion desired, as set forth."

On the 24th day of April, 1874, the above-mentioned patent was reissued, numbered 5,841, for "A new and useful improvement in the Art of Manufacturing Flour." The claim in the reissued patent was as follows:

"What I claim as my invention, and desire to secure by Letters Patent, as an improvement in the art of manufacturing flour, is: 'The hereinbefore described process for manufacturing flour from the meal of ground wheat, by first taking out the superfine flour, and then taking out the pulverulent impurities by subjection to the combined operations of screening and blowing, and afterward regrinding and rebolting the purified middlings.'"

The complainant is the assignee of the reissued patent.

The reissued patent was sustained by the Supreme Court in *Cochrane vs. Deener*, 94 U. S. Rep. 780.

A motion was made in the Supreme Court to vacate that decree, because it was procured by collusion. The charge was not sustained; but in denying the motion, the Supreme Court said:

"Under the circumstances, we think that third parties, who had no opportunity of being heard, and whose interests, as opposed to the Cochrane patents, are very important, should not be concluded from having a further hearing upon it whenever a future case may be presented for our consideration."

The defendants, in their respective answers, deny the validity of the reissued patent on various grounds, the more important of which is that such reissue is not for the same invention as that described and claimed in the original patent; and that the invention had been anticipated by others, and described in various publications and patents prior to 1863; and the defendants also deny the alleged infringement. Voluminous proofs were taken, accompanied with many diagrams, models and ex-

hibits. By consent of parties, the arguments were heard by the Circuit Judge and Judges Treat and Nelson.

Rodney Mason, Chas. F. Blake, C. H. Krum and others for the complainants; Geo. Harding, Gordon E. Cole, F. N. Judson and others for the defendants.

DILLON, Circuit Judge: The reissued patent is a process patent for an alleged new and useful improvement in the art of manufacturing flour. "The claim therein," as construed by the complainant, "is for the use of five consecutive steps performed in the art of manufacturing flour in a definite order, viz:

"First—Grinding the wheat into meal.

"Second—Taking out the superfine flour.

"Third—Taking out the pulverulent impurities by the combined operation of screening and blowing, so as to purify the middlings, which are then—

"Fourth—Regrind, and then—

"Fifth—Rebolted."

The real value of the invention described and claimed in the reissued patent, consists in the purification of the middlings by screening and blowing, thus freeing them from pulverulent impurities, and thereby fitting them to be regrind into flour of superior quality. The mode described in the patent and accompanying model and drawing, for effecting the purification of the middlings, is by the agency of revolving bolts, acting upon the meal or "chop" as sieves or screens, assisted in their operation by blasts of air introduced within them. The claim of the complainant is that whenever, in the manufacture of flour, the wheat is ground by the first operation of the stones into meal so that superfine flour is by the next step of the process taken therefrom, any purification of the middlings in residual mass (of which the valuable constituent is the middlings) by the combined action of screening and blowing, intermediately, for the purpose of regrinding and rebolting, whether such purifying is within the flour reels, or upon vibratory screens outside of reels, is an infringement of the Cochrane patent.

Four made from purified middlings is now, and since about the year 1871 or 1872 has been, well known throughout the country as "new process" flour. In what consists the essential value of this "new process?" The answer is, purified middlings, that is, the making of a first grade or even the best grade of flour out of middlings, from which it had generally been considered by the millers of this country (although more intelligent or advanced ideas prevailed in France, and perhaps elsewhere in Europe), unprofitable to produce, or at all events, impracticable profitably to produce flour of the first quality.

A fundamental question in the cause, underlying all others, is: Did Mr. Cochrane in his original patent, granted January 6th, 1863, contemplate, or provide for, the purification of middlings by the combined action of the screen and blast? If he did not, the reissue, which must be for the same invention, or the original patent, and which makes the basis of its claim such purifications of the middlings, is void.

In the light of arguments of great ability and thoroughness, extending over a period of fifteen days, and illustrated at every step by exhibits, diagrams and models, the judges who sat at the hearing have deliberately considered the question above stated, and have reached an unanimous conclusion upon it.

It becomes my duty to announce the judgment of the Court. I shall content myself with stating it, without displaying in detail the reasons, or elaborating the grounds upon which it rests.

The description of the invention in original patent as a "Method of Bolting Flour;" the progressively finer meshes in the three bolting reels therein described; the absence of any "re-turns;" the statement therein that the agency of the blast is to "assist the bolting;" the

cupola or dome on the model, provided with screens, which could have no other effect than to arrest the impurities, or the most of them, and return them directly to the flour; the enforced circuit of air containing any impurities that might escape the screens in the cupola and returning the air under the conditions specified, laden with such impurities directly into the reels; the absence of any statement in the patent of a purpose to purify middlings; the absence of any claim for purifying middlings; the statement that air is used to "aid bolting," and the obvious consideration that if air was used to purify middlings, it could not fail to have occurred to so ingenious a mind as Mr. Cochrane's that this could be most easily and most effectively applied, as it is now almost universally applied, outside of the reels or bolts, and not within them; the failure to provide for blasts of air in the "separator," or in a separator; the low grinding which his process evidently contemplated, as evidenced by the successively finer meshes; the fact now established that the manufacture of middlings flour is not practiced without more or less high grinding, or higher grinding than was ordinarily used in this country—the foregoing considerations, in connection with the extrinsic testimony as to what was done under the patent, all concur to satisfy us that the idea of Mr. Cochrane was the use of the blast in the reels as an aid in the mere process of bolting, with the view of obtaining an increased quality of choice flour, and not for the production of purified middlings. The reissued patent having been expanded to embrace a claim for purifying middlings, when no such process was described, suggested or claimed in the original patent, it is void. If this conclusion is sound, it is not necessary to consider the questions of anticipation or infringement, upon some of which, if compelled to decide them, we might not agree. The result is that the bills must be dismissed, and decrees will be entered accordingly.

Decrees accordingly.

Treat and Nelson, J. J., concur.

### JUDGE NELSON'S OPINION.

NELSON, J.—I concur in the opinion of the Circuit Judge. The actual invention of Cochrane has been enlarged by the addition of new matter in the reissue, so that when the two patents are compared the extension is apparent. The new patent is not for the same invention secured and embraced in the original letters patent.

Succeeding the delivery of the foregoing decision Judge Dillon stated that Judge Treat had also prepared a concurring decision, which Judge Treat then read.

### JUDGE TREAT'S OPINION.

I concur in the opinion just delivered by the Circuit Judge. The reissued patent No. 5,841 is not for the same invention as patent No. 37,317, and is consequently void. In addition to the summary of reasons just announced for the conclusion reached, it seems advisable to state that the original patent was merely for an improved method of bolting, in the manner described, whereby an increased quantity of choice flour could be obtained from the ordinary process of milling, without any reference to purified middlings, by combined blowing and screening in an intermediate, or any other stage of the operations.

The original contract of Cochrane in 1860 with Warder & Barnett shows that his purpose was, by low grinding, to produce a superior grade of flour in larger quantities than theretofore known. He agreed to make "the most superior grade of flour in the United States out of four bushels and twelve pounds of choice wheat for each barrel of flour," which result could not be accomplished, except by low grinding, if at all. His scheme or plan did not contemplate a large amount of middlings, and could not have done so for the lower the grinding the less the quantity, and as a general rule the poorer the quality of

the middlings. At the time said contract was made, Cochrane had an interest in the Cogswell & McKiernan patent, the devices of which he evidently designed to utilize. His experiments at Lagonda, and subsequently at the first Barnett mill, also show that his purpose was to produce a large amount of such choice flour, by low grinding, from the least possible, or a comparatively small, quantity of wheat. The early experiments were directed to that end; and hence the satisfaction evinced when the required amount of flour was produced approximately from the designated amount of wheat.

When, however, it was ascertained that no grade of good middlings flour could be thus made, the resort was had to higher grinding, of which, as the result, Warder & Barnett complained, as being one-quarter too much. They prove by their correspondence at the time, just as the original patent shows, that the inventor supposed that by his process and devices for bolting, he could accomplish his purpose by using the ordinary process of milling.

This is evident, not only from the correspondence at the time, but from the mechanical inventions to which he referred, and also from the special stress placed on meshes of increasing fineness.

In that correspondence there was a constant boast of the new mode of bolting whereby the meshes were to be kept cool and free from clogging, etc., and also of the device for returning the current of air through the cupola back into the reels whence it had just escaped through the perforated pipes, meshes, etc.

In one of the letters it was confidently claimed, that the difficulties as to low grinding even of spring wheat, could be overcome by Cochrane's contrivances; that grinding of even that class of wheat could not be so low as to prevent "clearing up." It was low grinding then whereby the large quantity of choice flour was to be made, that the inventor had in view.

This was to be effected, not by an "intermediate" stage of purification, between the production of superfine flour and the regrinding of middlings, but by the use of meshes of increasing fineness in the flour bolts, assisted by blasts of air.

Those blasts of air were to spend their force within the first three reels; for no blasts were to be used in the separator before regrinding. The necessary effect of using successively finer meshes, instead of successively coarser was to prevent the escape through the meshes of a larger quantity of impurities; and consequently of making the flour thus screened cleaner and better. The impurities thus prevented from passing through the screens into the flour would necessarily be retained in the reels and pass off with the tailings, consisting of middlings, shipstuff, etc.

It is not to be supposed that meshes of increasing fineness could operate in any other way. Hence, the Cochrane process was not to purify the middlings or increase their quantity or quality, but merely by "improved method of bolting" to obtain a larger amount of choice flour from the specified quantity of wheat.

In his original patent, No. 37,317, he formulated four claims, not one of which was for purifying middlings, but two were specially directed to his mode of "bolting." He especially stated that the flour screened through each of his first three reels could be kept separate or mixed, as the miller might desire, without a hint that the siftings of the third reel would consist of dirty flour or pulverulent impurities, not fit to be used, or which it was sought to remove, either from the flour thus sifted through the third reel or from the middlings within that reel which were to pass off with the tailings.

The devices specified in the original patent are very significant on this point. They pro-

[Concluded on page 91.]



## UNITED STATES MILLER.

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OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.  
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MILWAUKEE, APRIL, 1879.

We send out monthly a large number of sample copies of **THE UNITED STATES MILLER** to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send **THE MILLER** to you for one year.

### THE OFFICIAL CALL.

We have just received on the eve of going to press the official call for the next meeting of the Millers' National Association, which reads as follows:

MILLERS' NATIONAL ASSOCIATION,  
PRESIDENT'S OFFICE, ST. LOUIS, MAY 28, 1879.

The Sixth Annual Convention of the Millers' National Association will be held at the Grand Pacific Hotel, in the city of Chicago, May 13, 1879. All members of State Associations and individual members of the Millers' National Association in States where no State organization exists are invited to be present. The ratio of voting, as decided by the Executive Committee, will be based upon the number of runs of buhrs on which assessments have been fully paid up to the 1st inst.

As recommended by the Executive Committee, a reorganization of the Association will probably take place, and it is hoped as many members as possible will attend.

GEORGE BAIN, President.

FRANK LITTLE, Secretary.

The Executive Committee are requested to meet at the Grand Pacific Hotel at 10 a. m., May 12.  
J. A. CHRISTIAN, Chairman.

It is to be hoped that there will be a rousing turn-out of millers from all sections of the country, and especially from the Great Northwest.

THE Minnesota Millers' Association is officially called to meet at Minneapolis April 8th, 1879.

WE have received a very interesting article on the milling industry in Hungary, which we are obliged to omit this month for lack of space.

AN INVITATION.—We cordially invite all millers, millwrights, millfurnishers and inventors of milling machinery to call on the UNITED STATES MILLER when visiting this city.

S. H. WILLARD & Co., of 45 South Clinton street, Chicago, Ill., have purchased *The Millers' National Magazine*, originated by Messrs. Collins & Gathmann, manufacturers of the Garden City Middlings Purifier.

AN immense quantity of flour manufactured in Minnesota is for direct export to Great Britain. It is put up in sacks containing 140 pounds each. This trade has been rapidly growing during the past winter.

MISS MAGGIE KERN, daughter of the well-known Milwaukee miller J. B. A. Kern, was married March 25th to Mr. Ferdinand Meinecke, also of Milwaukee. The happy young couple have gone to Florida to spend the honeymoon.

**THE UNITED STATES MILLER** has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill-furnishing establishment.

HENRY HERZER, the mill-pick manufacturer and dresser, reports business lively since he moved into his new location, No. 456 Canal street. He is in daily receipt of orders from all parts of the West, and his work gives universal satisfaction. Milwaukee millers would not like to do without him.

WE were pleased to receive a call, March 27th, from Charles Gratiot, of Gratiot Bros., manufacturers of wheat heaters in Platteville, Wis. He reports business first rate, and that they are crowded with orders. Charlie holds his weight yet—which is considerable—and is, as ever, one of the best-natured men in the business.

WM. LEHMANN'S invention for truing the faces of millstones, which our readers will

find advertised in another column is all it claims to be. We have personally examined it and have asked the opinions of mill-owners who have bought it, and of practical millers who are using it, and they universally acknowledge its merits. The price is within the reach of all.

**HAFNER'S MODEL MILL.**—The dynamometer shows that by using the Eureka spring and friction clutch on bevel gear 38 per cent more power is obtained than by the quarter twist belt, the pressure of steam being the same; whereas, belt motion varies 20 per cent, gear and spring motion is uniform. This is the result of tests made by Sigismund Low, late Chief Engineer of the Northern Pacific R. R.

**MESSRS. GANZ & Co.**—We respectfully call the attention of our readers to the large advertisement of Messrs. Ganz & Co., mill and milling machinery builders, in Budapest, Hungary. This firm have met with great success in introducing their rolls in other countries, and they deserve the attention of our millers. Letters may be addressed to them in either the English, German, or French languages. Postage on letters to Hungary is five cents, and on newspapers or circulars two cents, which must be prepaid.

Mr. Robert Nunnemacher, of the Milwaukee milling firm of Nunnemacher & Co., has just arrived in New York on his return from Europe. He spent some time in Budapest and other important European milling centres, examining the milling machinery and methods in use there. It is a curious coincidence that at the very time Mr. Nunnemacher, Mr. Gray, and other millers from the United States were in Pesth examining the Hungarian machinery and methods that several mill-owners from Pesth were in Milwaukee to examine our American machinery and methods. Verily, millers on both sides of the Atlantic are really becoming not only willing but anxious to learn of each other.

### PATENT SUITS AND MILLERS' ASSOCIATIONS.

The year 1879 appears to be disastrous to plaintiffs in patent right suits, especially in some very noted cases. The Woodbury patent case, in which all the planing mills in this country were interested was decided in the United States Circuit Court for Massachusetts in the month of February in favor of the defendants, and consequently there was great joy amongst the planing-mill men. Now the great "Cochrane case," which has so long been the subject of hope and fears amongst the millers has been decided in favor of the defendants, and great is the joy thereover. We stated in our last number that we did not think that this latter case would be appealed, no matter which way it was decided. We did not think it would as certainly the three able Judges who sat on the case would undoubtedly render a decision which would not be altered by the Supreme Court of the United States, and we do not think, now that the decision is rendered, that the plaintiffs will gain anything by the appeal. The decision is unanimous and clear, and the great question at issue is practically ended. There are two things to be deplored in connection with this case, and those are: First, that so many millers have held aloof from joining the Associations and contributing towards winning this important case, for, as sure as the sun shines, so sure would every new process miller in this country have been liable to pay royalty to the Cochrane party if this case had not been ably defended. The non-contributing millers will now have the pleasure of enjoying the fruits of the labors of their more generous and energetic brethren. The second disagreeable feature is the compromise during the trial by Messrs. Stanard and Kehlor with the plaintiff. This last matter is too bad to talk about. The address of the Executive Committee—published last month—to the millers of the United States, professing to reorganize the National Association on a thoroughly legal and business basis appears to meet with very general approval, and it is to be hoped it will be practically and successfully carried out. There are other important cases, notably the cases of the Consolidated Middlings Purifier Company vs. Griffin, of Buffalo, N. Y., and the Denchfield suits. That these must be ably defended there is no doubt, as the plaintiffs have exercised the greatest shrewdness and secured unquestionable legal talent to conduct the prosecution of the cases. Vigorous means must, therefore, be used by the defense to overcome the dangers threatened. It is to be hoped that millers universally will take more interest in the Association. Millers must not be will-

ing now to repose upon their laurels lest their opponents "catch them napping." There is yet work ahead, and it must be faithfully done. "Many hands make light work," and the burden becomes individually lighter in proportion as the membership of the Association becomes larger. The Association works upon almost the same principle as a mutual insurance company, and its members will be the gainers in all patent cases whether contested or compromised.

We would call the especial attention of millers to *Article Seven*, to be proposed at the next meeting of the National Association at Chicago, May 13th. It reads as follows:

Seventh—That all patents considered by the Executive Committee to be valid and useful should be compromised for the benefit of all full-paid members of the National Association who may choose to avail themselves of the terms of such compromise, that the fullest possible encouragement should be accorded honest inventors, whose machinery will improve our manufacture, by arranging for moderate terms, alike bearable to users and remunerative to inventors; but that all fraudulent claims should be fought to the bitter end regardless of expense.

This should be acceptable and entirely satisfactory to both patent-right owners and mill owners.

### THOSE LITTLE MILLS.

Never since the advent of middlings purifiers in the Northwest has there been so much interest awakened as has been evinced in the past two months over the little mills made by the Milwaukee Middlings Millstone Company of Milwaukee. When Jonathan Mills first brought them before the milling public it of course created considerable talk, but comparatively few had sufficient faith in the departure to invest their money in *experimenting* with them. The Milwaukee Milling Company, a stock company organized for the manufacture of flour, however, were so well satisfied with the experiments made that they were willing to build a mill in which the Jonathan Mills' little mills were to be used entirely—the 16-inch stone for granulating the wheat, and the 24-inch for grinding the middlings.

Many skeptics predicted a grand failure of the enterprise, but now—that a mill has been built containing 37 run of these stone which work so entirely to the profit and satisfaction of the stockholders that they are about to double its capacity by adding from 33 to 40 more runs—they are filled with wonder, and are bound to confess to quote the language of one of them that "*this 'ere thing does work after all.*"

Millers from Minnesota, New York, Michigan, Ohio, Indiana, and even from the New England States, have visited this city during the past three months to see this mill in operation, and all are obliged to confess that the work turned out is as good as can be done. Visiting millers are surprised to learn that no "red dog" or "superfine" flour is made in this mill. The two brands made are "Patent" and "Standard Straight," which demand the highest prices in the city trade and the New York and English markets. The mill is now turning out steadily over 350 barrels per day, which is claimed to be produced at a less expense than in any other Milwaukee mill. Visitors to—as well as the stockholders of—this mill are now thoroughly convinced that the great success of this mill is mainly due to the accurate and precise workings of the little grinding mills used. The Milwaukee Middlings Millstone Company have during the past month closed several contracts for building new or refitting old mills entire with this modern little wonder, which seems bound to crowd out of use the old-fashioned, large and cumbersome millstones.

### A WATER WHEEL TEST.

The city water works of Minneapolis, Minn., which lately advertised for two turbine wheels, of 300-horse power each, to pump water into their reservoirs, decided to have the contesting wheels tested at the Holyoke flume in the Connecticut River, before April 1st by the engineers of the Lawrence Water Power Company. The wheels to be tested are the "Risdon," the "Swain," the "American" and the "Victor." The Holyoke Machine Company representing the "Hercules" wheel, and the Ames Company representing the "Boyden" were both a day too late in applying and so are shut out; but in case the contesting wheels fail to "toe the mark," there will be a new trial, to which all will be admitted. The Ames Company intend in that case to test their Boyden wheel at the Holyoke flume for the first time, which will necessitate putting in a "quarter turn."

