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# The United States

# MILLER

Volume 10.—No. 1.

MILWAUKEE, NOVEMBER, 1880.

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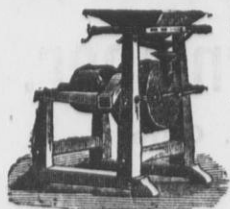
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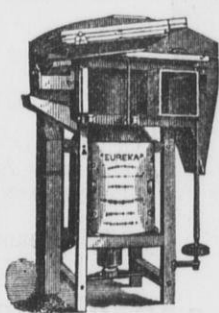
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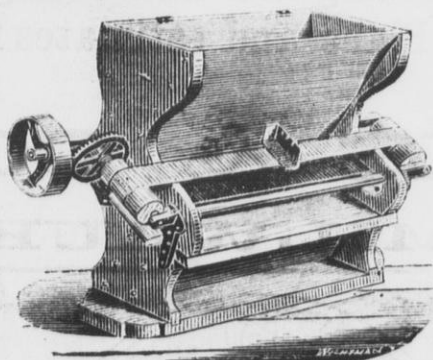
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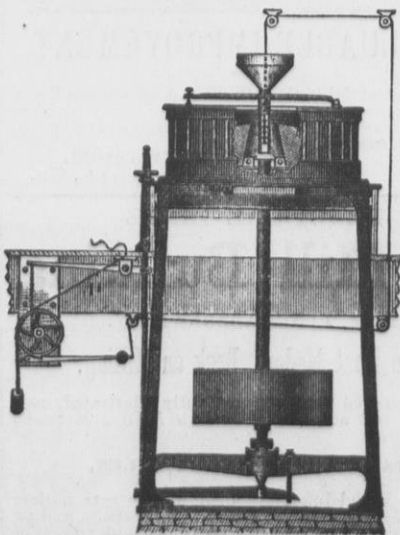
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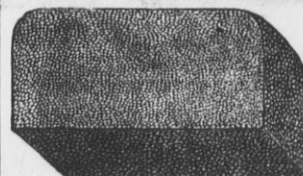
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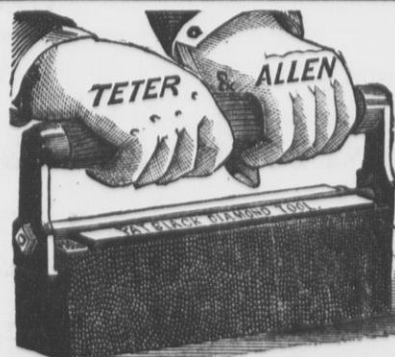
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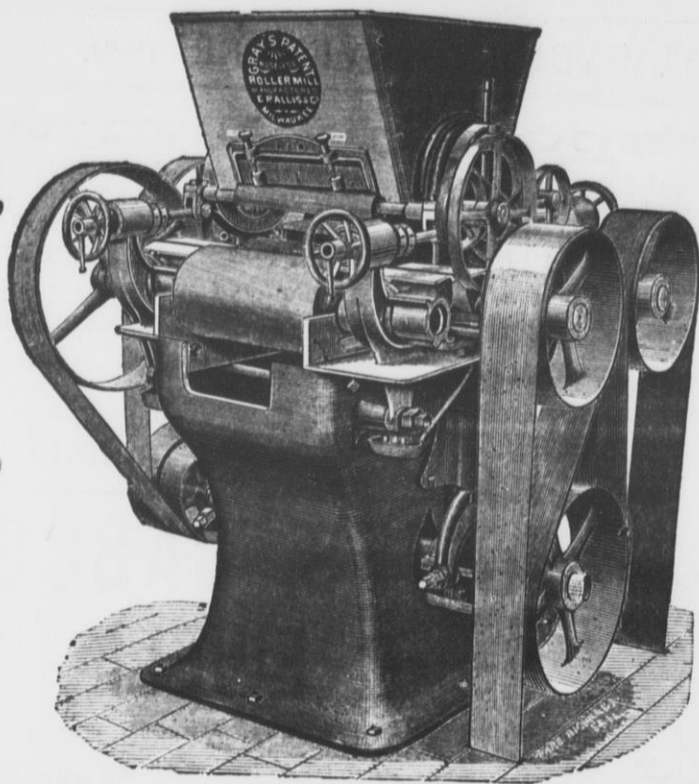
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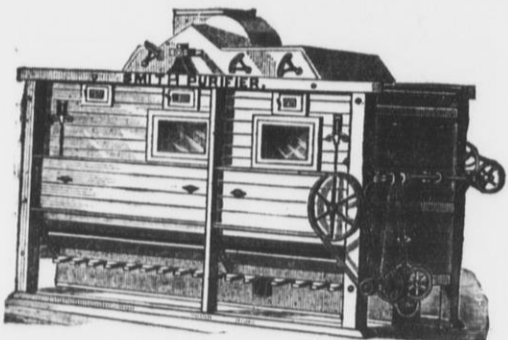
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# The United States MILLER

Volume 10.—No. 1.

MILWAUKEE, NOVEMBER, 1880.

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## Ancient Mills.

FROM THE GERMAN OF JOHN BECKMANN.

When Vitiges, King of the Goths, besieged Belisarius in Rome, in the year 536, and caused the fourteen large expensive aqueducts to be stopped, the city was subjected to great distress; not through the want of water in general, because it was secured against that inconvenience by the Tiber, but by the loss of the water which the baths required, and above all, of that necessary to drive the mills, which were all situated on these canals. Horses and cattle, which might have been employed in grinding, were not to be found; but Belisarius fell upon the ingenious contrivance of placing boats upon the Tiber, on which he erected mills that were driven by the current. This experiment was attended with complete success; and as many mills of this kind as were necessary were constructed. To destroy these the besiegers threw into the stream logs of wood and dead bodies, which floated down the river into the city; but the besieged, by making use of booms, to stop them, were enabled to drag them out before they could do any mischief. This seems to be the invention of floating mills, at least I know of no other. It is certain that by these means the use of water-mills became very much extended; for floating-mills can be constructed almost upon any stream, without forming an artificial fall; they can be stationed at the most convenient places, and they rise and fall of themselves with the water. They are, however, attended with these inconveniences, that they require to be strongly secured; that they often block up the stream too much, and move slowly; and that they frequently stop when the water is too high, or when it is frozen.

After this improvement the use of water-mills was never laid aside or forgotten; they were soon made known all over Europe; and were it worth the trouble one might quote passages in which they were mentioned in every century. The Roman, Salic, and other laws provided for the security of these mills which they call *molina* or *farinaria*; and define a punishment for those who destroy the sluices, or steal the mill-irons (*ferramentum*). But there were water-mills in Germany and France a hundred years before the Salic laws were formed. Ausonius, who lived about the year 379, mentions some which were then still remaining on a small stream that falls into the Moselle, and which were noticed also by Fortunatus, in the fifth century. Gregory of Tours, who wrote toward the end of the sixth century, speaks of a water-mill which was situated near the town Dijon; and of another which a certain abbot caused to be built for the benefit of his convent. Brito, who in the beginning of the thirteenth century wrote in verse an account of the actions of Philip Augustus, King of France, relates how by the piercing of a dam the mills near Gournay (*castrum Gornacum* or *Cornacum*) were destroyed to the great detriment of the besieged. In the first crusade, at the end of the eleventh century, the Germans burned in Bulgaria seven mills which were situated below a bridge on a small rivulet, and which seem to have been floating-mills. In deeds of the twelfth and thirteenth century, water-mills are often called *aquimollia*, *aqaimoli*, *aquismoli*, *aquimola*. Petrus Damiani, one of the fathers of the eleventh century, says, "*Sicut aquimolum nequaquam potest sine gurgitis inundantia frumenta permolere, ita, etc.*"

At Venice and other places, there were mills which righted themselves by the ebbing and flowing of the tide, and which every six hours changed the position of the wheels. Zanetti has shown, from some old charters, that such mills existed about the year 1044; and with still more certainty in 1078, 1079 and 1107. In one charter are the words: *Super tota ipso aquimola molendina posito in palude juxta campo allo*; where the expression, *aquimolum molen-*

*dina* deserves to be particularly remarked, as it perhaps indicates that the mill in question was a proper grinding mill. Should this conjecture be well founded, it would prove that so early as the eleventh century water-mills were used not only for grinding corn, but for many other purposes.

It appears that hand and cattle-mills were everywhere still retained at private houses a long time after the erection of water-mills. We read in the life of St. Benedict, that he had a mill with an ass, to grind corn for himself and his colleagues. Among the legendary tales of St. Bertin, there is one of a woman who, because she ground corn on a fast day, lost the use of her arm; and of another whose hand stuck to the handle, because she undertook the same work at an unseasonable time. More wonders of this kind are to be found at later periods in the Popish mythology. Such small mills remained long in the convents; and it was considered as a great merit in many ecclesiastics, that they ground their own corn in order to make bread. The real cause of this was, that as the convents were entirely independent of every person, without their walls, they wished to supply all their wants themselves as far as possible; and as these lazy ecclesiastics had, besides, too little labor and exercise, they employed grinding as an amusement, and to enable them to digest better their ill-deserved food. Sulpicius Severus gives an account of the mode of living of an Eastern monk in the beginning of the fifth century, and says expressly that he ground his own corn. Gregory of Tours mentions an abbot who eased his monks of their labor at the hand-mill, by erecting a water mill. It deserves here to be remarked, that in the sixth century malefactors in France were condemned to the mill, as is proved by the history of Septimina the nurse of Childebert.

The entrusting of that violent element water to support and drive mills constructed with great art, displayed no little share of boldness; but it was still more adventurous to employ the no less violent but much more untractable, and always changeable wind for the same purpose. Though the strength and direction of the wind cannot be any way altered, it has, however, been found possible to devise means by which a building can be moved in such a manner that it shall be exposed to neither more nor less wind than is necessary, let it come from what quarter it may.

It is very improbable, or much rather false, that the Romans had wind-mills, though Pomponius Sabinus affirms so, but without any proof. Vitruvius, where he speaks of all moving forces, mentions also the wind; but he does not say a word of wind-mills; nor are they noticed either by Seneca or Chrysostom, who have both spoken of the advantages of the wind. I consider as false, also, the account given by an old Bohemian annalist, who says that before the year 718 there were none but wind-mills in Bohemia, and that water-mills were then introduced for the first time. I am of opinion that the author meant to have written *hand and cattle-mills*, instead of *wind-mills*.

It has been often asserted that these mills were first invented in the East, and introduced into Europe by the crusaders; but this also is improbable; for mills of this kind are not at all, or very seldom, found in the East. There are none of them in Persia, Palestine or Arabia, and even water-mills are there uncommon, and constructed on a small scale. Besides, we find wind-mills before the crusades, or at least at the time when they were first undertaken. It is probable that these buildings may have been made known to a great part of Europe, and particularly in France and England, by these who returned from these expeditions; but it does not thence follow that they were invented in the East. The crusaders perhaps saw such mills in the course of their travels through Europe, very

probably in Germany, which is the original country of most large machines. In the like manner, the knowledge of several useful things has been introduced into Germany by soldiers who have returned from different wars; as the English and French, after their return from the last war, made known in their respective countries many of our useful implements of husbandry, such as our straw-chopper, scythe, etc.

Mabillon mentions a diploma of the year 1105, in which a convent in France is allowed to erect water and wind-mills, *molendina ad ventum*. In the year 1143, there was in Northamptonshire an abbey (Pipewell) situated in a wood, which in the course of 180 years was entirely destroyed. One cause of its destruction was said to be, that in the whole neighborhood there was no house, wind or water-mill built, for which timber was not taken from this wood. In the twelfth century, when these mills began to be more common, a dispute arose whether the tithes of them belonged to the clergy; and Pope Celestine III. determined the question in favor of the church. In the year 1332, one Bartolomeo Verde proposed to the Venetians to build a wind-mill. When his plan had been examined, a piece of ground was assigned to him, which he was to retain in case his undertaking should succeed within a time specified. In the year 1393, the city of Spire caused a wind-mill to be erected, and sent to the Netherlands for a person acquainted with the method of grinding by it. A wind-mill was also constructed at Frankfurt in 1442, but I do not know whether there had not been such there before.

To turn the mill to the wind, two methods have been invented. The whole building is constructed in such a manner as to turn on a post below, or the roof alone, together with the axle-tree, and the wings are movable. Mills of the former kind are called German mills, those of the latter Dutch. They are both moved round either by a wheel and pinion within, or by a long lever without. I am inclined to believe that the German mills are older than the Dutch; for the earliest descriptions which I can remember, speak only of the former. Cardan, in whose time wind-mills were very common both in France and Italy, makes, however, no mention of the latter; and the Dutch themselves affirm that the mode of building with a movable roof was first found out by a Fleming in the middle of the sixteenth century. These mills by which in Holland the water is drawn up and thrown off from the land, one of which was built at Alkmaar in 1408, another at Schoonhoven in 1450, and a third at Enkhuisen in 1452, were at first driven by horses, and afterwards by wind. But as these mills were immovable, and could work only when the wind was in one quarter, they were afterwards placed not on the ground, but on a float which could be moved round in such a manner that the mill should catch every wind. This method gave rise, perhaps, to the invention of movable mills.

It is highly probable that in the early ages men were satisfied with only grinding their corn, and that in the course of time they fell upon the invention of separating the meal from the pollard or bran. This was at first done by a sieve moved with the hands; and even yet in France, when what is called *mouture en grosse* is employed, there is a particular place for bolting where the sieve is moved with the hand by means of a handle. It is customary also in many parts of Lower Saxony and Alsace to bolt the flour separately; for which purpose various sieves are necessary. The Romans had two principal kinds, *oribra excussoria* and *polinaria*, the latter of which gave the finest flour, called *pollen*. Sieves of horse-hair were first made by the Gauls, and those of linen by the Spaniards. The method of applying a sieve in the form of an extended bag to the works of the mill, that the meal might fall into it as it came from the stones, and of

causing it to be turned and shaken by the machinery, was first made known in the beginning of the sixteenth century, as we are expressly told in several ancient chronicles.

This invention gave rise to an employment which at present maintains a great many people; I mean that of preparing bolting-cloths, or those kinds of cloths through which meal is sifted in mills. As this cloth is universally used, a considerable quantity of it is consumed. For one bolting-cloth five yards are required; we may allow, therefore, twenty-five to each mill in the course of a year.

When this is considered, it will not appear improbable that the electorate of Saxony, according to a calculation made towards the end of the seventeenth century, when manufactories of this cloth were established, paid for it yearly to foreigners from twelve to fifteen thousand rix-dollars. That kind of bolting-cloth also which is used for a variety of needle work for young ladies' samplers, and for filling up the frames for window screens, etc., is wove after the manner of gauze, of fine-spun woollen yarn. One might imagine that this manufacture could not be attended with any difficulty; yet it requires many ingenious operations which the Germans cannot easily perform, and with which they are, perhaps, not yet perfectly acquainted. However this may be, large quantities of bolting-cloth are imported from England. It indeed costs half as much again per yard as the German cloth, but it lasts much longer. A bolting-cloth of English manufacture will continue good three months, but one of German will last scarcely three weeks. The wool necessary for making this cloth must be long, well-washed, and spun to a fine equal thread, which, before it is scoured, must be scalded in hot water to prevent it from shrinking. The web must be stiffened; and in this the English have an advantage we have yet not been able to attain. Their bolting-cloth is stiffer as well as smoother, and lets the flour much better through it than ours, which is either a little or not at all stiffened.

The places where this cloth is made are also numerous. A manufactory of it was established at Ostra, near Dresden, by Daniel Kraft, about the end of the seventeenth century; and to raise him a capital for carrying it on, every mill was obliged to pay him a dollar. Hartau, near Zittau, is indebted for its manufactory to Daniel Plessky, a linen-weaver of the latter, who learned the art of making bolting-cloth in Hungary, when on a visit to his relatives, and was enabled to carry it on by the assistance of a schoolmaster named Strietzel. Since that period this business has been continued there and become common. The cloth which is sent for sale, not only everywhere around the country, but also in Bohemia, Moravia and Silesia, is worn in pieces. Each piece contains from 64 to 65 Leipsic ells; the narrowest is ten, and the widest fourteen inches in breadth. A piece of the former costs at present from four to four dollars and a half, and one of the latter six dollars. This cloth, it must be allowed, is not very white; but it is not liable to spoil by lying in warehouses. Large quantities of bolting-cloth are made also by a company in the duchy of Wurtemberg. At what time this art was introduced there I cannot say; for everything I know of it I am indebted to a friend, who collected for me the following information on his return through that country: The cloth is not woven in a manufactory, but by 18 or 20 master weavers, under the inspection of a company who pay them, and who supply all the materials. The company alone has the privilege of dealing in this cloth; and the millers must purchase from their agents whatever quantity they have occasion for. The millers, however, choose rather, if they can, to supply themselves privately with foreign and other home-made bolting cloth, as they complain that the weavers engaged by the company do not bestow sufficient care to render their cloth durable; besides, the persons employed to carry about this cloth for sale, often purchased secretly cloth of an inferior quality in other places, and sell it as that of the company. Bolting-cloth is made also at Gera, as well as at Potsdam and Berlin; at the latter of which there is a manufactory of it carried on by the Jews.—*American Miller.*

UNITED STATES MILLER.

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WM. DUNHAM, Editor of "The Miller," 60 Mark Lane, and HENRY F. GILLIG & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

MILWAUKEE, NOVEMBER, 1880.

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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.

MILLERS' DIRECTORY FOR 1880.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,600 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of 75 of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Five Dollars, on receipt of which Directory will be forwarded post-paid by mail, registered. Address  
UNITED STATES MILLER,  
MILWAUKEE, WIS.

The next International Millers' Association in Austria, will be held at Vienna, in 1882.

Over \$2,000,000 worth of dried yeast was imported by Great Britain in the year 1879.

The suit of Downton vs. Allis is set for trial in Milwaukee during the last week in November.

READ the advertisement of H. P. Yale & Co. This is a reliable Milwaukee firm, and they can fill your orders promptly and satisfactorily.

Of the 70,400,000 bushels of wheat imported by France for the year ending July 30, 1880, 44,000,000 bushels came from the United States.

A FOREIGN milling paper says that a barrel of flour can be shipped from Milwaukee to Liverpool cheaper than from Budapest to Vienna.

We publish in this issue the reports of the German and Austrian Millers' Associations as they appear in the October number of *The Miller*, London.

If you are not already a subscriber to the UNITED STATES MILLER, send one dollar at once and begin with our Nov. number, which commences the tenth volume.

\$120,558 worth of bolting cloth was imported into the United States during the three months ended June 30, 1880. During the same period last year \$67,358 worth were imported.

HON. E. G. RYAN, Chief Justice of the State of Wisconsin, and one of the most noted lawyers in this country, died at Madison, Oct. 20th. He was buried in Forest Home cemetery, Milwaukee, Oct. 22.

ADVICES from Buenos Ayres say: "A terrific snow storm occurred in this province on the 18th of September, and it is estimated that 700,000 cattle, 500,000 sheep, and 250,000 horses perished."

THE Melbourne International Exhibition opened October 1. The opening was attended by all the pomp and power possible to centralize at the time and place. The Exhibition is large, and nearly all countries are represented.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

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.

A GOOD miller's wages in London varies from \$7.20 to \$8.16 per week. They work from 6 A. M. to 6 P. M. every day, except Saturdays, when the quit at 4 P. M. Night hands get 10 cents per hour, and the London operatives are "kicking" for a raise.

In Milwaukee there resides a dog that can tell Sunday from work days. On Sunday he never barks, plays, or fights with other dogs, and regularly attends the Methodist church. He is much respected in the community. It is needless to say that his master is an honest miller.

WE acknowledge the receipt of the very extensive and valuable catalogue of Franquet Bros., of Oberhausen an der Ruhr, manufacturers of all manner of perforated metal plates for all sorts of purposes. Manufacturers of grain separators and cleaners will do well to send for their catalogue.

WE are pained to learn of the death of Samuel Wylde, Esq., a prominent miller of Runcorn, England. Mr. Wylde visited the United States three years ago and made many friends while here. His son, who was a resident of Milwaukee for some years, we are informed will now remain permanently in England.

MESSRS. FRANK & FLAMANT, the well known newspaper advertising agents, No. 149 Broadway, N. Y., have admitted John J. Kiernan to active partnership, under the firm name of Frank, Kiernan & Co. Publishers and advertising patrons will do well to consult them. They enjoy a good business reputation in this and foreign countries.

TRULY, the millers are not overpaid in Austria. In Vienna, the capitol of that Empire, workmen are paid \$4.08 per week for working sixteen hours per day. On account of depression in business in September, it was proposed to lower this rate of wages, but the workmen objected, and ninety employes in one mill struck.

THE *Corn Trade Journal and Millers' Gazette*, London, has recently shown commendable enterprise by issuing a well-bound extra number of 72 pages, giving a very complete description, with copious illustrations, of the late International Millers' Exhibition at Cincinnati. We are glad to learn that the circulation of this paper is quite extensive in the United States.

THE *Revista Mensual Para los Molinos* (South American Miller), for August, is just at hand and is an interesting paper. It contains arti-

cles descriptive of the Millers' International Exhibition at Cincinnati, Pampa rice, the South American Exhibition in Buenos Ayres, Engines, and rules for running them, commercial review and news in general. It is printed in the Spanish language.

THE Board of Trade of Chicago are taking steps toward erecting the most palatial Chamber of Commerce building in the world, and there is little doubt but that the project will be materialized soon. The plans so far as considered indicate that the building will occupy a half block of ground, and be eight stories in height. The cost is estimated at \$4,000,000 and it is believed that the offices can be rented so as to produce a revenue of seven per cent on that sum.

THE *American Brewers' Gazette*, of No. 194 Fulton street, N. Y., is one of our valued exchanges. It is edited and published by Mr. John Flinthoff, a gentleman of great ability and thoroughly conversant with the technicalities of the brewing business. Mr. Flinthoff is about to publish a "History of the American Breweries," which will be a valuable acquisition to the brewer's library. We commend the *Gazette* and the forthcoming "History of American Breweries" to the interested public.

FROM the report of Chief of the Bureau of Statistics, dated October 18, we learn that the total value of the exports of breadstuffs during the month of September, 1880, was \$23,881,936, as against \$35,828,848 in September, 1879. The total value of exports of breadstuffs for the nine months ending Sept. 30, 1880, was \$208,679,542, against \$176,399,946 for the same period in 1879. In September, 1880, we exported 14,262,655 bushels of wheat, and 607,542 barrels of flour; in September, 1879, 25,593,628 bushels of wheat and 517,354 barrels of flour.

CHAS. RANDOLPH, Secretary of the Board of Trade, has completed the census of the labor and capital employed in Chicago manufacturing establishments, and returned the same to the United States Census Bureau. There are 3752 manufactories, employing 113,507 hands, and representing a capital of over eighty million dollars. Number of women employed, 15,718, and boys and girls under sixteen, 4,797. The value of the product made per annum is \$249,000,000. Value of material used, \$178,000,000. The wages paid are \$37,000,000.

FIFTY years ago the 15th of last September the first railway on an extended scale, the Manchester and Liverpool, was opened for business. The little Stockton and Darlington road had been opened four or five years before, but that was a short line for local purposes. The Manchester and Liverpool was the commencement of railway building on a large scale for the transaction of heavy traffic. In the same year that it was completed, 1830, the United States could boast of 26 miles of patchwork lines; and a short iron tramway for vehicles, drawn by horses, in Austria, completed, probably, the railway system of the world. What an incredible change in fifty years—over 200,000 miles of railways now in operation, and each year increasing the number by thousands of miles!—*Railway Age*.

PRESERVING GRAIN CARGOES IN BULK.—A new system of preserving cargoes of grain in bulk has been tested at Antwerp, in the presence of the commercial bodies of that city, which, it is claimed, will keep grain in a state of perfect preservation for a year or longer. The principle consists in covering the floor on which the grain rests with perforated sheet-iron and forcing a current of dry air through the grain. Analogous to this is a suggestion made in a recent number of the *Railway Review* for preserving grain in transit. The *Review* starts out with the assertion that while grain itself is the most solid and dry of all produce, "it is certain to deteriorate in railway carriage from 1 to 5 per cent. between Chicago and New York, and if shipped the least damp it would be a total loss." To avoid this danger of sweating while in transit, it suggests that a means be contrived whereby the air created by the motion of every fast-moving train shall be passed through the wheat or corn, so that it may carry away captive every particle of moisture, and in so doing leave the grain cool and incapable of further ferment. As the motion of the train forms the mechanical force, it is alleged that this can be done "without money and without price."

SUBSCRIBE for the U. S. MILLER.

An International Milling Exhibition in England.

We have recently received the following circular letter.

NATIONAL ASSOCIATION OF BRITISH AND IRISH MILLERS,  
61 MARK LANE, LONDON, Sept. 30, 1880.  
Editor *United States Miller*.

I am directed by the council of this association to inform you that they have made arrangements for the holding of an international exhibition of flour mill machinery at the Agricultural Hall, London, in the early part of the month of May next.

This is the first exhibition of the kind that has been attempted in this country, and from the large amount of space that is available, and the very central position of the hall, as well as the great facility of access to it, the council has every reason to believe that a most successful show of everything relating to modern milling will be the result.

It is not the intention of the council to attempt in the present experimental stage of the milling industry anything in the way of prizes or medals for machines. Ample steam power will be provided, so that each maker may be able to show the results he may promise, and every facility will be afforded visitors to use their own judgment unfettered by any official recommendation.

From the numerous promises of support that are coming in, it is fully expected that the exhibition, in addition to being the best that has ever been held, will also be the largest. I shall, therefore, be extremely obliged if you will kindly use your best endeavors to induce an early application for space, so that the committee appointed to arrange the various exhibits may make a speedy commencement of their labors. I am, dear sir, yours very obediently,  
J. H. CHATTERTON, Sec'y.

We have no doubt but the exhibition will prove a great success and will be very full and complete. It is already assured that many prominent American manufacturers will be fully represented. If suitable arrangements are made for reduced fares it is also more than probable that a good many of our well-to-do millers will also attend. The cost of the trip, however, will not be considered by our millers as much as the time it will take. It is characteristic of our business men to desire to save time as much as possible, and when the milling business is prosperous as it is now, verily "time is money." We shall keep our readers advised of the progress of this important enterprise.

The Milling Newspapers of the World.

The total number of milling papers published at present in the world is twenty, of which eleven are published in the United States, two in Great Britain, three in Germany, two in Austria, one in France, and one in South America. The object of all these papers is to supply millers with needful statistics, trade news, technical information, and to explain and advertise new machinery and processes useful to the milling industry. The United States is more fully supplied with this class of literature than any other country. The names of the papers published in this country are as follows: THE UNITED STATES MILLER, Milwaukee, Wis.; THE *American Miller*, Chicago, Ill.; THE *Deutsche Amerikanische Mueller*, Chicago, Ill.; THE *Milling World*, Buffalo, N. Y.; LEFFEL'S *Milling News*, Springfield, Ohio; THE *Miller and Millwright*, Cincinnati, Ohio; THE *Millstone*, Indianapolis, Ind.; THE *Grain Cleaner*, Moline, Ill.; all of which are published monthly. THE *St. Louis Miller*, St. Louis, Mo., is published semi-monthly; THE *Northwestern Miller*, of Minneapolis, Minn., and THE *Milling Journal*, of New York, weekly; and THE *Millers' Magazine*, Chicago, Ill., quarterly. These papers all seem to be enjoying a very good business, and are recognized as indispensable to the trade. In Great Britain we find THE *Miller*, and THE *Corn Trade Journal and Millers' Gazette*, both published in London. In France the only milling paper is LE *Meunier*, published in Paris. In Germany we find THE *Deutsche Mueller-Zeitung*, *Allgemeine Mueller-Zeitung*, Berlin, and *Die Muehle*, Leipzig. In Austria we find THE *Ungarische Muehlen-Zeitung* (Hungarian Millers' Journal), in Budapest, and the *Austro-Hungarian Miller*, in Vienna.

In South America there is but one paper devoted to the flour milling interests. It is published in the Spanish language at Buenos Ayres, in the Argentine Republic, and is called by the somewhat extensive name of *Revista Mensual para los Molinos*.

From all indications mill owners have renewed confidence in the future of the milling business. A great many are preparing for an increased business by enlarging and improving their mills. Nordyke & Marmon Co., of Indianapolis, Ind., say that business has never before been so good with them at this time of the year.

**Case's Improved Middling Purifier.**

We are always pleased to lay before our readers anything new touching the milling interest if it is possessed of true merit. Nothing in the mill is receiving so much attention at the hands of millers and inventors as the purifier. And nothing that has been added to milling of late years is of equal importance to the miller. We bring to the notice of our readers a purifier, which, while not entirely new, may be new to many of them, and which appears to combine many new and special points of merit not heretofore offered to the milling public. This purifier has been on the market for some time, and is to be found in some of the largest and most progressive mills in the country, and the company, in their illustrated circular, call attention to the praise that has been given it by their customers, covering a wide scope of territory and including many of the best mills, which is flattering to the manufacturers. In calling attention to the Case purifier, made by the Case Mfg. Co., of Columbus, Ohio, we cannot, of course, enlarge upon it to the extent the manufacturers do, whose faith in their machine is evidenced by the strong language and many statements and propositions, which could only come from the knowledge of past successes. Beside the general claim that the Case machine is meeting with favor wherever known, both by millers and proprietors, we enumerate some of their special claims as follows:

1. That it is a double, triple or quadruple machine, that is that a number of purifiers separate and distinct from each other may, under their patents, be put in one frame, all of which operate easily and perfectly. They claim they can put a purifier in every 3½ feet of perpendicular space. The great advantage of this in crowded mills need not be dwelt on. This feature alone would cause every miller to investigate the claims of the manufacturers.

2. Their patent cloth cleaning device they claim to be superior to any method ever invented. While a description of it in detail cannot be attempted here, the statements of responsible parties who are using it will arrest the attention of every one who sees them, as so much has been written and invented to obviate the cloth cleaning difficulty, so many inventions have proven failures, that any new method, coming highly recommended by those using it, as this is, will surely be welcomed by millers generally. It is claimed that no *hand brushing* is done on the Case purifier.

3. The Case machine dispenses with the roller commonly used to accomplish the feed, and substitutes in its place a patented automatic feed box, a simple arrangement by which the middlings are very evenly distributed over all the width of the cloth in the most perfect manner. It starts and stops with the mill, and does not spill a quantity on the cloth, when the machine stops, to clog and choke up again when started. The demand for this patent feed box has been so great that the company are making a specialty of supplying them for other machines.

4. It dispenses entirely with the old-fashioned screw conveyor, and has in its place conveyor boards directly under the cloth, which shake with it, and so arranged that the returns may be cut off at any point desired. This is a great point gained as it does away with a large amount of gearing, belting, pulleys, etc., all of which absorb power and are expensive and annoying.

5. The space immediately under the screens is open, so that the miller can see and handle the purified middlings with the greatest convenience, and can determine when to increase or decrease the blast.

6. By the cut-off used in the Case machine the returns may be drawn to within a half inch from any part of the machine in a moment, by simply drawing a valve. Millers accustomed to the use of purifiers will appreciate this.

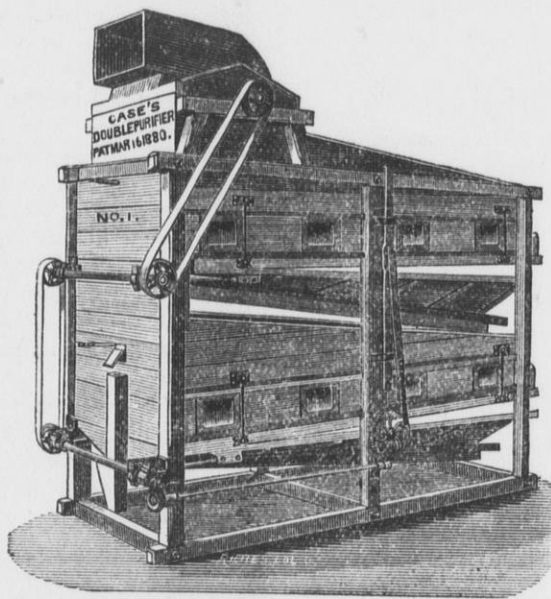
7. The fan in this purifier is so arranged that it can be made to blow either way, a great advantage in making connection with dust room, and one which often saves much expense in spouting and elevators.

8. Much is claimed for this machine on account of the control it has over the blast. The most convenient and efficient appliances accomplish this result. By simply drawing a valve stem the blast on any part of the screen can be changed in a moment. The practical miller cannot fail to be pleased with this arrangement, as the blast performs so important a part in purifying middlings. Owing mainly to this complete mastery of the blast, they claim a very small amount of waste in the dust room.

9. A new feature for the first time introduced on this machine, is a small bracket, suspended opposite each window, inside the suction chamber. The material accumulating on these brackets, indicates at all times just what is being carried into the dust room, a convenient and valuable arrangement.

10. The manufacturers claim also for the Case purifier, superior mechanical construction. They fully appreciate the importance of this and they assure us that it is well and heavily built throughout, and that every machine is fully tested before leaving the factory. They evidence their faith in it by publishing a statement in which they guarantee that their double machine will do as much work and do it as well as any two machines of any other make. This is certainly a strong announcement and they cannot hope to keep it long before the public if it be untrue. The purifier being double it practically cuts the price in two. Their price list being for two purifiers in one frame less than that for one of other standard machines, an important item to all millers.

With the principles above enumerated—which they claim are fully protected by patents which infringe on no inventors rights—embodied in their machine, the Case Purifier Co. cannot fail to attain success if it is in the hands of a concern possessed of abundant



CASE'S IMPROVED MIDDINGS PURIFIER.

capital and business energy, which we are assured is the case. All in need of purifying machinery are invited to correspond with the company at Columbus, Ohio.

**Millers' Law in Wisconsin.**

CONCERNING MILLS AND MILL-DAMS.—CHAPTER XLVI.

SECTION 3374. Any person may erect and maintain a water mill, and a dam to raise water for working it, upon and across any stream that is not navigable, upon the terms and conditions, and subject to the regulations hereinafter expressed.

SEC. 3375. No such dam shall be erected to the injury of any mill lawfully existing, either above or below it on the same stream, nor to the injury of any mill site on the same stream, on which a mill or mill dam shall have been lawfully erected and used, or is in process of erection, unless the right to maintain a mill on such last mentioned site shall have been lost or defeated by abandonment or otherwise, nor to the injury of any such mill site which has been occupied as such by the owner thereof, if such owner, within a reasonable time after commencing such occupation, completes and puts in operation a mill for the working of which the water of such stream shall be applied; nor shall any mill or dam be placed on the land of any person without such grant, conveyance or authority from the owner, as would be necessary by the common law, if no provisions relating to mills and mill dams had been made by statute.

SEC. 3376. The height to which water may be raised, and the length or period of time for which it may be kept up in each year, shall be liable to be restricted and regulated by the verdict of a jury, as provided in this chapter.

SEC. 3377. Any person whose land is overflowed, or otherwise injured by any such dam, may obtain compensation therefor in a civil action, as provided in this chapter, against the owner thereof, or the owner and occupant jointly, in the circuit court for the county where the land or any part thereof lies, but in no other manner; but no compensation for any damages sustained more than three years before the commencement of such action shall be recovered therein; except as otherwise prescribed in this chapter the proceedings shall be in all respects as in other civil actions.

SEC. 3378. The complaint in such action shall contain a description of the land alleged to be flowed or injured, and of the interest of the plaintiff therein, and such statement of the damages and demand for judgment that the record of the case shall show with sufficient certainty the matter that shall have been heard and determined.

SEC. 3379. The defendant may, in his answer, deny that the plaintiff has any interest in the land alleged to be flowed or injured, or allege that the defendant has a right to maintain his dam for an agreed price or without any compensation, or any other matter which may show that the plaintiff cannot maintain his action or is not injured by such dam.

SEC. 3380. If the defendant shall not appear, or no answer or demurrer be filed, the court shall order a jury to be impaneled to hear and determine the matters of the complaint.

SEC. 3381. If, upon the trial of any issue of fact, in such action, or upon a default, the jury shall find that the plaintiff is entitled to recover any damages, they shall assess the amount of such damages sustained within three years next preceding the commencement of such action and down to the time of rendering the verdict, or, if the title of the plaintiff shall have accrued within such three

the dam in question; and if the plaintiff shall not accept the same, with his costs up to the time, but shall proceed in the action, he shall be entitled to the costs only up to the time of the tender, and the defendant shall be entitled to recover his costs afterwards, unless the plaintiff shall recover greater damages or greater annual compensation than was so offered.

SEC. 3385. If the plaintiff shall accept the amount so offered for past damages and the future annual compensation, he shall have judgment accordingly, and also for his costs up to that time, and the judgment shall have the same effect as if it had been rendered upon the verdict of a jury impaneled according to the provisions of this chapter; or the plaintiff may accept either the sum tendered for past damages, or the offer for future annual compensation, and proceed to trial on the residue of the complaint, under the same liability for costs as before provided.

SEC. 3386. If in such action, the jury shall decide that the plaintiff is not entitled to any annual compensation for future damages, the judgment therein shall be no bar to a new action for damages alleged to have arisen after the former verdict, and for the compensation for damages that may be thereafter sustained.

SEC. 3387. The plaintiff in such action, at any time within three months after the verdict is rendered therein, may elect to take the sum in gross so awarded by the jury, for the right to maintain and use the dam forever, instead of receiving the annual compensation therefor; and if he shall make such election, he shall, within the said three months, cause the same to be entered on the record of the case in the clerk's office; if the plaintiff shall so elect, the defendant shall, within three months after such election is entered of record, pay to the plaintiff, or secure to his satisfaction, the sum due for the perpetual right to maintain the dam, with interest from the date of the verdict; after the expiration of said three months, such defendant shall lose all benefit of the provisions contained in this chapter, until the payment of said damages and interest.

SEC. 3388. If the plaintiff shall not, within the said three months, cause an entry of his election to be made upon the record, as before provided, he, and all persons claiming under him, shall be entitled to demand and receive from whoever shall be the owner or occupant of the mill, the annual compensation so established by the jury, so long as the dam shall be kept up and maintained, unless the sum due in that behalf shall be increased or diminished, in a new action, as hereinafter provided.

SEC. 3389. The person who shall be entitled to receive the said annual compensation, or gross damages, shall have a lien therefor, from the time of filing the notice of the pendency of the original action, on the mill and mill dam with their appurtenances, and the land under and adjoining the same, and used therewith; but such lien shall not extend to any sum due more than three years before the commencement of an action therefor. Such person may maintain an action in the circuit court for such annual compensation, or gross damages, against the person who shall own or occupy the mill or dam when the action is brought, and may therein recover the whole sum due and unpaid for three years then last past, whoever may have owned or occupied the mill or dam during that time, with costs of the action, irrespective of the amount recovered.

[TO BE CONTINUED.]

HOW TO EXERCISE.—Regularity and constancy in the pursuit of exercise are important, says the *Lancet*, if perfect health is expected to result from its employment. It is far better for men to lead altogether a sedentary life than to be irregularly active. This caution is the more needed since the transition from sedentary habits to arduous and exhausting physical labor is of frequent occurrence. Again, the transition from active habits to sedentary pursuits is generally accompanied by a marked disturbance of health, since organs roused to the full activity by the stimulus exercise given to them are liable to be functionally deranged when that stimulus is withdrawn. This, perhaps, would not be so frequently observed if, instead of relapsing immediately, as is frequently the case, into idle habits as far as exercise is concerned, an attempt was made to engage regularly, for however short a time, in some pursuit which would insure brisk muscular movement, so that the health acquired by exercise during the vacation should not be lost; and, moreover, that the body, when the next holiday period comes around, should be found in a fair condition to undertake the increased physical strain thrown upon it.

## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, NOVEMBER, 1880.

**A GERMAN REMEDY.**—A simple means for keeping flies away from horses it is recommended to moisten their hair, especially of their tail and nostrils, with a strong decoction of hazel-nut leaves. By means of this decoction the eggs which the flies lay on the skin of horses, are also destroyed.

## Personal.

Among the parties favoring the UNITED STATES MILLER with a call, during October, we mention the following:

Robert L. Downton, of Minneapolis.  
 Mr. C. E. Wenborne, of Buffalo, N. Y., editor of *The Milling World*.  
 Mr. J. S. Karns, representative of Messrs. John T. Noye & Sons, of Buffalo, N. Y.  
 Mr. Henderson, of Buffalo, N. Y.  
 Mr. W. H. Blackmer, representing Messrs. Howes, Babcock & Co., of Silver Creek, N. Y.  
 Mr. Wheatley, representing Messrs. Huntley, Holcomb & Heine of Silver Creek, N. Y.

## The Milling Industry in America.

Mr. Josef J. van den Wyngaert, who was commissioned by the Prussian Government to make a report concerning the Millers' Exhibition in Cincinnati, is said to have expressed the following opinions on the American industry of milling: In the different mills he had visited in the Eastern part of the United States he had found many excellently constructed, but also many primitive ones, built 30 or 40 years ago. America had undoubtedly been the most advanced country on earth in regard to milling, and when anything was said at that time about American mills in Europe, as a matter of course only the best and most excellent ones were meant. Since then things have changed. While America, as well as England and France, had come to a standstill, Germany and Austria had excelled remarkably in the progress of this branch of business. The construction of mills in these two countries is to-day much better than that of American mills, and it was only in the last few years that America had made efforts and adopted the improvements of the Germans and Austrians, and taking them for a basis had made further progress. Thus the roller system, for instance, for the grinding of grain, had been transplanted from Germany to America. We had first met with it in Naples, and introduced it into Germany in 1874, from whence it had only in the very last years found its way into America.—*Oesterreichische Ungarische Mueller.*

## American Flour.

*Die Muehle*, a Berlin paper, makes the following comments upon the American so-called "Patent Flour," the finest flour produced in America:

In appearance it resembles a dark No. 4 Pesh flour; when a dough is made of it, however, it resembles a fine No. 3. It is an established fact with us, that the coarse flour looks darker than the same quality flour ground down fine. This is based upon the same principle that larger particles throw larger shadows.

This flour feels like a coarse wire to the touch. When kneaded to dough, however, the full whiteness of the flour appears, but as stated above, it does not come up to the whiteness of our fine flours. A loaf of bread prepared from the flour raises well, but not near as high as we are accustomed to see in the loaves baked out of our flour. The flour also absorbs considerably less water. Newly made bread is very fragrant and palatable. The contents of gluten of this flour exceeds that of the corresponding quality of the Pesh flour, which by no means signifies that our grain contains less gluten than the American grain. As is well-known, the manner of grinding customary with us, has the result that the finer qualities of flour contain less of gluten than the darker qualities. No. 3 consequently contains less gluten than No. 6 or No. 7.

Americans produce three, or to the most, four different qualities of flour from the grain, in which the whole gluten is then contained. On this account all the different qualities of American flour contain more gluten.

On the other hand the gluten obtained from Hungarian flour is of a better quality than that obtained from American flour. The latter is light and looks very well, it is true, but it is brittle and our housekeepers could make no use of it in the preparation of some of their favorite dishes.

Neither would our bakers be satisfied with it, for as is well-known, the rising of the dough does not depend so much upon the quantity as upon the quality of the gluten contained in the flour. Besides this the brittleness of the gluten has the effect of causing milk and butter pastry, prepared from American flour to become covered with cracks, notwithstanding the fact that the quality of our yeast is well adapted greatly to improve the quality of the dough.

## The American vs. Russian Grain Trade.

In the *Export*, the organ of the Society for Commercial Geography, and the promotion of German interests in foreign countries, we find an article on the exportation of grain from Russia and the competition of America, which may be of interest to the general reader, and which we will, therefore, here quote:

"For some time past the Russians, but more especially the agriculturists and the exporters of Southern Russia, have regarded the rapid increase in the importation of grain into Europe from North America with growing anxiety, because it increased at such a rate that it threatened in time to ruin their grain trade. On account of this feeling it was decided to send Mr. Orbinski, director of the commercial school at Odessa, to America in the spring of the year 1879, in order to investigate the production and exportation of grain. Before he could return and report, however, the South Russians were terrified by the unexpected news conveyed to them by an Odessa paper, in January, 1880, that the Yankees were not content with supplanting the Russian grain from the European market, but even had the audacity to import grain into Russia itself. 'We should pronounce the man insane who would tell us about the importation of grain into Russia,' continued the *Pranda*, 'and should not have published it, if it had not unfortunately been confirmed by another Caucasian paper, whose statement was even more alarming.' It referred to the *Tifliser Boden*, which says: 'We have heard that a few days since grain from America arrived at Poti, and some had already been brought to Tiflis. It is said this grain is cheaper than the Russian grain.' At the same time the 'American paper' in Droeba(?), confirmed this: 'It is only natural that this news created quite a panic in Russia, and especially in Odessa, for the Russians had become accustomed to look upon the exportation of grain as a monopoly in Russia (in 1879 Russia exported 39,729,395 tschetwert, one tschetwert = about seven bushels), and Odessa alone exported almost 4,000,000 tschetwert, while now, according to Russian papers, America suddenly competed with an importation of 26,201,500 hectoliters of wheat and corn into England and the European continent from September, 1879, to January, 1880, and at lower prices than Odessa could furnish it. The natural consequence of this state of things was that the Government was compelled to consider the matter, and accordingly a meeting was held January 29, in Petersburg, at which the directors of the financial ministry, of the railroad departments, of the several private banks, and the State bank, the representatives of large grain dealers, and others, took part. Before this assembly Mr. Orbinski made his report, giving the result of his investigations in America, and concluding that Russia was not at present able to compete with America. Orbinski supported his opinion principally by referring to the extensive railroad connections in North America, according to which, in some counties, no farmer was more than five miles distant from the railroad, as well as by describing the many new improvements (as grain elevators, etc.) which were universally adopted in North America, but which were yet entirely unknown in Russia, and by means of which the transportation was rendered infinitely more simple and less expensive. Impelled by the information received, the Committee passed the following resolutions:

1. To adopt measures for improving the manner of farming in Southern Russia.
2. To agitate against the practice of allowing fields to lie fallow.
3. To petition to the government for the

connection of several railroad centres, in order to facilitate the transportation of grain, and for the building of several necessary new railroads.

4. To introduce such methods and improvements as render America so formidable a competitor (elevators, etc.).

If all this could be carried out in such a country as Russia, it would again render the Southern Russian grain market able to compete; yet such measures of the Government would meet with unsurmountable obstacles from its officials as well as from the farmers and dealers of grain. In Odessa, where there are no less than twenty-seven commercial houses exporting grain, and thousands of people earn their living thereby, improvements have already been thought of and considered. As yet, the greater part of the excellent wheat, which is chiefly shipped from there, has been stored in immense palatial buildings in the central part of the city, from whence the transportation of it to the railroad warehouses and to the dock, which lies 140 feet below the level of the city, costs often more, but always as much as the whole freight across the sea to England, in consequence of the high wages of laborers and the primitive mode of transportation. More recently the road to the railroad warehouses has been paved with flagstones to a distance of from two to three km., to prevent the grain trucks from sinking in the mud during the spring and fall months, and now the horse car line will probably soon be completed, which is designed chiefly for the transportation of grain from the railroad to the ship. Further, the building of thirteen three to four story granaries has been projected and laid before the common council of Odessa, the cost of which is estimated at 7,000,000 rubles. But even if the commercial world of Southern Russia would energetically adopt the facilities enjoyed by its competitor, it would yet be necessary that the agricultural population would do the same, and make use of machinery for the production of their grain in the most extensive way. It may be ages before such a revolution in the agricultural department, the modes of communication, and commerce is completed, but America needs only decades to make Europe its grain market since it has an immense territory which can be cultivated, makes use in such cultivation of the best machinery, and in the most extensive way, and at the same time enjoys the benefits of a most practical and cheap mode of transportation."

## What the World Owes to Mechanics.

How much the world owes to mechanics and their labors was set forth by Mr. Dudley Blanchard, in an interesting discourse made by him recently before a scientific society at the Cooper Institute, in this city. The following is the initial portion of Mr. Blanchard's remarks, which he prefaced by saying that he uses the term mechanic in its broadest sense, so as to include brain workers as well as hand workers—both him that contrives and him that constructs.

First-rate mechanics, he said, as has been said of poets, are born, not made; at least the constructive faculty in its highest development is partly a gift of the gods. To become a mechanic of the highest order, one must be born with a passion and adaptation for exercising the constructive faculties, and be educated by observation and experience up to a high degree of perfection.

When the intense delight of whittling a shingle impels a boy to thrust his tongue into his cheek, mark him as a mechanical genius. He may whittle away life to little purpose, perhaps, but a wealth of satisfaction and creative pleasure are in store for him. See how, with a relish as keen as his jack-knife, he severs the long and regular shavings, rounds the point, or corrugates the edges of his shapely shingle! Waste not your pity on this low manipulation, ye men of self; he has a source of infinite pleasure that you can never appreciate.

The true mechanic is a child of confidence and simplicity; and among the selfish elements of the commercial world he often gets but small share of the results of his own skill. If what the mechanic has done were stricken from the face of the earth, we should have little left of the outward manifestation of civilization. He serves us from the cradle to the coffin; yea, from the forceps of obstetrics to the monument of commemoration. From the crowns of our heads to the soles of our feet we display his handiwork. From the top of the chimney to the bottom of the well he administers to our wants. If we take the wings of the wind to fly to the uttermost parts of the earth, we shall find that the wind has no wings

that we can fly with except such as are the products of mechanical skill.

If Solomon, in all his glory, was not arrayed like one of the lilies of the valley, he at least furnished the nearest analogy, in the mind of one author of ancient literature. But all the glory of Solomon's array was due to the subtle fingers and fertile brains of some dusky manipulator, to whom literature, both ancient and modern, has given the cold shoulder.

The best mechanics are usually quiet modest and unobtrusive, spending their lives in congenial employment, the greatest remuneration of which is the pleasure it affords. The active and thoughtful mind, the skillful hand, the quiet and patient industry that characterize the true mechanic get little notice or commendation from the public; while the fighting men, the talking men, the writing men, the walking men, the starving men, the players and mountebanks, the quacks and charlatans, all get a share of notice and a meed of praise.

It now and then happens that an inventor starts a sensation that brings down upon him for a time an avalanche of notoriety; but he that is thus forward is usually the worst kind of a fraud and humbug; while the conscientious searcher after improvement toils on in obscurity, unhonored and unsung. But the neglect of the world does not trouble the true genius of construction. He does not seek notice; he does not expect it. The pleasure of an employment in keeping with his nature is his sufficient reward.

A popular writer of a generation that has passed puts this question into the mouth of his hero:

"Moves our free course by such fixed cause  
 As gives the poor mechanic laws?"

The poet appears to have supposed that the laws of mechanics were a code binding upon that guild only, and in no wise affecting warriors, kings and heroes. But the progress of time has turned the tide. The poor mechanic, by studying the laws of fixed causes, has arrived at definite results of comprehensive potency. The hero and the warrior are nothing without the appliances that the mechanic alone can furnish. The pride and prowess of Fitz James as a champion are gone. The poor mechanic has constructed a long tube of steel, fitted with spiral grooves and accurately sighted, with which he can pop an ounce of lead through the King as far as he can see him.

The mechanic is compelled by the necessities of his pursuit to yield a loyal devotion to the truth as far as it applies to his work. He is encompassed about, and his movements are bounded and defined by a cordon of inexorable facts which he cannot with impunity disregard. He must know, and to know he must measure what he manipulates. Let him cut too long or too short; let any of his angles or lines be in error; let any of his many manipulations prove faultily set; let the roof leak, or the window creak, or the door jar—every failure is a standing witness against him, and no one is willing to cover any of the faults of his handiwork with a mantle of charity, but an indignant clientage pursue him with vociferous reproaches. And in this atmosphere of injustice and uncharitableness he can only get satisfaction by sloth, delay and procrastination, which are sure to leave behind ineffaceable marks as a record of his incompetence.

How different with the fortunate practitioner of a liberal profession! The preacher may preach any doctrine he chooses. He may preach unitarianism, trinitarianism, or polytarianism; universal salvation, universal damnation, or universal annihilation; or any mixture or compromise of any of these ingredients; he may kaleidoscope his imagination into ten thousand different forms; and, provided he is cautious enough to defer his favorite catastrophe to the far future, his dogmas are safe from refutation. No one can corner him or bring his work to the test of any standard or rule except the elastic and uncertain one by which he has constructed it.

The medical practitioner may practice allopathy, homoeopathy, hydropathy or any other pathy that the profession may happen to be enriched with; and if he has sense, experience and skill enough to let nature have a fair chance, he may become popular and wealthy, notwithstanding the readiness of his rivals to denounce his system as false and pernicious.

And with the lawyer, it is in his favor rather than against him that he is able to make the worse reason appear the better. According to the popular estimate, it is more credit to win a bad case than a good one, and success delights his soul in a corresponding ratio.—*New York Scientific News.*

Nordyke & Marmon Co., of Indianapolis, Ind., are building a new mill for Castle & Basore, at Cottage Hill, Ind.

### General Meeting of the German Millers' Association at Dresden.

The thirteenth annual general meeting of the German Millers' Association was held in Dresden on the 6th September and following days. Mr. J. J. Van den Wyngaert, the President, in opening the proceedings said:

GENTLEMEN—Fifteen years ago there assembled in this town some thirty to forty men, with the intention of bringing about a union of the German millers. The idea conceived at that meeting took a definite form two years later in the founding of the German Millers' Association, which was at once joined by more than 800 millers. After another two years, when it had developed into vigorous youth, it received, in Leipzig, in addition to the approval of the men, also that of the fair sex, to whom we are indebted for the Association banner, which was to protect and strengthen the Association in its wanderings, then commencing at Leipzig. Eleven years have passed away since then, and the Association has wandered through all parts of Germany, and to-day it piously greets the spot where it first saw the light."

The meeting was then declared open, and the Mayor welcomed the assembly to the city, which he said must have the most lively sympathy for an Association with which they stood in such close personal connection. He trusted their deliberations would be accompanied with success.

Mr. Van den Wyngaert, who read the report of the work of the Association during the past year, expressed his regret that some of the statistical work had got behindhand during his absence in America. In referring to the grain and flour duties, he drew their attention to the great damage suffered by the trade in North Germany, owing to the difficulties placed in their way by the Government. Another question which had excited great interest for many years, viz., the establishment of a technical school for millers, had at length been brought to a satisfactory conclusion. Their effort had been directed to calling this institution into existence in connection with an establishment under Government control, and not as a private school. Their thanks were due to the Minister of the Interior for his assistance, and he hoped by Michaelmas of the present year a German technical school for millers would be opened in Chemnitz.

The next paper on recent milling progress at home and abroad was read by Mr. Oscar Oexle, C. E., of Augsburg, and was as follows:

Gentlemen—No other branch of industry has probably had such great and important stages of progress and development in so short a time as the milling industry of our days, and characteristic of the tendency of our times; the movement has not taken place in our country alone, but agitated in an extraordinary manner by the milling public of the whole civilized world. There were several causes which opened the way to this powerful and progressing movement, and the principal agents for it are the following: Firstly—The increasing demand for high-class flours, free of bran and woody fibre; glutinous middlings flours, which from year to year becomes larger, partly from the increasing luxury of our society, and partly, if not chiefly, from the fact that flours free of woody fibre and bran have proved to be more nutritive in spite of the opposite opinions prevailing on this subject. This assertion is, however, to be taken only in a relative way, as the results of chemical analysis have proved different, and have shown that the most glutinous parts of the wheat kernel are in the outskirts of it.

In practice the more or less nutritious qualities of human aliment will be tested by the amount of available physical strength they supply to the body, and we find, indeed, that this is proved by the large and increasing demand for high class flours, especially in those districts where the laboring classes have to exert great physical power, as in the iron and coal mining districts of England, Scotland and the Eastern States of America, the mining districts of Germany, France, etc. This is easily explained by the fact that the heat or power required for the digestion of the bran particles in the human stomach exceeds considerably the nutritious qualities of them, and our tendency of to-day to produce high class flour free from any woody fibre, if possible, is fully sustained to be right and of great national economical importance by its results, which enable us to gain from the separated bran particles highly nutritious and easily digestible substances by feeding with them our domestic animals (cattle, pigs, etc.), whose digestive organs are far better adapted for this operation.

The second cause of progress in milling was

the increasing consumption of breadstuffs and the declining result of our harvests, which were the cause of most formidable importations of grain, mostly derived from countries producing hard, glutinous wheats, which required a different way of treatment for their reduction into flour than heretofore in use.

Thirdly, one of the most important stimulants of the development of the milling art was the successful competition of other nations in our markets, which, in spite of the high freights and duties, and other obstacles, succeeded in gaining a predominating position in consequence of their refined flours.

These facts gave certainly the first impulse to progress, and we find that some ten years ago, and even before, some enterprising millers had made efforts to improve their old style of milling by substituting all kinds of machinery in their opinion more suited for the purpose. Still these were only few, isolated and partial, and it was only by the introduction of the roller system to the general milling public, in the great metropolis of milling, Budapest, promoted by Mr. Frederic Wegmann, of Zurich, in the year 1874, that the movement began to spread over the whole civilized world, and to draw the attention of even the smallest millers to this new mode of milling. The excitement produced was enormous, and more so by the fact that at the beginning of the movement the existence of the old and venerable millstone was questioned, and seemed endangered.

It is interesting to state that this introduction of the roller system was not the revelation of a new or novel invention, but that the theory and the successful use of it had already been in practical operation for about 50 years, and it is really astounding to think that such an innovation which now affects most intensely our milling interests, should have been, for nearly half a century, quite forgotten, and the only explanation for this extraordinary fact is that the above named main progressive agencies had been dormant during that period.

In Sulzberger's time (that is the name of the original inventor of the roller system, he also was a Swiss and a native Zurich) the commercial traffic was only of a local nature, and had not the international character of our days; the milling art was partly still in the hands of the guilds, and the demand for high class flour was very small, and in consequence the roller system was not as successful as in our days. The objection which is often brought against the Sulzberger roller system is that the construction of the Sulzberger rolls, and the materials used in the rolls, were the cause of their non-success does not stand, because a brilliant example for its efficiency can be shown: the old Pester Walzmuehle, which was built at the end of 1830, in Pest, and arranged entirely on the Sulzberger roller system, worked successfully, and paid from year to year for a long period of time from thirty to fifty per cent dividend to its shareholders. This mill was fitted up principally as our newest roller mills are now arranged; they used grooved rollers for the granulation, partly the same rolls for the regrinding of the bran and coarse middlings, smooth rollers for the reduction of coarse middlings, and the same for the entire reduction and grinding of semolina and even the finest middlings, and this was not done on a small scale, but they produced at first daily about 800 cwts. of flour, and continued to enlarge the establishment to its present magnitude. It is perhaps one of the few mills which have adopted and used the roller system to its fullest and most beneficial extent, employing the rolls up to the last stages of the milling operations—a practice which is not customary in all the other Pest mills.

Notwithstanding this, it is right to state that the general use of the Sulzberger roller system was partly rendered difficult by its rather complicated construction, and as everybody knows, progress has brought it to a high standard of efficiency, so that the roller machines of our days excel both in workmanship and material.

Sulzberger's application of three pair of rolls, one above the other, made his machine rather complicated and costly, and the great merit due to Mr. Wegmann is his having simplified this arrangement by devising the crushing to be performed through only one pair of rolls. The innovations which Wegmann was the first to introduce into roller construction for milling purposes were—firstly, the use of only one pair of rolls during one crushing action; secondly, the application of the self-acting pressure of the rolls; and, thirdly, the use of a material with a hard and gritty surface like porcelain, and these were the most important items, and the main stimulants for

the rapid introduction of the roller system throughout the whole world.

This gentleman has pushed the roller question with an enthusiasm, sacrifice and labor indeed worth notice and praise, and, no matter to what party you belong, you must acknowledge that Mr. Wegmann deserves the thanks of all millers for what he has done. He has revolutionized the milling system, or at least he has contributed a good deal more than anybody else to the grand and extraordinary development it has reached in our days.

At the beginning of the movement the tendency was very much for the use of rollers with equal speed, the so-called Schlepplwalzen, or frictional rollers, which were worked by mere pressure and friction, and with the wish to totally avoid the tearing action of millstones; these extreme views were adopted, maintained and defended by their partisans with great tenacity. The equal speed of the roller surfaces when reducing semolina into smaller particles is surely good, but the small differential speed afterwards applied to the use of rollers for the crushing of middlings, and in most other grinding operations, has not the effect of tearing the woody fibre as claimed by many adversaries of this principle, but simply adds to the capacity of the machines and avoids caking, so troublesome when using smooth polished roller surfaces with equal speed.

Ultimately Mr. Wegmann decided to adopt this principle for his machines, which, however, was not new, as Sulzberger had already found the advantage of differential speed and used it for his rolls. Sulzberger used with success, for reducing and grinding rollers, cast iron of a homogeneous porous structure, of a good quality, and carefully moulded and cast, and I myself have used his rollers for the grinding of middlings with success. His rollers had also the advantage of being of small dimensions, and I must say that I do not sympathize with the efforts of many roller manufacturers of to-day, who try to get a large capacity of the rollers by increasing their length; the difficulty of feeding them in a proper way increases in proportion to their length, and I am sure that a time will come when the smaller sized rolls will be generally preferred. I know of many of these Sulzberger small rollers which have been over ten years in successful operation.

The differential speed for reducing middlings into flour was at first preferred and largely adopted in foreign countries, especially in Great Britain. In Budapest the grinding of middlings has been in most cases performed with millstones, even up to this time, although the efficiency of rollers shows very clearly when comparing the flour from middlings ground by rollers or stones; the lower the grade of middlings which are to be ground the more the results are to the advantage of the rollers. The latter fact was acknowledged in all those countries where low grinding (Flachmahlen) was in use, and especially in England and the United States did the millers appreciate the advantage of rollers for the treatment of middlings. This was demonstrated by the rapid introduction in both countries of Wegmann's patent porcelain roller mills, with self-acting pressure and differential speed. Several years before the introduction of roller mills into these latter countries a preparatory movement had already begun in the shape of middlings purification.

It can be said that up to the year 1870 no British or American millers, with very few exceptions, had any idea that middlings after being purified would yield a far better flour when reground than the first flour got out of the wheat, a fact which was known to us as a matter of course, and in successful operation for over a century and more. They sold, indeed, their middlings as feed, and in the year 1868 when I first went to England I made a first-class business for my employers, buying up all middlings I could get, and making contracts for several years' supply with some large millers for middlings, which I purified on a large scale, and reground them on millstones. I produced a very superior quality of flour. Of course the matter did not run that way a long time, as very soon after, the purifying of middlings began in British and American mills. In America the system of purifying middlings and regrinding them afterwards got the name of "New Process," although it was nothing else but a modified "mouture économique," or a modification of our "half high grinding."

The consequences which followed these progressing steps were of a very beneficial character, and great care was bestowed especially on the dressing of millstones, and a great num-

ber and variety of millstone dresses were invented for the purpose of producing in one operation the largest possible quantity of middlings. The stream of progress in those countries was flowing towards the high-grinding system.

More especially welcome were these new acquisitions in the Northwestern States of America, whose climate and agricultural circumstances resemble very much the vast and fertile prairies (Pustas) of Hungary. The wheat which is cultivated in those parts of the world is just as hard, flinty and glutinous as the Hungarian wheat, and is badly adapted for low grinding, which, before this, was the customary mode of operation, and the Northwestern millers were forced into the "New Process" by the large quantity of middlings, which they could not help making, even under the old system, on account of their hard wheats. The machines, however, which American genius has improved and remodelled for the operation of middlings purification, although resulting from the old system (Cabane's), are now so perfected that in my opinion they take the first rank in their class throughout the world for the purpose intended.

Some few years later the introduction of Wegmann's porcelain rollers the Pest millers began to think of the use of grooved chilled iron rollers for the granulation of wheat, and the results were so astounding and far above those got by the use of millstones that in less than a year all the large mills of Budapest had discarded their millstones and introduced grooved chilled iron rollers for the cracking of wheat throughout the process of granulation.

The improved works of Messrs. Ganz & Co., iron founders, of Budapest, whose acquaintance with the roller system they had derived by having had the agency of Mr. Wegmann's patent, and being employed in the manufacture of his machines, took hold of the movement and prosecuted the production of grooved chilled iron rollers with great energy and immense success. Soon after the introduction of grooved rollers for the purposes of granulation in the Hungarian mills, the system was adopted in the South of Germany, in all parts of Europe, in many English mills, and more especially in the Northwest of the United States, where, at this moment, the large new Washburn Mills A, B and C are in successful operation, producing daily nearly 3,000 barrels of flour, being completely fitted up with grooved rollers for the granulation of wheat, and smooth porcelain and chilled iron rollers in combination with a few mill stones for the reduction of middlings into flour, and the other final grinding operations. The money invested in this new movement has reached enormous sums, and has made a great impression on all millers.

The wish to be the first to reap the promised benefit of the new system drove many millers, and especially our millers in the South and other parts of Germany, and in other parts of the world, headlong into the new roller whirlpool; many of them did not find what they thought, and the heedless way in which the system was adopted without judgment of its qualification for the various wheats and customs in the markets, resulted in an uneasy and uncomfortable feeling in the trade, and threw doubts on the question of rollers which will be removed by-and-by, but which make for the present the position of all millers in all countries very difficult. In my opinion there are but two distinct methods of milling, the high and the low grinding system, and each is quite entitled to consideration. The low grinding system is, without doubt, the best suited for the treatment of soft and tender wheats, and the great varieties of wheats between the two classes, hard and tender, are so many that it is impossible to fix where the one begins or the other ends, and, consequently, a great variety of grinding systems will be the result.

Personally, I am of opinion that the harder the wheats to be ground the more profitable the high grinding in combination with the grooved roller system will be found; this assertion is founded on my long and practical experience. This is, however, a limit which I would not pass over, and where, to my mind, the use of millstones is not only justified, but peremptorily wanted; then I use the millstones either higher or lower according to the quality of the grain to be treated. The system resulting by higher grinding is named "Half-High Grinding" and although it produces more middlings than the low grinding system, it does not have for its aim the production of so large a quantity of semolina and middlings, and so many varieties of flour



out of one wheat mixture, as is done in the high grinding system. Hard wheats are not suitable for the low grinding system, and can only be profitably ground on the high system, because the flour produced by low grinding is dark and intermingled with inseparable woody fibre, produced by the tearing action of the millstone, by which the thin and brittle husk (bran) of the hard wheats is easily pulverised. Moreover, the quantity of first flour gained by low grinding is less on hard wheat than on tender wheat, and the larger quantity of hard middlings consequently resulting is of very low grade and very difficult to purify sufficiently.

For this class of wheats, no doubt, the grooved chilled iron rollers will have the run for a long time. In all milling systems, however, the use of smooth rollers is, no doubt, followed by great advantages, and for the reduction and complete grinding of semolina and middlings, rollers will replace in a considerably large proportion, the millstone. The regrinding of bran by rollers is also a problem which will be surely solved in a short time. The great question chiefly ventilated by us in Germany, but to a larger or smaller extent interesting to all millers of the world, is "porcelain," or "chilled iron," and this matter, I fear is brought before you so often that it is getting rather annoying and wearisome; the question, in my opinion, will only be solved by practical experience, and in many cases this or that construction, and this or that material, will suit better for a special purpose.

For the complete reduction of middlings into flour, however, my experience has brought me to the conviction that only a material gritty, porous, and sufficiently hard is fit for the purpose, and that no perfectly smooth surface, be it as hard as it may, should be used for this operation. I have found a hundred times that I could not finish up the regrinding of fine middlings with smooth and polished roller surfaces, but I got very good results by using for this purpose cast iron rolls of homogeneous and porous structure, and better still by using porcelain rolls. For this simple reduction of large middlings (semolina) into smaller size any homogeneous and hard material will do well. With the use of the roller system the necessity arose for a systematic and logical arrangement of all the various machinery used throughout the milling process. The use of rollers for the breaking of wheat implies a gradual reduction which will be the more lucrative in its results the oftener the breaks are repeated, and, in consequence, the separation will be multiplied, and the number of sifting and purifying machines will increase, although such may be of less capacity, and this fact involves a rational and a systematic arrangement for the whole of the machines.

This important point has been considerably neglected in our mills up to this time, and far too little care was given to the proper arrangement of the single machines. Generally the plans for a new mill are made by an architect, and erected without the arrangement inside of the mill and its machinery having been fixed, and the American millers are a long way before us in this respect; they have well conceived that to be successful in the great international competition, the first thing to do is to be able to produce and transport at cheap rates, and, in consequence, their mills and granaries are erected with great care and at a cost which in our country would be looked upon as extravagant; however, my opinion is that this way is, after all, the best paying. You find in their new mills high, lofty floors, and a good number of them. The new Washburn A, for instance, has eight stories, and all of them have a height of more than 10 feet—some, indeed, have 16 feet. This arrangement enables the working of the mill in a self-acting manner, and the connection between the first and the subsequent operations are carried out more by gravity than by elevators and conveyors.

In this respect we have a great deal to do and to learn, and it would be far better to look more after the rational and self-acting arrangement of the mill than to make the first point a large capacity, and in consequence to curtail the practical management, a mistake which is often made with us when selecting and fixing the numbers, sizes and construction of the auxiliary machinery—as, for instance, the grinding, sifting and purifying machines. More especially now, when the tendency is gravitating towards high and middlings milling, observation of the above statement cannot be too carefully made. With milling on the high grinding system there should be no sparing of purifiers and dressing machines.

On roller mills I could say a great deal more, but time progresses and it becomes late,

and so I shall now turn to other matters of importance. The great progress which in our days has taken place from causes already mentioned, are proved in a prominent way by the enormous importations lately made from America to Europe. The large quantities of grain coming from the West effects our market severely even in Germany, and, further still, the successful competition of Americans with their fine flours of high baking quality seriously endanger our agricultural and milling industry. This movement will deeply effect the welfare of our farmers and millers if they do not exert their utmost efforts, and if our Government does not help by freeing our hampered agricultural, industrial and traffic interests and institutions.

In spite of our old civilization and high development of social life, we have not succeeded till now in availing ourselves, in a principal way, of the many water routes which nature has given us in abundance, whereas the comparatively young states of America have already extended over their territory a system of canals in the most practical and praiseworthy manner. The Americans understand too well the importance of being able, by cheap freight and easy means of transportation to the seaports, to extend their immense resources, and the result is already felt by us.

In consequence of this state of things, that are yearly increasing means and improvements in the way of transportation, storing and moving the large quantities of grain to the East, and we find the numbers of large elevators increasing from year to year with the most ingenious arrangements for the mechanical loading, unloading, ventilating, weighing, mixing and transporting of thousands and millions of hectolitres, and the whole arranged by only a few hands, thus enabling the reduction of the transporting and storing rates to quite an astonishing minimum. Only by this constant and energetic movement it is possible for that country to successfully compete with us in our own markets.

This elevator system ought to meet a good deal more attention in our country, although in latter years already some institutions of that kind have found adoption even with us. In America and in Great Britain this system of elevators is being adapted most successfully in smaller proportions by millers, and even by the smallest mill this system of storage will be found profitable. It is hard to understand how, for instance, the system of storage and conveyance of grain to the mills has been and is still so primitive, and I would say neglected, as it is found in Budapest, the metropolis of milling, and where the wheat is even now still brought to the mills with horses and cars in bags which laborers carry on their shoulder into the cellars of the largest mills, where the grain is handled only by hand labor, the shoveling, mixing and transportation to the wheat cleaning machinery being all performed by laborers, of whom quite a large number are wanted for the enormous quantities this big establishment manufactures. A slow and primitive proceeding like this is looked upon with astonishment by all American and British millers visiting Pesth, and, indeed, it is quite incomprehensible how this old style of treating grain can keep its hold in those places.

Along with this improved mode of storage we find also the cleaning of wheat constantly improving, and also in this respect we find the Americans at the head of the movement; having adopted from the first the system of aspiration or suction throughout all the grain cleaning operations, this effects a complete separation of dust and all light particles by the action of the machine as soon as removed from the kernel, a most important thing which in our present cleaning machinery is mostly neglected. There is no doubt in my mind that the Americans were the promoters of the now generally adopted system of cleaning, that is, to clean the kernel as much as possible from all foreign substances, to scour it free from dust, and to end the wheat by separating the germs and beard. All these operations take the greatest care, so as not to injure the husks and outer part of the grain kernels.

The machines for shelling and separating the husk from the kernel, which for some time, and even yet, had a good many advocates, are no longer used to such an extent as before, and the impossibility of arriving at a perfect solution of this problem is evident by a careful investigation of the structure and nature of the wheat kernel itself. The damping of wheat is getting out of use, and wheat heating is now more practised, it being claimed that to heat soft and damp wheat will increase the strength and improve the quality of the flour. Great improvements have been made

by the introduction of the cockle separators (trieurs), which have been successfully adopted in nearly all our mills. The machines with percussive action in combination with a simple and double suction, and the wheat brushes, although in combination with a strong ventilation, have secured in the last few years considerable attention by the most prominent millers, and will very likely get soon into general use. The old brushes failed to succeed from the want of the now ingeniously adapted ventilation and aspiration in such a way that the brush is found perfectly free of dust and smut even after two or three weeks and more of constant operation.

The dressing of flour and other milling products has necessarily undergone various changes on account of the different methods lately introduced into the milling art. The want of dressing silk surface was one of the most prominent wants in our mills, and by employing a larger dressing surface many mills have doubled their capacity and got a better percentage of flour. In Great Britain, as well as with us, the difficulty is the same in this direction, the newly erected mills are comparatively few in number and the old ones want sufficient space so that in using the old hexagon dressing reels no very great difficulties were encountered wherever the intention existed to increase the dressing surface. In the last few years, however, a first-class equivalent for the old hexagon reels was brought before the milling public in the shape of the centrifugal dressing reels, and this machine is unquestionably a most important one for all the smaller mills, and in all cases where space is wanting this machine will be effectually employed.

The treatment of bran has also received, in the last few years, great care and attention, and the new methods for cleaning bran with rollers, bran dusters with brushes, and revolving cylinders are getting into use. I am sorry the time is getting late. It has been impossible for me to treat the whole subject in the extensive manner it deserves and I wished. (Applause.)

Dr. Sellnick, of Leipzig, next reported on a bill now before the Government, for the protection of workmen against accidents in factories. Although he was not opposed to all the clauses in it, yet he was convinced the bill could not become law. He had noticed that in proportion as safety appliances were adopted, the greater became the carelessness of the workmen who had to look after the machinery. Their efforts were entirely directed to make the working of their mills automatic as far as possible. The report on fire insurance, furnished by Director Tschmarke, of the Magdeburg Fire Insurance Co., stated that the first twelve years' contract had expired on the 1st July of the present year. The results of the short three-year periods had been unfavourable, and they were consequently unable to grant any bonus on these policies. After careful consideration as to how these unfavourable circumstances were to be overcome, the committee of the company had decided to renew the contract for a second period of twelve years. It was chiefly through the large mills, whether driven by water or steam, that they had such a bad result to show this year, for when a fire did occur in them the loss was always very heavy. The company had, therefore, decided to slightly increase the rate, but still keeping it within moderate bounds. One great evil with which they had to contend was that only a proportionately small number of mills were insured with them, and, further, by the increase in the rate of premium, several of the large mills had withdrawn. This latter event was, however, consoling, in so far as the risk of the company was materially diminished. During the past three years they had received in premiums the sum of £84,082; against this they had paid for losses £82,206. Since the establishment of the company, in 1868, they had taken 10,994 policies, for the total sum of £47,531,260. On this amount they received £211,567 in premiums, and paid in losses, for 345 fires, £218,415, or 103 per cent. of the premiums. If to this were added 25 per cent. for expenses of management, and their reserve fund of £2,250, the account would stand thus:—Total receipts, £211,567; losses and expenses, £273,200. Since the 1st of July they had suffered losses amounting to £4,570, against £56,000 to be paid by other companies for mill fires. In referring to the causes of fires in flour mills, the speaker said that every step forward made in technical progress was a step backwards for the prosperity of the flour mill insurance companies; the elevators, dressing and cleaning machinery were frequently arranged in positions entirely un-

suitable to them, and machines requiring the most careful supervision stood on floors where they were not properly attended to; these among other causes would account for the increasing number of mill fires. In addition to the want of space in many mills, the keen competition forced them to work up to their fullest capacity, and thus where the pressure was kept up, the risk of fire was increased enormously. The use of naked lights in floors where there was a large amount of dust in suspension was also to be deprecated, and he could not understand how they could be used close to the dressing cylinders, which caused many fires every year. The appliances for extinguishing fire possessed by the mills were extremely defective, and he recommended them all to have extinguishers on the premises, and in this way they could often prevent the fire from spreading. The chief danger was that everyone under-estimated the risk of fire, and lived in the hope that a fire would not break out in their place. In concluding, the speaker expressed his gratification at the satisfactory manner in which the company and Association had worked together, and trusted that members would avail themselves still more of the advantages offered by the company. This closed the proceedings for Monday.

On Tuesday, the 7th September, the meeting was opened at 9.15 a. m., when Mr. Waltersdorf presented the statement of accounts for the past year. The balance standing to their credit was at present £350, against £180 in the preceding year. In this account, however, they had not included the deficit left by the Berlin Exhibition, amounting in all to about £500. This will be more than covered by the anticipated surplus from next year's account. One of the causes of there being a deficit at all from the exhibition, was explained by the fact that the Berlin municipal authorities compelled them to erect portions of the building in a very substantial manner, quite unnecessary for the short time for which it was required. The receipts for subscriptions, it was mentioned, had been about £150 in excess of the previous year's, over 500 new members having joined. Stettin was eventually selected after a short discussion for next year's general meeting. The remainder of the morning's sitting was devoted to the question of grain duties and the benefit of Trade Protection societies. In the afternoon sitting Mr. Joseph J. van den Wyngaert delivered his address on his visit to America.

#### General Meeting of the Association of Austrian Millers.

The annual meeting of this society was held in Vienna on the 7th September, Mr. Ignaz Seidl, of Trautmannsdorf, occupying the chair.

After the transaction of some formal business, the President called on Mr. Sturm to read the yearly report of the Association, which showed that the two chief subjects that had engaged their attention during the past year were the questions of duties and of standard samples. The petition presented to the Government praying that a duty of one shilling per cwt. should be levied on all German flour imported into Austria had as yet had no effect. The standard samples, as agreed upon at their last general meeting, had been settled and introduced into the trade, many home and foreign mills having procured duplicates of them. The negotiations with the Vienna Fruit Exchange for the renewal of the standards had not succeeded, as the exchange wished to undertake that duty entirely, a course which had been considered as likely to prove prejudicial to the interests of the Association. The adoption of a universal standard would be of special importance for the export trade. Many large mills in Vienna and the provinces had adopted their standard, and the millers and flour factors had expressed themselves quite satisfied with it. Now, when the small and medium sized mills were pressed so hard with the competition of the large limited companies, it was more than ever necessary for them to have union, and, as a matter of fact, it was the medium sized mills chiefly that were represented in the Association. If their colleagues would all except the Vienna standard samples, a large flour trade could be done, and the small mills would be able to work quite as advantageously as the large ones. In their trade, as in many others, the large mills were threatening the smaller ones with extinction, but if the latter were united, and kept pace with the times, then they would be able to hold their ground easily. In Bohemia, Galicia, and Moravia the millers in many districts were desirous of founding branch associations, but their efforts had not as yet been crowned with success, as it was difficult

to get there the minimum of twenty members required for each branch. The council had borne in mind the question of a millers' school, and awaited a favourable opportunity for taking action in the matter. The council and the committee had held twenty-eight sittings during the past year. The statement of accounts was then read and unanimously adopted, when the president called upon Mr. Sturm to read the terms of a proposal made by the committee for a partial increase in the yearly subscription of members. The subscription of eight shillings per annum had hitherto barely sufficed to cover all expenses, and many subjects of interest to the Association had to be left untouched for this reason. It was therefore proposed that members should contribute in proportion to the size of their mills, and the council had drawn up the following resolutions, which were submitted to the meeting for confirmation:—

1. The entrance fee to the Association shall remain as previously at 10 shillings.

2. The yearly subscription for members other than millers, or millers having only three pairs of millstones or rollers, shall remain at 8s.

3. Members having more than three pairs of millstones or rollers shall pay a supplementary fee of 1s. per set, the maximum amount of subscription being limited to 40s.

The adoption of this alteration would, with the present number of members, increase their balance some £40, the greater part being contributed by the large mills. In levying the rate a roller mill would pay the same rate as a millstone. The motion was then put and carried. A report on the excessive rates of carriage charged by the railway companies was also read, and it was decided to petition the Government to rectify the existing abuses.

Mr. Pappenheim then read the resolution adopted by the council with respect to the advisability of establishing an international exhibition of milling and baking machinery, as well as flour and grain products, to be held in Vienna in 1881, and at which all the machinery would be shown in motion. It could not be denied, he said, that the periodical exhibitions held by the Vienna Fruit Exchange, in conjunction with the Industrial Union, created great interest in the milling world, but still their advantage to the miller was often problematical, because none, or at all events only few, of the machines were in motion, and buyers were therefore compelled to rely on the word of the machinery agent or dealer. Sometimes it happened that a miller was in this way persuaded to purchase a costly machine which he afterward finds out is not suited for his purpose. In consequence there was a great amount of distrust in the minds of millers against all new machines, on the one hand the spirit of invention in the manufacturers was crippled, while all progress in milling was stopped. But if an exhibition were taken in hand that would show the machines in full operation, the visitor would have a chance of judging of their merits, uninfluenced by the statements of the vendors. This would all tend to the benefit of the milling industry in Austria, which had now more than ever to fight for existence against foreign competition. He thought that some of them might think what good was the whole affair, let them be glad that they had nothing new to see, and could keep their money in their pockets, as they had been taken in quite often enough. But that would be a very foolish policy. They must remember that they were not the only people in the world, and it would be to their own disadvantage to shut their eyes to progress, as was unfortunately the case often enough. He therefore begged them to confirm the resolution of the council, to whom it would be left free to make the necessary arrangements with the Fruit Exchange and Industrial Union. The exhibition would only take place in case it should be carried out fully. There would be little expense entailed in exhibiting the various products of grain, and in the Paris Exhibition they had full proof of the value of such exhibits. For the present they could make no definite proposal, as the various manufacturers had first to be consulted, and the feasibility of the whole matter depended on their being disposed to make the sacrifices required. They would also like to work in union with the manufacturers, who would at any rate be represented on the committee.

Mr. Polsterer acknowledged that an exhibition in the sense of the one proposed would be of great value to the millers and to the competent machine builders, and he quite agreed with the proposed principle. It appeared, however, to him that it would be too soon to hold an exhibition again in Vienna in 1881. They had had a trade exhibition this year in Vienna, but last year there had been

one in Berlin and all the other great countries were holding exhibitions. The manufacturers were at present somewhat discouraged from assisting them, and even among themselves it would be difficult to find anybody willing to take all the trouble for next year. He therefore begged to make the following proposition: "That the future council be instructed to bear in mind the establishment of an International Exhibition of Milling Machinery in Vienna in 1882, and to take the necessary steps to this end."

Mr. Pappenheim said that the lower Austrian trade exhibition did not offer what the milling exhibition was to do, for in the former only home manufacturers residing in Lower Austria were admitted, while those from all other parts of the country or from abroad were excluded.

Most of the home and foreign manufacturers had shown their approval of the seed market by sending their goods there, and many inquiries had been received whether such an exhibition would not be held again. If the Millers' Association would not take the matter in hand at once, then the Industrial Union would probably arrange for another seed market to be held in 1881, on the same lines as the previous one, where they would see nothing but closed boxes. They did not want to underestimate the co-operation of the Industrial Union, but he thought it would be more advantageous for the next seed market exhibition to be arranged by the Millers' Association along with the Industrial Union, than by the Industrial Union without the Millers' Association. It would be necessary to take immediate action so as to secure the Rotunda. The Minister of Commerce was very willing to meet them in the matter, and consequently they must take immediate action.

Mr. Emil Pfaff was of the same opinion as Mr. Polsterer, that the exhibition should be held in 1882, for just now the manufacturers were tired of exhibitions. As far as his knowledge went, the Industrial Union did not intend to hold an exhibition in 1881, for this year's had not given the result expected. Comparing the exhibitions of Berlin and Dusseldorf with their own, he found that the daily number of visitors to the former were at least 12,000, while in Vienna, even on Sunday, not half that number had visited the trade exhibition. The cause of this was that Berlin, and especially Dusseldorf, was in the center of a group of manufacturing towns, which was not the case in Vienna. He begged them to take into consideration who should make good the deficit, in case they had one with their milling exhibition.

Mr. G. Pappenheim did not concur in the views of Mr. Pfaff. Many manufacturers regretted this year that they were excluded on account of their nationality, and the numerous inquiries received by the council proved that such an exhibition is wanted. It should be the duty of the Association to see the matter carried through. While it was not so strong enough to do so, the Industrial Union had supported them, but now they were bound to carry it through in a proper manner. With regard to the deficit he did not see why there should be one if the German Millers' Association had not had one with their exhibition in the previous year. Whatever Berlin could do, Vienna could also.

Mr. Pfaff said that the Berlin Exposition was open for fourteen days, while the Vienna seed market was only open for eight. He wished to know who would put up motive power for only a few days, and, besides, the machinery department was put poorly represented.

Mr. Pappenheim stated that the absence of many of the large manufacturers from this year's exhibition was due to purely personal causes, well known to most of them. If the gentlemen present thought that the time was too short to have the exhibition complete in every respect, he would beg to support the proposal of Mr. Polsterer for its postponement till 1882. He therefore moved the following amendment:

That the preliminary steps are now to be taken, but should a Seed Market Exhibition for 1881 be intended by other parties, then the exhibition of milling machinery shall take place also in 1881.

The amendment was then put to the meeting in the usual manner, and accepted by everyone, with the exception of Mr. Pfaff.

After the election of the new council the proceedings came to a close, the President, Mr. Ignaz Seidl, requesting the members to do their utmost to make the Association known.

AN Austrian baker in Gratz recently failed, and when brought before the court for examination stated that the cause of his failure was

through his not being a drinker. The majority of his customers were publicans, who each expected him in return for their custom, to consume a large quantity of beer. As he could not oblige them all, he soon lost their custom and consequently failed.

#### Pennsylvania Millers' Convention.

The third annual meeting of the Pennsylvania Millers' State Association was held in the large parlors on the second floor of the Wyoming Valley Hotel at Wilkes-Barre. Many of the best known millers in the State were present. There were also in attendance dealers in mill machinery, insurance agents, dealers in patents for mill purposes, grain merchants, &c. The press was represented by W. A. Spore, of the *Milling World*, Buffalo, N. Y. John Wallower, *Independent*, Harrisburg. The *Record of the Times*, and *Scranton Republican*. His Honor, Mayor Broderick, was present, by invitation.

At three o'clock, Hon. Chas. A. Miner, President of the Association, called the meeting to order and introduced Thomas Broderick, Mayor of the city, who addressed the convention as follows:

Gentlemen of the Pennsylvania Millers' Association—On behalf and in the name of the city of Wilkes-Barre, I bid you a sincere and hearty welcome. The meeting of an association of men of your individual character and standing, and representing as you do one of the great industries and sources of wealth of this great nation, is an event of importance to this city. Accustomed as we of this Valley are to having our attention concentrated upon the one element of wealth that distinguishes this region as the finest body of anthracite coal in the world, it is well for us to have brought to our notice the interests and development of another and even greater national resource.

The old boast that cotton was king has long since died away, but it may well be said that, if grain is not king, it is the best representation of the true sovereignty of the whole republic—North, South, East and West.

There is nothing sectional about grain, and so long as we can feed ourselves and half the world besides, we may have good assurance of the prosperity of our whole country.

The development of the business of which you are the representatives of this Commonwealth, is one of deep interest to all of us, and the organization and energies of an association such as yours cannot but tend to increase and render harmonious such development in a large degree. Gentlemen of the Association, the hospitalities of the city of Wilkes-Barre and of her citizens are yours."

After the Mayor closed his address of welcome, Mr. Miner, the President of the Association, opened the session with a few remarks. Among other things he said he was glad to meet so many of the more influential members of the Association from all parts of the State. He was glad to see substantial millers from Beaver in the West to Northampton in the East, Bradford in the North and Montgomery in the South, and although we have had larger meetings as to members, we have probably more barrels of flour and bushels of wheat represented here than ever before. He urged upon them the necessity of individual effort to make the Association a success, and hoped the meeting would be a pleasant and a profitable one. He added that a member then present, had made arrangements for escorting the delegates to the mines and other points of interest in and near the city, including points from which views could be obtained of the valley. Mr. Miner stated that he would do all in his power to give the delegates pleasure. He then called upon Col. E. K. Hancock, of Philadelphia, who responded by remarking that he had been given a more responsible duty than he deserved. He would assist the President in making the visit of the Association to this city a pleasant one. The Lehigh Valley Railroad have generously and courteously offered the Association a special train to take the members in any direction as far as the road extended, or they wished to go. He was glad to meet so many members and to become better acquainted with them and hoped all would remain here to-morrow.

The train on the L. V. R. R. would leave the city at nine o'clock in the morning for Fair View, and return in time for dinner at the hotel. A visit would then be made to the Prospect colliery of the Lehigh Valley Coal Co., and to other points of interest. He hoped that each and all would take advantage of the opportunity, and that those having ladies or friends with them, would ask them to join the party. Most of the members ac-

cepted the invitation. The regular business of the meeting was then taken up.

The Secretary distributed the constitution and by-laws in pamphlet form to the members.

The minutes of the last semi-annual meeting at Harrisburg were read and adopted. The Secretary then submitted the following report:

"Mr. President and Gentlemen: In presenting my report for the last nine months I regret that I cannot give you a more flattering account of the growth and business of the Association.

We now number 121 members, an addition of fifteen since my last report. This membership should be largely increased, for all will, I think, admit that our meetings have been profitable, and would become far more so if a general interest were manifested. It should not be the work of a few, as its interests extend to all.

The special unfinished business considered at our last meeting having been generally referred to the different committees, will by them, doubtless, be brought before you.

The prominent public feature of special interest to the craft, during this interval, has been the Millers' International Exposition, at Cincinnati. Many of you, I know, attended that novel exhibition, and observed what can be accomplished in milling, by having the advanced ideas of the day practically demonstrated by properly modeled machinery. This feature of the exhibition was the absorbing one to the American; while to our foreign visitors that department of the exhibit showing the unbounded resources of our land, enabling us to supply the world with food, must have been equally interesting. Thus that enterprise in so clearly demonstrating the unparalleled productions of our broad acres, and the inventive genius of our people, cannot fail to prove of great and lasting good to our country.

To-day the term expires for which you have elected me your secretary.

I have endeavored to serve you as well as my engagements and appointments permitted, and regret that I have not accomplished more for your benefit.

I desire to take this opportunity of thanking you for the marked courtesy and kindness you have always shown me during the two years that I have occupied this position. I know that my successor will have the same kind treatment at your hands, and hope that he will do far more and better for you. Yours, &c., A. Z. SCHOCH."

The report of Mr. Schoch, as treasurer of the Association, was also submitted. Messrs. L. W. Pyle, F. U. Gantz and Benj. Wissler were appointed a committee to audit the account. This they did and found it correct.

J. A. Gerhart, Easton, and E. B. Barnes were enrolled as members of the Association.

The Committee on Insurance had no statement to make at present, but reported progress. M. Horton, a representative of the Millers' National Insurance Co., was called upon and addressed the convention at length upon the subject of insurance. He spoke of the necessity of insuring by millers, and of the danger of fires in mills. He explained these dangers, and after showing how fires often arose from causes little anticipated, showed how they were caused by spontaneous combustion, the result of accumulation of oil, waste, dirt, etc. He gave a full and clear description of many cases of peculiar interest to millers.

Mr. Wenger of the Committee on Patents made a report, in the absence of the chairman, Mr. Creswell. The report was adopted.

E. B. Isett, chairman of the Committee on Transportation had written a letter to the Secretary, in which he gave a full report of what had been done relative to freights on the Pennsylvania R. R. This subject gave rise to a general debate, many members expressing opinions. In order to continue their work, the committee was continued for another year. The following are the members of the committee:

E. B. Isett, Spruce Creek, Huntington; Samuel McIlvain, Philadelphia, T. L. Rogers, Pittsburg; Allegheny; L. W. Pyle, Bryn Mawr, Montgomery, F. U. Gantz, Marletta, Lancaster.

Thomas Wright, chairman of the Committee on the Mill Machinery and Processes, was present and spoke at length on motive powers, giving his opinion of the various kinds of machinery now in use, burrs, etc, and the system of dressing burrs. His explanations of the advantages and saving to the miller, by the use of certain machinery, were exceedingly interesting.

The Committee on Grain for Milling reported the different kinds of wheat that make the best flours, and those most profitable to makers and consumers, and also mentioned

certain kinds of wheats which are decidedly inferior. On this subject Mr. Isaac M. Thomas, of this city, and others, spoke briefly. A letter from E. K. Bollinger, on the same subject, was also read.

Messrs. Small, Isenberg, Walters, Graber and Heebner were appointed as a committee to make nominations for officers for the ensuing year, who would be elected at the evening session.

The convention then adjourned until half-past seven o'clock in the evening.

The meeting was called to order at half-past seven o'clock. The President announced that the subject of wheat for mills would be resumed. There were many expressions of opinion, but the long berry wheats appeared to be the favorites. White and red wheats had their advocates. A specimen of the Hungarian or Thies wheat was laid on the table by Mr. Wright, of Kingston. It did not seem to be favorable received. Mr. Wright said he had sent for eight bushels of the farmers in his country to try, but it came too late. After a full discussion, the Chairman of the Committee on Grain for Milling, recommended the following, which was adopted as the sense of the convention:

The Committee on Grading and Inspection report to the effect that in grading and inspecting grain for milling, they think the judgment of the miller of the first importance, and that some experience is necessary in buying wheat. It is generally customary for a miller to fix a price for the highest grade of wheat and then pay a less price for a poorer quality. The Committee say that great care should be taken not to admit more to his No. 1 grade than just what belongs there. The buyer is always expected to be generous to the seller, but he should be just as generous to admit only such quality into the first grade as is entitled to be so rated. The grain tester now in use shows the correct weight per bushel and the Committee regard this scale as a valuable help in determining the quality and value of wheat, and they recommend its use where wheat is largely bought. The sense of the above was adopted by the Convention.

Members of the committee, who visited the Cincinnati National Convention, gave their opinions on machinery, at length, showing what machines for cleaning bran and other mill stuff were complete, and which were the best. The corrugated rolls on middlings seemed to give satisfactory work, and were a favorite with many. Various other machines used about mills were fully explained, and those singled out which were the best in their opinion.

Mr. Small, as Chairman of the Committee, after returning thanks to the officers of the Association, stated that the choice of the Committee for President was Hon. Charles A. Miner, and for Secretary, A. Z. Schoch.

Mr. Miner urged business engagements as a reason for not accepting a re-election and requested earnestly that some one else be chosen.

The Committee refused to accept Mr. Miner's declination even if he positively refused. Mr. Schoch firmly declined re-election and said that his business relations rendered it impossible for him to serve. The Committee begged him to reconsider but he said it was impossible.

Mr. Miner was then re-elected President for the ensuing year by an unanimous vote, in spite of his protest.

The following is a list of the officers for the ensuing year:

President, Charles A. Miner, Wilkes-Barre, Luzerne county; First Vice President, Jacob Walter, Easton; Second Vice President, Wm. P. Duncan, Phillipsburg, Centre county; Secretary and Treasurer, B. F. Isenberg, Huntingdon; Executive Committee, W. Latimer Small, York, York county; A. Z. Schoch, Selinsgrove, Snyder county; S. L. Levan, Lancaster, Lancaster county; Nathan Sellers, Philadelphia; John Hofer, Harrisburg, Dauphin county.

#### Economical Housekeeping.

A FRENCH MADAME TELLS HOW SHE FEEDS A FAMILY OF NINE WITH \$15 A WEEK.

"I cannot give you exactly the English for it. I suppose the word overlap would come near my meaning," said Madame. "I do not believe that a rechauffe is always as good a dish as when the plat is freshly cooked, but still there are some kinds of ragouts which improve much by the re-cooking. I even tell you when it happens that things are better when rewarmed—say my dish is thin and not concentrated enough. That sometimes happens to the best of cooks. Then if you make a rechauffe and do it well you improve things.

Now you translate rechauffe; what it means. Not twice cooked, but something warmed up again. Great difference, you perceive, between subjecting food to a violent heat and a gentle warming. Do I make use of such? Of course I do. I cannot afford to waste anything. But that is not the—what I call it? Yes, the overlap. There are 10,000 things that come in that scheme—category—what you will. Now, I will explain. Yesterday some fishing friends sent us a large bluefish; too much to eat in one day, but it has been boiled. More than half remain. What shall I do? Why, make a fish pate for breakfast. Oh! it was easy enough. The fish, it was taken off carefully, not broken. I made a crust, put in fish, with an oyster or two, a very little anchovy sauce, some pursley, little mace, small piece butter, and it comes to table hot and brown, and we think it very nice. I do not call that a twice-warmed dish, for it was new. Now to-day we shall have for dinner, with some other things, small fillet of beef and a smoked tongue. Very certainly, though we shall have two or three people to dine, much of the fillet and some little of the smoked tongue will be left over. I already have in my mind some idea what shall be done with the remains to-morrow, for a good house-keeper, and that means an economical one, always looks ahead. I shall cut up what is left over of the meat, and mince the tongue fine, and the cook will fry a chopped onion, and add a little pepper and salt, with a little stock, and then we'll make some paste as for a pie, and we will have rissoles, which will be very good. You make rissoles by cutting the piece of dough in small squares, putting a small tablespoonful of your farcie in each. You turn over the ends, like a pincushion, and if you want, you paint each one with a leet'l egg, and you bake. Would you have these rissoles so that you shall fall in love with them? Have some friend to send you some truffle, and chop in piece not bigger than my thumb. You laugh at my enthusiasm? You know what happen to me? This very summer I spend some weeks in a hotel with my family, and things cooked very bad, and waste—waste bad enough to ruin the proprietor. I see the cook throw away every six, eight feet of sheep from leg of mutton. One day I ask the landlord "why he have them throw away," and he laugh and say, "they were not good." I tell him, "Wait, you see. Will you tell the cook to let me show him how to cook them, and, if good, will you eat them?" and he agree, and I get them. Of course, you know that I make pied de mouton a la poulette out of them. It is very simple. You clean the foot and parboil until tender; you keep the stock and boil it down; you make white sauce with much parsley, and give a dash of lemon to it last. I happen to find an intelligent mamiton in that hotel kitchen who do what I say, while the head cook look on sulky. The landlord eat, and was satisfied that I know about what I talk. When I first came to New York, and did not know how markets are manage, I say to my bonne, "You go to market and buy me half dozen sheep's feet," and she say, "No, I am ashamed to do that; the butcher man he will take me for beggar."

"Would you mind giving me the cost of your food?"

"By no means," mademoiselle. We are seven in family; with two servants, that makes nine; with one guest almost every day. I cannot afford for grocer, market man, bread, milk, more than \$15 a week, and should my bills ever be more I retrench. I do not include wine, but tea and coffee—coffee twice a day—is always served. Ah! my butter is not used so extravagant as in American families. Why, when you use meat for breakfast, do you want butter? Perhaps nine-tenths of the butter I use will go to the preparation of vegetables. I think two pounds of butter is all we use. I think we eat much mere bread than in an American family. Where my economy comes, I think, is in overlooking what my cook does. Now you make calculations how many times we have portions of food during the week; breakfast, luncheon, dinner—that makes 189 times converts that are laid. Divide that by \$15 in a week and see how little it come to, and yet we stint, for, if I remember, I told you once that I believed that if a man, or woman, or child work, they must have good food, enough of it, and, surtout, that it must be well cooked. It is not so difficult, after all, when you make up your mind that it must be done. If I do not do it, I should like to know how I dress my children myself. You think it very small? Why, I know a French menage in New York—family one more than mine—that live quite well on \$12 a week, and I could do it if it were necessary."—*New York Times.*

#### "The Old Stone Mill."

NEWPORT, R. I., Oct. 18.—Mr. S. Russell Forbes, of Rome, Italy, a well-known archaeologist who has spent many years watching the excavations in that city, and who has devoted his life to the study of historical antiquities, has been in town for several days for the purpose of studying into the mysteries of the old stone mill. He reaches his conclusions through a process of reasoning uninfluenced by current opinions, or previously advanced theories, and his familiarity with the old Norman architecture and his acquaintance with the ruins of the old world will lend additional value to his theory in regard to the solution of the problem. He says that the mill is undoubtedly Norman, and in the style of its columns it corresponds with many Norman edifices in France, England and Italy. He disposes of the popular idea that it is a copy of the one at Leamington, Eng., or that it resembles the baptistries of Europe, to which it has been compared by a recent writer in one of the leading monthlies of New York.

Mr. Forbes says: "This tower is mentioned twice in some papers of the English governor, Benedict Arnold, who speaks of it as his 'stone mill,' but he does not say that he built it. The strongest argument in favor of that view is that it is said that the governor's house, pulled down some years ago, was built of the same kind of masonry, and that a house still existing in this city shows the same construction. But, on the other hand, there is nothing to show that the idea for these edifices was not taken from the old tower. I find that the house referred to—the oldest stone house in the colony—is not of the same construction as the tower. The mortar is different in its composition. It has hair in it, and brick is used for the windows among the stone. If the governor's house was like this it certainly was not of the same construction as the old tower. Records exist of the building of all other edifices, but there is no record of the erection of the tower. The governor would certainly have boasted of such a tower had he built it. Easton's mill, near Newport, was of wood, and is recorded as being the first one erected. Great were the rejoicings at its completion, and as a reward of the owner's public spirit the town presented him with a mile of the beach."

"The old tower was not built for a mill, and has nothing in common with the Leamington square pillared mill, erected by Inigo Jones, near Chester, Eng., to illustrate the architect's idea of what a windmill should be. Tradition says that this was used as a mill. A party landing on the coast and intending to stay would naturally erect something to protect themselves from wild men and beasts. They would select that spot which commanded an extensive horizon and was easy of defense. Consequently, they would choose the highest ground convenient to their landing place. Their camp was probably pitched at the top of the hill, and in the centre they erected their *arc* (citadel, keep or watch-tower), and castle. As this was to them the most important place, they erected it of stone, after the pattern of their own Norman towers at home. Lying along the shore was material ready to their hands—stones of various kinds and shapes, cast up or washed from the rocks by the sea, such as can be seen at the present day on the adjacent shore. They naturally burned the shells strewn along the shore for their lime, and, mixing sand, made the mortar with which the stones were held together. Selecting the largest stones of the material most easily broken, they formed with these the bases of their Norman columns, and where they were not level they filled them in with smaller stones. Their rough, rubble material gave a rude appearance to their stronghold, and presented many points by which a savage might, like the Gauls of old, climb into the capitol. To obviate this they coated the whole of the edifice with mortar, which, from the materials composing it, formed the best kind of stucco. The fireplace and the window opposite are original (the other window is more modern), and are built with arches of a construction which it would be impossible to insert if not built so originally. They correspond with the arches which spring from the columns and support the tower. The two flues are peculiarly a Norman feature. Some of the smaller holes were for the joists of the flooring to the second floor, and some, now filled in with brick on the inside, were for loopholes. Other holes were for the support of the stairs. There are decided traces of where the stairs to the second floor were placed. A little way from either side of the fireplace and above it a ledge or shelf is noticeable, running all around the interior.

"This supported the roof of the second

floor, and formed a platform for a lookout from the top of the tower. As each arch sprang from the right and left of its column a space was consequently left in the wall for the massive joists of the first floor, which was reached by wooden steps, pulled up in time of danger or at night. This massive flooring is another proof of the antiquity of the tower, and it must have lasted a considerable number of years before it rotted out. A light in the original window would serve to guide any boat or bark they might have, or could be a signal to any comrades who might pass along the coast at night. The character of the construction is Norman, and when or by whom it was built, the purpose was to erect a watch tower and place of defense. It is un-English and decidedly Norman. As the Normans are known to have been acquainted with the coast, there seems to be no improbability in their having erected this tower. Of their camp ground nothing remains, because it was never more than a temporary affair, like all camps. The fact that the columns are true to the points of the compass indicates that seafaring men were the builders of the tower. For, as steered their bark by the polar star, so would they set their tower by it. If these builders were shipwrecked mariners, they would have no means of communication with other settlements of their countrymen, and we may presume there were no women among the crew, whose numbers would gradually diminish until, in the course of time, they died out, leaving no trace of their settlement except this unique and lonely tower."

The *Newport News*, this evening, editorially referring to Mr. Forbes' examination, says: "It will awaken the inquiry anew and lead many to reconsider the opinions previously entertained. That some of the old discussions are scarcely worthy of the name is evident from the fact that one of the most popular and widely-read articles on the subject that has ever been printed was written by a gentleman who spent but three hours in the vicinity, and who never passed inside the iron fence with which it is surrounded. Without even entering the building he pronounced it a baptistry and published an entertaining article, but wholly wanting as a substantial basis. Some other writers have been Newport men who have grown up in sight of the tower, and, having always heard it spoken of as the 'old mill,' can scarcely come to the believe that it could have been anything else."

#### A Wasp in an Old Man's Slipper.

There are times in the life of a small boy when he feels very sad from the use of a slipper or switch upon him. If anything happens to the person who thus afflicted him, his joy is great, as will be seen from the following incident: A gentleman returned home from his daily toil and had pulled off his boots and was going to put on his slippers, when a howl of intense agony resounded through the hall. The affrighted family rushed to the door, and beheld their papa leaving the shadows with wild gestures and frantic gyrations. "Take it off!" he shouted and made a grab at his foot, but, missing it went on with his wardrobe. "Waiter!" he shrieked, and started up-stairs, three at a step, and, turning, came back in a single strike. "Oh, I'm stabbed!" and sank to the floor and held his right leg high above his head; then he rose to his feet with a bound, and screaming for a boot-jack, and held his foot out toward his terrified family. "Oh, bring the arnica," he yelled, and with one despairing effort he reached his slipper and got it off, and with a groan as deep as a well and as hollow as a drum, sank into a chair and clasped his foot in both hands. "Look out for the scorpion," he whispered hoarsely; "I'm a dead man."

The small boy was by this time out in the woodshed, rolling in the kindling in an ecstasy of glee, and pausing from time to time to explain to the son of a neighbor, who had dropped in to see if there was any innocent sport going on in which he could share. "Oh, Billy! Billy," he cried, "you wouldn't believe; sometime to day, somehow or other, a big blue wasp got into the old man's slipper, and when he came home and put them on—oh, Bill, you don't know what fun I've had."—*Dallas Herald.*

"WILLIAM, you have again come up unprepared!" "Yes, sir." "But from what cause?" "Laziness, sir." "Johnson, give William a good mark for uprightness." "Bates, you proceed." "I have not prepared, too, sir." "But why not?" "From laziness, sir." "Johnson gives Bates a bad mark for plagiarism."

OLEOMARGARINE is sold by the grocer who tells you it is just from the cow. And so it is, but the cow is dead.

NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Cleveland, Neb., wants a grist mill.

Geo. Graham & Son have bought Preston's mill at Trenton, Mo.

The new mill of the Winona Mill Co. turns out 600 barrels of flour daily.

L. Pauly, of Alma, Kan., is building a new mill on the new process system.

T. J. Woodruff's grist mill at Grant, N. Y. burned Oct. 5. Loss \$40,000.

E. T. Martin, at Milner, Ga., has contracted for a three-run new process water mill.

J. J. Heacock, of Rochester, Iowa, is building a two-run steam mill at above place.

The mill of R. M. Simmons, of Adairsville, Ky., is undergoing extensive repairs.

The Schlitz Brewing Co. of Milwaukee, will built a \$40,000 malt house this winter.

Andrews, Ia., people are trying to get someone to locate there and built a grist mill.

Robert & Perkins new mill at Fargo, D. T. will have a capacity of 125 barrels per day.

Fred. Geiger has ordered one of Simpson & Gault's improved No. 4 Snow Flake purifiers.

Simpson & Gault have received orders from Australia for three No. 3 Snow Flake purifiers.

Simpson & Gault, have orders for a car load of Portable mills to fill orders in Portland, Oregon.

Scott & Co., of Greenfield, Ind., have ordered a Champion brush machine of Simpson & Gault.

It is reported that a larger amount of winter wheat than usual has been sown in Wisconsin this fall.

The new elevator at Duluth, Minn., has commenced business and is receiving wheat at a lively rate.

The propeller Quebec, in order to ride the lake storms, had to throw overboard 700 barrels of flour.

Barnard & Young, of Bloomington, Ind., are enlarging their mill and adding considerable machinery.

Jones, Ballard & Ballard have ordered two No. 3 Snow Flake purifiers for their mill at Louisville, Ky.

The damage by fire to the O'Fallon Mills in St. Louis, Oct. 8d, was \$30,000. This includes damage to stock.

Kyle Bros., of Beach City, O., have contracted with Simpson & Gault for a six-reel chest and other machinery.

About a million and a half barrels of flour have been shipped from Minneapolis from January 1st up to November 1880.

R. Monarch & Co., of Owensboro, Ky., are putting four of Simpson & Gault's corn mills in their distillery at that place.

M. Scheurider & Co., Jasper, Ind., are adding one of Simpson & Gault's 22-inch middlings mills and other machinery.

C. Martin, of Athens, O., is putting one of Simpson & Gault's Combined Smut and Brush machines in his mill at Shades, O.

The old mill belonging to C. N. Nichols, at Onalaska, Wis., after twenty-five years of profitable activity was recently burned.

The Chicago Pearl Barley Mill, owned by Charles Esemann & Co., was burned early in October. Loss, about \$8,000; insured.

Louis C. Richter, a miller of Lincoln, Ill., is in jail charged with an attempt to murder his divorced wife. He pleads not guilty.

W. H. Liggett & Co., of Columbia City, Ind., and David Scott, of same place, are enlarging their mills and adding new buhrs.

Fire destroyed the brick flouing mill of Lawson & Bell, Gallipolis, O., Monday, involving a loss of \$12,000; insurance \$8,500.

The boiler in the Enterprise flouring mills at Pomeroy, Ohio, exploded Oct. 3d, and severely scaled two lads. No employes were injured.

The building for the Queen Bee mills at Sioux Falls, D. T., is completed and the millwrights are placing the machinery as rapidly as possible.

Bread made from whole wheat soaked before being coarsely ground, is used in the French army. Sea water used in the kneading is said to add flavor.

The steam flouring mill at Cortland, Jackson Co., Ind., was burned October 13. It was owned by Geo. R. Brown. Loss, \$10,000; insurance, \$2,500.

H. A. Fox, Fountain City, Ind., is adding two of Simpson & Gault's Queen of the South under-roller mills, Champion separator, new conveyors, elevators, etc.

The Dan. Shaw Lumber Co., of Eau Claire, are changing their mill to a full roller mill using the Gray noiseless roller mills. Ewd. P. Allis & Co. have the contract.

The new brush attachment on the Snow Flake purifier, made by Simpson & Gault, is acknowledged to be the most practical device for cleaning cloths now in use.

Threshing in Great Britain reveals the important fact that the large bulk of wheat harvested in good condition has since been damaged in the stacks by rain.

J. C. Harris, of Montgomery, Ind., has given his order to Nordyke & Marmon Co., of Indianapolis, Ind., for a four-run new process mill, complete from top to bottom.

Simpson & Gault are refitting the mill of C. Morris, of Knoxville, Ky., and are adding two run of 36-inch buhrs, Champion smutter, four reel chest, new cloth for old reels, etc.

C. P. Hadley, of Portage, Wis, is building a new two-run improved mill at the above place, and Nordyke & Marmon Co., Indianapolis, Ind., has his order for the entire machinery.

John Boyle, of St. Martins, O., is refitting his mill at that place, and is adding two pairs of 30-inch stones, for wheat, and one pair 36-inch for middlings. Simpson & Gault are doing the work.

A special from Chicago states that the receipts of wheat in that city remain small, notwithstanding the statement by shippers that prices are five and six cents per bushel above an export basis.

Messrs. Ogelvie & Co., of Montreal, Canada, have ordered a full outfit of the Gray noiseless roller mills, and are to change the mill to a roller system. Ewd. P. Allis & Co. have the contract.

Ewd. P. Allis & Co. report sales of over 1200 of their Gray noiseless roller mills since 1st of January last. They are now furnishing 80 for Pillsbury & Co., of Minneapolis; 75 for Sanderson & Co., of Milwaukee.

The Seymour (Ind.) Milling Co, is about to build a six-run steam mill and a large elevator combining all the new ideas in that line. Nordyke & Marmon Co., of Indianapolis, Ind., are furnishing the entire job.

R. Tweedie, of Drayton, D. T., sends his order to Nordyke & Marmon Co., of Indianapolis, Ind., for a three-run new process steam mill. Spiers & Mekuchin, of Pembina, D. T., also order a three-run steam mill of the same firm.

Failure of the crops in Russia will afford a market for the splendid harvests of the United States. Official dispatches assert that Russia, usually exporting 40,000,000 quarters, or 320,000,000 bushels, will this year have to import breadstuffs. The outlook is encouraging for American farmers.

Work has been commenced on the 350,000 bushel elevator at Nashville, Tenn., for the Nashville Warehouse Co., under the direction of Nordyke & Marmon Co.'s superintendent, William Watson, Esq. The arrangement of this elevator is such that five cars can be loaded or unloaded at one time.

Elliott Robley's 3-run frame flouring mill, at Mapletown Depot, Pa., burned, Oct. 25. Loss estimated at \$12,000. No insurance. The mill was built 7 years ago and recently had an engine put in to furnish power when water was low. Coal and tan bark were used for fuel. The fire started in the vicinity of the engine.

Messrs. Kreisher & Son, Frankton, Ind., have contracted with Simpson & Gault for a five-run mill, complete, which is to be built at that place. It will consist of one 50-horse power Buckeye automatic engine, four run of 42-inch and one run 30-inch buhrs, one six-reel chest, one No. 2 purifier, one combined brush and separator, etc. This will undoubtedly be the largest flouring mill in that section of the State.

The Asonia Watch and Clock works, Brooklyn, said to have been the most complete of the kind in the United States, and having been in operation for only fourteen months, were destroyed by fire, October 26. The watchman declares that he witnessed an explosion of gas on the fourth floor, followed by a fierce outburst of flame. The loss is over \$1,000,000, and the insurance \$400,000. Phelps, Dodge & Co., a heavy hardware firm of New York, were largely interested in the works. Twelve hundred persons are thrown out of employment.

Heck Bros. were somewhat surprised to

have their mill suddenly stop and refuse to grind. They set about investigating the matter, and when they looked over the water wheel they found that a large eel had wended its way into the race and rather injudiciously became entangled in the wheel, and stopped the working of the whole mill. They pulled the eel out, and it measured two and a half feet in length. It is, probably, one of the eels that were placed in the pond about five years ago. This is no fish story; we never did believe an eel was a fish.—*Tecumseh* (Mich.) *Herald*.

P. B. Hughes an experienced miller has leased the mill on Rice Creek, 7 miles north of Minneapolis and after fitting it up thoroughly will be ready to turn out first class custom work.

An extraordinary case came under the notice of the medical staff at St. Thomas hospital, London, recently. A miller named Alfred Baxter was engaged at his work at some flour mills, and while fastening the chain tackle to the neck of a sack of flour, his thumb got caught, and he was dragged up a distance of over 12 feet, when the joint became detached, and he fell with a heavy crash to the ground. He was at once attended by his comrades, and was eventually removed to the hospital, where he now lies in a dangerous condition.

The following parties are putting in the Reynolds Corliss engine, build by Ewd. P. Allis & Co., Milwaukee: Sherman House, Chicago, 40 horse power. Smiley & Sisson Lakeville, Minn., 60 horse power. Chandler, Covgdon & Co., Beaver Dam, 60 horse power. Reveille yarn Mills, Natchez, Miss., 300 horse power. Natches Cotton Mill Co., Natchez, Miss., 300 horse power. Leadville Coal Co., Youngstown, O., 400 horse power. C. N. Nelson & Co. Stillwater, Minn., 800 horse power. Schulenbay & Boeckler, Stillwater, Minn., 800 horse power. Chicago Times, Chicago, 250 horse power. Atchison, Topoka & Santa Fe R. R. Co., 200 horse power. J. B. A. Kern, Milwaukee, 750 horse power. Daisy flour mills, Milwaukee, 300 horse power. The last two engines are of the compound type and will produce an extremely high economy.

New Method of Disintegrating Indian Corn.

An American named Bennett has devised a new method for separating the glutinous from the starchy matter in Indian corn in a dry state. The usual method of doing this by grinding the corn in a wet state has several strong objections. The offal produced is of little commercial value, as it cannot be profitably shipped any distance on account of the moisture it contains. If the corn is ground in the ordinary manner, in a dry state, it is impossible to effect a complete separation of the glutinous and starchy constituents.

The new system consists in subjecting the corn to whipping or beating in a properly constructed disintegrating machine having beaters which revolve rapidly in opposite directions. In this way the outer, hard, glutinous portion of each grain is broken into coarse particles, and the inner, starchy portion, which is much softer, is reduced to flour. The starch flour comes from the machine in suitable form for separation from the bran. Thus two or three products are made, either gluten and unbolted corn flour, or gluten, flour, and bran. The flour may be used for all purposes in which starch is employed, the bran for stock feed, and the glutinous matter, entirely free from starch, for food.

The advantages named by the inventor of this process are: Adaption to shipment to distant points, after the natural moisture has been expelled from the grain. Freedom from the vegetable oil in the gluten which makes the starch ordinarily have a bitter taste when used for grape sugar or corn syrup. A cooler process of separation is sustained, preventing the product from heating and sweating which take place when the corn is ground between stones.

The originator claims as his invention, and secures a patent on the process of obtaining the glutinous and starchy substances from Indian corn or maize, which consists in whipping or beating the corn until the soft starchy portions of the kernels are reduced to flour, when the tough glutinous portions of the kernels are reduced to coarse fragments, and then separating the fragments of glutinous matter from the starch-flour by suitable sieves or bolts, substantially as set forth.—*Leffel's News*.

A SUBSTITUTE FOR THE CRANK.—A device has recently been patented by Mr. Samuel W. Hanson, of West Union, West Virginia, intended to replace the crank in steam engines and other machinery where the crank is now used. On the end of the shaft, to the place

usually occupied by the crank, there is a heart cam, across the face of which, and at right angles to the shaft, a bar slides in suitable guides. The bar carries a lever, whose pivot is parallel to the main shaft and in the same horizontal plane. This lever has on each end a friction roller, which rolls on the periphery of the heart cam, and from one side of the lever projects an arm which is connected by a rod, with a pin working in a slot in the bar already mentioned. A slide on the bar is provided with two pins projecting downward on opposite sides of the pin connected with the rod. The slide is connected with a hand lever, by which it may be moved lengthwise on the bar. The bar is connected with the piston rod of a steam cylinder or any other prime motor, either directly or by means of a lever. The bar being reciprocated, exerts a pressure on the periphery of cam through the medium of the lever and its rollers. One end of the lever is below the center line of the bar, while the other end is above. This arrangement insures the rotation of the cam in one direction, and to reverse the motion of the cam, all that is required is to reverse the position of the lever by moving the slide. The inventor claims that the cam has no dead points, that the power and motion are equal throughout the stroke, and that for this reason a fly-wheel is unnecessary. He also states that he gains a great deal of power over the crank, that it will run either very slowly, or with any desired velocity, that it is capable of withstanding jars or shocks it is likely to receive, and is not liable to get out of repair.

Buckwheat.

The name of this plant, or rather the grain of it, is derived from the German word *Buckweizen*, "Beech-wheat," from the resemblance of the seeds to beech-masts. It is not properly a grain but belongs to the family of knot weeds of which there are several varieties in the Northwestern States. It is probably a native of China, but the time of its introduction into Europe is not well ascertained. It has been cultivated in England for about 300 years. It was introduced into North America by the Dutch early in the seventeenth century. Kalm, the Swedish naturalist, who visited this country in 1748 found it grown in Pennsylvania, New Jersey, and New York. There are three cultivated species—Common Buckwheat, *Polygonum fagopyrum*, Tartarian Buckwheat, *P. Tararicum*, and Notchseed Buckwheat, *P. emarginatum*. The first named species is chiefly cultivated in America, the second in Italy, and the last in China. In Europe it is grown for food from Russia to Italy, Great Britain excepted. In the United States it can be grown in every section, but is chiefly cultivated north of North Carolina and Tennessee. The total crop in 1820 was 7,201,743 bushels; in 1850, 8,956,916, and in 1860, including States and Territories, 17,571,818. It will be seen by these figures that the crop of 1860 was nearly double that of 1850, showing a greater increase than any other grain crop. In Pennsylvania and New York the grain is used extensively for feeding sheep in winter, and it has been found so valuable for this purpose, that the crop has increased enormously since 1850.

Boussingault gives the following as contained in the grain (A), and the straw (B):

	A.	B.
Water, per cent.....	12.5	11.6
Nitrogen, per cent, dried.....	2.40	0.54
not dried.....	2.10	0.48
Ammonia, dried.....	2.94	0.65
In 100,000 parts of Buckwheat straw Sprengel found 3,203 parts of ash, containing the following ingredients:		
Potash.....	332	
Soda.....	62	
Lime.....	704	
Magnesia.....	1,292	
Alumina.....	25	
Oxide of Iron.....	15	
Oxide of Manganese.....	32	
Silica.....	140	
Chlorine.....	95	
Sulphuric Acid.....	217	
Phosphoric Acid.....	288	
	3,203	

There is a striking similarity in the composition of buckwheat and rye. In the seeds of the former there is 27 per cent. of husk. The 73 per cent. of flour closely resembles that of rye in color and properties, containing 10½ parts of gluten and 52 of starch. The greatest resemblance exists in the constitution of the ashes, when both plants have been grown on the same soil. The dried grain of rye contains 24 per cent. of ash, and that of buckwheat 21 per cent. Buckwheat is frequently plowed in as manure for a wheat crop, for which purpose it is said to be, on some soils, fully equal to clover. Corn does not succeed well when it follows buckwheat, but on account of the soil being mellow and free from weeds, nearly all the cereals and root crops grow well after it. July is the month for sowing, but it can be sown as late as will enable it to escape frost.



## About Our European Cousins.

[Translations made from the German and Austrian Milling papers expressly for the UNITED STATES MILLER.]

**THE Ungarische Muehlen Zeitung** remarks: A new American technical journal has come to the conclusion that peculiar as the relations in Europe now are, a prolonged war between France and Austro-Hungary is inevitable, and that the Hungarian industry of milling would then be destroyed on account of the inability to obtain French stones. We look forward to the French-Austro-Hungarian war with the same calmness as to the want of millstones which shall grow out of it. It may perhaps be of interest to our new colleague, however, to be informed that in Sarospatak in Hungary, millstones are quarried, which are not at all inferior to the French burr-stones. If the ruin of our milling industry is dependent on this, it will certainly live to a very old age.

**ABOLITION OF THE GRAIN TARIFF IN GERMANY.**—The opposition to the grain tariff in Germany is still continuing and spreading more and more. Scarcely has the subject of abolishing the grain tariff been broached in the Prussian Diet (occasioned by the interpolation regarding the distress in certain parts of Prussia), when it is already said that a petition is being circulated among the Berlin merchants, in which the abolition of the grain tariff is absolutely demanded. In the German press, too, the same demand is made. The state of the market and the high prices of grain are referred to, in consideration of which the tariff might become fatal in case the harvest should eventually prove a poor one. The Prussian Government does, to be sure, as yet superciliously ignore this agitation, and officially declares that it does not think of an abolition of the grain tariff. It will, however, not be able permanently to deny this demand which is becoming daily more urgent. —*Oesterreichische-Ungarische Mueller.*

**EFFECTIVE MEANS OF REGULATING PRICES.**—A comfortable means of preventing the rise of the prices of commodities has been devised in Teheran. Although there is no reason for high prices there, they have been considerably raised of late. The last harvest was not a poor one, the next promises to be excellent, and yet meat and bread are exceedingly dear. In order to do away with this state of things the Prince Regent Raib "Es" Sallanet made a tour through the Bazar, and all the bakers and butchers who asked unreasonable prices had their earlaps immediately clipped off, while others were not lead by their ears to the doors of their shops for several hours, upon which proceedings the prices were instantly reduced all over the Bazar.—*Pappenheim's Oesterreichische Handels Journal.*

**RESULTS OF THE GRAIN TARIFF.**—It is reported the steam mill of Leer has notified all of its employes that it will shortly stop working—a result of the new tariff era. The interested parties—eleven shareholders in all—have come to the conclusion that for their establishment it is an impossibility to comply with the tariff regulations, as they have at length after much procrastination been definitely issued by the Council of State and to continue their profitable export trade to Holland. But without this export, a profitable business is out of the question, and for that reason the shareholders resolved at their last meeting to close the mill and not squander money in a hopeless fight with the impossible. The steam mill in Bremen has for some time been closed for similar reasons, and it is undeniable especially in Westphalia and on the Rhine that more establishments will be compelled to do the same.—*Die Muehle.*

[Translated from the German for the UNITED STATES MILLER.]

## American Flour.

The *Ungarische Muehlenzeitung* publishes an article treating of the differences between American and Hungarian flour, from which we quote the following:

It must be said of the Scotch that they are the best judges of flour in the world; it may be because they, more than all others, have had before them and have had the opportunity of comparing the real value of the most diverse kinds of flour from the most diverse quarters of the globe. These judges of flour are willing any day to pay 10 per cent. more for Hungarian than for American flour. The same may be said of Amsterdam and Rotterdam merchants. The London Corn Exchange quotations of the 14th of June, for instance, quote American flour "Patent Process extra fine" at 40 sh. per barrel, Hungarian 5 Crowns at 62 sh. per 280 lbs. While according to this,

100 lbs. of the former would bring 20 sh., the latter would come to 20 sh. 2½ d. and a fraction for the same amount. This can be due only to the absolutely greater intrinsic value of the latter article.

Several large American mills produce as many as eight different kinds of flour. The majority of mills, however, make no more than 3 or 4 kinds. This is no reproach whatever. Our mills could well congratulate themselves if they had less degree in quality to deal with, for each one is a separate article of trade with its separate market and separate season. In this way every mill deals in 12 different articles of trade, while it would otherwise have to deal with only a few.

The poorer qualities of American flour contain exactly as much gluten as the finer qualities. This is certainly an advantage. Our own fine qualities of flour contain less gluten than the darker qualities, simply because the fine flour is produced solely from the grits of the kernel, consequently contains only the gluten which forms the walls of the starch-cells, while the real layer of gluten lies below the husk of the kernel and is ground together with it to a dark quality of flour. These American mills which produce 8 qualities of flour likewise obtain them from the grits, and the greater amount of gluten is then too to be found in the poorer qualities. When only 3 or 4 kinds are produced, however, the same amount of gluten is distributed among them, and each one kind will receive a larger portion of it. The poorer qualities of American flour are very hard to bake, and this serves to prove our opinion that it is the quality and not the quantity of the contents of gluten that is of importance, and the quality of the Hungarian gluten is far superior to the American. Hungarian flour No. 9 will furnish quite good bread, certainly much better bread than is commonly sold in London. About the color of flour there should be no dispute, since this is a matter of either opinion or taste. Yet we may remark that if the Hungarian mills would grind their No. 0 in the same way that Americans grind their Patent flour, it would not be of nearly as bright, light a color as is now the case. It can therefore not be said that the American Patent flour looks finer than the finely ground Hungarian flour.

As to the baking qualities, the Patent flour is far inferior to No. 0 of Pest flour.

Now considering that it is claimed that the American flour has a nicer color, can be better baked and is stronger, how is it that in the market of the world it is rated at such a much lower figure than the Hungarian flour?

[Special correspondence of the UNITED STATES MILLER.]

## Our Austrian Letter.

[Communication from Buda-Pest, translated by R. BIRKHOEHL.]

The Cincinnati Millers' International Exhibition has verified graphically that the excitement which was prevailing among the millers of the United States for several years, was perfectly reasonable. The fear, that the old way of milling was bound to be abandoned and a new system had to be introduced was shown to be rather of just cause. Enormous sums have been spent during the last years for improvements in milling, and yet the ingenuity of our mill experts was not contended; new ideas, new applications and ameliorations of existing devices had to be brought forth to continue their strife for progress. Hungary, the milling centre of Europe, was the first which gave the impulse of improving on the system inherited by generations. It was there, where the grinding with stones was first almost radically abandoned—it was there were roller mills first were substituted for stones. The German, Austrian, Russian, English and American millers were watching the proceedings of their Hungarian fellow craftsmen with the greatest of attention.

Our American millers have been well aware of what was going on in Pest. They, as a nation, are justly acknowledged abroad as "go ahead"-people. No sooner is an invention considered practicable and lucrative—than it will be adopted by the Americans; should its application cost fortunes, there is no impediment so formidable as that could not be overcome. First, some important American millers traveled across the ocean for the purpose of learning, they ordered some of the machines recently engaged for milling purposes; then went some of the best milling engineers to convince themselves on the spot of the real benefit of "changing," and we notice to-day such radical changes going on in a great number of large and small mills in this country as we think never took place at once in the whole of

Europe together! The millers are aware of profit in "changing." They know that they must discard the old way of manipulating grain in their mill if they want to compete quantitatively as well as qualitatively.

The leading idea amongst the millers of to-day is, to improve their machines more and more, in order to do more perfect work with them. It is astonishing, for instance, how much the simple chapter "Roller Mills" has been elaborated! Many of the existing designs of Roller machines were seen at the exhibition at Cincinnati, giving the visitors full benefit to study the efforts "to excel."

The originator of this great movement, rather dreadful to the millers' pocket at the first glance, but a source of vast profit to the circumspet, was Mr. Fr. Wegmann in Zurich, Switzerland. He can justly be called the reformer of milling, for with the introduction of his roll-system, impulse was given to the invention and improvement of machines to perfectly purify the great amount of middlings thus obtained. We will give the biography of Mr. Wegmann in our next issue and hope to meet the wishes of many of our readers if we now entertain them with the history of Ganz & Co., who may be called the PROMOTORS of the system originated by Mr. Fr. Wegmann, considering their fortunate results in improving the roller machines.

In the year of 1844 Mr. Abraham Ganz, a citizen of Switzerland, emigrated to Hungary, to the city of Ofen, opposite Pest. We have to remark here that nearly all the celebrated men at Pest, millers and experts, are not all Hungarians by birth. The greater number hail from our sister-republic, Switzerland. *Swiss men* made the fame of Pest. Mr. Ganz started a small foundry there. The commencement was very moderate and for the first 10 years he only turned out common small castings. In 1854 Mr. Ganz began, encouraged by the help of some railroad acquaintance, to manufacture car wheels, which, owing to his ability and the excellent Hungarian charcoal iron, proved very lasting. His fame began at that time and many of the largest railroads of Europe became his customers. In the year 1867 Mr. Ganz died and business was carried on by his heirs under the remaining management of Messrs. Eick-leiter, Keller and Mechwart. In the year 1869 the factory was changed into a stock company under the name of Ganz & Co., with president Paul von Somssich, ex-president of the Hungarian house of representatives, and chief engineer Mr. A. Mechwart. The firm owns one branch factory at Pest, one at Ratibor in Silesia, and one blastfurnace with mines in Upper Hungary. The establishment consists at present of a foundry, machine-shop, and car-shop; it manufactures as specialties: gears, railroad crossings and frogs, projectiles, all of chilled iron, and roller mills with smooth or corrugated rolls.

Since 1874 Mr. Michwart has concentrated all his energy on the improvement of roller mills; he is the man who really broke the way for the development of the happy idea of Mr. Fr. Wegmann, by his constant improvements and the business-like manner of making the milling world notice the machines, buy and try them. The first rolls, which were built by the firm, were porcelain rolls according to Mr. Fr. Wegmann's directions. After some time the material of the roll bodies was changed from porcelain to chilled iron also the rather primitive roller frames were greatly improved and at once sprung into existence the constant fight about porcelain and chilled iron, and the competitive roller mills of all possible and impossible designs ever were invented (?) and Mr. Mechwart's energy was called upon very forcibly to improve, in order to keep "on top."

The rolls in the Wegmann frame were arranged like the ones in the Sulzberger frame, horizontally along each other, but they were not pressed together with screws as those were. Wegmann employed weights or levers to obtain a uniform pressure, and to have the rolls self-adjustable according to the sometimes irregularly passing of the feed. The mate roll of each pair was driven at first by friction. This arrangement was really not new as it was used previously on paper calenders and malt and oilseed rolls. New was the idea of using it for milling purposes. Ganz & Co. have the merit of applying screws to the lever motion for the purpose of confining the rather loose and unlimited action of the pressure combination. New was Wegmann's idea of once grinding the stuff, as it was customary before to grind two or three times consecutively without bolting the grindings after each pass. The construction of the Wegmann roller mill was liked very much in-

deed, especially after he improved it so as to give motion to the mate roller by differential gearing; but after they were tried at Pest they were unfavorably criticised. It seemed that the opposition mainly culminated on the fragility of the material employed. Now Ganz & Co. substituted chilled iron roll bodies in place of the porcelain shells, which subsequently proved a very happy idea. There are now by far more chilled iron rolls made and sold than porcelain rolls.

(Translator's remark: Porcelain rolls can never be superseded by smooth iron rolls for flouring of fine purified middlings without caking and without the thus necessitated subsequent disintegration, be it by separate disintegrating or centrifugal bolting machines. They can never be substituted by iron rolls for obtaining the *sharpest* and *whitest* flour. As to the fragility I explain that the old mode of fastening the shells by sulphur has long been discarded, and that the liability of breakage is reduced to a minimum. Iron rolls are perfect in their place and far superior to porcelain rolls for *sizing* coarse middlings and removing germs and brany particles. As to the quality of the rolls made of European cast iron—we can flatter ourselves, that our American cast iron is found by actual tests to take a harder chill, to be denser and clearer than any European iron.)

Ganz & Co. were the first who furnished two of the larger mills in Pest with a system of corrugated rolls in the year of 1875. The oblique corrugation and the shape of the tooth are valuable inventions of Messrs. Ganz & Co. They experimented with them long before they put them into market and found after having tried all possible shapes of corrugations that the sharp saw-tooth corrugations were working the most economically, producing the purest middlings. Corrugated rolls had of course been in use before, but they did not work successfully, owing to their wrongly constructed corrugations and framing.

After Ganz & Co.'s introduction of their rolls, stone after stone was laid idle and the system of breaking the wheat on corrugated rolls, a system now declared unanimously the most economical, sprung into life.

Different materials were tried for roll bodies, soft cast iron, steel, granite, all those did not prove durable enough for the purpose, and the only two materials now used are porcelain and chilled iron. Mr. Mechwart's newest invention, the ring-roller machines, prove his ardent efforts to perfect the roller mills. He was congratulated by many scientifically educated mill experts and mechanics for the introduction of the same. These ring-roller mills are desired not only in Austro-Hungary, but also in England, and even here in the United States we can point out various mills which use and give them the best of credit. The machines save power, about one-half horse-power per machine, in bearing friction, which means quite an amount of coal per year, say about seven to ten tons. Very important is Mechwart's low grinding arrangement on those ring-roller mills with applied shaker sieves. Thus the owners of small mills are enabled to grind their wheat down to flour by once passing it through one machine. The quality of the flour thus produced is better than the flour of wheat ground low on stones, also the yield is far more considerable, and the bran not cut so much as with stones.

Ganz & Co.'s general agents for the United States are the Throop Grain Cleaner Co., at Auburn, N. Y., and Messrs. E. P. Allis & Co., at Milwaukee, Wis. The sole manufacturers of the ring-roller machines are Messrs. E. P. Allis & Co., of Milwaukee, Wis. Both parties will be pleased to give all desired information concerning Ganz & Co.'s machines, and the new system of grinding, if called upon.

DUPIN.

"PAY JOHN WILLIAMS."—At a church meeting not far from Boston, a man whose credit was not the best, and who was somewhat noted for his failure to meet his obligations, arose to speak. The subject for the evening was, "What shall I do to be saved?" Commencing in measured tones, he quoted the passage, "What shall I do to be saved?" He paused and again more emphatically asked the question, "What shall I do to be saved?" Again, with increased solemnity and impressiveness of manner, when a voice in the assembly answered in clear and distinct tones: "Go and pay John Williams for that yoke of oxen you bought of him!" The remainder of the gentleman's address was not reported. All present appreciated the fitness of the unexpected words in season, and were saved from hearing a lengthy exhortation from a swindler's lips.



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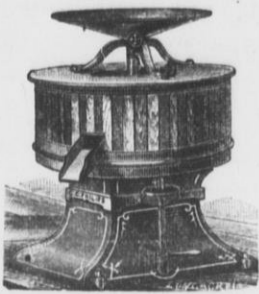
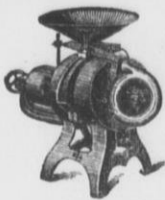
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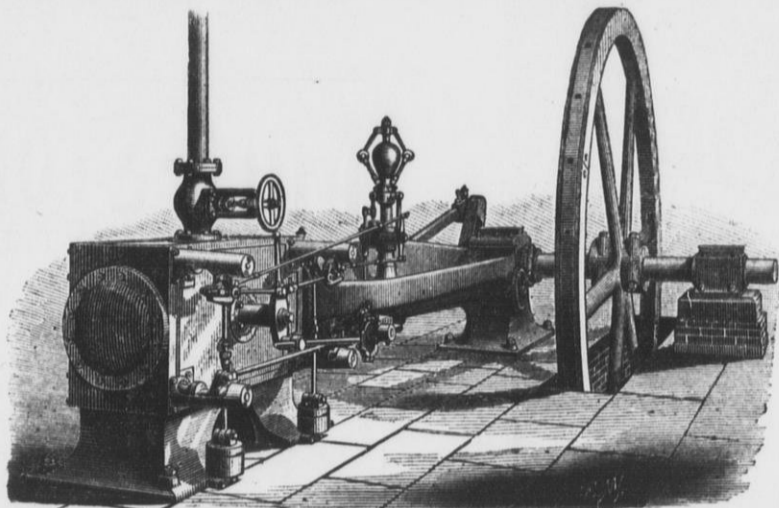
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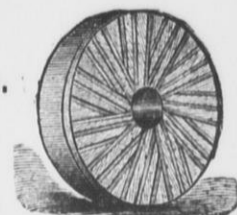
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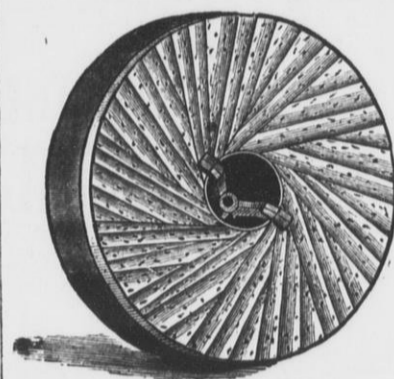
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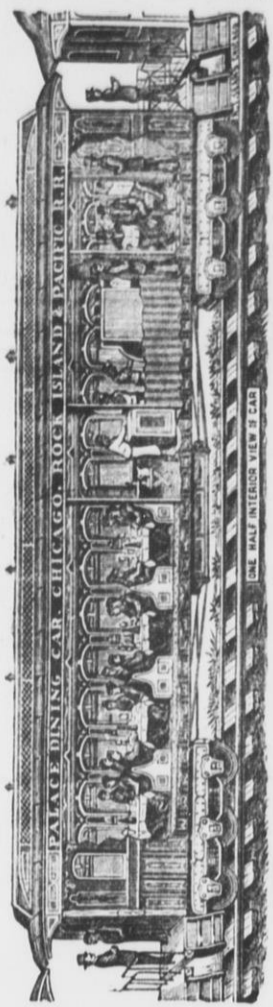
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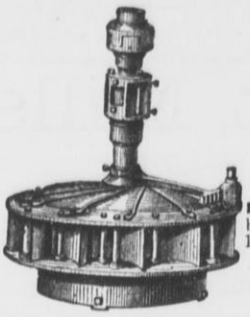
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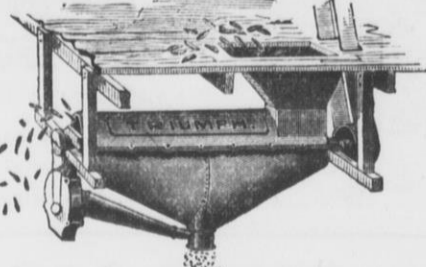
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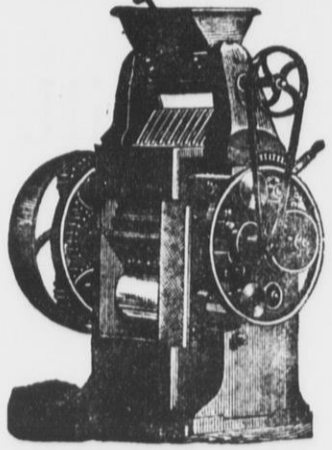
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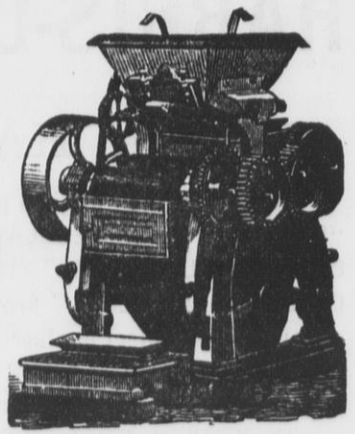
United States Miller, MILWAUKEE, WIS.

VIENNA EXHIBITION, 1873, Awarded Diploma of Honor. PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



# GANZ & CO., Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mills, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following:

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has benefited me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wonderful as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable. I remain, etc., (Signed) C. HAGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Roller, supplied to us by you. We have now had both smooth and fluted Rollers in use for the last two years, and have not found any appreciable wear in the smooth rollers. With reference to the work and capacity we can but report favorably. The flour produced by them is lively, and not killed as has been stated in some quarters, while its baking properties are first rate. Referring to the lately supplied fluted rollers, Mechwart's patent, grooved on the new method, they work admirably and are especially to be recommended for mellow wheats. Recapitulating, your Roller material is as tough as it is hard, and therefore in every way adapted for the purpose it is intended. We remain, Tivoli Kunstmuehle, A. MUELLER.

BUDA-PESTH, July 16, 1877.—Messrs. Ganz & Co., Buda-Pesth—Gentlemen: The most satisfactory results which, on testing the different 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 flour is produced, provided the rollers are used as directed, that your Rollers most satisfactorily detach the Semolina from the Bran, and thoroughly separate the Germ therefrom. 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 Rolls you have achieved an essential progress in the milling industry. Yours truly, PESTHER WALZMUEHL-GESellschaft, Riedle, m. p. Burchart, m. p.

BUDA-PESTH, July 11, 1878.—Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs, Having had occasion to try your newly patented Roller mills with others, known until now, I feel induced, regarding their excellent qualities to give orders for furnishing me the Roller mills to be erected in my two mills. These roller mills are to be recommended by their construction, surpassing all known until now, and especially for their remarkable capacity, doing much work with little power. Believe us, gentlemen, Yours truly, HEINR. HAGENMACHER.

BRANDERS A. ADLER, Bohemia, February 13, 1879.—Messrs. Ganz & Co., Buda-Pesth—Gents: I give you my best thanks for your delivering to me your well-made and well-working machines, as well as for those 2 machines you delivered me last year. I have no objection to your publishing this. Yours faithfully, G. HANNAK, Civil Engineer and Mill-owner.

Address all communications to

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Cable Address "GANZ, Kaiserbad." Or GANZ & CO., Ratibor, Germany.

## Or THROOP GRAIN CLEANER CO., Auburn, New York.

# The United States

# MILLER

Volume 10.—No. 2.

MILWAUKEE, DECEMBER, 1880.

Terms: \$1.00 a Year in Advance.  
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## A Famine Imminent in Russia.

Russian authorities have evidently endeavored to conceal the gloomy condition of affairs in that Empire, but the necessities of the people throws light on the subject which will cause a considerable commotion in the grain markets of the world. To a certain extent, Western Europeans have expected there would be short crops in Russia, but still sufficient to meet the wants of its inhabitants during the coming winter, but now it is a well assured fact that there is a great deficiency which must be made up by importing grain or flour, the bulk of which must be obtained from America. On this subject the *London Standard*, of November 3, says:

Already several cargoes of wheat have arrived from America, and the Odessa papers report the importation of wool from South Africa. Day by day the scantiness of the grain crop is becoming more and more evident, until it is certain that this year Russia, instead of contributing, as she has hitherto done, largely to the food supplies of Europe, will, to a considerable extent, be dependent on the surplus wheat, barley and rye harvests of other parts of the world. This state of affairs, happily unique in the annals of modern Russia, has arisen out of a variety of causes. Ever since the emancipation of the serfs, the tendency of the wheat-growing, and, indeed, of the agricultural area generally, has been to shift southward. The emancipation entailed serious loss on the proprietors of what is known as the Northern Agricultural Zone, and they nearly all abandoned tillage as an unprofitable occupation. On the other hand, the land owners of the more southerly region have found their revenues increasing under the altered condition of affairs, for even when they do not farm themselves they derive a good income from letting their land to peasants. But with the increase of the wheat and other grain areas in the South, the pest of locusts has made its appearance. These insects visit Southern and Eastern Russia every year, but this summer and autumn the swarms from the Asiatic steppes and deserts have done so much damage that very early in the season the Government endeavored in various ways to mitigate the misfortune. In the district of Rasachs 5,000 men were employed gathering locusts at the rate of 18,000 lbs per day, and in the country about Odessa fourteen companies of soldiers were detailed for the work of destruction. On the Poti-Tiflis Railway the trains were obstructed by the swarms, and the verdant steppes of the Don were by July so bare of vegetation that they looked as if a fire had passed over the land. Nor was the visitation confined to the Southern Governments, for many parts of the North suffered in an almost equal degree, and even in the latitude of Moscow the air on midsummer day was blackened by a cloud of the devouring insects passing over the city. In Russia, however, as in the Western States of America, the locust is irrepressible; hence the officials found all their efforts thwarted at every turn by this winged consumer of green things. But misfortunes never come singly, and an ally in destruction soon appeared to reinforce the locust and to make heavier still the peasants' already ample weight of misery.

This second plague of the wheat fields was the beetle known to the rural population of Kherson as "ceurzka," and to entomologists as *Anisoplia Austriaca*. This insect first appeared five years ago in the Melitopol district, but there is nothing known as to how and whence it came, as it had never been heard of in any other part of Russia, or in the bordering countries. It is a beetle of leisurely habits. From egg to adult it takes two years to complete its growth, but it is vigorous in proportion to the time it occupies in completing its transformations, for at the close of its second summer it appears on the ground in such numbers that as many as ten bushels have been

collected off one acre of wheat land. They fly from ear to ear, and never quit their prey until it is devoured. A field, or Commune, or Government disposed of, the courzka takes its flight to another, and so swift on the wing is this "shard borne beetle" that it removes from one ruined province to another doomed one with almost incredible speed, and so sharp are its mandibles that the unhappy peasant is never left long in suspense as to the fate of his fields. Last summer a mass of these beetles were discovered in the water near Ochakoff so dense that it was difficult to pull a boat through them. They were generally washed on shore, but the stolid people, instead of taking prompt measures to destroy them, allowed them to remain on the strand. When at last they recognized the danger with which they were menaced, persons were sent with horses and carts to remove them. But it was too late. About three-fourths of the insects had recovered strength and flown inland to form a new generation in that district, and spread, like the Colorado beetle of the New World, over the surrounding country. The British Vice-Consul at Nicolaieff, in reporting the occurrence to the Foreign Office, predicted that, unless efficient means were adopted in time, all agricultural Russia would become the prey of these insects, causing privations hitherto unknown in the country. What he prophesied has now become more or less a reality, though it is difficult to see what possible means can be employed to prevent the spread and increase of this most destructive of the coleopters, unless by burning the soil, which would, of course, injure its fertility. The case is, for English consumers, one of very grave concern. It is more than likely, even were the insect introduced, that it could not survive in the British climate. But its direct effect on the grain supply of Russia has for England more than most other countries a high and immediate interest.

The value of the Russian cereal exports is about 10,000,000 sterling per annum, and of this the greatest portion comes to Great Britain. In 1874 this country took 13,766,000 cwt. of this grain, and four years later, 21,409,000 cwt., of the value of £8,334,000. If Russia is at present importing grain for her own use, it is self-evident that this deficiency must be supplied from other sources. Of course, we need have no uneasiness on that score, for America, Australia and Upper India are quite able to more than provide the quantity which Russia can no longer send abroad. But in spite of this we may have to pay more than usual for our breadstuffs, though, as the addition to the price, owing to the abundant American supply, need not be great, our home growers will have more reason to rejoice than the consumers to repine at the enhanced cost. A more serious question is the loss of trade with Russia which this scarcity must necessitate. Our trade with Russia amounts, so far as the import of British manufactures is concerned, to something under seven millions, whilst, if we exclude grain, the other goods received by us from the Northern Empire are not valued at over eight millions. It is therefore undoubted that we must suffer directly and indirectly should the expected famine not be speedily tided over, for if the peasant has no grain to sell he has no money to spend. But to Russia herself the loss will be most severe. The country is not at present in a healthy condition. Her finances since the last war have been disordered, the people are heavily taxed, and a large class in the cities are notoriously discontented with the Government, which, rightly or wrongly, they blame for all their sufferings. A famine, of course, will not improve matters. An agricultural people not more than able to pay their way in good seasons will be almost ruined by one like that through the bitterness of which they have yet to pass. This state of matters will not fail to be taken advantage of by the Nihilist conspir-

ators in the cities who have hitherto been able to influence but slightly the unimaginative loyal, and prosperous "Moujiks." The coming famine may, however, have the effect of hastening the construction of railways over the Ourals, in order to tap the hitherto all but untouched agricultural wealth of the Black Earth Lands of Siberia, which neither the beetle nor the locust has yet reached. At present wheat can be bought in the valleys of the Yenessi and the Obi for less than a twentieth of what it will command in Europe, and cattle find so bad a market that young calves are sold in June for 6d each. Despite the discovery of the Nordenskjold-Wiggins sea route this region, in many respects far finer than Canada or some of the Northwestern States of America, is shut out from the world. Nevertheless, to Siberia the Government must look for their supplies of food, should the present bleak prospects of European Russia not improve.