The Risdon agent offered two of his 60-inch wheels of 375-horse power each for \$2,100 apiece; Swain, two 34-inch wheels for \$3,000

apiece, and the American Company, two 48-inch wheels for \$1,300 each. The Minneapolis people demand that the average of  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and full gate shall show 76 per centage for a 30-foot fall. Local authorities differ as to the ability of the wheels to show this. Mr. Emerson doubts it, and the Ames Company think it highly probable that a new series of tests will be necessary. This trial will be of considerable interest. As the Holyoke flume has only a 20-foot fall, there must be considerable figuring to show the required results for a 30-foot fall.

### A NEW THEORY ABOUT FOOD.

A German physician has started a new theory with regard to food. He maintains that both the vegetarians and the meat-eaters are on the wrong track. Vegetables are not more wholesome than meat or meat than vegetables, and nothing is gained by consuming a compound of both. Whatever nutritive qualities they may possess, he says, is destroyed in great measure and often entirely by the process of cooking. All food should be eaten raw. If this practice were adopted, there would be little or no illness among human beings. They would live their apportioned time and simply fade away, like animals in a wild state, from old age. Let those afflicted with gout, rheumatism and indigestion, try for a time the effect of a simple uncooked diet, such as oysters and fruit for instance, and they will find all medicines unnecessary and such a rapid improvement of their health that they will forewear all cooked articles of food at once and forever. Intemperance would also, it is urged, no longer be the curse of civilized communities. The yearning for drink is caused by the unnatural abstraction from what are termed "solids" of the aqueous element they contain—uncooked beef, for example, containing from 70 to 80 per cent, and some vegetables even a larger proportion of water. There would be less thirst, and consequently less desire to drink, if our food were consumed in its natural state without first being subjected to the action of fire. Clothing, our adviser also thinks, is a mistake, but he admits that the world is not yet far enough advanced in civilization to go about undressed. Whatever differences of opinion may exist as to this anti-cooking theory, there cannot be a doubt that in getting rid of the kitchen with all its abuses—including the cook—housekeepers would be spared a vast amount of worry, and probably on this account alone would live to a greater age than at present.

A new steam mill is to be built at Olivia, Minn.

Messrs. Hoyt & Seager of Frontinac, Minn., are about to build a flour mill. It will contain four run of stone and two sets of rolls.

Volk's flour mill at Wilmot, Wis., burned March 14th with most of the contents. Loss, \$12,000; no insurance. One man lost his life in trying to get the safe out of the office. His name was Emery Whapples.

March 31st, we were favored with a call from Mr. Herman Notbohm, of Notbom Bros., Janesville, Wis. Mr. Notbohm was on his return from a short trip to St. Louis. He reports the milling business not lively but yet satisfactory.

A. A. Freeman & Co.'s big mill at LaCrosse, Wis., thoroughly fitted out with all the modern improvements, has now a capacity of 500 barrels per day, and additions of machinery are now being made which, when completed, will increase its capacity to 750 bbls. per day.

The City Flour Mills of Minneapolis, Minn., burned on the morning of March 30th. Loss, \$70,000. Small insurance. The fire caught from the smoke stack of an adjoining mill. Minneapolis has been extremely unfortunate in the destruction of flour mill property during the past year.

F. W. Stocke, of Hillsdale, Mich., is putting in his mill eight of the Jonathan Mills' millstones, also two 8-reel bolt chests, Smith Bros., Milwaukee, are doing the millwright work. Mr. Stocke has already in his mill nine run of the 4-foot stone, and, with the new additions, he will soon have seventeen run in full operation.

March 18th, a reissue of an old grain-cleaner patent was made from the United States Patent Office. It is said that it has some bearing on the middlings purifier suits. We are informed that it is owned by the Consolidated Middlings Purifier Co., of Jackson, Mich. We will examine the matter, and, if it is of sufficient importance, will describe it with illustrations next month.

### Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

SCIENTIFIC CONVERSATION IN A EUROPEAN HOTEL.

A Humorous Account of the Primitive Method of Transporting a Mill-Stone in Germany.

[Translated from the German.]

Mr. Sigismund Low, a prominent civil engineer of the United States, while traveling in Germany for the purpose of scientific research, met a former college friend, Baron Wuertenau, at Heidelberg, with whom, after discussing various applications of technical science, he had the following conversation:

Sigismund Low—"My nephew wrote me, before I left America, that any information I might be able to give him relating to the latest and best improvements in American mill machinery would be of special service to him."

Baron Wuertenau—"Pardon the interruption, Mr. Low; but many millers who have visited America tell me that of the large number of improved American machines very many have to be thrown aside as useless."

S. L.—"That is quite true; there are many worthless machines put into the market, but in a majority of cases the fault is with the miller and not in the machine."

Baron W.—"How so?"

S. L.—"Well, I have seen stately palace-like buildings fitted up in the most elegant style from grinding floor to roof, built apparently to be ornamental rather than useful, while the most important part—the pit gear—runs as if intended to grind bones or cement. Any variation of motion, however slight, will make a burr quiver or wobble, causing rapid changes of the relative positions of the grinding surface, and thus grind too fine at some points and too coarse at others. If the action of the stone is thus defective all the improved machinery in the mill will not remedy the effect

identical with the native Germans of Hutzewald, on the Rhine. By the way, have you ever heard the Hutzewald anecdote?"

Baron W.—"I know the Hutzewalders are a good, honest, industrious, but slow people, who are adverse to any innovations or improvements, but I have not heard the anecdote."

S. L.—"Well, these people decided to build a mill. They quarried and cut a mill-stone from the hill, three hundred feet above the mill site, and were at a loss to know how to get it down. They decided to let it roll down, but, unfortunately, it turned to the left and ran down a ravine. After several days' diligent search they found it in a thicket, one and a half miles from the mill. Simply recognizing the fact that the blunder was made in not giving it a proper start, they, with great difficulty, carried it to the top of the hill from which it was started. Lest it be lost again, one of the party put his head through the eye of the stone, intending to accompany it down the hill in this manner, and in case it departed from the intended course, he promised to whistle, that the others might find it. Hannes (who in his younger days had been hostler in an artillery corps), with the air of a military expert, proceeded to make a reconnaissance of the field, and aimed the stone direct for the mill door, gave the command, 'Fire!' and off they let it go. The weight of a man on one side, of course, caused the stone to rapidly change its course, and man and stone went crashing through bushes and trees, finally landing at the bottom of a small lake. The parties on the hill vainly waited for a signal!—vainly searched for the stone. After carefully considering the matter, they concluded that the man, considering the stone of considerable value, had run away with it! There-

EVERYBODY READS THIS.

NEWS OF THE WORLD.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Kansas farmers are sowing wheat.

George Patlow, the miller at Grand Rapids, is dead.

C. G. Rogers, miller, at Sandy Lake, Pa., has failed.

Minneapolis coopers made 560,000 barrels during 1878.

Jas. A. Martin, miller, Roseville, Ohio, reported failed.

Wheat sells at Greeley, Colorado, for \$1.45 per 100 pounds.

Ellwood & Armstrong's mill at Rochester, N. Y., burned.

Joseph B. Enos & Co., Waterword, N. Y., millers, suspended.

Americus, Lyon county, Kansas, is to have a new flouring mill.

More wheat will be sown in Minnesota this year than ever before.

Geo. Farmer & Son's flour mill at Vestaburg, Mich., burned.

T. H. Vandercook, of Waukesha, has removed to Edgerton, Wis.

Messrs. Weller & Waldo, of Salem, Oregon, have sold their flour mill.

Hatch & Rogers, millers, of Chelsea, Mich., have dissolved partnership.

George T. Enos & Co., merchant millers, Buffalo, N. Y., have suspended.

Hammond & Noble, of Fostoria, Ohio, millers, have dissolved partnership.

The water is now sufficient to run all the Minneapolis mills to their full capacity.

Amos E. Whitson & Son, millers, of New London, Pa., have made an assignment.

The Atherly saw and grist mill at Orrillia, Ont., burned March 10th. Loss, \$25,000.

Betts, Miller & Snyder Bros., millers, at Bettsville, Ohio, have dissolved partnership.

A Mr. Marshall is building a flouring mill three miles from Stockton, Rooks county, Kas.

Thirty thousand acres in Los Angeles county, California, will be sown to wheat this year.

The assignment of Mrs. Lillia W. Hurd, owner of the flour mill at Decatur, Ill., is announced.

J. H. Keedy's flour mill at South Bend, Ind., burned March 7th. Loss, \$20,000. Insurance, \$9,000.

Barr & Thorne's flouring mill at Auburn, N. Y., burned March 18th; loss, \$40,000; insurance, \$24,000.

Edward P. Allis & Co. have received an order from England for fourteen of their belt porcelain roller mills.

The Reliance Works of Edw. P. Allis & Co. are running day and night on orders for engines and roller mills.

The millers of Devon County, England, have organized an association which promises to be an important one.

P. J. & J. B. Ferschweiler have purchased the flour mill at Newellville, Oregon, from John D. & Fred Hurst.

James Bedle & Son, millers, of Keyport, N. J., are reported to have made an assignment for the benefit of creditors.

Eighty-four thousand six hundred barrels of flour were made at Red Wing, Minn., for the year ending Feb. 1st, 1879.

The Milwaukee Middlings Millstone Company are building a 5-run mill at Auoka, Minn., for Messrs. Mayall & Owen.

B. D. Sprague, owner of the flour mill at Rushford, Minn., purchased from farmers in one week over 5,000 bushels of wheat.

Feb. 27th, the steam mills at Monticello, Iowa, were burned to the ground. Loss total, and put at \$12,000; insured for \$15,000.

The Milwaukee Middlings Millstone Company are furnishing twelve 16-inch mills to Mr. Frederick Stock, of Hillsdale, Mich.

M. Barbour, of the firm of Graham & Barbour, owners of the Jackson Mills at Carbondale, Ill., is dead and the firm has failed.

Messrs. Coleman, Jackson & Co.'s flour mill at Centralia, Wis., is being refurbished by the Milwaukee Middlings Millstone Company.

Todd, Reed & Stevens, of La Gro, Ind., are having buhrs and fixtures placed in their mill by Nordyke & Marmon Co., of Indianapolis.

The Government recommends municipalities throughout the island of Cuba to open schools for the education of the colored people.

The Red Wing and Lagrange mills, at Red Wing, Minn., shipped 28 car loads of flour in sacks to Liverpool and Glasgow, March 15th.

Three hundred barrels of flour shipped by a Racine firm were lost recently by the wreck of the schooner Restless, near Ludington, Mich.

The large 28 x 60 improved Corliss engine, built by Edw. P. Allis & Co., for the St. Louis Cotton Mills, has been started and is running finely.

H. H. Emminga succeeds in business the firm of H. R. Emminga & Son, dealers in buck-

wheat, graham flour and meal at Keokuk Junction, Ill.

E. Vandeventer's flour mill in East St. Louis, Ill., has burned.

W. S. Armstrong, head miller of the Lagrange flouring mills, at Red Wing, Minn., had his foot caught and crushed in some mill-gearing recently.

Mr. W. D. Gray, millwright for Edward P. Allis & Co., is on his way home from Europe, where he has been looking into the method of European milling.

Harvey Leonard, of Oberlin, Ohio, has contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a first-class four-run new process flouring mill.

Greeley, Col., with a population of 3,000 souls, requires no police or constable, has no liquor stores, and has spent only \$7 of its poor fund in two years.

Messrs. Edward P. Allis & Co. have nearly completed the experimental roller mill for Gov. Washburn, and the Hungarian miller has arrived to take charge of it.

Messrs. Edward P. Allis & Co. have lately put in several special grinding and polishing tools for finishing their porcelain rolls, which adds greatly to their efficiency.

Nordyke & Marmon Co., of Indianapolis, Ind., are remodeling the mill of Stubbs & Co. at Delevan, Ill., to the new process, and are now setting up the machinery.

The New Harmony (Ind.) Mill, now being built by Nordyke & Marmon Co., of Indianapolis, Ind., is having an additional run of buhrs, making it a four-run mill.

The damage caused by floods in Hungary during the early part of March are very extensive. Whole villages were swept away and many citizens deprived of homes.

Edward P. Allis & Co. have given notice through the milling papers that they are the owners of the Downton process patent, and will call to account all who purchase rolls elsewhere.

A two-run mill is being fitted up for I. J. Bolton, of Terre Haute, Ind. The mill and machinery are being manufactured at the works of the Nordyke & Marmon Co., at Indianapolis, Ind.

It is claimed that the idea of using magnets to take out wire and other particles of metals from wheat was first conceived and put into execution in the flour mill of Olds & Fishbeck, at Rochester, Minn.

G. K. Ziegler, of Bucyrus, Ohio, is putting in three additional run of buhrs, bolts, purifiers, elevators, and other machinery for his mill, purchased of the Nordyke & Marmon Co., of Indianapolis, Ind.

A Minneapolis man has invented a concave grinding mill, and upon the fact being mentioned, already nearly a dozen other inventors of similar mills speak up. A European journal illustrated one a few weeks ago.

The grain elevator at Bloomfield, Indiana, owned by F. M. Dugger & Co., was entirely destroyed by fire March 1st. It contained over 4,000 bushels of grain. Loss on building and grain, \$5,000; insured for \$2,000.

Louis Bode, of Shenandoah, Page county, Iowa, advertises for a wife. Wants either English or German, of sound health, and promises a suitable woman with a kind husband and good home. Show this to the girls.

Messrs. Edward P. Allis & Co. will soon be in receipt of a large shipment of French buhr blocks direct from the quarries in France, where they were selected by their Mr. Gray, and will be the finest lot ever brought to this country.

Shippers of grain inland, ocean carriers and dealers, of Montreal, are petitioning the Canadian Parliament to have no duty on American grain imported into the Dominion. They maintain that the export trade of the city, and its trade generally, would be seriously interfered with by the imposition of such duty.

Wm. Manypenny's extensive warehouse at Columbus, Ohio, was totally destroyed by fire March 1st, including its contents, consisting of 80,000 bushels of corn, 600 bushels of malt, 250 barrels of stearine, and considerable flour. The loss will be between \$80,000 and \$100,000. During the night five fires took place. Four men were arrested, supposed to have been connected with the gang who caused the fires.

The Minnesota Legislature has passed a bill regulating the grading and measurement of wheat. The new system is to be known as the "Minnesota standard gage," and includes seven grades, from "No. 1 Extra" to "No. 4 Standard" and "Rejected Standard." Grain must be measured in the legal half bushel by methods prescribed. A refusal of agents or purchasers to grade or measure wheat as prescribed is made a misdemeanor and punishable by fine and imprisonment.

Mr. John F. Cahill, the Mexican Consul at St. Louis, has received a telegram from the City of Mexico, stating that the Minister of Public Works, Gen. Vicente Riva Palacios, has given orders for the erection of a building for the International Exposition which is to take place there in 1880. The work is progressing rapidly, and all materials for the construction of the building will be purchased in the United States. While this Exposition will be international in character, exhibits from this country are specially invited, and it is expected that the Americans will make numerous and fine displays of their various goods, wares, machinery, etc.

Subscribe for the United States Miller. \$1.



DISCUSSING AMERICAN MILLING IN EUROPE.

produced by this evil. Let me tell you of a model mill I saw which combines improvements on this vital part of mill machinery. I had heard a great deal of the celebrated model mill built by Mr. Hafner of Pittsburg, Pa., and therefore stopped at that city to see it. I was really astonished at the number of ingenious improvements and sound practical ideas combined in so small a compass, among the most important of which are the Eureka coil spring and Eureka friction clutch, which are also important improvements for threshing machines driven either by horse or steam power. Mr. Hafner has certainly reduced the study of springs to a science, as, in addition to his celebrated springs he has invented a clock which has run continuously one year without re-winding. I made a number of tests with the model mill, and it exceeded my most sanguine expectation. I purchased this duplicate model for my nephew."

Baron W.—"Why is it that belt motion should vary twenty per cent?"

S. L.—"That is easily explained. A belt is merely a transmitter, and not a reservoir or equalizer of power, and if there is any variation in the motion of the driving pulley it is transmitted to the spindle pulley, and consequently to the stone."

Baron W.—"If so many American millers build steam mills upon a plan which actually loses thirty-eight per cent of power why do they make so much ado about the gain of two or three per cent by water wheel?"

S. L.—"Thousands of millers throughout the United States have seriously considered this question, and as a result, they are rapidly adopting the Eureka spring and Hafner's system, which absolutely saves this 38 per cent of power by reducing the friction and equalizing the motion. In fact, these improvements have been adopted everywhere in the States, except in a small community of Pennsylvania Dutch, who are, in their characteristic slowness,

fore, the Burgomeister was authorized to publish the following: 'Reward!!! Five thalers vil becomen to de man as vil arrest eine Deutchman mit eine mill shtone around mit his head.'"

IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. Subscription price, \$1. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address

THE UNITED STATES MILLER, Milwaukee, Wis.

The mill of J. Bauholzer & Son, at Shelburn, Ind., is being placed on a footing with other first-class mills in the vicinity, and the buhrs, purifiers and bolt-chests for same being furnished by the Nordyke & Marmon Co., of Indianapolis, Ind.

The mill of Addney & Witt at Lebanon, Ind., is undergoing important changes under supervision of Nordyke & Marmon Co., of Indianapolis, Ind. Two additional run of buhrs, iron hursts, bolt chests, purifiers and elevators are being furnished and set up by the manufacturers.

The mill of Lennon, Reynolds & Co., of Pannora, Iowa, formerly built by Nordyke & Marmon Co., of Indianapolis, Ind., is now being enlarged to a four-run mill, and the new process is being adopted, all of which is under construction at the works of the original builders.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, APRIL, 1879.

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M'LEAN'S Millers' Text Book and the UNITED STATES MILLER, for one year, for \$1.25. Order now. Send money or postage stamps.

LETTER postage to almost any country in Europe is only 5 cents. A newspaper can be sent to most any country in the world for two cents.

POSTAGE stamps taken in payment of subscription to the UNITED STATES MILLER and the Millers' Text Book. \$1.25 pays for both for one year.

WE are under obligations to the publishers for late copies of the illustrated *Adelaide News*, published by Messrs. Frearson & Bro., of Adelaide, Australia.

WE were favored during the early part of the month with a call from the editor of the *Deutsch-Amerikanische Mueller*, of Chicago. He reports business good.

THE pork packing interests of Milwaukee are very extensive. The packing from March 1st, 1878, to March 1st, 1879, was 540,374 hogs, making 117,874,247 pounds of pork and 19,475,644 pounds of lard.

WE will send a copy of the MILLERS' TEXT BOOK, by J. M'LEAN, of Glasgow, Scotland, and the UNITED STATES MILLER, for one year, to any address in the United States or Canada, for \$1.25. Price of Text Book alone, 60 cents. Send cash or stamps.

LEWIS J. HIGBY, one of the early settlers of Milwaukee, died at his residence in New Orleans, whither he moved some years ago, on March 12th. He was the first President of the Milwaukee Chamber of Commerce, and built the first elevator in this city.

MESSRS. LORD BROS., of Waupaca, Wis., have sent us a sample of the "ready reckoning card" for millers' use. It is a very convenient thing for quickly and correctly ascertaining the amount of flour, middlings and bran for any quantity of wheat, taking one-eighth toll.

THE *Northwestern Miller* has moved from La-Crosse, Wis., to Minneapolis, Minn. The move is a good one, and we only wonder that it has not occurred before. The *Northwestern* will now probably soon hang out the sign, "Official Organ of Minnesota Millers' Association."

THE Cackle Separator Manufacturing Company of Milwaukee inform us that during the past month they have made a very large number of shipments of their machines. Orders have been filled from almost all portions of the United States and quite a number from Great Britain.

WHY?—A correspondent of the *London Miller* asks, "Can any of your readers give me a good reason why in London a stone of bread

is 16 pounds and a stone of flour 14 pounds?" If they can, we would like to ask why it is that when our coal merchants buy coal that they get 2,240 pounds to the ton, and when they sell they give 2,000?