## The Scrap Shop.

Every well regulated machine shop has its scrap boxes for the reception of odds and ends that have served a purpose and may serve another, and has also its scrap heap, where usefulness awaits another form through the medium of the foundry or forge. But there is occasionally to be found a shop, the principal production of which is scrap. The proprietor or foreman may have learned his trade, but he cannot teach it; he may understand the characteristics of the metals he works, but he does not know human nature; he may see the end he desires to reach on a job, but he is more or less uncertain as to the road necessary to reach it. In such a shop every tool is its own gauge; there is no permanence of form to any appliance in use in the shop. To-day it is a strap holding a blank to a wooden chuck; to-morrow it will be a knee brace built into some weak place of the vise bench. Drills which had been carefully fitted to a job that went out of the shop two weeks ago with a possibility of being duplicated in order, have been changed in sizes when the duplicate order comes to-day. A long cape chisel is transformed into a fluted reamer; the reamer gets slightly nicked at the end, and is next seen as a tap, and it is very probable the tap will go to augment the scrap heap. The wrench serves as the hammer; the lathe ways are handy bench-blocks for straightening rods; the planer-platen is admirably adapted for straightening a sprung shaft under the blows of a fifteen-pound sledge; new files clean the sand and scale for new castings far better than half-worn ones, and any long drill, reamer or chisel is just as good as a jimmy or pinch-bar to use as a lever. When a job comes in the workman goes roaming about the shop to pick up the necessary tools or to find something to make them from. A drill or reamer with shank already formed is much better than a piece from the bar; and so from the general shelf where the tools are kept—the shop floor—he collects his spoil, and after the tools have done duty for that job, they are again "transmogrified" for another. This statement is a little "too previous," as the slangwhangers say, for frequently, before the job is done, some other enterprising shopmate has followed suit and made a second transformation.

In this shop there is a long advance on the rule of some other shops: "A place for everything and everything in its place." The rule here is: "Many places for everything and everything everywhere." Not much time is wasted in such a shop in the construction of gauges, and sets of drills, taps, reamers, etc., are unknown. The old saying that if a presently useless thing is kept for seven years, its time of usefulness will come, does not count for much here. There is no seven years' rest for the most useful thing in this shop; if it finds no call for its proper use in its present

form, it is soon refashioned and put at work. In a shop of this character a very useful spanner or open wrench was suddenly missed. The most vigorous search failed to discover it. Weeks passed by and a substitute was made, and the loss became an addition to the long list of mysterious disappearances which excited no wonder. One day the foreman was congratulating himself on having so competent an engineer, who had lately contrived to keep up steam even when hard driven by the machinery. He supposed he had made some repairs, and possibly stopped some leak in the boiler. One noon he was almost alarmed at the spiteful outrush of heady steam from the safety-valve, and going to the boiler-room—the engineer being at dinner—he noticed some string wound around the safety-valve lever. A close inspection showed the missing spanner, weighed some eight or ten pounds, tied on the further side of the lever, so as to be out of sight, and adding an immense additional pressure per square inch to the boiler. The engineer was simply following the general practice of the shop, and keeping a tool adapted for one purpose busy in some other branch, "when not otherwise engaged."

In such a shop there can be no shop spirit, little of mutual helpfulness. Handy tools are valuable, and when a workman possesses those which are useful and suited to his hand, and fitted for his work, he does not like to see them abused. So, in the scrap-shop there are locked drawers and chests, and queer hiding places for tools, and even shop appliances intended for the general use are pounced upon by some enterprising workman and self-appropriated. Of course, this creates dissatisfaction and engenders unpleasant feelings, which do little to help forward a job when mutual assistance is required.

It is singular that this class of shops does not become extinct. Nobody ever knew the proprietor of one of them to make money or achieve a reputation. Generally a failure is the winding up, and a forced sale, at which the true character of the shop is manifested in the prices paid—the entire concern is sold for scrap purposes. Probably, however, these shops will continue to travesty the name of work-shop, so long as there are slipshods, slatternly mechanics, who have no correct idea of order, and no gift of management. These men serve little use in the world; even their experience is hardly more valuable than their shop products; it serves to augment some mental scrap heap seldom stirred by one in search of a bit of useful information.—*Boston Journal of Commerce*.

INERTIA AND ELASTICITY.—In its admirable series of articles on "Physics without Apparatus," *Nature* gives this experiment, depending partly upon inertia and partly upon elasticity, which is often shown as an after-dinner trick. Upon a linen tablecloth is placed a three-penny-piece between two pennies or other larger and thicker coins. Over this an empty wine glass is placed, and the puzzle is how to get out the smaller coin without touching the glass. The very small operation of scratching with the finger-nail upon the cloth, suffices to accomplish the trick, for the little coin is seen to advance gently towards the finger until it has moved completely away from under the glass. The fibres of the linen cloth are elastic; when you scratch with your finger-nail they are drawn gently forward until the force of their elasticity become too great and they fly back, to be once more drawn forward, again to slip back and so on. While the fibres are drawn forward slowly, they drag the coin with them to a minute distance. But when the slip occurs and they fly backward, they do so very rapidly, and slip back under the coin before there is time for the energy of their movement to be imparted to the coin to set it in motion. So the coin is gradually carried forward over the surface of the cloth.

UNITED STATES MILLER.

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MILWAUKEE, DECEMBER, 1880.

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MILLERS' DIRECTORY FOR 1880.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,600 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of 75 of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Five Dollars, on receipt of which Directory will be forwarded post-paid by mail, registered. Address UNITED STATES MILLER, MILWAUKEE, WIS.

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THE German Government is going to build several new railroads as early as possible, and thereby greatly increase its transportation facilities.

THE Cockle Separator Manufacturing Company, of this city, have launched out into the general mill furnishing business, and are prepared to supply anything needed in a flouring mill at short notice, and at bottom prices.

EVERY Wisconsin miller who is not yet a subscriber should not fail to subscribe for the UNITED STATES MILLER at once. It is the only milling newspaper published in Wisconsin. One dollar a year is the subscription price.

HUNGARIAN millers are not a little surprised that American flour should be sold in their markets at a price lower than they are willing to sell at. American wheat fields and American millers are surprising the world, and the end is not yet.

We respectfully request our readers when they

write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige, not only this paper, but the advertisers.

We will send a copy of the MILLERS' TEXT BOOK, by J. McLEAN, 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.

MILLERS, saw and planing mill owners, and others desiring to purchase any kind of flour, saw mill or planing mill machinery or supplies, will consult their own interests by reading the advertisement of H. P. Yale & Co., on first page, and writing to them for prices.

A SYNDICATE of American and English bankers has been formed to furnish \$40,000,000 with which to complete the Northern Pacific Railroad within the next three years. This and lines recently constructed will open up an immense quantity of wheat land to successful cultivation.

IN 1870 the various manufacturing establishments in New Orleans gave employment to 5,640 persons, and produced \$9,980,278 worth of articles. In 1880 the number of persons employed was 10,977, and the product worth \$20,909,047. This is an increase of nearly 100 per cent. in the number of employes, and more than 100 per cent. in the product; a very fair showing considering surrounding circumstances.

THE Consolidated Middlings Purifier Company and the Lacroix Middlings Purifier Company have effected a compromise of their differences, the Lacroix Company recognizing the validity of Smith's brush patent, and assigning all their interest in the brush patent to the Consolidated M. P. Co. The Consolidated Company now own more middlings purifier patents than ever.

THE UNITED STATES MILLER for 1881 is what you should subscribe for at once. The paper will continue to be as in the past a faithful and reliable chronicle of all matters of interest to the milling trade. Manufacturers and mechanics of all kinds can gain valuable information from its columns. The subscription price is one dollar per year, and it is fully worth it. Subscribe at once. Remit currency or postage stamps by mail at our risk. You will receive a receipt by return mail.

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New Publications.

BAER'S HAND-BOOK FOR STEAM ENGINEERS.—The work is intended as a guide for persons in charge of, or in any way connected with, steam or steam machinery. It is not, and does not aim to be, an elaborate treatise on the steam engine, but a volume containing valuable and plainly-stated facts which every one who has anything to do with steam should possess. This book is published by J. H. Kerrick & Co., Indianapolis, Ind., and will be sent by mail on receipt of one dollar.

Immigration.

The Chief of the Bureau of Statistics furnishes the following information in regard to immigration into the United States. There arrived in the customs districts of Baltimore, Boston, Detroit, Huron, Minnesota, New Bedford, New Orleans, New York, Passamaquoddy, Philadelphia and San Francisco, during the month ended October 31, 1880, 69,808 passengers, of whom 61,312 were immigrants, 5,995 citizens of the United States returned from abroad, and 2,491 aliens not intending to reside in the United States.

Of this total number of immigrants there arrived from England, 6,665; Wales, 110; Scotland, 1,388; Ireland, 5,705; Germany, 17,059; Austria, 1,555; Sweden, 3,486; Norway, 1,453; Denmark, 970; France, 551; Switzerland, 923; Spain, 79; Holland, 230; Belgium, 141; Italy, 1,651; Russia, 325; Poland, 184; Hungary, 481; Finland, 14; Dominion of Canada, 17,517; China, 474; Australia, 81; Mexico, 33; Portugal, 82; Azores, 79; and from all other countries, 70.

Personal.

Mr. A. P. Holcombe, of the firm of Huntley, Holcombe & Heine, visited Milwaukee during the month.

Mr. Wm. Allis has gone South for a brief visit to recuperate his health. He expects to return quite well in a short time.

November 5, Col. Rodney Mason, of Washington, D. C., favored this office with a call. The colonel is in the West in behalf of his clients in patent cases.

We are pleased to announce the marriage, on November 3, of Capt. Robert E. Bain to Miss Marie Valle, all of St. Louis. The bridegroom is a son of George Bain, President of the Millers' Association.

It is our sad duty to record the death of Edward Campbell, who has served faithfully as head miller in the Star and Crescent Mills, of Chicago, for many years. Mr. Campbell died of heart disease, on the morning of October 27. His countless friends throughout the country will long remember the genial and generous, whole-souled Edward Campbell.

During the early part of the month we received a pleasant call from Wm. Moore, Esq., senior partner of the firm of Wm. Moore & Co., flour brokers of Liverpool, England. Mr. Moore has been travelling through this country for some weeks, taking observations. He has visited St. Louis, Minneapolis, Milwaukee and other flour manufacturing centres of greater or less importance, and will soon return to England. Mr. Moore expressed himself highly pleased with the beautiful city of Milwaukee, and predicted for it a brilliant future.

Cockle.

The cockle (Xanthem Strumarium) has come to be a very common weed in various parts of this country, and its peculiarly shaped seed was for many years a great annoyance to millers. It cannot be removed satisfactorily by the ordinary separating machines, and it was long since found necessary to have a machine invented especially for its separation from grain. The stalks grow to a height varying from one to four feet, and have many branches. The pods contain two seeds each, and they will propagate their kind rapidly if afforded any reasonable opportunity. Such a nuisance did this seed become in Pennsylvania some years ago that the Legislature offered a prize for the invention of a machine that would effectually separate it from grain. Machines with flannel and cork rollers were invented but were of little use. A machine was subsequently invented, and is now being successfully manufactured for millers use by the Cockle Separator Manufacturing Company, of Milwaukee, Wis. These machines remove every cockle seed, and are simple in construction and accurate in the performance of their duties. Many thousands of these machines are in use in the flour mills throughout this country as well as in Europe. The farmer and the miller has pronounced the cockle seed a nuisance and of no earthly good, but it has remained for the distiller to discover that cockle seed properly treated will yield a most palatable and pungent whisky, and it is a fact that the cockle is actually bought from millers by distillers for distillation.

Our Export Trade in Breadstuffs.

Exports of breadstuffs from all the United States ports for the month of October, 1880, and compared with the corresponding month of 1879:

Table comparing export trade in breadstuffs for October 1880 and October 1879. Columns include Quantity and Value for Barley, Corn, Meal, Oats, Rye, Wheat, and Flour.

Table comparing export trade in breadstuffs for October 1879 and October 1878. Columns include Quantity and Value for Barley, Corn, Meal, Oats, Rye, Wheat, and Flour.

These figures show a very large increase in the exports of corn, but a corresponding decrease in wheat and flour. The total decrease in the value for the month as compared with last year was \$7,300,000. In 1879 the exports of wheat were very large from early in the summer up to the latter part of October, but during the last two months of that year the shipments were comparatively light, owing to the relatively higher prices in this country as compared with those of Europe, but during October, 1880, the European demand was slack, and hence the decrease in exports as

shown by the above figures. The present month will, however, doubtless charge the order of things, as the exports are now quite large and are in excess of the same month of 1879. The total exports of breadstuffs from the United States for the ten months ended Oct. 31, 1880 and 1879, were as follows, flour and meal being reduced to bushels:

Table showing total exports of breadstuffs for October 31, 1880 and October 31, 1879. Columns include Articles, Bushels, and Value.

Table showing total exports of breadstuffs for October 31, 1879 and October 31, 1878. Columns include Articles, Bushels, and Value.

As shown by the above table there has been an increase of 100,000 bus. barley; 24,209,000 bus. corn; a small gain in meal and an increase of 225,000 bbls. flour, while in oats and rye there has been considerable falling off. Wheat shows a decrease of nearly 6,000,000, but an increase in value of \$2,400,000, due to the high prices prevailing in the early part of the year. There has been considerable talk of late about the great increase in the exports of flour but according to the above official figures the gain has only been 225,000 bbls. for the ten months, and during October the exports were only 618,691 bbls. against 648,313 bbls. for the corresponding month of 1879, being a decrease of 30,000 bbls. It is true that the showing made by the exports of flour for the ten months is much better than that made by wheat, but it is hardly sufficient to justify the notoriety given to it. The New York Produce Exchange Reporter has on several occasions predicted that the flour movement would be very heavy during the winter, and perhaps this may prove to be the case, as that journal is generally quite well informed.

The total values of the exports of breadstuffs were as follows, in detail:

Table showing total values of exports of breadstuffs for October 1880 and October 1879. Columns include Port, 1880, 1879, and Totals.

Table showing total values of exports of breadstuffs for Ten Months 1880 and Ten Months 1879. Columns include Port, 1880, 1879, and Totals.

The First Iron Casting.

Cast iron is new in such general use that one might be apt to imagine that it had never been invented; but, like Topsy, "had grown." Cast iron was not, however, in commercial use before the year 1700, when Abraham Darby, an intelligent mechanic, who had brought some Dutch workmen to establish a brass foundry at Bristol, conceived the idea that iron might be substituted for brass. This his workmen did not succeed in effecting, being probably too much prejudiced in favor of the metal with which they were best acquainted. A Welsh shepherd boy named John Thomas, had some little time previous to this been received into his workshop on the recommendation of a distant relative. Whilst looking on during the experiments of the Dutch workmen, he said to Abraham Darby that he thought he saw where they had missed it. He begged to be allowed to try, so he and Abraham Darby remained alone in the workshop all night struggling with the refractory metal and imperfect moulds. The hours passed on, and daylight appeared, but neither would leave his task, and just as the morning dawned they succeeded in casting an iron pot complete. The boy entered into an agreement with Abraham Darby to serve him and keep the secret. He was enticed by the offer of double wages to leave his master, but he continued faithful, and from 1709 to 1828 the family of Thomas were confidential and much-valued agents to the descendants of Abraham Darby. For more than one hundred years after the night in which Thomas and his master succeeded in making an iron casting in a mould of fine sand, contained in frames and with air-holes, the same process was practiced and kept secret at Coalbrook Dale with plugged keyholes and barred doors.

## Correspondence.

LYNCHBURG, Va., Nov. 7, 1880.

Editor United States Miller:

'Tis not often you have a letter from this quarter. This point is more of a tobacco region, than one devoted to growing the staff of life. It has improved greatly since the war. Its population is about 20,000, and the black and white population about equal. All labor in the many tobacco factories, warehouses, etc., and are of all sizes, ages and complexions. 'Tis a dull time, and none of the factories are working more than half their time. There are five mills that make flour, two of the oldest run six pair of burrs each, and one of them claims that the fixtures as used in the days of the Pharaohs were decidedly the best, and the modern machinery is a nuisance and humbug. There are about 25 run of stone in all the mills. Milling is unprofitable in many parts of Virginia, the difference in favor of wheat over the price of flour being such that many farmers sell their wheat to go to Richmond, Baltimore, etc., in preference to grinding it. A striking illustration of this is in the county of Shenandoah, where two brothers erected a mill with six pair of burrs, at a cost of \$20,000, and then sold their crop of 18,000 bushels. The wheat is for the most part seeded in the valley, and has come up beautifully. In this Piedmont region very little has yet been sown.

The crop of corn through Virginia, as through most of the United States, is an extraordinary one. Crops of most of all kinds are unusually plenty. I observed some hogs in the woods in the valley a few days ago, feeding on the white oak mast, so fat they would have made a Porkopolis dealer's mouth water.

HAMILCAR.

[A letter from P. D. Mickles which is not exactly encouraging to Millers.]

## The Denchfield Patent Case.

Editor United States Miller:

I take the liberty of sending you a printed copy of Judge Blatchford's latest decision touching the validity of the Denchfield patent.

Of course the jovial millers throughout the world—the milling world I mean—look to your columns for intelligence of all matters pertaining to their welfare, and this finding of Judge Blatchford being calculated to have some slight bearing upon their interests, to those of them at least who have been infringers upon this claim, you may think it worth while to bring it to their attention.

This decision of four cases together with three others by the same tribunal during the past season completes the adjudication of nine cases, brought to establish the validity of the Denchfield patent (unless recourse shall be had to the United States Supreme Court), and every point both in law and in equity, raised by either party has been decided by the several courts in favor of the claim.

If there was a possibility of ever gaining a suit for the infringers of this patent—if by any means its claims could be invalidated, doesn't it seem to you, sir, about time for some sign, some token in that direction?

The gentle millers and their legal advisers were positive that when Judge Harding took hold of the matter, and brought it before Judge Blatchford whom the claimants could not influence and whose decree would be according to the law and the facts, then they should be satisfied and we should have occasion to laugh out of the other corner of our mouth.

Well, all the conditions stipulated for have been complied with, and nothing has been lacking to enable them to present their case as strongly and as favorably as it could have been done; and, sir, it has transpired exactly as we were assured it would—in one respect—we are laughing out of the other corner of our mouth—we are laughing out of both corners.

Should some of your thoughtful readers, pondering over this "lame and impotent" advantage which has accrued to them, as the result of some seven years litigation, and which has only tended to strengthen the claim against them, conclude this method of postponing the day of reckoning to be paying rather dearly for their whistle,—that there was a more straight-forward, manly way of doing business than resorting to mere quibbling, with the futile purpose of tiring out somebody, deem it to be the part of wisdom to accept the inevitable, let them turn to the false siren who would allure them to further folly, and in sharpest tone say—scat!

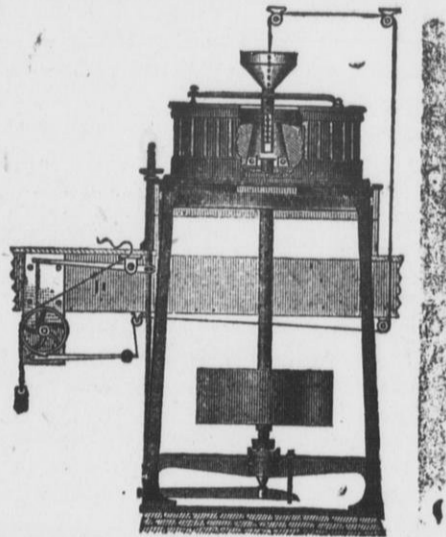
I have pleasant recollection of your courtly President Sanderson, and of your suave and genial Secretary Seamans, to each of whom I beg to send my "compliments of the season," through your columns. Yours with much esteem.

P. D. MICKLES.

THE Canadian millers are said to be in not the happiest frame of mind possible. A late issue of *The Toronto Globe* says: "We are obliged once more to call attention to the evils resulting from the bonding system. Within the past few weeks there have been large quantities of flour made from United States wheat sold in this market. The prices at which this flour is sold are much below those of Canadian wheat flour, and give rise to the belief that the duty was evaded. Our local millers are the sufferers, and is it any wonder that they complain? They are forced to compete with this foreign flour after having to pay a heavy duty on their domestic wheat."

## A Valuable Invention.

We desire to call the attention of our readers using millstones to the illustration herewith of Fruen's Automatic Stone Lift. It is simple in construction, acts quickly and effectively and should be in use wherever millstones



are employed. By looking at the illustration referred to the reader will have no difficulty in understanding its action, and will readily observe that it can be attached without stopping the mill. A cord, having upon it a series of leather disks, is suspended in the hopper, working something upon the principle by which the old-fashioned alarm bell was operated. This cord, passing over the pulleys, as shown in the cut, is attached to the end of a weighted lever. A ratchet tooth at the opposite end of the lever engages with a wheel, as seen at the left of the cut. This wheel is connected with a smaller drum, around which passes a chain which operates another lever connected with the lighter rod. A weight sufficient to lift the stone is suspended by a cord passing around the wheel. The action of this ingenious arrangement is so simple as to hardly require an explanation. As long as the stream of wheat running into the hopper is uninterrupted its weight on the end of the cord is sufficient to hold the lever in position against the wheel. The moment the feed is stopped, however, the weight on the lever causes it to drop, releasing the wheel. The suspended weight winds the chain about the drum, thereby moving the lever attached to the lighter rod so as to lift the runner enough to prevent it from striking the bed stone. This device is at once simple and effective. So long as the supply of feed to the stone does not run out or is not interrupted the machine is not called into play; but when the hopper becomes empty, it acts instantaneously, so that there is no possibility of any damage being done by the stones running together. Having no pulleys or running machinery to attach it is easily put in, and is no trouble to keep in repair. Any further information that may be desired regarding the lift can be obtained by addressing the manufacturers, the Victor Heater Co., Minneapolis, Minn.

A RIVAL OF THE GREAT EASTERN.—The Furnesia, a new monster steamship launched by the Barrow Iron Shipbuilding Company, at Barrow, England, a short time ago, is, with the exception of the Great Eastern, the largest ship afloat. The Furnesia is 445 feet in length between perpendiculars, 44 feet 6 inches beam, 34 feet 6 inches depth of hold, 5,500 gross tonnage, and 9,900 tons displacement of water when drawing 25 feet. She is to be brig-rigged, with two funnels. Her engines are of the inverted, direct acting, compound, surface-condensing type. The high-pressure cylinders are 49 inches and the low-pressure cylinders are 100 inches in diameter, with a stroke of 5 feet 6 inches. The pressure of steam is 90 pounds to the square inch, and this is generated by four double-ended boilers, having in all 24 furnaces. The propeller is 20 feet 6 inches in diameter. The new vessel was built for the Anchor Line, by which it will be run between New York and Glasgow.—*Iron Age*.

## "Magyar" Flour.

Many causes have of late tended to create depression in the Budapest milling trade, and not unnaturally some of the parties interested have sought help from the Government to overcome the difficulties they have to contend against. An invitation from the Minister of Commerce to call upon him seemed to give some hope to the directors of the mills that something was at last going to be done to aid them. Instead of obtaining assistance, they were subjected to a cross-examination as to the nationality of their foremen and employes, and the reason why so few Hungarians were employed. The result showed that only one Hungarian foreman was employed, and that at the Victoria Mills; the remainder proved to be Styrians, Tyrolians, or Germans, a fact at which his Excellency the Minister of Commerce was highly indignant. Director Brull in reply stated that the native Hungarians were seldom able to read and write, and besides they did not seem to care for a technical education. With the workmen of other nationalities the case was different, and thus it happened that they could eventually better their position without regard to nationality. The members of the deputation then received the ungracious advice to see that this state of affairs should be altered. As the Minister of Commerce is so intensely patriotic as to wish the Hungarian flour to be made by Hungarian workmen, superintended by Hungarian foremen, and working Hungarian machines, the *Ungar Muehlen Zeitung* recommends him to see that the directors and owners of the mills are natives too. Although the greater part of the business is transacted in German, it might be as well also to issue an order for all correspondence to be carried on in Hungarian, which would prove especially acceptable to the English, French and German houses trading with Budapest. Unless the Minister of Commerce can devise some other means to meet the foreign competition the future prospects of the trade are very gloomy.—*The Miller*.

## First Steam Whistle on the Missouri.

The story of the first steam whistle on the Missouri river is amusing. Its introduction dates back to 1844. At that time the settlers on the Missouri river were in the habit of making yearly visits to St. Louis to do their trading for themselves and their friends. They were not provided with daily intercourse with the outside world, and many who lived back from the river seldom, if ever, saw a steamboat more than once a year. It happened that during the fall of 1844 the new steamboat "Lexington" started up the Missouri river loaded down to the guards with freight. Among the passengers were Judge Joseph C. Ransom, Theodore Warner, of Lexington, Ben Holiday (afterward the famous overland stage proprietor), Colonel Pomeroy, of Lexington, and a planter of Platte county, named George Yocum.

The steamer Lexington was provided with a steam whistle—the first used on the Missouri river; and, as it happened, no one knew anything about it except Warner, who was a wag and a lover of joke. The night after leaving St. Louis, the passengers were collected together playing cards (for fun) in the cabin, when the talk turned upon steamboat explosions then very common.

"I feel perfectly safe on this boat," said Warner as he dealt the cards.

"Why?" inquired Yocum, the planter.

"Why?" echoed the rest of the company.

"I will tell you why," said the wag, carefully studying his cards. "This boat is provided with a new safety-valve, which notifies the passengers on board just when it is about to blow up. It is a concern which makes an unearthly noise; and, when you hear it, it is time to get back aft or jump overboard."

Notwithstanding the fact that Warner told his story with the most solemn and earnest countenance, some were skeptical. Not so, however, with the planter. Next morning, as the Lexington was steaming up the long stretch of river just below Washington, Mo., the passengers were at breakfast. The meal had been called, and all were busy engaged in doing justice to the kind of meals they were accustomed to serve on steamboats in those days. Suddenly the whistle commenced to blow, the first time on the trip. The passengers looked at each other a moment, and horror and dismay spread itself over their faces. The first man to realize the situation and to act, was Yocum, the planter, who, with hair erect and blanched face jumped up, crying as he pulled over one after another of the passengers:

"Run, run for your lives! The blame thing is going to burst! Follow me, and let's save ourselves!"

Of course, there was a stampede for the rear of the boat, and it was only by the exertions of some of the crew that the more excited were restrained from jumping into the river.

## The Cause of Perpetual Snow.

Many persons who have made the acquaintance of the mountain districts of Europe have often wondered why snow at great elevations does not melt. Dr. James Croll says it is owing to the fact that the heat received from the sun is thrown off into stellar space so rapidly by radiation and reflection that the sun fails to raise the temperature of the snow to the melting point—the snow evaporates, but it does not melt. The summits of the Himalayas, for example, must receive more than ten times the amount of heat necessary to melt all the snow that falls on them, yet in spite of this the snow is not melted. Notwithstanding the strength of the sun and the dryness of the air at these altitudes, evaporation is insufficient to melt the snow. At low elevations, where the snow-fall is probably greater, and the amount of heat received even less, the snow melts and disappears. This, Dr. Croll believes, must be attributed to the influence of aqueous vapour. At high elevations the air is dry, and allows the heat radiated from the snow to pass into space, but at low elevations a very considerable amount of the heat radiated from the snow is absorbed by the aqueous vapour in the atmosphere. A considerable portion of the heat thus absorbed is radiated back on the snow, and, being of the same quality as that which the snow itself radiates, is for that reason absorbed by the latter. The consequence is that the heat thus absorbed accumulates in the snow till this is melted. Were the amount of aqueous vapour possessed by the atmosphere sufficiently diminished, perpetual snow would cover our globe down to the sea-shore. In a like manner the dryness of the air will, in a great measure, account for the present accumulation of snow and ice in Greenland and on the Antarctic continent. The reason why the snow does not melt is not because the amount of heat received during the year is not equal to the work of melting the ice, but mainly because of the dryness of the air, the snow is prevented from rising to the melting point.

MILWAUKEE ITEMS.—A sad accident, resulting fatally, happened at B. Stern's New Era Flour Mills in Milwaukee, on the evening of Nov. 10. An employe named Fred Roderman fell into a bran hopper and sinking into the mass was suffocated before assistance could reach him. He was 23 years of age and leaves a family consisting of a wife and two children. He had only commenced working in the mill about a week previous to his death.

Fred Horn has leased the mill at Hales Corners, and will run it hereafter.

The foundation walls of the Milwaukee Exhibition Building are now laid, and the superstructure will rapidly rise. If the weather is favorable it is probable that it will be under roof before the end of the present year.

MINNEAPOLIS ITEMS.—The Trade Mill has been undergoing repairs.—The Galaxy Mills are putting in several new rolls.—The Dakota Mills have their rolls in place and have started up.—A 44-inch Victor turbine wheel, built by the Stilwell & Bierce Mfg. Co., of Dayton, Ohio, drives the machinery of the Crown Roller Mill.—The Palisade Mills have started up their new Stevens roller mills.—The North Star Iron Works have removed the traces of the late fire and are crowded with work.—The Empire Mills are putting in Downtown roller Mills.—The fire alarm and fire extinguishing apparatus of the Washburn mill is the most complete of any in the world.—Gunn, Cross & Co., is the name of the prominent millwright firm in Minneapolis.—C. W. Hughes, representative of the Hughes Bran Duster Co., of Hamilton, Ohio., who has been stopping in Minneapolis for some time is about to leave for England.—The Arctic Mills are now run by Messrs. Sidle, Fletcher, Holmes & Co., also proprietors of the Northwestern Mill; Chas. Peasley, formerly of the Washburn C, is head miller.

Simpson & Gault have a force of millwrights at work overhauling the mill of Fred Holsen at Allendale, Ill. They are changing it to new process, and are adding two run of 42 and one run of 30-inch burrs; also, one No. 2 Brush, two No. 2 Snow Flake purifiers, one 6-reel chest, and all necessary gearing and shafting for making a first-class new process mill.

## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, DECEMBER, 1880.

SUBSCRIBE for the U. S. MILLER.

MR. W. H. DUNWOODY, of the firm of Washburn, Crosby & Co., of Minneapolis, is at present in London.

THE Hungarian flour trade is reported to be exceedingly dull, with little prospect of an early improvement.

THE worthy citizens of Glasgow, Scotland, have elected Mr. John Ure, of the Crown Mills, their Lord Provost.

THE population of this country has been increased about half a million this year by immigration. Over 20 per cent. of the immigrants were from the Dominion of Canada.

"GRAHAM" flour is pronounced by the *Journal of Chemistry* to be good as a gentle laxative but far inferior to the best grades of fine flour in nutritious qualities.

RECEIPTS of the Patent Office for the fiscal year, from fees of various kinds, aggregated \$730,547, and total expenses, \$538,926, showing a net revenue to the government of \$191,621.

ACCORDING to the late census Chicago has twelve flouring mills, the combined capital of which is \$652,100. They employ 187 persons, pay \$105,326 wages, use raw material of the value of \$1,937,609 and make \$2,217,564 in products.

OUR readers everywhere, when writing to advertisers, are earnestly requested to mention the UNITED STATES MILLER in their letters. Such mention is of benefit to the paper, and advertisers like to know as far as possible what papers benefit them most.

THE Government influence in fixing prices is wonderful in Russia. The Government in its official organ recently intimated that the bakers charged an unreasonably high price for bread, whereupon 117 of the St. Petersburg bakers reduced their prices immediately.

DIED, at Janesville, Wis., Nov. 30, 1880, of typhoid pneumonia, O. B. Ford, aged 67 years. Mr. Ford was one of the oldest and most prominent citizens of Rock county, and was largely interested in milling and the water-power at Janesville. He came to Wisconsin from New York in 1854. He leaves a family consisting of wife, daughter and two sons.

A NEW KIND OF BREAD.—There has been lately turned out at Milan a new kind of bread made with blood from raw flesh. It is said to be a preventive of scurvy, and to do away among peasants with all desire for alcoholic drinks. The difficulty of blood coagulation being overcome, the "blood bread" will last for years. Twenty per cent. of its ingredients consists in blood, its cost is only  $\frac{1}{2}$  of a cent per loaf, and it is more nutritious than the ordinary loaves at 1 cent each.

THE correspondent of THE UNITED STATES MILLER, at Berlin, Germany, says that the milling business is very dull there. That the native wheat is generally too damp to make good flour, and that their excessive protective tariff on grain prevents them from obtaining supplies from abroad for mixing purposes. The heavy protective duty on rye has made rye as expensive as wheat. The great Borsig Rye Flour Mills are now running half time on wheat, when formerly they ran constantly on rye. Great efforts are to be made to remove or mitigate the obnoxious tariff.

ON Friday, Nov. 5, there occurred in North Texas the most remarkable phenomenon known in the history of Texas. The morning broke with a cold damp norther, interspersed with sleet, but at 10 o'clock the whole heavens were filled with snowflakes. It con-

tinued to fall for eight consecutive hours, or until quite dark. This snow came before any portion of Texas had been visited by a killing frost. It thus fell upon forests full-blown, fields with green crops still standing and growing in them, gardens in bloom. Here were morning-glories saluted and embraced, chilled and killed by its icy visitor Geraniums were fatally kissed by snow-drops, as were four-o'clocks frozen by the deadly touch of the unwelcomed, unheralded, and wholly unexpected visitation. Never did an old Texan of forty and fifty years' standing see a snow-storm in November before, and on its fifth day at that. They were more than astonished.

DUNHAM, FILS ET CO., No. 3 Place des Halles, Rouen, France, is the name of a new mill furnishing firm. They solicit the agency for France for American machinery, and will be happy to have manufacturers favor them with late catalogues and price lists. Mr. Dunham is the son of Wm. Dunham, the editor and publisher of *The Miller*, London. He visited this country during the past summer, and is quite extensively known personally by our milling machinery manufacturers and millers. We wish him unlimited success in his Rouen adventure.

## New Publications.

THE AMERICAN NEWSPAPER ANNUAL, published by N. W. Ayers & Son, Philadelphia, Pa., a well known advertising firm, is without doubt the most complete and handsome publication of the kind extant. It gives a list of all the newspapers in the United States and Canada, with memoranda of the extent of their circulation, religion, politics or other distinctive characteristics, and the population according to census of 1880, of the places where they are published. To the extensive advertiser this work is invaluable, and to the newspaper publisher it is a work of great utility. Typographically, we seldom see its equal.

Report of PROCEEDINGS OF THE UNITED STATES BOARD OF SUPERVISING INSPECTORS OF STEAM VESSELS, by James A. Dermont, Supv. Ins. Gen. of steamboats.

ILLINOIS MANUFACTURERS DIRECTORY. Fox, Cole & Co., 177 La Salle st., Chicago, Ill., publishers. This is a work, 228 pages in size, which shows the result of much patient labor and commendable enterprise. It is conveniently arranged and enables the possessor to reach the manufacturers of the state, of any class by circular or otherwise quickly. The demand for such a work is always large and we have no doubt but this has met with an extensive sale. Price \$3.00.

RECHARD'S TURBINE WATER WHEEL CATALOGUE FOR 1880, by George F. Baugher, York, Pa., a handsome 100 page catalogue giving much information in relation to turbine wheels, and the Rechar wheel in particular. Will be sent free on application to users of water power.

## Flour vs. Wheat.

According to the figures just furnished by the statistician in the Department of Agriculture, the estimates of the amount of wheat raised in the Northwestern States and Territories are as follows:

Wisconsin.....	16,464,000
Minnesota.....	40,752,000
Dakota and other N. W. Territories.....	18,995,000
Total.....	75,221,000

This is a sufficient quantity of wheat to make upwards of 16,000,000 barrels of flour, and the mills now in active operation in Wisconsin, Minnesota and Dakota are amply able to convert the entire amount of this wheat into flour, and are now busily engaged in converting the best of it, and it is not desirable to the millers of this district to have any really good wheat shipped either to the Eastern States or Europe, and it is not likely that shipments of good milling wheat, beyond Milwaukee and Chicago, will be extensive during the coming winter and spring, but it is evident that the flour trade will be vastly augmented. The milling capacity of this district has recently been greatly increased, and the latest and best improved machinery known has been extensively introduced, and the millers are determined, as far as possible, to grind the wheat here and thus prevent its being, except in a manufactured state, such an extensive article of export as in the past. The foregoing remarks apply to spring wheat only, and it seems probable that the exports of wheat in a short time will be almost exclusively confined to winter wheat, but the sooner the export of wheat altogether gives place to that of flour, the better it will be for the milling fraternity of the United States.

## The Middlings Purifier Cases.

THE WAR ENDED BETWEEN THE LACROIX AND CONSOLIDATED COMPANIES.

Two important cases in the United States Circuit Court at Indianapolis were finally disposed of on November 15.

The Consolidated Middlings' Purifier Company, of Jackson, Mich., sued the Lacroix Middlings Purifier Company for damages on account of infringement of certain patents granted to George T. Smith and William Stoll, the main feature of the patents being the combination of a travelling brush with a sieve and blast of air. The Lacroix Company answered among other things that the patents had been surreptitiously obtained, and that E. N. Lacroix was the original inventor. After a year employed in taking evidence, the parties agreed upon a settlement. The Consolidated Company paid the Lacroix Company for infringement and licenses, the judgments entered being an agreement of parties, and merely nominal, and at once satisfied of record without any money passing. The Consolidated Company also bought the brush patent, owned by the Lacroix Company, paying to the Lacroix Company for that patent and for infringements and licenses \$5,000 in cash. The Consolidated Company also executed a written agreement that the machine now manufactured by the Lacroix Company is not an infringement of any of the patents owned by the Consolidated Company, and consequently the Lacroix Company and purchasers from them will not be further annoyed by suits for infringement.

The other case was that of the Lacroix Company vs. William Paddock & Co., millers of Terre Haute, for infringement of patents owned by the company, the infringement consisting in the use of machines made by licenses of the Consolidated Company, and defended by that company, and was also adjusted, and the machines used by Paddock & Co. were licensed under the Lacroix patent, the Consolidated Company having purchased immunity for all customers. The main feature admitted to be an infringement is the over-lapping boards used to admit air under the sieve, known under the various names of "over-hanging boards," "central suction," and "cant boards."

It will thus be seen that the Consolidated Company has a clear field for the manufacture and sale of brush machines.

## Recent Milling Patents.

The following milling patents were issued from the United States Patent Office in December, 1880:

*Corn Sheller*.—James L. Woods, Alliance, Ohio.

*Middlings Purifier*.—James H. Redfield, Salem, Ind.

*Cockle Mill*.—James M. King, Walnut Station, Minn.

*Magnetic Grain Separator*.—Cook & Thayer, Ripon, Wis.

*Bag Holder and Tie*.—Lewis S. Fish, Fari-bault, Minn.

*Oat Meal Machine*.—Fahs, Belden & Kremer, of Akron, O.

*Grinding Mill*.—Thomas J. Obenchain, Logansport, Ind.

*Grain Separator*.—James F. Hatfield, of Cambridge City, Ind.

*Germ Detacher for Roller Mills*.—Adolph Fren-denhagen, St. Charles, Ill.

*Grain Measure and Register*.—John A. Porter, of Oakland Mills, Ky.

*Buck-wheat Hulling Apparatus*.—Beaty & Calkins, Painted Post, N. Y.

*Magnetic Separator*.—Gottlob Schaeffer, Gop-pingen, Wurtemberg, Germany.

*Grain Steamer and Drier*.—Frederick A. Hoffmann, Baldwin City, Kansas.

THE *Allgemeine-Mueller Zeitung*, of Berlin, Germany, in referring to the Cincinnati Millers' Exhibition, says, that it was no greater than the one held in Berlin in 1879. That at Berlin but two American machines were on exhibition, and at Cincinnati there were four German machines. In conclusion it says: "We are, therefore, led to the belief that commerce in milling machinery between the two countries is very limited as far as patented objects are not concerned, which is owing principally to the high tariff and freight which will discourage such trade. There is also no especial demand for interchange of milling machinery, for we believe America produces no milling machinery better adapted to our use than we manufacture ourselves at as low a price as we can import it for. The Americans can say the same in regard to German milling machinery. Americans pay less for their raw material, but they pay higher wages than we do."

A LENGTHY article entitled "Prospects of Grain Production and the Water Routes" in North America," recently published in the *Austro-Hungarian Miller*, calls the attention of its readers to the competition likely to become serious to the grain producers of Europe from America. It details our magnificent railroad, lake, river and canal system of transportation, commends its efficiency and cheapness and says that Europeans must imitate our example by increasing its transportation facilities and reducing the exorbitant freight tariffs of the present. The *Miller* believes that by a grand effort on the part of the grain producers and the transportation companies of the country that competition can be successfully resisted.

## The Adulteration of Flour.

The amount of discussion which the subject of flour adulterations has produced, admirably illustrates the saying, "Tall oaks from little acorns grow." While the quantity of discussion has been remarkably large, the amount of adulteration discovered has been almost if not quite insignificant. Every once in a while our foreign exchanges bring the news of some unprincipled miller or flour dealer being detected in mixing his flour with some foreign substances for the purpose of cheating in weight or color; but when we consider the thousands who are engaged in making and handling flour, the amount of sophistication indulged in, at least the amount discovered, is exceedingly small. Still, instances are by no means wanting abroad, where flour has been adulterated with plaster of paris, sand, chalk, alum, and numerous other substances which are available for the purpose of adding bulk or giving color to the flour. About fifteen months since a cargo of flour which found its way to London from some Dutch or Flemish port, was so largely adulterated with plaster of paris, that bread could not be made from the mixture. The public very properly raised an outcry and demanded an explanation. We do not remember what explanation was given; but probably the burrs ground so close as to grind their plaster of Paris backs off into the flour.

Affairs have never been nearly so bad as that in the United States, although a number of agitators east and west have attempted to make us believe that the adulteration of flour is a practice common with millers and dealers. It has been asserted that mills are engaged as a regular business in grinding up feldspar and similar articles into impalpable flour to be mixed with flour. While such may be the case, we do not feel called upon to believe the statement, until better proof of its correctness has been adduced. Adulteration in foreign countries consists principally in adding to wheat flour the meal of cheaper grains, and the same is true of the United States, where white corn is principally used. The only mineral adulteration we are aware of being used is alum, which some millers who have inferior wheat to grind, or who have inferior skill in grinding any wheat, employ for the purpose of "touching up" the color and rising properties of the flour. Reprehensible as this practice is, where very small quantities are used it does not prove injurious; but no miller can afford to employ such means since disastrous effects have been known to follow the misjudged use of alum. We are glad to know that the use of this mineral and other adulterants is so rare as it is in our country. While Mr. Angell and other alarmists make sweeping charges against the manufacturers and sellers of foods, including flour, cooler headed people have not been able to find any such evidence as the alarmists would lead us to expect. The state assayer of Massachusetts not long since declared that the flour used by the people might be pronounced practically pure. While a thoroughly competent Boston lady not long since procured twenty-four samples of flour from as many different stores, and found them all pure. Surely this is very favorable comment on the morality of millers and dealers. After all has been said on this subject, the fact remains that the chief motive for adulteration lies in a small margin or no margin for profit, and the demand by the people for an article cheaper than the cost of producing it. When people demand flour at a price less than the cost of the wheat, adulteration may be expected; when fair prices are obtainable, no miller or dealer not thoroughly depraved would risk his reputation by resorting to such artifices. The people have the whole question in their own hands. If they pay a good price they may be quite certain of obtaining a correspondingly good article.—*The Millers' National Magazine*.

## THE MILWAUKEE CHAMBER OF COMMERCE.

Dedication of the Building with due Ceremonies to the Uses of the Trade.

Followed by a Grand Banquet at the Newhall House.

AN IMPORTANT EVENT IN THE HISTORY OF MILWAUKEE AND THE GRAIN TRADE OF THE GREAT NORTHWEST.

The eighteenth day of November, A. D. 1880, will long be remembered as an important date in the history of the beautiful City of Milwaukee, that day having been selected for the dedication of the new Chamber of Commerce building to the uses for which it was erected by Hon. Alexander Mitchell, one of the oldest and wealthiest citizens of Milwaukee. The Milwaukee Chamber of Commerce was founded November 22d, 1858, and the first quarters occupied by it for business purposes were on the site of what is now designated No. 1, Grand avenue. After a short period it was deemed necessary to have more commodious quarters, and Messrs. Alexander Mitchell, James S. Brown and Thomas L. Ogden erected a building for the purpose on the site of the present one, and it was dedicated to use on the evening of February 3d, 1863. When it was decided to have a new building, the business quarters of the board of trade were removed temporarily to the Munkwitz block on Broadway. We have no doubt but what the following description of this new temple of trade will be perused with interest by our readers everywhere.

The style adopted by the architect in the Chamber of Commerce is what is known as modern conventional Italian, a style well suited to buildings of this character. The idea intended to be conveyed by the design is dignity and simplicity of effect, united with bold and massive construction, in which the dependence is upon the structural details and grouping of parts, rather than the usual ornamentation usually relied on in mediocre designs for effect.

Only at the doorway is any enrichment used. The massive piers of granite at the entrance support double pillars of the same material highly polished, the capitals of which are enriched, as well as the spaces between the brackets of entablature over them, with bold, well designed, carved, conventionalized foliage. The stone lintel of the greater doorway is also richly carved, and the key of the arch that spans the doorway is also ornamented with a boldly wrought lion's head. Resting upon the granite columns of the doorway is the massive entablature, supporting a blocking course of stone, which is to form the pedestal of a figure of Commerce of heroic size, now being especially modelled in New York for this building.

In all architectural composition some one feature should be the prominent and central one from which the design radiates. The campanile, or bell tower, is the leading feature of this design. Its elegant proportions and fine effect are observable from all parts of the city. Towering above the surrounding building, 150 feet from the pavement line, it properly supports and dignifies the building, of which it is an important part. The skylines of the building are very good, being well diversified by the turreted roof termination of the four angles of the building and the central tower. The general effect of the building is massive and imposing, the parts being well grouped and symmetrical, and the use of ornament very sparing and judicious throughout.

The materials used in the construction are grey—Minnesota granite—for the basement story, while above the basement up to cornice and inclusive of it the walls are grey Amherst stone. The interior walls are of brick, stairways, railings, trusses of roof pillars and beams generally are of iron, cast or wrought according to use.

The absence of ornaments is marked throughout the exterior of the building.

The building throughout is thoroughly fire-proof.

The interior partitions and walls are of brick, while the external walls are of masonry, faced inside with hollow brick, on which the plastering is placed direct, without the intervention of the usual wood finishing and lathing, so dangerous in furnishing channels for spread of fire in ordinary buildings. The isolated pillars and piers in the basement story and the great columns on main floor of the Chamber supporting stories over it are of iron, as are the roof trusses, and the general supporting beams of the building, all of which as well as

the columns are covered with a matrix of fire-proof terra cotta, under the Wight fire-proof process. The object of this precaution is to prevent the action of steam on the materials, as well as to lessen the liability of combustion. The staircases throughout are of iron and stone. The floor joists throughout the building are filled in with a course of brick on a flat surface set in mortar, on which the floor is built direct. These, with other precautions under the building, render the building fire-proof beyond doubt, as proved by several tests during progress of the work.

The building is six stories high, including granite basement, having a total height of 100 feet from curb to cornice. The width on Michigan street is 120 feet, with a depth of 100 feet on Broadway, exclusive of alcove and restaurant addition on the south extremity of the building. The basement story, the floor of which is at the sidewalk line on Michigan street, and at most two steps lower than the top of the sidewalk on Broadway, is divided by a corridor 24 feet wide, extending from the Michigan street entrance to the south extremity of the building. This is intersected 25 feet from the front by a corridor 13 feet wide, extending from east to west, dividing front offices from rear, and on the upper floor forming the north boundary of the Chamber.

Opening off this corridor on each side are three offices—two single and one double—each with entrance from Michigan street front. These offices are 12 feet high, and have each an average floor area of about 350 feet. On the east side of the center corridor, fronting on Broadway, are four offices of about 750 feet area, while on the west side of the same corridor a room of 2250 feet area is devoted to the use of the Western Union Telegraph Company, who also occupy the double office bordering on Michigan street and alley, as a general receiving office. At the intersection of corridors in the center of the building is located the toilet-rooms for the use of basement and first floor offices.

The first story of the building, 15 feet high, is occupied largely by the Chamber, the floor of which is 12 feet from the sidewalk line, the entrance being in the centre opposite the main doorway.

A corridor extends across the building from east to west, leaving four offices on each side of the main entrance, as in the basement story on Michigan street front.

In rear of the corridor line is the Chamber of Commerce, sixty feet wide by 120 feet long inclusive of space occupied at west end by the secretary's office, directors' room, 16x24 feet, smoking room 16x20 feet, etc. The entrance to the toilet-room for the Chamber is here, also the cloak-room. Over these rooms is the visitors' gallery with private stairs from the secretary's room. On the south side of Chamber an alcove extension is provided about 26x60 feet and 25 feet in height, for speaker's rostrum and telegraph offices. This is divided by piers and arches into an arcade of three divisions, and is an effective part of the arrangement. The Chamber is 46 feet in height, occupying three stories proper of the south part of the building. The arrangement of the room is such as to give an effect of three divisions. The center division is about 60 feet square, being divided from the east division of 28x60 feet by a handsome arcade of three arches supported by two pillars and pilasters. The same arrangement at the west includes the visitors' gallery and the rooms beneath it, while the south is balanced by the speaker's alcove of three arches before mentioned. In the center of the Chamber is an ample skylight, 24 feet square, filled with rich stained glass, and the three segmented windows of large area over the speaker's desk in the south wall are also enriched in the same manner, the north wall opposite being decorated by the glowing and well-designed cartoon of Conway's allegorical painting.

The third story of the building, on Michigan street, is divided into four single and two double offices, with the same arrangement as in the lower story, which is necessitated by the central corridor which extends up through the building.

The fourth story of the building extends over the Chamber. The offices fronting on Michigan street are similar in arrangement to the lower stories, while on the Broadway and alley side of the building are provided eight offices of about 600 feet area each, and at the rear four smaller rooms. The elevated position of this story gives the offices superior light, while by means of the elevator they are equally accessible with the offices nearer the street level.

The fifth story is divided into two very large rooms and eight smaller ones, besides ample

accommodations for the janitor's family and toilet rooms. This floor will be occupied mostly by the St. Paul Railway Company as offices, and will connect as well as the one below it, with the Mitchell Bank block across the alley, by means of iron bridges. The general arrangement of offices is excellent. All being amply lighted and having direct access to wide open corridors on each floor, which with the elegant central stairway gives an air of space and liberality to the whole arrangement. They are generally supplied with fire-proof vaults, water, gas, open fire-places, steam radiators and all the appurtenances of comfort and convenience. All have magnetic bells, telephone and telegraph attachments, and stock and gold ticker wires in each room.

The elevator, which is located on the north-west corner of the corridor that crosses the building, is of ample size and power, being an hydraulic power machine, built by the Crane Bros.' Manufacturing Company of Chicago. Connection for business purposes will be established with the bank building adjacent on the west side, by iron bridges over the alley, on the second, fourth and fifth floors, respectively.

The building is furnished with Cook's self-cleansing water filter. The passage of the liquid through an air circulating refrigerator, by means of covered tin-lined pipes, ensures at all times an ample supply.

A feature of harmony as well as utility, pleasing to the eye and serviceable to the perception of the inmates of the new building is the tasty and appropriate character of the gas fixtures, which are of polished bronze, wrought in the Queen Ann or Medieval style. The arrangement of the lights in the Chamber of Commerce proper is especially convenient, being four chandeliers of six lights each, depending from the ceiling of the main compartment, in such a manner as to brilliantly illuminate the entire area of the rooms. In the end compartments are four chandeliers of four lights each, while the piers supporting the ceiling are all provided with double jet brackets. The basement and first floor offices are furnished with fixtures of porcelain and polished bronze, while in all other offices and apartments the exclusive polished bronze fixtures are used. In this regard, as in others, the Chamber of Commerce building promises to stand for years, a shining monument of mechanical and architectural skill, casting the light of its well regulated gas fixtures down the dark and misty vistas of the ages.

The glass in the building with the exception of the cathedral glass in the main skylight and windows on the south side, was imported by Harper & Son from England expressly for the new building. In order to get the glass to Milwaukee in time for use the entire body of the ornamental glass for the interior of the building was shipped by express from New York, involving a heavy additional expense. The same firm did all the painting, oil-finishing and polishing hard wood throughout the building. The peculiar style of hard wood finish employed in the building was first practiced on the Continent, and has only been in use in this country for a comparatively brief period.

The decorations are numerous and exquisite in design. Thousands of invited guests visited the opening ceremonies in the afternoon, from 3 p. m. to 7 p. m. At 8:30 p. m. the members and their invited guests, about 400 in number, sat down to a banquet in the Newhall House, across the way from the new building, and enjoyed themselves with eating, drinking, conversation and listening to a judicious amount of speech making and beautiful music. The utmost harmony and enthusiasm prevailed and the festivities did not conclude until an early hour in the morning. The Bulls and Bears take to their new quarters as readily as ducks to water, and the regular routine of business goes on with all its accustomed naturalness and vigor.

### Coal Mines That Have Burned for Many Years.

The failure of all attempts to extinguish the fire which has been raging in the Keeley Run colliery, near Pottsville, Pa., for several weeks it is feared will add another to the perpetually burning mines that now exist in the Pennsylvania anthracite regions.

The greatest of these is probably that in the Jugular vein, near Coal Castle. This has been burning since 1835. Louis F. Dougherty opened this in 1833. The upper drift of the mine was above water level, and a huge fire was kept in a grate at the mouth of the mine in the winter to keep the water from freezing in the gutters. One night in the above year the timbers of the drift caught fire from the grate.

When it was discovered the fire had been carried down the air-hole to the lower drifts and was beyond control, two miners entered the mine, hoping to recover their tools. They never came out. The mine was abandoned. No effort was made to mine any of the coal near the burning vein, although it was considered the best coal in the region until 1856. Then John McGinnis put in a stone on the east side of it, below water level. He struck the vein at a place where the coal was so thick that two miners could keep a large breaker supplied. When four hundred yards of gangway had been excavated the heat from the burning Dougherty mine began to bother the miners. McGinnis attempted to open an air hole. The heat became so great that the men were paid double wages to induce them to work. They worked entirely naked, and were relieved every ten minutes. Finally the heat became so intense that work was abandoned. The mine was flooded. After being pumped out men could again work for a few days. The mine was flooded nine times. McGinnis finally failed, and the mine was then abandoned. The fire has been raging in the vein ever since. An area of a mile in every direction has been burned. No vegetation grows on the surface. In places the ground has caved in, forming chasms a 100 feet deep. There is but a thin shell of earth over the pit of fire. At night blue, sulphurous flames issue from the crevices in the ground. It is dangerous to walk across the spot. Several persons have mysteriously disappeared in the vicinity during the past 20 years. It is believed that in a majority of the cases they have fallen into the burning mine. Dougherty, the original proprietor of the mine, attempted to go across once. He sank to his arm-pits through the crust, and was only saved by courageous friends who ventured to his assistance. The stones on the ground are hot, and snow never rests there. Rain turns to vapor as fast as it falls on the roof of the burning mine. Millions of dollars' worth of the best quality of coal have been consumed by the fire.

The Summit Hill mine, near Mauch Chunk, has been burning for twenty-five years. It is believed that this mine was set on fire by discontented miners. Thousands of dollars have been expended in fruitless efforts to extinguish the flames.

The Butler mine, near Pittston, has been burning three years. It was set on fire by a party of tramps, who built a fire in the mine in 1877. The fire is in the upper drifts. It is confined to an area of forty acres by an immense ditch forty feet wide, which was excavated between the burning drift and connecting ones. The digging of the canal cost \$50,000. But for that obstacle the fire would have communicated to some of the most extensive mines in Lackawana valley, and a subterranean conflagration would have swept under the whole of West Pittston. Miners have worked in the lower drift of the Butler mine since the fire broke out, but there are forty feet of rock between them and the field of fire above. The water that trickles through the roof is scalding hot. The temperature is so high that the men can wear but little clothing.

### Steam vs. Water-Power Mills.

The motive power by which the machinery of the St. Louis mills is driven is steam. Coal for that purpose is, of course, abundant and cheap. In other respects there is no material advantage possessed by the flour manufacturers of St. Louis that may not be acquired in Winona. Indeed, recent experience has demonstrated not only that coal may be obtained in this city at rates but little above those prevailing in St. Louis, but that steam as a motive power is in the end cheaper and more reliable than water. There may be exceptions, but the history of water-powers in Minnesota, as compared with that of steam as a propelling power for mill machinery, proves this to be the rule. But for the generosity of the general government in expending large sums of money in the "improvement" of the Falls of St. Anthony for the benefit of private interests, the cost of erecting mills in that city and maintaining the water-power in efficient order would have ruined the owners. Except in certain peculiarly favored instances, as we have intimated, water is a far more uncertain element than steam. Mill-dams are usually expensive to construct, and when constructed they are continually liable to serious breaks if not to complete destruction. The supply not infrequently becomes exhausted or inadequate just at a time when its use is the most desirable and of the greatest value. Steam, on the other hand, can be depended upon almost with the certainty that attends the movements of the sun. It is not only an obedient servant, but, in effect, a never-failing one. Thus, as regards the two essential considerations of cost and reliability, the owner of the steam flouring mill has, on the whole, the advantage of his competitor who depends upon the running stream.—Winona (Minn.) Republican.

## LEGAL DEPARTMENT.

## The Denchfield Case.

## A Decision Adverse to the Millers.

CIRCUIT COURT OF THE UNITED STATES  
FOR THE  
NORTHERN DISTRICT OF NEW YORK.Lemuel W. Bignall, vs. Horace J. Harvey and  
Francis J. Henry.

BLATCHFORD, J.—This suit is brought on re-issued "letters patent granted to John Deuchfield, January 16, 1872, for fourteen years from April 20, 1858, for an improvement in cooling and drying meal." It is the same patent which was the subject of the suit in Herring vs. Nelson (14 Blatchf. C. C. R. 293). In that case, after full consideration, the reissued patent was sustained against the objections that it was not for the same invention as the original patent; that new matter has been introduced into the specification of the reissue contrary to the statute; and that the patentee was not the first inventor of what is claimed in the first claim of the reissued patent.

The defendants in the present case do not ask for a review or reconsideration of any of the specific questions disposed of in the former case. But two new matters are brought up on the question of novelty. One is a patent granted in England, December 18, 1853, to Joseph Robinson. The other is an addition granted July 31, 1840, to a French patent granted April 21, 1837, to one Cartier.

The Robinson patent cannot be held to be an anticipation. It is clear from the drawings of the plaintiff's patent that the curbs of the mills are open curbs, as distinguished from close curbs, that is, are the open curbs which were in general use in American mills at the time. Open curbs are curbs or covers over the upper mill-stone, provided with a circular opening over the eye of the upper stone. This enables the air in the plaintiff's arrangement to pass over the top of the upper stone, and through the annular space between the outer edges of the stones and the inside of the curb and thence, with the meal, through the closed meal spouts into and through the closed meal chest. In the Robinson patent, the small orifice in the center of the top of the curb is tightly stopped up by a tube which extends downward into the eye of the upper stone, the outside of the tube fitting into the interior of the eye. The object must have been as the necessary operation was, to prevent the passage of air over the top of the upper stone, inside of the curb, and to force it to go down into the eye and between the grinding faces of the stones. Thus the operation is the reverse of that in the plaintiff's patent. Moreover, Robinson has no current of air traversing the length of the meal chest and carrying of the moisture which rises from the meal as the screw conveyor operates upon it. The elements combined in Robinson are not there combined in the same way as in the plaintiff's patent to produce the same result by the same mode of operation.

As to the Cartier arrangement, which is the one most earnestly pressed, I have examined with care all the evidence in regard to it. It would be unprofitable to discuss such evidence minutely. It is sufficient to say that the description and drawings of Cartier do not furnish such clear and definite information as to enable a skilled person, beyond any reasonable doubt by following them, without aid from anything not known when they were made, to construct an apparatus like the plaintiff's. They do not meet the requirement of law in regard to what is necessary in a prior description and drawings, to defeat a subsequent patent. They are neither full nor clear, nor exact.

The only other point urged in defense is that the original patent was granted to John Deuchfield and that the reissue is to John Deuchfield, and is therefore void. The reissued patent states that the original was issued to "him," that is, John Deuchfield, that it has been surrendered and cancelled, and that a new patent has been ordered to issue to "him." The plaintiff has put in evidence a certificate of extension, which states that on the petition of John Deuchfield "for the extension of the patent granted to him April 20, 1858, and reissued January 16, 1872, it is extended for seven years from April 20, 1872." An original patent is in evidence which was granted to John Deuchfield April 20, 1858, for fourteen years from that day, and there is no dispute that that is the patent which was surrendered when the reissued patent to John Deuchfield was granted, and that no original patent was granted to John Deuchfield unless the one so granted to John Deuchfield was one. The real name of the man was Deuchfield. The mistake was, clear-

ly, one made in the Patent Office, a clerical and accidental mistake, in taking the letter *n* to be the letter *u*.

The defendants did not, at any stage of the taking of the proofs in the cause, raise any question as to the identity of the person to whom the reissue was granted with the original patentee either when the documentary proofs were being put in or when the oral testimony was being taken. In the defendants' proofs, the questions to their witnesses and the answers thereto refer to the reissue as having been granted to John Deuchfield, and as having been granted to the same person to whom the patent of April 20, 1858, was granted. If the point had then been suggested, doubtless the plaintiff would have proved in fact the identity of John Deuchfield. Such identity seems to have been shown in Herring vs. Nelson, the evidence in which case is made part of this case by stipulation and notice. The question is one of identity merely. (Janes vs. Whitbread, 11 C. B. 406; Jackson vs. Boneham, 15 Johns. 226; Jackson vs. Cody, 9 Cowen, 140). The defendants gave no evidence to show that there was any such person as John Deuchfield or that the reissue was not intended to be issued or was not in fact issued to the same person to whom the original patent was granted. Indeed, there is sufficient in the proofs, in the evidence given by the plaintiff as a witness, to show that the person to whom the original patent was granted, and whose name was John Deuchfield, was the person to whom the reissue was granted. Such proof is always competent in a case like this (Jackson vs. Stanley, 10 Johns. 133; see Northwestern Fire Extinguisher Co. vs. Philadelphia Fire Extinguisher Co., 6 Off. Gaz. of Pat. Office, 34).

Infringement of the first claim of the reissue is proven and not contested. As the patent has expired there can be no injunction, but the plaintiff is entitled to the usual decree in other respects, in regard to said first claim.

BENJAMIN F. THURSTON &  
EDWIN S. JENNY,

For the Plaintiff.

GEORGE HARDING &  
GEORGE B. SELDEN,

For the Defendants.

The same decision is made in the cases of the same plaintiff against Thomas Elwood and others, Henry Rodee and others, and Sidney R. Brown and others.

TAXING CORN IN TRANSIT.—A case of interest to grain buyers and counties in Illinois was heard before the Federal court in Chicago recently. A large amount of corn has been bought for shipment and placed in cribs at Dennison, on the Chicago & Northwestern Railroad. It remained in the crib two years, and, without the advice of the State Auditor, the Assessor was directed to assess it for taxation. The tax amounted to \$550, which the owner did not pay, and a levy was made by the sheriff on the corn, when the owner paid the tax under protest. He then brought an action in the Federal courts, being a non-resident, to recover the amount of tax paid, and sets up that the corn was in transit, and therefore not taxable. As the State is directly interested in the matter, the Attorney-General appeared as counsel for defense. Should the county gain the case there will be a lively hustling of old corn from this State. There are millions of bushels 2-years old now in the State.

## Millers' Law in Wisconsin.

CONCERNING MILLS AND MILL-DAMS.—CHAPTER  
CXLVI.

[Continued from November Number.]

SECTION 3390. The execution issued on such judgment, if not otherwise satisfied, may at any time within ninety days after the judgment is rendered, be levied on the premises so subject to the lien, and the same may be sold by virtue thereof, or so much thereof as may be necessary to satisfy such execution, and all costs and charges thereon.

SEC. 3391. The officer making such sale shall make and subscribe, file and deliver, duplicate certificates thereof, in the form prescribed upon the sale of real estate upon executions, in other civil actions, except that he shall insert therein that the time when such sale will become absolute, and the purchaser will be entitled to a conveyance thereof, will be one year from the date of such sale.

SEC. 3392. Any person entitled to the premises sold may redeem the same at any time within one year after such sale, upon paying to the purchaser, his personal representatives or assigns, or to the sheriff of the county, for his use, the sum paid therefor, with interest

thereon at the rate of twelve per cent. per annum.

SEC. 3393. If the premises so sold shall not be redeemed within said year, the officer making the sale or the then sheriff of the county, shall complete such sale by executing a conveyance to the purchaser, his personal representatives or assignees; which conveyance shall be valid and effectual, to convey all the right, title and interest of all persons having or claiming title to such premises, at any time within the time covered by such lien.

SEC. 3394. When either party shall be dissatisfied with the annual compensation established by any verdict of a jury under the provisions of this chapter, a new action may be brought for the increase or diminution of such annual compensation, or for ascertaining the gross amount of damages, and all the proceedings in such action shall be conducted substantially in the manner before provided in the case of an original action; but when any plaintiff shall have declined to accept the amount of gross damages awarded him, no jury shall again determine the amount of gross damages until the expiration of ten years thereafter.

SEC. 3395. Such new action may be maintained by and against either of the parties to the original action, or by or against any person lawfully holding under either of them, respectively, as the case may require.

SEC. 3396. No such new action shall be brought within one month after the payment of the then last year shall have fallen due; and either party may, within the said month, make an offer or tender to the other, as provided in the next section.

SEC. 3397. The owner of the mill or dam may offer in writing to the owner of the land injured, any increase of the annual compensation as fixed by the last verdict, and if the owner of the land does not agree to accept the same, but brings a new action to obtain an increase thereof, he shall not recover costs, but shall pay costs to the adverse party, unless he shall obtain a verdict for a greater annual compensation than was offered to him. The owner of the land injured may offer in writing to the owner of the mill or dam to accept any smaller sum than that last established as the annual compensation, and if the owner of the mill or dam does not agree to pay such reduced compensation, but brings a new action to obtain a diminution thereof, he shall not be entitled to costs, but shall pay costs to the adverse party, unless the annual compensation shall be reduced by the verdict to a sum less than that which was offered him.

SEC. 3398. Such offer may be made by or to the respective tenants or occupants of the land, and of the mill or dam in question, in like manner and with like effect, as if made by or to the respective owners, except that no agreement founded thereon shall bind the owners, unless it be made with their consent.

SEC. 3399. If the offer is made by either party is agreed to and accepted by the other, it shall establish the annual compensation to be thereafter paid in like manner as if it had been established by a verdict and judgment in a new action: provided, that a memorandum of such offer and acceptance, and of the agreement thereupon, be made and signed by the respective owners of the mill or dam and of the land, or by persons duly authorized by them, and filed and recorded in the clerk's office of the court in which the former judgment was rendered, with a note of reference on the record of the former judgment, to the book where the agreement is recorded.

SEC. 3400. The verdict in any action under this chapter may be set aside and a new trial ordered as in other cases, and an appeal may be taken from any final judgment rendered therein, in like manner and with like effect as in other civil actions.

SEC. 3401. No such action shall abate by reason of the death of any party thereto, but the same may be prosecuted or defended by the surviving plaintiffs or defendants, or by the executors or administrators of the deceased, and if any such action shall be abated or otherwise defeated for any matter of form or failure to acquire jurisdiction, the plaintiff, or any person claiming from, by or under him, may bring a new action for the same cause, at any time within one year after such abatement or other determination of such original action, and may in such new action recover such damages as shall have been sustained during the three years before the commencement of such original action or at any time afterwards.

SEC. 3402. The provisions of this chapter shall extend to all cases where compensation has not been made for damages sustained by reason of the erection or maintenance of any such mill dam; to all cases where the owner

of occupant of a mill or dam makes any material change, by raising the dam or altering the machinery, or the manner of using the water, so as to cause additional damage to the land of another, and to all cases of new action brought for the purpose of increasing or diminishing the annual or gross damages which may have been heretofore determined by a jury under the provisions of law.

JOINT OWNERS OF MILL-DAMS, BOOMS AND PIERS  
MAY COMPEL REPAIRS

SEC. 3403. Whenever two or more persons shall own jointly, or as tenants in common, or in severalty, either legally or equitably, any mill-dam or booms or piers necessary to the enjoyment of any mill to which they are appendages, in the absence of any written agreement between the owners thereof providing for keeping in repair and maintaining the same, such owners shall keep in repair and maintain the same proportionably to their interests, or such portion thereof as belongs to them respectively in severalty; and whenever in the opinion of any such owner, any such mill-dam, boom or piers needs repairs, and such co-owner shall neglect or refuse, after five days' notice in writing, to commence such repairs and prosecute the same with reasonable diligence, the party giving such notice may make such repairs and recover of the party so neglecting or refusing to make the same, in the manner hereinafter provided, unless the owners upon whom such notice is served shall, within five days after the service thereof, notify, in writing, the owner, giving such notice that they have abandoned such dam, piers or booms, and claim no further interest therein; in which case the owners receiving such notice of abandonment may take full possession of and make the necessary repairs to such dams, booms or piers, and thereafter hold and enjoy the same as their sole property. Such notices may be served in the same manner as a summons in a civil action in a court of record.

SEC. 3404. When any such owner shall neglect or refuse to make such repairs, after the giving of such notice, and shall not have given such notice of abandonment, the owner or owners giving such notice and offering to do their portion of such needed repairs, may apply to a justice of the peace of the county in which such dam, boom or piers are situated, by complaint in writing, duly verified, setting forth the interests of the different owners in such dam, boom or piers, and the notice given any defaulting owners, and thereupon such justice shall issue a summons in favor of such complainants, as plaintiffs, and against such other owners as defendants, directed to the sheriff or any constable of the county, commanding him to summon such defendants, and also six disinterested freeholders of the county as a jury, to meet at such dam, boom or piers on a day and hour therein named, not less than three nor more than six days from the time of the service of such summons upon the defendants, and make due return thereof to the justice who issued the same.

SEC. 3405. At the time and place mentioned in said summons, said jurors shall appear, and the justice shall also be present, and in case any person summoned as such juror shall not appear, or shall be interested or incompetent to act from any other cause, the justice shall issue a special venire to the sheriff or a constable of the county, requiring him to summon forthwith a sufficient number of disinterested freeholders of the county to make up such jury. When a jury shall have appeared, they shall be sworn by the justice faithfully to discharge the duties as such jurors, and thereupon they shall examine such dam, booms or piers, and may hear the parties and any witnesses offered by them, and shall determine what, if any, repairs are deemed necessary to be made, the time within which the same shall be commenced and completed, and a fair estimate of the costs and expenses of making such repairs, and the proportions thereof to be made by each of the parties named in such summons, all of which shall be reduced to writing and signed by the said jury and delivered to the justice. In case the jury shall have determined that any repairs on such dams, booms or piers are necessary, and that any portion thereof ought to be made by the defendants, the justice shall render judgment against such defendants, requiring them to make such repairs in the manner and within the time fixed by said jury, and for the costs of the action to be taxed as in other cases. If the jury shall have determined that no such repairs are necessary, judgment shall be rendered against the plaintiff for the costs of the action to be so taxed; and in either case execution shall issue thereon for such costs.

SEC. 3406. If any party against whom a

Judgment shall have been rendered, requiring him to make repairs upon any such dam, boom or pier, shall neglect to make the same as required by such judgment, the other party may make such repairs and recover of the party so neglecting the full amount of the cost and expense thereof as estimated by the jury, and in addition thereto the sum of twenty-five per cent. per annum upon the amount of such estimate and expense, to be computed from the time when such repairs shall have been directed to be completed by the determination of such jury.

**A Miller's Brother.**

The following pretty story is told of General Baur who commanded the Russian cavalry in Holstein. He was a soldier of fortune, whose family and country were unknown to every one. When encamped near Husum he took a mode of discovering himself, as novel as it was amiable. He invited all his field officers and some others to dine with him, and sent his adjutant to bring a miller and his wife who lived in the neighborhood to the entertainment. The poor couple came, very much afraid of the summons, and quite confused when they appeared before the Muscovite General. Baur seeing this, bade them be quite easy, for he only intended to show them kindness, and had sent for them to dine with him that day; at the same time he conversed familiarly with them about the country. At dinner the General placed the miller and wife one on each hand, and nearest to him and paid particular attention to them. In the course of the entertainment he asked the miller many questions about his family and relations. The miller stated that he was the eldest son of his father, who left the mill he then possessed, and that he had two brothers and one sister. "Have you no other brother?" asked the General. "No," replied the miller, "I once had another brother, but he went away with the soldiers when he was very young, and must have long ago been killed in the wars." The General observing the company much surprised at his conversation with the miller, said to them: "Brother soldiers, you have been curious to know who I was, and whence I came. I now inform you that this is the place of my nativity, and you have heard from this miller, who is my eldest brother, what my family is." Then turning to the astonished miller and his wife, the General embraced them, saying that he was the brother they had supposed dead. The General then invited the whole of the company to meet him next day at the mill, where a splendid entertainment was provided, the General pointing out to his brothers in arms the room in which he was born, and with as much evident joy as if he had been showing them the place where he had gained a victory.

**New York Canal Business During 1880.**

The receipts of grain and flour reduced to wheat at Buffalo from the opening of navigation to the present time, according to *The Buffalo Commercial Advertiser*, amounted to about 100,000,000 bushels, which is about 50 per cent. more than last year, and about 37 per cent. more than for any preceding year. This, says *The Advertiser*, exceeds the grain business of any other city in the world, and, notwithstanding the magnitude of the receipts, they were stored, transferred and forwarded without inconvenience or delay. The larger part of this grain was forwarded East by canal, the amount so shipped being 63,278,404 bushels, against 46,845,194 bushels last year, and 53,238,725 in 1878, and this was put through without any glut or blockade on the canal or at Buffalo. Better rates of freight have been obtained than during the season of depression previous to 1879, but they were lower than last year, and not above a fair remunerative figure. The lake freight for the month of October averaged 6.8 cents per bushel for wheat, and 6.3 cents for corn, against 7.7 cents and 7.1 cents respectively last year. The canal rate for the same time was 6.7 cents per bushel for wheat and 6 cents for corn, against 9 cents for wheat and 7.9 cents for corn last year. More grain was received in October than any other month, the amount being 16,186,000 bushels. The shipments by canal for the season included, in round numbers, 18,000 barrels flour, 26,500,000 bushels wheat, and 35,250,000 bushels corn, against 8,863 barrels flour, 25,100,000 bushels wheat, and 19,000,000 bushels corn last year. To have transported the 63,250,000 bushels of grain and 18,000 barrels of flour by rail would have taken thirty-five trains of twenty cars each per day for six months, including Sundays.