LOOK HERE.—Every mill-owner, miller, millwright and apprentice should have a copy of the Millers' Text Book, by J. M'Lean, of Glasgow, Scotland. Price 60 cents; or the UNITED STATES MILLER, for one year, and a copy of the Text Book for \$1.25. Postage stamps taken.

WE have lately received the first two numbers of the *Oesterreichisch-Ungarische Mueller*, published at Vienna, Austria, by Mr. Otto Maass. The paper starts out with liberal patronage and is well edited. We hope our trans-Atlantic contemporaries will all meet with success.

Advertisers will consult their own interests by patronizing the UNITED STATES MILLER, which circulates almost exclusively amongst the flour milling class. It has the largest circulation of any milling paper published in America, and was the first independent milling journal started in the United States not being connected in interest with any patented machine or milling supply house.

ON Monday, March 10th, the *St. Louis Post-Dispatch* came out from its new office more than doubled in size. The prosperity of this journal is something unprecedented in St. Louis journalism. The issue on the date above named was 30,000 copies. The new office is filled throughout with new types and presses, and the prospects of this brilliant paper are truly dazzling.

DURING the year 1878, 121,369 persons—75,347 of whom were aliens who had never been in the United States before—arrived in this country from foreign ports; 80,000 of these it is estimated went to Western States. It is also estimated that during the year 520,000 persons emigrated from the Eastern to Western States, most of whom have entered upon agricultural pursuits.

JONATHAN MILLS, ESQ., the well-known inventor, called on us a few days since and reports that he has at last perfected his gradual reduction system. The favored few who have been invited to see it say it discounts anything yet discovered in milling. We are not at liberty to publish any particulars yet, but will do so soon. Mr. Mills' business headquarters are in Chicago. He still resides in Milwaukee.

In a recent letter from Messrs. Gratiot Bros. of Platteville, Wis., they mention that business is opening out well this spring. They have lately sold Iglehard Bros., Evansville, Ind., 7 heaters; Nickeen Bros., Terre Haute, Ind., 5 heaters; Star and Crescent Mills, Chicago, Ill., 10 heaters; Bennett, Knickerbocker & Co., Jackson, Mich., 6 heaters; F. Schumacher, Akron, Ohio, 6 heaters; Commins & Allen, Akron, Ohio, 6 heaters.

JOHN A. HAFNER, the well-known manufacturer of the Eureka coil springs for mill spindles, locomotive counterbalance, threshing machines, street cars, etc., at 39 Water street, Pittsburgh, Pa., writes us that business opens out livelier this spring than ever before. The usefulness of his springs needs no commendation from us. They have already been introduced into and their merits are vouched for by thousands of flour mills in this country.

CARR'S PATENT DISINTEGRATING GRINDING MILL.—We respectfully call the attention of our readers to the advertisement of the above mill in our advertising columns, and would advise our enterprising millers to write to the advertiser for further particulars. It is intended by the owners to introduce this system into our country at an early date, and they would be pleased to hear from as many as feel an interest in the advancement of the milling art as possible.

WEED SEEDS IN BARLEY AND OATS.—Barley and oats as brought into market frequently contain a considerable amount of cockle, wild buckwheat, and numerous other seeds of similar shape, which if not removed are injurious to the barley for brewing purposes and to the oats for the manufacture of oatmeal. The Cackle Separator Mfg. Co. of Milwaukee now construct a machine for the especial purpose of removing these obnoxious seeds from oats and barley. It does the work almost per-

fectly. Oat and barley mea. manufacturers and maltsters should not fail to examine this machine and try its merits.

THE product of wheat in England and Wales in the year 1811 was 32,000,000 bushels. At that time about 20,000 sacks per week were consumed in London.

WE were favored with a pleasant call, March 22d, by Mr. H. E. Kratz, the representative of the well-known firm of M. Deal & Co., of Bucyrus, Ohio, manufacturers of the California smutter and separator. Quite a number of these machines have been put in in this city during the past winter, and they have been found especially adapted for use in the numerous wheat-mixing establishments which have sprung into existence by the score in Milwaukee lately. The condition of the last crop was unusually advantageous to the mixers.

THE DUMPLING TEST.—A correspondent says that "in regard to the best method of testing flour for strength and color, I beg to say that for the past thirty years I have adopted the old practical method of boiling dumplings for this purpose as follows: I am provided with a small pair of scales, and I weigh off three ounces (which is about two tablespoonfuls) of the flour I desire to test. I place it in a small basin, and add the necessary quantity of water to make it into a dough, which tie up in a cloth, and boil for about twenty minutes. The dumpling, on the removal of the cloth, if the flour is strong and good, should present a smooth appearance, and the creases produced by the cloth should be clear and well-defined; if, on the contrary, the dough hangs to the cloth, and the creases are flat and ill-defined, the flour is weak, and its baking properties bad. On cutting the dumpling, if the color is good it will not darken on cooling; but flour of bad color, on the contrary, becomes darker as it cools. I use a graduated glass to measure the water. The quantity of water used to make the dough of the usual consistency varies considerably, and is also a guide to the strength of the flour, as the stronger the flour the more water it will take."

GERMAN MILLERS' ASSOCIATION.

The German Millers' Association was first established January 31st, 1865, with 51 members, at a meeting held in Dresden. Josef J. Van Den Wyngaert was the first President. The Association now numbers over 3,000 members, and is in as flourishing a condition as could be desired. The discussions at their various meetings are lengthy and instructive. One of the practical benefits arising from association is the great reduction in the cost of insurance which theretofore was so great as to be almost prohibitive. Questions of duties on flour and grain, transportation, trade schools, machinery and methods of milling have been considered to great advantage. The annual meeting is now the occasion of a general exhibition of milling machinery, to which inventors and dealers from all parts of the world are invited to contribute. President Van Den Wyngaert takes the deepest interest in advancing the scope of usefulness of the Association.

BRITISH MILLERS' BOTHER.

It seems to be the delight of European legislators to enact laws of peculiar burden in many instances to manufacturers. The recent Factory and Workshop Act of 1878 has just now put the British millers—who have had trouble enough during the past few years to withstand the encroachment of foreign opposition—to their wits end, and at a recent meeting of the British and Irish Millers' Association this act was construed to them by Mr. Redgrave, C. B., Chief Inspector of the Factory Department. Flour mills are classed as factories and come within the provisions of the act. The entire inside of mills must be whitewashed at least once in 14 months, or else painted and varnished once in seven years; perfect ventilation and freedom from dust must be provided for; all shafting and machinery that may be considered in the least dangerous must be fenced in; and then follow various arbitrary provisions about the number of and between what hours boys between 16 and 18 years old and men can be allowed to work. The matter was discussed at considerable length, and the millers finally concluded that, as they must, they would try to bear all the provisions except the whitewashing, and on that subject they proposed to use the Britishers' great and glorious prerogative—to get up a petition. But the whitewashing in the meantime will have to be done just the same.

MINNEAPOLIS FLOUR PRODUCT.

The branch of manufacturing which represents the largest amount of capital invested and value in product, is flour. The product in 1878 was materially diminished by the destruction of six of the mills on the 2d of May, by fire and in November of another by the same cause. By these two fires one-half the milling capacity of the city was destroyed. This loss of milling capacity, however, was only temporary, as most of the mills destroyed have been rebuilt and three new mills put in operation, giving a capacity far greater than before the fire. Two new mills are now in course of construction which, with the three that are being rebuilt, will about double the milling capacity of the city. All of these will be completed during the present year. The addition of a large number of rollers increases the capacity of the mills thirty-three per cent.

List of mills now in operation, with number of run of stone in each, including additions being made:

Name	No. run.
Cataract	10
Arctic	10
Union	6
Holly	5
R. P. Russell	7
Dakota	6
Empire	12
Minneapolis	11
Pillsbury	12
Excelsior	14
City	5
Pettit & Robinson	20
Zenith	12
Palisade	11
Humboldt	14
Washburn B.	41
Anchor	12
North Star	7
Phoenix	5
Total	220

SHIPMENTS OF FLOUR IN 1878.

Month	Barrels.
January	84,139
February	80,114
March	95,804
April	112,632
May (mills destroyed)	64,654
June	63,973
July	65,239
August	41,250
September	62,258
October	87,900
November	88,189
December	94,634
Total	940,786

One feature of the flour trade of the city in 1878, is the opening of a direct trade with Europe. By shipments on through bills of lading, from thirty cents to one dollar per barrel is saved in commissions and transfer charges at sea-board ports. Of the shipments, 109,183 barrels were shipped on through bills of lading to European ports in 1878.

The demand in Europe for Minnesota flour is steadily on the increase, as its superior qualities become known to consumers, and it bids fair to be the best market to which Minnesota millers can send their flour. Orders of shipments are received daily by millers.

The receipts of wheat at Minneapolis for the year 1878, were 5,023,880 bushels. This wheat was almost exclusively manufactured into flour in this city.—*Minneapolis Tribune*.

WINDMILLS were invented in the year 1299. In the year 1633 a wind sawmill was erected in the Strand, London, by a Dutchman.

THE first newspaper published in England was called the *English Mercury*, July 28, 1588. A copy of it is on file in the British Museum.

MILLERS' BURR RUBBER.—Messrs. Miller & McCarthy, of Mt. Union, Pa., are meeting with great success in selling their burr rubbers, and they give general satisfaction wherever used. Among the numerous testimonials they have on file is the following:

JUNIATA MILLS, PA.; June 17, 1878.—Messrs. Miller & McCarthy—GENTLEMEN: Having used a pair of your burr rubbers for more than two years I take pleasure in recommending them to the milling fraternity. They will do all that they are recommended to do, and I would not be without them. When I take my burrs up I wash them off when warm, and when dry staff them; and if any high spots are on them I crack them a little and take the face rubber and rub my burr all over—the high spots the most. If there be no high spots and I want to make them sharper, I do not use the pick, but rub the face all over with the rubber, and that gives me the natural grit of the burr, and then a burr will grind even, white and soft, and clean the bran well. I can keep my burrs in good face with half the labor by using your rubbers, and the flour is better and the yield greater. I think all a miller has to do is to try them and he will soon see the benefit of using the rubbers. They should be in every mill, both the face and furrow rubber. Very respectfully,  
 H. M. BUTLER.

**GRAIN.**

**Peculiarities in its Normal and Manufactured State.**

*An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.*

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

**Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.**

[Translated from the German of Dr. Herman Klenske expressly for the UNITED STATES MILLER,—cuts reproduced by our special engraver from the original.]

**WHEAT FLOUR.**

This is the ground seed of the *Triticum vulgare*, the two kinds of which are distinguished as summer and winter wheat. The universal belief is that it is best when it appears very white, that is to say, when it has been thoroughly bolted and free from all admixture of bran. Since this white flour brings the highest price in commerce, we also, from the point of view of the customary commercial opinion, must describe the fine white flour which contains no bran, and is consequently not so white, since it is not alone much more nutritious than the bolted flour, but has also when baked into bread the important quality of assisting the dissolubility of the flour or bread in the stomach, and thus makes it much more digestible. In commerce, according to the quality, several grades are distinguished, and the price is determined accordingly. The best quality is of a white color, lightly tinged with yellow, has a very peculiar odor, a bright gloss, and is without reddish, gray or blackish points. The taste may be compared with that of fresh paste. According to the usual demand it must be free from all particles of bran, and if it is so, the fact may easily be proved by pressing a finger on it, since in flour containing no bran it will then present a perfectly uniform smooth surface. The best wheat-flour will be found soft, dry and heavy to the touch, will adhere to the fingers, and by pressing it in the hand it will form a lump. When kneaded with water, whereof it must absorb more than a third of its weight, it must form a uniform, ductile elastic mass which will not be very sticky and may be drawn into thin strings. The less ductile and elastic the dough is, the poorer is the quality. All inferior qualities have a dull-white color since they contain bran, and if such flour is pressed firmly in the hands, it forms no lump, but will slip away, unless it is moist. Good wheat flour burned to ashes, will yield from 80 to 90 per cent residuum.

A chemical analysis has disclosed that good wheat flour contains:

Water parts.....	10.00 to 12.00
Gluten .....	10.96 to 14.55
Albumen.....	29.00 to 30.20
Starch .....	71.49 to 72.80
Glucose.....	4.48 to 8.48
Dextrine.....	3.32 to 5.80
Bran.....	0.00 to 2.00

Though good wheat flour may always in its principal nutritious components attain and even surpass the amount of 10 per cent gluten and 70 per cent starch, such amount depends very much upon the soil on which the wheat has been raised, on the mode of grinding, etc., and it has been ascertained that in general the Russian wheat shipped from Odessa, though richer in its glutinous contents is remarkably poor in its percentage of starch, which generally amounts only to 56 to 57 per cent. All wheat flour (as all grain flour generally) is richer in glutinous contents the more of the bran particles it still contains. That bran contains very many nutritious substances might become clear by its chemical analysis, which (according to Milon), shows it to be composed of:

Starch, dextrine and sugar.....	50.
"Reglisse" sugar.....	1.
Gluten (and albumen).....	14.9
Fatty matter.....	3.6
Cellular substances.....	7.9
Salts.....	5.7
Water.....	13.9
Other substances.....	1.2

Total.....100.0

Another difference in the quality of wheat flour results from the different degrees of hardness of the wheat. The buyers of wheat prefer the heavy, plump wheat, for which reason the farmers separate the light kernels from their wheat and either use it for themselves or feed their cattle with it. When the time has come that, in practice, gluten is more highly estimated, than it is at present, and when the nutritious and digestion promoting quality of

bran shall be acknowledged, the so-called lighter wheat will also be more highly valued, since this is much richer in gluten and consequently much more nutritious than the heavy wheat. The flour of hard wheat is usually more granulous, and less fine and white, absorbs more water and yields more bread. To distinguish wheat flour from

other kinds of flour with which it is but too frequently mixed, the microscope furnishes a reliable method, since the starch particles of wheat show definite characteristics. As is well known, all starch consists of distinctly marked particles of different build and characteristically shaped according to the kind of plant, which particles are enclosed in the starch cells and are liberated by the grinding and washing. In Fig. 11 we give a picture of the wheat flour magnified 420 times, where in the shape of the starch particles and also those starch cells which have not yet been opened by the grinding are represented. Some of these starch particles are of considerable size, others again are smaller, generally round, sometimes oval with a dot or circle in the center; the larger specimens mostly form large, flat discs with a narrow rim and more or less concentric rings around the center. On the larger particles the surface also sometimes appears furrowed, especially on the more or less deformed or oval specimens, which look wrinkled or plaited, as though their center contents were compressed; but they are seen in profile and the long furrow seems to be only the rim, which refracts light less, for when the two glass-plates of the object-bearer are rolled, so that the oval bodies are flattened and turn the plane of the disc to the eye, the furrow disappears. All poorly ground and gray looking flour as before said contains more or less

as for instance in pudding or meal soup, all magnified 400 times. Wheat flour without being purposely adulterated and without containing the aforementioned fungi, seeds of weeds and animal parasites, may still be of inferior quality when offered in trade. When good it always contains a proportion of water, which it absorbs from the air, either after grinding

or already in the grain, and the water it contains has an evident influence upon the weight of the flour. The smallest quantity is usually 6, the largest from 20 to 25 per cent, and good flour will always contain about 10 to 12 per cent. The percentage of water it contains may be found by drying an accurately weighed quantity of wheat flour in a moderately warm sand-bath for two hours, and then again weighing it; what it has lost in quantity is the water which has evaporated. If the flour cannot be pressed much in the hand, or if it does not feel cold when the hand is put into it, a further examination of its contents of moisture is not necessary, for it will then only con-

tain the normal proportion of 12—15 per cent. Dried wheat flour put in some moist place will soon begin to ferment and thereby become lumpy, which often increases the weight more than 14 to 15 per cent. All moisture has an injurious effect upon flour, changes the gluten, and renders it unfit to produce good dough; besides this it promotes the fermentation of spores of fungi and their further development, and in this way poisonous bread may be made. Often flour which is otherwise good, is mixed with the sand of mill-stones, especially when the mill-stone was soft or the grain moist. In good mills grain ought never to have an admixture of more than 15 g. of sand from the stones to 50 k. g. (about 1 cwt.) of grain. Such sandy flour is known by grating on the teeth, and to determine the quantity of sand in the flour, a certain amount of flour is boiled, the water is poured off, and the sand will be found on the bottom of the vessel. The best flour has often been damaged by the exposure of the meal sacks to the sun during transportation, thereby heating the flour. An alteration of the gluten, something similar to when heated in the mill is occasioned by this. The same will sometimes occur with new grain when ground. By being stored for some time it will improve, as the gluten is thereby again rendered adhesive, and will not form lumps when the flour is prepared for use. The glutinous contents of wheat flour is very different both in quality and quantity in the various kinds. The former may become poorer by too rapid grinding of the corn, since the mill-stones, rotating too fast, will become heated and change the gluten. Such flour is said to be heated. The contents of water in the gluten also has to be considered, by weighing it when moist and when dry; the less water it contains, the more bread will it yield,—100 parts of gluten of ordinary flour contains 12 to 14 per cent of water and produce 133 to 136 parts of bread on an average. But if 100 parts of gluten contain 18 per cent of water, they will only produce 120 parts of bread. To examine the quality of the glutinous contents, dealers in flour and bakers usually apply a very simple method; with their fingers they make a dough of a very small quantity of wheat flour and a little water and judge of the quantity and quality of the gluten by its elasticity, toughness and ductility. If it is necessary to examine this with scientific exactness we recommend an instrument called the aleurometer (meal measure), which the Paris baker, M. Boland, has invented. This consists of a hollow copper cylinder, about 15½ dm. long, and from 2 to 2½ cm. in diameter. It is composed of two main parts; the one, about 5 cm. long, is closed at the end with a sort of lid or cover, and is capable of holding about 15 g. of fresh gluten; it is screwed to the remainder of the cylinder. A copper rod or stem about 5 cm. long and divided into 25 parts, is provided at one end with a small, round, slightly arched plate, reaches down to a third of the cylinder and may escape through the upper part of the cylinder opposite to the cover, and in such a manner, that when the lid is filled, there is a vacuum between the gluten and the base of the movable stem, the height of which is about 25 deg. of the stem. The whole of the small apparatus, when in practical use, is then placed in an oil-bath, that is, in a vessel filled with oil, heated from 150 to 250 deg. entigrade. At this high temperature the gluten swells, increases in volume, rises in the cylinder, and soon reaches the graduated stem which it forces more or less upwards. The length of the swelled gluten, or rather the height to which the graduated stem has been raised, which here serves like a pump-piston, indicates the development of the gluten, its quantity and quality, and thereby allows to judge of the qualities of the flour out of which it was taken. Good wheat flour ought to contain gluten which will increase from 4 to 5 times in this apparatus, if the gluten which has been examined in this apparatus has been obtained from poor flour it will not swell in the cylinder, will become slimy and almost liquid, adhere to the walls of the cylinder and sometimes become of a disagreeable odor. Good gluten will cause a smell as of hot bread. If the gluten does not reach the stem during this process, that is if it does not expand to 25 deg., the flour out of which it has been taken is unfit to make good bread. The 25 deg. are numerated in such away that they begin with No. 25 and end with No. 50. Once in possession of the instrument the test is easily applied, and the use of the apparatus will be better understood by practice than by our description. For the experiment about 5 to 8 g. of gluten are taken which by being dried and thereby free from water would be reduced to about 3 to 4 g. In what manner the gluten is separated from the flour so that this experiment may be applied to it, has been stated before. In good flour the gluten usually will expand to by far more than 25 deg., in most cases to 33, 35, 39, and even 50 deg.

husk (bran); to discern this and judge at the same time whether this husk comes from the seed, the name of which the flour bears, it is necessary to be familiar with the microscopic nature of the husk also. In Fig. 12 a and b we give a picture of the structure of the husk of the grain of wheat in its length and cross incision. But to be

enabled also to point out the starch particles of wheat flour when baked and cooked, it is necessary to know the changes caused by the influence of heat in the shape of the starch particles of wheat. For the purpose of comparison we give in Fig. 13 a picture of the starch particles in raw wheat flour, its appearance in bread after being baked with yeast, after dry baking, and lastly after being cooked,

as for instance in pudding or meal soup, all magnified 400 times. Wheat flour without being purposely adulterated and without containing the aforementioned fungi, seeds of weeds and animal parasites, may still be of inferior quality when offered in trade. When good it always contains a proportion of water, which it absorbs from the air, either after grinding



Fig. 11—Good wheat flour starch particles and starch cells, magnified 420 times.