**The Crops of 1880 in the United States.**

Mr. Charles Worthington, statistician of the department of agriculture, has completed his final investigation and compilations in regard to the wheat crop of the United States for 1880, a detailed statement of which, by states, is as follows:

States.....	1880, bus.	1879, bus.
Maine.....	283,135	488,688
New Hampshire.....	204,525	195,529
Vermont.....	520,095	463,924
Massachusetts.....	15,069	15,354
Connecticut.....	43,730	49,348
New York.....	19,831,237	10,749,680
New Jersey.....	2,473,374	1,784,115
Pennsylvania.....	22,398,080	23,307,245
Delaware.....	1,369,040	1,019,584
Maryland.....	7,485,800	6,939,086
Virginia.....	9,329,350	8,351,007
North Carolina.....	2,470,080	3,323,897
South Carolina.....	690,720	1,140,400
Georgia.....	2,582,370	3,616,020
Alabama.....	946,630	1,501,592
Mississippi.....	374,000	417,312
Texas.....	3,901,500	3,454,200
Arkansas.....	1,167,900	1,384,000
Tennessee.....	9,309,800	11,852,040
West Virginia.....	4,661,140	4,880,580
Kentucky.....	5,347,120	7,681,520
Ohio.....	87,792,800	86,591,360
Michigan.....	30,705,000	28,773,120
Indiana.....	38,341,990	43,709,148
Illinois.....	53,787,200	44,896,830
Wisconsin.....	16,404,000	20,635,468
Minnesota.....	40,752,000	31,887,185
Iowa.....	86,098,400	32,787,043
Missouri.....	30,338,000	26,802,300
Kansas.....	19,850,000	18,089,060
Nebraska.....	10,208,000	13,043,703
California.....	45,700,000	35,000,000
Oregon.....	12,200,000	6,188,800
Other states and territories.....	13,005,000	16,900,000
<b>Total bus.....</b>	<b>490,849,733</b>	<b>448,755,118</b>

The following compilation will show at a glance the comparative yield in the several general divisions of the country, in bushels:

	1880.	1879.
New England states.....	1,167,092	1,169,843
Decrease.....	29,751	
Middle states.....	39,073,341	35,850,605
Increase.....	3,222,736	
Southern states.....	49,256,990	54,473,703
Decrease.....	5,216,713	
Western states.....	314,667,390	297,145,167
Increase.....	17,522,223	
California and Oregon.....	58,630,000	43,188,800
Increase.....	15,441,200	
Other states and territories.....	13,005,000	16,900,000
Increase.....	1,105,000	

The increase in the crop compared with 1879 is 32,094,603 bus.

The corrected information in regard to acreage of wheat for 1880, in the United States, shows 36,037,950 acres, against 32,835,909 in 1879. The yield per acre for 1880 is 13.3 bus., against 13.7 in 1879; 13.1 in 1878, 13.9 in 1877. Previous to 1877 the general average for fifteen years was 12.2.

The figures given by the bureau of statistics indicating the amount of wheat remaining for domestic consumption, per capita, for several crop years, compare as follows: 1878-9, 6.03 bus.; 1877-8, 6.09; 1876-7, 5.34; 1875-6, 5.23; 1874-5, 4.79, etc. In this reckoning the flour exports are not taken into consideration—and thus the amount stated per capita includes wheat consumed at home for seeding, flour, etc., and also covering the amount of flour exported. For the year ending June 30, 1880, the flour exports were equivalent to 27,051,375 bus. of wheat; preceding year equivalent to 25,333,713 bus.

The annual production of wheat in the United States, the exports of wheat, including flour, and the remaining supply for domestic uses, compare for five years, each ending June 30, as follows:

	Production, bushels.	Exports, bushels.	Remaining, bushels.
1875-76.....	392,186,000	74,750,622	217,385,318
1876-77.....	360,359,300	27,043,935	293,315,364
1877-78.....	364,164,145	92,139,336	272,024,810
1878-79.....	420,123,400	147,657,649	272,465,751
1879-80.....	448,755,118	180,804,168	268,450,950

If the domestic requirements shall be 275,000,000 bus. during the current year, there will remain 205,000,000 bus. for export, or 25,000,000 more than in the preceding year.

In a book laid before the chamber of commerce of New York recently by Mr. L. B. Ruggles, it is shown that in the United States there has been a growth in cereal products from 615,000,000 bus. in 1840 to 802,000,000 in 1850; 1,238,000,000 in 1860, 1,387,000,000 in 1870, 2,178,000,000 in 1877, and 2,431,000,000 in 1879. The annual product increased from \$3,965,000,000 in 1850 to \$7,977,000,000 in 1860, and \$11,000,000,000 in 1870, yielding, after paying for labor and wages, a net amount of \$2,170,000,000, being nearly 20 per cent. on the value of \$11,000,000,000. The book states that this immense product is derived from 480,000,000 acres of land north of the Ohio river, which, after deducting 80,000,000 acres not immediately available, would leave 400,000,000 acres, which could produce in wheat or other equivalent cereals at least 4,800,000,000 bus. annually to meet the demands of a greatly-increased population.

Germany annually consumes 7,300,000 tons of rye, the staple food of the working classes being rye bread. The average rye crop is 6,200,000 tons, but this year it is only 5,200,000, so that the country must import 2,100,000 tons, cost 357,000,000 marks, or \$89,220,000. The import duties on this rye are 21,000,000 marks, or \$5,000,000, a direct tax on the necessities of life of the poorest people. The 5,200,000 tons produced at home are also proportionally enhanced in price.

**How to Set a Turbine.**

The following are the simplest and best rules for the setting of turbines that we have ever seen, having been arranged by Mr. A. N. Wolff, a water-wheel inventor and millwright, so that any millwright can understand them:

At the beginning let us consider some essential points regarding the proper mode of preparing the wheel site.

1. The cross section of the canal or head-race should contain, in square feet, at least one square foot for every fifty cubic feet of water used per minute by the wheel (or wheels, if there are more than one). Example: You use by your mill, 2,500 cubic feet of water per minute, your head-race should have a cross-section area of fifty square feet, or it should be about ten feet wide and five feet deep. This will give you a flow of something less than one foot per second of current in head-race. Your fore-bay should contain a cross-section of one square foot for each sixty cubic feet used per minute. With this proportion of inlet capacity your head of water will keep up to the standard point, and the full effect will be produced, due from the head.

2. Your tail-race, measuring from the standing surface of tail water down to the regular race bottom, should have a cross-section of fully one-third of that due to the head-race, or one square foot for each 150 cubic feet per minute used by the mill.

Rule 1.—Water-wheel pit should be dug down to such a depth as to allow the depth of tail water to be fully three-fourths the diameter of the wheel.

[NOTE.—In case of clay or gravel formation, substantial mud-sills should be laid, covering the entire pit (laid close together). These sills being perfectly level, must be floored over with plank not less than two inches thick—a double floor is even better. Upon this floor you place your pillars to support your pen-stock sill; in case of sand formation you should, in addition to rendering the floor perfectly tight, build up with substantial planks a tight curbing around and on the floor to prevent the sliding of the bank formed by the excavation. This renders your mill foundations safe from undermining and settling. Do not slight your work in any of the above points.]

Rule 2.—The distance from the lower edge of the draft cylinder of the wheel down to the pit floor should not be less than two-thirds the diameter of the wheel.

Rule 3.—The discharge room for water from the pen-stock should have under the sill an area measurement of one square foot for each one hundred cubic feet of water used per minute.

Rule 4.—Sills of pen-stock must be of good, sound, durable timber, of ample size, and well framed together, and when placed must be properly level and solid.

Rule 5.—The pen-stock should never be smaller in the square than three times the diameter of the wheel. The larger the pen-stock is made the better, however. For wheels above forty-eight inches twice the diameter is large enough for pen-stock.

Rule 6.—The pen-stock must be supported by proper pillars of wooden blocks or good stone, holding the sills in a permanently level position.

Rule 7.—The mud-sill or under foundation must be of a most secure and permanent nature, allowing no chance whatever for any under settling or any possibility of being undermined.

Rule 8.—I come now to floor of pen-stock. Heavy trimmers of good, stout timber must be neatly framed in bands across between the sills to receive the floor.

Rule 9.—The floor of the pen-stock must be well and tightly laid with thick plank (from 2½ to 4 inches). The plank should be broad, say 18 to 24 inches.

Rule 10.—The hole for the wheel draft cylinder must be cut through this floor (between trimmers) of a diameter one inch larger than the cylinder measure to allow for adjusting wheel.

Rule 11.—Use extra care to plane off the curb of this hole until it is perfectly level, so that the wheel may set exactly level when it is in place.

Rule 12.—Be careful in adjusting the followers at top of dome, that you do not get them too tight. They must be set up by the set screws carefully, so that the shaft stands perfectly upright and easy.

Rule 13.—In setting your transmitting shaft too much care can not be exercised in getting it perfectly plumb; also resting properly in the box above. Notice that the coupling at the wheel is put together according to the marks made upon it.

**The Just Judge in the Guise of a Miller**

A gentleman who possessed an estate worth about five hundred a year, in the eastern part of England, had two sons. The eldest being of a rambling disposition, went abroad. After several years, his father died; when the younger son, destroying his will, seized upon the estate. He gave out that his elder brother was dead, and bribed false witnesses to attest the truth of it.

In the course of time, the elder brother returned; but came home in destitute circumstances. His younger brother repulsed him with scorn, and told him that he was an impostor and a cheat. He asserted that his real brother was dead long ago; and he could bring witnesses to prove it. The poor fellow, having neither money nor friends, was in a sad situation. He went round the parish making complaints, and, at last, to a lawyer, who, when he had heard the poor man's story, replied, "You have nothing to give me. If I undertake your cause and lose it, it will bring me into disgrace, as all the wealth and evidence are on your brother's side."

"However, I will undertake it on this condition; you shall enter into an obligation to pay me one thousand guineas, if I gain the estate for you. If I lose it, I know the consequences; and I venture with my eyes open." Accordingly, he entered an action against the younger brother, which was to be tried at the next general assizes at Chelmsford, in Essex. The lawyer, having engaged in the cause of the young man, and being stimulated by the prospect of a thousand guineas, set his wits to work to contrive the best method to gain his end. At last, he hit upon this happy thought, that he would consult the first Judge of his age, Lord Chief Justice Hale. Accordingly, he hastened up to London, and laid open the cause, and all its circumstances.

The Judge, who was a great lover of justice, heard the case attentively, and promised him all the assistance in his power. The lawyer having taken leave, the Judge contrived matters so as to finish all his business at the King's Bench, before the assizes began at Chelmsford. When within a short distance of the place, he dismissed his man and horses, and sought a single house. He found one occupied by a miller.

After some conversation, and making himself quite agreeable, he proposed to the miller to change clothes with him. As the Judge had a very good suit on, the man had no reason to object. Accordingly, the Judge shifted from top to toe, and put on a complete suit of the miller's best. Armed with a miller's hat, and shoes, and stick, he walked to Chelmsford, and procured good lodging, suitable for the assizes, that should come on next day. When the trials came on, he walked like an ignorant country fellow, backward and forward along the county hall. He observed narrowly what passed around him; and when the court began to fill, he found out the poor fellow who was the plaintiff. As soon as he came into the hall, the miller drew up to him. "Honest friend," said he, "how is your cause like to go to-day?"

"Why, my cause is in a very precarious situation, and, if I lose it, I am ruined for life." "Well, honest friend," replied the miller, "will you take my advice? I will let you into a secret, which perhaps you do not know: every Englishman has the right and privilege to except against any one jurymen out of the whole twelve; now do you insist upon your privilege, without giving a reason why, and, if possible, get me chosen in his room, and I will do you all the service in my power." Accordingly, when the clerk had called over the names of the jurymen, the plaintiff excepted to one of them. The judge on the bench was highly offended with this liberty.

"What do you mean," said he, "by excepting against that gentleman?" "I mean, my lord, to assert my privilege as an Englishman, without giving a reason why." The judge, who had been highly bribed, in order to conceal it by a show of candor, and having a confidence in the superiority of his party, said, "Well, sir, as you claim your privilege in one instance, I will grant it. Whom would you wish to have in the room of that man excepted?" After a short time, taken in consideration, "My lord," says he, "I wish to have an honest man chosen in;" and looking round the court—"my lord, there is that miller in the court; we will have him, if you please." Accordingly, the miller was chosen in. As soon as the clerk of the court had given them all their oaths, a little dextreous fellow came into the apartment, and slipped ten golden guineas into the hands of eleven jurymen, and gave the miller but five.

He observed that they were all bribed as well as himself, and said to his next neighbor, in a soft whisper, "How much have you got?"





### The Fire Hazard of the Flour Mill of the Present Day.

BY H. H. HOBBS.

The subject of "Flouring Mills" is, according to the programme of the Eleventh Annual Meeting of the Northwestern Association, assigned to me to write upon; and if it were my intention to take for a text this one great topic and view it through all its different phases and aspects, you would naturally expect and demand a collection of data, statistics and facts sufficiently voluminous and expansive in their scope to treat upon the subject in a properly clear and comprehensive manner. And to those of you who are seated here with the expectation of hearing such an essay, I can do no better than refer you to the paper read before our last meeting by our talented associate, Mr. W. B. Cornell, who has done all that could be done in that line. Does it not appear upon first thought, that, in a profession like ours, where a full knowledge and intelligent comprehension of the detail of working and the minutia of construction of so many, in fact of all branches of business and manufacture are pre-requisite to success, that so much time and thought have already been devoted to this one especial subject, and yet upon reflection of the fact of the magnitude of the flouring mill interests, the capital involved in it, and the relation the production of the staple bears to the existence of mankind, can we study it too thoroughly? My aim in presenting these pages for your perusal and criticism, is, as I said before, not to theorize upon the subject in a general way, but simply to briefly review the physical and moral hazard (as underwriters express themselves) of the flour mill of the present day, and more particularly to touch upon the different new processes and methods now employed in the manufacture of flour.

Much clear and comprehensive knowledge is frequently obtained by comparison, and there comes to mind a comparison which is apropos to this subject. Near the entrance to the grand display of the Millers' National Convention and Exposition, which was held in the city of Cincinnati in June last, was constructed a truthful and vivid representation of the exterior of the grist mill of our forefathers. Art had successfully studied to copy nature, and from down an admirably constructed hillside came a stream of natural water, which was conveyed to an old fashioned "bucket" wheel by means of a moss-covered wooden trough; the wheel revolving slowly upon a hickory "shaft" communicated the "power" thus deprived to the interior of a bark covered log mill, which was, in all its appointments, as primitive as its surroundings. Compare the mill thus pictured with the model mill of the present day, and do we not learn with emphatic certainty that we live in an age of progress? And further, that if the subjects upon which we were called upon to pass, can in themselves undergo so radical and thorough a change within the time allotted to our stay below, we, in order to keep up with the changes that are so constantly and rapidly taking place about us, must needs be diligent in our studies and inquiries, and keenly alive to the necessity thereof.

The old, low grinding system of flour making needs no explanation and demands no time at my hands; it is thoroughly familiar to you all, and is now nearly obsolete and found only in frontier, or in some localities, custom grist mills. I do not recall a single exception where in any merchant mill in this section of the country, the newer process is not in use.

The advance step toward the production of higher grade flour, as well as the improvement and economy in producing the same, was made in the introduction of the method known as the "New Process," and the product of this process is called "Patent Flour." With this innovation we were made acquainted with the operation, the distinctive aim of which was to produce as large a yield of high-grade flour as possible out of a given amount of wheat. This is accomplished by the use of extra precautions in cleaning, smutting and brushing, followed by frequent bolting and separating, and in some mills by heating the wheat before grinding, it being claimed that heating the wheat immediately before grinding gives a beneficial result in several particulars. First and most important, that the same grade of flour can be uniformly produced at all seasons, as the wheat is all ground at the same temperature. Second, that by heating, the moisture of the berry is drawn to the outside covering or bran, thereby producing the doubly favorable result of drying the berry and toughening the bran. Third, the quality of the middlings is improved, they being coarser, sharper, and purify with much less waste. The heaters, where properly constructed, cannot be considered as a perceptible

increase to the fire hazard of a mill, as steam is always used as the agent, and the product must be heated as used and be done in close proximity to the burr, and consequently where constant attendance and observation will avert accident. The middlings purifier has been considered as much of an object of interest and investigation and as great a source of danger as our first teachings in flour mill inspection taught us to regard the smutter. But where the careless or thoughtless introduction of an open light into either smutter or purifier has occurred, the consequence has been a perfectly natural, but disastrous one. The Minneapolis disaster, as you all know, was attributed to fire communicating with fine dust emanating from the purifiers and other machinery of a like character. But carelessness and ignorance can be charged with being elements of human life and character against which we, in our profession, are being constantly brought in contact, and that the introduction of such machinery by which the liability of accident or loss to our companies is enhanced either by carelessness or ignorance or otherwise, is unquestionably an increase of the physical hazard and one which should be fully considered by us, and paid for by the insurer, is not a debatable question. In May, 1878, Minneapolis taught us all that this logic was legitimate, and when other mishaps of smaller magnitude followed Minneapolis as some had preceded it, there were among our numbers many who would frankly admit that we neither comprehended nor contemplated the causes which were producing such dire results, and further, that the mill owners themselves could not be conversant with the dangers of their own mills, or most certainly they would have taken steps to avert the dreadful loss of life and property, occasioned as we believe and argue by their lack of knowledge and experience in the manipulation of their calling. The memorial stone over the door of the entrance to the present Washburn mill, on the falls of Minneapolis, is a constant and lasting reminder and witness of the truth of this assertion. It is, however, fair to presume that the knowledge and benefits purchased at such a cost have tended to guard against a recurrence of a like character, and in all well regulated mills the introduction of preventives in the shape of inclosed stationary lamps, Davy safety lamps, inclosed air-tight dust rooms, patent ventilators, dust-cloths, etc., have to a great degree modified the danger.

We now come to the last process employed in the manufacture of flour up to the present day. It is called the Hungarian or roller process, and from present indications, judging from the number of mills which have already, or are to adopt it, it may be regarded as the process which is to be employed by the leading merchant mills of the country. The leading features of the true Hungarian roller system are—(I quote a millwright of prominence and undoubted authority, and one who is qualified to judge by experience among mills of this character in Europe, where the process has been in use for years, who writes as follows):

1. A thorough and systematic cleaning of the wheat with the most improved scouring and brushing machines and separators for the elimination of extraneous seeds and dust.
2. The granulation is done entirely by grooved chilled iron rolls having from eight to thirty grooves to the inch, the reduction leaving the bran finished.
3. The separation of the light chaff from the breaks by means of aspirators.
4. A thorough and systematic grading and purifying of the middlings by means of air or sieve purifiers.
5. The sizing of the middlings on smooth chilled iron rolls having equal speed in order to reduce them in size and eliminate the germs and bran specks which may adhere to them.
6. The final reduction to flour of the fine, clean middlings, by means of porcelain rolls having different speeds.
7. A full and complete separation by bolting following each of the above operations.

This gentleman goes on to state that "by this system about twenty-five per cent more flour can be made by the same power, the yield is increased about twenty pounds to the barrel, and the flour is all of a higher grade, with a much larger percentage of choice flour and very little low grade." If we assume these facts to be as stated, have we not indeed a revolution in this line of manufacture? Less power produces, with a given amount of wheat, better flour, and more flour, by the Hungarian process, than if made by any other known process. Let us see further. The process described above as the true Hungarian process is claimed to be bettered by some of

our enterprising millers, by reducing or crushing the wheat through three, four or five pairs of rollers, separating and bolting after each, with aspirator used in connection with each roller machine, and then passing the product thus partially reduced, between a pair of finely cut burrs. One mill in particular that has come under the writer's observation, uses in the final process a cast iron wheel delicately and finely sharpened on the flat side running in connection with a French burr, which they claim is doing excellent work. Whether or not these departures from the "true" system will prove advantageous time, experience and constant experimenting will alone decide. It will, however, be out of the usual order if Yankee brains and ingenuity do not improve upon the methods of the Old World. Tersely expressed, the difference between a new process patent flour mill and the Hungarian or roller process consists simply in the difference in the respective methods of reducing the grain—in the new process mill the work being done by burrs—in the Hungarian the wheat is crushed not ground, and is done gradually, by grooved iron and porcelain rollers with a constantly recurring and consequently more thorough separating, bolting and purifying. As to the advantages and disadvantages, pro and con, as between the two methods, as viewed from an insurance standpoint, let us look first upon that which we term the physical hazard.

1. As to the danger from friction or fire from sparks created by either the stones running dry or the introduction into the feed of any foreign or metallic substance, my judgment in this particular is decidedly in favor of the roller system, and this decision is coincided in by all insurance men and millwrights, who have examined into the matter. A stone or a nail to pass between metal rollers would throw either the upper or lower roller out of true, as the rollers are delicately adjusted, and are so set that they can be spread apart at once. A like substance passing between porcelain rollers would break them, and, it is believed, do no further damage.

2. As to the cleanliness of the same capacity mill of the two systems—again the verdict will be in favor of the roller mill, except wherein the process of purifying and bolting is increased in the roller mill and proper construction and ventilation of these machines is not observed. The roller machines themselves are comparatively dustless, as the separating and bolting process between each break removes the particles which create the dust.

3. It is a noticeable fact that in a majority of the mills recently reconstructed into roller mills, as well as of the entirely new mills erected, that the cleaning machinery is being removed from the mill proper. This is probably explained by the fact that the roller mills require more room for purifying and bolting. And on one hand while the hazard of extra purifiers and bolting chests and reels is added, the hazard of the smutter, the brush and the separator is avoided.

4. Upon the point of lubrication I can find no change (neither an improvement nor a retrogradation). Properly conducted mills where the management is competent will never use anything but highly refined lubricating or lard oil upon the many rapidly running journals of their different machines, and to my mind, when this care and judgment is not apparent, or where we find crude or partially refined, cheap oil, or heavy earth oils, used as a lubricating medium, or where heating of the journals can be observed to any degree, the natural effect of too infrequent lubrication, prompt measures should be taken to remedy this evil (which cannot be exaggerated) or to take up the policy.

"The moral hazard of the flouring mill of the present day." An old familiar adage tells us that "Straws show which way the wind blows," and I firmly believe that from the number of prominent merchant mills in the West and Northwest which have adopted the roller machinery, we may cease to look upon them in the sense of an experiment, and accept without hesitation the fact that this system will eventually be universally adopted. One writer on this subject says: "It is our judgment, from a careful and thorough investigation of the system as practiced in Europe, and the experience we have had in this country, that rolls are the only machines by which reductions can be properly made. Those millers who have tried rolls, or, better still, have tried to compete against them, will agree with us." This is plainly and concisely stated, and to us speaks volumes.

There is no doubt but that a general feeling is growing among companies writing upon flouring mills, that while the roller process will, in expense of running and quality of goods made, give a decided advantage to the larger mills, smaller mills, not able by reason

of limited area or capital to improve their machinery, will be at a disadvantage, and consequently fear there will be among them (the smaller mills) a large increase of moral hazard. Whether or not this feeling is based upon sound logic, it behooves us as the representatives of our companies, to use our best efforts to solve the question, and in considering the subject, we cannot but conclude that the operator of a merchant mill, who is not sufficiently alive to the necessity of improvement and advancement in his business, to adopt whatever may be deemed advantageous to his business, in order to successfully meet the natural competition in his line of trade, cares so little for his business and his mill, that we as underwriters should be chary in placing our policies between him and loss.

A conversation held between a special agent, well known to all of you, and an eminent millwright of Minneapolis, is reported to the writer to have brought forth the following statements, which are given for your reflection: It was argued by the millwright that the roller process was a success, that it had ceased to be regarded as an experiment. The mills which were of the largest capacity, whose brands were most sought for upon the seaboard for export, were all either then using the "crushing" process, or were to use it. That it would, in this gentleman's opinion, be an unprofitable effort for any mill to try to compete against the roller process when engaging in manufacturing flour for merchant or export markets; and, lastly, that within five years' time all then existing mills of the character above referred to would be using the true roller process, either as described to you in this paper, or improved upon. If your judgment and experience lead you to agree in this opinion and comment (and would it not be wise to come to a conclusion based upon your judgment before your experience proves it to you), the query naturally arises, what then is to become of the mills which are not in proper competing shape? I leave that question for each of you to answer for himself.

The single fact that a certain mill has not seen fit to equip itself with roller machines, however, ought not to be enough to condemn it as a subject for insurance. There are other features to be regarded when considering the "moral" of a flouring mill, which each in itself is as important as the one upon which we have just written. This point of consideration is one upon which it is useless to theorize; practice, consistent, but well defined, a principle thoroughly understood and always lived up to; and inspection, unvarying and imperative, are essential to determine whether the moral is free from taint. If you will be successful in anything you undertake, you must be practical in it. It will do to listen to theories, but carry out your own convictions. If you see a risk, be it flouring mill or what, which your judgment cannot approve, cancel it. Do not get into the pernicious habit of instructing the agent to drop it at expiration. You will not only do your company the proper service you owe it, but will gain the respect of your agent by his knowledge of your sincerity of purpose, and firmness to do what you believe to be your duty.

Where, then, shall we look for a moral taint in a flouring mill of the present day? Crowded, old fashioned, old machinery mills, heavily encumbered, and having more interest to pay than profits to divide. Mills having no practical, interested head, where a dishonest employe may commit the crime of incendiarism to shield the crime of embezzlement. Ask yourselves the following questions, after your thorough inspection of the mill, and be governed in your decision by the answers the facts and circumstances will give you. Is the mill properly situated? That is, can it supply itself with wheat at prices which will admit of its competing with other mills in its market, and are the facilities for selling and shipping such as they should be, to enable the mill to have a fair margin on its products? Is it a steam power mill? Then, has it water-power competition to such an extent as to enhance its cost of operation, and to make the cost of its product greater than that of its more favored competitor? Is the mill of such construction that if it has not already put in the newer and approved machinery it could easily do so? Bearing in mind that a much larger area is required to fully equip with a roller process machinery than the old process, the capacity of the hypothetical mills being equal, these points well and clearly defined and understood, will give a good insight into what might be termed the apparent visible moral hazard. But there is another phase of moral hazard which requires keen insight and close perception, if not intuition to discover. I



bastion produced by oxidizing various articles of food. Supposing we were to take the average of all persons present in this room, and assume we are all ten stone weight (140 lbs.), and if we wished to go up 10,000 feet against gravity, what amount of force should we require? I could have given you the quantity in metre kilogrammes of force, as I have already done, but let us see what amount of money it would cost in the form of different kinds of food, in order to do that amount of mechanical work.

WEIGHT AND COST OF FOOD REQUIRED TO RAISE 140 LBS. 10,000 FEET HIGH.

	Weight in lbs. re- quired.	Cost per lb. in pen- ce.	Total cost in pence.
Potatoes.....	5	1	5
Flour.....	1 1/2	3	4 1/2
Bread.....	2 1/2	2	5
Oatmeal.....	1 1/2	2 1/2	3 3/4
Rice.....	1 1/2	4	6
Lean of Beef.....	3 1/2	12	42
Beef Fat.....	1 1/2	10	15
Cheshire Cheese.....	1 1-5	10	12

On this table we have the number of lbs. required of different kinds of ordinary food to produce this amount of mechanical work. If we take potatoes, we find 5 lbs. of potatoes would be required, and if we consider them as costing 1d per lb. it will cost 5d. You will readily understand that the last column, which gives the value of the articles, will vary from time to time. Of flour we should only require 1 1/2 lbs., which is taken at about 3d per lb., and this would therefore only cost 4d. Bread would cost 4d; the difference is due, doubtless, to the expense of the process of making bread. In the case of lean beef, deprived of fat, 3 1/2 lbs. are required; and, as the cost of very lean beef is taken at 1s per lb., that would cost 3s 6d, whereas the fat would only cost 5d, because so small a quantity as 1/2 lb. would do the work which 3 1/2 lbs. of lean beef would do; 1 1-5th lb. of Cheshire cheese would be required; which, assuming the price to be 10d per lb., would cost 1s, to do that amount of mechanical work. Of course, this table is merely suggestive, but you see perfectly well that man does not require a large quantity of albuminoids in doing heavy work.

I told you that bread contains a very fair ratio of nitrogen to carbon, and that, when considered from another point of view—the mechanical work capable of being done by the use of such food materials—that, really, the money spent upon flour is not at all badly laid out; whereas, on the other hand, if you wish to have a large quantity of work done in a short time, then, in addition to bread, we require not to use much nitrogenous matter, but rather to use fat, and, therefore, the peasants, not merely of England, but of all countries have been right, in spite of many scientific assertions that they were wrong, in their instinctive habit of adding fat, rather than nitrogenous food, to their diet when undergoing hard work.

At a former meeting I said I would again revert to the subject of bran; in doing so now, I wish to be distinctly understood that, in my criticism against the admixture of bran with flour, I have been anxious to defend the miller from the charges of being ignorant of true scientific principles. I hold that the miller who so well mills his flour as to eliminate all bran is the man who is working on true scientific principles. His object is to enable the baker to produce a fine, well-pled loaf, not a sodden, heavy one. I think it is right I should suggest a method by which wheaten flour may be used, and yet not produce the injurious effects which I told you finely-ground bran, with its cerealin, produces in the panification process. This is to do what I suggested at the last meeting should be done with inferior flours, namely, to make the ferment and the sponge of really good, strong flour, and then in the dough process, when it is so much stiffer, and where the whole operation only lasts one hour, to use the wheaten flour. Of course, you are perfectly well aware that hydrochloric acid and bicarbonate of soda are sometimes used for raising wheaten bread, but I am suggesting this other plan for those who prefer a fermented loaf, and yet wish to avoid the high-colored products, and sodden bread, formed by the action of the finely-ground bran on this flour during the many hours of the ferment and sponge stages, and who desire that the fermented loaf of whole meal shall be light and porous.

I have, at last, come to the conclusion, and I will briefly recapitulate what, it seems to me, have been the prominent features of our study together. In the first place, you will remember, we studied in some detail the properties of the different constituents of the cereals, giving, of course, more especial weight to wheat. Secondly, we found that climatic conditions have a most important bearing upon the nature of those constituents; and then, thirdly, we consider together the right mode of treating such weights by the miller, and, subsequently by the baker. Lastly, we saw the necessity of microscopic examinations of the yeast, in order to be sure that we were not introducing into our fermenting process organisms of disease producing acetic acid, lactic acid, butyric acid, and other injurious products. These, perhaps, have been the chief points, though, at the same time, there have been several others which have occupied our attention for some time.

I have now only to say that, if I have succeeded in awakening an interest in the wonderful phenomena connected with the art of bread-making, and have raised in our minds a true conception of the high importance and dignity of the art—based, as we have seen it to be, on some of the most interesting departments of physical, chemical and biological science—and if I have stimulated any of you to resolve on the further study of these sciences, whereby greater and more rapid progress may be made, I shall rejoice that my efforts have not altogether failed.

NEWS.  
EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Montrose, D. T., wants a flour mill.  
R. West is building a mill at Burnsville, Ky.  
A two-run mill is being built at the Messteson Agency, Dakota.  
A new mill is being built at Oakford, Ind., by Joseph Haskett.  
The Spearfish, D. T., mill has a capacity of 500 barrels per day.  
It is said that President Hayes will sail for Europe in May next.  
W. Forkel has become owner of the Diamond Mills, Farmington, Iowa.  
A firm in Hamburg, Germany, manufactures porcelain millstones.  
Dickson and Amsden have just purchased the mill at Storm Lake, Ia.  
Eighty millwrights are at work on the Queen Bee Mill at Sioux Falls, D. T.  
The Humboldt Mill, at Minneapolis, it is now said, will be entirely remodeled.  
A new four-run steam mill is to be built at Lafayette, Ala., by Mr. J. Y. Trammel.  
Eichler & Son have purchased a 4-run new process mill at Orange, Juneau Co., Wis.  
Jacob Rohm, of Mansfield, Ind., is building a two-run water mill, to have two turbines.  
Cold weather has stopped the mason work on the new Archibald mill at Dundas, Minn.  
The official report says that Ohio produced 54,522,794 bushels of wheat in the year 1880.  
150,000 barrels of flour were received in Chicago during the week ending November 16.  
The yield of wheat in Great Britain and Ireland this year amounted to 84,000,000 bushels.  
J. C. Neal, of Sullivan, Ind., has just received an order from Europe for 1,000 barrels of flour.  
Kafader & Fisher, of Worthington, Ind., are putting in a large amount of new machinery.  
W. A. Schofield's mill, situated five miles north of Indianapolis, Ind., is being remodeled and enlarged.  
The Minneapolis millers, having filled all their warehouses with wheat, are now storing in St. Paul.  
Peter E. Kern, of Pigeon Falls, Trempeleau Co., Wis., is rebuilding his mill recently destroyed by fire.  
Daniel Clune's mill, in Holland, Brown Co., Wis., burned November 26. Loss, \$6,000; insurance, \$3,000.  
The flouring mill owned by Gardner, Campbell & Co., at Irving, Mich., was destroyed by fire Nov. 23. Loss, \$35,000.  
The net earnings of the Chicago & Northwestern Railway for the past year over the previous year were \$1,424,421.  
Mr. W. De la Barre, the consulting engineer of the Washburn Mills, Minneapolis, after a short visit to Europe, has returned.  
McIver & Lipscomb's mill at Nashville, Tenn., is being enlarged, and new rolls, purifiers, bolts, etc., are being added.  
A hot journal on a middlings purifier caused the burning of Wm. Lampe's mill at Chaska, Minn., Nov. 2. Loss, \$2,500; insurance, \$1,800.  
An explosion took place November 12 in the Ford pit at the Albion mines at Stellarton, Nova Scotia, at which about thirty-five men were killed.  
A neat three-run new process water mill is being built at Farwell, Mich., by Geo. L. Hitchcock. This will make two mills now owned by Mr. Hitchcock.  
H. H. Williard, a carpenter at work on the scaffolding of the new Pillsbury mill at Minneapolis, Minn., slipped and fell a distance of 90 feet, killing him instantly.  
Jones & Chaney are re-modeling the old Jones mill at Bourneville, O. Simpson & Gault have a force of millwrights at work in the mill, and are also furnishing the machinery.  
W. S. Hoke, of Parsons, Kan., is building a large grain elevator under the direction of Nordyke & Marmon Co., of Indianapolis, Ind., who also furnish all the machinery for same.  
Messrs. R. Gregg & Co., of Cannon Falls, Minn., own two mills at that place, the Goodhue Mills, capacity, 225 barrels, and the Old Mills about 200. Both are driven by water power.

The emigration to the Western States from the Eastern States and the Canadian Provinces is simply enormous. Thousands upon thousands are seeking for homes on the fertile plains of the Great West.

Fred. Knoche, an employe in G. N. Miner's feed mill at Cedar Falls, Ia., got his clothing entangled in some gearing in the upper story, and was crushed to death. November 12 was the date of the sad accident.

The warehouse and contents belonging to H. B. Graff & Co. and others, at Lancaster, Pa., burned Nov. 24. Loss on warehouse, \$20,000; insurance, \$9,500. Loss on contents, \$50,000; insurance, \$25,000.

Lawson & Bell, of Gallipolis, O., whose mill was destroyed by fire in October, have contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a new five-run steam mill having all improvements to date.

Four thousand six hundred and fourteen miles of railroad were constructed in this country during the first ten months of 1880. Two thousand eight hundred and fifty-nine miles were constructed last year.

L. Pauly's mill, at Alma, Kan., has lately undergone extensive alterations, and its capacity increased to fifty barrels per day. The millwright work was done under the superintendency of J. T. C. Willman.

James W. Hamilton, now living at Newton, Jasper County, Iowa, built the first mill at St. Anthony, Minn., in 1854, for Messrs. Rollin, Upton & Eastman. He also thinks he was the first to use belts for driving millstones.

November 9 a desperate attempt was made to murder Mr. R. H. Appleton, a prominent miller of Stockton, Eng., by a former employe. Several shots were fired, but it is believed that none of the three wounds received will prove fatal.

November 19 a boiler exploded in O'Neal's saw and grist mill at Stevenson, Ala., killing four men and seriously injuring four more, and completely demolishing the mill. The explosion was the result of carelessness on the part of the engineer.

The Leon Mill Company, at Little Walnut, Kan., ordered of Nordyke & Marmon Co., of Indianapolis, Ind., the machinery for a new process three-run mill, with engine. (Mr. Tong, the secretary of the company, contracted for the machinery.)

William Schultz, Esq., a well-known miller, of Sigourney, Iowa, was offered inducements to build a three-run new process steam mill at Thornburg, Iowa, and has purchased the necessary machinery from Nordyke & Marmon Co., of Indianapolis, Ind.

A company of French capitalists have a scheme on hand for placing settlers from Alsace and Lorraine on 150,000 acres of land in the Northwest. The delegate of the company is in consultation with the Canadian authorities on the subject.

The mills in New England, New York and Pennsylvania are compelled to lie idle much of the time on account of low water. A Maine farmer alleges that the cause of the low water is owing to the large quantity of ice cut out of the streams last winter. Next.

A change has been made in the milling firm of White, Listman & Co., of La Crosse, to take effect Dec. 16. Mr. White retires from the firm. Mr. C. L. Colman and G. Van Steenwyck enter as special partners, investing \$20,000 each. The firm name will be Wm. Listman & Co.

This year's wheat crop of the big Dalrymple farm in Dakota foots up 432,000 bushels—about 900 car-loads or 45 train-loads of 20 cars per train. This immense crop will go to the seaboard by way of the lakes, through Canada and the Erie canal, and is expected to net 60 cents per bushel at the farm.

November 15 a portion of the insane asylum at St. Peters burned, and, as near as can be ascertained, 32 persons were burned or died subsequently from the exposure to the terrible cold and from nervous prostration caused by fright. Gov. Pillsbury will advance money for the immediate rebuilding of the portion of the building destroyed.

The prominent millers of Bartholomew county, Indiana, have organized an association to be known as the "Courtland Milling Company," and will immediately commence the erection of a six-run new process steam mill and elevator, at Seymour, Ind. They have

contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for all the machinery.

There is a great complaint of a scarcity of water in the Eastern portion of Pennsylvania. Not only is there such a scarcity of water that mills and manufactories have to remain idle, but in many places the farmers have to drive their stock miles to water. A light snow has just fallen (Nov. 29) and it is hoped that a thaw will take place which will furnish water soon.

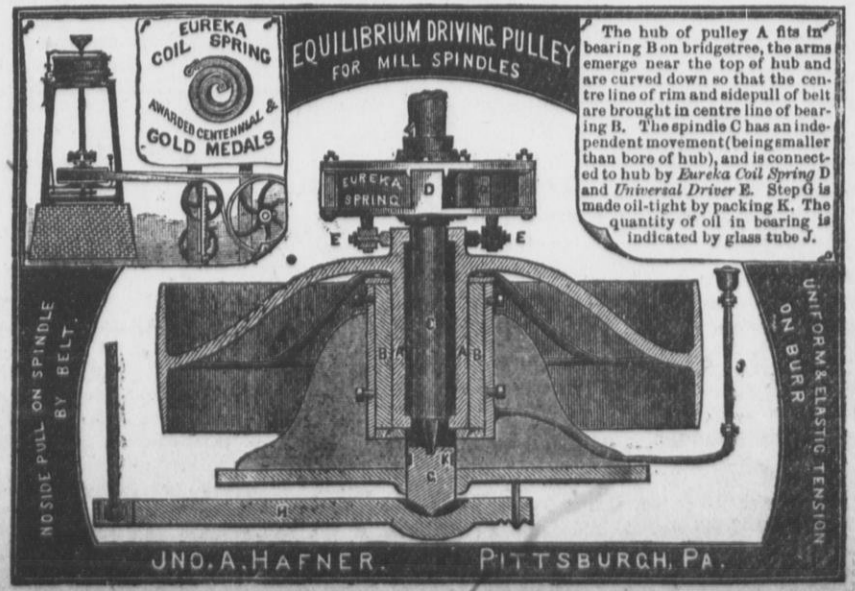
The sawdust of a mill at Victoria harbor is burned in a kiln eighty feet high, made of boiler iron. Carriers, on an endless chain, carry the refuse to a door forty feet from the ground, and dump it into the fire within. The other day an employe named Payne, who looks after the carriers, got on one of them to go to his place at the door above. Everything went all right until he got close to the doors, when he found that his feet were caught, and he was unable to extricate himself, and that he was gradually going to meet a sure and horrible death. He managed to attract the attention of some of his companions, who stopped the machinery just as he was entering the fiery furnace. He was severely scorched before he was rescued from his perilous position.

The French wheat crop of 1880, as estimated by M. Vanden Berghe, an eminent grain merchant, as published by the *Paris Debats*, will show a yield of 97,757,302 hectolitres, or 269,382,580 bushels, from an area of 7,015,353 hectares, or 17,327,921 acres. The average product is placed at 102,546,603 hectolitres, or 282,003,433 bushels, showing that the 1880 crop is slightly under an average amount. It is estimated that the crop will be disposed of as follows: For seed, 14,993,802 hectolitres; public food, 72,000,000; consumption by animals, 4,365,263; industrial purposes, 4,456,760; total, 95,815,825 hectolitres, leaving an apparent surplus of 2,141,477 hectolitres, or 5,889,661 bushels.

About six o'clock on the evening of Oct. 29, a fire broke out in the separator in the upper story of Hon. H. M. Matteson's flouring mill at Faribault, Minn., and notwithstanding the gallant efforts of the firemen the building was totally destroyed. Loss, about \$20,000; insurance on mill, machinery, etc., \$11,400; on stock, \$5,000. The origin of the fire is supposed to have been from a hot journal connected with the machinery in the upper story of the mill and near the dust room. The mill was running, and the fire when first seen was in the upper story, and soon after there was an explosion in the dust room, which immediately enveloped the upper part of the room in flames. The mill will be rebuilt.

Concerning the milling interests of Mankato, Minn., the *Review* says: "The Mankato Mill company, formed of R. D. Hubbard and F. L. Waters, has erected a fine flouring mill seventy-five feet square and five stories high. It is built of red brick, and is a most neat and imposing structure, with warehouse and engine room separate from the main building. It contains all the latest improved machinery, and turns out 500 barrels of flour per day by the Hungarian roller process. In the engine room is located a standing pump which supplies the city with water, there being over three miles of mains laid. W. H. Rokey & Co., in the City mill, grind about 100 barrels per day of straight grades, which is largely used by bakers. The Farmer's mill of W. Clark turns out some forty barrels of good flour, and does a considerable custom business."

The *Fargo Argus* supplies some interesting particulars of the result of this year's operations on the now celebrated Grandin farm in Dakota: "During the season of 1880 the management cultivated 5,921 acres of wheat, the total yield of which amounted to 137,287 bushels, or an average of 23 bushels and 10 pounds to the acre. In addition to this there were 304 acres of oats, which produced 18,925 bushels, and 141 acres of barley, the crop of which was 3,520 bushels. The Grandins will break new land for the next crop to the extent of 2,000 acres, giving a total area for seeding next spring of 8,001 acres. This splendid estate consists of the river wheat farm of 40,000 acres on the Red River of the North, and the stock farm at Mayville, covering 29,000 acres. Total, 69,000 acres. As a slight commentary upon the question, 'Does bonanza farming pay?' it may be mentioned that 37,000 bushels of wheat will pay all the expenses of the institution for the year; the other productions—oats and barley—will feed the stock, and the proceeds of 100,000 bushels of North Dakota No. 1 hard wheat will represent the net profit of the Grandin crop for 1880.



**Enemies of the Wheat Plant.**

BY REV. C. J. S. BETHUNE.

*Read before the Dominion Agricultural Commission.*

The most destructive insect pest to the wheat crop is the wheat midge, or *Cecidomyia tritici*, which has been first observed in America in 1820, when it was discovered in the State of Vermont, having been imported, like most of our destructive insects, from Europe. It spread with great rapidity over the Eastern and Central States and Canada, and in 1856 the loss to Canadian agriculturists from its ravages was estimated at \$2,500,000, while in the following year, 1857, it was calculated that 8,000,000 bushels of wheat were destroyed in the Province of Ontario alone. From that time up to 1868 it continued to be very destructive, but since 1869 it has been almost unknown. It is probable that the checking of the midge plague was due partly to a parasite which preyed upon the insect itself, and which was well-known in England and the countries of Europe, though, owing, perhaps, to its extreme minuteness, it had never been detected in this country, and partly to the general introduction of what were known as midge-proof varieties of wheat. Some of these varieties resisted the midge on account of the hardness of the envelope which inclosed the kernel, and some on account of their maturing either before the midge became formidable or after it had ceased to be so. The midge resembles the Hessian fly in appearance, the main difference being that the color of its body is yellow, while that of the Hessian fly is black. It frequents the ripening ears of the grain, and lays its eggs in the blossom of the wheat. As soon as the larvæ are hatched they begin to feed upon the juices of the grain, causing the latter to gradually shrivel up and become useless. When the period of the ripening of the grain arrives, the midge descends into the earth, remaining there throughout the winter. In the following spring it emerges into the pupa state, and in the month of June becomes a perfect insect. It is fond of moisture, and therefore likely to be found in low-lying lands, or lands not thoroughly drained.

The Hessian fly, or *Cecidomyia destructor*, is of older standing on this continent than the midge, its first appearance in America being about the year 1776. It was first observed in Ontario in 1846, and since then has been a very familiar insect, though its ravages have been serious of late years. Although the insect is very similar to the midge, its mode of attack is entirely different. It appears first in the fall of the year at the roots of the plants, lays its eggs, and the larvæ are hatched out and remain in the earth all winter, the brood appearing in the spring. There is a second brood in the spring which attacks the stalk, and it is upon this portion of the plant that the Hessian fly is most commonly observed. There are happily a number of parasites which prey upon this pest, the chief being a species of *apis*, ichneumons of various kinds, and probably some of what are more properly termed bugs. Spring wheat is not so much affected by this pest as fall wheat, as the grain ripening the same season in which it is sown affords no place for the larvæ to hibernate during the winter. This fact would point out as a remedy for the Hessian fly the abandonment for a time of the cultivation of fall wheat, and the substitution of spring wheat. Another remedy would be the sowing of fall wheat as late as practicable in the fall, in order that the larvæ might not find the plant sufficiently advanced for its attacks at the root before the winter sets in. Thorough cultivation would also aid in lessening the damage done by this pest, as the stronger and more healthy the plant, as a matter of course, the less it would suffer from the ravages of the fly.

The chinch bug, or *Micropus leucopterus*, might be called the most powerful insect foe of the United States agriculturist, but it has never been known to be destructive in Canada. Our proximity to the States, however, renders us liable to an invasion by this plague, and there is nothing except a slight difference in climate that would warrant the belief that it would not thrive in this country. It is an insect that requires heat and drought, to long-continued spells of which the Western States are much more subject than the older provinces of Canada. There is, however, great danger of its importation from Minnesota into Manitoba, where the climate conditions are very similar. It has been seen in Canada, and in 1866 the writer published a description of it in the *Canada Farmer*, from specimens which had been forwarded to him from Grimsby. It attacks other grains besides wheat, and, like many other insect pests, it is hibernating, existing throughout the winter in its perfect state. In the Western States, where it is

abundant, there are a great number of broods during the year. One of the remedies used is the application of water. A heavy thunder-storm during the seasons of its ravages is worth millions of dollars to the farmers of the Western States. It attacks the heads of the grain, clustering round them, and extracting their juices by means of its proboscis. A number of the larger carnivorous insects prey upon this creature, such as the lady-bird, the lace-winged fly, and the syrphus fly.

The same parasites are useful in this case as in the case of the grain fly, or *Aphis avenæ*. This latter belongs to the widely distributed family of *aphidæ*, or plant lice, which were so destructive to flowers grown in conservatories, windows, etc., and were consequently well known to everybody. The ravages of the grain aphid were never so serious as to give cause for alarm, though in 1861 it was quite a plague to the farmers of the Province, but it has not been very destructive since. Its diminution was attributable to the parasites which he had already mentioned as preying upon this insect in common with the chinch bug. Thunderstorms also wash off and kill large quantities, as they have no means of regaining their position on the plant.

The joint worm, or *Isosoma horder*, is especially injurious to barley, but it is not common in America, though in 1866 and 1867 it was somewhat prevalent in Ontario. It attacks the grain near the second joint, and the result of its work is to raise a gall or excrescence somewhat like a joint, hence its name. It does not attack the ear. The best artificial mode of dealing with it is to burn the stubble of the grain infested by it.

The army worm, *Hamecania unipuncta*, is much more common in the United States than in Canada, and receives its name from the fact that it assembles in large numbers when its food is exhausted in any particular locality and moves away in search of fresh supplies. New Brunswick was lately visited by this pest in such numbers as to put a stop to railway trains through the quantities slaughtered on the tracks, but they have never yet visited Ontario in anything like considerable numbers. A good way to meet this approach is to dig a deep trench and allow them to accumulate in it, afterward covering them with straw or shavings and setting the trench on fire. A number of parasites, both of the ichneumon and beetle kind prey upon the army worm.

The wire worm, or *Agrilus mancus*, is sometimes very troublesome to wheat. It receives its name from the fact that it is a long, slender grub; it attacks the root of the plant underground, and is consequently seldom observed by the farmer. It is sometimes seen in plowing, and where it is observed, a good plan would be to have children follow the plow and gather the insects up and destroy them. Turkeys and ducks also eat them.

**FLOUR MILL FOR SALE.**

Anyone desiring to purchase a 3-run Mill, driven by two water wheels, in a good neighborhood, and suitable for custom or merchant work will, address

A. C. BURNETT,  
Maquen Knox Co., Ill.  
[Mention U. S. MILLER when you write.] dec

**Water Power Flour Mill For Sale.**

Has 3-run of stone, and suitable machinery for making straight brands of flour. Parties desiring to buy a mill will do well to address

JOHN EVANS,  
Marengo, Calhoun Co., Mich.  
[Mention U. S. MILLER when you write.] dec



**\$100 PRESENT!**  
For a Machine that will Saw as Fast and Easy as this one.  
This is the King of Saw Machines. It saws off a 2 foot log in 2 minutes. 20,000 in use. The cheapest machine made, and fully warranted. Circular free. United States Manufacturing Co., Chicago, Ill.

**Case's Middlings Purifier.**

**The Most Important Addition to Milling Machinery of Late Years.**

It will be to the advantage of every miller thinking of getting a new Purifier to investigate the Case machine before ordering.

**WE GUARANTEE:**

1. That one Case Purifier, costing the price of one and occupying the space of one, shall be equal in capacity and result to two of any other make.
2. That we have the best cloth cleaning device in use.
3. That we have the best control of the blast.
4. That we waste less in the dust room than any purifier in use.
5. That our Patent Automatic Feed-Box is about perfection.
6. That giving twice the capacity our prices are only one half of those of any other standard Purifiers.

THE CASE MANUFACTURING CO., Columbus, Ohio.  
[Mention this paper.]

**The British Labor Market.**

The labor market continues, on the whole, to show steady progress. Both the iron and coal trades in the leading centres are well employed. In the North of England, though the price of iron is lower, the wages, under sliding-scale arrangement, are not effected. At Wigan the mines are still unsettled, but generally there are few important strikes to record. At Bradford, the long engineers' strike is now over. At most of the ports iron ship-building and marine engineering remain brisk, and steel rail makers are equally well employed at Sheffield, Newport and elsewhere. The reopening of the Rosedale iron-stone mines is announced, and an improvement in the Staffordshire potteries may be noted. At Birmingham the hardware trades are quiet, and the nail trade remains very depressed. Lamp makers are somewhat better employed. In the textile trades a somewhat more settled condition prevails. At Leicester trade is improving, and at Dundee there is also an upward movement. Several sections of railway servants are now asking for a rise in wages, consequent on increasing traffic. Trade in the United States continues good, and the emigration from the United Kingdom remains high. It is again stated that arrangements for the Canadian Pacific Railway construction have been made. Recent advices from Fiji indicate that the local industries are making progress, and there is less difficulty in getting labor.—*Labour News*.

**WHY A PUMP WILL NOT LIFT HOT WATER.**—The suction pump depends for its action on atmospheric pressure. When the piston of such a pump is raised a vacuum is formed beneath it, and the water from the well or reservoir is forced to follow the piston up to the top of its stroke by the atmospheric pressure on the water surface with which the pump is connected. When the attempt is made to lift very hot water, however, the rise of the piston causes an abundant evolution of steam or vapor from the water surface, which fills the space beneath the piston. This steam or vapor has considerable tension, and exerts a sufficient back pressure to counterbalance and equalize the atmospheric pressure. On this account, the lifting of hot water, save for very small lifts, is impossible. When hot liquids are to be pumped, therefore, the point of supply should not be below the pump, but rather a little above it, so that the liquid may flow into it.—*The Manufacturer and Builder*.

Chicago and Milwaukee "bucketshops" and their branches in the interior, have collapsed during the past month.

**5-Run Water Power Flour Mill For Sale.**

It is four stories high with stone basement. 4 new purifiers, submerged flume under 14 feet head. First-class railroad facilities and in a good wheat country.

Address F. M. GRAY, Niles, Mich.  
[Mention U. S. MILLER when you write.] dec

**4-Run Steam Flour Mill For Sale**

At La Grange, Mo. It has also a large corn run and machinery for kiln-drying meal. Machinery all in good order. Good shipping facilities by river and rail. Will be sold cheap and on easy terms. It is located in a first-class winter wheat country. Address

LA GRANGE SAVINGS BANK,  
La Grange, Mo.  
[Mention U. S. MILLER When you write.] dec

**Situation Wanted**

As miller by a single man, age 34, 18 years of experience. Is a good stoneman and accountant, is strictly temperate, and uses no tobacco. Address  
H. Y. Z., East River P. O., Cortland Co., N. Y.

**TO RENT, SELL OR TRADE**—A two-run Water Mill and 160 acres of land. Good dwelling. In Clinton County, Iowa.  
nov JNO. F. MCGUIRE, Clinton, Iowa.

**FOR SALE**—A Morgan Smutter, 45 bushels an hour. A Becker No. 5 Brush. Both almost new. Enquire at  
NORTHWESTERN MILLS,  
518 Canal St., Milwaukee, Wis.

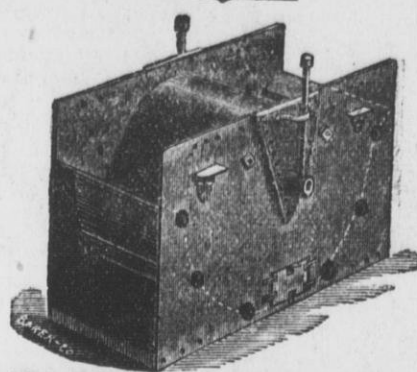
**SITUATION WANTED**—By a first-class miller of long experience, to take charge of a mill. References, if desired, given on application. Would run a good custom mill on shares. Address,  
MILLER,  
Care U. S. MILLER Office,  
No. 62 Oneida St., Milwaukee, Wis.  
sep

**SPECIALTIES**

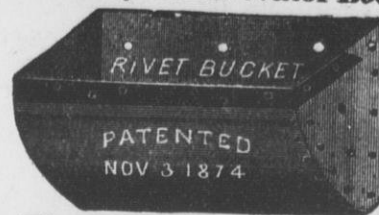
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**The Rivet Bucket Co.**

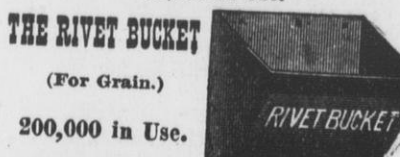
ESTABLISHED 1874.



**The Safety Iron Elevator Boot.**



**The Rivet (Corn) Bucket.**  
25,000 in Use.



**THE RIVET BUCKET**  
(For Grain.)

200,000 in Use.



**THE RIVET**  
(Mill) Bucket.

250,000 in Use.



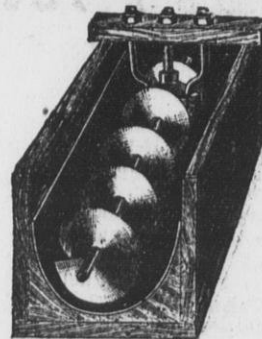
**THE CORRUGATED**  
**Belt Bolt**

This saves 10 to 25 per cent. in the wear of the belt. Sample sent.

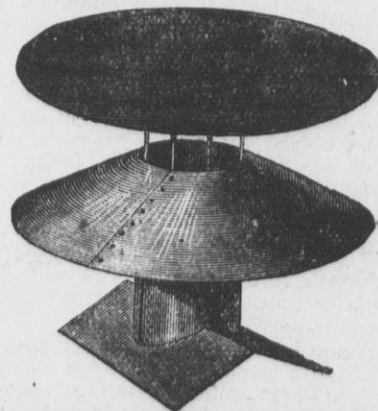


**PATENT IRON CONVEYER.**

This is the Strongest, Most Durable and Efficient ever produced. 25,000 Linal Feet in Use.



**CONVEYER BOX**  
**SHEET IRON LINING**



**The Safety Ventilator.**

Rids the mill of dust by the natural draught. These goods, of extraordinary merit and cheapness, together with all Mill and Warehouse Furnishings, sold by

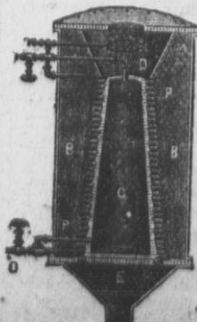
**N. HAWKINS & CO., Supply House,**

No. 83 Market Street,

CHICAGO, ILL., U. S. A.

[Mention this paper when you write.]

**Welch's Improved Wheat Heater**



WITH STEAMING ATTACHMENT.

First premium Millers' International Exhibition.

Its superiority over all others is fully established. Heats every grain of wheat evenly and thoroughly.

**WE GUARANTEE SATISFACTION** or no sale, and invite a trial of thirty days to prove our claims.

Send for circulars and prices to

Albert B. Bowman, Manufacturer,

708 Market Street, ST. LOUIS, MO.

# The United States

# MILLER

Volume 10.—No. 3.

MILWAUKEE, JANUARY, 1881.

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

SOMEBODY perpetrates the following which should be "posted in a conspicuous place" where users of steam power may see it:

Patch her up, the dear old boiler,  
She has boiled of years a score;  
'Twould be cruel now to leave her—  
Where she ought to be—on shore  
At the junk shop.

Patch her up, the cracks are sizzling!  
In Providence we put our trust;  
Flags are waving, music playing,  
Surely she will never bust.  
Bang! Whang! Pop!

Well! Really that's the fun  
Time she ever bust!

## Looking for a Situation in Gunnison, Col.

Somewhere between Leadville and Gunnison City wanders a Detroit who is penniless, ragged, hungry and discouraged. Four weeks ago he met a Michigan man out there and sent his love to all inquiring friends at home, and also explained why he was in that hard-up condition. He was too honest and particular for that country. He reached Gunnison City without a dollar in his pocket, but with lots of ambition in his soul, and soon met a man, who explained:

"I can give you the softest kind of a snap at \$4 a day. I want you to run one of my faro tables."

"But I don't know the game."

"You don't say, stranger? You must have had a queer bringing up. Out here and don't know faro! Pass on—no time to bother with you!"

The second man applied to for a situation squinted his eyes and took a long look at the Detroit and quietly asked:

"Whar' from?"

"Detroit."

"No use—that's too far East. My pard run off with the company's funds last night' and I kalkerlated on payin' somebody about \$100 to overtake him and bring me back his skalp. You'd look sweet takin' his trail, you would! You'd better inquire on the next corner."

The next was the site of a saloon about to be opened. The proprietor was a six-footer with a revolver on each hip, and in response to the inquiry he said:

"I s'pose you know how to pour whisky and weigh dust?"

"Yes."

"Suppose that one of the tough ones comes in after his nip and refuses to hand over."

"I'll call the police."

"Police be hanged! Every man's his own policeman out here. You must open on him with a shooter and keep pulling the trigger until he falls! The sit's open at \$3 a day and found."

"I—I guess I won't take it."

"Then git! No place for milksops around here. Might a-knewed you hadn't any narve by lookin' at ye!"

The Detroit made one more effort. This time it was a man who explained:

"Glad to see you; sot down a bit. Ye see, there's bad blood between me and a feller called Sandy Tom. We've agreed to drop each other on sight, and we mean business. I want to get the bulge on him, and bein' you're a stranger you can help me. Put this derringer in your pocket and go and shoot Sandy Tom, and I've got \$200 for ye!"

"Why, that would be murder!"

"What of it? Do you expect to hang out around here over a day without doin' any shootin' Where was ye raised?"

"In Detroit."

"Git! You haven't any spinal column. You'd better run home to your ma, you had. Out ye go—so long!"

**A GOOD GRINDSTONE.**—The *American Builder* thus sums up the qualities of a good grindstone: It should be strong, simple and clean; the trough expanded to catch as much as possible of the drip water and grit; a movable shield, securely hinged, to keep the water

from splashing, and yet permit the stone to be used from either side; rests provided, upon which to rest tools and the rod for truing the stone, these rods being arranged to move toward the centre as the stone wears smaller. The bearings should be generous in size, proper provisions being made for oiling without washing the grit into the bearings with the oil, and the ends of the bearings being protected by some device which effectually prevents the entrance of the grit. The stone should be secured to the shaft by nuts and washers fixed so they cannot turn with the nuts as they are screwed up or unscrewed. In hanging the stone, great care should be taken to hang it true sidewise, not only for convenience in using, but because a stone that is not true sidewise can never be kept true edgewise.

## Things Worth Knowing.

### TO KEEP LAMP CHIMNEYS FROM CRACKING.

—The following recipe for keeping lamp chimneys from cracking is taken from the *Diamond*, a Leipzig journal devoted to the glass interest: Place your tumblers, chimneys or vessels, which you desire to keep from cracking, in a pot filled with cold water, add a little cooking salt, allow the mixture to boil well over a fire, and then cool slowly. Glass treated in this way is said not to crack even if exposed to very sudden changes of temperature. Chimneys are said to become very durable by this process, which may also be extended to crockery, stoneware, porcelain, etc. The process is simply one of annealing, and the slower the process, especially the cooling portion of it, the more effective will be the work.

**BORAX TO PREVENT MILDEW.**—We understand that experiments lately made by Whewell, of Blackburn, on the employment of borax for preventing mildew in cotton goods, show that it cannot be employed with flour paste, as it turns the paste yellow. It can be used with advantage with farina, as it does not color the paste, and also increases its tenacity. A six per cent solution can be employed, which, at the present price of borax, namely £65 per ton, is equal to about £4 per ton.—*Textile Manufacturer.*

**TO MAKE CORKS AIR-TIGHT AND WATER-TIGHT.**—A German chemical journal commends the use of paraffine as the best method of making porous corks gas and water tight. Allow the corks to remain for about five minutes beneath the surface of the melted paraffine in a suitable vessel, the corks being held down by a perforated lid, wire screen or similar device. Corks thus prepared can be easily cut and bored, have a perfectly smooth exterior, may be introduced and removed from the neck of a flask with ease, and make an absolutely perfect seal.

**SOLID MUCILAGE.**—Mucilage in a convenient solid form, and which will readily dissolve in water, for fastening paper prints, etc., may be made as follows: Boil one pound of the best white glue, and strain very clear; boil, also, four ounces of isinglass, and mix the two together; place them in a water bath—a glue pot will do—with one-half pound of white sugar, and evaporate until the liquid is quite thick, when it is to be poured into moulds, dried, and cut into pieces of convenient size.

**PAINT FOR BASEMENT WALLS.**—A dry coating for basement walls may be made as follows: Take 50 pounds of pitch, 30 pounds of resin, 6 pounds of English red and 12 pounds of brick-dust. Boil these ingredients, mix them and stir thoroughly, then add about one-fourth the volume of oil of turpentine, or enough to make it flow easily, so that a thin coating may be laid on with a whitewash or paint brush. Walls thus coated are proof against dampness.

**HOW TO TEMPER CHISELS.**—In hardening and tempering a cold chisel, care should be

taken to have a gradual shading of temper. If there is a distinct boundary line of temper color between the hard cutting edge and softer shank portion, it will be very apt to break at or near that line. The cutting edge portion of the chisel should be supported by a backing of steel gradually diminishing in hardness; and so with all metal cutting tools that are subjected to heavy strain. Not every workman becomes uniformly successful in this direction, for, in addition to dexterity, it requires a nice perception of degree of heat and of color in order to obtain the best result.

**INDELIBLE INDIA INK.**—Draughtsmen are aware of the fact that lines drawn on paper with good India ink which has been well prepared cannot be washed out by mere sponging or washing with a brush. Now, it is proposed to take advantage of the fact that glue or gelatine, when mixed with bichromate of potassa, and exposed to the light, becomes insoluble, and thus renders India ink, which always contains a little gelatine, indelible. Reisenbichler, the discoverer, calls this kind of ink "Harttsch," or hard India ink. It is made by adding to the common article, when making, about one per cent, in a very fine powder, of bichromate of potash. This must be mixed with the ink in a dry state; otherwise, it is said, the ink could not be ground up easily in water. Those who cannot provide themselves with ink prepared as above in the cake, can use a dilute solution of bichromate of potash in rubbing up the ink; it answers the same purpose, though the ink should be used thick, so that the yellow salt will not spread.

## Results of the Turbine Tests.

*Holyoke Herald:* The Water Power Company have just published results of the hydrodynamic experiments at their flume last winter. The report of the tests makes a pamphlet of eighty pages, containing illustrations of the flume and cuts of thirty or forty different wheels. The method of testing a wheel on a horizontal shaft, and the experiment with draft tubes and belts and gears, are also illustrated. In April, 1879, the Water Power Company sent notices to turbine makers to forward wheels to be tested. The trial began in September of that year, but the tests continued through the winter and spring. Engineers T. G. Ellis of Hartford, Conn., and Samuel Webber of Manchester, N. H., witnessed the tests, and their reports are in the book, but the mechanical work of setting the wheels and making the experiments was superintended by James Emerson, who had much previous experience in testing turbines. Mr. Emerson's figures were verified by one or the other of the engineers. The experiments were competitive as regards economy in the use of water, cost, durability, etc. The company find that there has been the most gain in the efficiency of the turbines economical at partial gate, and ranging from half to full gate. Some of the principal wheels gave the following results at from one-half to full gate, the figures representing the average percentage of useful effect of water used on the wheel: "Hercules," made by the Holyoke Machine Company, 771; "New American," Stout, Mills & Temple, Dayton, O., 763; "Success," S. M. Smith, York, Pa., 747; "Tyler," John Tyler, Claremont, N. H., 715; "Tait," Thomas Tait, Rochester, N. Y., 712; "Thompson," Thompson Iron Works, Union City, Pa., 709; "Nonesuch," A. S. Clark, Turner's Falls, 666; "Houston," Fales & Jenks Machine Company, Pawtucket, R. I., 557. The "Victor," made by the Stilwell & Bierce Manufacturing Company, of Dayton, O., the "Richard," by George F. Baugher, of York, Pa., and others gave good results, but the above eight wheels are all whose averages were worked out by the engineers. The experiments with draft tubes were not favorable to that method of setting wheels. The theory is that the water will exert the same force as

when the wheel is set in the ordinary way, but the trials showed as high a difference as 34 horse-power in favor of the wheel placed at the bottom of the flume. In the experiments to ascertain the amount of loss of power through gears and shafting, an astonishing loss was discovered in spur gears, but the same results were found after repeated trials on several days.

**MAKING STEEL FOR LESS THAN THE PRICE OF THE IRON OF WHICH IT IS MADE.**—Mr. James Henderson, of New York, writes to the *American Manufacturer* the details of a process which he claims as his own, and which he terms the fluorine and oxides, preferably fluorspar and iron ore, finely pulverised, and applied as a covering to the bottom of the apparatus in which the cast iron is converted. It may also be applied as a dust, injected into the metal as in the Bessemer process. The claim for this process is that these agents form a chemical combination with themselves, and with the impurities in the crude metal at the same moment, and remove the silicon and phosphorus, so that the metal becomes steel by the time the carbon is reduced to one per cent., and that cast steel for tools is thus formed. Mr. Henderson claims to evade any steel patent, also that the process is economical with all kinds of iron, that good pig iron produces more and better steel than is produced without it, and inferior pig iron produces steel suitable for uses, such as rails, for which puddled iron is generally applied. In general, the object of this combination is to extract the phosphorus and sell it, and he claims to be able to extract phosphorus enough to make the steel cost less than the pig iron originally cost. Whether Mr. Henderson ever realizes all that he anticipates or not, only a thorough trial upon a large scale will determine. If he should succeed, however, in reducing the cost of steel materially, the process will be invaluable.

**PRESERVED AUSTRALIAN RABBITS.**—The Australian Meat Preserving Companies, which have, during the last year or two, taken to cooking and "preserving" rabbits which have been killed in such enormous numbers, have found their resources unequal to the task of boiling and tinning in a fresh state all the rabbits which have been offered to them. The Colac Preserving Company, for instance, whose works are situated about ninety miles from Melbourne, had, on an average, 7,000 of these rodents brought in every night for the first four nights of the past season's operations. How the supply would have increased as the season advanced it is impossible to say, but orders were given to limit the daily quantity to 2,700 pairs. This number cooked and "canned" for five days a week and during a season of twenty-five weeks gave 675,000 rabbits as the return for one establishment—a quantity which is 50 per cent. more than was dealt with in the season of 1879.

**CHANGE OF SEED WHEAT.**—We have often urged upon the farmers of the State the necessity of changing their seed wheat. In a conversation recently with Major A. G. Wilcox, who owns several large farms out on the line of the St. Paul, Minneapolis & Manitoba Railroad in Swift County, he informed us that last season he purchased a car-load of wheat in Winnipeg, and sowed it on one of his farms. The result was that, last fall, when he threshed his wheat, the ground which was sowed with the seed from the British province yielded five bushels more to the acre than that which was seeded with choice plump wheat raised in the neighborhood of his farm. The land, the cultivation and the harvest were all alike. This shows what virtue there is in obtaining seed wheat from a distance. We trust our wheat-growers will notice this experiment, and improve on it.—*Minneapolis Tribune.*



NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Ward Bros. will build a mill at Harding, Minn.

J. S. Wagner is building a 4-run mill at Cooperstown, Pa.

Baltimore's storage capacity is now placed at 3,350,000 bushels.

Hobarts mill at Crook City, D. T., burned Dec. 12. Loss \$7,500.

Several Texas flouring mills have been changed into cotton mills this year.

The ground is being broken for the erection of flouring mills at Thomson, Minn.

A 7-run flouring mill is about to be erected by a stock company at Rich Hill, Mo.

2,400,000 bushels of wheat were purchased by Minnesota parties during November.

Important discoveries of petroleum have been made in Venezuela, South America.

Renslow & Mason are now the proprietors of the Reidell Mills, at Owatonna, Minn.

A. J. Brown's mill at Ludlow, Vt., was recently damaged by fire to the extent of \$2,000.

The Red Wing Milling Co., Red Wing, Minn., turn out 1,000 barrels of flour per day.

Low water and lack of freight cars are the troubles which afflict Minneapolis millers now.

H. A. Doty's feed mill in Janesville, Wis., has been burned. Loss \$10,000. Insurance \$2,500.

F. Goodnow & Co., of Salina, Kas., have an order for 3,000 barrels of flour for export direct to London.

9,736 tons of dried yeast were imported into Great Britain during the past year, valued at \$508,000.

Messrs. Smith Bros., of Milwaukee, have finished the mill for Anton Klaus, at Jamestown, D. T.

Messrs. Smith Bros., of Milwaukee, have just built a mill for the Government at Ft. Foltz, Dakota.

The Zenith, Phoenix and North Star mills at Minneapolis have shut down to put in more new machinery.

D. J. Miner's mill at Freehold, N. Y., was recently destroyed by fire. Loss \$5,000. Insurance \$1,000.

The Washburn A mill at Minneapolis will, all completed, have a capacity of 3,500 barrels per day of 24 hours.

A great many mills in Great Britain are being entirely remodeled, some of them on the latest American plan.

A company in Antwerp, Belgium, will invest about \$600,000 in grain elevators, built on the American plan.

Louisiana's rice crop for 1880 is estimated at 250,000 barrels, an increase of 150,000 barrels over the crop in 1879.

Messrs. Smith Bros., of Milwaukee, have completed the rebuilding of the Los Gatos Flour Mills, at Los Gatos, Cal.

It is estimated that there are now in store in the warehouses of Dakota, Iowa and Minnesota and awaiting shipment 8,780,000 bushels of wheat.

The receipts of flour at Cincinnati for the year ending Aug. 31, 1880, were 771,900 barrels, against 613,914 barrels for a similar period in 1879.

Messrs. Smith Bros., of Milwaukee, have the contract for furnishing and placing the machinery in a Chicago, Milwaukee & St. Paul elevator in Iowa.

The Minnesota millers are again talking up a mutual insurance company, and the Legislature will be called upon this winter for the necessary legislation.

The Oregon wheat surplus, which is immense this year, and, in proportion, almost as extraordinary as that of California, has hardly been touched.

Messrs. Smith Bros., of Milwaukee, report business lively, and that they are crowded with millwrighting work of every description for both flour mills and breweries.

Austin & Worden will rebuild their mill, that was burned down at Minnesota Falls, Minn. It will be fitted up with the roller system, with a capacity of 125 barrels.

Dr. Glenn's harvest in Colusa county, Cal., is just finished, and the total yield is 460,000 sacks of wheat. The doctor reserves 60,000 sacks for seed, and has shipped the rest.

J. L. Dunham & Co., of Depere, Wis., have just completed the changes in their mill. They

have eight sets of rolls and twelve of stone. Capacity, 150 barrels daily—waterpower.

Van Valkenburg & Arndt have remodeled their mill at Depere, Wis. They now have ten sets of rollers, three runs of stone, and capacity of 200 barrels daily—waterpower.

Alex. Waer's flouring mill in Lapeer, Mich., burned December 22. Loss, \$25,000; insurance, \$10,000, in the Millers' National, and \$5,000 in the North American Insurance Companies.

Minneapolis millers are complaining about the mixed quality of wheat they have been receiving of late. Minnesota farmers are urged to take great pains to secure good, clear, hard wheat for seed.

Another German miller has been sentenced to fine and imprisonment for selling flour adulterated with 36 per cent of sulphate of barium. Verily, he was not "von of dose 'oneest Dutch vellers."

The Australian wheat crop which is now being harvested, will employ all the vessels available in foreign ports, and charters are being made there at the rate of 60s for the shorter voyage from Adelaide to Great Britain.

The Atlantic Milling Co., of St. Louis, of which Geo. Bain is President, has purchased a lot north of the "Atlantic Mill," 135 by 165 feet. It is suggested that Mr. Bain intends to put up a splendid mill on this new purchase.

Fifty-eight national banks were organized during the past year; 5 have failed and 21 went into voluntary liquidation, leaving an increase for the year of 82 banks. The total number of national banks now doing business is 2,102.

The Jonathan Mill Gradual Reduction system has been introduced in Jewell Bros. Brooklyn City Mills, Brooklyn, N. Y. The mills will have a capacity of 800 barrels per day. They use 27 purifiers, 13 sets smooth rolls and 15 gradual reduction machines.

**BURNED.**—The Walnut Valley elevator and Bonanza Mills, owned by E. K. White, at Eldorado, Kansas, burned Dec. 2. Ten thousand bushels of wheat and several thousands of corn were destroyed. The loss is placed at about \$20,000, with very little insurance.

We are pleased to learn that Mr. Henry C. Yaeger, the former proprietor of the Yaeger Mills of St. Louis, which were destroyed by fire some time ago, has just started up a new mill at Kane, Ill. Mr. Yaeger's countless friends will wish him unbounded prosperity.

The Great Western Manufacturing Co., of Leavenworth, Kan., have just completed a new brick machine shop, 150 by 75 feet, and three stories high. They have added a number of new machines, and write us that they are still running day and night to complete contracts.

The network of Japanese railroads is being rapidly extended. Two lines have recently been completed in the Island of Nippon, and another at Yesso, lying in the extreme north of the Japanese Archipelago. The rails used in the construction of these roads were manufactured in England and the locomotives in the United States.

In Baltimore the number of flouring and grist mills is six; greatest number of hands employed, 111; total yearly wages paid, \$38,418; value of material used yearly, \$1,227,158; value of product, \$1,373,109; number of boilers used, 13; number of engines, 7; total horse power, 680.

About thirty feet of the dam across the lake at Badger State Mills, at Eau Claire, Wis., went out on the night of December 19, but as the ground was frozen so hard its progress was very slow, and the prompt measures taken by Mr. Chinn prevented any further damage. Mr. Chinn estimates the damage already done at \$500, but does not anticipate any more.

The Plamondon Manufacturing Company, Chicago, manufacturers of mill machinery, shafting, pulleys, hangers, etc., have added new machinery to their works in the way of four new lathes. They are busily engaged constructing the machinery for a number of flour mills on an entirely new principle, and have within the past two months increased their working force to 100 men.

A singular accident recently occurred at Palmer's flouring mill at Shiawassee, Mich. C. Thomas, the engineer, while attempting to tighten a box in the engine shaft was caught by the clothing in the machinery in some unaccountable way, and hurled over the engine and left standing on his feet, with no other apparel than his cap and boots, his clothing being torn completely to shreds.

The books of the Secretary of the St. Louis Merchants' Exchange, show that during the past year there has been sold at regular call on 'Change, over eighteen and a half million bushels of cash grain, and a trifle less than eighty-five million bushels for the future. The future sales of option deals made on the floor of the Exchange outside of the sales at call will aggregate fully five hundred million bushels for the same period.

The Pillsbury A mill, at Minneapolis, is to be topped off with a forty-foot flag staff, still above which will be placed a weather vane eighteen feet high. The arrow which forms the vane will be eighteen feet long, and the points of the compass will be indicated by arrows nine feet in length, with letters twenty inches square, while a golden flour barrel placed on top of the flag staff will indicate the character and object of the great structure. The height from the ground to the top of the weather vane will be 188 feet.

One of the most conspicuous and successful new enterprises in Kansas City, Mo., is the Zenith Flour Mills. Its proprietors are active young Pennsylvanians who came amongst us last spring and have erected on the Chicago and Alton railroad, at First and Troest ave., the finest brick mill in the city. It has six run of stones and is capable of turning out 200 bbls of flour per day. The mill is now running night and day and large quantities of its flour is being shipped east, west and south.—*Ex.*

The foundations for a mammoth glucose factory to be occupied by the Chicago Sugar Refining Company, situate upon West Taylor street, between the river and the car tracks of the Chicago & Alton railroad, is so far progressed that a good idea can be had of the immense size of the structure. These works cover an area of some seven acres, comprising two main buildings and six smaller ones, the largest of which will be 160 feet square in extent, and eleven stories and basement in height. The second building will be 10 stories and basement high, and 70x130 feet in size. The company have about 200 men employed night and day, and it is the intention of the proprietors to have the building ready for occupancy about July next.

Near Rugby, Tenn., Thomas Hughes' English colony, there is a primitive water mill called Buck's Mill, which was run by the owner for years—until he sold it a few months ago—on the following system. He put the running gear and stones up, and above the latter a wooden box, with the charge for grinding meal marked outside. He visited the mill once a fortnight, looked to the machinery and took away whatever coin was in the box. Folks brought their corn down the steep bank if they choose, ground it at their leisure, and then, if they were honest, put the fee in the box; if not, they went off with their meal, and a consciousness that they were rogues. Buck probably found his plan answer, as he pursued it up to the date of sale.

The village of Geneva, Kane county, Ill., has recently added to its manufacturing industries a glucose factory, which is now in successful operation, consuming 1,000 bushels of shelled corn per day. The works have cost about \$125,000. The process of manufacture is as follows: The corn is first ground and soaked in pure water. It is then passed over several shelves and through rollers to extract all the moisture and starch. From the rollers it passes into large vats, and is there boiled until reduced to starch, pure and white. It is taken in the starch form from the vats, and by a chemical and purifying process is converted into corn sugar or glucose. The refuse or crushed corn, left after the rolling process, is sold to the farmers for feed, commanding not less than \$3 per ton.

The *Northwestern Miller*, of Dec. 17, says: Not content until their last mill has been overhauled and changed to the roller system, Messrs. C. A. Pillsbury & Co. are preparing to give their "Pillsbury" a most thorough renovation, tearing out everything but the walls, and, in fact, making a new mill of it. The fact that Henry Crossen is drawing the plans is sufficient to insure a model concern of it. Like the Empire mill, it will be mainly furnished with Downton rolls, enough of which, with six of its thirteen run of stone, will be employed to give it a daily capacity of between 700 and 800 barrels of flour. The "Pillsbury" mill is the one with which Mr. C. A. Pillsbury first embarked in the milling business in this city, and is consequently one of the oldest on the Falls. To show to what gigantic proportions this comparatively small starting has grown, it is only necessary to cite the fact that this firm now operate four large mills—the Anchor, Empire, Excelsior and Pillsbury—each of which turn out over five hundred

barrels of flour per day. When they have completed the mammoth Pillsbury A mill on the East side, for which they claim a capacity of four thousand barrels, Messrs. C. A. Pillsbury & Co. will be the largest flour manufacturing firm in the world, having a total capacity of six thousand barrels a day.

**PASSENGERS MUST HAVE SEATS.**—The Rhode Island supreme court was occupied last week with a matter of interest to all classes of travelers. Last September Mr. Frank W. Trainor of this city took the Shore line train from Boston for Providence. The cars were crowded, and, when Conductor Egan came through the train to collect the tickets, Mr. Trainor refused to surrender his pasteboard until a seat was furnished him. The conductor exerted himself to find a seat, but the only one he was able to find was one a portion of which was occupied by another man whose looks Trainor objected to; at least, he was dissatisfied with the seat, and still declined to give up his ticket. There was some further effort made to secure accommodations for him, but with little success. When the train arrived in Providence, Mr. Egan called the night police officer, Mr. Hansom, and Trainor was taken into custody. He spent the night in a cell at the police station, and was discharged the following morning. Subsequently he brought an action of trespass to recover damages for an assault committed upon him by Conductor Egan and Officer Hansom. Considerable testimony was heard on both sides, but the jury, after being out some time, brought in a verdict for the plaintiff of \$250.

**"CHALK YOUR HAT."**—The cant phrase, "Chalk your hat," which is still current in many parts of the Union, is said to have had its origin in a literal illustration of the words. "Admiral" Reeside was an owner of various stage coaches in the days before railroads. He spent much of his time in Washington, where, indeed, he lived for several years. At the annual adjournment of Congress he would pass his friends of the House and Senate—he was well acquainted with all the prominent politicians of his era—over any stage line he controlled. He would say to an Ohioan or Kentuckian: "I suppose your'e going back to Cincinnati or Louisville, and I'll pass you through by stage." When he was asked: "How?" he would reply: "Give me your hat." He would take the hat, make a cabalistic chalk-mark on it impossible to counterfeit, and return it with the remark: "That will serve your turn; any of my agents will recognize that anywhere, and won't receive a cent from the man whose hat is so marked." Reeside was right. All his agents knew the sign at once. The thing became so common that some fellows tried to imitate it, but they were invariably detected and compelled to leave the stage or pay their fare. In the South and West "Chalk your hat" still stands for what the East styles dead-heading.—*New York Times.*

**THE BRITISH BOARD OF TRADE RETURNS** show what a tremendous difference the goodness or badness of a harvest makes to the prosperity of a country. The imports of food into Britain in October, 1879, was £14,164,300; in October, 1880, £11,109,400; decrease, £3,054,900, or 21.6 per cent. The decrease is more than half of it in wheat, of which cereal only £1,710,600 was brought in, against £3,522,500 in October, 1879, a decrease of over 50 per cent. The import of live animals increased from £668,700 to £925,500, or nearly 38 per cent. The import of potatoes fell from £499,300 to £93,100.

**A NEW YORK STREET GAMIN.**—"I have a great desire to see one of your street boys," said Thackeray to a gentleman of New York as they walked together. "We shall be likely to meet some of them," said his friend, "see, there's one!" Thackeray drew near the ragamuffin and accosted him, "My lad, I want to go to Chambers street." The young Arab turned a sharp eye on the handsome stranger, delivered a mouthful of yellow fluid to the flagging and answered, "Well, run right along, sonny, only mind you don't be gone too long."

**PROF. HUXLEY** declared recently that ninety-nine men out of every one hundred became simply obstructive after sixty years old, and were not flexible enough to yield to the advance of new ideas. The world, he thought, would be benefited by any man who had taken part in science being strangled after sixty.

**MR. BRYAN CORCORAN'S** article on Millstones, corrected and revised, with 17 illustrations, will appear in our next number.



## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.

SUBSCRIPTION PRICE.—PER YEAR, IN ADVANCE.  
 To American subscribers, postage prepaid..... \$1 00  
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[Entered at the Post Office at Milwaukee, Wis., as second-class matter.]

MILWAUKEE, JANUARY, 1881.

SUBSCRIBE for the U. S. MILLER. Only \$1 per year.

WE wish our readers one and all a HAPPY NEW YEAR.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

MILLERS are much troubled now-a-days because freights are so backward in going forward.

A NATIONAL bankrupt law is greatly needed and it is probable that the national legislature will soon furnish one.

MANUFACTURERS of any article used in a flouring mill should make use of the advertising columns of the UNITED STATES MILLER. It will pay.

IN order to demonstrate what might be done in the way of corn raising, Mr. Nathan G. Price raised from one acre of ground during the present year, 110 bushels of shelled corn.

PARTIES desiring to sell or buy a mill, or get a situation in a mill, or in want of a miller or journeyman millwright, should make their wants known through the columns of the UNITED STATES MILLER.

FREIGHT cars are loaded much heavier than in former times. Car loads of ore have been drawn weighing 48,500 pounds. The present average weight of a car of heavy freight is not less than 25,000 pounds.

THE enormous freight traffic over the New York Central road may be considered when it is stated upon undoubted authority that in a single month 57,000 loaded freight cars went East and 54,000 went West.

MILLERS desiring to purchase any article used in flouring mills, can find where it can be obtained by addressing parties advertising in this paper. When you write to them, be sure and mention that you saw their advertisement in the UNITED STATES MILLER.

As an inducement to millers to establish business in Louisiana, that State exempts from taxation the milling property of all mill-owners whose plant employs five persons or more. We believe that there are many points in that State where milling could be made a profitable business.

THE jetties of the Mississippi have proved to be a perfect success. Nov. 17 the Dominion line steamer Montreal, bound for Liverpool, passed the jetties with the largest cargo ever taken from New Orleans, consisting of 6,669 bales of cotton, 48,658 bushels of corn, and 2,000 packages of miscellaneous cargo.

A SECTION in the United States Revised Statutes forbids the marking of an unpatented article with the word "patent." In a case in Oregon (Oliphant vs. Salem Flouring Mills) Judge Deady held that the act of branding flour "patent," was a violation of the law even though the machinery with which the flour was made was patented. The sooner millers quit branding flour "Patent," the better.

WIRE ROPES FOR THE GREAT BRIDGE IN NEW YORK.—Each rope is 4,550 feet in length, three inches in diameter, and their aggregate weight is 102,495 pounds. Each rope is made in seven strands. The central strand has 49 No. 11 wires, and the six strands enveloping this have 19 wires each, of No. 4, 5, and 7 gauge, making 163 wires in all. The strength must equal 160,000 pounds per square inch cross-section.

An English gentleman recently in this country said to us, that many of the English millers who were now remodelling their mills were putting in just such machinery as our

millers here who are remodelling their mills are throwing out, and that when he returned he was going to tell them they could save money by buying the discarded machinery at second-hand prices of our millers if they were going to carry out their present plans, but that they had better put in at once our latest new process roller system.

MINNEAPOLIS is now undoubtedly the largest milling centre in the world. St. Louis has lost two important mills during the year 1880. August 17th the Yaeger Mills, which produced in the year 1879, 328,724 barrels of flour, was burned, and on December 23d, 1880, the Pacific Mills, which produced in 1879, 152,141 barrels, was burned. This reduces the milling capacity of St. Louis, 480,875 barrels in one year. On the other hand, many additions have been made to other mills increasing their capacity, but no where near enough to compensate for the great loss entailed by the destruction of these two mills. Next to Minneapolis our own fair city of Milwaukee claims to rank as a milling centre.

## Books Received.

*Annual Report of Inspector General of Steam Vessels, U. S. A.* From the United States Treasury Department.

*Commercial Relations of the United States.* From the Department of State. Vols. I. and II. This constitutes one of the most valuable publications ever issued by the State Department.

*Consular Reports on Commerce and Manufactures, etc.* Nos. 1 and 2. From the State Department. These works will greatly aid our manufacturers and merchants in extending our foreign trade.

GEN. C. C. Washburn visited our city recently, and in a conversation said that he believed the mills of Minneapolis would grind 22 million bushels of hard spring wheat during the year 1881. Minneapolis millers are now universally using roller mills. Eastern mills can no longer compete with Minnesota mills for the reason that they cannot obtain the proper quality of wheat. All the hard wheat which reaches Chicago is mixed with soft to grade it up, and consequently millers there or east of there cannot get the same quality of wheat, all alike in its nature to make the best grades of what is known to the trade as Patent flour. Minneapolis flour can be delivered in Great Britain for \$1.20 per barrel above its cost in Minneapolis. Minneapolis millers are taking steps to improve their transportation facilities, so as to transport their produce in as direct and short a line as possible, and as soon as the arrangements are perfected, but little flour will go East by way of Chicago. Gen. Washburn speaks proudly as well he may of the great progress of Minneapolis in the milling industry. Minneapolis is now the greatest milling centre in the world.

## The President's Message.

Congress has assembled and the President has communicated his annual message. The reports from the various governmental departments show that we are at peace with all nations and that our internal affairs are generally in a prosperous condition. President Hayes advises that the coinage of silver be stopped and that the greenback currency be retired. It is probable that the coinage of silver will be restricted, but any effort to secure the reduction of the amount of greenback currency now in circulation will meet with vigorous opposition.

President Hayes recommends that Gen. Grant be made Captain General of the Army. It seems likely that something of the kind will be done and probably without any great amount of opposition. The President still advocates his theory of civil service, but as long as human nature is as it is, victors will not only claim but secure the spoils, and members of congress and senators will not conspire to cut off from themselves the power they may enjoy by the distribution of offices to their adherents in their respective districts.

The President takes up the Mormon question at considerable length and desires to have Mormonism thoroughly abolished at any cost. President Hayes is to be congratulated in having enjoyed a peaceful and prosperous administration.

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.

## Personal.

Mr. Wm. Richmond, of Lockport, N. Y., manufacturer of milling machinery, has been in Milwaukee some days on business.

The milling firm formerly White, Listman & Co., of LaCrosse, Wis., will hereafter be known as Wm. Listman. Mr. G. Van Steenwyk and Mr. C. L. Colman are special partners, contributing to the copartnership \$20,000 each.

Mr. H. Watters is now the resident agent at Fargo, Dakota, of the mill-building firm of Hulbert & Paige, of Painesville, Ohio. This firm has established a large and prosperous business in this prosperous northwestern Territory.

Ex-Gov. John Bidwell, a flour-mill owner and great land owner, residing at Chico, Cal., is a candidate for United States Senator from that State. Gen. Bidwell is reported to be worth over a million dollars. He owns one of the finest estates in California.

Messrs. Thomas & Stone, publishers of the *St. Louis Miller*, paid Milwaukee a short visit during the early part of the month. These gentlemen own a good paper, and justly feel proud of it. The *St. Louis Miller* is now in its third year, and bids fair to be a stayer.

Albert Hoppin, Esq., the genial editor and proprietor of the *Northwestern Miller*, spent two or three days in the city during the month. We dared him to go over to London and take in the British Millers' Exhibition, but he recalled his experience of the boat excursion at Chicago two years since, and said that he was sometimes troubled with sea-sickness and preferred to be excused.

We acknowledge the receipt of a photograph from Messrs. Simpson & Gault, of Cincinnati, Ohio, which attracted a good deal of attention and provoked much merriment at the expense of the Executive Committee of the Millers' National Association and the Commissioner of the Exhibition. Those who saw it in Cincinnati appreciated it, but words fail us to describe it. We also acknowledge the receipt of "John Gilpin's Ride," illustrated, from the same firm.

THE United States Consul at Berdiansk, thus describes the Russian workman: "His wants are few and easily satisfied. He lives in a wretched, unfurnished hovel, possessing but one recommendation, warmth in winter. His bed is a piece of felt and a straw pillow; he has no sheet or other covering. He sleeps in his clothes, and his sheep-skin coat serves him for a quilt. His dress is of common print, and he generally wears it until it drops off from age. A thick sheep-skin coat is his dress in winter and this is seldom taken off during the cold months. His food consists principally of black bread, made from rye, salted, sun-dried fish, cheese of very poor quality, eggs, and occasionally pork; the better class of workmen generally have a noon-day meal of soup made with meat and vegetables. His drink is tea, quass (a kind of weak beer), and vodka, (a very pure and cheap spirit made from rye). Of this spirit large quantities are consumed. His recreation is drinking with its accompaniments, singing and dancing. Such lodging, such food, such clothing, such amusements, are totally unfit for an Englishman or American. Under such circumstances he could not long retain health."

THE GERMAN FLOUR TRADE.—The German milling industry is at last showing some signs of revival. In fine flours the German millers have always supplied the home demand, but middle qualities have till now been imported from Hungary. Recently, however, the imports from Hungary have considerably declined, and German millers are now supplying the home markets with their own products. The flour exports from Austro-Hungary amounted in September of last year to 126,028 metr centners, of which 45,833 centners were dispatched to Germany. In September of the present year, the flour exports from Austro-Hungary amounted to 164,892 centners, of which, however, only 28,573 centners were forwarded to the German markets. The exports to England have, however, increased in great proportions, and these have more than compensated for the decline in the exports to Germany. Many of the Buda-Pesth millers, especially those engaged in the export trade to the U. K., are reported to have themselves been large purchasers of flour, with which to supply the wants of their customers.

A BREWERS' COLLEGE.—At their meeting, held in St. Louis, June, 1879, the United States Brewers' Association appointed a committee to report upon the establishment of a brewing academy. This committee reported

at the convention held in Buffalo, June, 1880, and after some discussion the committee was increased in number and the report re-committed; at the same time a resolution was adopted, offering a prize of \$150 for the best plan for the establishment of a brewing academy. For the purpose of giving effect to this latter resolution, the committee on brewing academy hereby offer in the name of the United States Brewers' Association, a prize of \$150 for the best essay on the subject of the scientific education of brewers, which shall also contain a scheme for the establishment of a brewing academy, or of a special course of instruction to be furnished by some already existing institution of learning.—*The American Brewer.*

GARLIC.—The garlic is a small onion-like plant which is a peculiar nuisance to millers in Pennsylvania and vicinity. It has a head somewhat like a seed onion and containing seeds about the size of a wheat grain and only a trifle lighter. This seed contains a glutinous material which, in grinding, gums up the pores of the buhrs, necessitating frequent scrubbing of the stone faces. The best dress for grinding garlicky wheat is obtained by cracking them roughly all over the face and dressing them quite open about the eye. Separation of the garlic from the wheat is very difficult, by reason of the similarity in the size and weight of wheat and garlic grains. To manufacture garlicky wheat, it must be cleaned several times, then chopped or half ground. This will break the garlic, which is somewhat softer than the wheat, and allow its gum to diffuse itself through the meal, so as not to close the stones very much in the second grinding. It is better if the chopped grain be allowed to lie a considerable time before second grinding, that the garlic may dry.

DIRECTIONS FOR LACING RUBBER BELTS.—The belts should be placed on the pulleys as tight as possible. This can be done by the use of belt clamps, except in the case of very narrow belts. In all cases the belt should be cut about one-eighth of an inch less than the distance around the pulleys with a tape line. The seam of the belt should always be on the outside. For narrow belts, butt the two ends together, make two rows of holes in each end (thus obtaining a double hold), and lace with lace-leather. For wide belts, put, in addition, on the back, a strong piece of leather or rubber, and sew or rivet it to the belt. If the belt should slip, it should be slightly moistened with boiled linseed oil—animal oil will ruin the belt. If one application does not produce the desired result, repeat until it does. The belts will be greatly improved and their durability increased by coating the surface lightly with a composition made of equal parts of black lead and litharge, mixed with boiled linseed oil and Japan enough to cause it to dry quickly; the effect of this will be to produce a finely polished surface.

THE GREAT EASTERN'S NEW WORK.—The Great Eastern steamship has been definitely chartered for ten years to carry dead meat to the United Kingdom from the American seaboard or the River Plate. It is calculated that from Texas or the Argentine Provinces beef of prime quality can be laid down in England at 3 pence per pound. The promoters of this bold scheme intend to slaughter the cattle on board the great ship as received from day to day, and for this purpose they have secured the services of trained butchers from the slaughter-house of Chicago. The dressed meat will be stored in refrigerators, and it is estimated that 10,000 to 15,000 carcasses of beef, all hung—equal to 3,000 or 4,000 tons of meat—will be shipped each voyage. The result of this enterprise, if successful, will have a far-wider bearing than appears at first sight. It will be watched with much interest by the public, no doubt, for, notwithstanding the large imports of fresh meat we are receiving, retail prices still rule very high. But it will also break down that ring which, while reaping immense profits, keeps almost at famine prices one of the first food requisites of the people.

All the hogs and pigs on Joseph Perrin's ranch, near Grass Valley, Ind., went on a big bender on Wednesday, which happened in this wise: Several casks of native wines had been placed outside of the house and facing the barnyard, and it is supposed that some of the hogs in rubbing against one of the casks knocked out the spigot, and caused the contents to run out. The wine formed a pool in a depression of the ground, and around it all the hogs, little and big, about the premises, to the number of about thirty, congregated and drank their fill, and before any person about the place was aware of what was going on the hogs were as drunk as fiddlers.

**Illinois Millers.**

The seventh annual convention of the Illinois State Millers' Association was held December 1, 1880, in the parlors of the Leland Hotel, Springfield. The attendance was not large. The following, among others, were present:

D. R. Sparks, of Alton, President; C. H. Seybt, of Highland, Secretary; E. C. Kreider, Jacksonville; Henry Schuneman, Carlyle; A. Fredenhagen, St. Charles; W. L. Barnum, Chicago; Phil. Eisenmayer, Summerfield; J. Koenigsmark, Columbia; H. G. Fahs, Olney; W. T. Crow, Cotton Hill; Hon. E. C. Woodward, Shelbyville; F. M. Brickey, Prairie du Rocher; W. H. Davis, Glassford; J. Trull, Macomb; W. P. Grimsley, I. W. Currier, Wm. Broecker, Springfield.

The convention was called to order by the President at 10 A. M. Mr. Seybt, Secretary and Treasurer, submitted his report of the receipts and expenditures for the year, and it was referred to a committee composed of Messrs. Kreider, Davis and Brickey, to be reported upon at the afternoon session. Mr. Siebond was elected a member of the Association. Upon motion, a recess was taken until 2 o'clock P. M.

During the recess, the Association, upon invitation of Judge H. Welton, visited in a body the chamber of the Springfield Board of Trade. Having spent a few pleasant minutes with the business men of the Illinois capitol, the Association was escorted to the new mill of the Springfield Elevator and Milling Co., being thereto invited by Mr. Wm. P. Grimsley, one of the firm. This recent addition to the material prosperity of Springfield is five stories in height, with an area of 78 by 56 feet. It has ten runs of stones, six Geo. T. Smith No. 4 Purifiers, Richmond's Bran Duster, Smith's Dust Rooms, etc. The engine is an Atlas-Corliss, of 200 horse-power. The mill will begin operations January 1, 1881, and will have a capacity of 200 barrels of flour per day. The Elevator and Milling Company is composed of the following gentlemen: S. W. Currier, Wm. Broecker, Wm. P. Grimsley and George Kern.

Upon re-assembling at 2 o'clock P. M., the committee to which was referred the report of the Secretary and Treasurer submitted a report. This showed as follows:

Cash on hand December 1, 1879.....	\$ 615 23
Amount collected to December 1, 1880.....	3,290 00
Amount of expenditures.....	2,996 00
Cash on hand December 1, 1880.....	324 00

The remainder of the report was as follows:

We, the undersigned committee appointed to examine the report of the Secretary and Treasurer of the Illinois State Millers' Association, for the year ending November 30, 1880, find the same correct, and recommend its adoption. We find that twenty-six firms, owners of 123 runs of buhrs, have not met their assessments, and we recommend that the Secretary be instructed to issue a circular letter to each of the firms, reciting the benefits that have already been reaped by reason of our combination, and the dangers of allowing the Association to die for want of pecuniary support; also calling their attention to the suits now pending against members of the Association by Denchfield and other patent-right men, and urge upon them the importance of prompt payment. [Signed.] E. C. KREIDER, F. W. BRICKEY, W. H. DAVIS, Committee.

The report was adopted. Mr. Seybt very carefully and ably detailed all the important points regarding the patents now in litigation, and of interest to millers. A recess was then taken until 7 o'clock P. M.

The convention being called to order at 7 o'clock, Mr. Kreider made a motion that an assessment of \$5 per run of buhrs upon all members of the Association be made to defray the expenses of the Association for the ensuing year.

Agreed to. Mr. Woodward moved that the thanks of the Association be tendered to the officers for the very able manner in which they had performed their very responsible and arduous duties.

Carried by a full standing vote. The officers of the Association were re-elected for the coming year by acclamation. They are as follows:

President—D. R. Sparks, Alton.  
First Vice-President—E. C. Kreider, Jacksonville.  
Secretary and Treasurer—C. H. Seybt, Highland.

Executive Committee—C. B. Cole, Chester J. Underwood, Dixon; E. C. Kreider, Jacksonville; F. W. Brickey, Prairie du Rocher; E. R. Sparks, Alton.

On motion, the President narrated his experience with a Cincinnati telephone last June, during the Millers' International Exhibition. The story was received with much laughter and applause, and the Association adjourned until next year.

**On Middlings.**

**THEIR VALUE AND TREATMENT.**

[A paper by Mr. Frederick Richardson, of Bishopwearmouth Mill, Sunderland, read before the British and Irish millers, November 22, 1880.]

MR. PRESIDENT, GENTLEMEN, MEMBERS OF THE BRITISH AND IRISH MILLERS' ASSOCIATION—

It is with some diffidence I stand before you to-day, at the same time I take it as an honor to have been asked to prepare a paper for your consideration. The subject is "Middlings: Their Value and Treatment," or rather their "Treatment and Value."

Now that we have agreed (and wisely so) to make public our meetings, I hope it will be accepted by the general milling trade of this country as a humble effort to try and raise the standard of a manufacture we have all so much at heart.

I will not trouble you with percentages, nor lofty problems of theory, nor the higher flights of mathematics, but simply give you my views and experience of middlings as produced in this country with stones and medium grinding of mostly foreign wheats, also the machines used to purify and reduce the same.

It is not my intention to advocate any particular machines, either purifiers or rollers, as such would be quite without the province of this paper.

Let us first consider the grain we have to manufacture. A grain of wheat consists essentially of three parts: first, the outside hull or bran, composed of layers exhibiting different color, tenacity and composition; second, the germ, a soft, oily substance, very nutritive but fatal to the color of flour; third, starch and gluten. Connected with the latter substance is one of the all absorbing topics of the day, how to separate it from the other two without waste.

That there are impurities amongst middlings, I think no one who has given the slightest attention to his business will fail to admit. Now it is these fibrous particles, which, when mixed with flour and doughed, do not enter into the organic change that the starch and gluten pass through, but serve to destroy fermentation and darken the dough.

I think I am correct when I say that the purification of middlings was known in Austria nearly 100 years ago, at any rate so far back as 1820 machines were made in France, and later on we know that they were made by Perigault, Cabane and others. For many years some of our mill furnishers tried to introduce them into this country, but with little success. It was not until they had been taken up and adopted by our American cousins, and we began to feel the effects of their improved flours, that we woke up and found them indispensable in our mills.

With your kind indulgence and permission, I will take you North for a few minutes while I explain the system of middlings purifying as carried out in our own mills; not that I think we are perfection by any means, but simply to bring my arguments more clearly before you. I will not trouble you with the routine of cleaning, grinding and bolting, but take you direct to the middlings—in the first place, we thoroughly dust them through centrifugal reels. As middlings, and also the impurities, differ in size and weight, it is essential they should be differently treated, for this reason we pass them through a sorting reel. Dressing our flour very fine, there are, as a consequence, a considerable quantity of fine middlings; these pass through the head sheet No. 9 or 10, and are rolled without purifying.

I have not yet seen a machine that will treat such without waste, in fact I don't think they require it.

The remainder of reel is covered with No. 8 and No. 6, a six sheet reel. What passes through No. 8 goes to a purifier with a blast under the sieve, that which passes through No. 6 to a machine with both blast and exhaust; the tailings are purified upon a machine having a sieve with four different lower numbers of silk, the middlings passing through them fall over shelves and are subject to an exhaust, which can be regulated to suit each quality. The tailings from this machine pass over a purifier with centrifugal action and exhaust. I should have mentioned that the tailings from No. 1 purifier pass to head of No. 2, No. 2 to No. 3, and so on.

Having made four sizes of middlings, Nos. 1 and 2 are rolled separately, but dressed together in centrifugal machines, the tailings from which, after passing through a detacher, are dusted. The last sheet of this reel is clothed with No. 9 silk. As we again find fine middlings, these are re-rolled, the tailings re-purified, re-rolled, and so on; the other sizes are treated in much the same way.

The flours are kept separately and mixed with the first run as desired.

Some may ask why I prefer a blast machine for fine middlings. Common sense and experience has taught me that with an exhaust you are sure to draw a certain amount of the finer particles into the stive-room, whereas with a blast under the sieve you simply float the dust or fibre, whilst the middlings fall through the silk. Besides, the pressure and velocity of the air under the silk tend to keep the meshes open. After passing through the middlings it loses its force, hence the heavy particles fell through, the lighter ones are carried into the stive-room or over the tail.

For coarser middlings a combination of both may be used with advantage, but for coarsest of all I prefer an exhaust with the assistance of centrifugal force. If you put such middlings under a magnifying-glass you will find them of all sizes and shapes. To illustrate: I want twenty men of a given weight—that is easily done; but if they have to be of the same height and width the task is not so easy. So it is with these middlings, you cannot get them through the same meshes of the silk, though they are of the same weight and value, therefore it is only by their specific gravity that we are enabled to treat them properly.

Before concluding these remarks on purifiers, let me urge upon all who contemplate putting them in to first see they have middlings to purify—not soft flour and fibre; also to see that they are thoroughly dusted through a centrifugal machine. A reel is of no use, no matter what length; they require a certain amount of force or whipping, the same as bran, but, of course, not so severe.

Another important point is to have plenty of stive room, with sufficient outlet for the air; unless particular attention is paid to these two simple points you will not reap the full benefit of the machine.

If you make a sufficient quantity of middlings, make their purification a system, the same as you do your bolting.

I have yet to find one single machine that will do the work perfectly.

For reducing middlings, rollers no doubt are the best, more especially for the coarser kinds, and those with portions of bran adhering; but for pure, clean middlings small stones properly dressed will give you a fine granular flour. The purer your middlings the coarser number of silk you can use. As regards the value of middlings I need say but little; they will speak for themselves, if you will only make them and treat them properly. I, for one, do not like to buy them too dear. I mean do not make your offals too rich (unless you propose re-treating them), nor too small for the sake of making middlings. As I have said before in this room, "Broad, clean bran, with as many middlings as possible," ought to be our motto.

I know several millers who were so elated with purified middlings that they took no heed of the bran until stock taking came round. I need hardly say they were thankful that the salutary period had come round, and only wished it had come a little sooner.

Middlings flour is much whiter and stronger than first run flour, and if made from fairly dry wheats will keep a long time—we have sent it all round the world.

In conclusion, let me urge upon every miller who has not adopted purifiers to do so at once. I would sooner think of throwing my smutters out than be without them. For why? Because I can go into the market and buy fairly clean wheats, but I cannot buy a single grain of wheat that has not this fibrous dis-coloring matter in it.

I have often been asked, Can you get as great a yield of flour by purifying? I say, Yes, provided you work everything close up, and use rollers, more especially for the coarser kind. Why, we are getting a useful flour from stuff that used to go to the pigs, and, oddly enough, it looks better after purifying and rolling than it did before.

If the substance of this paper should prove of some use to our members, as well as those who have not yet seen their way to join us as an Association, I shall be greatly pleased. As I said before, I felt some diffidence in appearing before you with this paper, because I believe I am the first miller who has contributed an article on milling for this Association; I hope I may not be the last. I have had very little time to prepare it, so I hope you will overlook any discrepancies and accept it in the free, open manner it is given.

MILL for sale advertisements will be inserted in the UNITED STATES MILLER hereafter for One Dollar per insertion, cash to accompany the order.

**The British Millers' Exhibition.**

Following are the regulations and conditions of the International Exhibition of milling machinery to be held at Agricultural Hall, London, May 10, 11, 12, 13 and 14, 1881.

1. A full description of articles proposed to be shown must be forwarded with each application for space.

2. The management reserve the right to refuse any article not deemed suitable.

3. The charges for space will be as follows: Up to 250 feet, 9d. per square foot; up to 500 square feet, 8d.; up to 1,000 square feet, 6d.; up to 2,000 square feet, 4d. All charges must be paid at the time of application. Applications for space to be sent not later than Saturday, January 1, 1881. Special arrangement must be made by exhibitors requiring steam or gas power.

4. The allotments of space will be made by a committee of the National Association of British and Irish Millers, immediately after the 1st day of January.

5. Each exhibitor may erect benches or other contrivances for displaying exhibits, but will be responsible for the removal of such exhibits and any fixture and fittings at the close of the exhibition, and for making good to the satisfaction of the Managing Director any damage from the action of smoke, or from any other cause and the Managing Director may at any time require the removal or alternation of any objectionable fixtures or fittings.

6. Exhibitors will be permitted to employ persons to explain their exhibits and receive orders, but will be prohibited from soliciting them to the annoyance of other exhibitors. No exhibit may be removed until after the close of the exhibition.

7. The management will not be responsible for the safety of any articles exhibited. The cost of conveying goods to and from the exhibition must be borne by the exhibitors.

8. An explanatory catalogue will be published under authority. A few pages of the catalogue will be reserved for advertisements. Terms for advertisements: Whole page, £4; half page, £2. Particulars of advertisements to be forwarded to the secretary not later than April 12, 1881.

Exhibits will be received at the hall on and after Saturday, April 23, 1881, and all preparations must be completed by 7 o'clock on Monday evening, May 9. All exhibits and fittings must be cleared by 6 o'clock P. M. on Wednesday, May 18, 1881.

Should any question arise not provided for in the foregoing conditions, the same must be referred to the managing director and the committee, whose decision shall be final.

Exhibitors' tickets and attendants' tickets will be forwarded in due course.

The exhibition will be open from 10 A. M. to 10 P. M. each day. Admission, first day, 5s.; second day, 2s. 6d.; other days, 1s.

Applications for space must be made to John H. Rafferty, managing director, Agricultural Hall, London, or to John H. Chatterton, secretary National Association of British and Irish Millers, 61 Mark Lane, London.

**Our Trade With Asia.**

The following is an extract from the report of Secretary Thompson, of the Navy Department: The Pacific ocean opens to our future commerce its broadest and most profitable field. Upon the Atlantic it encounters such formidable European rivalry as can only be overcome, if at all, by the most persistent and vigorous measures of protection on the part of the Government, but our acquisition of Alaska and the Aleutian Islands, and our treaty relations with Japan, the Sandwich Islands, and Samoa, together with our present commercial intercourse with China and the East Indies, place us upon such equal terms upon the Pacific with other powers that it will be our fault if the advantages now promised to our commerce shall be lost. An exchange of our products for those of the East is fast becoming a necessity to all the Oriental people, and their interests, as well as ours, suggest the adoption of the most efficient measures on our part to increase our trade with them. Even in Corea our manufactured articles are preferred to those of England; but they find their way there through the Japanese, with whom the Coreans have a treaty of amity and commerce.

The benefits derived in this way, however, are indirect, and would be greatly increased if the ports of that country were open to our merchant vessels. Our relations with the Japanese Government are such that there is no reason to doubt its friendly agency in bringing about this result, and it is confidently believed that it will be accomplished in a short time.

(Written for the UNITED STATES MILLER.)

## About Roller Mills.

BY W. D. GRAY, ESQ., MILWAUKEE, WIS., CONSTRUCTING ENGINEER OF MILLS AND MILLWORK.

Editor United States Miller:

Time and again have you requested me to write an article for your valuable paper, and as often have I promised to do so as soon as I could find the necessary leisure for the purpose. As you are well aware the past year has been an extremely busy one for me, and even now I am using hours for fulfilling my promise which I feel as if I ought to devote to needed repose.

Modern writers delight in introducing their essays with a citation from the writings of some ancient Greek or Roman, and perhaps it is as well for me to follow the fashion and quote the sage conclusion of Confucius, which in liberal English may read: "times are continually changing and so are we changing with them."

Yes, indeed—times, and customs, and methods, and processes, and machines change with surprising suddenness sometimes, and no one is at present in a better situation to know this fact than the modern millwright, miller and millowner. The enterprising miller of to-day is anxious to be rather ahead of than behind the times. We are bound to move ahead with the enterprising spirit of this age,

Who would have thought 15 years ago that the grinding of grain could be accomplished more economically with something else than with stones? It was, I believe, in the year 1873 that I first heard of rolls being used for this purpose. At that time a wide-awake miller in the great Northwest (Mr. Mowbray of Winona, Minn.) had some marble rolls constructed at the works of E. P. Allis & Co., in Milwaukee. The work, so to speak, was ordered in a whisper and executed on the sly,

FIG. 4.

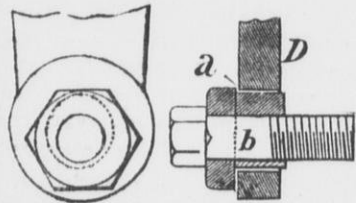


Fig. 4.—Leveling Eccentric.

and the rolls carefully boxed and marked "This side up with care," were sent up to the mill. The roll bodies were about 20 inches in diameter and 4 feet in length. Curious stories I heard about people stealing admission through the basement windows, and filling their pockets in haste with samples of bran, middlings, flour, feed, etc. Mowbray proposed to keep this thing to himself, and his double barreled shot-gun was reported to be always loaded. Next in line were Mr. J. B. A. Kern, of Milwaukee, and Mr. John Karcher of Isenours, Minn. They also tried the marble rolls. I heard that they experimented with them eagerly to harden them by tempering, or case-hardening, as they quickly wore out and had to be frequently returned. The rolls were apparently giving good results, but marble is rather ominous. It is used generally for monumental purposes, and those marble rolls for the time being were the tourstones of progress in that direction.

The next I heard of was the importation of chilled cast iron rollers by Ex-Gov. C. C. Washburn at Minneapolis. None but the most faithful men were picked out to unbox and put them up, and in the meantime the doors which formerly had always been open to fellow craftsmen, were shut on them. About the year 1876 I saw the first porcelain rolls. They were F. Wegmann's patent rolls. Those were of the smooth character. I saw the roller mills work, closely scrutinized the products and came home fully persuaded that the porcelain rolls were grinding cooler and with less power than the millstones; that the natural biscuit porcelain was eminently adapted to the reduction of fine purified middlings to sharp white flour; that the rolls were keeping sharp and did not need the constant trouble and careful dressing and sharpening, without which millstones will never do good work on fine middlings. I expressed my views to Messrs. E. P. Allis & Co., and they entered into a contract with the inventors and manufacturers, Messrs. F. Wegmann & Co., of Zurich, Switzerland, by which they were to be the sole agents for and sole manufacturers of the United States. I found Messrs. F. Wegmann & Co's. agent, Mr. Oscar Oexle, to be a very highly educated gentleman and a thorough milling expert, and he explained most clearly the success of grinding with rolls in Hungary

and South Germany. As I was well persuaded of the superiority of porcelain rolls for the purposes above explained, I worked them in wherever I could, and they gave successful results. It is true I am advocating the use of porcelain rolls strongly. I do the same with anything which I believe to be a benefit to my milling friends, and I can assure you it was not very pleasant for me to hear just com-

plaints about the European machines as well as the ones manufactured by E. P. Allis & Co. All millers using the rolls were pleased with their work, but the cry about some of their defects became as loud as the noise made by the rolls themselves. The complaints were that the rolls had only a limited capacity, that the shells broke and involved great expense and delay—that the rolls could not be levelled

rolls by introducing a bona-fide "American" machine, which could be run faster and producing better results. It stopped the breakage of shells, made it possible to level the rolls in a few minutes and discarded the abominable noise altogether. The United States and Great Britain granted me a patent on my roller mill of which Fig. 1 shows the driving side, Fig. 2 shows the opposite side, Fig. 3 shows the

and by means of three strong bolts the flanges are pulled together on the shell as much as the bolts will stand. Users of belted porcelain rolls with shell fastened by the new mode are to be congratulated on the fact that breakages of the porcelains are now comparatively rare. In the winter of 1878-79 I visited Europe to study the subject of foreign milling. I found porcelain rolls used very extensively, but there were also many smooth chilled iron rolls, perhaps more than porcelains, in use. I examined the grindings and sought to discover if the same result could be obtained from the chilled iron rolls as from the porcelain rolls so eminently fit for the desired purpose.

The rolls did not work well at all. The flour felt greasy, was rather warm and very flaky. It had to be disintegrated by extra machines or these flakes would have all passed over the silks no matter how coarse. The iron rolls grinding middlings to flour had to be set together very powerfully to accomplish grinding. The great amount of power lost in bearing friction, an intelligent miller will readily comprehend. Porcelain rolls need no disintegrators. The meal from them is cool, sharp and white. I saw a great many rolls of different construction, but never found roller mills in which each roll was driven by belt. When I informed the experts of the success of my belted roller mills in America, they thought the holding back of the slow roll was not positive enough!

I told them if the belt was of sufficient width and tightness, it would not slip, no matter how tightly the rolls were screwed together. By examining the above cuts, you will find that I locate a counter-shaft through the centre of the machine stand. It is hung in universal bearings and can be screwed down at any time, even when the roll is at work. It is a reverser of motion and tightener simultaneously. The roll boxes were of brass and were in two parts, bottom and caps. Being divided horizontally, the pressure was just on the dividing line. I parted the bearings at 45 degrees, receiving the pressure by bottom of box. I am of the opinion that a box babbitted by No. 1 Babbit metal, will work cooler than a brass box, therefore I employ Babbit boxes on my rolls exclusively. The Chief Engineer of Messrs. E. P. Allis & Co., Mr. Edwin Reynolds, a gentleman of

Consequently I applied BELTS, thereby doing away with the noise, increasing the capacity of the machine and improving the grinding.

It is early to convince millers that for good grinding on a mill-stone that the belt is the best. If it is good on mill-stones, it must also be good on the rolls.

I read recently in Appleton's Encyclopedia, page 369, that in most European mints the gears on the coining rolls have been discarded and each roll is now driven by an independent belt, thus insuring a gold or silver sheet of a far greater accuracy than heretofore accomplished by the geared rolls. If it will do this in rolling gold, will it not do the same in making flour? I think it is evident enough that it will.

The mode of fastening the porcelain shell to the shaft was to key on shaft a ribbed cast core half an inch smaller than the inner diameter of the shell, then fastening the latter to the cast core by pouring melted sulphur in between the roller shell and core. Now when boxes got hot and the shaft with the cast core expanded, the sulphur and porcelain did not expand and burst.

Another source of breakage was the loosening of the shell, the sulphur becoming broken by the constant jarring and trembling caused by each individual tooth of the gears. Mr. Wegmann did away with this mode and fastened the roll merely by friction, allowing the air to circulate between the shaft and shell. Two faced-off flanges are keyed on the shaft, and the porcelain shell is put between them

FIG. 12.

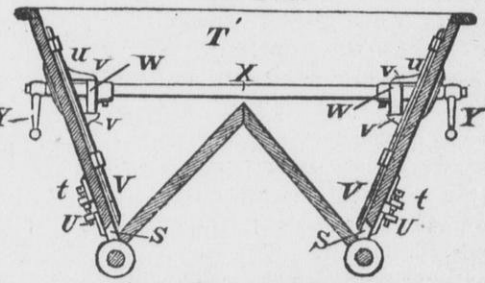


Fig. 5.—Hopper Inside Gates.

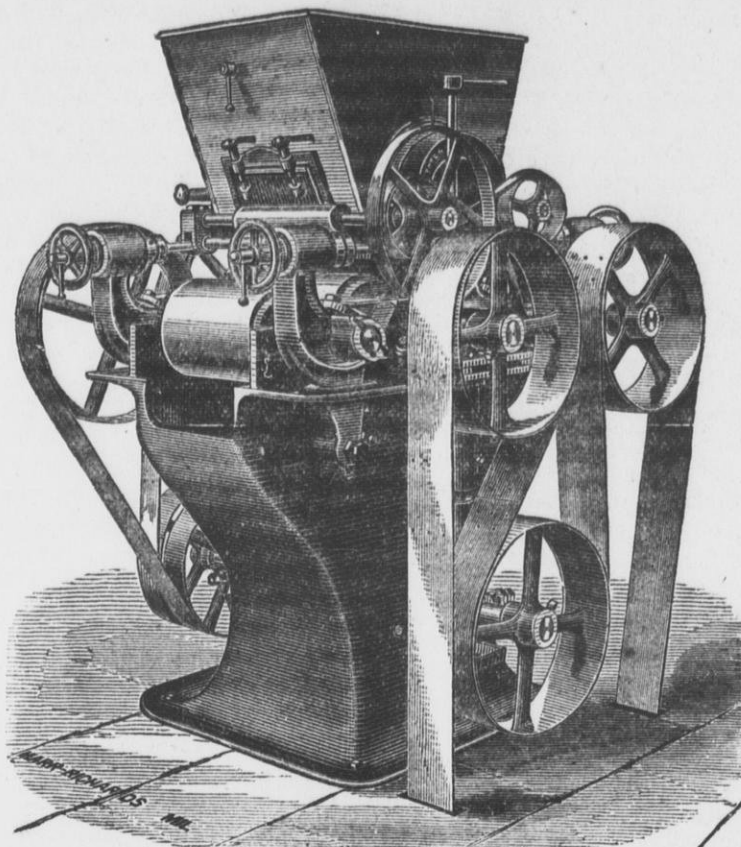


Fig. 1.—Driving Side.

applied to firmly placed shafts, their crowding apart requires an increase of power, but if one shaft is backed into mash by springs, the crowding of each tooth may be easily felt, especially in the case of core-wheels, consequently the shafts will be in a constant tremble. I was also aware that when gears

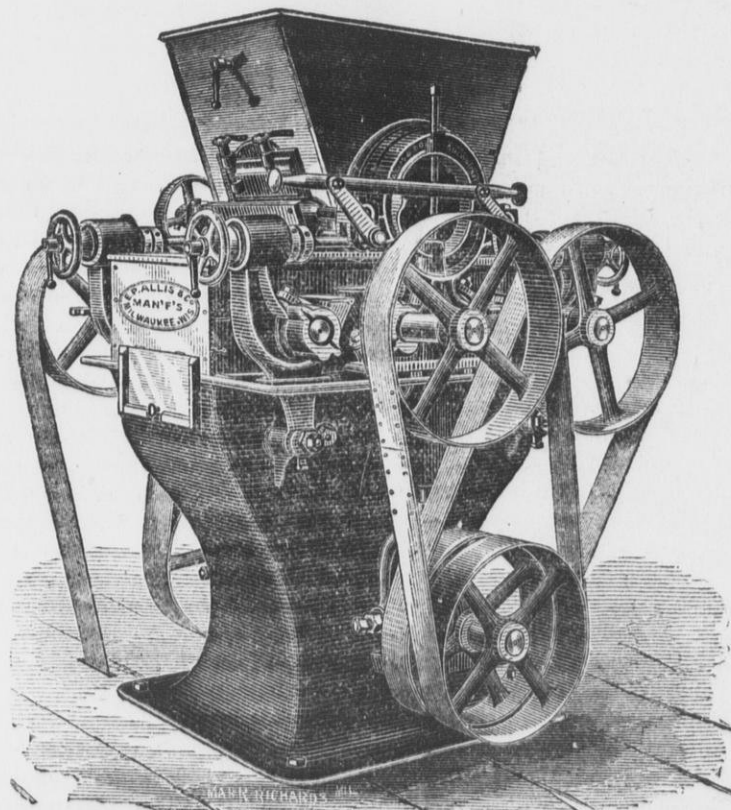


Fig. 2.—Roller Mill, Rear View.

and that the noise the gears made was almost enough to make the millers fit subjects for the lunatic asylum. I felt sorry about this knowing that the criticisms were just, and I determined to improve the rolls if I possibly could. I was successful and was happy to be able to stop the manufacturing of the European

applied to firmly placed shafts, their crowding apart requires an increase of power, but if one shaft is backed into mash by springs, the crowding of each tooth may be easily felt, especially in the case of core-wheels, consequently the shafts will be in a constant tremble. I was also aware that when gears

FIG. 3.

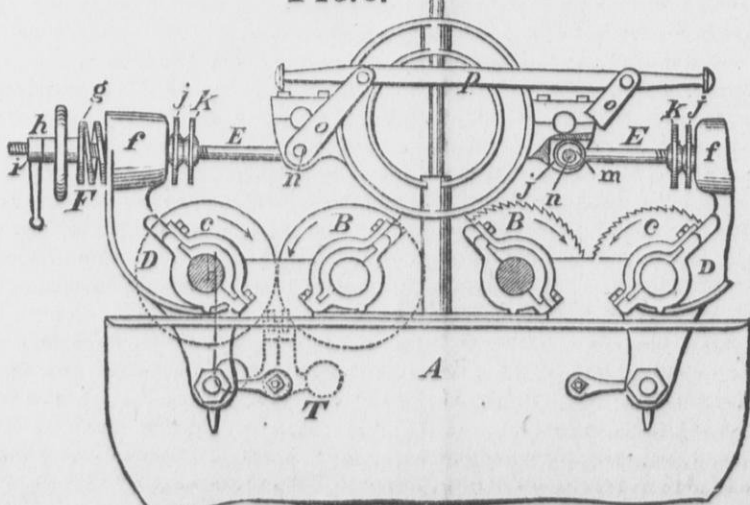


Fig. 3.—Throw Out Lever.

great practical experience, babbitts the main pillow-blocks of his famous Reynolds-Corliss engines, and is at any time ready to prove the superiority of good babbitt bearings over brass bearings. To keep the rolls in place, laterally, I have collars turned on the roll-bearings in centre of journal, so that the collar is always running in oil and no oil is thrown off as would be the case if the shafts were shouldered on the inside face of the bearings. It has been my aim to construct a self-oiling box for the roller-machines. I have tried many devices, and about six months ago applied wick-boxes to all bearings with very good results. The wicks stand upright in oil-chambers below the journals, and touch the same. None but pure oil will rise in the wickings to the shaft owing to capillary attraction. The boxes are stopped on ends, where no shafts penetrate, and are thus all well protected against filling up with flour dust. The oil-chambers can be easily cleaned by scraping them out with a wire after having removed an oil-tight plug on the end of the box.

If two true rolls are touching they will only bear all along their bodies, when the axis of the one is perfectly parallel to the axis of the other.

The touching line is as fine as the edge of a knife, and unless the rolls are parallel, these knife-edges will cross at one point and grinding will be effected at the crossing point to such an extent as to kill the middlings, while on both sides of this point the rolls are open. The miller will screw the rolls together very tight in order to get a better result, and the consequence will be heating in the bearings, increase in power required, and the product will be left as imperfect as before.

I saw the great necessity of arranging the rolls in my machine so that at any time one roll of each pair could be raised on each of its ends. Fig. 4 represents the simple device accomplishing this. The inside rolls are stationary and the outside rolls are movable, swinging on an eccentric nut which is held in position by a tap-screw. By loosening the tap-screw a trifle the eccentric sleeve-nut can be turned, and thereby that end of the roll above the eccentric nut can be raised or lowered. With each roll the manufacturers furnish a planed leveling-plate. If this is placed on the roll bodies and it can be "rocked," it will show that the rolls are not parallel. Now use the eccentric nut and adjust the roll until the leveling plate will stay firm, and the rolls will be perfectly parallel.

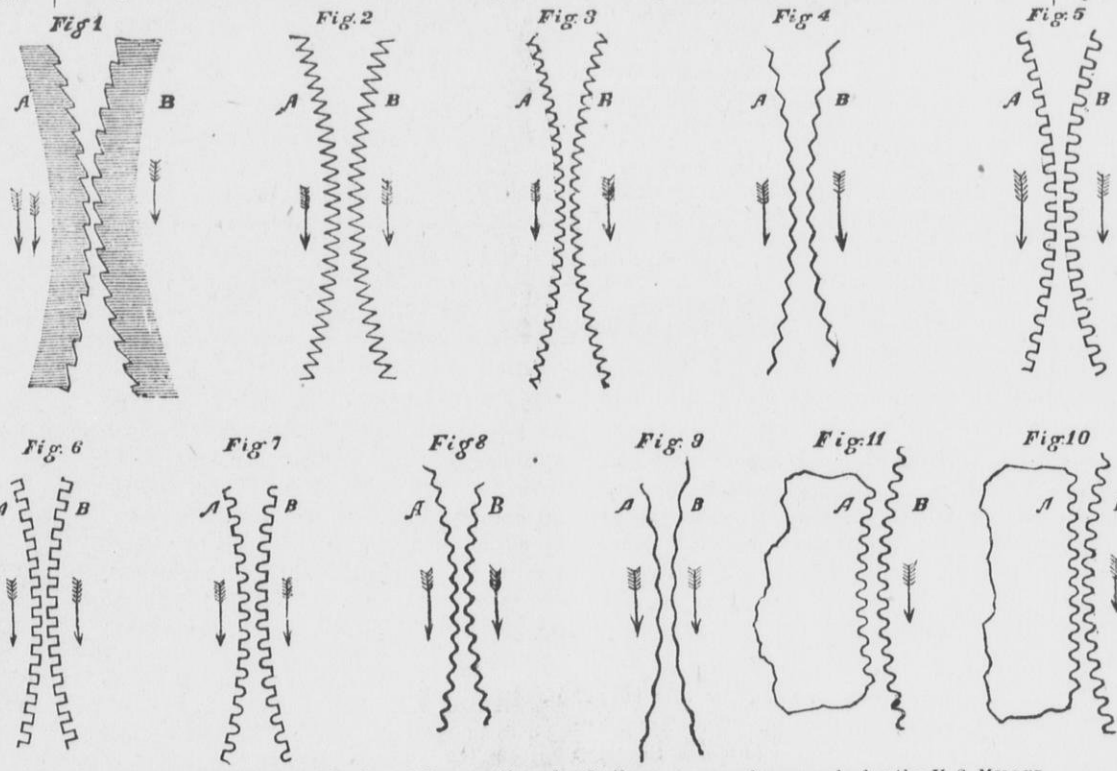
This resetting is necessary as the boxes will never wear off evenly.

A glance at the cuts of the machine will show you that I have abandoned the old idea of setting the rolls together with weighted levers. This is a relic of former times and was used in the first roller mills built in Europe. Weights do not work quickly enough. They act too lazily or, as the learned men would say, the inertia of the weights is a cumbersome thing to contend with on sudden changes of the streams of the feed. Many who have their rolls held together by weighted levers prefer to do away with them and set their rolls together rigidly. I applied spiral springs guarded in sleeves. They are located as far above the center of the roll as the latter are above the eccentric sleeve nut so that but half the pressure is needed to press the rolls together that would be required if the tightening screw and spring was right back of the shaft. In this way I employ a small spring and the setting up of rolls does not require great exertions.

I am giving the patient reader the full description of the course of improvements I had to make to render my rolls fit to do their work well, and I will mention that I was greatly troubled by millers using more than one of my roller mills complaining that when the mill was shut down for oiling, etc., some of the stuff in the hopper would trickle through between the gate of feed rolls and on re-starting the belts could not master the accumulated stuff between the rolls and slipped off. In order to guard against this emergency the miller had to release the springs and destroy their careful setting. This was very annoying as the rolls would have otherwise worked well for a long time after they were once carefully set.

The manner in which I overcame this trouble is shown in cuts Fig. 3 and Fig. 5. The pull-rods passing through the springs and movable boxes have threads on one end and the hand wheels thereon by means of which the rolls are set together. I fastened these on shafts with eccentrics which shafts are placed parallel to the rolls in the machine. In

my four roll machines I used two of those shafts both of which are provided with cranks on ends, which cranks are connected by parallel rods with knobbed ends. The miller can reach one of these knobs from whichever side of the machine he may stand and throw the loose rolls apart enough to allow the leakings of the hopper to pass through without accumulation. He does not need to touch the hand-wheel back of the spring, nor the gauge nuts, setting the rolls apart any distance required. On throwing the rolls together again they will work precisely the same as before. Subsequently I put on gates on the inside of the hopper, moved by eccentrics on one shaft, penetrating the hopper perpendicularly to the axis of rolls. This shaft projects out of the hopper on both sides, and it being provided with a small lever on each end it may be turned from both sides of the machines. All millers know that it takes some time in starting up a mill to get the feed of the different machines just right, which is done by the inside gates in my machines. When the adjustment is once effected it will remain good for weeks. If the machines did not have the outside gates above described the outside gates



Cut, Showing the Different Styles of Corrugations for Rollers, prepared expressly for the U. S. MILLER.

would have to be disturbed and shut every time the mill was stopped to oil up, etc.

During my journey in Europe I saw roller mills having rolls with corrugated or creased surface. I had heard about these rolls before I crossed the water, and was rather interested in seeing their work and the shapes of the corrugations. I will say here that I made many sketches of roller mills and corrugations to take along, for if you have a thing in black and white you will frequently find it a great comfort. The cuts shown in the accompanying illustrations are made from some of these sketches. The reader will see that all possible shapes are in use by our European milling friends.

Some of these corrugations run parallel to the roll axis, some on a flat, some on a steep screw line, both rolls being provided with a right hand or left hand thread, or both with different threads. I found that the most rolls were corrugated on screw line, both rolls having either a right or left hand thread so that the corrugations cross each other at the point of contact effecting a shearing of the particles to be cut or reduced in size. As to the shape of the grooves I can report that the most of the rolls were corrugated in the saw-tooth fashion, similar to the one I put on my rolls. I represent the shape of my corrugations in Fig. 1 in the plate showing different styles of corrugations. Fig. 2 represents the dress of the Sulzer rolls used thirty years ago. Messrs. Escher, Wyss & Co., roller mill builders, used this dress exclusively, but they have changed and have adopted altogether the saw-tooth like dress. Fig. 3 is an out-of-date corrugation, seldom used. Its form is like fig. 2 with its points turned off. Fig. 4 is a very shallow corrugation, the space between points is greater than the depth. Figs. 5, 6 and 7 represent corrugations I have only seen used on very old rolls. Fig. 8 shows deep round grooves. Fig. 9 represents a similar corrugation, but very shallow and wave like. Figs. 10 and 11 are of the same shape as 7 and 8 respectively, but in Fig. 10, B is the roll and A is a stationary straight shoe. In Fig. 11, B is the roll and A is a concave shoe.

The aim of all our experienced modern millers of the present day is to reduce the wheat on corrugated rolls to middlings, which are purifiable, and to make as little flour as possible

during the breaking process, as it cannot be purified and will necessarily be mixed, more or less; with bran particles and dust having adhered to the wheat berry.

Fig. 1 showing the dress I use on my rolls gives, according to my experience, the best results. Run as I direct. Roll A is the fast roll and runs at least from two to three times as fast as roll B. The wheat, if well graded, will be split open lengthwise, almost every berry. Only a small quantity of flour is made in the first break, which flour is chiefly the dust lodging in the crease of the kernels, and therefore only fit to go into low grade flour. By the splitting of the berries I get rid of the greater portion of the germ. If you reduce the ratio of speed of the rolls you change the conditions and you will make more flour owing to the increase of the squeezing action. If you run the rolls at an even speed the conditions are entirely changed, as there will then be only a squeezing action. Again, if we make B the fast roll and A the slow one, the conditions are entirely changed, as the work is then done on the back of one tooth passing the back of the other producing a rubbing or bruising action which, of course,

can be obtained by rolls corrugated as per Fig. 1, with roll A as fastest, and running about two to three times as fast as roll B, in reducing the wheat, in cleaning the bran, making the least flour and the most middlings. Some roll makers tell the millers that rolls corrugated as shown in Figs. 4 and 9 with round, fluted or wave-like corrugations are the best to buy, as only few rolls and purifiers are required, and a vast percentage of the "patent" flour was obtained, I think 90 per cent. A great many small mills are talked into this. Very well, but my idea is thus: Some of the objections to the dull rolls are, they make too much soft flour, too many fine middlings that are hard to purify, which middlings will on regrinding produce a flour which cannot pass for a fancy flour, but must rank with Bakers, and if half the mills of this country should put in the dull rolls and make 90 per cent of "patent" flour, or to call it by right name Bakers' flour, this class of flour would be a "drug" in the market. The dull rolls also require a great deal more power than the sharp rolls, as it has been experimented upon and found that it takes twice the power to squeeze wheat than it takes to cut it. The dull corrugations, already used in Europe years ago, were revived during these last few months, and millers have been appealed to adopt them. A new discovery! There are millions in it! has been the cry. I think the same, but it is in letting it alone. They say, the sharp rolls break the germ. This is so, any corrugated roll will break the germ in hard, dry wheat, but not more than the dull rolls, besides the percentage of broken germ, caused by sharp rolls, is very small.

Some say, for the first reduction the dull rolls are best adapted. If it will do for any reduction at all, it will not do for this one, as the first reduction wants to be made without any bruising, so as make as little flour as possible, for what is made must go to Low grade, as it is largely the black dust in the crease of the berry. The advocates of dull rolls assert: there is no dirt in the crease of wheat if it is well brushed; that it is the sharp rollers which make it. This, I think, is a mistake. If you will take the trouble to sit down with a sharp knife and split one peck of wheat, grain by grain, sift the spoils, you will get dirty or low grade flour. The advocates of dull rolls say this is a part of the 90 per cent of Patent. Or if you will pass your wheat through smooth rolls running at even speed and bolt it, you will have low grade flour hardly fit for red-dog. All Minneapolis millers know that, as they have done this for years, but the dull roller men still say—this is a part of their 90 per cent of Patent. Well, it may do for their Patent flour, but it will not bring a patent price.

Will dull rolls do for the last two reductions? I say that bran cannot be cleaned on dull rolls. For the past year they have been put in many mills for such purposes, but Messrs. E. P. Allis & Co. have displaced them all by sharp rolls, and the men that have gone so far as to advise the use of those dull rolls for the last reduction have just found out that fact, and are putting sharp rolls in for their last two or three reductions. I presume, that, after they have learned a little more about gradual reduction with rollers, they will put in sharp rolls for the three breaks remaining.

I would say to my milling friends before closing, that they had better buy rolls as soon as they can, for rolls of any kind or description are better than stones for the reduction of wheat and cleaning of bran.

I have tried to fill my promise in as plain and simple a manner as possible, not claiming to be a writer on milling subjects, but a mill builder. I remain, yours truly,

W. D. GRAY.

Another St. Louis Mill Burned.—The Pacific Mills, of St. Louis, owned and operated by Kehlor Bros., caught fire between 4 and 5 o'clock on the afternoon of Dec. 23d, and were completely destroyed. Loss is estimated at \$100,000. This mill produced 152,141 barrels of flour during the year 1879. About 500 barrels of flour, 10,000 bushels of wheat and \$15,000 worth of new machinery not yet set up, were also destroyed: Henry Carroll and Patrick Larkin, members of Fire Engine Co. No. 18, were carried down by falling floors in the elevator on the north side of the mill. Carroll was killed and Larkin injured. Insurance \$46,000. The fire was caused by one of the stones running empty.

No one pair of rolls, corrugated as shown in figs. 2 to 11, can give the same results that

## Hot Journals.

One of the most important cares of an engineer is to see to it that the various bearings of the machinery in his charge are smooth, of uniform surface, and rightly adjusted. This apparently simple duty frequently requires the exercise of his best judgment; it is not only necessary that the journal box surfaces be close to the journal, but it is frequently just as necessary that the journal boxes be prevented from accidentally approaching closer to the journal. In a steam engine under full head of steam the play of one sixty-fourth part of an inch between the crank pin boxes and the crank pin may be sufficient to jar the whole engine; and yet, if the engineer, in endeavoring to take up this lost motion, should accidentally overtighten the crank pin boxes, the chances are that a broken crank pin or pitman, and a knocked out cylinder head, will serve as an illustration of the union which is apt to take place between the crank pin and its boxes under such circumstances. Many an apparently unaccountable break in a revolving shaft has occurred from a defective bearing. Heavy shafting, carefully lined in hangers secured to the workshop ceiling, may for months run without any sign of heating; but a pile of iron castings, or other heavy weight, unequally disposed on the floor overhead, may cause just sufficient deflection to expose the revolving shaft to one of the most destructive strains, and cause one or more of the hanger bearings to heat. In machinery, the wearing away of one of the parts may subject another part to destructive strain, and it generally requires the exercise of experience and judgment in the construction and handling of the machinery, in order to prevent the harm. Many tons of coal have been wasted and much wear and tear of bolts and machinery caused by inattention to these defects. In steam engines especially the adjustment of the journal boxes requires close attention. The expansion of the journal by heat, the quality of the lubricant used, the condition of the bearing surfaces and the amount of pressure they will be subjected to, exclusive of dust, speed of revolution, etc., should be taken into account. In all metal there is more or less elasticity, and when one box of a journal is by means of its screw bolts drawn to the right position in regard to its journal, it should also bear solidly on the other box, in order to maintain the adjustment of the boxes to the journal; if this precaution is neglected, when the shaft is revolving the elasticity of the screw bolts appears to act to cause an approach of the boxes, thereby squeezing out the oil from between the bearing surfaces and causing them to heat or grind. It appears that the continuous motion in one direction of one metal in close contact with another, tends to produce a still closer contact and finally a union of the metal surfaces; the lubricating oil, by preventing direct contact of the metal surfaces, opposes this tendency, and the use of liners or equivalent means to prevent the improper approach of the journal boxes, aids the oil in insulating itself between the bearing surfaces. It is surprising to watch the effect of a few minutes' grinding of a journal in its bearing. We have seen a twenty-horse engine, under full pressure of steam, brought almost to a standstill by the sudden grinding of one of the bearings of a shaft about two inches in diameter. It appeared that the shaft would have twisted off sooner than revolve in the defective bearing.—*Scientific American*.

## Mechanics as Writers.

There is no department of productive business in which a larger proportion of actual brain-work is employed than in the building and working of machinery, and there is no class of our producers who offer so little of their experimental knowledge and observant wisdom to the world in printed form. The agricultural papers teem with communications which frequently contain valuable hints, exact information and suggestive facts. But the publications devoted to mechanical matters and the interest of workers have far less of these voluntary contributions. One of the reasons for this is, undoubtedly, that practical mechanics may be properly considered one of the easiest sciences, and statements that in departments of industry would pass for mere personal opinion, become of great importance as elucidations of mechanical law or demonstration of fact, which are too often deemed by the experimenters as mere tests, lacking the authority of practical use. Yet, in many cases, these tests are more than experiments, and frequently carry with them their own demonstration. The mechanic deals with material substances and mechanical processes that are continually presenting new problems for solu-

tion, and are capable of being solved by more than one method. At least, this solution invites attempts in more than one direction. So the mechanic dislikes to provoke criticism and invite comparison when he knows the field is so large and the cultivators so many. There may be another reason why the mechanic does not "rush into print" so readily as some others. He is not given to talk. His work requires, largely, concentration of attention that leaves little time for talk. Indeed, the mechanic generally prefers to illustrate by sketch or work rather than to elucidate by words. In fact, this method is easier than talking. It is not easy to convey a proper idea of a machine and its operation by words alone. The choice of language and the avoidance of mere "shop talk," necessary to convey to the general reader mechanical ideas, demands a very thorough knowledge of the English language and some acquaintance with cognate tongues. It is not meant that the writing mechanic must necessarily be a college graduate, or even to have borne off the honors in a high-school class. But choice of language in mechanical writing is a necessity—not a mere convenience. The writer on mechanical subjects ought to know that "rotary" and "revolving" are not synonyms, and that "force" is not necessarily "power," these and similar errors being quite common. There may be other reasons why mechanics are not fond of writing for publication. But it is a fact that the number of really practical workers who are writers on their specialty is very small indeed. The number of practical mechanics who are regularly employed on mechanical papers in this country is so insignificant when compared with the value of our mechanical interests, as to surprise one who takes the trouble to inquire. There can be no doubt that the welfare of working mechanics would be greatly enhanced by a greater willingness on their part to present the results of their own experience to their fellows through the medium of the special papers devoted to their interests.—*Industrial Monthly*.

## Why Southern Manufactures Develop Slowly.

A great many people complain that all sorts of finished articles for use on farms, in households, and workshops, are not made in the South where wood and iron are so cheap. There may be some ground for this sort of grumbling, but not much. The American people go in any direction in which they get their heads set fast enough—a good deal faster than any other people go, or ever did go.

Cheap raw material is only one consideration entering into the problem of successful manufacturing. Wood in the crudest form is more plentiful and cheaper in the primeval forests of the great Northwest than anywhere else in the world. But there are no manufactories there of lumber, sash, doors, blinds, shingles, laths, tubs, pails, or of any one of the thousand and one articles of lumber and finished wares made from it. The logs are rafted to the towns and cities, there first made into rough boards and square timber; and thence most of this is taken to the great marts of trade, where capital and skill are concentrated, and converted into finished works of art and use. Chicago is many miles from any great supply of pine, but it is there the whole South buys millions of dollars' worth, yearly, of pine doors, sash, shingles, and the like. There are the great factories of woodenware of all kinds.

Two or three conditions must be combined to secure the building up of factories producing the finer and higher articles produced from iron and steel: 1. The crude metals must be abundant, cheap, and of the higher grades. 2. There must be accumulations of capital or its immigration must be secured. 3. The courage to take hold, as pioneers, must abide with those who have the capital.

The South has not yet developed a good steel iron. That is to say, we have not produced in any quantity worth mentioning irons that can be relied on for the making of first rate open-hearth, Bessemer, or crucible steels. Soon enough our furnace-men will reach these higher grades of products; and when they do the money and skill will probably be here to make them available.

One thing at a time! The Southern iron district has been developed with a rapidity unprecedented in the history of iron-making. "First the blade, then the ear, then the ripe corn in the ear." Our excellent coke and charcoal irons are the "blade" of the iron furnaces. The higher arts in iron articles will arrive all in time, when we shall reap the "ripe corn." For the present, let our people be thankful that the fodder made from the "blade" and the crude "blades" adds \$10,000,000 annually to Southern commerce and industries.—*Chattanooga Tradesman*.

## Crossing Wheat.

The sexual construction of the wheat plant and its habit of reproduction are remarkably interesting. It is commonly supposed that two varieties of wheat sown near together will mix. This opinion is not true, for wheats cannot mix in this way; and yet cases have occurred in which it has appeared that they had done so. For instance, a white wheat is planted near a field or a plot in which red wheat is sown. The facility with which wheat changes its appearance will often, and has sometimes made the red wheat lighter and the white wheat darker, and this has led to the supposition that the two had mixed. But the habit of growth of the wheat plant prevents such an occurrence, for the fertilization takes place before the glumes or chaff open to permit the anther, which bears the pollen, to extrude itself. Besides, the anther sheds its pollen before it emerges wholly from the glume, and the pollen falls directly downward upon the pistil at the bottom of the glume, and thus fertilizes the ovule or embryo seed. Every glume on the ear is closed very tightly at this time, and the pistil within cannot be reached without forcing open the glume or chaff. Thus every single grain is self-fertilized, and the variety cannot be changed by impregnation from an outside source without artificial help. This help is given in the operation of crossing or by artificial breeding, often called hybridizing, but wrongly so, because a hybrid is a cross between species and not varieties. For instance, a cross between sheep is a cross, and that between a sheep and a goat would be a hybrid; so a cross between one variety of wheat and another is precisely similar to the crossing the Ayrshire and Jersey breed of cattle together, and cannot be truly called hybridizing. The operation of crossing is a delicate one, and requires very great care and nicety. It is as follows: Before the anthers have emerged from the glume this is opened and the three anthers contained in it are cut off with fine scissors and removed. After this is done, pollen from anthers of the variety chosen to cross with are applied to the pistil which has been deprived of its accompanying anthers. The pollen grains falling on to the pistil, which is much like a feather in form, adheres to its glutinous surface, and are absorbed into the ducts which carry them to the ovule, with which they immediately coalesce and become united. The ovule then begins to swell and grow until the seed forms and becomes mature. In this way several experimenters are diligently occupied in producing new varieties, which they are able to do with as much certainty of reaching desired results as the breeder who crosses his cattle, sheep, or pigs. The laws which govern the reproduction of animals are the same for all practical purposes as those which control the reproduction of plants, and the effects of crossing varieties are as marked in the one case as in the other. Some of our best varieties of wheat are crosses, and there are hopes that very great improvements in the character of wheats as regards hardness, prolificness, and freedom from depredations of insect pests, may be made from time to time.

PARAFFINE AS A PROTECTION TO WOOD AND IRON.—A German scientist recommends paraffine as an efficient means of protecting wood against damp, acids and alkalis. The wood is first well dried, and then covered with a solution of one part melted paraffine in six parts petroleum, ether or bisulphide of carbon. The solvents evaporated quickly, leaving the paraffine in the pores of the wood. Great care must be taken in the use of this preparation, as paraffine, as well as petroleum, ether or bisulphide of carbon, is especially inflammable; and even the vapor of the two last mentioned substances, if mixed with air, may give rise to dangerous explosions. Paraffine melted, with equal parts of linseed oil and rapeseed oil, is also very useful to protect iron from rust.

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## Historical Sketches of the Corn Trade.

From the *Corn Trade Journal*.

The earliest record we have of the corn trade in Biblical history, if we accept the journey of Joseph's brethren to purchase corn in Egypt, is in the twenty-seventh chapter of Ezekiel, where we are told that the merchants of Judah and the land of Israel traded with Tyre in wheat of Minnith and Pannag, two cities of Palestine noted for the peculiar excellence of their grain. The merchants that purchased Joseph were probably itinerant traders attached to a caravan en route from India to a port on the Red Sea or the Mediterranean, or possibly the Nile, in the neighborhood of which river it is highly probable the city of the Pharaohs was situated. In ancient times the difficulties of transport limited the dealings of merchants to spices, aromatic gums, fine cloths and other light and marketable commodities, unless the peculiar excellence of the article, like the wheat of Minnith and Pannag, commanded a high price and a ready sale in the opulent commercial cities of Tyre, Tarsus and Sidon, or in the luxurious courts of Persia, Greece and Rome. The Israelites were not a commercial people, but eminently agricultural, as were also the Egyptians. The little trade that was carried on was conducted by the Arabs (the Ishmaelites and Midianites), whose geographical position enabled them to monopolize the carrying trade between India and Europe. The inhabitants of Arabia maintained this monopoly almost exclusively until the discovery of the passage to India by way of the Cape of Good Hope in the fifteenth century revolutionized the commerce of the world and opened a direct route to India to the maritime nations of Western Europe. The Suez Canal has, in the present generation, dealt yet another blow to the caravan trade of Arabians, and if an overland railway to India be ever constructed, this ancient, but decayed, race of merchants will find in European capital and enterprise rivals that will soon deprive them of the remnant of their carrying trade and probably supplant them in their inland commerce.