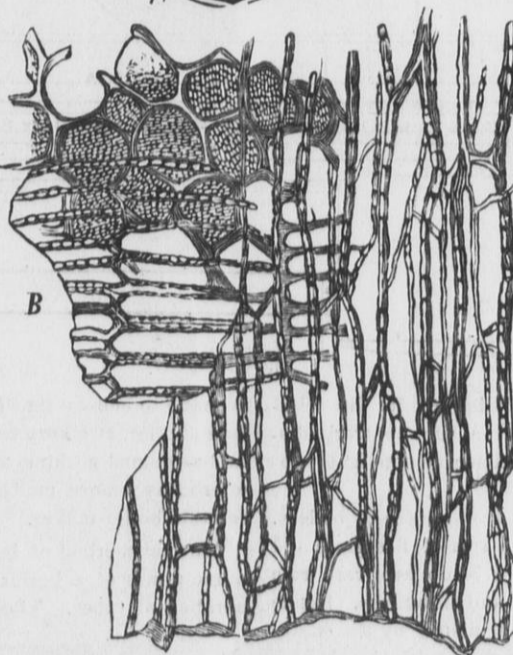
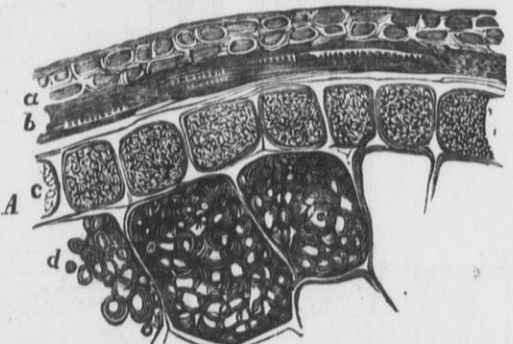


FIG. 12—STRUCTURE OF THE HUSK OF A GRAIN OF WHEAT. a—Cross incision. a—Outer membrane. b—Middle membrane. c—Inner membrane. d—Starch-cells of the wheat berry proper. B—Cut lengthwise of wheat berry. Magnified 200 times.

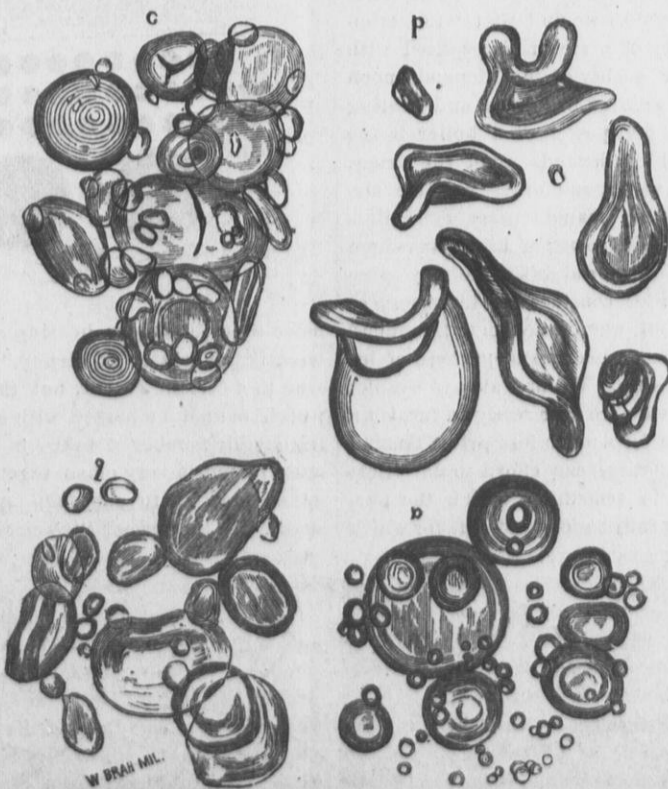


FIG. 13—VARIOUS FORMS ASSUMED BY THE STARCH PARTICLES OF FLOUR AFTER SUBJECTION TO HEAT. a—Starch particles in uncooked or raw wheat flour. b—The same in bread baked with yeast. c—After dry baking. d—After being cooked in porridge or pudding. Magnified 400 times.

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[To be continued.]

## ABOUT STEAM BOILERS.

The frequent boiler explosions in the land from year to year have called for some intelligent investigation into their cause. Were they the result of poor material, poor workmanship, careless management, or, all three together? These are questions of great importance, not only to the manufacturer, but to the people in his employ. The use of steam power has increased vastly within the past ten or fifteen years. Boilers of various types and materials have been devised. Some inventors have devoted their time to the production of a "non-explosive" boiler, while others have turned their attention to the question of economy in fuel. The combination of different materials in construction, varying greatly in the matter of expansion and contraction under different degrees of heat, have rendered many of these efforts entirely fruitless. It has been a favorite idea with some, that if instead of confining the water and steam in a large reservoir or cylinder they can be circulated through small pipes, the great danger of destructive explosions would be avoided. It is found, however, that the character of the water has much to do with the usefulness of such boilers. In localities where the water deposits a heavy scale, small passages are very liable to get filled up, notwithstanding the claim that rapid circulation prevents the accumulation of such deposits. That some of these types of boilers work well in localities where the water is comparatively pure, there is no doubt; but their success has not been so marked as to satisfactorily settle the question of their adaptability to general use. In mills, tanneries, and establishments remote from great centers, difficulty is often experienced in making repairs easily and readily on sectional boilers, especially if they are partly or wholly constructed of cast-iron. Special castings must be obtained, and special workmen must be sent, often from great distances. These are some of the difficulties which we have noticed. They are not mentioned to disparage the efforts of those who have labored to produce a "non-explosive" boiler, nor to interfere with any honest industry, but to point out some of the difficulties which must be overcome before complete success can be attained.

Another matter, which should be better understood by those purchasing boilers, is "competitive tests." At mechanics' and industrial fairs are usually found all kinds of steam boilers, each claiming points of superiority in economy and efficiency over others. The greatest care is exercised in running the boilers during the trials; expert firemen are employed; the water and coal are carefully weighed; the inflow of air into the furnace is measured with great accuracy; all escapes of steam by even the slightest leaks are stopped; the temperature of the uptake is regulated with the greatest care, so that the least possible heat shall be wasted and yet be kept high enough to be considerably in excess of the temperature due to the pressure of steam.

The result to be gained is, the evaporation of the greatest quantity of water by a certain number of pounds of coal, within a certain time, and this is called the evaporative efficiency of the boiler. But in making these tests particular attention should be given to the dryness or humidity of the steam.

The heating surface of boilers is often so arranged as to supply over-saturated steam, which is mistaken for evaporative efficiency. It is found that over-saturated steam, when supplied to an engine, does not give the power due to the consumption of fuel, and hence the rate of evaporation *must not* be regarded as a reliable indication of the steaming capacity of the boiler.

The man purchasing a boiler should understand that there is little or no probability of his ever attaining, in daily use, such results as have been obtained under the tests. He must remember that these results have been secured under the most advantageous circumstances, and if he purchases a boiler and it does not meet his expectations, he will understand from the foregoing why. There have been serious mistakes made by inducing steam-users to purchase boilers which in type and construction were not adapted to their wants. Some manufacturers have but an imperfect knowledge of steam and steam machinery. Being in want of a new boiler and the necessary attachments, they apply to some competent person for plans and specifications. These are furnished after a careful consideration of his particular wants. They are taken to a boiler-maker, and he begins to suggest changes, and he is allowed to change here and there as he chooses. Soon an agent for a new kind of grate-bar ap-

pears; he tells how much Mr. A. or B. thinks of it, and "whips" out a recommendation that sets it high above everything else.

No sooner is this done than an agent for some other attachment appears and convinces the manufacturer that the use of it will save him ten per cent. of his fuel, and so the work goes on until finally the boiler is set up and ready for use. The person who prepared the original plans and specifications calls in to see how nearly his plans are carried out, and finds something different from anything he ever saw

he will pay dearly in the end.

This will be better understood by the following: It is common among boiler-makers to estimate the horse-power of boilers by allowing a certain number of square feet of heating surface for one horse-power. Some claim as low as ten square feet as sufficient, while others place it as high as eighteen square feet. We will assume fifteen to be a fair average. Now we have a boiler five feet in diameter, fifteen feet long, with sixty-six three-inch tubes. What is the approximate horse-power?

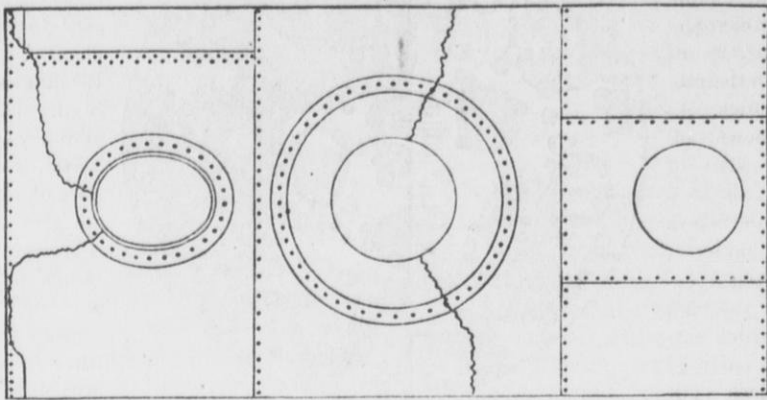


Fig. 1.

or dreamed of. He expresses some surprise, but the manufacturer assures him that every one of those changes and attachments will save fuel. When the various guarantees are figured up it is found that some fifty per cent of the fuel is to be saved. The boiler is started up, and found, with all its well-recommended changes and attachments, to possess no ad-

If we allow ten square feet of heating surface, it will be nearly ninety-horse power. If we allow fifteen square feet, it will be about sixty-horse power. Hence we see that the same boiler will be differently rated by different makers, and the manufacturer who purchases on the former estimate being ignorant of the rules by which horse-power is estimated,

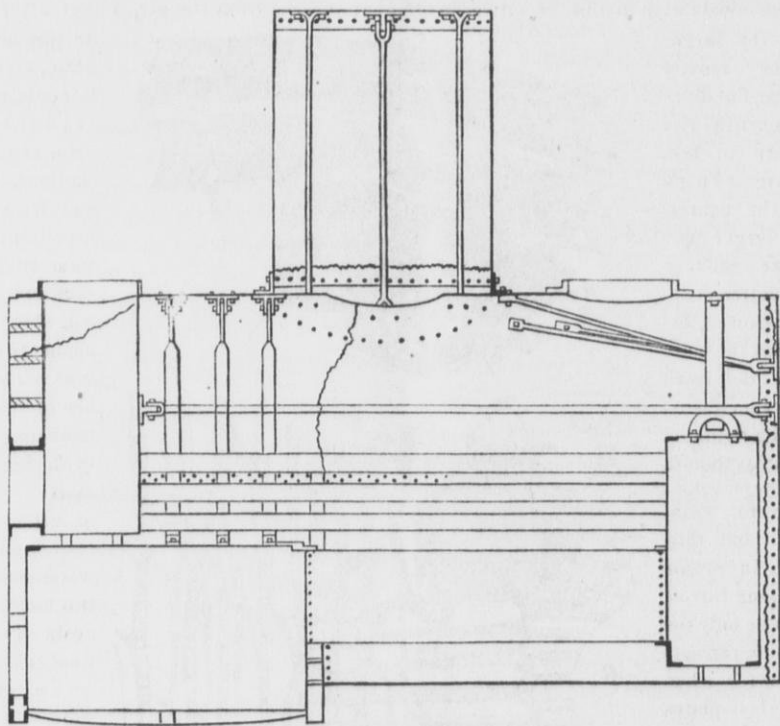


Fig. 2.

vantages over the one called for in the original specifications, but, on the contrary, discloses disadvantages which give constant vexation and trouble.

Another point is the horse-power of boilers. This depends upon the area of fire-grate and heating surface. There is no arbitrary rule which will apply to any and all boilers. Hence manufacturers are often misled by the statement that a boiler of a certain size is of a certain horse-power.

The average horse-power may be approximately jumped at. But when we come to investigate the subject we find that "the evaporating capacity of a steam-boiler fired with a given kind or quality of fuel depends upon the extent of area of fire-grate and heating surface." The real power of a boiler is the evaporation, which depends upon the firing, circulation of water, and other variable circumstances. One manufacturer of boilers may place the horse-power of his at a medium rate, while another for a less price may agree to furnish a boiler considerably in excess of power, but which, when constructed, is found to be of even less capacity and perhaps of inferior workmanship. We are always suspicious of those who are ever ready to furnish a great deal more for a much less price, than an honorable competitor can afford to do. Rest assured there is something which the purchaser does not fully understand, but for which

is made to believe that he has obtained a very large boiler, at a very low rate, when in fact he has gained nothing over the boiler that was offered by a more modest and probably more reliable boiler-maker.

Another method of increasing the apparent horse-power of a boiler is, by increasing the number of tubes. The argument is: "The

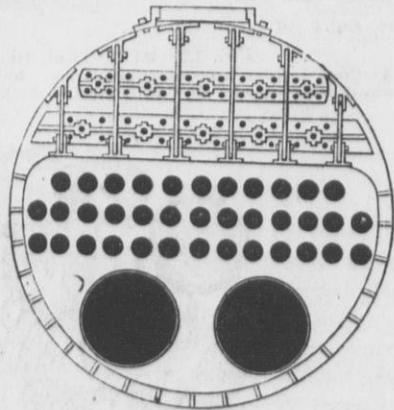


Fig. 3.

more tubes, the more heating surface, consequently the greater efficiency." This may be true to a certain extent, but there is a limit which cannot be passed with economy. If a reasonable number of tubes is exceeded they must be put in very close together, or carried up so high as to encroach upon the steam space. In the former case circulation is inter-

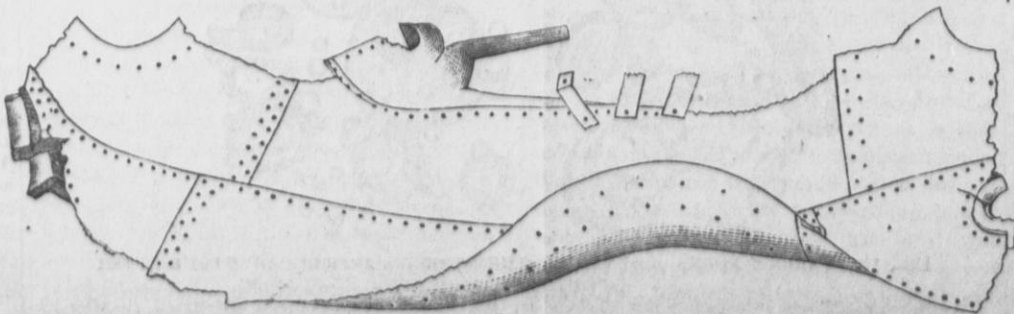


Fig. 4.

ferred with, and if the water is bad, the spaces between the tubes and between the tubes and shell become filled with sediment and scale, and the efficiency of the boiler is greatly impaired; besides, the tubes, being unprotected by water, soon burn out. In the latter case the steam-room being reduced, the steam is liable to be highly saturated, and, as has already been said, "over-saturated steam when supplied to an engine does not give the power due to the consumption of fuel."

Experience has shown that comparatively large tubes, with ample spaces between, is the best method of constructing steam boilers.

In the care and management of steam-boilers, one cannot be too careful. It is poor economy to buy "cheap" boilers, or to employ "cheap" help to have the care of them. The lives of operatives and others are too valuable to be put in such jeopardy. True economy is commendable, but that economy which saves a dollar at the risk of losing hundreds, is false, as experience has often shown.

During the year ending Dec. 31st, 1877, The Hartford Steam Boiler Inspection and Insurance Company, of Hartford, Ct., to whom we are under obligations for the accompanying illustrations, made 11,629 internal inspections of steam-boilers, and 32,975 external examinations; 2,367 new boilers were tested by hydraulic pressure. By these examinations, 15,964 defects were discovered, of which 3,690 were regarded as of a serious character, and required immediate attention. The Secretary of the company says: "We are not prepared to say that every one would have resulted in a 'boiler explosion,' but they were of such a character that we required repairs at once. They were as follows, viz.: Furnaces out of shape, 709—85 dangerous. These defects arose from a variety of causes. Boilers urged beyond their capacity are very liable to show this defect. The plates are contorted and 'buckled,' the seams are strained, and general weakness becomes evident. There is no economy in overworking a boiler; better by far increase the boiler capacity, and then the work will be performed with ease and safety. Scale and sediment upon the fire-sheets of a boiler prevent the free transmission of heat, and the iron is burned and weakened. Fractures of plates in, at, or near the seams or through the line of rivets, 1,190—of which 517 were regarded as dangerous. Burned plates, 1,112—337 dangerous. These defects are caused by the same circumstances as those which cause the distortion of furnace sheets. Blistered plates, 2,602—357 dangerous. These defects are the result of a want of homogeneity in the plates. From the presence of scoria or some foreign substance, the bars composing the 'pile' did not weld perfectly, hence there are thin 'leaves,' one or more, which make an imperfect sheet. These are usually near the surface, and when subjected to heat bulge down, and by preventing a free transmission of the heat to the water within the boiler, the plate is liable to be burned. If the lamina (for there are often several lying one over the other) constitute any considerable portion of the plate, it is weakened and should receive immediate attention. Where the blister is confined entirely to the surface, if not of any great thickness it may be carefully trimmed off and no harm will result. Cases of sediment and deposit, 2,005—440 dangerous. Incrustation and scale, 2,621—341 dangerous. These are difficulties which are common to boilers all over the country. Water contains more or less impurity in solution which becomes precipitated by an elevation of temperature, and if great care is not exercised a hard indurate scale is formed, which is always a bad conductor of heat. The plates become over-heated, often to such an extent as to destroy their 'life' and strength, and render them positively dangerous. Various 'compounds' and 'boiler purgers' have been prepared to overcome these evils, and many of them work well in some localities. These difficulties arise mainly from the geological formation through which the water percolates, and as the formation is not uniform all over the country, the water will of course carry different impurities in different localities. Hence a preparation that would remove or prevent a lime scale, would have very little effect upon a scale formed from chalybeate waters. Above all things a preparation in which acid predominates should be avoided. External corrosion, 1,063—366 dangerous. Boilers are externally corroded from not being properly protected from the weather; also from leaky joints in steam-pipes running over them, and from leaks in their seams or attachments by which water is allowed to trickle over their surface. In

ternal corrosion, 173-39 dangerous. Water-gauges defective, 533-143 dangerous. Blow-out defective, 256-96 dangerous. Safety-valves overloaded, 383-158 dangerous. There is probably no boiler attachment more tampered with than the safety-valve. It is overloaded, tied down, or, from want of attention, allowed to corrode in its seat, and yet it is called a "Safety-valve." It is an attachment that should have the most careful attention at all times. Pressure-gauges defective, 1,623-403 dangerous.