Among an agricultural people like the Israelites, where every man not only grew his own corn but was his own miller and baker, a corn merchant's field for operations was about as limited as a hawker of warming pans in the tropics, or a vendor of ice creams at the North Pole. Even at the present day the population in many parts of the East is too thin and scattered to afford remunerative employment for a professional miller, and a hand-mill, as in the days of the Israelites, is a necessary adjunct to the domestic arrangements of every household. In the time of Moses every house possessed its mill, which consisted of two circular stones about two feet in diameter and half a foot thick. The upper surface of the lower "nether" stone was slightly sloped from the centre to the edge, and the under part of the upper or "rider" was hollowed to fit evenly upon the "nether." The mill was fed by the hand through a hole in the centre of the "rider," while a small hole about two inches from the edge admitted an upright stick that served as a handle. The amateur millers, commonly the two lowest maid servants of the household, sat with the mill between them, and alternately seizing the handle impelled it round, one accomplishing half the revolution the other completing it; while the meal, gravitating to the edge, fell into a trough placed to catch it, or more commonly upon the floor. Reference is made to the manner of grinding in the Gospel of St. Matthew (xxiv., 41)—"Two women shall be grinding at the mill, the one shall be taken and the other left." The importance of the domestic mill in the time of the Hebrews is signally indicated in Deuteronomy (xxix., 6), where the pledging of a millstone is made unlawful, "No man shall take the nether or the upper millstone to pledge, for he taketh a man's life to pledge."

Solomon, in his contract with Hiram, King of Tyre, for workmen to build the Temple, agrees to supply 20,000 measures of beaten wheat and 20,000 measures of barley. This would show that the mortar, which superseded the mill, was still in use, probably to bruise the corn for the inferior class of laborers. When the Israelites had thoroughly established themselves in Palestine, and built themselves towns and cities, bakers appear to have sprung up among them. We read in Jeremiah, xxxvii., 21—"Then Zedekiah, the king, commanded that they should commit Jeremiah into the court of the prison, and that they should give him daily a piece of bread out of the bakers' street." The fact that each household of the Israelites, when they hurriedly left Egypt, were forced to bring away their

bread unleavened, testifies to the absence of bakers among them. The king's baker, whose dream Joseph interpreted, was an important officer of the court, but, like the king's butler, confined his attention entirely to the royal oven, and preparing not only bread but baked meats for Pharaoh's table. Barley bread was mostly eaten by the common people, and frequent mention is made of barley loaves in both the Old and New Testaments. Flour, or rather wheaten meal, was reserved for the more well-to-do section of the community, and the methods pursued by the Hebrews in preparing their bread three thousand years ago is still followed by many of the pastoral tribes of Western Asia.

The lawgivers of ancient Greece and Rome regarded the food supply of the people as so vital to the welfare of the State, that public granaries were established and officers appointed especially to make provision against dearth and famine. In famine these fathers of wisdom recognized the mother of sedition and revolt. They knew the evils that follow in its train, and sought to secure the State against tumult and civil commotion by shutting the gates of their cities against its insidious influences. In France, a century ago, the immediate and calamitous effect of famine was signally illustrated when the shouts of the Parisian populace crying for bread culminated in the bloodiest revolution that ever blotted the page of history, and in a series of wars that desolated half Europe. A rotten Government and a dissolute aristocracy were tolerated in that country so long as the necessities of life were within the reach of the masses, but when famine stalked the land and starvation galled the industrious and down-trodden people to action, nothing could save the State from destruction or stem the torrent of fury that burst from the famine-stricken populace. To provide against famine, the Romans were accustomed to despatch a fleet of ships every year to collect corn from their tributary States. This proceeding was politically prudent, but undoubtedly a serious commercial blunder, for had the State left the food supply of the nation to private enterprise a wider field would have been opened for commerce and an impetus given to trade that might have made Rome a granary, not only for its own populace but for the nations of Western Europe.

Britain, in the time of the Romans, was the chief granary of the imperial legions posted in Germany and Gaul. When the Roman colonies of the Upper Rhine were ravaged by the barbarians in the time of the Emperor Julian, a fleet of 800 vessels was built to bring corn from Britain. England herself was at one time a frequent prey to famine, and that too in its most terrible form. Stow tells us that the extremities of famine have driven the people of England to eat horses, dogs, cats, and the bark of trees, and, what is most horrible to imagine, even to feed upon their own children. It is recorded that during a terrible famine in the year 1316 criminals upon being cast into prison were torn into pieces and devoured by the hunger-maddened wretches that lay famishing in the loathsome dens that constituted the prisons of the period. Incredible as these facts may read they are nevertheless confirmed by Maitland and other historians. In those times when the people lived from hand to mouth, and dearth or plenty depended from year to year on the state of the harvest, the fluctuations in the price of corn were of the most violent character. During the twelfth and thirteenth centuries it fluctuated from about 1s. to £20 per quarter.

The price of wheat during a famine in the reign of Edward I. was nearly £20 per quarter; yet it is recorded that it was sold during the same reign at sixteen pence. Such extraordinary fluctuations are no longer possible. The rapid transmission of intelligence and facilities of transport, whereby transactions of the greatest magnitude are nowadays conducted with promptitude and dispatch, preclude sudden and extreme fluctuations, excepting when the natural course of trade is politically affected and the machinery of commerce thrown out of gear by war or other extraneous circumstances. A dearth in any country within the pale of civilization is now no sooner apparent than the fact is flashed by electricity to every great centre of the trade throughout the world, and the intelligence is the signal for a fleet of grain-laden vessels to hasten to the famine-threatened shore; while over-speculation on the part of importers not unfrequently reduces prices considerably below average quotations. An instance of this occurred during the recent failures in our own

crops when, owing to the extensive operations of importers, prices were lower than when our fields have been teeming with plenty.

Ireland at one time appears to have supplied England with considerable quantities of corn. Edward II. when he invaded Scotland in 1322 drew a large portion of his supplies from that island. By-the-bye, so late as the time of William the Conqueror English slaves were regularly exported to Ireland. Bristol seems to have been the chief seat of the British slave trade, and Wulfstan, Bishop of Worcester, the Wilberforce of the period, preached a crusade against its practice. That English men, women, and children should have been sold as slaves to the Irish is a circumstance in the history of the two countries that their present relative positions render perfectly incredible. The observation made by Gregory when he saw the English children exposed for sale in the streets of Rome "Non anglis angeli;" a remark stigmatised by A'Becket in Leech's Comic History of England, as an atrocious pun, indicates the existence of the slave trade in the time of the Romans, and William of Malmesbury refers to the odious custom as having had such a hold upon the people that they did not scruple to sell their nearest relatives and even their own children into slavery.

A NEW CEREAL AND FORAGE PLANT.—A new forage plant is announced from Central Asia, under the name of "Deschugara." It is said to be largely cultivated in Turkestan, as well as in Poland, where it has given most satisfactory results. From 100 pounds of seed sown 2,800 pounds of grain have been harvested, and a large quantity of straw, which is consumed with avidity by cattle and sheep. The plant has a tall-growing stout stem, which forms a green cattle food. A variety of the plant ripens three months after being sown. In the climate of Odessa it is described as arriving at maturity as soon as it does in its own country. The chemical composition of the plant approaches very nearly to that of the oat and barley, so that it is extremely useful as a cattle food. The seeds, however reduced to powder are used as ordinary flour. Some mystery attended the botanical identification of this plant, when its properties were first made known in the pages of a Continental journal a few weeks since. Mr. Christy has, however, succeeded in obtaining some seed from Russia, which together with information he has also obtained, prove the plant to be that of *Sorghum ceruum*, a grass closely allied to the well-known Dhurra of India.—*Journal Society of Arts*.

## Asbestos.

The *Journal of Chemistry* says of this curious mineral: "Asbestos is one of the most curious and interesting minerals; or, we might rather say, classes of minerals, the name being applied to quite a number of varieties of amphibole, actinolite, etc., which are themselves varieties of amphibole or hornblende, as it is more commonly called. Chemically viewed, these are compounds of silica, magnesia, lime and oxide of iron. They differ from other varieties of hornblende chiefly in containing little or no alumina, and are remarkable for assuming a fibrous character, the fibres being sometimes very long, fine and flexible, and having much the appearance of flax. They form compact masses, but can often be easily separated by the fingers. They vary in color from white to green and light brown. The name asbestos is from the Greek, and means incombustible. It is nothing strange that a mineral should be incombustible, but that delicate threads, looking like flax, should not be destroyed by fire, but should come forth from the ordeal only the whiter, like ordinary thread when washed in water, naturally seemed a remarkable phenomenon to the ancients who gave them the name.

The finest variety is called amianthus, which, in the Greek, means unpollutable; all the stains that it receives being removed by fire. The resemblance of these mineral threads to flax at once suggests that they might be woven into an incombustible fabric; and this was done by the ancients, the cloth being mainly used for wrapping corpses for the funeral pile, in order to preserve the ashes of the body from being mixed with those of the materials used in burning it. In our day, some experiments have been made with fabrics of asbestos, especially as a material for firemen's dresses, but we are not aware that these have led to its permanent use for that purpose. Some years ago, it was tested in Paris, where firemen, wearing hoods or helmets of the incombustible cloth, and garments of it put on

over clothing, rendered fireproof by chemical preparations, remained for some minutes without injury in the midst of blazing piles of wood and straw. Asbestos has also been used for lining safes, for making incombustible wicks for lamps, and for chemical filters, but its industrial application is still very limited. The mineral is found in many localities, but the chief deposits of it are in Savoy and Corsica, and on Staten Island, in New York harbor."

In addition to the uses specified above, asbestos is very extensively employed for roofing and for liquid paints, on account of its fire-proof and non-conducting qualities, the H. W. Johns Manufacturing Company, New York, now turning out more than two miles a day of asbestos roofing, and large quantities of liquid paints of which asbestos is a constituent. Among other articles manufactured by this company and supplying wants universally experienced before their introduction, are asbestos steam-pipe and boiler coverings, asbestos cement, for cementing joints in stone, wood, and metals, concrete coating, prepared ready for the trowel, and forming a fire-proof covering that resembles stone; fire-proof coating, fire proof paper, and asbestos cloth and thread, etc.

A. J. Slicer, Elizaville, Ky., is putting one of Simpson & Gault's Separators in his mill.

Messrs. Brooks & Gaster, Darbaville, O., have ordered one of Simpson & Gault's Pony Middling Mills.

Guthrie Long, of Owensboro, Ky., has ordered two Gladiator dustless corn shellers of Simpson & Gault.

Bullman & Sunman are putting one of Simpson & Gault's Champion smutters in their mill at Oldenberg, Ind.

T. W. Sheward, Wilmington, Del., is putting one of Simpson & Gault's Champion smutters in his mill at that place.

Simpson & Gault are furnishing F. Miller & Co., Watertown, Wis, an 8-reel chest, complete with cloth for same.

H. Mueller & Co., malters of Cleveland, are putting one of Simpson & Gault's warehouse separators in their brewery.

Simpson & Gault are remodeling Greek & Hallet's mill at Princeton, Ind., changing it to new process, and are adding two run of 48-inch burrs, one No. 2 Champion brush, one No. 2 Champion smutter, etc.

Stiles & Johnson, Monroe, Mich., have ordered a No. 2 Snowflake purifier, with the cloth-cleaning attachment, from Simpson & Gault.

John Boyle, of St. Martins, O., is putting one of Simpson & Gault's Champion smutters, one No. 2 purifier, and other machinery, in his mill at that place.

J. Sutchin & Sons, Middletown, O., are rebuilding, and are adding one bolt chest, two 30-inch mills, all necessary gearing, etc. Simpson & Gault are furnishing the same.

N. S. Gregg, Circleville, O., is enlarging his mill at that place, and is adding one Victor wheel, four run of 42-inch burrs, etc. Simpson & Gault are furnishing the same.

Bradford & Smith are adding a Gladiator sheller to their mill at Harrison, O., also putting new cloth on their reels and overhauling the same thoroughly. Simpson & Gault are doing the work.

W. G. Pennypacker, of Philadelphia, Pa., is making some improvements on his mill there, and is adding three run of 36-inch stones, one Economic packer, etc., all the machinery is being built at Simpson & Gault's factory.

Kyle Bros., of Hopedale, O., have contracted with Simpson & Gault for a 6-reel chest, one No. 3 Snowflake purifier, one separator, two run of 30-inch stones for wheat, one 26-inch for corn, and one 22 inch for bran, also one packer, gearing, etc.

The Ottumwa (Iowa) Starch Co., which started about two years ago, with a capacity for working up about 2,000 bushels of corn per day, has been so successfully managed that the demand for its product has entirely outgrown that capacity. They are now erecting an additional new brick building 70x90 in size, two stories and basement, which will nearly double the capacity of the works. They will also largely increase their facilities for shipping by having a switch run from the C., B. & Q. track along side the new building, so that cars can be loaded directly from the factory. The largely increased demand for the Ottumwa Starch is the best evidence of its superior quality, coming in competition as it does with the product of many old and long-established factories.

**Bunt and Smut.**

The names bunt and smut are indifferently applied to a class of fungoid diseases which attack all grain crops more or less. The chief predisposing cause of the appearance of these parasites is a warm abnormally wet summer. The bunt of wheat "Tilletia caries," also known as brand, black ball and pepper bran, attacks every kind of wheat, spels having less to fear from it than other sorts, and winter less than summer wheats. The fungus fills up with its spores the whole of the ovary, so that at the time of ripening there is found in place of the grain an elongated, black, greasy body of the most disagreeable odor.

Smut "Ustilago carbo," more especially attacks oats, so that the phrase "smut of oats," has become familiar. The disease first shows itself in the organs of fructification, the epidermis of which is irregularly ruptured in a great number of places, a black powder then appearing through the slits. The different parts of the flower are attacked in a very unequal degree. The whole of the parenchymatous tissues is often destroyed, and so much is this the case in winter barley that of the whole ear the common axis of the inflorescence alone remains, while in other cases, as in oats, the seed only is destroyed, the rales, or glumes, inclosing the grain, remaining unaffected. During the progress of the disease, and especially towards its later stages, the black dust consisting of the spores also emerges from the culms beneath the flowers and even from leaves. "Ustilago maidis" is the smut of maize, which converts the grains into large tumors filled with the black dusty spores, the diseased part frequently exhibiting swellings as large as the fist, and sometimes the size of the head. "Ustilago occulta" fructifies in the leaves and haulms of the rye, while the millet smut, "Ustilago destruens," destroys the whole of the flower, even before the ears have emerged from the leaf sheath. Besides wheat, barley, oats, rye, maize, millet and dari, various species of grass are liable to the attacks of bunt and smut, so that the disease is often very widely spread.

These parasites were, with rust "Puccina graminis," long included by fungologists in the division Hypodermii, on account of their vegetating beneath the epidermis of the host plant. Recently, Ferdinand Cohn, a celebrated German botanist, has advanced reasons for assigning bunt and smut to separate orders, the "Ustilagineæ," (from "rustus," burnt, destroyed) the rust being relegated to the order Acutiomycees, this and the one already mentioned forming two orders of the highest group of fungi, the "carposporæ."

The life history of the parasites now under consideration is comparatively simple. When one of the microscopic spores germinates it gives rise to a delicate hyphal tube, the promycelium, which soon begins to branch, and after a while the branches conjugate, or become fused together; the place of union swells somewhat, and forms what is called a sporidium, and this develops the delicate web, or mycelium of branching hyphæ, which can always be found by the aid of a microscope beneath the epidermis of the infested part. The free ends of the mycelial hyphæ become constricted off into a series of spores, which, one after another, fall away, and by thus establishing its independence within the host-plant, each spore is capable of giving rise to the same series of changes as those we have just described. The life history of the Ustilaginea may, therefore, be represented thus: Spore—promycelium—codjugating branches—sporidia—mycelium—spore.

The manner in which bunt and smut are enabled to infect the growing plant is by the introduction of the spores in the seed. Grains of wheat, oats, etc., may look perfectly sound, and yet may contain a few of the minute spores; these germinate at the same time as the seed, and as the young plant grows, the mycelium is carried up with it, and vegetates most luxuriantly in the delicate parenchymatous tissues of the inflorescence, absorbing all the nutritive juices sent up for the nourishment of the grain, and producing at a prodigious rate crop after crop of sooty spores, which sometimes entirely usurp the position of the grain. The latter retains its shape, but when pressed between the fingers it either crumbles like a mass of soot or mices in unctuous black pulp, which smells like putrid fish. In the process of harvesting, and in a boisterous wind, the spores get scattered broadcast, and thus it becomes a difficult matter to insure that any grain that has grown in the neighborhood of the field infested with bunt or smut, shall itself be entirely free from the contagion.

It has long been known that bunt and smut

are transmitted through the seed, and all remedial practices are based on this fact. The grains intended for seed are washed or pickled in various solutions before being sown. The uses of corrosive sublimate and arsenic for this purpose are now abandoned, because, though they destroy the spores, they also impair the vitality of the seed. A strong solution of Glauber's salts (sulphate of sodium) is undoubtedly of value, but by far the most useful agent is blue vitriol (sulphate of copper) which is a blue crystallized substance, prepared by dissolving the worn out copper plates from ship bottoms in sulphuric acid. The blue vitriol is powdered, and two ounces are dissolved for each pint of water, one pint of the solution being the quantity employed for dressing one bushel of wheat. The grain is laid on the floor, and while being spread about with a shovel, the solution is sprinkled over it and is absorbed, and so kills the spores without affecting the vitality of the grain. The application of sulphate of copper as an antiseptic agent in this way will probably be much extended, for an agricultural chemist has very lately adduced some valuable experimental evidence in justification of this use of blue vitriol.

Bunt and smut are, as we have shown, very wide-spread in their ravages, not only the cereals, but many grasses, and even other plants quite outside the order of natural Gramineæ, being liable. Of the cultivated cereals, rye is perhaps attacked less frequently than any of the others; but nature compensates for this in the fact that rye is most subject to the attacks of the dangerous ergot. The flour from bunted wheat will always fetch a price; it is generally used for making dark-colored food, such as ginger-bread, and no harm is known to arise to those who eat it.

In conclusion, we may compare bunt and smut with rust. The two former have but one kind of spore corresponding with the teliospore of rust. Rust requires two host plants for the completion of its life history. Bunt and smut are confined to the same host throughout. Rust attacks chiefly the leaves and culms of the host plant, so that the straw suffers most, while the grain only suffers indirectly, in consequence of the impairment of the efficacy of the organs which should prepare the nourishment for the grain; in bunt and smut, on the other hand, the grain itself is the victim. Lastly, the spores of rust are brownish or reddish, never quite black; while those of bunt and smut are best described as sooty.—*Mark Lane Express.*

**A California Dam and Escape Weir.**

The following interesting description from the *Sacramento Record-Union*, of one of the undertakings of hydraulic engineers in California, will no doubt be read with interest:

The crevasse known as the English break is a washout through the west bank of the Sacramento River, about four miles above the Sacramento and Yolo bridge. The levee is destroyed for about 525 feet in length, and a crevasse 24 1-10 feet in depth is cut through the natural bank for an average width of 132 feet. Upon the plane of the natural bank level this break is about 180 feet in length. It has been seriously feared that longer neglect of this break would result in the river some day taking its course through the crevasse and finding a new channel through the low lands on the west of the present river bed, a result which would entail vast damage, and be a serious injury to the whole State. The Board of Drainage Commissioners of Drainage District No. 1 have resolved to secure this crevasse from further enlargement, and to bring its bottom line up to a level about five feet below full flood stage in the river. For this purpose a dam of small trees and brush, built after the plans and specifications originally drawn for the dams contracted for on the Yuba and Bear rivers, is to be built across the opening on a line well behind the deep cut, and connected with the levee above and below it by means of an embankment of earth.

In the main, the proposed structure will consist of two sections of levee, to be placed nearly at right angles to the main levee upon the bank of the river, and terminating in abutments with wing-bulkheads to protect the extremities from abrasion. The intervening space between the bulkheads is to be filled with a brush dam of from four to six feet in height above the average level of the present surface, the centre of the crest of the dam to be upon an arc of about 372 feet radius. The general character of the dam is to be the same as those specified and contracted for in the Yuba and Bear rivers. The dam is to be so constructed that its crest as represented by the upper edges or corners of all the tree butts which end at the top surface throughout the width, on completion of the work, shall be within four-tenths of a foot of one level plane. The overall face must be on a uniform slope of about 45 degrees. The foundation of the dam is to be laid in level benches at depths below the general surface of the adjacent ground. When completed, the crest will not vary more than four-tenths of a foot from a level plane across it. The trees on the up-stream face of

the dam will lie in a plane within 5 degrees of the slope of one foot vertical to two feet horizontal, and its down-stream face will lie in a plane within 5 degrees of a slope of one foot vertical to one foot horizontal. In making the excavation for the foundation or subgrade within which the brush laying will begin, if it is found that a suitable foundation cannot be had at the estimated depth, the contractors are bound to go as much as twice the depth originally designated, but it is provided that they need not go down over 6 feet on the average for any 100 feet of foundation. The structure is to be built in this manner: The lower apron will be first built and laid entirely beneath the average plain of the ground's surface. The material to be used will consist of small trees, ranging from 20 to 30 feet in length in the average-sized structure, and of greater or less length, as may be required, in the longer or smaller cross-section, and from 4 to 7 inches in diameter at the butt, laid closely together lengthways up and down the stream, in horizontal layers separated by smaller poles, planted three feet apart and parallel with the line of the dam, the whole consolidated and filled in with smaller brush and spare material that is being moved. The poles of each set are to be spiked solidly down upon the tree trunks below, and the trees of each layer are to be spiked to the poles upon which they rest. Heavy stakes are to be driven as firmly as can be done with a ten-pound sledge, five feet apart, through and along the upper edge of the apron, to which the pole and trees are to be firmly secured. The upper apron, to be laid partially below and partially above the natural surface of the ground, is to be next built. This apron rests partly upon the lower apron and partly upon the ground above, and is to be composed of the same class of materials as the lower apron, and laid in the following manner: Small trees, or trunks of trees, varying from 15 to 20 feet in length for the average sized structure, and of greater or less length for the larger or smaller sections, and from six to seven inches in diameter at the butt, are to be laid closely together lengthways up and down stream, in layers sloping downward, and retreating up stream, the butts exposed in the down stream edge of each layer, covered or buried at the up-stream edge for the greater portion of their length. Alternating with these layers of trees, poles of a smaller diameter are to be laid, three feet apart, crossing the trees substantially at right angles. The intervening spaces are to be well filled and consolidated with small brush and spare material that is being moved. The poles of each set are to be solidly spiked down as in the first instance, and heavy stakes are to be driven as before.

The dam, resting partly upon the up-stream edge of the upper apron, partially upon the ground's surface next above, and partially in a pit at the upper edge, is to be next built. In its composition it is to be similar to the upper apron. Small trees or trunks of trees 14 to 18 feet in length, and 6 to 8 inches in diameter at the butt, are to be laid closely together lengthways up and down stream, in layers sloping downward in an up-stream direction, the butts exposed on the down-stream edge of each layer. Alternating with these layers of trees, poles of a smaller diameter are to be laid, crossing the trees substantially at right angles. The intervening spaces between the trees and layers are to be well filled with small brush and spare material. In this manner the dam is to be built up to the intended elevation of its crest, and then trees of a larger diameter, and 25 to 30 feet in length, are to be used, with their butts in rows forming the crest of the dam, their trunks sloping downward up-stream, their tops buried in the pit, and incorporated with brush and earth. On the up-stream face of the dam, and on the top, a back of such material as may have been excavated from the pit beneath is to be placed. With the consent of the Board of Directors a layer good second-hand grain sacks, filled with sand, and strongly closed, may be used either to supplement or as a substitute for the earth backing to an extent of at least three sand bags for each lineal foot of dam.

At each end of the overfall of the dam, at the juncture with the projecting levee, will be constructed an abutment of timber and plank, filled with sand, earth and brush. The surface of the ground beneath each abutment is to be excavated to the depth of 3 feet below the natural surface. The ends of the dam are to be well built into the abutment and firmly secured to the timbers which comprise its frame. The frame is to be of 8 inch square timber, and the planking is to be 2 and 3 inch plank. The interiors of the abutments are to be filled with sand bags. At each end of the dam are to be built earth levees, 8 feet on top, with slopes 5 to 1 on the river side, and 2 1/2 to 1 on the land side. The old levee crown, for 200 feet each side the break, is to be re-formed and raised. To protect the levee a brush revetment is to be built where needed on the water slope of the levee from its base to within three feet of its crown, and will consist of layers of brush and cross layers of saplings, cross-pegged down, thus making a mattress. Brush spurs, at right angles to the embankment, are to be built from the face of the levee to the river bank, a distance of 90 feet. The details of this brush spur work are elaborate, and call for very superior and strong structures. There will be about 450 feet of this spur work, averaging six feet in height. The spur work may be described as that of inclined open work walls of brush, supported on a string-piece or ridge-pole resting in a crotch of small, rough timber cross-horses placed at convenient intervals.

There are 263 boats frozen up in the Erie canal. Of these 117 are East bound, mostly loaded with grain, aggregating 7,000,000 bushels.

**Heating by Friction.**

NOVEL AND USEFUL INVENTION OF A BOSTON SCIENTIST.

A Boston gentleman has invented a simple device, which, if its present promises are realized, ought to work a revolution in methods of heating. It is nothing less than an invention to use friction as a practical means of producing heat. At the time of the Ashtabula horror, when so many persons were burned to death by the wrecked cars catching fire from the stoves, Mr. Webster Wells, then the Professor of Mathematics at the Massachusetts Institute of Technology, began to consider the problem of heating the cars without fire. He has now solved it. His invention consists of a strong iron cylinder, at one end of which, inside, is a fixed plate of hardened iron, against which, firmly attached to a revolving shaft, another plate presses, either closely or lightly, as required. The cylinder is filled with water, and this, heated by the friction of the two plates, circulates through pipes, warming the room through which they run, just as steam pipes do. The water is kept in constant circulation in these pipes, returning to the cylinder to be heated over again. The water in the cylinder, which is brought to a high degree of heat in a remarkably short time, keeps the plates lubricated, preventing their wearing away at a rapid rate. When worn away the cost of renewing them is trifling, and the machine has no complicated work about it, so that it is easily kept in repair. The power required to run the machine is so slight that the waste or surplus power of the engines in use for running elevators and other machinery in hundreds of buildings throughout a city is enough for ordinary purposes. The machine can be utilized in any place where power is used. The ordinary sized machine has 36 square inches of friction surface in its plates, sufficient it is said, to heat 10,000 cubic feet of space. This requires but half a horse power. A machine with 225 square inches of friction requires but four horse power, and would heat a room 60x200 feet, or containing 126 cubic feet. In railroad cars the machine is operated by power taken direct from the wheels, doing away with all danger from fire in case of a smash-up. When the cars are standing still the machine can be operated by power from the locomotive, by a contrivance somewhat like that which operates the Westinghouse brake. In mills it is calculated that a great saving can be made both in fuel and in the rates of insurance, especially in those run by water-power. The agent of a mill where water-power is used estimated that in twenty years by the use of this device, a saving of at least \$185,000 in fuel alone could be effected. Prof. Wells is now in Europe, looking out for his patents there. The machine has now been in operation in Boston for seven months.—*Boston Herald.*

SARA BERNHARDT'S THREAT.—Mademoiselle Bernhardt threatens to sue the *American Queen* for damages for defamation of character, under the laws against libel. We have never said anything about her that was not true, and have never wished to wantonly injure her or hurt her feelings. We have not sought to damage her professionally; have not advised our readers to stay away from her acting. We have merely said that the fact that she has several children born out of wedlock makes her an unfit companion for virtuous American maidens and matrons. She thinks this is squeamishness; prudery; affectation; hypocrisy; but this is because she does not comprehend American morals and manners. The *Queen* warned the ladies of New York for their own sake—for the sake of good society—because its function is a social one, and it had no right to shirk the responsibility. Mademoiselle may prosecute us for libel; but we congratulate the ladies of the metropolis that even a written appeal from the future King of England did not win for her a single invitation to any respectable home, with possibly one or two exceptions.—*Andrew's American Queen.*

\$25,000 worth of improvements are to be added to the Vermilion Mills at Hastings, Minn. 20 sets of rolls will be added.



**5100 PRESENT!**  
For a Machine that will  
Saw as Fast and Easy  
as this one.

This is the King of Saw Machines. It  
saws off a 2 foot log in 2 minutes.  
20,000 in use. The cheapest machine  
made, and fully warranted. Circular free.  
United States Manufacturing Co., Chicago, Ill.

**Barkley's Flour Bolt.**

This invention is an improved flour bolt, the special construction of which will be fully described hereinafter.

The shaft or axis of the bolt is supported at its ends by journals held in any proper bearings, and is adapted to receive revolution in any suitable manner from any proper source. Radial arms of the usual well known, or other proper construction, extend outward from the central shaft, and longitudinal ribs are secured to the outer ends of the arms.

There are plates consisting of a strip of any suitable material of proper length and width, which is provided with a beveled or inclined face. These plates are secured to the inner faces of the ribs in such manner that the inclined faces are opposite the bolting cloth. These plates are located in short lengths on several ribs, a plate on one rib being arranged opposite a space on the adjacent rib, by means of which construction a clear space is obtained for the descent of the flour when discharged from the caps—that is to say, the flour from one cap will not be discharged onto the back of the preceding one.

The operation is substantially as follows: The proper revolution having been given to the bolt, and the flour having been introduced therein in the usual manner, the latter will be acted upon, as in other bolts for the purpose of separating the different kinds of flour. In addition, however, to the usual operation of the bolt, a further result is obtained from the employment of the peculiarly constructed plates attached to the ribs. By means of these a series of caps having an inclined face is formed between the plates and the bolting cloth, by means of which the flour is carried up from below to the highest point of the bolt and then fully discharged upon the bolting cloth beneath. By means of the beveled edges of the ribs all tendency to clog is avoided, the flour being fully discharged from the caps at each revolution. The broken arrangement of the plates on any of the ribs has the effect of lifting only a portion of the material and throwing it down again, instead of dumping the whole line simultaneously, as in the case of a plate extending the entire length. As only a portion of any one line is lifted at a time, the flour or meal at the spaces or intervals flows down through this space upon the section of the cloth next below, and is there intercepted by the alternating plate which faces this interval or space.

Mr. James Barkley, of Huntersville, W. Va., is the patentee.

**A New Grain.**

According to the Kansas State Board of Agriculture, says the New York *Shipping List*, a new cereal, represented to be more nutritious than corn, rye or oats, has recently been discovered in Kansas and New Mexico. The new cereal is variously called "pampas rice," "rice corn" and "Egyptian corn," and is supposed to have sprung from seed brought to the United States by the Mennonites, who came from Southern Russia. The kernels grow in a tuft like that on the top of sorghum. Each one is some smaller and rounder than a grain of wheat, and is inclosed in a "shuck," or independent capsule. The berry can be eaten ground into flour or cracked like wheat, or whole like rice, or used generally like any other cereal. The meal resembles that of Indian corn, and in color is intermediate between the yellow and white varieties. A chemical analysis shows that its percentage of starch, fat, dextrine and sugar, which produces heat and fat in the animal organization, compares favorably with that of Indian corn, wheat, rye and oats; and in its contents of flesh-forming albuminoids it surpasses all Indian corns, and ranks with wheat, rye and oats. The small percentage of cellulose, or non-nutritious woody fiber, is remarkable. The stalk makes as good fodder as corn does, and a few acres will furnish a family with fuel for the winter—a consideration of first importance in that nearly treeless country. All this signifies little in comparison with its power to resist drouth, and as to that an example, one of a great many attested by the signatures of practical, well-known farmers, may be given. Forty acres of turned-over sod, which had not been wet with rain for eight months, were planted with two or three grains, deposited with a seed-planter, something more than a foot apart. There was no rain for five weeks after planting, yet the corn germinated. After it was fairly started, the hot blasts from the Llano Estacado, blew over it, but it grew right along although grass and garden-truck beside it were fairly burned up. It stood the rains equally as well, and finally it yielded sixty 90-pounds bushels to the acre. It is, moreover,

worm and grasshopper proof. The Board of Agriculture prints a mass of letters, which place these facts beyond question, and their significance is of the first importance. From New Mexico to the British lines there are tens of thousands of square miles—500,000,000 acres according to a reliable estimate—which it was thought nothing but an expensive system of artesian wells could reclaim to any better use than pasturage, and now comes this African plant to furnish food and fuel to this vast country, besides crops for export, whose value it may yet be impossible to estimate.

**A Woman Blacksmith.**

ONE OF THE SIGHTS OF THE BLACK COUNTRY OF ENGLAND.

A correspondent of the London *Daily Telegraph* says: At one forge later on, between 9 and 10 o'clock, in fact, I discovered a female nailer working under disadvantages that might have daunted an anchor smith. Whether she had a husband whose absence was accounted for by his being addicted to beer-shop fogging, or whether she had no husband, I did not ask her, and she did not tell me. Anyhow, she was working alone, and she spoke of having "all these brats" to provide for, as though the whole responsibility rested on her poor narrow shoulders, the bones of which were so sharp that they threatened to cut through the flimsy material that covered them every time she tugged at the heavy bellows. There were four little children, the oldest about 7, the youngest baby in "long clothes"—in a calico bed-gown, in fact, and nothing else. This solitary article of raiment had once been white, but was now approaching the complexion of a coal-sack.

The two children who came between the eldest and the youngest were disporting in the ashes, and pummeling each other's awfully dirty little bodies in a fierce struggle for the mangled remains of a wooden doll. There was only its carcass left, and its hair was singed off its head, and the paint on its face all scorched and blistered; but the two infant nailers could not have fought for it more ferociously had it been the choicest prize in Mr. Cremer's collection. The other two children—the oldest and the youngest, the former acting the part of nurse to the latter—were deposited in a kind of wooden cradle, that shared with a bellows the hearth where the fire was. The baby was shrieking, and the boy was shouting out a hymn in a vain endeavor to quiet it.

One way and another, the mother, poor soul—she was quite a young woman—seemed well-nigh distracted as she banged away at her work, bent seemingly on getting some set task done; the perspiration streamed down her face as though she was crying. She stuck to her work, however, and kept the sparks flying—showers of them besprinkled the occupants of the cradle, but without producing the least effect on those young salamanders—until a shriller shriek than hitherto caused the woman to throw down her hammer and take the child on her lap as she sat down on the nose of the anvil.

"Hard work!"  
"It is just that, master," she remarked, in reply to an observation of mine; "and often I wish I was in heaven and out of it all, 'pon my soul and body, I do; I raley get so sick of it."

And as she took the sooty handkerchief from her head and wiped her wet face with it, a milder form of asseveration would have satisfied me of the change suggested being to her advantage. It was in vain she tried to pacify the squealing child at her lean bosom.

"Hush, then, and mammy'll spare a penny for half a pint of beer presently, and then, perhaps, she'll tuckle down a bit," said the poor soul, as, protesting against the mockery offered it, the little rebel stiffened itself out and refused either to unbend or leave off shrieking.

"Haven't I got no help in working for 'em all? No, master. I've got no help. How much can I earn? Well, its right down slavery to earn a penny an hour at it. More often especially when this young un 'o mine is cross—it isn't more than ninepence for the whole day. No; we don't quite live on that, sir; I'm 'lowanced two loaves a week, but it's nigh on four miles to fetch 'em, so I don't know, reckoning the loss of time, that I'm much richer, after all, I'm sure I don't know what's coming to the work, and the price they're giving for it. It's almost as bad as chain-making."

"Is that worse than nail-making?"  
"For the women it is. Just you go to Cradley and ask 'em."  
It was too late to follow her advice that night, but I did so next day.

**Anecdote of Governor Grimes.**

The following story of ex-Governor Grimes is vouched for by one who knew him well: The Legislature had just convened at the capitol of Iowa. Gov. Grimes had arrived the night before, and taken rooms at a certain hotel—at least so a young aspirant for office from a distant portion of the State ascertained as he drove up and alighted from his carriage at the steps of that public house. The hostler threw off his trunk, and the landlord conducted him to his room, leaving the trunk in the bar-room. Wishing his trunk, the young man demanded to have it brought up, and seeing a man pass through the lower hall, whom he took to be the porter, he gave his commands in an imperious and lofty tone. The order was obeyed, the man charging a quarter of a dollar for his services, a marked slip, that was good for only 20 cents, was slipped slyly into his hand, and was put into his pocket by the man with a smile.

"And now, sirrah!" cried the new arrival, "you know Governor Grimes?"  
"Oh yes, sir."

"Well, take my card to him, and tell him I wish an interview with him at his earliest convenience."

A peculiar look flashed from the man's blue eyes, and with a smile, extending his hand, he said:

"I am Gov. Grimes; at your service, sir,"  
"You—I—that is, my dear sir, I beg—a—a thousand pardons!"

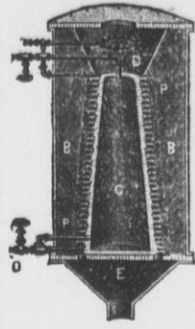
"None needed at all, sir," replied Governor Grimes; "I was rather favorably impressed with your letter, and had thought you well suited for the office specified. But, sir, any man who would swindle a workingman out of a paltry 5 cents would defraud the public treasury had he an opportunity. Good evening, sir."

**A Very Quiet Baby.**

Children in arms generally enjoy exemption from customs duties, and even the octroi officials stationed at the "barriers," of French and Italian cities, fiscal martinets though they be, are wont to allow these innocent creatures to pass them free of duty. There are, however, exceptions to every rule. Only the other day, among the passengers in an omnibus undergoing the usual inspection at the Porta Garibaldi of Milan was a ruddy-cheeked wet-nurse, bearing on her lap an infantile treasure, carefully swaddled, its youthful lineaments hidden from view by a thick white-lace veil. It seemed a baby of excellent conduct, by no means addicted to infuriate screaming, or even to the complacent gurglings affected by some infants, but wrapped in a profound and noiseless slumber.

"That is a remarkably quiet child of yours," observed the searching official to the nurse.  
"Yes, indeed it is, dear little angel," rejoined the latter; "it hardly ever cries, the sweet poppet, and when it does whimper a little, I can quiet it in a moment with a lump of sugar."  
"It must be quite a treasure," replied he of the octroi; "just step down, there's a good woman, and bring it into my office, will you; I should like to have a look at it, being a family man myself." The nurse grew pale; she had, however, no valid excuse for non-compliance with the request, so she descended from the omnibus and followed the fatherly official into his bureau, where, strange and sad to tell, the extraordinary placidity of her infantile charge was speedily accounted for by the discovery that it consisted of fourteen pounds of fine bologna sausage, neatly packed up in the snow-white robes of guileless babyhood.—*London Telegraph.*

**Welch's Improved Wheat Heater**



WITH STEAMING ATTACHMENT.  
First premium Millers' International Exhibition.  
Its superiority over all others is fully established.  
Heats every grain of wheat evenly and thoroughly.  
WE GUARANTEE SATISFACTION or no sale, and invite a trial of thirty days to prove our claims.  
Send for circulars and prices to  
Albert E. Bowman, Manufacturer,  
703 Market Street, St. Louis, Mo.

OVER 4,000 IN USE.

**KAESTNER'S PATENT Grinding Mills.**

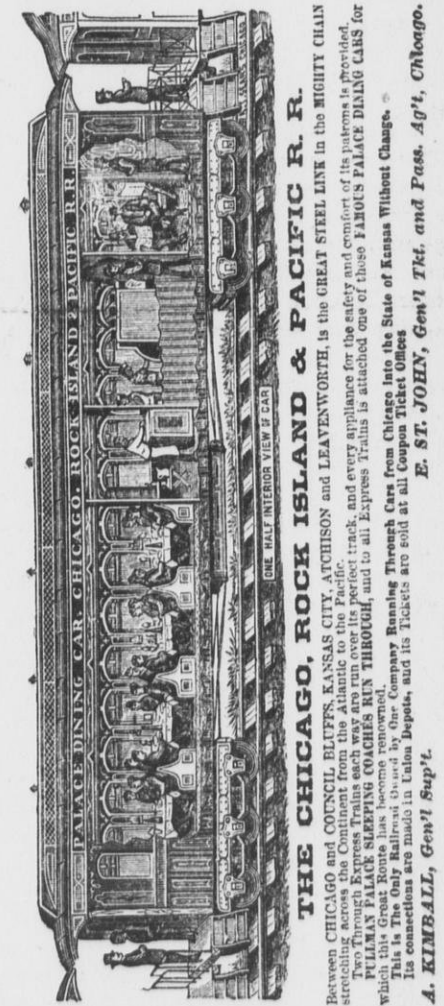
Each one sold under a full guarantee to give entire satisfaction or money refunded. Rigid or adjustable Bed Stone (Vertical), and can be perfectly adjusted.  
They will grind Middlings as slow as 15 lbs. per hour and as fast as 600 lbs. according to speed and pressure, and for grinding Wheat or Corn are unequalled.  
We use none but French Burr Stones, and build four sizes—16, 20, 24 and 30 inch.  
Write for circulars and prices.

**Chas. Kaestner & Co.,**

63 S. Canal St., Chicago, Ill.

Mention U. S. MILLER when you write. jan

If you are going to Kansas, Nebraska, Colorado, New Mexico, Arizona, Wyoming, Utah, Montana, Dakota, Nevada, Oregon, California, China or Japan, Ask for Tickets via the "GREAT ROCK ISLAND ROUTE."



THE CHICAGO, ROCK ISLAND & PACIFIC R. R.  
Between CHICAGO and COUNCIL BLUFFS, KANSAS CITY, ATCHISON and LEAVENWORTH, is the GREAT STEEL LINK in the MIGHTY CHAIN of Pullman Palace Sleeping Cars. These cars are built to the highest standard of perfection, and every appliance for the safety and comfort of its passengers is provided. Pullman Palace Sleeping Coaches Run Through, and to all Express Trains is attached one of these PALACE TRAINING CARS for which this Great Rock Island Route is famous. Our Company handles Through Cars from Chicago into the State of Kansas without change. In connections are made in Union Depots, and its Tickets are sold at all Coupon Ticket Offices.  
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FOR SALE—A Morgan Smutter, 45 bushels an hour. A Becker No. 5 Brush. Both almost new. Inquire at NORTHWESTERN MILLS, 518 Canal St., Milwaukee, Wis.

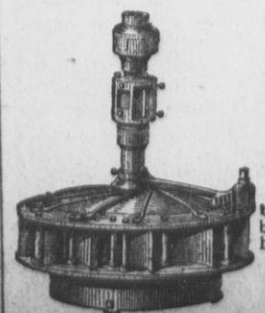
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True to pattern, sound and solid, of unequalled strength, toughness and durability.  
An invaluable substitute for forgings or cast iron requiring three-fold strength.  
Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for Locomotives, etc.  
15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over all other steel castings.  
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PRICES GREATLY REDUCED FOR 1879-I



The "OLD RELIABLE" with improvements, making it the Most Perfect Turbine now in Use, comprising the Largest and the Smallest Wheels, under both the Highest and Lowest Heads used in this country. Our New Book for \$5.9 sent free to those using Water Power. Address

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### FLOUR MILL FOR SALE.

Anyone desiring to purchase a 3-run Mill, driven by two water wheels, in a good neighborhood, and suitable for custom or merchant work will, address

A. C. BURNETT,  
Maquen, Knox Co., Ill.  
[Mention U. S. MILLER when you write.]

**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.

### SUBSCRIBE FOR THE United States Miller!

THE LEADING MILLING JOURNAL OF AMERICA.

Subscription Price One Dollar per year, post paid. Address UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

### 4-Run Steam Flour Mill For Sale

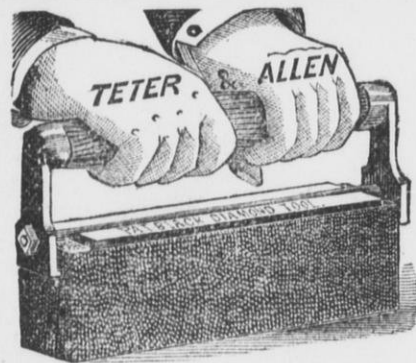
At La Grange, Mo. It has also a large corn run and machinery for kiln-drying meal. Machinery all in good order. Good shipping facilities by river and rail. Will be sold cheap and on easy terms. It is located in a first-class winter wheat country. Address

LA GRANGE SAVINGS BANK,  
La Grange, Mo.  
[Mention U. S. MILLER when you write.]

### Situation Wanted

As miller by a single man, age 34, 18 years of experience. Is a good stoneman and accountant, is strictly temperate, and uses no tobacco. Address

H. Y. Z., East River P. O., Cortland Co., N. Y.



Over 4000 now in use. Guaranteed the best Tool in the market for smoothing the face and furrows, removing glaze, and restoring the burrs to their sharp, natural grit. It is far superior to Emery or Corundum. Used with or without water. Too large to send by mail. Price, \$5.50. Will send our Tool on trial against any other in the market, Miller's to pay for the best after a trial. Sold by Mill Furnishers throughout the world.

See that it has "Teter & Allen, Pat. Black Diamond Tool" on the plate.  
**TETER & ALLEN,**  
404 Commerce St., Philadelphia, Pa.



### BOTTLED BEER.

VOECHTING, SHAPE & CO.,  
SOLE BOTTLERS OF

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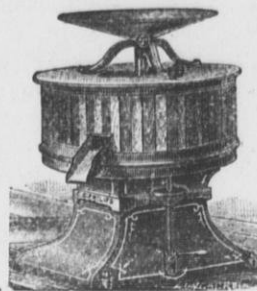
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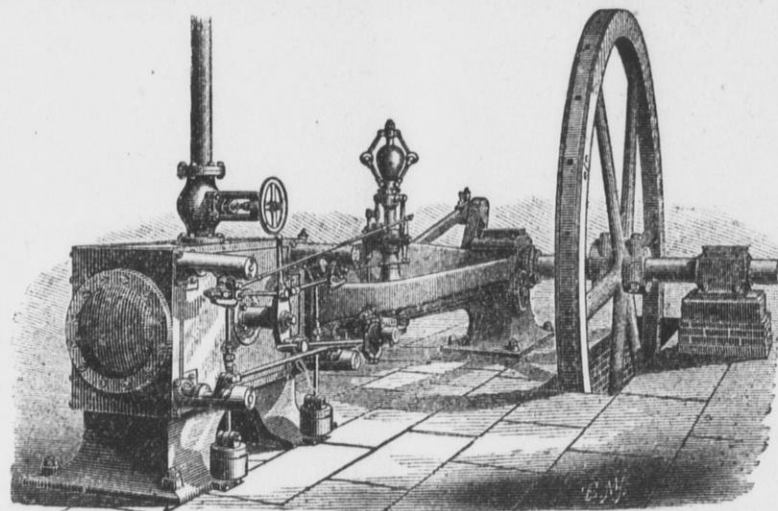
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All parties who desire to obtain Will do well to consult the undersigned, who is a thorough milling expert as well as

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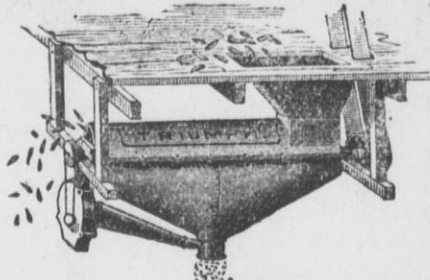
Unquestionable references furnished in Europe or America on application. Address all communications to

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N. B.—I respectfully ask that manufacturers of American milling machinery and agricultural machinery will favor me with their catalogues. Address as above.

### TRIUMPH POWER CORN SHELLER!



Shells and Cleans 2,000 Bushels Ears per day.

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### FOR SALE.

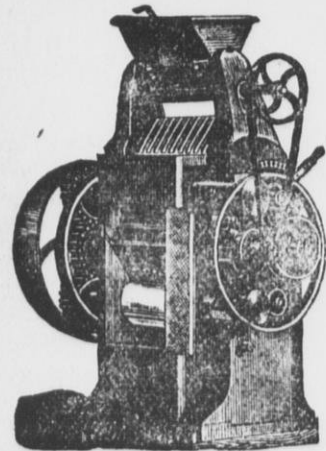
We offer four run of stones, 4 1/2 feet in diameter, with spindle, curb, iron hurst frame, pulleys, Johnson's patent universal driver, etc., all complete, ready to set up and run at once. Apply at once to

C. Manegold & Co.,

Reliance Mills, Milwaukee, Wis.

VIENNA EXHIBITION, 1873, Awarded Diploma of Honor.

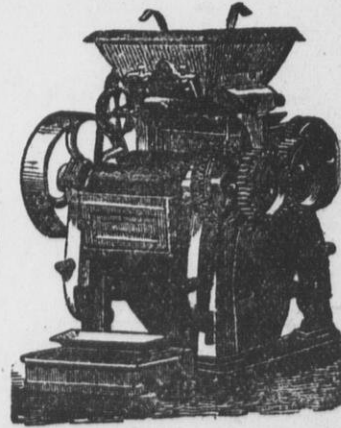
PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



### GANZ & CO.,

### Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mills, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following :

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing, and without any need of re-grinding, unless with reference to new rollers, quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wondrous as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable. I remain, etc.,

(Signed) C. HAGGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

### GANZ & CO., Buda-Pesth, Hungary.

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOR GRAIN CLEANER CO., Auburn, New York.

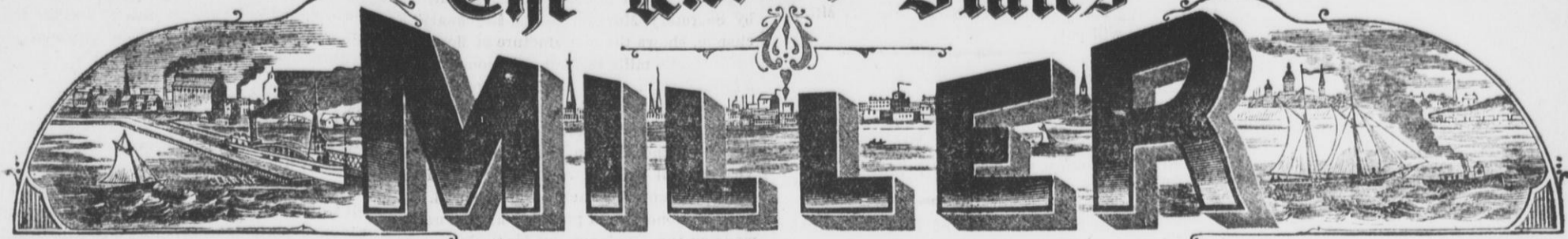
supplied to us by you. We have now had both smooth and fluted Rollers in use for the last two years, and have not found any appreciable wear in the smooth rollers. With reference to the work and capacity we can but report favorably. The flour produced by them is lively, and not killed as has been stated in some quarters, while its baking properties are first rate. Referring to the lately supplied fluted rollers, Mechwart's patent, grooved on the new method, they work admirably and are especially to be recommended for mellow wheat. Recapitulating, your Roller material is as tough as it is hard, and therefore in every way adapted for the purpose it is intended. We remain,  
Tivoli Kunstmuehle, A. MUELLER.

BUDA-PESTH, July 16, 1877.—Messrs. Ganz & Co., Buda-Pesth—Gentlemen: The most satisfactory results which, on testing the different 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 flour is produced, provided the rollers are used as directed, that your Rollers most satisfactorily detach the Semolina from the Bran, and thoroughly separate the Germ-Particles, and finally that they are of an astonishing durability, and that it requires no skilled labor 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,  
PESTHER WALZMUEHL-GESELLSCHAFT. Riedle, m. p. Burehart, m. p.

BUDA-PESTH, July 11, 1878.—Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs, Having had occasion to try your newly patented Roller mills with others, known until now, I feel induced, regarding their excellent qualities to give orders for furnishing me the Roller mills to be erected in my two mills. These roller mills are to be recommended by their construction, surpassing all known until now, and especially for their remarkable capacity, doing much work with little power. Believe us, gentlemen, Yours truly,  
HEINR. HAGGENMACHER.

BRANDERS A. ADLER, Bohemia, February 13, 1879.—Messrs. Ganz & Co., Buda-Pesth—Gents: I give you my best thank for your delivering to me your well-made and well-working machines, as well as for these 2 machines you delivered me last year. I have no objection to your publishing this. Yours faithfully,  
G. HANNAK, Civil Engineer and Mill-owner.

# The United States



Volume 10.—No. 4.

MILWAUKEE, FEBRUARY, 1881.

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Single Copies, 10 Cents.

## Chestnuts for Flour.

It is well known that the chestnut was much used by the ancient Greeks and Romans as an article of food. Indeed, at one time the Arcadians subsisted almost wholly upon this farinaceous nut. The same may be said of the peasants of some parts of Italy at the present time at certain seasons of the year. The common chestnut tree is said to have been brought from Asia Minor to Sardinia, and from there it has spread over the whole of Southern Europe. It existed for centuries in Tuscany, where at one time nearly every hill and mountain side was covered with its verdure. The number of trees in Tuscany and Lucca is estimated at several millions, and the nut and wood have done more to maintain the population of some of these districts than any other production; indeed in some places wheat, flour and corn meal are entirely superseded by the chestnut flour, which is very nourishing, and much cheaper as an article of food. This tree grows to the height of 60 or 70 feet, and attains full maturity at the age of 60 years. Its vitality and productiveness, however, last for more than a hundred years. In many parts of Tuscany it is cultivated largely, and is always raised from the seed or nut. The large variety of Spanish chestnut is cultivated by grafting on the young trees. The chestnut flourishes in a light, fertile, deep soil, but thrives on the sides of mountains facing the south and west. The chestnut is composed of starch, a glutinous substance analogous to that of the cereals, and sugar. Dr. Guerazzi, in experiments narrated by him, was able to extract the sugar without altering the farinaceous or nutritious part of the nut. After gathering—which should be done by picking up those that have fallen, and not beating the tree,—the nuts are deposited in huts, in the upper part of which deep trays are constructed on which the chestnuts are placed to the depth of six inches. In these huts slow fires are kept up, with the use of green wood, until the nuts become hard and dry. In this condition they may be kept for years. They are, however, more generally carried to the mill, where they are ground into flour in the same manner as corn or wheat. From this chestnut flour various preparations are made, such as *polenta* (a kind of pudding like our so-called hasty puddings of Indian meal), and various sorts of cakes, fritters, and even a heavy kind of bread. These various ways of cooking the chestnut flour are known under the popular names of *necci*, *pattoni*, *castagnacci*, *cialdi*, *frutelli*, etc., and the food so made is sweet and agreeable to the taste, and healthy. The country people cook the chestnuts in water, and make use of the water as a drink for chest complaints, colds and dry coughs, and in most cases it has proved very beneficial. The food product of the chestnut which is most in favor, is the *polenta*, made by simply boiling the chestnut flour in water for ten or fifteen minutes, with a little salt to flavor it, taking care to keep up a constant movement of the paste, and clearing the edges of the cooking utensil, so that no part becomes burnt. It is eaten with cream, butter, ham, etc., and is most healthy and nutritious. The food called *necci* is composed of flour formed into a cake, and is made by first mixing the flour with cold water, and then making cakes piled one upon the other, and separated by chestnut leaves, pressed for the purpose, and moistened by water. The whole mass is cooked over a hot fire, and the cakes are taken off one by one, when the leaves are almost burnt. The cakes are eaten with buttermilk, cheese, bologna sausages and meat. The chestnut flour can be preserved sweet and in good condition for two years in the same manner as wheat flour, but a round chest of chestnut wood is preferable, which should be kept in a fresh, dry place. The flour must be pressed into the receptacle as firmly as possible, and then covered with chestnut husks. It may

then be preserved for two years, and is exceedingly agreeable to the taste, and, though less nutritious, is much cheaper than wheat flour. It is certainly a fact that in those regions where the inhabitants live almost entirely on the chestnut, they are of better appearance, more healthy, and not less strong than those people who live on what with us is considered more wholesome and nutritious food.

Professor Church has made the following analysis of the flour: Moisture, 14.0; oil, or fat, 3.0; proteids, 8.5; starch, 20.2; dextrine and soluble starch, 22.9; sugar, 17.5; cellulose, etc., 3.3; ash, 2.6; total, 100.0.

The cakes were found to contain only 6.7 per cent of proteids, with 3.4 per cent of flour. The large amount of dextrine is due to the high temperature to which the chestnuts are subjected in the process of drying. Prof. Church thinks that chestnut flour ought to be of easy digestibility and a suitable children's food, considering that it contains over 40 per cent of nutritious matter, soluble in pure water.—*The Farmer, London.*

## Cameo-Cutting.

### MICROSCOPIC DEXTERITY OF THE WORKMAN.

Cameo-cutting is one of the most profitable arts to engage in. There are but few cutters and there is a steady demand for all they can produce. The cutters are very secretive and greatly dislike to talk about their work. Most of the cameos are produced from sea shells. A visit to a cameo-cutter's workshop found him seated at a table covered with tools, varying from a strong triangular-pointed steel instrument, to the most delicate pointed bits of steel wire fastened in handles. Very fine files and knitting needles, set in wooden grips and ground to infinitesimal points, figured in the lot. On a pad of leather, before the cameo-cutter, was a block of wood just big enough to be grasped with his hand, and cemented to the middle of it was an oval object that looked like a piece of alabaster, just big enough to make a seal for the finger of a man who did not object to wearing large rings. Upon this the artist was just finishing a copy, with a pencil pointed to needle fineness, of a photograph in profile of a gentleman, which was leaned against a little photograph easel before him.

Having finished the outline, he laid his pencil by, and taking up a fine wire tool he scratched the pencil mark around with it. Then he took a darning-needle with a sharp point and scratched the line deeper. He worked with a magnifying glass at his eye, and stopped continually to inspect the progress of his work with critical minuteness. Then he went at it again, working slowly, scratching over the same line again and again, and always examining after each scratch. He changed his tools as he went on, and from the darning-needle descended to a trifling little fragment of steel wire, not as thick as an ordinary sewing-needle, set in a slender handle. With this he scratched and rescratched, until the lines he had drawn with his pencil had quite vanished, and a thin, fine streak of a dark color had marked the outline of the head he had been tracing his way around. Next he took one of his burin-like tools, and commenced again. This time he worked on the outside of the outline, cutting and scraping at the surface until the white turned gray, then brown and, finally vanished, leaving the face in relief, surrounded by a black ground; that is, the portrait remained intact in the white substance which formed the outer layer of the cameo, while it had been cut away around it to the lower or dark layer.

The portrait or figure is then modulated upon its surface until it assumes the roundness of nature. The edges are left square to the dark ground. This is necessary, as, if they are gradually rounded down, the outline becomes undefined toward its juncture with the

relieving surface, owing to the white of the raised portion being partially transparent, and permitting the dark to show through when it is thinned down. Care is taken to finish this dark surface as much as possible with the cutting tools, and so separate the white from it as to leave it smooth and unscratched. A final polish is given it, however, with putty powder, applied dry with a stiff brush, but the utmost care is necessary in this operation, as the slightest slip will ruin the work. This ends the cameo-cutter's work, the mounting being the jeweler's work. The cameos sell unmounted for about \$25 apiece.

Italy is the home of cameo-cutting, and the finest works of art in that line are still turned out there. Genoa and Rome are the centers of production. There is a colony of several thousand cameo-cutters in Paris who produce very good work. The cameos made abroad are, as a rule, fanciful works, copies of statues, mythological figures and the like. The shells used in cameo-cutting are of several sorts, but all are ordinary seashells or conchs. Some come from the East and others from the West Indies. Many are imported, as there is commonly only enough material available in each one for a single cameo. These shells all have a white surface, but the inner layer is red, black and dark claret in color, according to the species. The pieces to be used by the artists are sawed from the shells and shaped into the square or oval form required on a grindstone. Then they are ready for the artist.

A REMINISCENCE OF CHRISTMAS.—A sad story is told of twelve young men, who formed a sort of club, and agreed to meet once a year and dine together in a certain room. No one was ever to be admitted to the annual gathering save the original members, nor was the number ever to be made up by fresh elections as they died off or disappeared. The story goes on to tell how joyously the feasts were held for the first few years, as the young men rose to distinction, or married and settled into happy life; and then, after a time, how there came to be a vacant chair; and a health drunk in silence to the one who would never take his place there again. As years rolled on another and another seat was empty. The men who survived grew old, and clasped each other's hands mournfully as they sat scattered round the long table. It was always the same room, the same lights, and wine, and flowers; but the faces around it were withered and changed. There came a year when only two old men sat down together and named over their trembling glasses all the brothers who once occupied the empty places beside them. And then there was one anniversary more. The people in whose house the club had so long held its meetings laid the long table as usual, wondering whether any guest would arrive; but at the appointed hour there entered one aged man, who tottered feebly to his usual seat, and, after toying a little with the food before him, lapsed into stillness and was left alone. When the room was entered again, some hours later, the old man was dead.—*European Mail.*

ONE WAY OF GETTING THE RENT.—The correspondent of a London paper says:—There are many ways of managing Irish tenants. One of my acquaintances, a landlord in the Sister Isle, summoned his people to pay, and arranged for them to come into his room singly. The first to appear refused anything beyond Griffith's valuation, and was asked to step into another room, where he was locked in. The next man that entered, seeing a lot of money on the table, imagined that his predecessor had paid the full rent, and consequently paid up too, being taken in turn to another part of the house and there supplied with plenty of whisky, the immediate result being that all the tenants paid up properly, and were finally dismissed to their homes, without any unpleasantness.

## Things Worth Knowing.

STRONG CEMENT FOR STEAM JOINTS.—Take 10 parts of white lead ground in oil, 3 parts black oxide of manganese and 1 part lithrage. Reduce to a proper consistency with linseed oil and apply where needed.

HOW TO MAKE CISTERNS AND TANKS WATER-TIGHT.—Paint thickly on the inside with a mixture composed of 8 parts of melted glue, 4 parts linseed oil and then boil with lithrage. In 48 hours after application it will have hardened so that the cistern or tank can be filled with water.

AN IMPROVED GLUE DRESSING FOR WOUNDS. Cabinet makers and wood workers generally are familiar with the uses of glue in dressing tool cuts and other slight wounds incident to their calling. The glue pot is always handy in their shops, and a glued rag answers as well as the best adhesive plaster. In a recent paper read before the Philadelphia Academy of Surgery, Dr. Hewson recommends the addition of acetic acid to the glue, and a little attar of roses to cover the odor of the glue and the acid. This compound spread on paper or muslin makes, he says, a good substitute for adhesive plaster for surgical use. It is easily and quickly prepared, simply by putting into a vessel of boiling water, a bottle containing one part of glue to four, by measure, of the acid, and letting the bottle remain in this bath until the glue is fully dissolved and mixed with the acid. Common glue may be used and official acetic acid, to be had at any drug store. The mixture should be kept in a wide mouthed bottle, well stoppered by a long cork, which can always be removed by heating the neck of the bottle. Care should be taken to keep the mouth of the bottle clean by wiping it well with a cloth dipped in hot water. A bottle of this cheap and easily prepared dressing would be a good thing to have at home as well as at a workshop.

PATENT SELF-RAISING FLOUR.—Take 100 pounds kindred flour, add 10½ ounces tartaric acid. Mix well. After 2 or 3 days add 12 ounces bicarbonate of soda, ½ pound white crushed sugar and 1½ pounds of salt. Mix and pass through a flour dressing machine. Keep everything perfectly dry. To bake bread from this flour it is only necessary to make a dough by adding milk or water and put in the oven and bake quickly.

A DEVICE which is considerably used to prevent the clogging of middlings, consists of a simple rod of wood placed inside the eye and extending to the balance rynd. The rotary motion of the rod separates the middlings and prevents clogging, the same device being equally effective if extended into the feeding spout.

COMPUTING HORSE POWER.—To get the horse power of a steam engine multiply the area of the piston by twice the length of the stroke in inches, times the number of revolutions per minute, times the mean effective pressure of steam in the cylinder in pounds, and divide the product by 33,000 which will give the horse power required. To get the actual mean effective steam pressure in the cylinder apply an indicator and take some diagrams. The horse power of a boiler is an indefinite expression, as a so-called boiler of forty horse power may be able, with good setting, good fuel and the most favorable circumstances to devote eighty horse power, while under adverse circumstances may not develop more than twenty horse power.

HOW TO CURE MUSTY FLOUR.—Mix 6½ pounds of carbonate of magnesia with 1000 pounds of flour. This will improve the flour, causing it to become more wholesome. It will make lighter and better bread than when alum is used, and it absorbs and dissipates the musty smell.

SUBSCRIBE for the U. S. MILLER.

UNITED STATES MILLER.

PUBLISHED MONTHLY. OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.

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Wm. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLIG & Co., 419 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

MILWAUKEE, FEBRUARY, 1881.

MILLERS' ASSOCIATION DIRECTORY.

NATIONAL ASSOCIATION. President—George Bain. Secretary and Treas.—S. H. Seamans.

- MINNESOTA—President, W. P. Brown, Red Wing; Secretary, Francis Hicke, Minneapolis; Treasurer, J. A. Christian, Minneapolis. IOWA—President, J. J. Snouffer, Cedar Rapids...

MILLERS' DIRECTORY.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work.

UNITED STATES MILLER, MILWAUKEE, WIS.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices...

SUBSCRIBE for the UNITED STATES MILLER. Only \$1 per year.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

PARTIES desiring to buy or sell a mill, or get a situation in a mill, or in want of a miller or journeyman millwright...

MANUFACTURERS of any article used in a flouring mill should make use of the advertising columns of the UNITED STATES MILLER. It will pay.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER.

THE Supreme Court of Iowa has decided that a millowner who builds a dam shall make it possible for fish to go up stream for spawning purposes...

MILLERS desiring to purchase any article used in flouring mills, can find where it can be obtained by addressing parties advertising in this paper.

WE respectfully call the attention of readers to the new advertisement of O. L. Packard on the last page of this paper.

WHILE the farmers and millers of the Great West are striving to increase their productions, the business men of the East are striving to increase their facilities for storing, handling and shipping the produce of the West...

GOOD NEWS FOR BREWERS.—It has been ascertained that the new cereal largely introduced in the West, especially in the state of Kansas, known as pampas rice...

British Imports of Breadstuffs from America.

We certainly do not wish the British Millers any ill-luck, but there is, however, something consoling (even if it is a little selfish to feel that way) in reading the following extract from the editorial Review of the Year in The Farmer...

The American shipments of corn during the past year have been exceedingly heavy. Of breadstuffs a quantity equal to about twenty million qrs. have been shipped, of which shipments 7,000,000 qrs., or a little over, have had a continental destination...

A South Australian correspondent in a letter dated 18th Nov., says that the harvest in that quarter which was just commencing, is likely to be far below that of last year...

St. Louis Flour Statistics for 1880.

The appended table of statistics furnished by Secretary Morgan, of the Merchants' Exchange, shows the manufacture of flour, etc., by St. Louis mills in 1880.

Table with columns: Name of Mill—Owners, Capacity, Flour, Corn meal. Lists various mills like Anchor, Yeager Milling Co., Park, Standard and Kauffman, etc.

Total Hominy and Grits—Southern, Engelke & Feiner, 17,410; Pearl Hominy, Wood-Maude Milling Co., 27,844. Total, 45,254.

Foreign Trade Notes.

The condition of the Buda Pesth milling and corn trades is illustrated by the following interesting official figures:—

Table showing Imports into Buda Pesth and Exports from Jan 4 to Nov 30, 80. Lists Flour, Wheat, Rye, Barley, Oats, Maize.

The French are becoming alarmed at the rapid increase of imports of American flour and a movement in Marseilles shows there is apprehension of excessive imports in the future from America.

THE Cuban International Fair will open February 10, 1881.

MESSRS. Kosmack & Hulseok, flour brokers of Glasgow, have recently opened an office at 16 Mark Lane, London.

SNOWDRIFTS from 5 to 15 feet and depth were plenty in Northern England on New Year's Day.

THE New Corn Exchange Building, Mark Lane, London, is nearly completed.

New Zealand anticipates a good wheat crop this year.

The Pall Mall Gazette anticipates the time when the wheat producing capacity of the United States will be reduced to next to nothing by excessive overcropping...

The amount and quality of the Manitoba wheat crop for 1880 is said to have been considerably overestimated.

HERE is an item which may prove a grain of encouragement to the Grahamites and British Bread Reform League: A lady who has raised a large number of hens says that, after vainly trying the recommended remedies for lice, she had hit upon the plan of giving them

once or twice a week a large loaf made of Graham flour in which a handful of sulphur has been mixed. The hens like it, and are freed from lice and kept healthy through the season.

Halls for Public Speaking.

In large rooms, such as churches and lecturing halls, all echoes which can accompany the voice of the speaker syllable by syllable, are useful for increasing the volume of sound; but all which reach the hearers sensibly later, only produce confusion.

As to distant parts of a hall for public speaking, the more completely all echoes from them can be destroyed, the more favorable it is for distinct hearing. It is indeed true, that if a hearer is within 35 feet of a wall, however remote from the speaker...

A thrilling accident occurred at the American Iron Works in Pittsburg, recently. While Robert Moore was at work at his rolls, his catcher failed to seize with his tongs a bar of white-hot iron which had been placed between the rolls.

THE magnitude of the dairy industry in this country is shown by statistics compiled by Mr. Geo. P. Lord, of Elgin. He estimates the number of milch cows in the United States at over 13,000,000, requiring the annual product of 52,000,000 acres of land for feed...

**Meeting of the Iowa Millers' Association.**

The annual meeting of the Iowa Millers' State Association was held in the council chamber at Des Moines, Wednesday Jan. 19, President Snouffer in the chair. After the call to order the minutes of the last meeting were read and approved. The reports offered made a gratifying showing of the strength of the association and its financial condition. Several new members were admitted at this meeting. The committee on exhibits at the Cincinnati exhibition made a report showing that the Iowa exhibits were one of the best, but that the expenses were borne by the committee. A letter was read from the secretary of the National Association of British and Irish Millers, inviting the Iowa Association to send exhibits to an international exhibition of flour mill machinery to be given at London in May of this year. A vote of thanks was tendered to the Chicago & Northwestern Railroad Company, for free transportation of the Association exhibit. A subject of special importance to the Association at present, is the law requiring owners of mill-dams to put in and maintain fishways at their own expense. A committee was appointed to consider what action should be taken in the matter, with instructions to report at the evening session of the Association. Governor Gear next addressed the Association, making very flattering comments on the condition of the milling industry in the State. The business of the session was concluded by an election of officers resulting as follows; J. J. Snouffer, of Cedar Rapids, re-elected President. J. B. Jones, of Algona, re-elected Vice-president. J. H. Read, of Boone, re-elected Secretary. Executive Committee—D. B. Knight, Boone; H. Hammond, Le Grand; C. A. Bryant, Agency City. The Association then adjourned till 7 P. M.

The evening session was largely taken up in a discussion on various matters connected with the milling business. Great interest was shown by the members, and there was a lively interchange of opinion on the different subjects brought up. The following report was submitted by the committee appointed at the morning session, to consider the fishway laws:

*To the Millers' State Association:*

The Committee appointed to recommend a course proper to be adopted on the part of the Millers' State Association, and the owners of mill dams in the State of Iowa, in view of the action threatened under the provisions of the law relating to fish-ways now in force, beg leave to report:

That from the very limited time permitted them they have not been able to give the matter the consideration its importance deserves. They present their views, therefore, with much hesitation, and are by no means satisfied that the line of policy recommended is the best to be pursued.

The committee recommend:

1. The policy of delaying all action, judicial or otherwise, in relation to fish ways, as far as may be done, until the meeting of the next general assembly.
2. That all owners of water mills in this State be requested to meet in convention at the city of Des Moines on the first Wednesday in March, 1881, to take such steps in this relation as may to them seem necessary, and that notice of such meeting be given them by the Secretary of this Association.
3. That a committee of three be appointed by the President of this Association to aid, so far as they may, in the defense of any suit involving the constitutionality of the law relating to fish-ways that are liable to come on for hearing in the Supreme Court prior to the meeting of the next general assembly; to memorialize in this relation, in behalf of this Association, the said general assembly; to present the case of the millowners in relation to fish-ways before the proper committee

thereof, and to take such steps as they may deem necessary and proper to secure the modification or repeal of the present fish-way law.

That for the purpose of presenting to the next general assembly in the strongest manner possible the absurdity, inefficiency, impracticability and impolicy of the present law relating to fish-ways, as it is sought to be enforced by the present fish commissioner, particularly the unsuitability for the purpose intended of the designs now in the hands of the auditors of the different counties of the State, and of the great injury that would be inflicted upon the manufacturing interests of the State by compelling the construction of fish-ways in mill dams in the manner proposed, the different owners of water power in the State are requested to forward to S. D. Nichols, at Panora, Iowa, Chairman of said Committee, such information as is in their possession either by personal observation or otherwise, showing:

1. The habits of the fish native to the waters of the State, and in this connection their running time, voracity, different heights they are capable of ascending a fall of water, their liability to discover and ascend a fish-way constructed after the designs adopted.
2. The chances for increase in our lakes and rivers of fish not natives thereof.
3. The practical success which has to their knowledge heretofore attended the efforts of our present fish commissioner.
4. The value to the State of the fish commissioner and notably of our assistant fish commissioner.
5. The necessity of stocking with fish the lakes of this State.
6. The liability of the fish ways proposed to remain where placed in the mill-dam, and if, in consequence of the construction of such fish way, there is in their opinion any greater risk to said mill-dam, their reasons for such opinion.
7. Liability of ice in the spring freshets or floating drift to affect the dam and fish-way, etc.
8. Whether in their opinion a fish-way constructed on any plan would subserve any useful purpose in the passage of fish up the rivers of the State, and if so, upon what plan should said fish-way be constructed.
9. Reasons, if and, why the State or county should bear the burdens incident to fish-ways and not the mill-owner.

S. D. NICHOLS,  
I. MCBRIDE,  
ABNER GRAVES,  
J. W. CATHURN,  
R. T. BURNHAM,  
Committee.

The following resolution of thanks was passed:

*Resolved*—that a vote of thanks of the Iowa State Millers' Association be tendered to Bemis Bro. & Co., bag manufacturers of St. Louis, for their generous liberality and kindly help and assistance without fee or reward—adding greatly to the success of the Iowa display at Cincinnati.

The association then adjourned to the first Wednesday in March, 1881, at Des Moines.

**Yeast.**

The yeast plant is now universally admitted to be a fungus growing and feeding on decaying organic matter, and is met with all over the globe. Nature seems indeed to have very carefully provided for its universal diffusion. The mildew which forms on the surface of yeast is really the fruit, the spores of which, it has been calculated, are but one-sixth of the diameter of the pollen-dust of the fir tree, showers of which have been sometimes met with hundreds of miles out at sea. When the yeast plant comes to maturity, therefore, and throws off its spores, they are very likely to travel over a great part of the earth's surface before settling. The propagation of the plant by the budding process just alluded to is very curious. A single cell will put forth one, or sometimes two tiny projections, which presently become complete cells, capable themselves of multiplying in the same manner, and thus in a few hours, under favorable circumstances, a portion of yeast introduced into a saccharine fluid will increase its volume to

five or six times its original dimensions. Scientific men have made a distinction between surface yeast and sediment yeast—surface yeast being, they tell us, propagated by buds, and sediment yeast by spores. Beer yeast, at any rate has been thus divided. There is, however, very little, if any difference in the cells of the two kinds, and sedimentary yeast appears to be only a fungus developed at a lower temperature than surface yeast, into which, as a matter of fact, it is readily converted by a rise of temperature. The reason of one kind appearing as a sediment and the other a surface growth is said to be attributable to a difference in the evolution of carbonic acid gas, the rapid generation of which keeps one "variety" of yeast at the surface, while the want of the buoyancy imparted by this generation of gas is the cause of the other kind remaining as a sediment. It seems, in fact, to be not a difference of kind, but of condition.