Most engineers place great reliance on the steam-gauge, and so long as the pressure does not exceed the required limit they think all is safe. But when an examination of the gauge is made, and it is found not to show the actual pressure of steam, but instead some thirty or forty pounds less, and that the boilers are under one hundred and ten or one hundred and twenty pounds pressure instead of eighty pounds, it becomes a serious matter. This is no imaginary condition of things, but one which frequently comes up in our experience. Hence the importance of examining steam-gauges and comparing them with one known to be correct. We have found 615 boilers without gauges during the year, but as most of them were running at pressures very little above the atmosphere, we account only six as immediately dangerous. Cases of deficiency of water, 101-43 dangerous. Broken braces and stays, 378-216 dangerous. These defects were found by internal examinations. No superficial inspection or hydrostatic test simply will discover such defects. And from want of a careful internal inspection, boilers greatly weakened by internal corrosion or broken braces and stays are pronounced sound, and in good and safe condition. When an explosion occurs, scattering death and destruction in its vicinity, the discovery of such defects is not calculated to appease the public indignation. During the year 133 boilers were condemned as unsafe to use and beyond repair.

The defects enumerated above can only be discovered by the most careful examination. It should be done by men of experience and good judgment. The cursory examination of boilers which is often made lulls the proprietor into a feeling of security which may be fatal. The examination may have cost him less money, but he knows very little about the actual condition of the boiler.

**BOILER EXPLOSIONS.**

Most of these we believe can be traced to poor material and workmanship, or to very inefficient care and management and carelessness. There are steam users who, rather than stop for examination and repairs, will take the chances of running a "little longer," hoping that good luck will carry them through, a responsibility being thus assumed which, if better understood by the community, would be frowned upon.

The following is an account of the explosion of the boiler of a tug-boat, by which two persons were killed. Portions of the boiler were thrown 250 feet; timbers eight inches square were wrenched into shreds. It was stated at the inquest that only 75 pounds of steam was on the boiler at the time of the explosion. Of this, however, there is no certainty. The following is the report of a special agent who visited the scene on the day of the explosion:

This tug, which exploded in June, had to all appearances a very strong boiler—so much so that the Government inspector said if he had been called on to name the best boiler in his district, he would have selected this one. At the inquest the engineer was very sharply questioned as to his tampering with the locked safety valve, and about a lead weight that was found on the lever. It came out that the boat was much used in winter for breaking ice in the river, and the shock of butting against it would shift the weight toward the fulcrum in spite of such fastenings as had been used, so to keep up the load on the valve he had added another weight, claiming that it would "blow" at the prescribed pressure.

A short time before the accident the boiler had admirably sustained the usual hydrostatic test as the law directs. The question was then asked, whether the man-hole frame was cast or wrought iron? But the engineer could not say. Whether it was then cracked and leaking we do not know, but such a state of things would most naturally prompt such a question, inasmuch as the plate was a large one, while the frame was rather small in cross-section, and placed the long way parallel with the axis of the boiler.

Figure 1 is a view of the top of the boiler, showing the man-hole, steam dome and smoke opening. From a careful examination the

conclusion arrived at was, that the boiler, notwithstanding its assumed strength, was very weak from faulty construction. It contained within itself in the form of braces and stays the elements that caused its own destruction. The shell was cut away for the man-hole and dome 40 inches in 78, and reinforced by a light cast-iron frame and by 8 stays or braces from the dome-cover to a yielding portion of the shell, that portion within the dome being in equilibrium of pressure. In addition to these

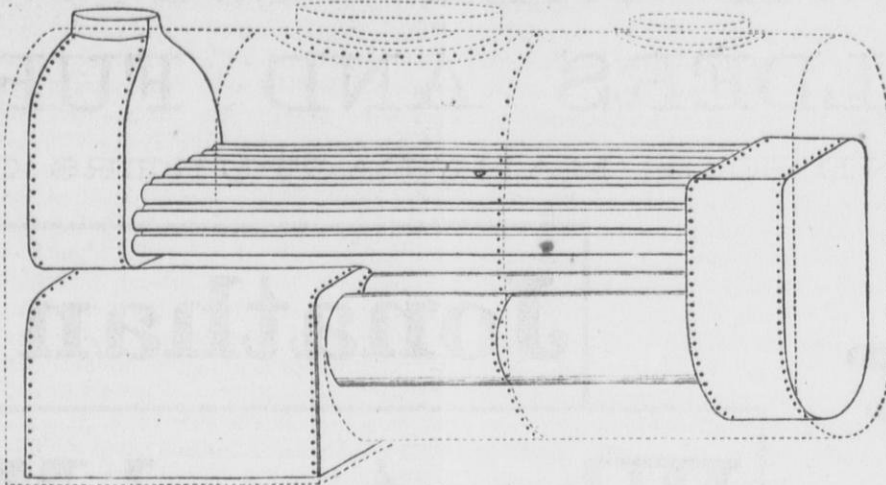


Fig. 5.

supports six braces were connected to the shell and the back smoke-box.

Figure 2 is a longitudinal section of the boiler, showing the bracing of the dome to the unsupported portions of the shell. Other bracing is also shown, and the line of fracture on the left side. These braces, which are 1/2 x 4 1/2 inches in section, are nicely fitted, having round bolts fitting snugly into round holes in the arched double stirrups which stand upon an unyielding part of the crown of the smoke-

Two years' action proved quite sufficient to bring it to destruction; a considerable length of weakened plate gave way like opening a door, and the contents of the boiler, water surcharged with steam, and steam expanded in so sudden a manner as to tear all before it.

There was extensive internal corrosion at the point where the barrel joins the box, and in other places on the lower parts of the shell. We can hardly escape the conviction that the lower part of the shell, where the water is

cooler from defective circulation, was kept in an unhealthy state of tension by the thrust of the hotter and very rigid flues above. With sketch No. 4 before us, we could not, however, decide that the initial point of rupture was in the lower part of the boiler, or otherwise the boiler would have gone high in the air, as the dome and smoke-stack did. There was very little scale, incrustation, or deposit, and no burned plates or other evidence of lack of water.

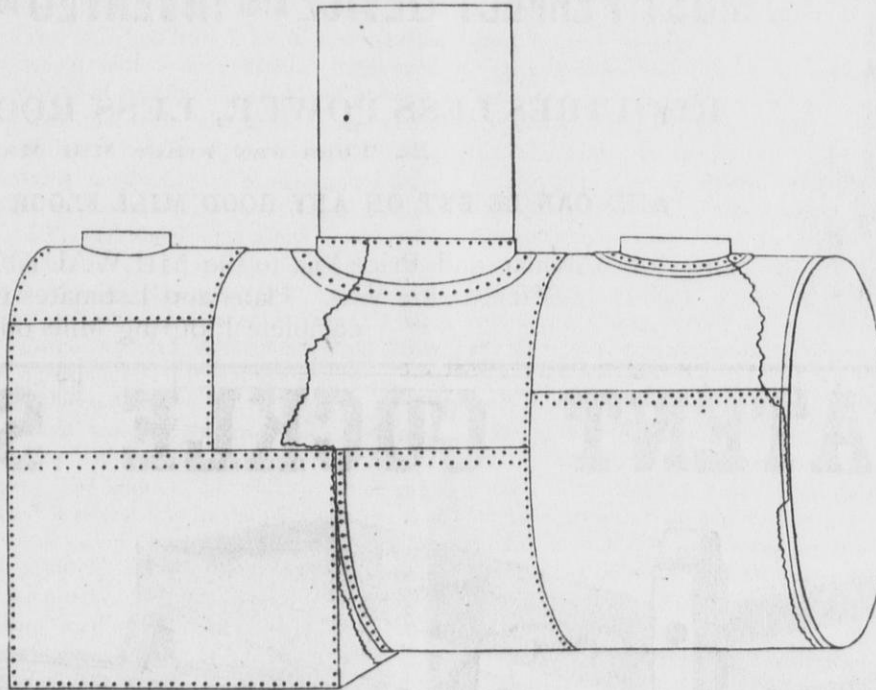


Fig. 6.

box; the other ends of the braces being similarly fitted to double-angle plates on the shell. Now glancing at Fig. 3, imagine this smoke-box to be an expanding body relatively to the shell; that is, imagine it to be a little hotter than the shell (and why may it not be considerably so, filled at times with intensely heated gases, and surrounded by water at 331 deg., which is the temperature at which it boils under 90 lbs. pressure above the atmosphere, while the shell, unprotected as it was from the

Fig. 4 represents the principal part of the shell which was torn off and thrown some distance into the water.

Fig. 5 is a perspective view of the interior of the boiler.

Fig. 6 is a perspective view of the exterior of the boiler, showing cracks around manhole and dome.

Fig. 7 shows what remained of the boiler after the explosion.

[To be continued.]

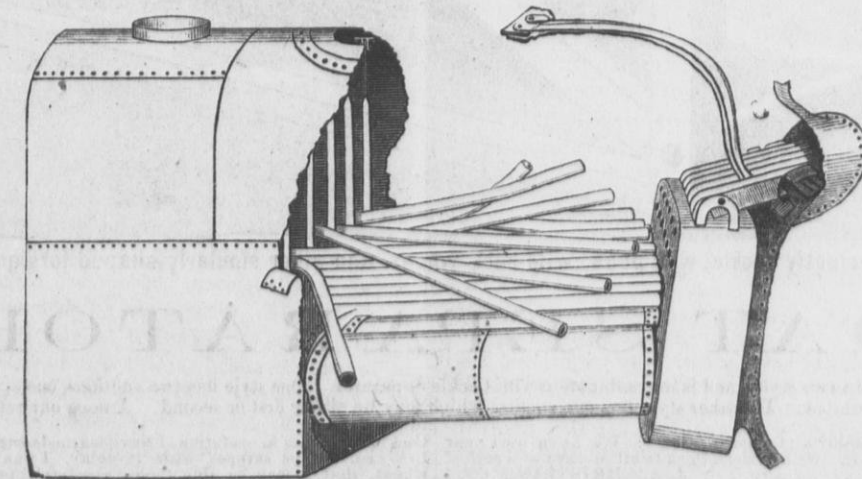


Fig. 7.

cold atmosphere, say at times as low as 60 deg. outside and 331 deg. inside?) and who can estimate the force that is added to the 90 lbs. internal pressure? But the shell was not entirely rigid and unyielding, the space above the back smoke-box must be flattened by the radial thrust of all the stays and braces around the smoke-box, which would bend the flange of the back head inward. The cracks that were caused by this action were plainly distinguishable from the fresh rupture, as was a crack or old fracture in the man-hole frame.

ONE OF THE LATEST INVENTIONS.—A new and improved mode of planting telegraph poles has recently been discovered and tried with success in Titusville, Pa. The ground being staked off at distances of about 200 feet apart, a man starts off with a pocketful of four-ounce cartridges containing a wonderful new explosive known as "electric powder," and with a crowbar in his hand. A hole is punched from four to five feet with the bar in a few minutes, and a cartridge dropped to the bottom with a fuse lighted with a match.

The operator then walks to the next stake, before reaching which, a low, dull thud is heard behind, a hole about the diameter of a flour barrel has been blown in the ground to a depth of four or five feet, and the work is followed up by a gang of men who plant the poles in the holes thus made, fill in with gravel and earth, and the job is complete. It matters not what soil is perforated with the bar, wet or dry, loam, clay, gravel, slate or boulders (provided the bar can be inserted), the effect is the same. A gang of four men, with poles delivered on the ground—one man to blast and three to erect the poles and tamp them—will put up from 100 to 150 poles a day of ten hours each. The cost, therefore, of this new and improved process is about two-thirds less than the ordinary method of planting telegraph poles, as now practiced.—*St. Louis Commercial Gazette.*

A REMEDY FOR DIPHTHERIA.—Here is a simple but excellent cure for diphtheria: Roast an egg very hard; take of alum or copperas each the size of a large hazelnut, and burn them in a skillet or on the rim of the stove, until it quits blistering; then put the yolk of the egg and a teaspoonful of sugar with the alum and copperas all together, and burn again, as above, slowly until black, stirring and mashing all the time. All children large enough can eat it as candy; for smaller children dissolve and swab. Good for any sore throat or sore mouth.

RECIPE FOR THE HAIR.—To prevent one's hair fading or turning gray while young, one-half pint Jamaica rum, one pint castor oil, half ounce tincture cantharides. The hair and scalp to be thoroughly washed with castile soap and water once a week at first, then less often, then the oil mixture applied to the scalp in small quantities, a tablespoonful being sufficient in most cases, and thoroughly rubbed with the hands; apply every other day. This stimulates and nourishes the hair admirably. The opiates given to infants are the chief cause of hair falling out or turning gray while young, in soothing syrups, etc.

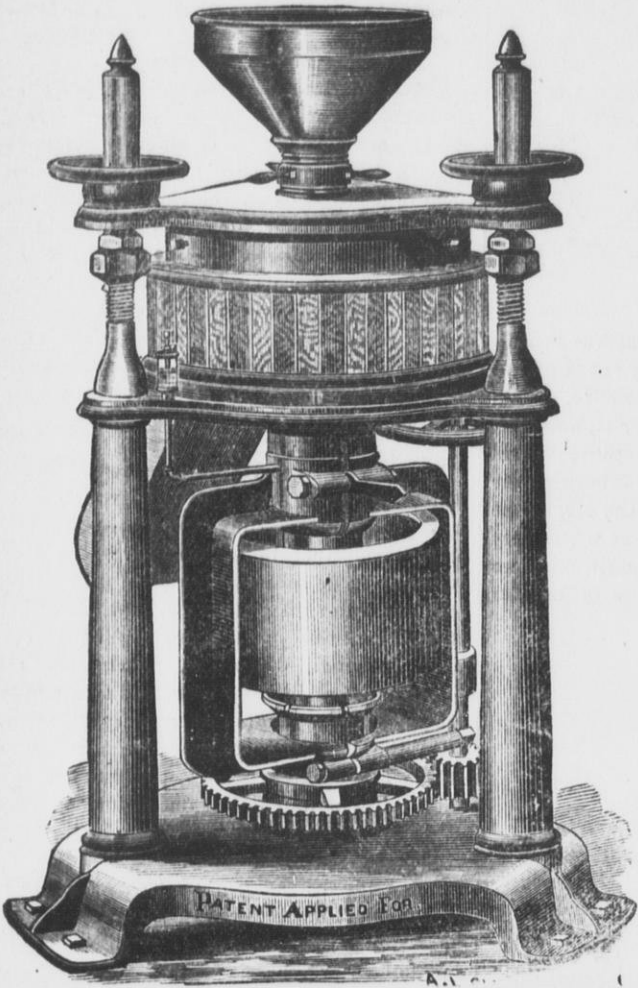
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**SNAKES.**

Mr. J. H. Beeson, the well-known Central Branch contractor, gave *The Patriot* a pleasant call, and from him we learn the particulars of the most remarkable snake story we have heard. In the extension of the Central Branch road from Beloit to Cawker City the line passes through the town of Glen Elder. A short distance from Glen Elder, on the Solomon River, is a steep and rocky bluff, about fifty-five feet high, a large portion of which has to be blasted away to make room for the opad-bed. A few days ago, while the excavation was in progress, a blast of nitroglycerine caps and giant powder tore off an unusually large part of the bluff, and down the declivity there came writhing and rolling a bunch of snakes, which Mr. Beeson assures us was almost as large as a barrel. They were of different varieties, rattlesnakes predominating, with racers, adders, garters, etc. When first disturbed from their warm bed they were active and dangerous, but coming out into the severe cold they were soon completely harmless, and were killed by the men without much trouble, or covered up in the dump of earth and stone. But this is a very small portion of the story. Every day and every blast, since this first batch appeared, has brought another huge bundle of these reptiles. Every hour a moving, writhing lump comes rolling down the hills, only to separate at the foot, and what escape the laborer's shovel and pick crawl off to get covered up in the dump. Thousands of them have been unearthed and killed, and every blast brings thousands more, far rivaling in number the famous snake den of Concordia. Not a single case of snake bite has yet occurred, notwithstanding it is many times almost impossible to avoid stepping on them. There are no unusual monsters among them, the great majority being as large around as a man's wrist, and about three or three and a half feet long. The farmers for five miles around tell that this is the regular winter den of these venomous creatures, and that during the fall the snakes in that country, which are discovered, are headed in the direction of these bluffs, and the only way they can be turned from their course is to kill them. It is said to be one of the most remarkable sights ever looked upon, and hundreds from the surrounding country visit the quarries to see the curiosity.—*Atchison Patriot.*

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**MILWAUKEE, WISCONSIN,**  
**MILL BUILDERS AND FURNISHERS,**  
 AND SOLE MANUFACTURERS OF



**Jonathan Mills'**  
**Wheat and Middlings**  
**Mills.**

**MOST PERFECT DEVICE ever INVENTED for REDUCING GRAIN to FLOUR.**

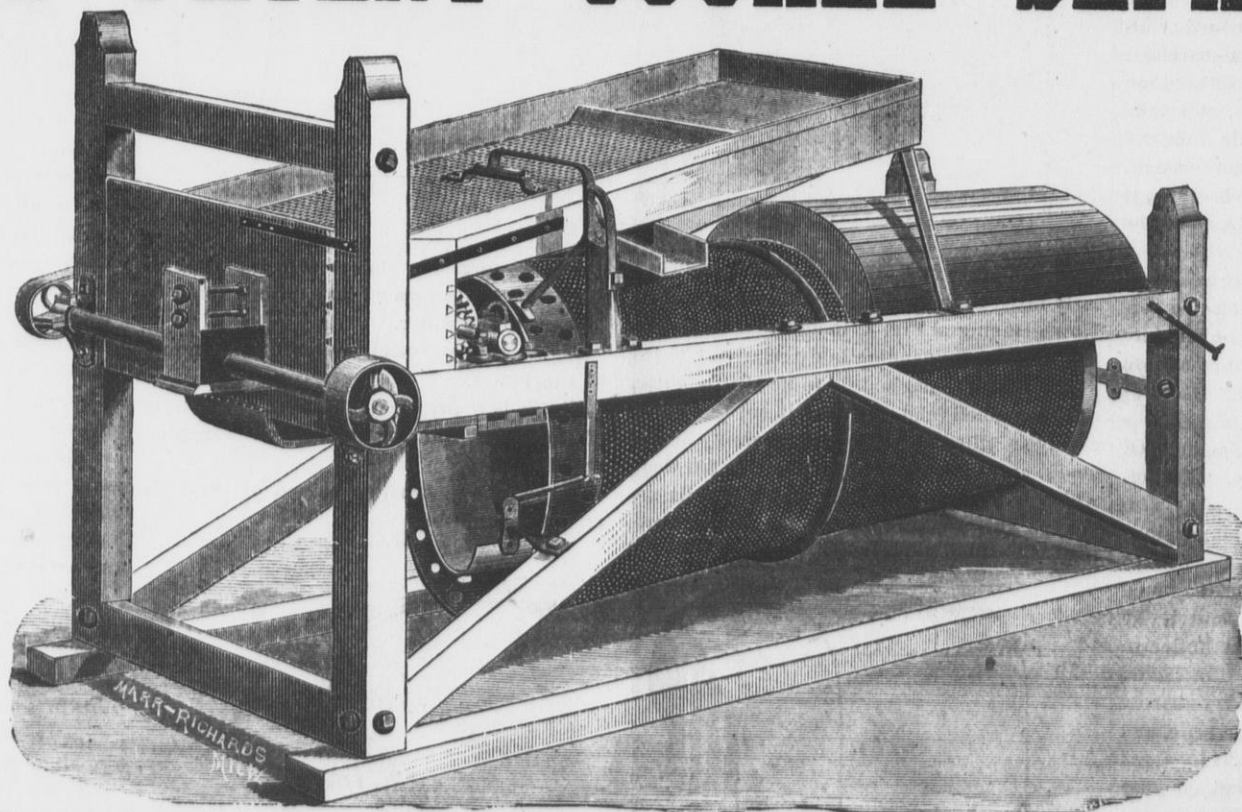
**REQUIRES LESS POWER, LESS ROOM, and LESS ATTENTION**  
 Than any other Mill Manufactured.