It is the rapid generation of carbonic acid gas which has given yeast its great value as a substitute for the ancient "leaven" in the making of bread, which is still used in many parts of the continent in the manufacture of black bread. Leaven is simply sour dough—dough that has been over-fermented, and which has the power of imparting its own fermentation to any fresh batch. In this case, also, the fermentation is produced by a fungus, the growth of which is attended by the evolution of carbonic acid gas. This permeates the whole mass with bubbles, which puff up the solid dough into an agglomeration of cells, thus imparting to it what we call lightness, and which within the past few years science has endeavored to accomplish in a more direct manner by "aerating with the gas chemically manufactured. Whether in bread or an infusion of malt, however, the growth of the yeast plant is the same. The tiny vesicles of the yeast are nourished by appropriating the sugar in the fluid, or, more correctly, by decomposing the sugar. This decomposition, in some way which, so far as we are aware, is still a mystery to scientific men, produces a similar process throughout the fluid in which the yeast is operating. Whether this process, which is neither more or less than fermentation, is caused by the action of the yeast, or whether the action of the yeast is caused by the fermentation of the liquor, is a point on which a good deal of discussion has been held. Some have maintained that one is simply the accompaniment of the other, and that the two things do not stand to each other in the relation of cause and effect. It is now very generally considered that fermentation is initiated by the yeast, though it is not, we believe, a point that can be considered settled beyond dispute. As is very well known, an outcome of the process of fermentation set agoing by the yeast is alcohol. This is produced in the bread that has been "raised" by yeast just as it is in the infusion of malt or the grape juice, and it was computed by Dr. Odling a few years ago that no less than 300,000 gallons of spirit were annually generated by the manufacture of bread in London. All this escaped into the atmosphere, and some forty or fifty years ago a company was actually formed for carrying out a process of bread-baking by which this waste of spirit might be avoided. They proposed making their profit by catching this 300,000 gallons of spirit, or the proportion of it corresponding to the amount of bread they made. It need hardly be said it was an utter failure. The promoters sunk a great deal of money in their preparations, but they were unable to catch their volatile profit, and in the attempt to do so they spoiled the bread.

The baker's oven puts an end to the action of the yeast by simply killing the plant, just as it would kill any other plant. It cannot survive a temperature of more than about 312 degrees—the temperature of water boiling in an open vessel. The yeast fungus may, however, be dried in a moderate temperature, or it may be desiccated by pressure, and its vitality would be arrested. The plant may thus be kept for a long time, and hence it is that "German yeast" has found such a market in this country. We have no statistics at hand for the present time, but about fifteen years ago it was computed that from the large breweries of the continent nearly 6,000 tons of dried yeast were annually imported into this country, and consumed by our bakers. At the present time the quantity is probably far greater. At the same time it is a curious fact that large quantities of yeast are bought up from our own brewers and exported in a compressed form to the continent, whence it probably returns in various forms of "baking powders," as well as in the shape of "German yeast." If the yeast trade is to revive in this country this fact will probably commend itself to the serious attention of English capitalists. —*Brewers' Guardian (London).*

**MILWAUKEE ITEMS**—Messrs. Weisel & Vilters engine and machinery builders of this city, are furnishing the machinery for G. G. Hansen & Co's. new malt house in Milwaukee. Messrs. Smith Bros., 454 Canal St., Milwaukee, are doing all the millwright work.

Smith Bros., millwrights, are going to overhaul the flouring mills at Kewaskum, Wis.

Messrs. Smith Bros. have just completed the construction of the new grist mill at Hale's Corners, Wis.

Those well-known, Milwaukee millwrights, Smith Bros., report business driving, and their shops crowded with work.

**MINNEAPOLIS ITEMS**—The Phoenix mill with its new roller mills has started up.

The owners of the Crown roller mill contemplate putting in an engine for use in case of low water.

Low water and floating ice have worried the millers considerably this winter.

The Arctic mill is shut up and it is probable that it will not be started up again until remodeled.

Work on the old Pillsbury mill is being pushed rapidly. It will when ready to run have a capacity of 600 barrels per day, instead of 800 as heretofore stated.

Mr. H. J. Russell, a miller in the Standard mills, recently met with a serious accident. While adjusting a set screw on a roller mill his hand and arm became entangled in the pulley, breaking his arm in three places, and also giving him several severe cuts on the head. His physician says he will recover without losing his arm.

A portion of the old tunnel on the east side, at Minneapolis, recently caved in. The damage can soon be repaired at no very great expense.



This is the King of Saw Machines. It saws off a 2 foot log in 2 minutes. 20,000 in use. The cheapest machine made, and fully warranted. Circular free. United States Manufacturing Co., Chicago, Ill. [Mention this paper when you write us.]

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Rooms 27 and 28 Chamber of Commerce.  
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**COMMISSION MERCHANTS,**  
**GRAIN, SEEDS, PROVISIONS, ETC.**

Special attention given to the purchase and shipment of grain for milling purposes.

We have an experienced man in attendance at each elevator constantly, to see to the inspection of grain when loaded into cars for shipment, and the interests of parties ordering through us will be carefully protected in every way.

Orders for purchase and sale of grain for future delivery will be promptly and carefully executed.

[Mention this paper when you write us.]



Beau.

(Dedicated to the Modern "Heroic" School of Writers.)

ION, PONDEROUS POLYLOQUENT, LOQUITUR.

That reminds me, dear sir, of a little occurrence which happened  
When I was a lad.  
Ah, let me replenish your glass, sir. And if you'll permit me,  
I shall be very glad  
To recount it to you, for I venture to flatter myself that  
It is other than bad.  
You observe, at the side table there, that majestic old darky?  
Well, that sir, is Beau.  
The hero who made himself famous upon that occasion,  
A long time ago,  
Way back in Virginia—let's see, if my memory serves me,  
In the year twenty-fo'.  
'Twas in Albemarle County, Virginia, my father resided  
Till the day that he died,  
Well off in fine horses, and niggers, and arable acres,  
And family pride;  
Thomas Jefferson's friend; a horseman, a swordsman, a Christian,  
Was he known, far and wide.  
This digression pray pardon. 'Twas here that he raised us together—  
Old Beau there and me.  
Though Beau was a nigger, and I was the son of his owner,  
Not a little cared we;  
We were simply two boys—we were friends—we were constant companions,  
In work or on spree.  
Well, a cousin of mine, James Tottett, from Washington city,  
Came over one year  
To pay me a visit—a priggish young blue-blood and churlish,  
With an arrogant sneer  
For our "primitive" customs, and boasting his wondrous achievements  
In tobacco and beer.  
From the first Beau conceived a dislike to James,  
"The town-tacky,"  
Which he sought not to hide;  
While James was accustomed to make him the butt of his banter,  
And frequently tripped  
To goad him by taunts to a quarrel, to which the young darky  
Very seldom replied.  
One Sabbath we went, with a lot of the neighboring youngsters—  
Inclusive of Beau,  
And of James—to the river near by, our ultimate purpose  
A-swimming to go.  
Walking thither James ridiculed Beau more severely than usual  
(If he could have done so).  
Now Beau was a wondrous musician on whistles and fiddles,  
Which he made with his knife,  
And the Christmas preceding my father had brought him from Richmond  
A marvellous fife,  
To perform upon which, to his friends' and his own delectation,  
Was the pride of his life.  
And upon this occasion his fife, from his pocket projecting,  
In view of us all,  
Was snatched at by James. Then they clinched  
In the tussle ensuing  
Beau was rather too small;  
James gave him a drubbing, and then put the fife in his pocket,  
Thus concluding the brawl.  
We continued our journey until we arrived at the river,  
Our prime destination;  
Our ablutions performed, our habiliments donned,  
'twas suggested  
That, for more recreation,  
We proceed up the stream to the "Door of the Devil," which motion  
Received approbation.  
This Door of the Devil was then a notorious feature  
In the river hard by.  
Where the water dashed swirling beneath the steep bank excavated,  
With a sigh and a sigh;  
And never again had aught swallowed down by its current  
Been perceived by man's eye.  
Arrived, we were gazing with wonder down at the white waters,  
And with some superstition,  
When, attempting to cast an unwieldy projectile into them,  
James lost his position—  
Falling in—in a trice sucked from sight—while we stood stark as statues,  
In our helpless condition.  
Great God! Not an atom of hope! Yet some one cried "Murder!"  
In response to which call  
Came a number of parties—among them were Beau and my father  
(Beau after the brawl)  
Having sulked in the rear—and despair and a sickening horror  
Filled the faces of all.  
No hope; for the Door of the Devil never yields up its victims,  
And none is so rash  
As to forfeit his life in a futile endeavor to rescue,  
Nor— Hold!—like a flash,  
A figure darts through us—leaps over the bank—in an instant  
Disappears with a splash.  
It was Beau! There's a breeze of a murmur, and then a dead silence.  
He can ne'er re-appear;  
This we know, even though he is one of the finest of divers  
To be found far or near.

Thus we wait a full minute—another—two heads above water!  
And from us a hoarse cheer.  
There's a fearful suspense—a grand struggle—and Beau, with his burden,  
At last is ashore;  
And the men rear him, dripping and bleeding, aloft on their shoulders,  
With a thunderous roar.  
And my father for once is profane, as he swears, By Jehovah,  
He is FREE, evermore!"  
When James had recovered, he walked up to Beau, and he thanked him.  
And assured him James Tottett  
Was his friend from that forth, and he offered his hand, but Beau scorned it,  
And muttered, "Dod rot it!  
Do you think it war you I war after?" (his hand on his pocket)—  
" 'Twar my fife, and I got it!"  
T. H. ROBERTSON.  
—Editor's Drawer, in Harper's Magazine for February.

The Grain and Flour Business of St. Louis.

The grain trade is one of the most valuable industries of St. Louis, and in wheat, corn, and barley there was an increase of receipts in 1880 over 1879. The receipts of wheat for the entire year was 18,439,403 bushels, against 17,093,362 bushels in 1879, an increase of 1,346,041 bushels over last year; the increase of 1880 over 1879 being over a million bushels less than the increase of 1879 and 1878. The receipts and shipments of wheat in this market, for the last ten years, were as follows:

Year.	Receipts.	Shipments.
1870.....	6,634,253	636,562
1871.....	7,311,910	1,048,532
1872.....	6,407,987	918,477
1873.....	6,185,028	1,210,386
1874.....	5,255,321	1,938,841
1875.....	7,604,265	1,462,453
1876.....	8,375,754	2,639,007
1877.....	8,274,151	2,410,190
1878.....	14,325,431	6,900,802
1879.....	17,093,362	7,302,076
1880.....	18,439,403	11,263,358

The receipts of wheat during the month of July, 1880, were unprecedented in this market, for in the two weeks of that month 1,871,885 and 1,356,167 bushels respectively came in, and the total receipts for that month amounted to 4,006,131 bushels. In the late fall and during the month of December there was a great falling off in receipts, owing to a local panic in the grain market. This lessened greatly the receipts for the year 1880.

Corn showed a very large gain for the year over 1879. The total receipts for the year just closed amounted to 21,227,157 bushels against 13,360,000 bushels for 1879, an increase of 7,866,522 bushels, being the largest gain ever made in one year. The following table will show the receipts and shipments of corn at this point for the past ten years:

Year.	Receipts.	Shipments.
1870.....	4,768,238	3,637,060
1871.....	6,330,734	4,469,849
1872.....	4,479,387	8,079,739
1873.....	7,701,187	5,290,916
1874.....	6,991,677	4,148,556
1875.....	6,719,263	3,523,974
1876.....	15,249,909	12,728,849
1877.....	11,847,771	9,309,014
1878.....	9,000,723	6,382,712
1879.....	13,360,000	8,311,005
1880.....	21,227,157	17,565,908

The receipts of oats for 1880 were 5,127,078 bushels, against 5,072,165 bushels in 1879, an increase of 124,913 bushels; total shipments of oats for 1880, 2,537,757, against 2,154,026, an increase of 383,731 bushels. Receipts of rye for 1880, 420,535 bushels, against 423,720 bushels in 1879, a decrease of 3,185 bushels; shipments, 274,978 in 1880, against 423,730 in 1879, an increase of 158,744 bushels. Total receipts of barley for 1880, 2,482,905 bushels, against 4,831,507 bushels in 1879, an increase of 651,398. In shipments there was a decrease of 106,390 bushels, which shows that the breweries consumed a very heavy amount of barley during the past year, the receipts having been so far ahead of 1879, and the shipments so much less. This indicates also a considerable increase in the amount of malt and beer brewed here, the breweries of St. Louis ranking among the largest and best in the land.

As regarding the source of supply for St. Louis, on grain, about 9,000,000 bushels of wheat were transported from the west by rail and the Missouri river; from the south, west of the Mississippi river, by rail, about 3,000,000; from the south, by lower Mississippi river boats, about 800,000 bushels, and about the same amount from the south, east of the Mississippi, by rail; from the east, by rail and the Illinois river, upwards of 3,000,000 bushels, and the remainder from the north, by rail and river and from wagons from near the city. The great bulk of the corn comes from the west by rail and the Missouri river, but the receipts from the east by rail and the Illinois river, and from the north by rail and river, are also quite heavy. The oats, rye and barley come chiefly from the west and north by rail and river. The elevator capacity of St. Louis is at present 6,850,000 bushels. This is not sufficient for the grain business of the city.

The need of more elevators and better locations has long been felt, but, from some cause or other, capitalists have been slow in the matter. This seems strange, when the grain receipts have been so heavy. But this is fast being remedied. Within the past six months some of the leading elevators have been increased in capacity, and two more are to be increased at once to the capacity of 600,000 and 1,100,000 respectively. Several new elevators are now in course of construction, and will be completed in time to handle this year's new crops. There will be three new ones in East St. Louis, with an aggregate capacity of 2,750,000 bushels. Some outside capital has been secured, and the elevator interests of St. Louis have a bright outlook. Several disastrous conflagrations during 1880 were serious drawbacks.

The flour trade of St. Louis for the year 1880 does not show much of a gain, the total receipts being 1,612,827 barrels, an increase of 5,591 barrels, the receipts of 1879 amounting to 1,607,236. Two years ago the flour trade was the largest and most valuable of any industry in the city, giving employment to upwards of 5,000 men. The product of the city mills in 1879 was 2,142,949 barrels; but for 1880 the total amount of flour manufactured here will not exceed 1,800,000 barrels, which will cause St. Louis to drop from first place in making flour. Minneapolis will probably lead St. Louis in the production for 1880, on account of the disasters which overtook our millers during the past year. Three of the largest mills were destroyed by fire, the largest being the Yeager, which had a capacity of 1,500 barrels in twenty-four hours. This was the finest mill in the whole west, with but one exception, and was the most extensive mill ever operated in St. Louis. It was burned in August, just at the very height of the flour season, and had but a short while before been stocked with new machinery. Its owners had several times previous met with losses by fire, and had had embarrassments in business, and just as they were straightened up, with an immense amount of wheat and flour on hand, a fearful conflagration swept away the handsome property which had but one week before commenced to net its owners \$1,000 per day—the only time in the history of the concern that it had begun to pay handsomely. The insurance being small, in proportion to the loss, the owners of this mill were not able to rebuild, nor could they raise the money in this great, wealthy city. The ruins of the building still stand, a blot upon the enterprise of the city. The leading spirit in the Yeager mill has gone to Illinois to engage in the same business, but not on so great a scale. Another mill of 300 barrels capacity per day burned in October, and about two weeks ago the Pacific, with a capacity of 1,000 barrels per day, also was destroyed. The latter will be rebuilt, as its owners are men of large means. Prominent millers tell me that St. Louis will not be behind this year (1881) in producing flour; that she will again keep the front rank. The twenty-three mills now in operation here produce daily about 10,000 barrels of flour. The largest now running has a capacity of 1,000 barrels per day, which will be increased at once to 1,500. Another mill will be erected by a company operating a smaller concern, with a capacity of 1,500 barrels per day. The Pacific, when rebuilt, will turn out that much. Five other mills will greatly increase, and the plans are drawn for another large mill of 1,200 barrels daily capacity. It will require these many additions to make the necessary gains to place St. Louis in the front rank. The falling behind, the past year, although due to the destructive fires which swept away one-third of the milling capacity of the city, is a sore subject with the millers and flour dealers here, especially as Missouri has ranked so high in milling products and taken premiums all over this and foreign lands.

The export business in flour for the year 1880 shows a gain of 298,104 barrels, the total shipments amounting to 3,253,139 barrels. The flour business is worth to this city about \$25,000,000.

The shipments of grain in bulk by the river route during 1880 showed a very large increase. The total amount of wheat shipped from St. Louis to New Orleans, down the Mississippi, was 5,578,240 bushels, against only 3,187,343 bushels over the shipments of 1879. It is claimed by the best authorities that they would have been much larger if there had been enough boats and barges, as well as elevator capacity. This is another instance of slowness of action in this place. It was known the year before that extra boats were needed, and that

the elevator capacity was insufficient to handle the grain which comes to this market, but our capitalists were too cautious to invest their money, before they knew the grain would be on hand, or in the country barns; they are, in short, not far-sighted enough, and this is where St. Louis loses many an advantage. Now that the jetties are opened, and there is a surplus of grain on hand, they are moving slowly in the matter, and are increasing the elevator capacity as mentioned above. Jay Gould has turned his attention to this river, and will reap profits, which St. Louis capitalists should have secured. As soon as navigation is reopened forty-five of the Gould barges, which are now ready, will be put on the river. These barges are built very broad and shallow, having a fifty foot beam instead of thirty, as the others are. There is to be a large wheat elevator built at Belmont, on the river, about thirty-five miles from the south line of Arkansas.

Exporters of grain and flour tell me that during the past year the demand has been very great; that not a firm in the exporting business but could have sold twice the amount of stuff had there been proper shipping facilities from this point. Your correspondent had an interview with a prominent exporter in reference to the river route, and here is what he claims for St. Louis in this respect, which, if true, is good for this city, and may set shippers in other cities to thinking, as well as furnish a subject for discussion for the press as to the rail and river route. He said that "the grain association formed here several years ago lost \$100,000 by its constituents in testing the river route, but the humidity of the Gulf stream was clearly demonstrated, and that not a single cargo that was sent abroad via New Orleans during 1880 but has reached Europe in good shape; that England and her merchants have never appreciated why the St. Louis flour mills have stopped some of the English mills, and they have based their ideas on what could be manufactured from the No. 2 red and No. 2 white wheat obtained from Baltimore and New York, when the fact is that the class of wheat obtained from these markets has an altogether different constituent part, lacking the glutinous substance of the wheats raised in a line drawn through Virginia, Kentucky, Tennessee, southern Illinois, Missouri and southern Kansas; that the constituent parts of the wheat in the section mentioned are so different from that raised in northern Indiana, northern Ohio, Wisconsin, and Michigan, that the flour made from wheat raised in the latter section will not bring, even in the consuming markets of this country—mainly in New England—as much as the third brands of the mills in the section of country first spoken of. The consequence has been that, while the French and Belgian millers have appreciated the wheat from the first section mentioned, and, as the exports from New Orleans will show, have taken nine-tenths of the wheat exported from the country tributary to St. Louis, or in the line of country spoken of, the English millers have not had a chance to touch these wheats; and basing their ideas on the so-called No. 2 red winter of Baltimore and New York, have turned out a flour that has not given the satisfaction that the flours exported from St. Louis have. No doubt, in the future, after the classes of the wheat raised in the line first spoken of have been fully tested in the United Kingdom, they may manufacture such flour as will compete with the mills in the Virginia-Missouri-Kansas scope of territory; but as the Richmond mills, and some of the St. Louis, will find their main markets in South America, principally Brazil, it will not have the effect upon the mills of St. Louis that it might have, had they no other outlet. If the government will extend to a line of steamers from New Orleans to Brazil the same inducements that they have extended the Roach line of steamers from New York to Brazil, there is no question but that the Mississippi valley will supply to Brazil the larger part of the flour consumed in that empire, and instead of having the coffee trade of the Mississippi valley supplied by New York and Baltimore, it will come by way of New Orleans and Mobile."—*St. Louis Cor. of the Chicago Times.*  
  
A WATCHMAKER at Copenhagen, of the name of Sonderberg, is reported to have made a watch which requires no winding up, inasmuch as it performs that work itself by means of an electric current. An electric magnet fixed inside the watch keeps the spring perpetually in a state of tension. All that is required to keep the watch running is to preserve the battery in proper working order, for which purpose one or two inspections in a twelvemonth are said to be sufficient.

MILLSTONES.

Facing, Hanging, and Running.

BY BRYAN CORCORAN, OF 31 MARK LANE, LONDON, E.C., ENGLAND.

[The following article was read by its author, Mr. Corcoran, before the meeting of the British and Irish Millers' Association, and the text is reproduced from THE MILLER, London, as amended by the author. For the illustrations we are indebted in part to Mr. Dunham, publisher of THE MILLER, and Mr. Corcoran, the author.]

GENTLEMEN—Mr. Alderman Hadley honored me with a request to read a paper, which I have now much pleasure in doing. After some consideration I came to the conclusion that the most important study of a miller is the true face and working of a millstone, and I think the subject is of increasing importance. Millstones are not displaced from their high position by roller mills.

The millstone can fairly afford to allow the roller mill to assist in some departments, but when the roller mill threatens the very existence of the millstone, it is time to step forward and challenge its arrogant pretensions.

"Demetrius, the silversmith, who made silver shrines for Diana," said to the craftsmen at Ephesus, whom he called together with the workmen of like occupation, "Sirs, ye know that by this craft we have our wealth."

In like manner I come before you as an advocate for the millstone, as a millstone maker of the third generation, my grandfather having started the business nearly 100 years ago. Here, thanks to the establishment of the National Association of British and Irish Millers, we have an impartial tribunal where we can each and all plead our cause, and in our technical papers, The Miller and the Corn Trade Journal, we can make our voices heard.

Many millstones in use are not suitable for the present new system. There are also a great many millstones hung in such a way that they are incapable of high-class work, and, nevertheless, all these have been doing the work of the country, proving that with superior workmanship, and greater care in details they are capable of doing far superior work. I meet some who do not believe in these niceties, others who do not understand them, and many who do not realise their importance, so I have endeavoured to treat each item so that any ordinary workman can understand it, risking repetition of some facts that are not new; and I have rather tried to include all that bears on the subject in a consecutive form, and so avoid the necessity of repeated explanation every time the subject is brought forward. I feel that if I can impart to you my own conviction I shall have raised the ground of argument from, Are millstones better than rollers? to What is the best dress, &c., for millstones, and best condition, &c., for rollers, to accomplish any result desired by the advanced miller? In the natural course of events, some other way than that of running the upper stone may come into use. Some persons advise running the lower stone. The want of practical belief in the necessity of carrying out the details has in many cases allowed the roller millers to gain an advantage.

I have avoided bringing forward any other subject in order to give this one more importance, and I hope an opportunity will be given me to read another paper on the large subject of Millstones at some future time.

FACING.

The face of a millstone should be a "plane" or level surface. (I leave the "dress" and "swallow" for some other opportunity.) Mr. Babbage, writing some fifty years ago, says: "If two surfaces are worked against each other, whatever may have been their figure at the commencement, there exists a tendency in them both to become portions of spheres. Either of them may become convex and the other concave, with various degrees of curvature. A plane surface is the line of separation between convexity and concavity, and is most difficult to hit; it is easier to make a good circle than a straight line."

The plane may be obtained with machinery, as in turning and planing. In obtaining it by

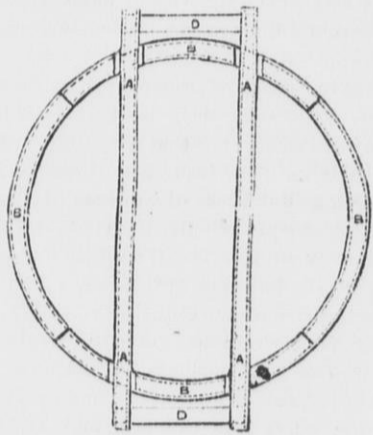
known them to do so, or certainly not without wasting their labor.

The number of beds I prefer for many good reasons is three, fig. 1, supplemented by three others as in fig. 1A. These beds indicate definitely where the plane or face will be and are themselves part of the finished face. Each bed must be made true from end to end before beginning the next, and each bed must "staff" on all beds that it crosses. My workmen have to follow this plan, and they all prefer it to any other when they once understand it.

In turning and planing, accuracy depends on the machine. Machines standing on the face of the millstone naturally follow the inaccuracies of the surface on which they rest and give bad results. The idea of the lathe may be obtained for hand work by using a trammel to staff a ring or circular bed on the face of the stone, and the idea of a planing machine is obtained with the straight beds, the intervening surface in both cases being levelled with the aid of the staff and mill-bill (mill pick) (for I do not intend to consider the relative advantage of the "diamond," "corundum," or other means).

A circular staff indicates at once the high place, as it cannot mark the low parts, and is certainly almost indispensable to a miller who wishes to keep his stones in floor or out of winding. It can only take a bearing on the part that wants taking down, so that it requires less skillful handling than a straight staff. A miller seeing it used for the first time would be surprised to find how few of the stones in the mill are true enough to stand the test. The late Mr. Potto Brown, of whom I cannot speak too much, took great pains with his millstones, and I find on June 23, 1868, a patent in the name of Potto and Bateman Brown for a circular stone staff, but it is now public property, as the patent was not carried through.

[The following is a plan of the staff shown at the meeting:]



Potto & Bateman Brown's Patent Millstone Staff.

A, A, A, A.—Two parallel straight edges built of mahogany.

B, B, B, B.—Circular staff, built in segments and layers of mahogany.

D, D.—Cross bar handles, by which the staff may be held when in use.

I read the following from the specification: "In place of forming the staff as a single straight-edge, so that it gauges the stone only in one straight line across it, we so form the staff as to gauge the stone simultaneously in several lines at the same time, and so arranged that should the stone be low on any side the staff may be sure to take a bearing on the high side only, and be prevented from falling into the hollows to color them. We prefer to construct the staff of two parallel straight edges connected together by a circle somewhat smaller in diameter than the stone. When the instrument is in use, color is applied to the straight edge, or it may be to the whole of its face, and the instrument is applied to the stone with one of its straight-edges on either side of the centre or eye. These edges (if they alone be colored, as we prefer) communicate the color to the high parts on which they chance to bear; but should it so happen that the highest parts are not beneath the edges, then the ring sustains them out of contact with the face of the stone. The form of the instrument may be to some extent varied, but it will be observed that whereas the staff heretofore employed is a straight-edge, taking its bearing along one side only, our improved staff is in principle an extended skeleton surface, which, however it may be applied, takes its bearing on the high parts of the stone only. This skeleton surface or frame is very portable and convenient in use; it is kept true without difficulty, and is easily coated with color, advantages which a complete surface would not have, and the absence of which renders a complete surface inapplicable."



Fig. 1.



Fig. 1A.

hand with ordinary "stone-staff," however much or little of the surface has to be taken off, I think it is easiest to mark out beds or spaces across the face, just wide enough to allow free working of the stone-staff. Some men say they can do without, but I have never

LEVELLING BEDSTONE AND ADJUSTING SPINDLE.

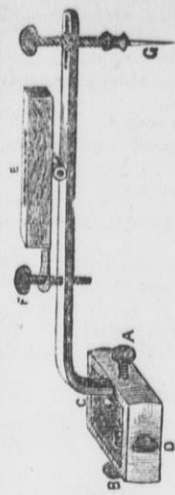


Fig. 2.—Jack-Stick with Spirit Level.

The face of both runner and bedstone being perfect planes, the "stone spindle" has to be set vertically or perfectly upright, and one of the easiest ways to accomplish this is to use a "jackstick with level;" fix it firmly with the screws A B C D on the stone spindle just below the cockhead or "cockade," adjust the level by the set screw F, and the stone spindle must be vertical when the bubble E, retains the same position in the tube in whatever direction the jack-stick is turned.

TO LEVEL THE BEDSTONE.

Without shifting the jack-stick, fix a quill G, in the end, and adjust the bedstone so that the quill just touches the face all round, and the bedstone will be perfectly horizontal. See that the step and neck fit properly and are held firmly. Also take the precaution before taking the jack-stick off to see that it has not got loose on the spindle, turn it carefully round and see that the bubble still retains its stationary position, while the quill just touches the face of the bedstone over which it passes.

HANGING AND BALANCING RUNNER.

The "centre bar" should be fixed as centrally as possible (by measuring from the circumference of the stone), or when suspended on the spindle the stone will be heavier on one side than another.

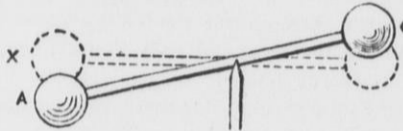


Fig. 3.—Diagram.

The balls, A, C, being of same weight, A will hang lower than C.

The stone should be suspended at a point somewhat above its centre of gravity, as it is easily balanced by adding weights to the back of the stone, but if the centre bar is fixed so that the point of suspension is below the centre of gravity, the weights for balancing need to be heavier, and below the face where there is no place for them, and the stone cannot be balanced.

An ordinary scale beam (one, for instance, about 4 ft. long, such as is generally used for weighing sacks of flour) has its knife edge at

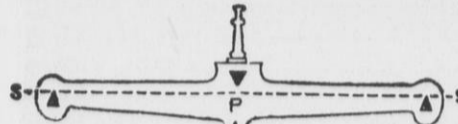


Fig. 4.—Ordinary Scale Beam.

the (pivot) fulcrum, P, about 1-16th of an inch above the line of the "knife edges" S, S (on which the scales hang); if they were on the same level the beam would oscillate too much and make the operation of weighing too slow and tedious for commercial purposes, and if the fulcrum, P, were below the line, S, S, the beam would not oscillate, for either end would remain down without recovering itself.

The stone should oscillate freely on the cockade.

Boxes are provided in the back of the runner for holding lead to adjust the balance of the stone, so that the face is horizontal while it is standing still, but it is also necessary and even more important to obtain as well a

RUNNING BALANCE.

Standing balance is an adjustment for gravitation; running balance is an adjustment for centrifugal action, caused by rotary motion.

Bodies fall by gravitation; bodies fly off from the centre of motion by centrifugal

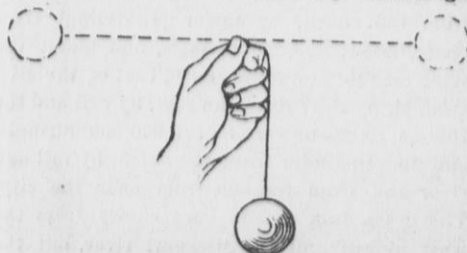


Fig. 5.—Diagram Illustrating the Running Balance.

force, and it is only by adjustment of these two antagonistic forces that the face of a millstone can be maintained in a true horizontal position while running.

It is well known that a ball attached to a string when swung round will rise till the string is nearly level. When an ordinary gov-

ernor revolves, the balls endeavor to fly from the spindle, but the arms being hinged above, the balls must rise to get away, and the greatest distance they can attain is when they are out straight, in a line level with the point of attachment. The greater the speed, the nearer they approach this line, and no speed will cause them to rise above it. A millstone that is well and evenly built and balanced for gravitation (standing balance) will run better for the care that has been expended on it, but that is not sufficient to secure a running balance, for it is practically impossible to make a millstone of perfectly even density or weight.

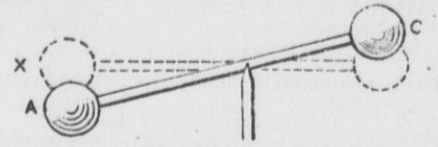


Fig. 5.—Diagram.

When rotated, the ball A will rise and C fall, and at a high speed might be on a line level with the point of suspension and return to the old position as the speed slackened. The same would be the case with balls of unequal weight at equal distance from point of suspension.

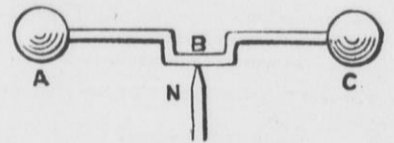


Fig. 6.—Diagram.

Equal balls, equi-distant from but above the point of suspension, when at rest would over-balance, one would be up and the other down, but both would be level when rotating fast,



Fig. 7.—Diagram.

like a spinning top, as the balls would exert equal power to gain the line level with point of suspension, and wobble and fall again as speed slackened and rotary motion stops.

Equal balls equi-distant from, but below the point of suspension, will retain their level position when at rest or rotating at any speed.

A millstone is built of separate burrs of different densities, and the backing consists of stone chips and cement which is not so heavy as burr.

The heavy or denser burr will fall when standing still, but when running will exert greater force than the light burr towards the point of suspension and cause the light burr to dip, as at Figs. 8 and 8.

Weights may be put in the bottom of the balance boxes that will balance the stone standing, and yet the light burr will dip when running, as at Figs. 8, and 8.

The same weights may be so raised that they will exert a force downwards to the line of suspension to compensate the force of the large burr upwards, so that the stone will balance standing or running at any speed, as at Figs. 8, and 8.

Hence it follows that a stone may balance while standing still, and yet not balance while running, and in the same way a stone may balance while running at a certain speed, and not balance when standing still.

Clarke and Dunham's Patent Balance Boxes have iron weights in each, and these iron weights are filled in when necessary with lead, until the standing balance is obtained. The lids of the four boxes are then fixed on, and the weights, which are suspended by a screw, are raised or lowered with a key or socket spanner to adjust for the running balance.

The runner must be raised so as not to touch the bed-stone, and made to revolve in the ordinary way.

A quill, or thin flat splinter of wood, dipped in red dye, inserted between the stones, and the point gradually brought in contact with the face of the runner will mark the

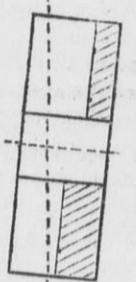


Fig. 8.—Running.



Fig. 8.—Standing.



Fig. 8.—Running.

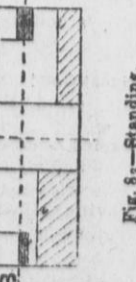


Fig. 8.—Standing.

face of the stone where it dips, or with care and a little practice, the back of the stone may be marked with a feather, or the fingers dipped in redde, on the part corresponding with the part of the face that dips and causes a hissing noise when it touches the quill. The stone must be stopped, and the weights lowered in the box A, where the back of the stone is marked or raised in the opposite box B, by turning the screw with the key to lower or raise the weights. The stone must be again revolved, the side that dips again marked, and this operation repeated until the face of the runner runs so true that no wobble can be appreciated.

The weights cannot shift, and the same balance is maintained in good order, and only requires altering with the ordinary wear and tear of the stones.

MACE AND CENTRE BAR.

The mace should grip the center bar evenly, both back and front, for should the mace M touch the center bar I, at the lot at the bot-

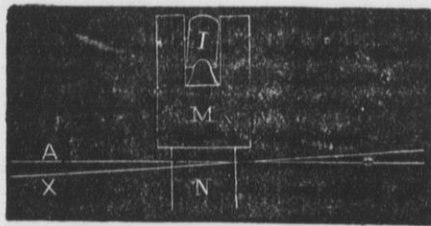


Fig. 9—Mace and Centre Bar.

tom (be the difference ever so little), it is apt to cant the face of the stone from A to X. Pieces of thin paper in the jaws of the mace will be nipped where the pressure comes when the stone is revolved, and the mace or centre bar can be filed or fitted accordingly. The driving power applied to the center bar, above the point of suspension, allows the stone to hang more feely than when gripped below the point of suspension near the mace.

PIVOT OR "COCKHEAD."

A sharp point (1, Fig. 10) is the most sensitive, but with a heavy weight like a millstone, and which has continually to be taken up and put down again, it is apt to wear or get knocked about, which alters the level of the point of suspension and destroys the balance.

If the point is made rounded (2, Fig. 10) it is subject to the same objection, or if it is flat on the top, the center bar is apt to ride, so that a half circular top (3, Fig. 10) or a perfect globe (4, Fig. 10) being more likely to be made true, appears the best, as the level of the point of suspension is the center of the sphere which is the least likely to be altered or affected by any amount of oscillation or wear.

UNIVERSAL DRIVING IRONS

Require to be carefully made, for if the four trunnions are not exactly on the same level,

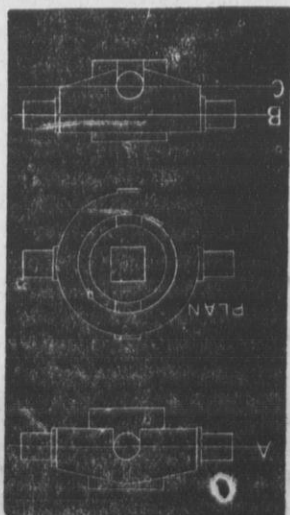


Fig. 11—Universal Driving Irons.

A, it is evident there are two points of suspension or centres of oscillation on two different levels, B, C, and it is very difficult, even if it is possible, to balance a millstone so hung.

These sorts of driving irons also are generally so near the face of the stone, or below the centre of gravity that the stone must wobble or one side drag round on the bedstone until it runs at a considerable speed.

PATENT DRIVING IRONS.

There are many patent driving irons, and some from America are guaranteed to produce a standing or running balance. I have examined a few, but I fail to understand how it is accomplished. By investigating the shape of pivots, levels of the centers of oscillation, fit of the bearings, and position where the power is applied, the weak points may be easily detected, and it should be borne in mind that increased number of bearings means increased chance of inaccuracy.

SPEED.

In England, 110 to 140 revolutions per minute is a fair average for a four foot stone. In France I find it about the same, viz: 490 meters on the circumference.

The dress of the stone must to a great extent be regulated by the speed, quality of the stone, and work desired to be done. The dress that is suitable for 110 revolutions is not likely to suit the quantity of material that would pass through the stones running at 160 revolutions per minute, whether with low, half-round, or high grinding.

RESULTS OF DEFECTS.

If the stone is not pivoted in the center, although it may be balanced so that the face runs in a true horizontal position, or if the stone is not properly balanced, there will be a side strain, causing wear on the side of the neck and toe of spindle, and undue wear of the neck and step brasses. If the stone wobbles, or one side drags on the bedstone, the stones wear unevenly, and are apt to strike fire, unless there is sufficient meal between them to protect the surface, like a fender between a steamboat and a landing stage, and some of the flour will be killed and the rest not properly ground, and the meal will be treated as though the faces were not true, causing vibration, waste of power, wear and tear or expenses for repairs, production of less flour, and of an uneven and much lower quality than the wheat is capable of yielding, and requiring finer silks and more dressing and purifying machinery than is necessary; the bran cannot be clean, and some is so finely powdered as to be very difficult of separation.

STIFF DRIVING IRONS.

Keep the stone rigid in the position in which it is set, but it requires care to adjust it each time it is put down. If set exactly horizontal, one side cannot drag on the bedstone, but unless properly balanced it will exert its power to take its own course, which would be a wobble, causing undue wear of bearings, etc., and it cannot well relieve itself should any foreign substance enter with the wheat without lifting the spindle, or the stone if it is loose.

I have heard it stated that a runner hung in the ordinary way is floated, or its weight practically diminished by about 1 cwt. for each bushel of grain ground per hour.

Mr. J. H. Carter, in his paper read before this Association in January last, in speaking of an experiment with stiff irons, says, "We anticipated at least an increase of 10 per cent of middlings over balanced stones. The result was *nil*, and we attribute it to so much of the weight of the stone being carried by the wheat that the runner, as it were, became unsteady on the irons. It is also more troublesome to keep in order than the balanced stones. In shelling oats and ending wheat, from which the idea originated, the operation is a light one, no appreciable pressure of the stone being required.

Under stone running requires very careful balancing, and if fixed rigidly to the spindle it works like on stiff irons. Unless the upper stone is simply held in position by its own weight there is no relief in the event of any foreign substance entering. The advantages are that the feed drops on a live instead of a dead surface, is at one distributed, cannot collect on any part of the face, and is perhaps capable of doing more work than with the upper stone running. With mills of small size any degree of pressure can be exerted, and a large feed can be passed through, which would lift the upper stone off its bearings were it to depend upon its weight only.

There are also advantages for certain classes of work. For instance, in splitting beans the object is to open, but not in any way to grind them (or a greater quantity is required to fill the bushel), and the live under-stone drives them out as soon as their size is reduced so that they cannot be nipped between the two faces again.

BOTH STONES RUNNING.

If stones run in reverse directions the speed

of each need be only (60) half that of one stone running (120), or they can go respectively at different speeds (as 40 to 80) to make the faces pass each other at the same rate; but I know of no advantage of this arrangement to compensate for the trouble of running both stones. If both stones run one way, the practical speed of the faces is only the difference of the speed of one beyond the speed of the other, causing loss of power without corresponding advantage.

VERTICAL MILLS.

Millstones working in a vertical position would not, I should think, distribute the feed equally over the surface. One runner with two faces can do double work between two bed or fixed stones, but the two faces of the runner must be exactly parallel.

CONCLUSION.

A master miller who personally tests periodically with a circular staff, jackstick and quill, that the stones are true and in running balance, need fear no competition in manufacturing, and a journeyman who can accomplish it need never want a berth.

An upper runner is the easiest to take up and put down, is easy to drive, is the best understood, and least liable to accident; and I believe that an upper stone free to oscillate, with an inclination, or rather a powerful determination to retain its perfect horizontal position against all obstacles while running at any speed, is not to be equalled.

The introduction of the purifier for middlings has so altered the work required of a millstone, from grinding to granulating, that I believe very few millers know to what extent the millstone is capable of doing the work for the present system of milling.

I refrain from saying anything on milling in the presence of so many who understand it, and I trust that I have proved that millstones can be made to run with a perfectly true adjustable parallel space between the faces, and are capable, with suitable dress, to do the work like rollers, besides that which rollers cannot do.

Mr. Smith, of Stone, Staffordshire, showed me last week a sample of spring American wheat, granulated at one operation through a pair of four-foot stones, in which there was, I should judge, less than 10 per cent of flour; the semolina and middlings were excellent, the bran not smeared but in favorable condition for subsequent treatment at the discretion of the miller, and the flour adhering was in a dry, granular state, easily removed as middlings flour. Middlings can be reduced by small millstones, or by the skirt of larger ones, with good results, and I think it will be allowed that flour may be killed by rollers.

Historical Sketches of the Corn Trade.

During the Commonwealth, a time when one would naturally suppose that society in general and trade especially were enjoying unprecedented exemption from state interference, an incident occurred at Reading showing what arbitrary measures were adopted even by the champions of liberty when circumstances rendered the adoption of despotic measures expedient. The high price of corn having alarmed the Executive, lest national distress might be fomented by political agitators into civil commotions, the Lord Protector of the Common-wealth, disguising himself as a miller, repaired to Reading with the commendable object of "bearing" the market. Having looked at some samples of wheat he offered what he considered a fair price for it. His evident disposition to buy prompted the unsuspecting farmers to increase their prices in proportion to his requirements and to meet his bids with counter offers at advanced rates. The typical miller would have struck a bargain by splitting the difference; but not so the irascible Cromwell. Swelling with indignation he adopted a more prompt but less pleasant method of closing the business. Beckoning to a couple of soldiers who had accompanied him, he ordered them to seize and hang the two astonished agriculturists, who had so outrageously presumed to place their own prices on their own corn. His orders were promptly carried out, but the effect upon the market, although very depressing in one sense of the word, was not exactly what Oliver expected. A general stampede of the farmers was the immediate result, and the following market day found very little corn and very few farmers on the road to Reading market. The scant supply naturally induced higher prices, and Oliver found the last state of that market worse than the first.

In all ages and in all countries unsuccessful efforts have been made to control the price of corn. Only a few weeks since an effort of this

sort was made in Russia, when the Government, alarmed at the high prices prevailing in St. Petersburg called upon the dealers to supply a certain quantity of corn to the public at a stated price. With commendable promptitude and pardonable trickery the dealers complied with the requisition by palming off upon the innocent public a quantity of inferior produce at the prescribed price, which was, in fact, about its market value. Indeed the folly of the edict and the ease with which it was evaded were so manifest that no attempt was made to repeat it, but a more effective and less arbitrary course pursued. A large quantity of Government stores were offered to the public at low rates, and the markets, which had been abnormally inflated by speculation, gave way to a general collapse and fell in prices. Whatever temporary benefit such measures as these may effect, they are extremely prejudicial, not only to the trade itself, but also to the general public, for although artificially reduced prices may afford for a short period relief to the many at the expense of the few, in the end the many are mulcted in costs. For not only are traders obliged to adopt a wider margin of profit to cover their losses, but speculators being wary to invest in a market that is at the mercy of the Government withdraw their capital from this branch of commerce, and leave the trade in the hands of a clique who are thereby enabled to monopolize it to the prejudice of the nation at large. Merchants dare not import, lest low prices, caused by the action of the Executive, render their ventures unprofitable, while exportation on the other hand is increased, as a sure market abroad is naturally preferred to a dubious one at home. A heavy drain upon the home supply is the consequence, with high prices and the committal of further follies by a blundering Directorate.

To encourage the cultivation of corn an act was passed in the reign of William III. allowing a bounty of 5 shil. per quarter upon all wheat exported from these shores. The impetus that was given to agriculture rendered the measure one of the most beneficial errors of legislation ever committed. The land—hitherto devoted almost entirely to pasture—was extensively tilled, and wheaten bread, until then only eaten by the upper classes, came into common use in lieu of barley, rye and oat bread that formerly formed the food of the masses. In consequence of this measure the exportation of wheat increased, in the course of half a century, from about 70,000qrs during the decade ending 1700, to almost 4,000,000qrs in that ending 1750. The benefits that have accrued fully compensate the country for the temporary inconveniences attending the measure, which, besides inducing exportation, and thereby enhancing the price of bread for our own poor, supplied a cheap loaf to the foreigner at the expense of the British taxpayer. Indeed, the sacrifice made during this period by the nation would merit the gratitude of posterity but for the disagreeable fact that the benefits that were being heaped upon generations unborn, were fully discounted by the establishment of the National Debt. Our ancestors, while conferring upon us the inestimable blessing of cheap bread, virtually borrowed the purse of posterity to effect the purchase.—Corn Trade Journal.

Pottery in the United States.

There are now eight hundred potteries in the United States, the total products of which supply fifty per cent of the wares annually consumed, the chief centres of the industry being Trenton, the capitol of New Jersey, and East Liverpool, in Ohio.

The former city offered peculiar attractions to the potter, both from its railways and canals connecting it with the great cities of the Union, and its nearness to mines of the raw material. West and southwest lie the coal, kaolin, spar and quartz mines of Pennsylvania, Delaware and Maryland, and eastward the fire and white clays of New Jersey.

The clays of Ohio, Missouri, and Indiana, and abundance of fuel, have built up East Liverpool, making it the ceramic centre of the West. For thirty years it has been engaged in the manufacture of the ordinary Rockingham and yellow wares, furnishing the greater portion of the two million dollars' worth annually produced in this country. It was not until 1873 that white ware of any description engaged the attention of the Liverpool potters; to-day white granites, semi-chinas and "cream color" are manufactured in fourteen thriving establishments, and one or two firms are experimenting in china.—Miss F. E. Fryall, in Harper's Magazine for February.





**Paper Barrels.**

ANOTHER USE FOR PAPER MATERIAL.

The American Paper Barrel Company of Hartford, Ct., which has for some time been making paper barrels on a small scale, or in an experimental way, has now in operation machinery and a capacity of appointments for turning out two hundred barrels a day, with a single machine. The process of manufacture is sufficiently ingenious and interesting to make it worth our while to describe it in the pages of *The Paper World*. The pulp, made of straw, wood, rags, jute, marsh flag, or anything, in fact, from which a fibrous pulp may be made, can readily be turned into most excellent barrel material. Even jute flyings alone, when properly prepared, will make barrels of great strength and durability. The pulp is prepared in a common beating engine, similar in construction and operation to those used in ordinary paper mills, and the pulp when properly prepared is conducted to a tank on an upper floor, whence it is again conducted, by gravity, down to the barrel machine, which has for its center fixtures two barrel-shaped forms standing upright, and three or four inches apart. When the machine starts up the pulp is forced in at the bottom, passing up into the vacant space between the two barrel forms. As the machine revolves, the outer form is drawn together, contracting rapidly until the space between the two forms reaches the desired thickness of the barrel, by which time the water has all been forced out of the pulp by the immense pressure of the machine, and the pulp becomes as hard and solid as the hardest of native woods. At the turn of a thumb-screw, the inside form moves inwardly away from the pulp, and winds itself into a compact roll in the center of the machine. Then a crane is swung over the barrel and a hook attached to it, when the machine lifts it out of its place in an instant. From the machine the barrel goes to the drying-room, where it is kiln dried. The heads, made from the same material as the barrel itself, are passed under a powerful compressing press, where they receive their rimmed form, and are then fitted to the barrels as soon as they are sufficient dried to receive their hoops. An ordinary flour barrel is three-eighths of an inch thick, and weighs from seventeen to twenty pounds. The day upon which *The Paper World* looked over the establishment, an order was being filled for three hundred barrels to be used by a spice merchant in shipping spices, and barrels were being prepared for holding hot lime, for kerosene, for whiskey, for wines, for cider, for vinegar, for lard, for honey, for butter, for fruit, for flour, and in fact for almost every thing for which barrels can be used. There were also wash-tubs, bath-tubs, pails, buckets, powder kegs, etc., scattered around, all being made from the coming king of the paper trade—pulp.

The inventor of the barrel and of the barrel-making machinery has also invented a preparation of wash for use in barrels intended to hold liquids, lard or kerosene, which precludes any penetration of the barrel's contents into the barrel proper. Pieces of broken barrels were seen floating around in vessels of running water, where they had been for days, without being softened apparently or at all affected. Three and a half tons pressure has been applied to one of these barrels without affecting its ribs in the least. A flour barrel can be made for twenty-two cents as against forty cents for one of wood; an oil barrel for one dollar which in wood costs a dollar and thirty-eight cents. The Standard Oil Company is now testing these barrels with the view of adopting them for future use in its business. Barrels have been made by the American Paper Barrel Company, for samples only, of wheat straw alone, of pulp made from pine shaving alone, and also from spruce. The patents for the machines upon which these barrels are made were taken out by Mr. George W. Laraway, then of Port Byron, N. Y., on May 2d, 1876. Patents for improvements were also taken out July 30, 1878, and experiments have been making by way of perfecting the machinery until success seems to have crowned the efforts of both the paper barrel inventor and paper barrel manufacturer. Verily, great is paper, and Pulp will soon be king.

**PARAFFINE AS A PROTECTION TO WOOD AND IRON.**—A German scientist recommends paraffine as an efficient means of protecting wood against damp, acids and alkalis. The wood is first well dried, and then covered with a solution of one part melted paraffine in six parts petroleum, ether or bisulphide of carbon. The solvents evaporate quickly, leaving the paraffine in the pores of the wood. Great care must be taken in the use of this prepara-

tion, as paraffine, as well as petroleum, ether or bisulphide of carbon, is especially inflammable; and even the vapor of the last two mentioned substances, if mixed with air, may give rise to dangerous explosions. Paraffine melted with equal parts of linseed oil and rapeseed oil is also very useful to protect iron from rust.

**The Sandwich Islands.**

The *Auckland Evening Star* gives the following account of the present prosperity of the Sandwich Islands and their industries: "We recently arrived in Honolulu, and what struck us at once was the business activity of the place. This has been caused by the reciprocity treaty with the United States. Sugar plantations are springing into existence all over the group, and the amount of sugar exported to San Francisco is enormous. This ship took in during our stay of twelve hours, 700 tons, and large quantities are sent regularly by sailing vessels. The export last year was little short of 20,000 tons, and this year it is estimated to reach 30,000 tons, so great has been the growth in number and size of the plantations. A gentleman named Claus Spreckels, of San Francisco, is the greatest, and nearly the only, operator in the production of Honolulu sugars. He is pretty well liked, and has spent very large sums of money in irrigating his plantations—the only plan he could adopt with the land he had leased. He has introduced Chinese to a large extent, and with so much success that Chinese labor does nearly the whole work of the plantations. So great has been the influx of Chinese, that from 1,500 in 1876, there is now a population of nearly 12,000 in the group of Hawaiian Islands, and, by their industry and cheap living they are gradually closing all the avenues of labor to the native and European. They either buy or lease every bit of land fit for agriculture they can get hold of. All the vegetables and nearly all the fruit produced are grown by them. On the swampy lands that were really desolate marshes, they are growing rice; and they give quite a high price to lease this description of land. For one piece belonging to the Dowager Queen Emma, of 1,000 acres, near Honolulu, they pay a rental of \$500 per annum. The natives do not like the Chinese at all, and many of the white population view the influx with dismay; but what is to be done? The natives will not work; and even in all the tirades written against the Chinese the admission is made that the race possess the virtues of industry and perseverance. The King is having an extensive new palace built, which is to cost a heap of money. And while I am on houses I may say I was much pleased to see the very handsome wooden residences there are in Honolulu. Auckland has nothing to compare with them for elegance, finish, or anything else. There are in Honolulu 14,000 inhabitants, and the place has an appearance of far greater activity than Auckland. Freehold property is 'booming.' Land that could be got a few years ago at \$10 per acre is now bringing from \$100 to \$150. City property is increasing in a similar manner. About twelve months ago a corner piece, fronting the main street 90 feet, brought \$10,000."

THE increase of the population of the city of Berlin, Germany, is altogether unparalleled in the history of capitals. In 1860 its population was 528,900, while, according to the census taken recently, it now contains 1,118,630, an increase of more than two-fold in 20 years. Rapid as has been the growth of American towns, it is questionable whether anything equal to this can be shown in America. This increase in the size of Berlin is the mere singular inasmuch as Berlin possesses no natural advantages whatever. There is no doubt that Berlin owes its increase to the immense though temporary prosperity induced by a plethora of money after the wave of conquest on the crest of which the Germans swept through France.

**WHERE OUR FORESTS ARE GOING.**—To make shoe-pegs enough for American use consumes annually 100,000 cords of timber, and to make our Lucifer matches, 300,000 cubic feet of the best pine are required every year. Lasts and boot trees take 500,000 cords of birch, beech and maple, and the handles of tools 500,000 more. The baking of our bricks consumes 2,000,000 cords of wood, or what would cover with forest about 50,000 acres of land. Telegraph poles already up represent 800,000 trees, and their annual repair consumes about 300,000 more. The ties of our railroads consume annually thirty years' growth of 75,000 acres, and to fence all our railroads would cost \$45,000,000, with a yearly expenditure of \$15,000,000 for repairs. These are some of the ways

in which American forests are going. There are others—our packing boxes, for instance, cost, in 1874, \$12,000,000, while the timber used each year in making wagons and agricultural implements is valued at more than \$100,000,000.

**Lentil.**

THE cultivation of lentils has received a great impetus by the discovery—er, rather, the fresh promulgation of the old discovery—that this form of pulse contains the most valuable nourishment for human beings. This is amply shown in the Egyptian agricultural returns for the present year. For the twelve months ended August 31, 1879, the total lentil crop amounted to 8,340 ardebs, a quantity somewhat larger, we believe, than the average of previous years. Egypt produced magnificent crops all round in 1879, that of cotton being the largest ever known, and lentils no doubt participated in the general prosperity. But while other crops show a considerably diminished yield in 1880, that of lentils is immeasurably the largest on record, the total outturn being 52,610 ardebs. We may, therefore, assume that the little bean—of which Egypt grows by far the finest sort—is rapidly making that progress in public estimation which its merits as an esculent deserve.

**Manitoba.**

Mr. Robert Machray recently delivered a lecture in Aberdeen, Scotland, entitled: "Out West; or, Five Years in Manitoba." He said that in his opinion *Winnipeg would be the metropolis of the great American Continent at the beginning of the next century*. With regard to the climate he said the average summer temperature was 85° in the shade, 100° being the extreme, and that though the winters were colder an Englishman wouldn't find it out as the atmosphere was so much drier. Insensible Englishmen! He did not say anything about 50° below zero in winter which appears to have been the average for some days lately, but spoke of the rich lands and great crops in glowing terms. He might have added that Manitoba furnishes a fine crop of blizzards also, enough of which gets over the boundary line without paying custom duties to thoroughly convince Yankees that they live far enough north for comforts sake. Really, the principal objections to living in Manitoba are its hot summers and very, very severe winters.

**Immigration.**

The population of the United States during the year 1880 was increased by immigration over half a million. It is impossible to accurately estimate the actual value of this great addition to our population. All brought some money, but what they brought in actual cash is but a trifle in comparison to what their labor and skill will amount to in the development of the immense resources of this country. There is room here for hundreds of millions more, and the industrious and enterprising able-bodied immigrant will be well received and furnished the opportunity to secure a competency for himself and family.

The immigration from foreign countries to the United States for the past 40 years numbers 5,273,000 persons, 534,465 of which came into this country during the year ending with June 1880. It looks as if the "old stock"—those who trace their descent from colonial families, will soon be entirely obscured. But it does not make much difference. The children of those who immigrated to this country last year when they grow up will in all probability feel and act as patriotic in the interests of our country as the descendant of the most thorough and full blooded Massachusetts colonist of the Auld Lang Syne. We do not want the criminals and paupers of Europe, but her good men and women may come and be welcome.

**A Remarkable Boiler Explosion.**

The first explosion of a stationary boiler in New York, for a period of five or six years, occurred about midnight, December 17, under decidedly peculiar circumstances.

It was a new vertical tubular boiler, which had been tested within a year to 150 pounds, and was registered at 100 pounds. It was set upon a fire box of quarter inch iron in a newly constructed brick boiler house, in the rear of No. 123 West Twenty-sixth street.

The engineer claims that when he left the boiler that evening the water was within a few inches of the top of the boiler, the fire was dying out, and, as he intended to build a fresh fire in the morning, he opened the furnace door and closed the damper and ash pan. Wood for kindling the next day's fire was in the boiler house. On going away he fastened the outer gate with a chain and padlock.

About midnight the neighborhood was star-

tled by an explosion, and, when an examination was made, the boiler house was found to be wrecked and the boiler gone. Two hours later it was discovered in the rear of No. 441 Sixth avenue, something like 200 feet from where it belonged. It was unbroken, and had fallen on its end after its long flight over a number of tall buildings.

As the gate which the engineer locked was found to have been tampered with and the kindling wood was missing, it was suspected that some one had taken refuge in the boiler house, or entered it maliciously, and had fired up leaving the furnace doors closed on going away. The two steam gauges, which fell through a skylight two blocks away, registered 70 and 80 pounds respectively.

**Prosperity in the United States.**

Our country is in a prosperous condition. There is no doubt about it. Our manufacturers, merchants, bondholders, bankers, mechanics, all admit it, and the statistical returns from National and State authorities, and from the commercial agencies, add further testimony to prove that we are now in the felicitous position of being the most prosperous nation in the world, and have got a right to rejoice over it as loudly as we please. The total number of failures in the United States during the year 1880 were 4,735, with liabilities to the amount of \$65,752,000. The failures in 1879 were 6,658 in number, with liabilities of \$98,149,053, and in 1878 the failures numbered 10,478, with liabilities of \$234,363,132. This shows that the number of failures is rapidly decreasing. Statistics also show that the number of persons and firms engaged in business in the United States in 1878 has increased about ten per cent. The stock of precious metal has been increased during the year 1880 by home production and by importation to the extent of \$250,000,000. This large increase in available currency has undoubtedly inflated prices and greatly stimulated the spirit of speculation. There are of course many of a pessimistic turn of mind who think this condition of prosperity is too good a thing to last long, and are lustily crying out a warning to "look out for breakers ahead." Others more optimistical in their views answer that we can stand prosperity for a good length of time yet, and anyhow that there is no use in trying to cross a bridge till we get to it.

**The Increased Demand for Maize Flour.**

The consumption of maize (which we almost universally designate corn) in England is yearly increasing. In Germany, millers have used successfully an admixture of 25 per cent of maize flour with rye flour. It is undoubtedly sold as *straight rye* to the consumer. The German rye crop for 1880 was considerably larger than in 1879, but it has also been found necessary, to supply the demand, to import annually large quantities from Russia, which imports in 1879 amounted to 28,591,461 centners of 110 1/2 pounds, against exports for the same time of 2,960,553 centners. Holland millers use as high as 33 1/2 per cent of maize or corn flour for admixture with rye flour. They claim that a pound of maize flour only costs half as much as a pound of wheat flour, and yet furnishes nearly as great an amount of nutriment. Now that foreign millers and dealers have got into the practice of using corn flour, it seems probable that the demand for American corn will rapidly increase, and to such an extent, perhaps, that the demand for our wheat and wheat flour at good prices will be materially interfered with. There is said to have been a firm demand at good prices for all the American corn flour that has been shipped.

There were many excellent samples of corn flour on exhibition at Cincinnati in June, 1880, and they were closely inspected by many of our foreign visitors. We were informed then that corn flour was used in different parts of Europe, to a considerable extent, for adulterating wheat flour, to meet a popular demand for cheap flour.

Sweden like Germany has adopted a protective tariff on breadstuffs. The bill establishing this tariff was supported by a party similar to our granger party here, which was strong some time ago, and having passed the legislature, has been signed by the King. The production of cereals in Sweden for 1880 was as follows:

Wheat	455,000 tons
Rye	4,536,000 "
Oats	11,614,000 "
Barley	3,542,000 "
Grain for feed	1,307,000 "
Peas	42,000 "
Beans	17,000 "
Lentils	165,000 "
	22,424,000 "

## Vale!

O the swift years!  
 Pleasure, dismayed, beholds them hurry on;  
 And love, strong love, looks back through passion-  
 ate tears;  
 Like the bright meteor that scarce appears,  
 Soon are they gone.

O the fleet hours!  
 Why, what is man?—their puppet and their slave;  
 At first his fetters wreathing with fair flowers;  
 Then galled and worn and robbed of all his powers,  
 Gaining a grave.

Vale! we cry,  
 Watching in youth the sweet June roses fall;  
 They bloom again—small matter if they die.  
 Ah! yes, they bloom; but canker worms will lie,  
 Doubt not, in all.

Vale! The word  
 Later has smitten us with mortal pain;  
 Rung out the death-knell of dear hope, or stirred  
 The lips whose earthly voices may be heard  
 Never again.

Then does it wake  
 Sad recollections; haunting thoughts that grieve  
 We know the cruel wounds some farewells make,  
 We learn to dread the nothingness, the break  
 Parting may leave.

So the years run!  
 Vale! we soon must bid this brief estate;  
 But for that heritage which shall be won  
 When the freed soul with time itself has done  
 Trusting, we wait.

—The Argosy.

## A Terrible Ride.

ONE HUNDRED AND TWENTY MILES IN A STAGE  
 COACH AT FORTY BELOW ZERO.

[Letter from Chief Justice Wade, of Montana, to Judge  
 McKinney, of Cleveland.]

HELENA, Montana, Jan. 2.—*My Dear McKinney*—I arrived here on the evening of December 29, and I must give you an account of my winter journey. We arrived at Dillon, Montana, the terminus of the Narrow-gauge Railroad, on the evening of the 26th of December, and prepared to start on the stage coach for Helena—distance 120 miles. During the night it became quite cold, the thermometer being 15° below zero when we got on to the coach in the morning. As we went along the cold increased, and soon the four horses were as white as snow with frost. Arriving at the first station, fifteen miles away, the horses were changed for others, and on we went. Very soon it commenced to snow and the wind to blow a hurricane. A terrible storm was upon us, and the thermometer went down to 30° below zero. There were three passengers besides myself, one lady.

At noon we arrived at a station called Salisbury, and had dinner. The storm raged with great fury; we were in a wide valley, and there was nothing to obstruct the wind. The snow was as hard and fine as very small shot, and it pelted in the horses' faces, almost blinding them and the driver, but on we went, reaching the second station from the dinner station at 4 o'clock. Here the driver lighted the lamps at the side of the coach, and we all prepared for a night ride to the next station, sixteen miles away, where we expected to remain for the night. I heard the driver say to the stableman who took care of the horses, he did not much expect to reach the next station, but thought we should be lost in the storm. We were still in a wide valley, covered with snow, with scarcely a house to be seen anywhere, and with no landmarks except the mountains in the distance, and these the storm almost obscured.

We started out and very soon it was totally dark, the storm still howling with great fury and the cold having increased. We had proceeded but a little way when the driver lost the road. The snow and the storm had blotted out every appearance of a road, and the pelting snow and the fierce wind made it almost impossible to look for one. My whiskers and eye-lashes had become a solid mass of ice while riding in the coach. The driver cried out that he was lost, and asked some one of the passengers to take the side-lamp of the coach and go forward and look for the road. It was all he could do to keep the horses in order. I volunteered to go, and went out to search for the road. The snow was knee deep, and it was impossible to face the storm. The pelting snow seemed to take the skin off every time it struck. I wandered around in the snow searching for a road, and finally found it, and called to the driver to come on.

This I did for a long time, until completely worn out and exhausted I had to go into the coach and rest, and one of the other passengers took the lamp and went ahead of the horses, searching for the road. I found after I got into the coach that both of my ears and my nose were frozen stiff, and that my fingers holding on to the heavy iron lamp were also frozen. The second fellow that went out was a failure. He would not face the storm, and every few rods would find him walking with the storm. The driver called lustily for me,

and I went out again, but I soon lost all traces of the road. The prairie was as pathless as the ocean.

Oh, how the storm raged! It seemed greedy to find something upon which to wreak its vengeance. I could not find the road. The driver thought he could, and asked me to take care of the horses while he made the effort. I stood at the head of the horses. A fierce gust of wind took my hat and carried it out of sight in an instant. I borrowed another from a passenger. The driver was equally unsuccessful. Could not find the road. We were lost. The situation was full of peril. To remain in the coach all night was full of danger, for the cold was sufficient to freeze us, and to wander about in the snow in search of a road which would do us no good when found was equally dangerous.

Finally the driver thought it best to try and follow the back track to a certain hill and there make an effort to find another road which branched off from the hill but also arrived at the station. We turned around, but all traces of the back track had disappeared. We searched for the hill an hour and finally found it; but the other road was equally obscured. I could not walk any farther; my legs refused to go and I got up with the driver and we felt our way along by the side lamps, not attempting to follow or to find the road. After going in this way about an hour, we came to a fence. The driver knew this for they are a great rarity in this country. He also knew that there was another fence half a mile away, and if we could find the second fence, we should be within a half a mile of the station. We searched for the second fence for an hour, and at last found it, and then in a short time blundered on to the station. I do not think a fellow was ever happier to find a stage station than I to find that one.

This station is sixty miles from Helena, and the coach from Helena, due there in the evening, did not arrive until 2 the next day. We reached the station at 12.30 o'clock at night, having wandered on the prairies eight hours, lost in the storm. I went to bed in a room with an inch of snow on the floor, and it was almost as uncomfortable as being out in the storm. I believe I would much rather freeze out on the prairie than in bed.

We concluded not to take another night ride, especially as we had to go over two ranges of mountains to reach Helena, and so let the coach that came in that afternoon start back without us. It was well we did, for it was from 3 o'clock in the afternoon until 3 in the morning in going seventeen miles.

The day we remained at the station the coach came down from Helena on runners, and the next morning we started in this open sleigh for Helena, the thermometer standing, when we left, forty degrees below zero. We had six good horses and not much load. The snow was two feet on the level, but we could follow the track it made the day before in coming down to the station. Soon we passed over the boulder range of mountains. Besides the mountains always there, we found mountains of snow. It seemed as though the earth was wrapped in its everlasting winding sheet. The day was still and clear. The silence of the mountains was oppressive. It seemed as though the earth was dead.

Helena at 6 o'clock in the evening, the thermometer standing when we arrived at thirty degrees below zero, and went down to forty below before morning. I found the town buried in snow. I have been here ten years and never saw anything like it.

## The Velocity of Light.

It has been ascertained by several independent methods, that light moves at the rate of 192,500 miles per second. One method is by means of the eclipses of Jupiter's satellites. To render this mode intelligible to those who have not studied astronomy, it may be premised, that the planet Jupiter is attended by four moons which revolve about their primary, as our moon revolves about the earth. These small bodies are observed, by the telescope, to undergo frequent eclipses by falling into the shadow which the planet casts in a direction opposite to the sun. The exact moment when the satellite passes into the shadow, or comes out of it, as would be seen by a spectator at the mean distance of the earth from the sun, is calculated by astronomers. But sometimes the earth and Jupiter are on the same side, and sometimes on opposite sides of the sun; consequently, the earth is, in the former case, the whole diameter of its orbit, or about one hundred and ninety millions of miles nearer to Jupiter than in the latter. Now it is found by observation, that an eclipse of one of

the satellites is seen about sixteen minutes and a half sooner when the earth is nearest to Jupiter, than when it is most remote from it, and consequently, the light must occupy this time in passing through the diameter of the earth's orbit, and must therefore travel at the rate of about 192,000 miles per second.

Another method of estimating the velocity of light, wholly independent of the preceding, is derived from what is called the aberration of the fixed stars. The full explanation of this method must be referred to astronomy; but it may be understood in general, that the apparent place of a fixed star is altered by the motion of its light being combined with the motion of the earth in its orbit. It will be remarked that the place of a luminous object is determined by the direction in which its light meets the eye. But the direction of the impulse of light on the eye is modified by the motion of the observer himself, and the object appears forward of its true place. The stars, for this reason, appear slightly displaced in the direction in which the earth is moving; and the velocity of the earth being known, that of light may be computed in the same manner as we determine one component, when the resultant and the other component are known. The velocity of light has been determined also by direct experiment, in a manner somewhat analogous to that employed by Wheatstone for ascertaining the velocity of electricity.

## A Middlings Purifier Patent.

On the 28th day of December, 1880, a middlings purifier patent was granted to George T. Smith, the gentleman so well known to the milling trade from his interest in middlings purifier patent suits. The application for this patent was filed Nov. 2, 1880, being a division of an application filed Jan. 4, 1873, the original application having been filed July 12, 1871. For the information of all interested we quote the claims which form part of the specifications of the patent granted, and which appear to be exceedingly broad.

## THE CLAIMS.

1. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of different degrees of fineness, a fan for causing air-currents to pass upward through the screen, and the chest which encloses the screen and forms an air-trunk, by which the air entering below is directed through and escapes above the screen through a contracted tubular discharge, and provided with apertures which are made of different areas opposite the various sections of the screen, for the purpose of regulating the force of the current through such sections substantially as set forth.
2. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of different degrees of fineness, a suction fan placed above the screen, a chest which incloses the screen and forms an air-trunk between the air openings below and the fan above the screen, and adjustable openings placed opposite the different sections of the screen, whereby the force of the current may be regulated according to the texture of the cloth and material to be treated, and the material raised by the fan is carried away through the tubular mouth of the fan-case, substantially as set forth.
3. The combination, in a middlings purifier, of a fan and reciprocating screen clothed with cloths of different degrees of fineness, a chest which incloses a screen and forms an air-trunk, causing the entire current to pass through the screen, and constructed with transversely-elongated and adjustable openings extending across the cloth, so as to equalize the action of the atmospheric currents upon the material traversing the sieve, substantially as set forth.
4. In a middlings purifier, in combination with a suction-fan and reciprocating screen clothed with cloths of different degrees of fineness, a chest forming a portion of a continuous wind-trunk inclosing the screen, and auxiliary wind-trunk connecting the fan with the interior of the chest through a series of openings of different areas placed opposite to the different sections of the bolting-cloth, substantially as set forth.
5. The combination, in a middlings purifier, of a reciprocating screen clothed with cloths of progressively coarser mesh, a fan for causing an air-current through the screen, a chest which incloses the screen and forms part of a continuous wind-trunk to conduct the air put in motion by the fan through the entire extent of the screen, and controlling its delivery after it has passed through the screen, and a contracted tubular air-discharge, whereby a film of middlings is subjected to a current or air uniform across the width of the screen and

continuously increasing in force as the residuum becomes continually coarser and the cloth proportionally increases in coarseness of mesh, substantially as set forth.

6. The combination, in a middlings purifier, of a screen having cloths of different degrees of fineness, a fan, and chest which incloses the screen and directs the air-currents through the entire series of cloths, while the middlings pass from the finer to the coarser sections, a hopper which collects the middlings as they fall through the cloths, and a conveyer and slide for remingling the middlings from two or more cloths after they have separately passed through cloths adapted to their several sizes, substantially as set forth.

## Jay Gould.

JAY GOULD is forty-five years old, but looks younger. There is a slight tinge of gray upon his black beard, and his high, full forehead and sharp, dark eyes attract notice. His friends say that within a year or two he has changed his method of doing business, when he used to manipulate stocks altogether. They say he is now exclusively engaged in the establishment and management of great telegraph and railway enterprises. But it won't do to rely wholly upon the apparent stillness of the man who holds the stock market by the throat, and can choke shekels out of it whenever he happens to be in the mood. Some twenty years ago Mr. Gould married a Miss Miller, whose father was of the firm of Dater & Co., grocers. They have six children. Mr. Gould is eminently a man of habits. At the close of business he rides home, takes dinner with the family, and passes the evening in his study. In this room are the telegraphic operator and his private secretary. Private wires enable him to communicate with his broker and aids all hours of the day and night. No man works harder than he. Wine and tobacco are forbidden guests. Reading and looking at his magnificent pictures are his only recreations. He is a generous, open hearted, largely minded, unostentatious man. To his family Mr. Gould is devotedly attached. He rarely travels either for business or pleasure, unless accompanied by some of his children. They have anything and everything they want, and do just as they please. Mr. Gould is at all times the plainest of men.

## A Disheartened Inventor.

It was in a smoking-car on the Hudson River Road. A New Yorker was exhibiting an invention to several gentlemen, when an old farmer, with a settled look of sadness on his face, heaved a sigh and said:

"I never see such things without wanting to weep."

"Nothing about the invention to weep over that I can see," replied the inventor.

"Wall, it sort o' calls up old recollections. Twenty years ago this month I thought I had a fortune in my grasp. Yes, sir; I believed I had struck the biggest thing since steam was brought into use."

"What was it?"

"One day when the old woman was flat down with her lame leg I had to cook my own dinner. After I'd got the pancake batter all fixed up I couldn't find the greased rag the old woman used to rub over the spider. Sort of absent-minded like, I picked up a piece of raw turnip from the table and used it instead. It worked to a charm, no smell, no smoke, no stick."

He paused here to wipe away a tear, and then continued:

"There was the fortune. I figured that 9,000,000 greased rags were in use in this country nine months in the year. Fifty thousand barrels of grease were used up greasing spiders. Over \$100,000 wasted and gone. One turnip would make six greasers—1,000 bushels would make enough to supply the country. All that was needed was to cut them out in fancy style, affix a handle, and go to supplying the demand at 10 cents each."

"There was money in it"

"No, there wasn't. I bought 100 bushels of turnips, \$56 worth of wire, and hired two men to go to work, and then I took some greasers and went over into Vermont to see how it would take. They wouldn't have it. They had something more simple and much cheaper."

"What could it have been?"