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Send for Circular and Price List to the **MILWAUKEE MIDDLINGS MILL-STONE CO.,**  
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 complete Flouring Mills on our system.

**KURTH'S PATENT COCKLE SEPARATOR.**

Cor. of Florida and Clinton Streets,



MILWAUKEE, WISCONSIN, U. S. A.

The above illustrated machine separates perfectly cockle, wild peas, wild buck-wheat, and other similarly-shaped foreign seeds from wheat. Requires but little power to run it. We also manufacture an

**OAT SEPARATOR,**

Which is fully equal to any manufactured. This is made in two styles, and is in combination with Cockle Separator. One style has two suction, one operating on grain as it enters the machine and the other as it leaves it, each being independent of the other and easily regulated. The other style has one suction, which may be either first or second. Among our references we respectfully call attention to the following:

MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Company—Gents: We have used your Cockle Separator for the past three years, to our entire satisfaction. We commend them to all in want of a perfect machine. Yours truly,  
 J. A. CHRISTIAN & CO.

MINNEAPOLIS, Minn., Jan. 16, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: In answer to your favor, would say that we have in use four of your Cockle Machines, and find them to be the only machines that we have yet seen that will separate the cockle from the wheat. The improved machines give us no trouble in any way. We shall want two more machines soon, to replace those burned in our Anchor Mill. Yours,  
 CHAS. A. PILLSBURY & CO.

MINNEAPOLIS, Minn., Jan. 9, 1879.—Cockle Separator Manufacturing Co., Milwaukee: We are using two of Kurth's Patent Cockle Separators, and while they work somewhat to a disadvantage on the present crop, we know of nothing that will do the work as well. We consider them the best machine made. Yours truly,  
 BULL & NEWTON.

AKRON O., Jan. 27, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gentlemen: Having three of your

Cockle Machines in operation, I have learned to appreciate their value, and trust that the fourth, ordered a day or two ago, will be shipped without delay. I want this in addition to the two machines I have already running on wheat, that I may be able to do absolutely perfect work, and cheerfully recommend them to those who aim at perfect work. On the other hand, I was free to admit, the other day, that your Separator is of no use to millers who argue that cockle makes good white flour, increases its bulk, and that therefore it is wasteful to take it out. Yours respectfully,  
 FERD. SCHUMACHER.

OSWEGO, N. Y., Jan. 29, 1879.—Cockle Separator Manufacturing Co., Milwaukee—Gents: We are pleased to say that our use of your machines for the last two years, has been highly satisfactory, and especially do we like the new double suction machine, which does its work so perfectly that we would not like to do without it. Indeed we deem the machines indispensable in good milling, particularly with spring wheat. Your friends,  
 PENFIELD, LYON & CO.

WHITEHALL, Wis., Dec. 11, 1878.—Cockle Separator Manufacturing Co., Milwaukee—Gentlemen: Allow us to say that the machine works to a charm, and that we calculate our flour is worth fifty cents more per barrel for the use of it. Respectfully yours,  
 WHITEHALL MILL CO.

We make a machine especially for extracting Cockle and other similar Seeds from OATS and BARLEY, which is of great importance to oat-meal manufacturers, malsters, etc. Send for Illustrated Catalogues, describing machine fully with diameter, capacity, etc., to

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## REJOICE YE MILLERS!

[Continued from page 83.]

vided for the introduction of a blast of air through perforated pipes into each reel as stated, for the purpose of keeping the meshes open, cooling, etc., without mentioning any effect to be produced toward removing pulverulent impurities, or even naming such impurities. Indeed, if that effect had been contemplated, the inventor would not have provided a cupola with two screens and brushes to arrest the escape of whatever was blown or wafted into the cupola and to cause that wafted matter to be thrown back or discharged directly into the first flour chest. If that wafted matter, whether flour dust or pulverulent impurities, was to be thus returned and mixed with the siftings of the first reel, it is evident that the invention had reference to the removal and separation of such matter from the flour. The devices involved necessarily a contrivance for the escape of the air forced into the reels; for an enforced current of the kind must have an outlet, otherwise disastrous results would follow, or the blasts cease to be operative. The screens in the cupola and the brushes for the purpose of returning the arrested particles into the reel chest indicate plainly enough that there was no thought of causing pulverulent impurities to escape through the cupola. This is made still more apparent from the fact that whatever escaped through the cupola, was in the normal operation of the connecting tube to be blown back into the very reels from which it had been just expelled. It was only in exceptional states of the weather that the valve in the tube was to be opened, but at all other times there was to be a return of the current escaping from the cupola into the reels carrying with said current whatever it contained. If then the purpose was to expel impurities, why such well arranged devices to force them back into the contents of the reels? Again, the "cant" ventilator of Cogswell & McKiernan and their air blasts through zinc jackets had been used at Lagonda and in the Barnett mill before the original patent No. 37,317 issued, and simultaneously with that patent Cochrane had procured for his "cant" ventilator, his patent No. 37,321; yet in the specifications and claims of No. 37,317, he omitted and it must have been *ex industria*, all reference to his No. 37,321, and substituted therefor his cupola, with screens and brushes. When he had ascertained in 1874, that his devices as referred to in the original patent would not purify middlings nor essentially aid in so doing, he interjected into his specifications for a reissue the rejected device No. 37,321. The testimony sufficiently explains why from his experimenting at Lagonda and in the first Barnett mill he discarded the "cant" ventilator, independent of its anticipation by Cogswell & McKiernan. The devices by which the improved method of bolting was to be carried on so far as air was concerned, looked to an enforced current, or blast operating from within the reels outward, and not by induced currents, operating from without, through the screens inward or upward as in flat and vibrating sieves.

Whatever construction may be properly put on the words, "combined operations of screening and blowing," it is obvious that the original invention contemplated a blast of air from within the reels, whereby its force should be directed not only through the meal as it was whirled around inside the reels, but also against the meshes of the reels, tending to force through whatever was small enough to pass. If the flour dust was thus forced through and wafted into the cupola, while the heavier particles, small enough to pass, fell by their greater specific gravity into the conveyors, the extremely comminuted particles of the integuments of the wheat-berry, or of its cell-walls, would, like the flour-dust, pass into the cupola by force of the blast, there to be arrested and brushed back into the flour, or returned through the tube into the reels, to be again and again whirled in and out in a continuous round. The many changes made by Cochrane and Warder & Barnett, after the original patent issued, and also after the reissued patent was granted, in order to adjust the devices referred to in No. 37,317, to an induced current or suction, indicate very clearly that the idea or thought of a process for purifying middlings in an "intermediate" or any other stage, of the manufacture, by the combined operations of blowing and screening, was not originally in the mind of the inventor. The testimony is clear that when the Cochrane device or machine was re-arranged and altered so as to work by suction, the perforated pipes performed no function. The manner of inducing or drawing the air into

the reel chests by suction, and the operation of the reel screens, when suction was used, were the reverse of combined blowing and screening. It cannot be fairly said, in the light of facts and circumstances now in evidence, that those reverse modes of operating were substantially the same or immaterial changes, as to form or modes of accomplishing what the patent covered. Even after the reissue, No. 5,841, Cochrane and Warder & Barnett had to resort to important changes, as to the modes of introducing air into their reel chests; they abandoned the device of a cupola with screens and brushes, introduced practically a new tube and valve, left their perforated pipes functionless, and changed blasts into suction or enforced into induced currents. In brief, the essential changes in Cochrane's devices, as described in No. 37,317, which he was compelled to make, in order that a beneficial result might follow, so far as purifying middlings went, demonstrate that a process for purifying middlings and making therefrom a high grade of flour, superior to superfine, was not thought of by him in or before 1863.

But where can there be detected in No. 37,317 a suggestion either of a mode of purifying middlings by the combined operations of blowing and screening, or of an "intermediate" stage therefor, between the production of superfine flour and the regrinding of the middlings, where is or was there such an "intermediate" stage? It is contended that the screenings by the first reel were superfine flour, or, if not, perhaps the screenings also of a part or a whole of the second reel; and, consequently, the combined operations of blowing and screening in the third reel purified the middlings at that stage, which was intermediate the production of superfine flour and the regrinding of the middlings. But we have endeavored to show that the screenings of the third reel were less free from impurities than they would be if coarser meshes were used, the process of purification could not occur by the use of that reel, nor at that stage of the operations. There is suggested in the original patent neither the idea of purifying middlings at the intermediate stage mentioned, nor the use of the combined operations of screening and blowing for that specific purpose. It cannot be said that the mention of "white middlings" embodies such a conception, so that the reissue, without expansion, could cover the purification of middlings in the manner and at the stage claimed; for the term "white middlings" was well known to the art of milling long before, and also to the commercial world. The manner in which "white middlings" is referred to in the patent shows that the term was as one well known, and not as a new or special product of any superior value.

A comparison of the original and reissued patents, and an examination of Cochrane's contract with Warder & Barnett in 1860, also of the correspondence of the latter, and of the testimony concerning low and high grinding in connection with Cochrane's invention, will show that the purpose was as stated, viz., by the ordinary process of milling, through his method of bolting, to increase the yield of choice flour. He soon learned that higher grinding—or what Prof. Horsford's report terms "half-high milling"—was necessary to the production of the best quality of flour, or of that superior grade which he contracted to make. Instead of accomplishing the promised result by low grinding, from four bushels and twelve pounds of wheat, higher grinding was soon resorted to, requiring five bushels and twenty pounds of wheat per barrel. He complained to his millers, it is said, that they persisted in grinding too low, although that mode of grinding was necessary to make the required yield; and insisted that they should grind higher. It was well known in the art that high grinding made a better quality, but less quantity, of good flour; but Cochrane thought he could increase the quantity of choice flour by his process. Warder & Barnett, it seems, following, it may be, the suggestion of Cochrane, began the use of high grinding at an early day, and stated to their correspondents that certain shipments made were from grinding high, yet in one of their letters they then boasted that by the new method even spring wheat could not be ground too low to prevent its being "cleared up." The ordinary process of milling, in connection with which Cochrane's method of bolting was to be employed, must have been, if not low grinding, certainly not the high grinding used in defendant's mill, for the value of his method looked to the greater yield of choice flour.

The reissue says: "It is this intermediate treatment (between the separation of the superfine flour and the completion of the middlings flour by regrinding and rebolting) for the separation and removal of pulverulent im-

purities which distinguishes my improvement in the art from all before known modes of manufacture." In the original patent there is not only no such claim, but nothing is said about the removal of pulverulent or any other impurities, or any such intermediate treatment. A brief use of air in an expanded portion of one reel at Lagonda, operating as a separator, was soon abandoned in the course of the early experimenting, and hence in the original patent no use of air in the separator was mentioned.

The proof is that in the modern or present mode of purifying middlings the purification occurs in connection with what answers to Cochrane's separator, and in that connection a current of air is now employed, while Cochrane did not call for any blast of air at that stage of the process, and previous to regrinding. His plan or process was not to use blasts of air in connection with the separator, but to rely on the ordinary process of screening without the use of air blasts or currents. The reissue attempts to expand the original invention to cover, therefore, in connection with the separator, what he did not originally claim or suggest, in order that he might appropriate to himself what had been since discovered or used, outside of his invention. As the conclusion is reached that the reissued patent is void, it is unnecessary to consider whether the process claimed was anticipated in any of the various publications or by any of the persons or processes as set up by defendant. The question concerning "high milling," the French and economical processes as used in Europe, the connection of the Cabannes and other patents with such processes, and also of Gove's method and machine, would, if fully considered, involve a very elaborate investigation of details, and require for a clear presentation of their analyses, resort to numerous drawings and models.

If the reissue had been held valid, an embarrassing and delicate question would have arisen concerning the alleged infringement by the defendant. In the case of "Cochrane vs. Deener," the United States Supreme Court decided that the Welch patent was an infringement of Cochrane's. That Court had before it, not only the process patent of Cochrane, but also his patents for machines, and to what extent this Court, under the circumstances, should venture to enter upon the subject anew, if an investigation as to that point were needed, might be doubtful. But if an appeal is taken, that Court will have before it in this suit the large amount of new evidence introduced; in the light of which it can determine for itself whether it will review its former opinion or not. Were it necessary for a decision on that point to be now made, and were it open for our consideration, we might possibly reach a different conclusion.

**HOW GROWING CORN MIXES.**—The manner in which corn mixes is as follows: The pollen falls from the fassel on to the silk, which is thereby inoculated; and each thread or fiber of silk is attached to a white hull on the cob, where the kernel is grown complete. Now if the pollen should miss one thread of silk, there will never be corn where that silk is attached to the cob. Plant two sorts (not varieties) of corn side by side, and if the pollen falls from one kind on to the silks of the other kind, the kernel thereby produced, will be of the nature of both kinds; although the color may be like either sort planted. No man is smart enough to unmix these two sorts of corn. Plant it twenty years and then you will see both kinds plainly.

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## EXPLOSIONS FROM COMBUSTIBLE DUST.

We give below a very important and exceedingly interesting report of a lecture by Prof. L. W. Peck, printed in the *Popular Science Monthly* for December. Prof. Peck, it will be remembered, made a series of experiments showing the nature of the explosions by which the Minneapolis flour mills were destroyed some time since. The results of these experiments are now embodied in a lecture, which was delivered on June 1st, 1878, at Association Hall, in Minneapolis, Minn. The conclusions reached are of so important a character, and are of so much interest to almost all classes of people, especially those who have anything to do with combustible substances, or with the fitting up of heating apparatus in places where there are large quantities of combustible dust, that we give the lecture entire. The professor said:

I wish to demonstrate to you this evening, by a few simple experiments, the fact that all combustible material when finally divided, forming a dust or powder, will, under proper conditions, burn with explosive rapidity. If a large log of wood were ignited it might burn a week before being entirely consumed; split it up into cord-wood, and pile it up loosely, and it would burn in a couple of hours; again, split it into kindling-wood, pile loosely as before, and perhaps it would burn in less than an hour; cut it up into shavings and allow a strong wind to throw them into the air, or in any way keep the chips comparatively well separated from each other, and it might be entirely consumed in two or three minutes; or, finally, grind it up into a fine dust or power, blow it in such a manner that every particle is surrounded by air, and it would burn in less than a second.

Perhaps you have noticed that shavings and fire kindling will sometimes ignite so quickly in a stove that the covers will be slightly raised, the door forced open, or perhaps small flame will shoot out through the front damper. You have in such a case an explosion on a very small scale, similar to that of the Washburn, Diamond and Humboldt mills of this city on the night of May 2d, upon which occasion the rapid burning of hundreds of tons of flour, bran, etc., completely demolished the solid masonry walls, six feet thick, of the mills, and threw sheets of iron from the roof of the Washburn so high into the air that they were carried two miles by the wind before striking the ground.

Let us see now why such explosions occur. Wood has in it a large amount of carbon, the material of which charcoal is composed, and the air is about one-fifth oxygen. Now, at the ordinary temperature the carbon of the wood and the oxygen of the air do not combine, but when they are heated, as by friction, concentration of the sun's rays, chemical action as from a match, or in any other way, they combine to form carbonic acid gas. This chemical action produces a large additional amount of heat, which keeps up the action as long as there is any carbon and oxygen left to unite, and also makes the temperature of the gas which is formed very high. As the space occupied by the carbonic acid gas and that occupied by the oxygen which entered into the combination is the same at the same temperature, there would be no bursting if, after combination, the temperature were the same as before; but it is a fact, which you have all observed, that fuel in burning produces heat; it is also a fact that heat expands a gas, and it is this great amount of heat, taken up by the carbonic acid formed, that produces the immense pressure in all directions.

Let us return to our log of wood. There is exactly the same amount of heat and carbonic acid produced when complete combustion takes place in each of the cases of burning, the only difference being as to time. In the first case, the explosion or pushing aside of the surrounding air occupies a week, in the last only a second.

Snow-flakes fall gently upon your shoulders, and you are required to perform an insensible amount of work to resist the crushing effect of each flake; but, suppose that all the snow that has fallen upon your head and shoulders for the last ten years was welded together in one solid mass of ice, weighing perhaps one hundred pounds, and that it should descend with the velocity of a snow-flake upon you, an immense effort would be required to prevent its crushing you, even if you were able to withstand the shock at all. The work of many days would be concentrated into an instant.

So it is with burning wood; four or five cords of wood and a large stove will give you a roaring fire all the winter; the work done is manifested by the heat obtained, by the rush-



ing of hot gases up the chimney and of air from outside into the room through every crack. But if the wood were ground into a powder and scattered through all the house and burned instantly, the cracks, doors, windows and flues would not be sufficient to give vent to the hot gas, and the roof and sides of the house would be blown to pieces.

What is true of wood is also true of grains; also of vegetables, with their products when they contain carbon, with this exception—grain, either whole or ground, will not burn readily when in bulk. A fire could be built upon a binful of flour and kept burning for half a day without igniting the flour, it would char upon the surface, but it lies in such a compact mass that the air does not get access to it readily, hence it does not burn.

I wish to show you now how combustible dust will burn when blown into the air by means of a pair of ordinary hand bellows. I have here two boards, about 12 by 18 inches, nailed together, forming a V (see fig. 1). Just outside of the V an ordinary Bunsen's gas burner is placed, and within is a small handful of dust, taken from a sash and blind factory. Upon blowing it smartly with the bellows a cloud is formed about 15 feet high—extending in fact to the ceiling—which ignites from the lamp and produces a flash, very quick and exceedingly hot, resembling much a gunpowder flash. You will notice that a large amount of dust falls from all around the edge of the flame without burning; that is because it is not thick enough. Two things are necessary; first that each grain of dust be surrounded with air, so that it can get the oxygen required instantly; and secondly, that each grain shall be so near its neighbor that the flame will bridge over the space and pass the fire from particle to particle.

I think, after seeing the immense flame produced by such a small amount of fine saw and sand-paper dust, you will no longer wonder at the rapid spread of flames in furniture and similar factories. You know it is practically impossible to put out a fire after any headway is attained in these establishments; the draught produced will blow all the dust from walls and rafters into the air, and the building in an instant is a mass of flame. Perhaps

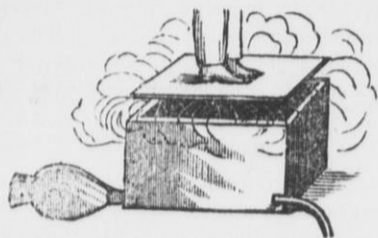


Fig. 1.

many of you remember the fire in the East Side saw mills a few years ago. Large masses of fine saw dust had probably collected upon the rafters, and the whole roof was perhaps filled with cobwebs loaded with dust. A fire started from one of the torches used and shot through the mill with lightning-like rapidity, and, save for the fact that the ends and sides of the building were all open, there would have followed an explosion like that at the flour mills. As it was, the men had very great difficulty in escaping with their lives, notwithstanding that a short run in any direction would have taken them out of the mill. It is very evident that too great care cannot be taken to keep all such factories and mills as free from dust as possible.

I will now blow some ordinary starch into the air in the same way and you notice the flame is more vivid than in the last experiment, and, if you were in my position you would notice that the heat produced is much greater. Notice now that this powdered sugar burns in the same way.

You will see from the experiments further on, that three-quarters of an ounce of starch will throw a box weighing six pounds easily twenty feet into the air, and that half an ounce burned in a box will throw up the cover three inches with a heavy man standing upon it.

With these facts, which I have demonstrated before you, no one need regard as a mystery the Barclay street explosion in New York City, where a candy manufactory, in which large amounts of starch and sugar might in many ways be thrown into the air by minor disturbances, took fire and completely wrecked a building and destroyed many lives.

I will now burn in the same way some buckwheat, which as you will observe, gives a very large blaze; now some corn meal, which is too coarse to burn as well; now some rye flour, which burns much better than the corn; now some oatmeal, the finer part of which only burns; and so I might continue with all sorts of finely ground vegetable material.

Let us take up now the products of the

manufacture of flour from wheat. There were between 300 and 400 tons of these materials (upon which I am now to experiment), in the Washburn mill at the time of the explosion, and there was a corresponding amount in the Diamond and Humboldt mills, which, by their sudden burning, produced the second and third shocks heard directly following the explosion of the larger mill.

The wheat is first placed in a machine, where it is rattled violently and brushed. At the same time a strong draught of air, passes through it, taking up all the fine dust, straw, etc., and conveying it through a spout to a

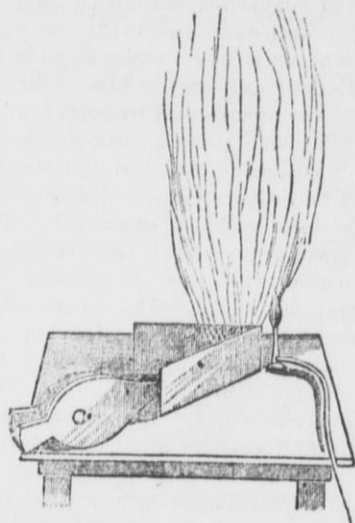


Fig. 2.

room known as the wheat-dust room, or perhaps more commonly it is blown directly out of the mill. You see some of this material; it looks like the wood-dust of the first experiment, and, as you see, burns with a quick and sudden flash when subjected to the same conditions.

Here, then, we have the first source of danger in a flour mill. A thick cloud of this dust, when conveyed through a spout by air, will burn in an instant if it takes fire; and, if there is any considerable amount of dust, as there would be if there were a dust-room, an explosion will follow which may become general if it stirs up a thick dust-cloud throughout the mill.

The wheat after it has been cleaned in this way goes to the crushers which are plain or fluted or iron porcelain rollers, working like the rollers in a rolling mill. The object of these rollers is, I believe, to break off the bran in as large pieces as possible, and to crush out or flatten the germ so that it can be separated with the bran from the rest of the meal.

The crushed wheat goes now to the stones, where so much heat is produced (average 135 Fahr.) that a large amount of steam is formed from the moisture in the materials. This steam would condense in the meal and interfere with the bolting, etc., if it were not removed. To effect this another draught of air and another spout are employed, and as might be expected, this current takes a large quantity of the very finest flour, called flour dust, with it. To save this a room is provided near the end of the spout, called the flour-dust house. The spout conveying steam and dust enters this room on one side, and another spout opposite leaves it, passing to the open air. It is in this comparatively dead air space that the dust settles and can be collected from the floor. Here is some of this material, which, as you see, when blown into the air, produces a vivid flash, extending from the table to the wall.

The evidence taken before the coroner's jury shows very clearly that it was this material that started the great explosion of May 2d.

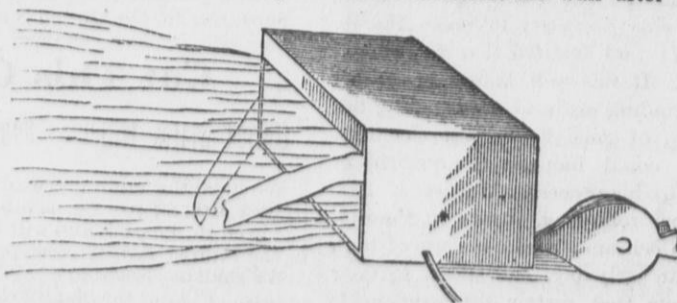


Fig. 4.

Just how the mill took fire will perhaps never be known, of course, but in all probability the stones either ran dry—that is, were without any meal between them—or some foreign substance, such as is produced by an emery wheel or a scissors-grinder's wheel. These sparks set fire to small wads of very hot dust, which, as soon as they were fanned into a blaze, communicated it to the spout and house full of dust. An eye-witness of the explosion first saw fire issuing from the corner of the mill where this flour-dust spout was situated, the end of the spout having probably been blown out. This fire was followed by a quick flash,

seen through all the windows of the floor upon which the flour-dust houses were situated, followed instantly by a flash in the second story, then the third story, and in rapid succession, fourth, fifth and sixth stories; then followed the great report produced when the immense stone walls were thrown out in all four directions, and the roof and part of the interior of the mill shot into the air like a rocket.

It would seem that a blaze is necessary to ignite the mixture, for I have tried powerful electric sparks from a machine, and from a battery of Leyden jars; also incandescent platinum wire in a galvanic circuit, and glowing charcoal, without producing any fire, however thick the dust might be. Perhaps, however, under more favorable conditions the dust would ignite directly from sparks, but it seems very improbable.

Let us continue now with the process through which the ground wheat is made to pass. From the stones it is conveyed to the bolting reels, where the very finest is sifted out first, and we obtain a grade of flour; after the finer material is sifted out it goes to a coarser bolt, where the "middlings," as it is called, passes through, leaving the bran, which comes out at the end of the reel. The middlings, as it comes from the bolts, has fine bran and dust in it, and to purify it, it is subjected to an operation similar to that of cleaning the wheat; that is, in the middlings purifier it is subject to a draft of air which takes away all the light bran and dust, leaving the heavier material (purified middlings), which goes again to the stones to be ground into flour.

Here is some of the dust from these "middlings machine;" you observe it burns as the other materials burned, quickly and with intense heat.

Here is some of the purified middlings. Each grain is comparatively large and heavy, making it difficult to blow it well into the air, but as the blaze produced by each particle is quite large, a flash is produced which does not differ materially from the others.

Here is some of the general dust of the mill, that is, dust swept up from the floor, walls, beams, etc. You will see it acts in all respects like the other substances.

And, finally, here is some of the flour taken this afternoon from the flour sack at home, it burns, you observe, if possible with even more energy than the other kinds of dust. I have performed a few experiments which I will now repeat, which will illustrate to you the immense power that these materials exert when burned in a confined space. This box (fig. 2) has a capacity of two cubic feet; the cover has a strip three inches deep nailed around it, so that it telescopes into the box; there is in this lower corner an opening for the nozzle of the bellows, in this an opening for the tube to the lamp. I place now a little flour in the corner, light the lamp, and my assistant places the cover upon the box and steps upon it. Take notice that upon blowing through the hole, and filling the box with a cloud of flour, the cover comes up suddenly, man and all, until the hot gas gets a vent, and a stream of fire shoots out in all directions.

Here (fig. 3) is a box of three cubic feet capacity, including this spout, nine inches square and fifteen inches long, coming from the top of it, at the ends doors are arranged closed like steam-boiler man-holes; openings for light and bellows are arranged as in the previous box.

Here is a box, weighing six pounds, that will just slip over the spout; it has a rope lest it should strike the wall after the explosion.

the spout five thicknesses of newspaper: upon igniting a boxful of dust as before the paper is thrown violently into the air, accompanied by a loud report as it bursts.

For the last experiment I have a box of four cubic feet capacity (fig. 4); five sides are one and a half inch thick, the remaining side one-quarter inch. Upon igniting the dust in this box, filled as in the other cases, the quarter inch side bursts, and a stream of fire shoots out halfway across the stage.

One pound of carbon and two and two-thirds pounds of oxygen, when they combine to produce carbonic acid, will evolve heat enough if it were applied through a perfect heat-engine, to raise 562 tons ten feet high; if, therefore, 40 per cent of flour is carbon, it would require two and a half pounds to accomplish this result, if an engine from which there would be absolutely no radiation, conduction, or loss of heat in any way were a practical possibility. Let us see how much air would be required to supply oxygen enough. Under ordinary conditions every 100 cubic inches of air contains 7.13 grains of oxygen, from which we find that 151½ cubic feet of air would be required for the two and two-thirds pounds of oxygen. Hence the two and a half pounds of flour must be equally distributed as a dust through 151½ cubic feet of air in order to produce the most powerful result.

If 41 ounces of flour require 151 cubic feet of air for perfect combustion, one cubic foot of air will supply oxygen enough for 40-151 of an ounce of flour. Hence our box, which lifts the man so readily, burns one-half ounce of flour or less; and the other, which throws the box into the air, three-quarters of an ounce, unless, as I think quite probable, an additional amount of air is drawn through the cracks as soon as the vent is opened at the top of the

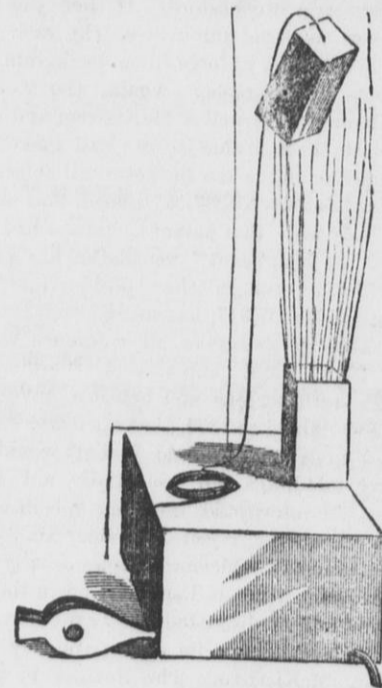


Fig. 3.

box. In fact, these experiments work better if a few small holes are made near the bottom of the boxes. It may be worthy of mention here, as a point of interest to insurance companies that, in all dust explosions, a fire precedes the explosion in every case. The dust must burn before the heat that produces the immense expansive force is generated.

Too great precaution cannot be taken in all kinds of manufactories, where combustible dust is produced, against fire, especially in those establishments where it is conveyed in thick clouds by air-drafts through spouts and rooms.

**VARNISH FOR PATTERNS.**—A varnish for foundry patterns and machinery has been patented in Germany, which dries as soon as put on, gives the patterns a smooth surface, thus insuring an easy slip out of the mould, and prevents the patterns from warping, shrinking or swelling, as it is perfectly impervious to moisture. This varnish is prepared as follows: Place in a vessel 50 pounds of shellac, 10 pounds of manilla copal, and 10 pounds of Zanguebar copal, and heat it by the external application of steam for four or six hours, stirring it in the meantime constantly. Then add 150 parts of the finest potato spirit, and heat the whole during four hours to 190 deg. Fah. This liquid is then dyed by the addition of orange color, and can then be used for painting the patterns. When used for painting and glazing machinery, the varnish may consist of 35 pounds of shellac, 5 pounds of cocoriel copal, 10 pounds of Zanguebar copal, and 150 pounds of spirit. Similar varnish to the above is used quite extensively by pattern-makers in this country, and much of the superior appearance of American castings is due to its use.

RECENT PATENTS.

The following patents were issued from the United States Patent Office, Feb. 11th, 1879:
Corn planter, R. H. Avery, Galesburg, Ill.
Steam condensing and feed water heating apparatus, Benj. T. Babbitt, New York.
Seed planter, Jos. C. Barlow, Quincy, Ill.
Check row planter, Moses J. Barron, Sangamon county, Ill.
Planter and cultivator, T. M. Hunt, Caldwell, Texas.
Stone-dressing machine, John D. Brunton, Batterssea, England.
Engine governor, F. Burns, Philadelphia.
Water wheel, Armisted Burwell, Mecklenburg county, Va.
Combined grinding mill and feed cutter, Thos. Clarke, Truro, Nova Scotia, Canada.
Weighing scales, P. M. Cummings, Lyons, Iowa.
Millstone driver, J. C. Dane, LaCrosse, Wis.
Strawband grain binder, George Davis, Milford, Mich.
Feed steamer and generator, Chas. Gordon, Adrian, Mich.
Rotary engine, John Henderson, Jr., Watertbury, Conn.
Water elevator bucket, Steven W. Kershner, Indianapolis, Ind.
Traction engine wheel, Jacob Kirchoffler, Walla Walla, Wash. Ter.
Wind engine, J. C. Kuempel, Clayton, Iowa.
Corn planter, Thos. B. McConoughey, Newark, Del.
Water wheel gate, James S. Meherg, Coosa county, Ala.
Wind wheel, Jacob T. Mider, Wathena, Ks.
Knot-tier for grain binders, Henry E. Pridmore, Brockport, Ill.
Millstone setting, W. L. Teter, Philadelphia.
Middlings separator, H. G. Clouser, Millersburg, Penn.
Cut-off gearing, Nelson W. Twip, New Haven, Conn.
Rotary engine, Geo. C. Yarborough, Baldwin county, Ala.

ACTION OF WISCONSIN MILLERS.

They endorse the Expulsion of Stannard and Kehlor by the Missouri Millers' Association.

March 3d, an adjourned meeting of the Milwaukee members of the State Millers' Association was held in the office of Secretary Langson, in the Chamber of Commerce building. The object of the gathering was to take action in regard to the course of ex-Gov. Stannard, of St. Louis, a member of the Missouri Association, whose case the millers of the country have been assisting to defend against the demands of the Cochrane patents, and who while the case was being heard in Court entered into a compromise and settled with the ring. The following preamble and resolutions were offered and unanimously adopted:

Whereas, There have been organized in the several wheat-growing States associations composed exclusively of the manufacturers of flour, for the purpose of defending each and all their members against claims for royalty brought by parties under what is known as the Cochrane Patents, which are believed to be unjust and fraudulent; and

Whereas, Each State so organized has assisted with the money necessary to defend these claims before the Courts of the country, in order that a decision might be reached, to determine whether these claims are just or unjust; and

Whereas, Suits were brought against parties, members of the State Associations, in Wisconsin and Minnesota, which suits have been contested with the aid of funds furnished by other States, in accordance with agreements entered into by the delegates from all the State organizations; and

Whereas, Parties to this agreement in St. Louis, viz., R. O. Stannard & Co., against whom suit was brought in the sum of \$150,000 damages for infringement of said Cochrane patents, have compromised with the owners of said claims, contrary to their associates, thereby breaking faith with all members of their own and other associations who came forward—when these defendants were in distress and threatened with heavy damages—with money necessary to prevent the collection of such damages; and

Whereas, The Millers' Association of Wisconsin, without any suit to defend, having contributed to this defense of Stannard & Co., and their associates, the sum of \$8,000, which sum has been jeopardized by the action of said Stannard & Co., in settling with the "Cochrane ring," thereby breaking faith with and betraying their friends, who came liberally to their defense when in distress; therefore be it

Resolved, By the members of the Wisconsin State Millers' Association representing at this meeting nearly 200 run of burrs, that we heartily approve the action of the Missouri State Association in expelling Messrs. Stannard & Co., and Messrs. Kehlor Bros. from membership in their association, and regret there is no worse punishment or disgrace that can be meted out to them.

Resolved, That we approve the course of Messrs. Bowe, Smith, Godard and others in expelling said parties, and that Wisconsin in the future as in the past will stand ready to assist in the fight against this and other fraudulent claims.

Resolved, That we demand the expulsion of Messrs. Stannard & Co. and Kehlor Bros. from membership in the National Association.

Resolved, That the Association has full

faith in the justness of our opposition to the claims of the "Cochrane ring," and believe that the decision when reached in the St. Louis cases will be against the demands of the "ring."

Resolved, That a copy of these resolutions be forwarded to the loyal millers of St. Louis, the milling papers of the country, and the daily press of this city.

The meeting adjourned without further business.

SEED CORN.—Good seed must go hand in hand with good cultivation, but with good seed and good cultivation our corn yield ought certainly to be doubled. For instance I find it easy to select ears of corn. Seventy of these ears would make a bushel. Corn planted in hills four feet apart each way gives 2,722 hills to the acre. If each of these hills should produce three such ears of corn the acre would yield 116 bushels. Now I fully believe that at least nine farms out of every ten in our State are capable of a yield very nearly approaching this, but it is only to be attained through that higher education which shall induce more thorough work and closer attention to details of every description than is now given by one farmer of ten thousand.

Frank Nicolin, of Jordan, Minn., is busy rebuilding his mill lately burned. It will contain eight run of stone and several sets of rolls. Chas. Rudolph will be the head miller.

GRANULATED WHEAT BREAD.—Take a pint of actively-boiling water, salted slightly, and add enough fine granulated wheat flour to form a thin mush; to this stir in a quart of tepid water, a small piece of butter, two eggs, well beaten, one-half teacup of New Orleans molasses, and one-half cake compressed yeast dissolved in a little water; thicken it as stiff as it can be stirred with a spoon with cold-blast flour, and put each loaf in a separate pan; let it stand until it puffs up nicely, and then bake in a quick oven two hours.

A GREAT Milling Invention

SUCCESS ATTAINED AT LAST.

To Mill Owners: I have invented, and secured by letters patent, No. 211,244, an Improved Method for Fringing the Grinding Surfaces of Mill-Stones. Having been practically engaged in the milling and mill stone business for over 30 years I have learned the great value of having a perfectly true face on grinding stones, and during the past 10 years I have expended a great deal of time and money in making my invention and securing my patent. The very foundation of successful milling is in the proper treatment and use of the mill-stone. A true face will make even, uniform flour and a large percentage of middlings, while an uneven stone will cause uneven grinding and poor flour, which no purifier or system of bolting will rectify. With a true face on the mill-stone the miller can set his irons right, can trim the spindle right, can get the level right, and not half the work in dressing will be necessary. This is a matter of the

UTMOST IMPORTANCE TO MILLERS,

And I respectfully call your attention to it, and invite correspondence.

I have just sold rights for mills to the following well-known mill owners, to any of whom I refer you:

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Gerlach & Dittmarch, Milwaukee, Wis.
Huntingdon & Koch, Barton, Wis.
Smith & Co., Grafton, Wis.
Folker & Jonas, Saukville, Wis.
Geo. Guttler, Thiensville, Wis.
Milwaukee Milling Co., Milwaukee, Wis.
Orville Hathaway, Oconomowoc, Wis.
F. Miller & Co. (2 mills), Watertown, Wis.
Barnes & Hodson, Janesville, Wis.
Coman & Morrison, Fox Lake, Wis.
E. R. Hoyt & Son, Beaver Dam, Wis.
H. G. Mathews, Brandon, Wis.
Filer, Stowell & Co., Milwaukee, Wis.

I have placed my price for rights for mills at an extremely low figure, considering the value of my invention, so as to bring it within the reach of all. For further information and correspondence address

WM. LEHMANN,

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Blanchester, Ohio.

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A LADY of experience gives advice on kissing to a younger lady friend as follows: "Be frugal in your bestowals of such favors. In the first place I would cut off all uncles, cousins and brothers-in-law; let them kiss their own wives and daughters; and I would not kiss the minister, or the doctor, or the lawyer who gets you a divorce." You see this lady understands her business and does not leave out the editor; he of all others needs these osculatory attentions to "lighten up the gloom;" she's a jolly, sensible woman, with a heart in the right place.—Marshalltown Times.

Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order.

WANTED—A miller with \$1,500 capital to take an interest in New Process water mill. Write at once for particulars to S. & C., care United States Miller, Milwaukee, Wis. dec

SITUATION WANTED—I have had two years practical experience in a good flour mill, and want a situation where I can finish learning the trade. I can furnish first-class reference. Address GHO. P. WANDER, 512 Spring st., Buffalo, N. Y. mr3t

WANTED—Situation as head or assistant miller in some first-class firm. Twenty years' experience in steam and water mills. Speak German and English. Salary an after consideration. Address LOUIS HALLER, Hicksville, O. ap\*

WANTED—A situation as mechanical draughtsman by a graduate civil engineer who has had thorough experience in marine and stationary engine work and general mill machinery. Good references furnished. Address C. E., Box 381, Bay City, Mich. ap\*

WANTED—Permanent situation by a miller of 18 years' experience, 12 years in the Northwest; understands "New Process;" am industrious, honest, and capable, and have a family; a place where there are good schools desired; can furnish references. Address C. C. A., care United States Miller. ap3t

WANTED—A first-class foreman to take charge of a stone shop; must be perfectly competent to superintend building and finishing burr stone. Best references required, and none but experienced men having acted as foremen need apply. A good chance for the right man. Address F. J. S., care United States Miller. ap1t

WANTED—Millers out of employment and proprietors of mills to act as agents for the sale of the Ashland Patent Adjustable Sack Molder; one of the best selling articles out. Exclusive territory given. Sample sent to those who wish agency or to use on the receipt of \$1.50. Address L. JEFF. SPRENGLE, Ashland, Ohio. ap2t

WANTED—A situation as Oatmeal Miller by a thoroughly practical, competent man, sober and steady; understands all the different grades for home and foreign markets; the drying and handling of oats in all its details; has had a long experience and can come well recommended. Address "Oatmeal Miller," care of United States Miller, Milwaukee, Wis. ap3t

WANTED—A situation by a miller of long experience in milling in both Germany and America. Has filled responsible positions in several well-known mills in this country. Will guarantee satisfaction. Is married, of steady habits, and can furnish reference as to ability and character. Address at once, J. M. B., care United States Miller, Milwaukee, Wis. feblt

For Sale or Exchange.

Advertisements under this head \$2 per insertion, cash with order.

FOR SALE—Cheap—A two-run merchant mill in a good wheat country, on the Illinois Central R. R. For particulars, address W. GILBERT, Jacksonville, Ill. feb\*

FOR SALE—Three-run water mill and 63 acres of land; good house and barn; plenty of custom. Cheap for cash, or half cash. JNO. F. MCGUIRE, Clinton, Iowa. mrlt

FOR SALE—Two-run steam mill; best run of custom in the county; two houses and barn. Pays 10 per cent on \$8,000. Cheap for cash, or half cash. JNO. F. MCGUIRE, Clinton, Iowa. mrlt

WANTED—To buy or rent a mill, by a practical miller thoroughly versed in merchant and grist work. Talks both English and German, and can give best of references. Address, S. KAMBERER, Fountain City, Buffalo Co., Wis. mr\*

WANTED—A good steam flouring mill at Cawker City, Kansas. The location is exceptionally good. The best of wheat and other grain produced in great abundance. The investment will surely make heavy returns. The Aetehson, Cawker City & Denver Railroad will be completed to this point on or before June 1st, 1879. Parties desiring to secure a good location may address for any further information, EDMUND O. GARRETT, Cawker City, Mitchell Co., Kan. feblt

FOR SALE—A grist mill with two run of stone, on one of the best and clearest water powers in the country. Two houses—one a hotel—barns, sheds, hog pen, ten lots with fine fruit trees, in the village of Bird, Oceana Co., Mich. The whole can be had for the give away price of \$4,500, or one-half for \$2,500. Being in other business the subscriber feels compelled to sell. Address at once, J. PALMITER, Hart, Oceana Co., Mich. mr\*

FOR SALE—A superior mill site in southern part of Illinois, suitable for a custom and merchant mill. The location is in one of the best wheat-growing sections of the State, and enjoys railroad facilities to all points East and South. Also one engine and two 4-flued boilers in perfect condition. All will be sold at a bargain. For full particulars, please address, IMBS, MEYER & CO., 120 & 122 S. Main St., St. Louis, Mo. feb\*

FOR SALE—A flour mill on Pawpaw Creek, in Mecklenburg Co., N. C. Mill is a three-story building, first-story rock, second and third wood. Rock dam. Two run of stone, one for wheat and one for corn, with other machinery, run by 17-foot overshot water-wheel. Also saw mill with improved circular saws, etc.; 194 acres of land go with the property. Price, \$4,100. This is a fine opportunity for an enterprising miller to make a fortune. Address DAWSON & CO., Charlotte, N. C. jan\*

FOR SALE OR RENT—One of the best steam flouring mills in the State. Four stories, brick and stone, slate roof, four run of burrs. Adapted to new process. Everything new. Best wheat region of the State. Fuel cheap, water plentiful. Near depot and has side track, cooper shop, wagon and stock yards. Pleasant town of 2,000 inhabitants. Satisfactory reason given—neither of us know anything whatever about milling. Terms easy. Fine bargain. Address C. H. HEARD & SON, McLeansboro, Ill. feb\*

FOR SALE—A Texas flour mill and land; a rare bargain. I offer my steam flouring mill at Trinity Mills, a depot 16 miles from Dallas, Texas, and on the Dallas & Wichita Railroad, for sale at a great sacrifice. The mill has three run of stone, two for wheat, and one for corn. It has a capacity of 100 barrels per 24 hours; fine tubular boiler and good but old style engine; stones driven by beveled gear; mill built four years ago, and cost over \$9,000. With the mill I will sell 420 acres of more or less land, on which a at the mill are two dwellings of four rooms each and a large store-house; about 50 acres of superior prairie soil for field crops, fruit and vegetables; the balance is in timber and will afford perpetual fuel for the mill and fine pasturage. It is located on the Elm Fork of Trinity River, and is exceedingly fertile. I will sell the whole to a CASH purchaser for \$15 per acre—net more than the value of the land. There is plenty of wheat raised in the county. Satisfactory reasons for selling. Address immediately, DR. ROY B. SCOTT, Trinity Mills, Texas. apt\*

FOR SALE—A four-run steam flouring mill, all in first-class running order. Three 34 foot burrs for wheat and one 34 foot chopping burr, one Eureka wheat cleaner and a Eureka smutter, Garden City middlings purifier, Excelsior bran duster, Eureka flour packer and all other machinery necessary to complete a first-class mill. Two 28-hp boilers, 65-horse power engine. Still-well heater. Frame building and seven desirable town lots belonging to the property. Side track of A. T. & S. Railroad close by the mill, which is located in the city of Sterling, Rice Co., Kansas, in the midst of the best wheat district in the Arkansas valley. The parties owning the mill are not practical millers, and are engaged in other business. They will sell the property low and on easy terms. Address LANDIS & HOLLINGER, Sterling, Rice Co., Kan. feb\*

FOR SALE—We offer for sale the steam merchant flouring mill located at Peterson, Fillmore county, Minn., one of the finest wheat growing counties in the State. The mill is situated on the Southern Minnesota railroad, with side-track to the door of the mill, thus giving the best facilities for grinding wheat in transit. This road is being rapidly extended westward into the best wheat growing section in the North-west, so that the facilities for obtaining choice milling wheat are growing better each year. This mill was built in 1876; is 40 x 60 feet; three and one-half stories high above the basement. Contains eight run of burrs, with all the modern machinery; brick boiler and engine rooms, practically fire-proof, adjoining the mill 30 x 40 feet; two boilers and 22 x 34 inch cut-off engine built by us. The mill has a capacity of 150 barrels per day, and has a well established trade, the flour commanding the highest price in the market. This property will be sold cheap as we have no use for it. For further particulars inquire of FILLER, STOWELL & CO., Cream City Iron Works, Milwaukee, Wis. mrlt

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FOR SALE—Best Mill in Southern Pennsylvania—This mill, situated in a small village within a few miles of Broad Top coal fields, was recently rebuilt with all modern improvements and is in good repair. Mill is on a never-failing stream, with 30 feet head and is propelled by two turbine wheels. Has three run of burrs and one run of choppers. Building is frame, 42 by 50, and four stories high. Machinery is suited for making either merchant or custom work. Belonging to the mill are a good saw mill, 180 acres of farm land, 100 acres of valuable bark-tanbark land, three dwellings and a store-room. The owner of the above property will also sell three separate tracts of good bark and fine timber land, containing 400, 280 and 72 acres. For further particulars call on or address, WILSON BERGSTRESSER, New Grenada, Fulton Co., Pa. feb\*

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 80 acres of timber land one mile from town. Terms: \$2,000 cash down, and balance in store goods or on five years time. Address for full particulars, WM. SKINNER, Mount Morris, Waushara Co., Wis. feblt

FOR SALE—Flour and Saw Mill—One-half interest in a first-class three-run Steam Flour and Saw Mill. The saw mill is a double rotary, with gang edger, cut-off and bolt saws and shingle machine. It has been built but 18 months, and is in as good a wheat country as there is in the State. My object in selling is to have cash in hand to put in a good country store in connection with mill. Would prefer to sell to a miller or a man that is well posted in store business who can command from \$6,000 to \$7,000 and furnish good references. I will guarantee good margin to the trade. Address all communications to A. J. FULLERTON, Bonduel, Shawano Co., Wis. feblt

FOR SALE—Manchester, St. Louis Co., Mo., thirteen miles west of the city of St. Louis. It is located in a never-failing wheat country and is supplied directly by the farmers at reasonable figures. The mill has been run profitably for the past sixteen years. Was rebuilt on a thorough and convenient plan six years ago. Good reasons for wishing to sell or rent. Mill is running to its full capacity and is doing a good business. No competition, no railroads. All of the offal sold at the mill, and a large trade established for the flour. Will be sold to parties having part cash; long time given for remainder at a reasonable rate of interest, or will rent on reasonable terms. Address or call on the proprietor, JACOB SCHREINER, Manchester, Mo. feb\*

FOR SALE—A grain elevator in the best grain-growing section of Kansas. County seat. Splendid business. Address LOUIS C. WITHAUP, Clyde, Kansas. ap\*

FOR SALE—A whole or a half interest in a good three-run steam mill in a good wheat country. Mill doing a good business. Half will be sold very cheap. Address ROGERS & RAMBACH, West Liberty, Iowa. feb\*

FOR SALE—Steam power saw mill for sale cheap, and on reasonable terms. Mill is in good location, and is doing a good business. Satisfactory reasons will be given for selling. Call on, or address, SMITH & TUCKER, Cawker City, Kan. feb

FOR SALE—Custom and merchant mill; steam power; three run of burrs; the mill has a good run of custom and the flour a good reputation; mill is situated in a fine wheat country and at the junction of three railroads; satisfactory reasons given for wishing to sell. For particulars address Box 106, Altamont, Effingham county, Ill. apt\*

FOR SALE—Alabama Flour Mill—Two-run Custom and Merchant Mill in Springville, Alabama, complete. Excellent location. Good trade. Splendid climate. Mill close to a perpetual cold spring, furnishing water enough to run 15 or 20 horse-power turbine with 15 foot fall. Mill now uses steam power. Satisfactory reasons given for selling. Terms, \$1,500 down and \$500 in 12 months. Must be closed out soon. For further information address A. J. ADERHOLD, Springville, Ala. jan

FOR SALE—A good custom and merchant mill, three stories high, built of stone, with three run of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid home and business, and will be sold very cheap. For particulars call on or address E. G. GILBERT, Raubsville, Northampton Co., Pa. feb\*

FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4 1/2 acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 80 acres of timber land one mile from town. Terms: \$2,000 cash down, and balance in store goods or on five years time. Address for full particulars, WM. SKINNER, Mount Morris, Waushara Co., Wis. feblt

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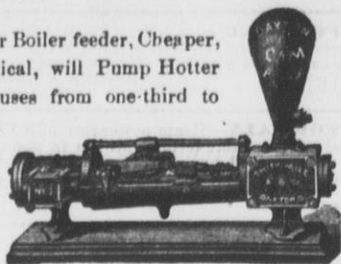
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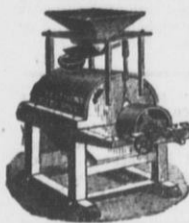
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It is a better Boiler feeder, Cheaper, More Economical, will Pump Hotter Water, and uses from one-third to one-half less steam than any other Pump.



BUY ALSO THE **KAESTNER PORTABLE MILL,**

which will do more and better work, with less power, less repairs, and stand more speed than any other mill made.



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Stave and Heading Machinery,

**ENGINES, BOILERS,**

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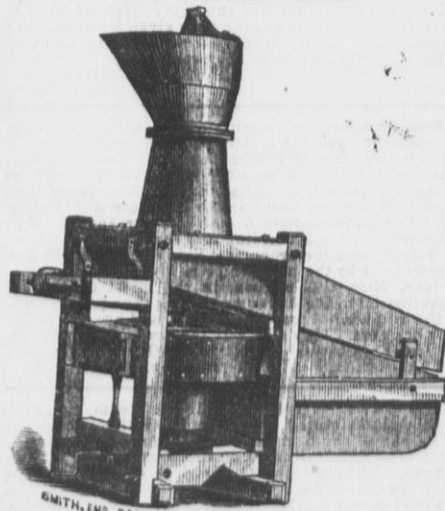
MANUFACTURER OF

**THE BEST QUALITY OF FRENCH BURR MILL-STONES.**

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**THE SILVER CREEK CORN SHELLER and CLEANER.**



It is Adjustable while Running. It is Especially Adapted to Millers' Use. It has no Equal in the World.

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**ATTENTION! MILLERS! ATTENTION**

**Wayman's Bolting BUG AND MOTH PREVENTIVE.**

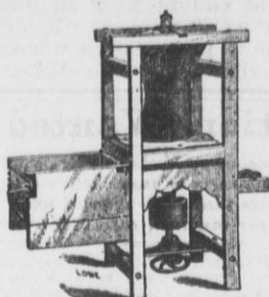
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This composition is put up in boxes sufficient to dress a four-reel chest, at \$5 per box. It will clean the cloth of all such pests as cause so much trouble in patching. It will not affect the flour nor damage the cloths, and is free from poison.

For particulars send for circulars. Address **JOHN WAYMAN,** Cobden, Union Co., Ill.



**R. P. WARD, MANUFACTURER OF THE IMPERIAL Corn Sheller**



**Adjustable While Running** So as to shell corn of any size.

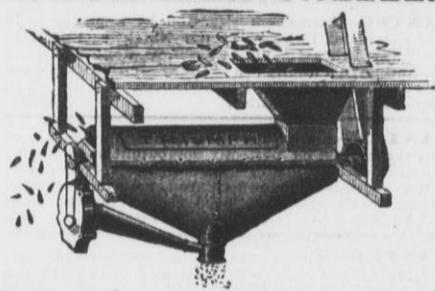
**WILL also CLEAN the SHELLED CORN.**

Send for descriptive circular.

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**TRIUMPH POWER CORN SHELLER!**



Shells and Cleans 2,000 Bushels Ears per day. The Cheapest, Best and most Simple Power Corn Sheller in use. Send for Circular and Price List.

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—OF—

**HENRY HERZER,**

MANUFACTURER AND DRESSER OF

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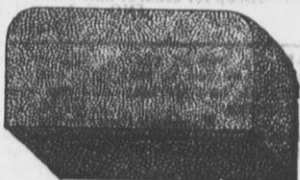
456 Canal Street,

MILWAUKEE, WISCONSIN.

I desire to call attention to the durability of MILL PICKS made and dressed by me. I manufacture them of the best ENGLISH STEEL, and warrant all work to give satisfaction.

I shall be pleased to receive your orders, as I always have a supply of New Picks on hand, and give particular attention to dressing Picks.

**GET THE BEST.**



**MILLER'S PATENT COMPOSITION BURR RUBBER.**

For Cleansing, Sharpening, and Facing Burrs, and Smoothing Furrows.

Warranted to produce a better grinding surface than the Pick or Diamond and save 50 per cent of labor in dressing Burrs and expense for tools. Face Rubber 10 x 6 x 3 in., weight 12 lbs., price \$3.00. Furrow Rubber, 10 x 6 x 1 1/2 or 1 1/4, 1 1/4 or 2 in., as required, price \$2.50 or both for \$5.00. Sent by express on receipt of price. Circulars free. Address all orders to the sole manufacturers, **MILLER & McCARTHY,** Mount Union, Penn.

**POOLE & HUNT, BALTIMORE**

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**THE POOLE & HUNT LEFFEL TURBINE**

**WATER WHEELS,**

**MACHINE MOULDED MILL CEARING,**

SHAFTING, PULLEYS AND HANGERS,

STEAM ENGINES AND BOILERS,

MIXERS FOR FERTILIZERS AND CHEMICALS.

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**VOECHTING, SHAPE & CO.,**

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BOTTLE SUPPLIES CONSTANTLY ON HAND.



**Stout, Mills & Temple,**

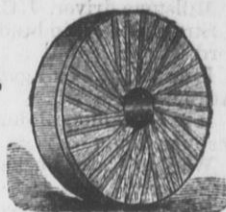
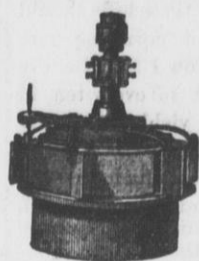
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**AMERICAN TURBINE WATER WHEEL,** Best Quality French Burr Millstones.

Sole Agents in Dayton for the sale of DU FOUR & CO.'S CELEBRATED BOLTING CLOTHS.

Flour and Paper Mill Machinery, Best Chilled or Porcelain Rolls for Crushing Wheat or Middlings, AND GENERAL MILL FURNISHINGS.



The AMERICAN TURBINE, as recently improved, is unequalled in the power utilized from a given quantity of water, and is decidedly the BEST PART GATE Water Wheel ever known. It has also been otherwise greatly improved.

Large Illustrated Catalogue Sent Free on Application.

**HULBERT & PAIGE, MILL BUILDERS, CONTRACTORS,**

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MANUFACTURERS OF

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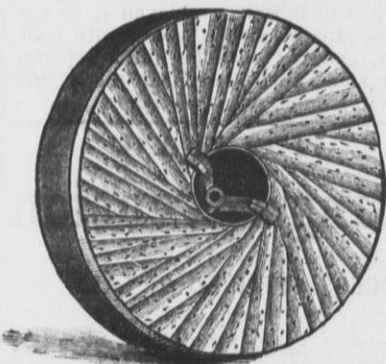
Triumph Power Corn Sheller.

Plans and specifications made by accomplished Mechanical Engineers and Millwrights.

Send for Illustrated Catalogue "G."

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BRANCH HOUSE, Kansas City, Mo.

**Noye's Patent Pick Holder**

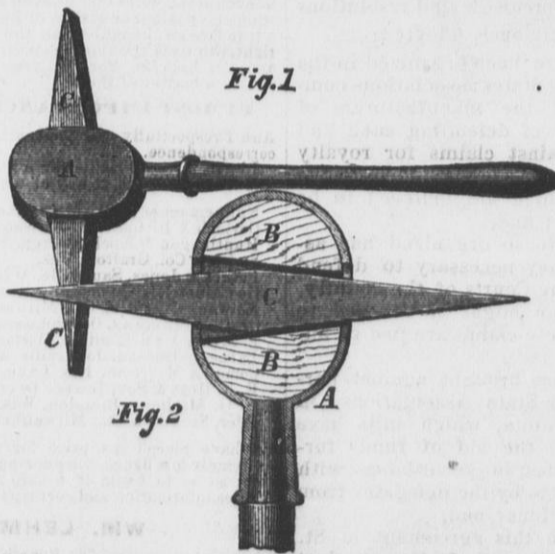


Fig. 1

Fig. 2

**The Only Holder Worthy of the Name.**

The Pick can be adjusted at will to strike the Stone at any desired angle. We have constantly on hand a large assortment of our celebrated

**Cast Steel Mill Picks**

AT PRICES TO SUIT THE TIMES.

**JOHN T. NOYE & SON,** Buffalo, New York.

apr-12p

**B. F. GUMP,**

No. 53 South Canal Street, Chicago, Illinois.

**GENERAL MILL FURNISHER,**

COMMISSION MERCHANT,

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**GENUINE DUFOUR & CO.**

**BOLTING CLOTHS.**

I HANDLE NO OTHER BRAND.

All numbers kept constantly in stock to supply the largest order at a moment's notice. Grit-Gauge Cloths equal in Mesh to 000 to number 6 inclusive always on hand.

**Flour Mill Trimmings a Specialty.**

Such as Rubber, Leather, and Solid Wove Cotton Belting, Elevator Buckets and Bolts, Bran Dusters, Wire Cloth, Plated Wire Cloth, Brass Wire Cloth, Water and Steam Gauges, Boiler Injectors, Pumps, Packing, Smutters, Corn Shellers, Portable Mills, &c., &c. And all necessary articles for Mills at prices to suit the times. Send in your orders.

**The Millers' Text Book.**

By Jas. McLean, of Glasgow, Scotland.

A DESCRIPTIVE AND EXPLANATORY ACCOUNT of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation, including gold sifting, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to B. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 92 Grand Opera House, Milwaukee, Wis., who is sole agent for America.