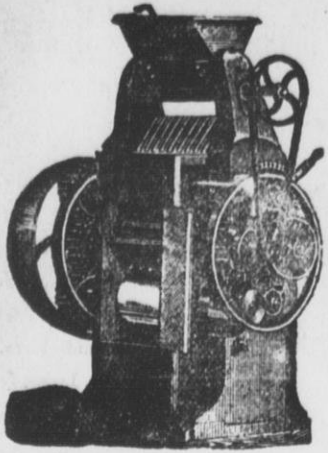
"They spit on the spider," replied the old man, as a tear made a break down his nose and was swallowed up in the dust on the floor.

Jas. Andrew's flouring mill at Mitchellville, Iowa, was totally destroyed by fire on the 6th inst. Loss, \$10,000, with no insurance.



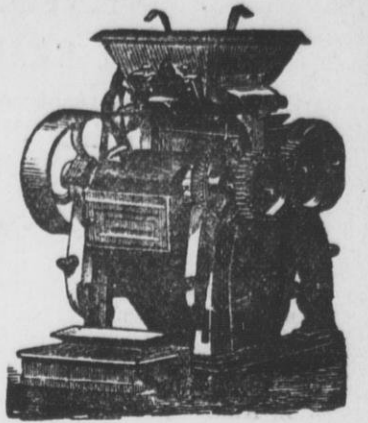
VIENNA EXHIBITION. 1873, Awarded Diploma of Honor.

PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



# GANZ & CO., Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Anstro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling the Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mill, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following :

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than industrially. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purpose of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wonderful as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable, I remain, etc.,

(Signed) C. HAGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1876.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

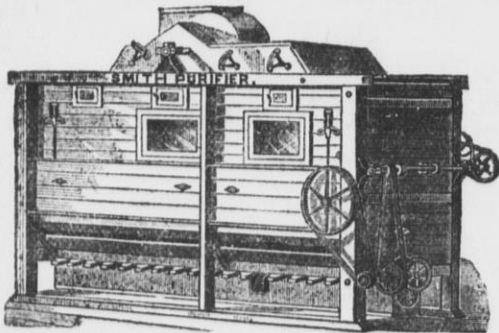
## GANZ & CO., Buda-Pesth, Hungary.

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOP GRAIN CLEANER CO., Auburn, New York.

[Mention this paper when you write us.]



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of equal capacity. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

### THE GEO. T. SMITH MIDLINGS PURIFIER

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery—THE LOCKWOOD MEDAL—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich.

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## SMITH BROTHERS, Practical Millwrights.

Plans, Specifications and Estimates made for all kinds of

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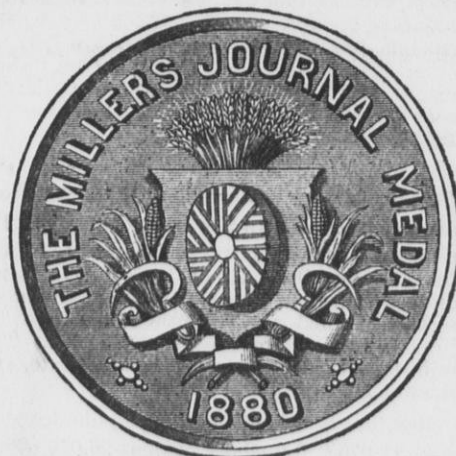
Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

No. 454 Canal Street,

MILWAUKEE WIS.

[Mention this paper when you write us.]

THE LOCKWOOD MEDAL, "Awarded to the Geo. T. Smith Middlings Purifier, as the machine marking greatest progress and utility in its application to the grain and milling interests, invented within the last ten years."  
Miller's International Exhibition, Cincinnati, Ohio, 1880.



### FLOUR MILL FOR SALE.

Anyone desiring to purchase a 3-run Mill, driven by two water wheels, in a good neighborhood, and suitable for custom or merchant work will address

A. C. BURNETT,

Maquen, Knox Co., Ill.

[Mention U. S. MILLER when you write.] dec

### German and Austrian FLOUR MILL DIRECTORY.

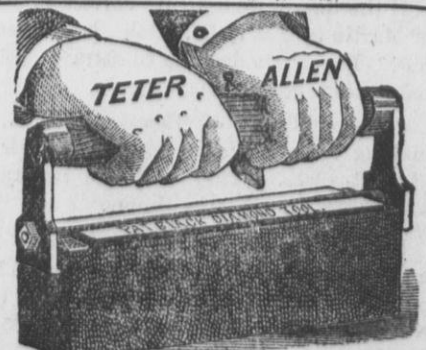
Compiled from official sources and giving in every instance the number of runs of stone and kind of power used, just published at Leipzig, Germany. This work is of great value to all who desire to build up trade with Germany or Austria. Price, \$9 per copy. Sent by mail on receipt of price. Address

UNITED STATES MILLER,

MILWAUKEE, WIS.

CHRISTIANA MACHINE CO'S  
SPECIALTIES.  
PORTABLE BURR MILLS  
MILL & FACTORY GEARING  
CIRCULAR SAW MILLS  
with improved Ratchet head blocks  
STEAM ENGINES.  
SHAFTING PULLEYS AND HANGERS.  
TURBINE WATER WHEELS  
AND MILLING SUPPLIES.  
ADDRESS, CHRISTIANA, LANCASTER CO, PA.

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Over 4000 now in use. Guaranteed the best Tool in the market for smoothing the face and furrows, removing glass, and restoring the burrs to their sharp, natural grit. It is far superior to Emery or Corundum. Used with or without water. Too large to send by mail. Price, \$2.50. Will send our Tool on trial against any other in the market, Miller's to pay for the best after a trial. Sold by Mill Furnishers throughout the world.

See that it has "Teter & Allen, Pat. Black Diamond Tool" on the plate.

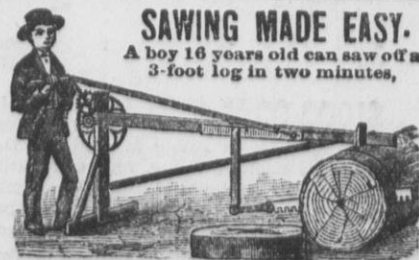
TETER & ALLEN,  
404 Commerce St., Philadelphia, Pa.

[Mention this paper when you write us.]

### 5-Run Water Power Flour Mill For Sale.

It is four stories high with stone basement. 4 new purifiers, submerged flume under 14 feet head. First-class railroad facilities and in a good wheat country.

Address F. M. GRAY, Niles, Mich.  
[Mention U. S. MILLER when you write.] dec



### SAWING MADE EASY.

A boy 16 years old can saw off a 3-foot log in two minutes.

Our new portable Monarch Lightning Sawing Machine rivals all others. \$50 cash will be given to two men who can saw as fast and easy in the old way, as one boy 16 years old can with this machine. Warranted. Circulars sent Free. Agents wanted. MONARCH LIGHTNING SAW CO., 163 Randolph St., Chicago, Ill.

[Mention this paper when you write us.]

# The United States

# MILLER

Volume 10.—No. 5.

MILWAUKEE, MARCH, 1881.

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

## Origin of the "Baker's Dozen."

Close by Market street (now Broadway) lived and prospered a baker, the first man that ever baked New-Year cakes—in fact, the inventor of them. The name of our friend was Volckert Jan Pietersen Van Amsterdam, commonly known as Baas. He was Dutch from his large feet to his round bald head, and had no respect for any one or anything that was not Dutch. He was a regular attendant at the old Dutch church, but, nevertheless, in constant fear of being bewitched. His wife, Maritje, was economical even to saving the parings of her nails, and his ginger-bread babies were always made in imitation of his children. It was New-Year Eve, 1665, and Baas was in his shop dealing out cakes for small pieces of money, called wampum. He had taken an extra glass of rum in honor of St. Nicholas, when he heard a sharp rap, and in walked as ugly an old woman as ever he had set his eyes on.

"I want a dozen New-Year cookies," she screamed.

"Vell, den, you needn' speak so loud," replied Baas. "Duyvel! I ain't deaf, den."

"I want a dozen," screamed the old woman, "and here is only twelve."

"Vell, den, und that de duyvel is dwalf but a dozen?" said the baker.

"I tell you I want one more!" she shrieked.

"Vell, den," said he "you may go to the duyvel and get anoder; you von't get it here."

From this time on our baker's wife and himself were made miserable. Their money and cookies were taken away by invisible hands; their bread either rose out of their sight or sank into the earth; their famous brick oven was torn down, and poor Baas pelted with his own bricks; Maritje became deaf; Baas was black and blue from head to toe; and such a life as he led was purgatory. Thrice the old woman appeared, and thrice was she sent to "de duyvel." And at last, in his agony, Baas bethought himself of St. Nicholas, who advised him, on hearing of his troubles, when he counted a dozen to count thirteen.

"Py St. Johannes the Dooper, put St. Nicholas is a great plockhead!" thought Baas; and while he was thus thinking, St. Nick. had vanished, and in his stead was the old woman. She repeated her demand for "one more" and Baas, remembering St. Nicholas, acceded to her demand, when she exclaimed, "The spell is broken, and henceforward a dozen is thirteen, and thirteen is a dozen." And taking a cookey with an effigy of the good saint on it, she made Baas swear that ever afterward twelve should be thirteen, as a type of the thirteen mighty States that should arise out of the ruins of the government of Vaderlandt.

It is well known how terribly St. Nicholas revenged himself upon those who set themselves up against the venerable customs of their ancestors, and refused the homage to him to whose good offices it was owing that this his favorite city has surpassed all others in beautiful damsels, valorous young men, mincepies, oliekoeks, and New-Year cookies.—*Harper's Magazine for March.*

## A Porky Story.

"On this day seventeen years ago," remarked a New Yorker the other day, "I shipped 1,000 barrels of pork to Washington. I was an army contractor then, and whenever I heard of a barrel of pork I went for it and bought it at some price. I remember this particular shipment because a serious mistake was made."

"How?"

"Well, I counted the barrels at the depot myself, and there were only 990, when there should have been an even thousand. Men were ready to roll the barrels into the freight cars, and to make my number good I took ten barrels of lard from a stock ready to ship to Baltimore. They mixed in all right, and, of course I expected to pay for 'em. A whole

day went by before I saw the owner. These were stirring times, you remember. He had found himself short, and he cribbed ten barrels of beef to make good his number of barrels, and hustled the shipment away."

"And who did the beef man crib from?"

"Well, his beef was for the soldiers, and he made himself good by buying three barrels of vinegar, two of crackers, and stealing five barrels of apples from a lot in the depot."

"And did it go any further?"

"Yes. The most curious thing of all was that the man I took the lard from sued the man who stole the apples, and got judgment against him for the worth of the lard, and none of the rest of us were out a cent."

## New Method of Constructing Factory Floors.

A curious method of laying floors is used in France when great solidity is needed, and which has obtained a wide application. It consists in putting down a floor, not, as usual, on sleepers, but embedding the boarding in asphalt. Pieces of oak, usually about 2½ to 4 inches broad and 12 to 30 inches long and 1 inch thick, are pressed down into a layer of solid asphalt not quite half an inch thick, in the well known herring-bone pattern. To insure a complete adhesion of the wood to the asphalt and obtain the smallest possible joint the edges of the pieces of wood are planed down, bevelling toward the bottom, so that their cross-sections become wedge-like. It is stated that these floors are used mainly for ground storeys in barracks and in hospitals, and that they have been laid in numerous newly-constructed forts around Metz. A number of advantages are cited in connection therewith. A plan in some respects resembling this has been employed in the construction of the floors in a new factory recently erected by Messrs. Bliss & Williams, Brooklyn. It is similar, however, only in some of the more general features, the details being altogether different. Sleepers are employed, but instead of stretching between supports they are solidly bedded in concrete. Upon them planking is placed, each plank as laid being bedded in hot tar. One of the most annoying points of many otherwise well-built factories is their poorly-constructed floors. A tight, smooth, strong and durable floor is what is wanted, but in floors as commonly constructed some of these qualities at least are lacking. A floor on which heavy machinery can be placed without regard to the position of beams and girders is a rarity. Floors which have to rest upon the ground, as ordinarily built, are constantly wearing out, and are never to be depended upon. The construction employed in the factory above mentioned combines all the desirable qualities which we have mentioned, and avoids the objectionable features. The business conducted in this factory, which is the manufacture of presses and dies, is such as will test any floor quite severely. Accordingly, whatever construction is satisfactory in this case is very likely to prove desirable in other instances. The following description shows the construction employed. The surface of the ground after the top earth has been removed was thoroughly smoothed and rolled. Four inches of concrete was then applied, and, while this was soft, locust stringers were spaced about 30 inches between centres. After the concrete had become perfectly hard and solid, 2 inch planks of Georgia pine were laid, each plank in turn being bedded in hot tar, which was spread on to the concrete as fast as the planks were laid and spiked. The result is a floor upon which the heaviest machines can stand in any convenient position without the necessity of any special foundations. Moreover, it is waterproof, dampproof, and no miasma can arise from the ground through it. A floor of this kind is both cheap and solid, but an advantage which will appear to every factory

owner and builder is that such a floor will last until worn out from the top. There can be no decay from the under side. It is reported that floors constructed upon this general plan have been in use in some of the older factories upwards of twenty-five years. They have not, however, come into general use.

## An Emphatic Witness.

Allick Thompson, of Virginia, tells a story illustrative of the peculiar vernacular of the people among whom he was born, and of their special capacity for giving evidence in a court of justice in a compact, accurate and picturesque style. Some time ago he chanced to be visiting at a county seat in Virginia, and was courteously invited by the Commonwealth's attorney to come into the court-room on the following morning, with the assurance that a witness would testify in a murder case then pending. He entered the court-room, and speedily after his arrival a witness was called, who advanced to the stand with such a jaunty air of self-assurance, and who kissed the book with such loud-sounding confidence, that he was sure that this must be "his man." His judgment was not incorrect.

"Mr. Williamson," asked the Commonwealth's attorney, "do you know anything of the killing which took place at Robertson's store last month?"

"Know anything!" was the response, "I were thar."

"Then tell the Court and jury," said the attorney, "what you know."

The witness planted himself more firmly on both feet, glanced around upon his auditors, and thus delivered himself: "Well, you see, Mr. Robertson was a-sittin' in the back part of his store a-playin' of his fiddle, net a-thinkin' of bein' stobbed, nor nothing of the kind, when in come Mr. Johnson, and then and thar stobbed him; then he gathered a bung-starter, cleaned out the crowd, tipped the palin', and c'ored herself.—EDITOR'S DRAWER, in *Harper's Magazine for March.*

HE GOT HIS WIND SHUT OFF.—A miller of South Lincolnshire, England, writes as follows to an English journal: "I occupy a wind-mill, and since it has been erected a wealthy gentleman has purchased land and built a residence within a short distance of the mill. He has planted a quantity of trees close to the mill, the consequence is that my wind is blocked nearly all round; indeed, in some directions I can not go at all, which is a serious loss to me. Since a greater part of the trees have been planted after the mill was built, I should like to know if I have any legal redress for my loss." The journal thinks the case too vague to go upon, and knows of nothing absolutely bearing upon the subject.

TO GET RID OF RATS.—Set your trap in your mill and catch one alive. Paint him a bright red color and let him go. Then put your tarp in another place in the mill and catch another and likewise paint him and let him go. your rats will soon disappear from the premises. Try it.

A GENTLEMEN, with an evidently statistical turn of mind, recently calculated that London consumes 450,000 tons of bread annually, and at 7d. per quarter, all round, this gives a daily cost of £21,875, or £7,320,000 in the year. Of this immense sum, we are told by the bread reformers, more than one-fifth is absolutely wasted. Out of a quarter of wheat, weighing on the average some 480 pounds, only about 380 pounds of flour is produced; while the remainder, which contains, according to analysis and experts, the more nutritious portions of the wheat, is used chiefly to fodder cattle. When economists tell us that such extravagant waste is being daily perpetrated among us, we must indeed assent to the dicta of the "League" that the subject of bread reform deserves serious attention.—*For. Ez.*

## About the "Victor" Turbine.

The *European Mail*, of February 2, 1881, contains an article on turbine water wheels, by Bowis Bale, M. E., in which he writes of the "Victor" wheel, manufactured by Messrs. Stilwell & Bierce, of Dayton, Ohio, as follows:

"An American turbine of recent construction, and one that possesses several features of interest, is that known as the "Victor," designed by the Stilwell & Bierce Manufacturing Company, of Dayton, Ohio, and which we illustrate herewith in fig 7.

"This wheel receives the water upon the outside, and discharges it downwards and outwards, the line of discharge occupying the entire diameter of the lower portion of the wheel, excepting only the space filled by the lower end of the shaft.

"The outside case, containing the guide and wheel, is cast in one piece; a flange projecting from the cylinder is placed exactly at right angles to the vertical shaft. The outside case is accurately bored to receive the circular water guide; this is also cast in one piece, and the water-ways are made fixtures, but the whole guide is moved round for the purpose of admitting or shutting off the water by means of a segment and pinion. The movement of this circular guide, or, as it is called in the United States, register gate, regulates the amount of water supplied to the wheel. The inventors of this form of wheel claim for it as a great advantage that the improved guide secures an equal and uniform delivery of water on all parts of the wheel without changing the direction of the current or the relative angle of the stream and the face of the bucket, or in any degree checking the velocity of the water admitted to the wheel. The circular guide or gate is fitted closely to the outside case, so that much water cannot leak between them. The guide is protected from the vertical pressure of the flow of water by a cast iron movable top.

"In a recent trial it is stated that a 15 inch wheel of this type under a 18-34 foot head of water, gave out 29-36 horse power, or about 88 per cent. of useful effect. If this is correct, this wheel must be held to have surpassed most other types now constructed.

## Immigration January, 1881.

The Chief of the Bureau of Statistics furnishes the following information in regard to immigration into the United States:

There arrived in the ports of Baltimore, Boston, Detroit, Eastport, New Bedford, New Orleans, New York, Philadelphia, Port Huron and San Francisco, during the month ended January 31, 1881, 15,224 passengers, of whom 13,134 were immigrants, 1,554 citizens of the United States returned from abroad, and 536 aliens, not intending to reside in the United States. Of this total number of immigrants there arrived from England and Wales, 1,745; Scotland, 312; Ireland, 737; Germany, 4,333; Austria, 319; Sweden, 271; Norway, 96; Denmark, 56; France, 297; Switzerland, 389; Netherlands, 70; Italy, 1,027; Russia, 126; Poland, 36; Hungary, 512; Dominion of Canada, 2,027; China, 547; Australia, 113; and from all other countries, 201.

The number of immigrants arrived at the above-named ports during the seven months ended January 31, 1881, was as follows: From Germany, 77,407; Dominion of Canada, 74,839; England and Wales, 34,292; Ireland, 29,265; Scotland, 7,586; China, 3,213; all other countries, 63,345.

The heaviest rains ever known visited California during the early part of February. The damage done to property was very extensive. Many mill-dams were carried away and mills and other buildings damaged. The quantity of rainfall is deemed sufficient to ensure a good crop however, if there should be little or no more rain before harvest time.



**The Duplex Safety Boiler.**

The increasing frequency of fatal and disastrous boiler explosions seem to us to demand more attention than it has been receiving from the press of the country. Since the commencement of the present year there has been in the United States alone, an average of nearly two boiler explosions daily, which have resulted in the loss of over one hundred lives from stationary boilers alone. Our investigation of this subject leads us to the conclusion that there is a wanton sacrifice of human life urgently demanding legislative interference. There are several makes of non-explosive boilers in the market, from among which we have selected the Duplex Safety Boiler as presenting to our mind, probably, most merit in the important features of durability and economy, with the least labor in keeping them clean and in effective working condition.

This boiler was introduced about a year ago, and has met with a large sale among leading manufacturers in the Eastern States. We regard it as worthy the careful investigation of engineers and all others who are in any way concerned in the use of steam.

Of its safety there can be no reasonable question, and a considerable economy over the ordinary boilers in use is guaranteed by the responsible company who manufacture them. Its construction is shown by the illustrations we publish and explanations below:

A, represents the steam drum, 30 inches in diameter, double riveted. BB represent cast malleable iron or steel spherical shaped sections or connecting spheres, which are attached to each other by the wrought iron boiler tubes that are regularly expanded and caulked in the usual way. The neck pipes C are attached by means of riveted joints to the bottom of the steam drum. DD, bars of wrought iron set in the side walls, upon which the boiler is suspended. Within each of the larger or 4 inch tubes are placed others of 2 inches, expanded also; the 4 inch tubes are attached to the inside of the spheres, which the smaller tubes pass through and to the opposite sides—the water space being between them—the heat passing inside the smaller and outside the larger, shown by F. In the centre of these tubes in each section is a larger one of 7 inches in diameter of solid water, G, without any inside tube, the water ascending in the smaller tubes and descending in the larger one, insuring the best attainable circulation. H, the water line. MM represent side doors in the walls for cleaning and inspection. The bottom of each section has its separate

connection with the feed pipe, which is shown by the dotted line P. Any of the sections may be removed for repairs without interfering with the others, or preventing the use of the boiler. The hot air and gases rise from the fire between the wall J, and bridge wall K, and coming in contact with the steam drum pass along through the opening T into the combustion chamber between the walls K and L, where, in their downward course, the gases and smoke are claimed to be nearly, if not perfectly, consumed. The passage N leads to the chimney.

We have evidence where these boilers have been run completely dry, and cold water then put in, and no explosions occurred.

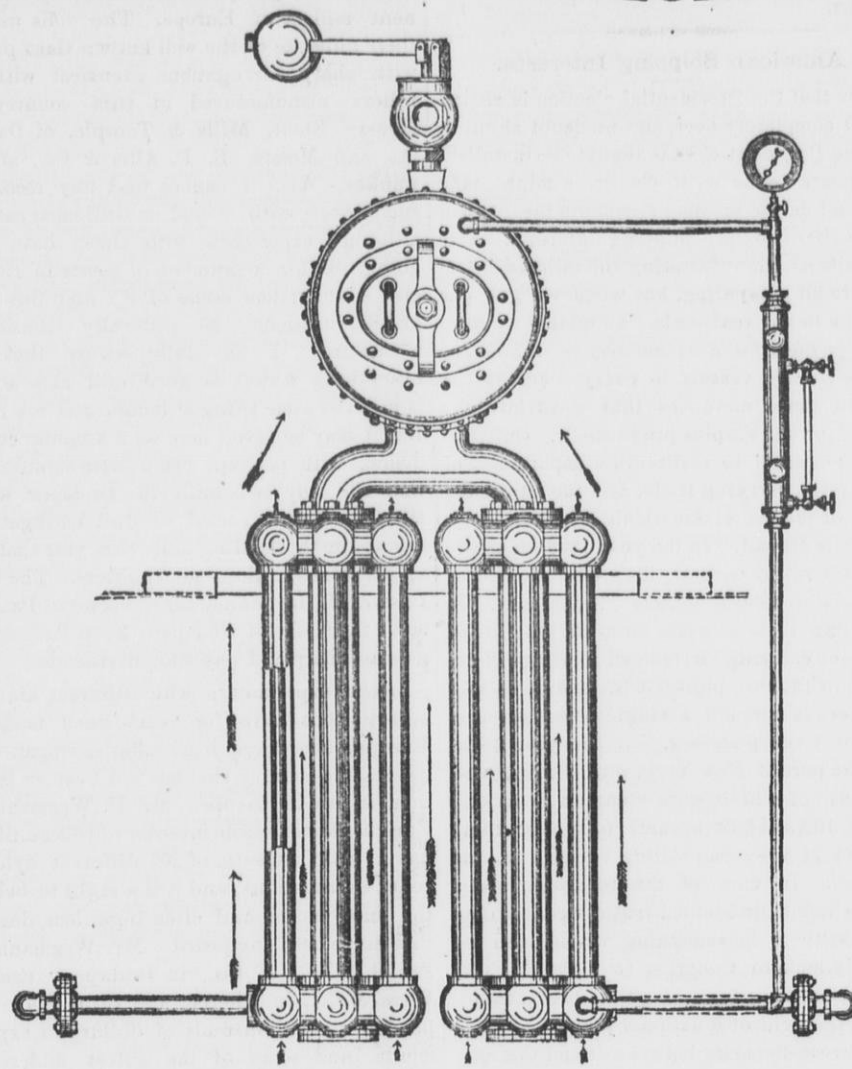
It is beyond dispute that this pattern is made in the strongest possible manner, and the leaking caused by the unequal expansion of the different parts (as in other boilers) is entirely overcome, as all the parts are equally subjected to the heat. The design is plain, and easily understood.

It is also very compact, occupying but

little floor space, and can be easily taken apart by any one that can use a monkey wrench, and packed for transportation, as two sections can be carried on the back of a mule, which is very desirable in mining countries; and when ready to set up nothing is required in the shape of tools except a monkey wrench, as none of the tubes are removed, therefore a

square bars effectually overcomes the danger of any strains to any part, from unequal expansion.

Further information and particulars, as to cost, can be obtained by addressing the Duplex Safety Boiler Co., 34 Courtland St., New York; or 52 South Canal St., Chicago.

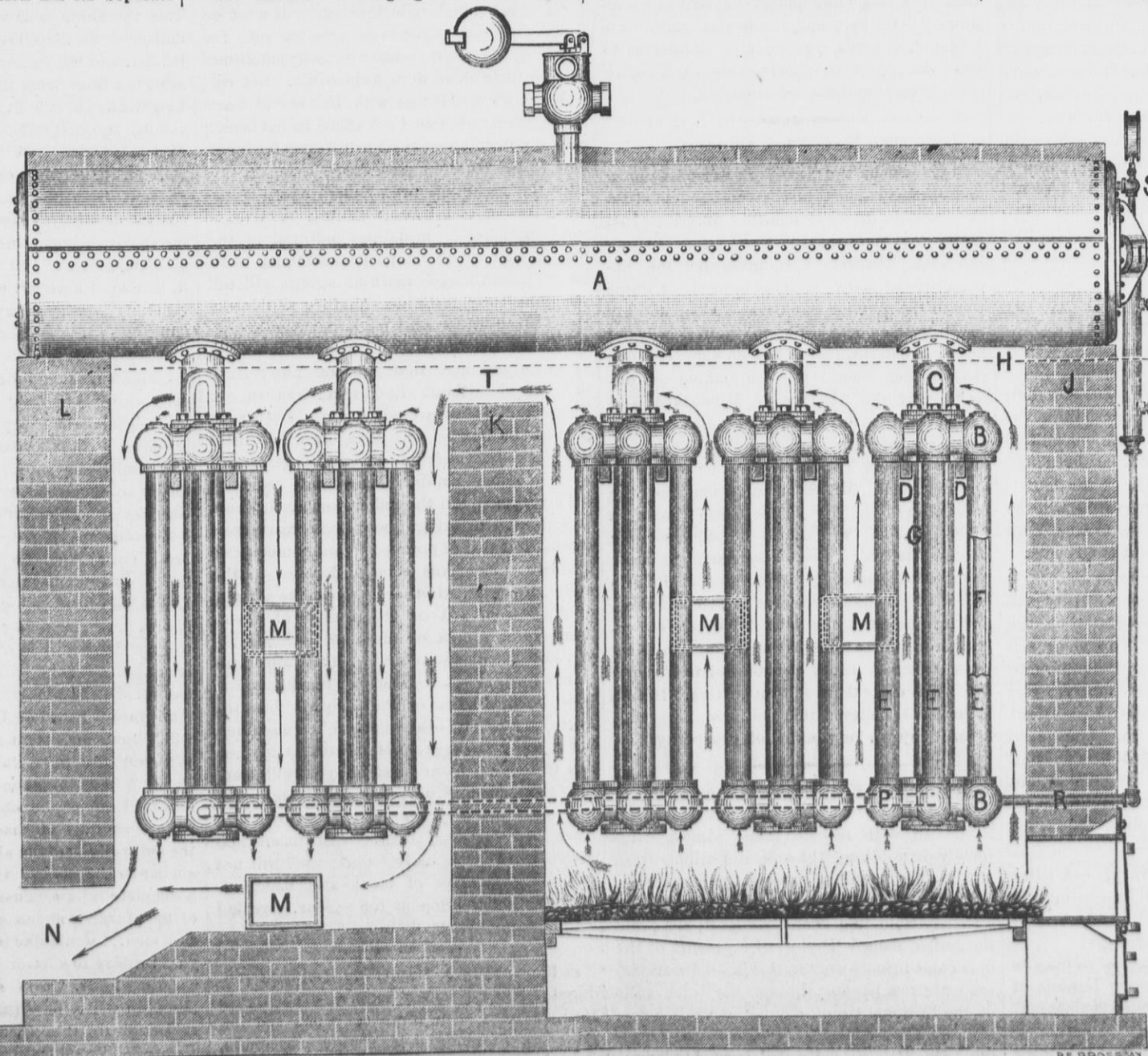


BOILER WITH DOUBLE SECTIONS.

large amount of time and skill are dispensed with. No deposit of dirt can take place in the tubes to stop them, as they are all vertical. The boilers which we have seen give evidence of care in the manufacture, and the drums or any of the parts can be made of steel when required.

The manner of hanging the boiler upon

BARGES are being loaded at St. Louis elevators with wheat and corn for shipment down the river to New Orleans and thence by steamer to Europe. 400,000 bushels were sent out the last week in February and arrangements are being perfected to keep up the river trade.



NEW TUBULAR STEAM BOILER.

**Minneapolis Items.**

A. H. KIRK has invented a new attachment for keeping the cloth in middlings purifiers clean. It has been in operation several months and is said to do well.

THE Cataract Mill has been thoroughly refitted and has just started up.

THE Stevens rolls are being set up in the North Star mills.

DURING the early part of February the low water in the canal was the cause of much inconvenience.

DAVID WILLIAMS, a millwright, fell from a staging in the Pillsbury A mill and striking some timber broke his nose and kneecap.

THE receipts of wheat at Minneapolis for the month of January were 1,124,100 bushels.

MESSRS. Lockwood, Upton & Co., of the Union Iron Works, will greatly enlarge their plant early in the Spring.

THE Minneapolis Millers Association has recently issued a circular of which the following is a copy: "We have learned that there is a large amount of unmerchantable wheat in the country, viz: Bin-burnt, stack-burnt, wet, musty and generally unsound. Several cars have already been received here containing more or less of the worthless stuff. It ought not to be taken into an elevator with any idea of mixing it with better wheat, as a very slight mixture seriously injures the good, and any considerable amount makes the whole entirely unfit for milling. Unless great caution is used in taking in wheat the trouble is likely to largely increase on account of the large amount still in stack, which is being threshed in a wet and frozen condition; and which is and will be offered for market. Such wheat, if taken, ought to be kept by itself, and shipped and sold on its merits. We experimented thoroughly with such wheat last year and the result was many thousands of dollars loss, a slight mixture of the burnt or damaged wheat rendering the flour unsound and unsalable at anything like full prices. We therefore notify all shippers that such wheat as is described above will be rejected, and good wheat, when mixed to any extent with such burnt, musty or damaged wheat will be treated in the same manner."

DIED—Feb. 16th, J. Washburn, from injuries recently received in the Pillsbury A mill. Mr. Washburn leaves a wife and four children.

THE Vienna Roller Mill which was destroyed by fire Nov. 15, 1880, was insured for \$306,500.

THE city of Galveston, Tex., as is well known, is situated on an island several miles from the main land; and it has been a perplexing problem there for many years how to obtain a supply of fresh water. Several attempts have been made from time to time to accomplish this result, but none have been successful. A plan is now being carried into effect which it is thought will undoubtedly secure the end desired. The city council have concluded a contract with a party at Oil City, Pa., for boring an artesian well, which it is proposed to carry to a depth of 2,500 feet if necessary, although the opinion is that satisfactory water will be reached at a less depth. Should this venture prove successful a sufficient number of similar wells will be sunk there, thus insuring a supply for public and private use and fire protection.

FAILED. — Samuel Hazelhurst & Sons, of Baltimore, operators in flour and grain, suspended payments Feb. 5th. The liabilities are placed at \$40,000 and are mostly to local parties.



## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

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MILWAUKEE, MARCH, 1881.

THE *Vienna Technologist* says that the proposed plans for the execution of criminals by electricity is enthusiastically advocated by many European scientists.

THE great State of Illinois may well be proud of its financial exhibit. The entire debt of the State has been paid, and there are now over \$2,000,000 in the treasury.

GERMAN and French engineers are still trying to utilize the sun for industrial purposes. The *Vienna Technological Journal* believes that the present century will see this problem satisfactorily solved.

PARTIES desiring to buy or sell a mill, or get a situation in a mill, or in want of a miller or journeyman millwright, should make their wants known through the columns of the UNITED STATES MILLER.

IN several State Legislatures, bills have been introduced to regulate the grading and traffic in grain. The more Legislatures let this thing alone the better for everybody. The trade regulates itself very well.

J. A. FRIED, of Frankfort a M., Germany, has recently patented an invention for shutting off water from waterworks before it becomes cold enough to freeze, and turning it on again when the temperature moderates, by means of a current of electricity.

THE exports of merchandise for the month of December 1880 were of the value of \$98,856,623 being larger than during any previous month in the history of this country. The imports of foreign merchandise in December 1880 were of the value of \$47,372,788.

THE *Farmer* (London) advises the thousands of pretty bar-maids in London to emigrate to America and there become wives and mothers of respectable families. Allright—send along your pretty barmaids, Brother Farmer, and we'll set up the beer and things for 'em.

THE import tariff on all foreign pig iron is \$7.00 per ton. It is said that at a recent meeting of Manchester, England, manufacturers, a speaker made the remark that if that tariff was abolished they would be able to close every iron work east of Pittsburgh inside of three months.

The various Boards of Trade have recently subscribed to the fund for establishing a telegraph line from Chicago to New York for their use. There is one already between Milwaukee and Chicago. The capital is to be one million dollars all of which, it is said, has been subscribed. The estimated cost of the line is \$450,000. A message of ten words will be sent from Milwaukee or Chicago to New York for 20 cents. The present tariff is 50 cents.

A STORM of almost unprecedented fury prevailed throughout the United States on the 11th and 12th of February. The snow fell and drifted in tremendous quantities throughout the northern portion of the country, while in the middle, southern and western portions the rain fell in torrents. The damage to property has been immense. Railroad communication has been greatly obstructed and the general business of the country seriously interfered with for the time being.

MILLING IN GLASGOW, SCOTLAND.—A letter just received by us from a well known milling engineer in Glasgow, Scotland, in speaking of the condition of the trade there says:

"The mills here are by no means as busy as they used to be before the heavy imports of American and Hungarian flour commenced. Many of our mill masters are always persisting in the vain attempt to equal them (Americans and Hungarians) for quality and are eternally

making changes in their machinery but they generally find when they do make the quality equal, that it will not pay with the average wheat they can get, but nothing less than the loss of their fortunes will convince some of them that the Northwestern States of America and Hungary have advantages which make their struggle a hopeless one at least for the present.

## American Shipping Interests.

Now that the Presidential election is entirely and completely over, and no doubt about it, and the President-elect is about to be installed, it appears to us as if Congress might take time and devise means to promote the growth and welfare of our shipping interests. Our agricultural, manufacturing and railroad interests are all prospering, but when we get our produce to our seaboards we find that we have got to pay one hundred millions of dollars per year to foreign vessels to carry it across the seas to those countries that constitute our market for our surplus productions. Our people do not seem to realize the importance of this foreign carrying trade, and the rapid decrease of the use of American ships for carrying goods abroad. In the year 1860 American ships did 75 per cent of this trade, which has decreased in 1880 to a bare 17 per cent. In 1855, 381 vessels were built in the United States for carrying on trade with foreign countries. In 1879 we built but 37, and it is said that there is now not a single American iron ship for trade purposes. In the year 1879, from the port of New York, out of 2,987 vessels, 1,075 of which were steamers, carrying abroad 102,312,568 bushels of grain, there were but 74 American sailing vessels, and no steamers. In view of the foregoing statement, which is undoubted truth, we must concede that there is something wrong, and we naturally look to Congress to right it. Our national navy has for a long time been considered in the light of a national joke on account of the great disparity between it and the navies of other great nations, and our people generally have felt as if we did not care much for a navy anyhow, as we had got something better and more profitable to be doing than to be picking quarrels with our neighbors, and that if we did get into a tangle with some other nation that was necessary to be straightened out by fighting, that we could soon rig up an *impromptu* navy that would answer every purpose, but these are days of facts, and ironclads and steel ships, and, in the language of the Dutchman, when he commenced sliding down the incline of an icy roof, we had "petter look a leedle oud pefore ve strikes somedings." Our navy and commercial marine are subjects, at present, pregnant with interest to our country, and our law-makers should give them preempt and careful attention.

## The New York Canals.

Mr. Seymour, the New York State Engineer and Surveyor, has just given his annual report which shows a condition of great prosperity for the canals in New York. British interests, however, have prompted the expenditure of many millions to secure a water way to the ports on our Great Lakes notably to Milwaukee and Chicago, and it will not be any great surprise if British ships of 2,000 tons burden should be seen loading and unloading at the wharves of Milwaukee and Chicago within three years, in which case the prosperity of New York canals, and consequently of New York city, may be considerably effected. Mr. Seymour recommends the deepening of the New York State canals at least one foot, which can be done for one million dollars. Our Government is now engaged in deepening the harbors at Buffalo and at the channels between the Great Lakes, and it is believed that the tolls can be reduced on the canals from Buffalo to New York from 5½ cents per bushel to 4½ cents and still make them self-supporting. If this is done it is believed that the New York canals will enjoy a long period of prosperity.

EXPLOSION.—A boiler in the flouring mill of Frank Schmidt, at Kimswick, Mo., exploded Sept. 3rd with terrific force, almost completely demolishing the mill and killing John and Frank Schmidt, sons of the proprietor, and Chas. Baker, a boy of fourteen years, and seriously wounding Frank Schmidt, Sen., and the miller named Taylor. Fragments of the boiler and furnace were hurled in all directions, some of them passing through the brick walls of the National Hotel, a hundred yards away, and doing considerable damage to the building. The loss is estimated from \$15,000 to \$20,000.

## W. de la Barre on Roller Corrugations.

[Extract from a letter to the North Western Miller Feb. 1st 1881.]

Mr. Putz states that he has found that a roller mill produces 30 per cent more work with a saving of 47 per cent of power compared with millstones. Such are the results of a series of experiments made by two eminent millers of Europe. The rolls used in their mills are of the well known Ganz pattern with sharp corrugations identical with the rollers manufactured in this country by Messrs. Stout, Mills & Temple, of Dayton, O., and Messrs. E. P. Allis & Co., of Milwaukee, Wis. I cannot find any record of such work with round or dull corrugations, although experiments with these have been going on for a number of years in Europe and nothing has come of it, and this kind of corrugations is generally considered a failure. I am fully aware that not everything which is good and nice abroad is just the same thing at home, and *vice versa*. But it may be given here as a singular coincidence, with perhaps just a little significance, that the only two mills in Budapest which still grind with round or dull corrugations, are again the leading mills this year that pay no dividends to their stockholders. The Ofen Pester, H. Haggemacher's, Victoria, Panonia and other mills of Budapest, keep their corrugations sharp and pay good dividends.

Large experiments with different kinds of corrugations have for years been made in Europe, and there is no roller corrugation in use in this country that has not been, or is not now in use in Europe. Mr. F. Wegmann, in Zurich, the venerable inventor of roller milling, has a little museum of 207 different styles of roller corrugations, and it is a sight to behold the many novel and often ingenious designs that have been suggested. Mr. Wegmann, in Zurich, Ganz & Co., in Budapest, Escher, Wyss & Co., in Vienna, and others have expended many thousands of dollars in experiments, and some of the ablest millers of Europe have been busy trying to establish by thorough scientific trials and tests what kind and form of roller corrugations would be the most practical, useful and best. All of them have returned to the sharp fluted rollers of the Ganz pattern, which stand now, at least in Europe, in universal esteem.

I am aware, and freely admit, that in grinding spring wheat a round or dull corrugation of a roller mill produces a somewhat whiter break flour than the sharp corrugated rolls; but this is done at the expense of a lot of middlings, and middlings are what we are grinding for in this gradual reduction age. It must be the aim of every miller who uses the rolls for breaking the wheat to make as many middlings with as little break flour as possible. If I can make more middlings with the aid of sharp corrugation rolls, can I not afford to put back a certain percentage of them to bring up the break flour to the required standard? I can do this after the middlings are purified, which is certainly better and more advantageous than to mash up a lot of middlings material in the breaks with all the impurities adhering to it. Some smooth-tongue machine agents will tell you that their machines produce all the way from 70 to 90, or still more, per cent of patent flour; the break flour from their rolls is so white and nice that you can put it into the Patent without hesitation, and so on. These men are ever ready to supply you with samples of breaks and flour, and their little hand-sieves for sifting out middlings are always in their hands. These men generally fail however to tell the miller how much wheat it will take to bring about such marvellous results, but that of course is of no consequence to them. It makes some difference to the miller, however, whether he can make a barrel of flour from 270 or 285 pounds of wheat. These same agents or machine men will tell you also that the flour made on their apparatus brings from 25 cts. to \$1.00 per barrel more in New York, Boston or Philadelphia than the flour made on other people's machines; but if you take the trouble to write a few letters to Eastern flour dealers, you will learn that the schedule of prices points the other way and that they are getting actually that much less for such flour. Consumers and dealers are not so easily fooled; they will not pay for a mixture of break and middlings flour the same price as for a clear, pure and legitimate middlings flour.

IN the year 1879, 13 mills in Budapest produced 4,309,261 meter-centners of flour; in 1880 14 mills with large additions and improvements produced 3,683,005 meter-centners, showing decrease of production with enlarged capacity, of 626,256 meter-centners.

## Sharp vs. Dull Rolls.

A Communication from W. D. Gray, M. E. of Milwaukee, Wis.

Editor United States Miller:

It was an Editorial in the *Milling World* of Buffalo, N. Y., that tried to censure my plain and simple letter I wrote to you, and which you gave room in your January number. The subject of my communication was the gradual introduction and improvement of Rolls and Roller mills in this country.

The able writer introduced his rather lame attack with an abundance of flourish. He is a scholar I admit. (Why, Mr. Editor, I had to be aided by my Unabridged to read his elegant English.) After having told me some pleasantries about my ability as a mill builder, and of my large experience in perfecting Roller mills, he endeavors to brand me as a theorist and hero of the pen. These assertions are rather ridiculous ones, as I am known to be neither a theorist nor a professional writer. I never made pretenses to be such. The Editor of the Buffalo Paper "did not want to discuss the superiorities of either dull or sharp corrugations," yet went on to declare the dull corrugations to work all-right, and my affirmation to the contrary—wrong. I wonder, where the Editor of the *Milling World* got his valuable experience. Is he a practical mill builder? I think, he is not. Is he a practical miller? I think not. Someone must have influenced him and told him those *stubborn* facts he mentions with so much emphasis, for I never shall believe that the running of a milling paper, having sprung into existence less than two years ago, can make the Editor so wise, can furnish him so much practical experience as to competently judge about technical difficulties, which often prove to be a "bore" even to practical "dusties." I rather suspect someone has inspired our Editor of the Buffalo Paper to blow the horn for the dull rolls, and meantime used him—as a twenty foot pole to tickle with. O, trust those professional heroes of the pen, they are capable of anything!

He acknowledged that my theory was good, that I had a large experience, and yet he declares me to be wrong, putting his foot on it with the remark, "facts are stubborn!"

My views about the superiority of sharp corrugated rolls I have mainly obtained by practical experience. I have found out that those rolls, or machines, which will reduce the wheat to middlings and clean the bran, making thereby the least flour, are the best. I recapitulate, that the object of the first reduction is to split the wheat and relieve the germ and the dust in the crease of the berry. This the sharp rolls will do better than the dull ones. In all well regulated mills, where the builder and the miller understand their business, the flour from this reduction will go to Low Grade, as it is fit for nothing else, unless you use the dull rolls. In that case, you will have better flour. Why? Because you make more of it, as you break up good middlings and put that flour together with the same amount of dirt you would get separate by using sharp corrugations. As to the cleaning of bran, I think, had he known more about it, he would have left that part out, for it is generally considered by the men that use the dull rolls, that the sharp ones are the best for bran.

I am aware that your readers will know exactly who has the best chances to be right in his judgment on sharp or dull rolls, the Buffalo editor, with two years of experience in running a mill—ing paper, or myself, with good theory and practical experience, as acknowledged even by our Buffalo critic.

He tells us, if we would follow the first break flour from the dull rolls through the mill, we would find that it does not go to the Low Grade flour, follow it to the market, and it does not bring a low grade price. This I will not dispute; this *stubborn fact* will answer for us both. But I will tell you just what he has done. He has taken a peck of dirt and put it into a barrel of Patent flour, and if you will follow this Patent flour to the market you will find the price falls short of the best Patent. This brings me to what I said in my letter. I am of the candid opinion that the editor's attempt of discussing the merits of the dull rolls over the sharp ones, will prove, similar to the work of the Danites, a lost one, a complete failure, considering the shrewdness of the plurality of our smart, energetic, practical men. I would like to draw the attention of your readers to a letter I have just read, from the pen of Mr. De la Barre, of Minneapolis, Minn., in which he expresses his views on the subject of roller mills, and remain,

Yours truly, W. D. GRAY.

SUBSCRIBE for the UNITED STATES MILLER.

## Adulterations of Food.

Abstract of a paper read before the meeting of the American Social Science Association, at Saratoga, by Professor S. W. Johnson.

To read the many undeniably authentic and the many more apparently true accounts of the tricks that are stated to have been practiced upon human food, here and there, formerly and recently, is really a shock to one unprepared for the dismal story. The revelations of the experts who have studied these matters are of a sort to exasperate and enrage any honest citizen. Worse than that, they not only convince us that a great deal of other people's food is fraudulently made unfit for any human stomach, but they actually unfit our own stomachs, temporarily at least, for any food whatever.

Knowledge of the nature and extent of adulterations that have been practiced, is the first requisite in protecting ourselves from those that may be attempted; and here follows a brief account of some of the most conspicuous falsifications which are said now to be or recently to have been practiced on a few common articles of diet.

The statements here made are many of them correct beyond question, others are given on what passes current as good authority, but the writer cannot in all cases vouch for their truth.

Wheaten flour, which makes the most palatable and nutritious bread, has long been the subject of falsification. The most usual and most harmless adulterations have been the flour of other cheaper grains or seeds. Flour of rice, of barley, of peas, beans, buckwheat and of Durra or Egyptian millet, it is said, have thus been employed in England. It has long been a habit of many good housewives to add a small proportion of boiled potatoes to their wheaten dough in making bread, and this and similar mixtures are entirely proper in domestic bread so long as those concerned are satisfied; but in the hands of the British bakers, if we may credit English authors, the same practice has been adopted for the twofold purpose of employing a cheaper flour and of retaining a greater percentage of water in the loaf. This mode of extorting larger profits from the public is justly regarded as an adulteration and a swindle.

A curious feature in British bread-adulteration is presented in the history of the so called "cones flour." This is supposed to have been originally the flour of a particular variety of wheat which was sold to bakers for the purpose of dusting their kneading troughs as well as the fashioned loaves to prevent the dough from sticking where it was not wanted. It is evident enough that any flour that is fit to make dough of is suitable to restrain the adhesion of that dough, and what the peculiar merits of cones flour once were cannot be clearly made out. But cones flour, or "cones" as the bakers termed it, was speedily made the means of turning a multitude of dishonest pennies, and its sale and consumption increased enormously until some master bakers directed their journeymen to mix a bushel of cones with a sack of flour,—more than enough to fully test the "dusting" power of the "cones," one would suppose. In short it appears that "cones" became the trade name of an article which was represented to have qualities serviceable in the manipulation of the baker's shop, but which was really a cheap and inferior flour valuable for putting money in the pockets of miller and baker, and for dusting the eyes of the police and health officers. We may well imagine that when the millers began to commend cones to the bakers

as an "artful dodge" to further the interests of the trade, the former represented truly what was the real nature of cones at that time, and the bakers most likely thought that an invention which would enable them to get adulterating material under a respectable name was well worth paying for. So the millers thought too, and soon cones became anything that would swindle the public and if possible the bakers also and contained no wheaten flour at all, but was a mixture of the cheapest materials that could pass muster as a breadstuff.

Since free trade was adopted in England that country has been the head center of all kinds of adulterations. In 1860 the British parliament began a series of enactments to prevent the adulteration of food, drink and drugs, and in consequence of the investigations that accompanied these enactments a large mass of literature on the subject of food-adulteration has been published in the English language. This literature consists in the record of the researches of scientific men and in testimony elicited in the courts from experts and detectives, as well as from adulterators grown rich enough to retire from business or induced by prospect of greater profits to turn state's evidence.

To return to bread-adulteration, the use of bean flour is said to have been resorted to in order to give due tenacity and lightness to bread made from damaged wheaten flour. Boiled rice was employed to increase the quantity of bread to be obtained from a sack of flour. A sack of two hundred and eighty pounds should yield, according to Letheby, ninety-five four-pound loaves; but by adding three or four pounds of rice boiled for several hours in as many gallons of water to the flour, at least a hundred four-pound loaves can be got,—a gain of twenty pounds of bread, or more than five per cent. By this use of rice or of boiled potatoes, which being nearly pure starch are perhaps even more effectual than rice, the bread is indirectly adulterated with water.

Inferior flour is produced in immense quantities from grain damaged by incomplete growth, by injury from wet in the harvesting or storing, by incipient sprouting, mold or mustiness, as well as by the presence of the seeds of other plants. Flour itself once good is damaged in transportation and in storage. The endeavor to make an apparently good bread from cheap or even damaged flour is probably the reason why certain chemicals have been widely used in the making of bread.

Liebig states in his "Letters on Chemistry," that "the bakers of Belgium discovered twenty (now sixty) years ago how to bake from damaged flour by adding sulphate of copper—a poison—to the dough, a bread in appearance and external properties as fine as from the best wheat flour. Alum has the same effect as sulphate of copper; when added to dough it renders the bread very light, elastic, firm and dry, and the London bakers, in consequence of the demand for white bread, have been compelled to add alum to their flour. I saw (in 1840) in an alum factory in Scotland little mounds of finely ground alum which was destined for the use of London bakers.

To conceal its true nature, the powdered alum used to bear the trade names "hards" and "stuffs." Hassall not long ago asserted that "alum is used in bread-making nearly all over the United Kingdom." The proportion of alum used in England is said to range from 3 to 12 ounces to the sack of 240 pounds, according to the quality of flour. These quantities have been sometimes exceeded, it would

appear, for not only does the baker put alum with the flour he buys, in order to deceive his customer as to the quality of the bread, but the miller or flour dealer mixes alum into the flour he sells, to deceive the baker.

However happy the effects of alum may be in improving the appearance of the bread and swelling the profits of miller and baker, the effects upon those who are obliged to eat such bread are liable to be most disastrous if indeed they may be not so inevitably. A very little alum in bread may not prove immediately or seriously injurious, but no considerable amount of such a powerful astringent is required to disorder digestion and ruin health, as is shown by a vast array of competent testimony.

The use of alum in bread has not been confined to Europe. Some twenty years ago Dr. Wetherill, of Philadelphia, examined twenty-four samples of bakers' bread of that city, and found alum in two instances. In 1873, Dr. Waller, of the Board of Health of New York, examined fifty-one samples of bakers' bread made in that city, and found six which were probably adulterated with alum and two with alum and sulphate of copper. Last year Dr. Leeds examined a number of bakers' loaves sold in Hoboken, N. J., and in five cases found evidence of alum, which in one sample amounted to 23 grains to the 4-pound loaf.

The writer has investigated half a dozen samples of bakers' bread made in New Haven, Conn., without finding either alum or sulphate of copper. It is possible that the comparative immunity from bread adulteration under which we mostly suppose ourselves to be living, is but imaginary, and that falsification is actually practiced and remains unknown because the real facts have not been ascertained by thorough and systematic investigation.

The use of alum for making (out of flour which of itself would give a dark, sticky, sodden bread) a white and flaky loaf, is not a recent invention. In the days of Henry VIII. of England, it was ordained that "his Highness's baker shall not put alum into the bread, or mix rye, oat or bean flour with the same, and if detected he shall be put in the stocks."

Whether or no alum is mixed by the baker with our daily bread, it is a fact that alum, or its equivalent, is, or recently has been, an ingredient of some of the substitutes for yeast which is so largely employed among us. Yeast itself is a microscopic plant whose growth in wheaten dough generates carbonic acid gas, which inflates or "raises" the loaf. The use of chemicals mixed with the flour that will yield the same gas answers the same purpose, and has the advantage of shortening the time and lessening the labor of preparing bread. The chemicals best adapted in all respects for carbonating dough in the kitchen, are cream of tartar (bitartrate of potash) and soda of saleratus (bicarbonate of soda), and these two salts are the active ingredients of the best "baking powders." But as the supply of cream of tartar is limited, and its cost is considerable, various cheap substitutes have come into use. One of the cheapest that can be employed is alum or the sulphate of aluminum, which, mixed with bicarbonate of soda, produces carbonic acid gas abundantly, but contaminates the bread with an injurious or even poisonous substance. In 1878, Dr. H. A. Mott, of New York, stated that the "Patapsco Baking Powder" contained 20 per cent of burnt alum or its equivalent, the "Andrews" 22½ per cent, "Dooley's Standard Baking Powder" 26½ per cent, and "The Charm" 30 per cent. More recently, Dr. Mott asserts that twenty-three brands of baking powder

examined by him contained alum or a similar sulphate of alumina.

Before quitting the subject of alum in bread I ought perhaps to say that the effects of it upon the consumer have been much discussed and some chemists in Europe, and I believe in this country also, have defended its use. Doubtless the people may survive the long continued ingestion of small quantities of alum, as of almost any poison, but the correct principal to adopt in fixing upon a standard of purity in cases of all articles which are understood to be essentially nutritious, is to stigmatize a deleterious adulteration the addition of even the smallest quantities of any substance which has decided poisonous or injurious effects. The recently published experiments of Dr. Mott, made upon dogs, are sufficient demonstration that bread containing alum is a highly dangerous article of diet.

Baking powders are also highly adulterated with terra-alba, which is a trade name for several sorts of white earth, being sometimes ground gypsum (plaster of Paris or sulphate of lime), sometimes carbonate of lime (whiting), and sometimes pipe-clay (kaolin). The cream of tartar and the saleratus sold by grocers are also often grossly weighted by admixture with worthless terra-alba.

If the wheaten flour and the wheaten loaf are thus adulterated, we should expect to find that other cereal foods are similarly falsified. So it happened in Great Britain, especially in Scotland, that oatmeal—which is a standard diet in prisons, work-houses and charitable institutions—is extensively mixed with cheaper barley meal, rice flour, and even Indian meal. Thirty years ago there was a famine in the Scotch Highlands, and some \$300,000 was devoted to supplying the needy Highlanders with food. One of the contractors who supplied these unfortunates with oatmeal was suspected of adulterating the article, and was brought to trial. It was shown that the oatmeal was grossly mixed with bran and "thirds" (cheap horse-feed). The defender was convicted and punished, but he brought forward some of the principal millers of Glasgow to swear that the practice was quite common—was, in fact, one of the usages of the trade.

MINING IN MAINE.—Mining down in Maine is a funny business to lookers-on from the Pacific coast. The men running the mines appear to be old sailors and Nantucket whalers. They speak of the levels of a mine as "decks," and the force of men employed is the crew. The Superintendent is the skipper and the foremen are his mates. When the skipper passes through the main hatch and gets down to the bottom of a three-decker mine, he calls out along the main gangway toward where the "chase" (lode) was last seen, and asks his first mate: "How does she head?" "Sou-sou-west half west," says the mate. "Port your helm to the larboard and hold her a little more sou," says the skipper. "Aye, aye, sir," cries the skipper, "sou it is." Then, turning to his second mate, the skipper says: "Mr. Jones, are we making much water now?" "Just sounded the well, sir, and found but about four feet. I stopped the worst leak we had this morning at four bells." "Very well, sir; if she makes much water better man the pumps. Now, sir, if all is right below decks, suppose we go up to my cabin and splice the cable."—*Virginia Enterprise*.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

**E. P. BACON & Co.,**

Rooms 27 and 28 Chamber of Commerce.

**MILWAUKEE.**

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**COMMISSION MERCHANTS,**

**GRAIN, SEEDS, PROVISIONS, ETC.**

**Special attention given to the purchase and shipment of grain for milling purposes.**

We have an experienced man in attendance at each elevator constantly, to see to the inspection of grain when loaded into cars for shipment, and the interests of parties ordering through us will be carefully protected in every way.

**Orders for purchase and sale of grain for future delivery will be promptly and carefully executed.**

[Mention this paper when you write us.]



## How, and Where to Order Bolting Cloth.

In ordering Bolting Cloth, Millers know that it pays to buy the heaviest and most uniform silk to get the best results in bolting, and also for durability, and they should be particular in ordering of parties who handle the best and nothing but the best brand. Another important thing they should observe in sending in their orders and that is; that the order is sent in a way that there can be no possible way of a mistake occurring in the making of it, which is too often the case on account of the order not being perfectly plain, and if the cloth is not spoilt entirely, it takes considerable time to change it to fit the reel, and then the fit is not so perfect as when made by the mill-furnisher who has this department under the superintendence of a competent forewoman, especially traded to the art. For tacking the cloth on the reel head and tail and ribs, nothing but the best A. C. A. ticking should be used, and the silk used in making up the cloth should be the best make of show silk.

Millers in ordering bolting cloths should always observe the following if they wish to secure a perfect fit to their reels:

- 1st. Exact length of Reel over all?
- 2d. Diameter of Reel?
- 3d. Measurement around Reel?
- 4th. Number of Ribs in Reel?
- 5th. Distance from centre to centre of Ribs?
- 6th. Number of parts the Cloth is to be made in?

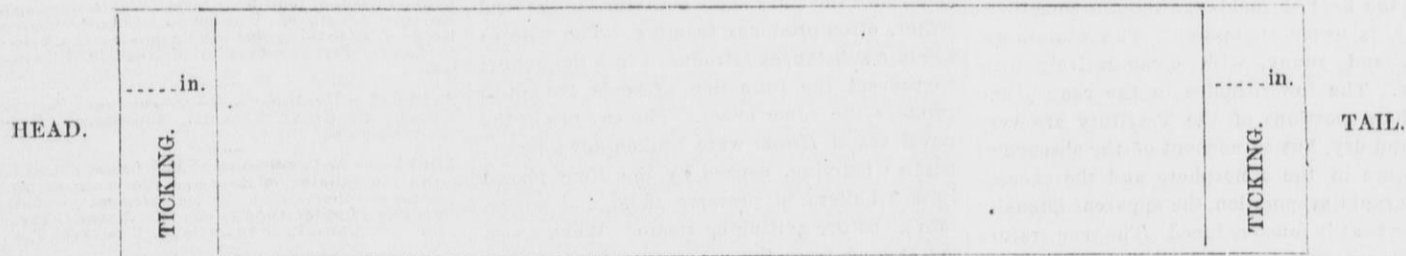
A very novel idea of Edw. P. Allis & Co. in advertising bolting cloth is, when sending out their price-list of bolting cloths, to have a diagram of a cloth made out on the opposite side of the pricelist, so the miller can fill in the blanks and send in his order without fear of a mistake occurring. This firm have been kind enough to furnish us with this diagram and we take pleasure in presenting it to our readers as it may be of service to them:

MESSRS. E. P. ALLIS & CO., MILWAUKEE, WIS.

Please fill the following order with Genuine Dufour Bolting Cloth.

Exact Length of Reel over all.....feet.....inches.

188



Diameter of Reel.....inches.  
 No. of Ribs.....  
 Distance from centre to centre of ribs.....inches.  
 To be made in.....parts.

It is but justice to say that this firm sell only the celebrated "Dufour & Co.'s Old Dutch Anchor" brands, and by adhering strictly to this, and putting it before the public in a way that will attract the notice of the millers and assure them that by ordering here they can rely on what is sent them as being the Genuine Dufour Silk and the fit to be perfect, their trade in this branch alone is enormous. This celebrated cloth is too well known for any description as to its superiority over other silk. Every piece of this silk received by Edw. P. Allis & Co. is stamped with the following cut, and millers, when trading with this well known firm, can be assured that they are getting the genuine article and not one of the many inferior brands.



For the benefit of the milling interests this firm kindly favors us with the number of meshes per lineal inch for each number of bolting cloth as per the table below, and also some interesting facts about Gritz Gauze and Wire Cloth. Millers will find it useful in determining the cloth needed when altering their mill:

16 Meshes to the lineal inch.		84 Meshes to the lineal inch.	
0000	16	7	84
000	22	8	92
00	28	9	100
0	36	10	108
1	46	11	116
2	54	12	124
3	58	13	132
4	64	14	140
5	70	15	148
6	76	16	160

In Gritz Gauzes the following numbers are made: 16, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 64 and 68.

These are numbered so as to indicate the number of meshes to the current inch, and correspond in this respect with the usual numbers of bolting cloth as follows:

0000	is equal to No. 20	1	is equal to No. 50
000	" " " " 26	2	" " " " 56
00	" " " " 30	3	" " " " 60
0	" " " " 38		

But as the threads are very heavy, it is necessary to adopt the following scale to accomplish the correct result in bolting:

0000	results as No. 16	3	results as No. 54
000	" " " " 20	4	" " " " 58
00	" " " " 26	5	" " " " 60
0	" " " " 34	6	" " " " 64
1	" " " " 44	7	" " " " 68
2	" " " " 50		

In wire cloth the following table will show the comparative size of meshes with Silk Bolting Cloth. To Millers adopting the Roller System, where so much of this is used for scalping purposes, this table may be of interest.

No. 18 Mesh Wire Cloth equals No. 0000 Silk Bolting Cloth.	No. 70 Mesh Wire Cloth equals No. 6 Silk Bolting Cloth
No. 22 " " " " No. 000 " " "	No. 80 " " " " No. 7 " " "
No. 28 " " " " No. 00 " " "	No. 90 " " " " No. 8 " " "
No. 36 " " " " No. 0 " " "	No. 100 " " " " No. 9 " " "
No. 46 " " " " No. 1 " " "	No. 110 " " " " No. 10 " " "
No. 54 " " " " No. 2 " " "	No. 120 " " " " No. 11 " " "
No. 64 " " " " No. 3 " " "	No. 135 " " " " No. 12 " " "
No. 76 " " " " No. 4 " " "	No. 150 " " " " No. 13 " " "
No. 90 " " " " No. 5 " " "	No. 160 " " " " No. 14 " " "

### Friction—Its Causes and Effects.

Friction in machinery is resistance offered to motions, arising from the interlocking of minute projections and depressions in the working surfaces. Humat agency cannot produce a surface that, under the microscope, does not present these projections and depressions. The finest cambric needle, under the above conditions, looks like a moth-eaten crowbar, so to speak. The best machine is one that, accomplishing the result for which it was designed, charges the least toll of the original power for its passage through it. Oils, etc., reduce friction, because they fill up the depressions, thus preventing actual contact by floating the surfaces apart. The oil, in any case, must be suited to it. Thus, light sewing machine oil would not do for the driving boxes of a locomotive, because of its thinness. It would be forced out of the depressions in the bearing by the weight. Engine oil applied to a sewing machine would add to the friction, because of its thickness, body and cohesion. Therefore, heavy bearings require a heavy oil, which will, by its consistency and cohesion, in and of itself, retain its position on the wearing surfaces. The poetry of friction is beautifully illustrated by the transmission of power by frictional contact, the depression in the face of one wheel fitting over the projections of the others, like a pair of gears. Locomotive engineers have frequently noticed the fact that an old pair of driving wheel tires, when worn so as to fit the entire top of the rail, are not as effective as when the tire comes into contact in but a small portion of its surface. The reason is that, when the entire surface of the tire comes into contact with the rail, it is prevented by a minute covering of dirt, etc., from forcing its surface into actual contact. Sand is, therefore, necessary to grind away this covering of dirt. When, however, but a small portion of the tire comes into contact with the rail, having the same weight on it as before, it, by virtue of this extra weight on a small surface, forces the dirt, etc., out, and interlocks by actual contact with the rail.

When a bearing runs dry, abrasion or cutting occurs, because the projections are allowed to interlock, and the stripping off of these projections, like the teeth of the gear, is "cutting."

Cutting progresses so rapidly when once commenced, because the original projections on the wearing surfaces are much smaller and finer than these which result, or are secondary to the tearing off of the first.

Thus, being larger, more metal is removed. Babbit metal, brass, etc., are well adapted for bearings, because these projections, being soft, rivet down, are burnished over instead of stripping off, presenting a smoother surface. If the builder of the first locomotive who geared his engine into a rack laid under the engine between the rails, had examined with a microscope the smooth surface of a driving wheel and rail, he would have found a much more efficient gear and rack than he could have constructed. He carried out on a larger scale nature's idea.

Morin and Conlomb are accepted authorities on friction, and their investigations have established the law that friction does not increase with increased surface, the weight or force pressing the surface remaining the same. Thus, a brick-shaped piece of metal would offer the same frictional resistance, whether down on its edge or side, the surface being twice as great in the latter case. When drawn on its side, the greater surface prevents the interlocking of the faces to the same extent that occurs when drawn on its edge, but the greater surface inter-locked offers the same resistance as the lesser surface more deeply in contact.

It is plain therefore that a heavier oil would be needed in the latter case to prevent contact. The increase of velocity, merely, does not increase friction. This is, however, dependent greatly on secondary or incidental causes, such as resistance of the air, generation of heat, etc. Pressure alone, therefore, governs the amount of friction.

The time that surfaces are in contact, especially if such surfaces are soft, increases the frictional resistance on the start, as time allows the projections and depressions to become acquainted with each other, so to speak, and more deeply ingratiate themselves in each other's affections, by hunting up accommodating depressions to work into. Thus, an engine is "stiff" on the start in the morning, having lain idle over night, mainly from this cause.

MANUFACTURERS of any article used in a flouting mill should make use of the advertising columns of the UNITED STATES MILLER. It will pay.



[From *The Miller*, London.]

## GOSSIP ABOUT MILLERS AND MILLS.

The Miller in Story.

## The Maid of Abbey Mills' Valentine.

*A Legend of St. Valentine's Day.*

## CHAPTER I.

A LAWSUIT AND ITS RESULTS.

Abbey Mills, Fairholm, were in the hands of a family named Draper for many generations, and it had acquired a crust of antiquity so thick as to secure no small measure of respect from that section of the Fairholm population whose organ of veneration for the antique in race, buildings, or institutions was largely developed. The first of the family known in local history held the office of "grinder" in the Abbey Mill early in the fourteenth century. Mention is made of him in the Abbey Chartulary, which was published by a Fairholm Dry-asdust by subscription. In this record indeed he does not figure in a very dignified position, as it was that of a demaunt brought before the Lord Abbot for some minor delinquency, for which he had to do suitable penance. The ray of light thus cast upon the first Fairholm Draper we have any knowledge of is too faint to throw any illumination upon the antecedents of the race, but from the same source from which we have derived the small shred or snip of biographical fact mentioned, we learn that he died at a good old age, and that he was succeeded in his office, and the emoluments thereunto pertaining, by his eldest son.

From this tiny source an unbroken stream of Drapers stretch on to the period to which the present history belongs, when it was merged in another current under circumstances which will be shown in the sequel.

Some time prior to the Reformation, the family had become tenants of the mill, and at the Reformation, an event in connection with which a great deal of valuable property changed hands, the tenant for the time being became the owner, with all the privileges enjoyed by the dispossessed owners, as to "grinding corn and malt" in Fairholm parish, upon very easy terms.

The hamlet of Fairholm, which had grown up under the fostering care of the Abbey, became, in course of time, a town of respectable dimensions. Cloth making, weaving and other industries took root in it and flourished; and about the close of the eighteenth century a stranger from the north, who bore the name of Cruickshank, appeared in Fairholm, and, having acquired a piece of ground on the outskirts of the town, about two miles from the Abbey Mills, close by the stream which supplied the motive power for the latter, he commenced to erect a building, keeping his own counsel, however, as to the purpose for which it was intended.

It was generally supposed that it was destined for cloth manufacture, as the stranger, it was known, had acquired the right of usage of the stream already mentioned, but on passing the new erection one morning, Mr. Draper saw, with astonishment and indignation, inscribed in conspicuous letters on the front of the building,

## FAIRHOLM ENTERPRISE FLOUR MILLS.

With these words branded upon his brain, Mr. Draper went straight to his lawyer for consultation as to the promptest method of ejecting this daring stranger from territory over which the owner of Abbey Mills had inalienable right of "soke." The consequence was the raising of an action which, after running the gauntlet of the local courts, was transferred to the supreme courts in London for final decision. The litigation was long and expensive, ultimately resulting in the non-suiting of the plaintiff, on the ground that it was proven to the satisfaction of the court that he could not grind a tithe of the corn and the malt required by the parish of Fairholm.

Mr. Draper was not one of these exceptionally meek litigants who, when smitten on the one cheek, offer the other for similar treatment. As an Englishman he was, of course, firmly convinced that the institutions of the country, including those that dispensed justice, were perfect, but there might be perfect institutions, and at the same time very imperfect men connected with their management. The fountain of English justice might be pure and her balance impartial, but the one might be polluted, and the other biased by wicked men. One thing was certain, he had sustained the greatest possible injury from the machinations of unprincipled adversaries and the prejudices of London judges. The respectable legal practitioner of Fairholm, who acted as his lawyer, had shown him that the defendant

Cruickshank "had not a leg to stand upon," and the counsel retained to conduct his case in the London court had made it clear to the meanest understanding, that the intrusion of the defendant into Fairholm parish, as a miller, was a direct and gross infringement upon rights which were conferred by the Crown upon the original proprietor of Abbey Mills, "and his heirs forever." But for all that, on some miserable quibble, that "such rights were forfeited when the person to whom they belonged proved incompetent to their exercise," he had been nonsuited! "A more monstrous miscarriage of justice," to quote the words of the Fairholm *Mercury*, a journal which strongly espoused the cause of Mr. Draper, "had not been known since the days of the Star Chamber."

Mr. Draper, however, was composed of too substantial metal to allow the loss of a lawsuit to paralyse his energies.

Previously to the advent of his rival he had thought of making a considerable addition to his mill, but the thought had been in his mind only as a seed is in the soil, vital, but dormant until influenced by the conditions which result in germination. Had the thought been put into action the result of the lawsuit might have been different, although at that time forces were at work in the country which were disposing of the popular mind to a less tender regard for prescriptive rights *per se* than had formerly been the case.

The fact that increase of custom might follow increased means of production would have been a sufficient inducement to most men to make provision for the latter, but in Mr. Draper's case it was not powerful enough to overcome the reluctance he felt to incur the expense involved in the enlargement of his mill. Men, more especially in quite well-to-do provincial towns, were not in the habit in those days of doing things rashly. "Let well alone" was a proverb for which they had a profound respect, and the substantial balance Mr. Draper had with his banker was "a bird in hand," a feather of which he cared not to risk on the chance of securing birds still "in the bush."

But if the prospect of increased gain proved a motive too weak to overcome his reluctance to build, the triumph of his rival in the law courts acted as a thoroughly effective spur to his previously half-formed intention. "I have never been worsted before in my life, and I will not accept defeat at the hands of a stranger, and a Scotchman to boot, without making an effort to avenge myself." From a high, ethical point of view, the idea of vengeance was, of course, exceedingly reprehensible, but there was a great deal of unregenerate nature in Mr. Draper, and when he received a blow he was never satisfied until he returned it with interest.

Accordingly, the builders were set to work, and while the existing mill, which was as old as the Abbey itself, which stood in a picturesque state of ruin near it, was religiously preserved, a new erection speedily arose by its side, which dwarfed into comparative insignificance the "Enterprise Mills" that had been built by Mr. Cruickshank.

Steam, which had been recently introduced as a motive power in corn mills, was had recourse to by Mr. Draper as an auxiliary to the stream which had driven the old mill. The best machinery available at the time for use in the different processes of flour manufacture was secured, regardless of expense, and the task of starving the interloper Cruickshank out of Fairholm was vigorously commenced. To the astonishment, and, it must be added, intensely to the disgust of Mr. Draper, his rival showed no sign of capitulating. The latter even paid him the compliment of imitation, by enlarging his mill and the adopting of steam; and while Mr. Draper's business increased at a greater rate than had been anticipated by that gentleman, even in his most hopeful moods, that of his rival, so far as he was able to ascertain by what he heard on the markets he frequented, was also in a most flourishing condition.

After twenty years unceasing war, a neglected cold, which settled on his lungs, compelled Mr. Draper to exchange the comforts of Abbey Mill House for the dreary retirement of the Abbey churchyard, leaving his rival master of the situation.

## CHAPTER II.

A NEW GENERATION.

Sixty years after the events related in last chapter, the Abbey Mills and the Enterprise Mills were in the hands respectively of a Draper and a Cruickshank, grandsons of the principals in that famous lawsuit which orig-

inated in the first establishment of the Enterprise Mills. The bitterness of the old feud between the families had died out to a great extent, and when John Draper and Chas. Cruickshank met at markets and other places they exchanged greetings, but there was no great cordiality between them. Fairholm was famed for its neighborly hospitalities, and from time to time the rival millers met at the tables of mutual friends, but Mr. Cruickshank had never been invited to dine at Abbey Mill House, nor had Mr. Draper been asked to share the hospitalities of Lomond Lodge, the residence of Mr. Cruickshank. Not, to do him justice, that the latter had any hostile feeling which prevented his giving to or accepting an invitation from his rival; but as the old feud originated with Mr. Draper's grandfather, and its bitterness was occasioned chiefly by the animus displayed by that gentleman with reference to the founder of the Enterprise Mills, Mr. Cruickshank felt a shyness in making advances to Mr. Draper, which might not be received in the spirit which inspired them. Mr. Draper had an only child, a daughter, whose mother died when she was an infant, and Mr. Cruickshank, also a widower, had an only son.

Maud Draper, who was popularly known as the "Maid of Abbey Mill," was in her nineteenth, and Robert Cruickshank in his twentieth year when they are first introduced to the reader. It was universally admitted in the circle in which they moved, that Maud was its brightest and most winsome ornament, and a handsomer or more high-hearted fellow than Robert Cruickshank was not to be found in Fairholm male society. Maud was graceful as a lily, with a complexion in which the lily and the rose were blended. Her hair was brown with a dash of gold in it, and her eyes were dark, opinion being divided as to whether they were a deep blue or a deeper grey. They possessed a charm, however, which, whether they glaced at the beholder through their dark fringe of eye lashes, or looked him straight in the face, had a fascinating effect. Maud and young Cruickshank had met several times at Fairholm parties, and though each was conscious of the existence of some coldness between their fathers, arising from that old lawsuit, they seemed to be of opinion that there was no reason why it should chill the pleasure they derived from these occasional meetings. What happened at Verona when a gallant Montague met a fair Capulet, happened at Fairholm, and the daughter of the house of Draper and the son of the house of Cruickshank were lovers before it was suspected by their fathers that they were the merest acquaintances.

The lovers, aware of the state of feeling that existed between their parents, were of opinion that in all probability it would act as a barrier to the immediate realization of their wishes, but they decided that it was best to know at once what degree of opposition, if opposition there was to be, they were to meet with. Anything like clandestine intercourse was repellant to the nature of both. The relationship that had been formed between them had sprung up as the flowers do—unconscious to themselves, without any thought of circumstances outside the sphere of their own feelings by which such a relationship might be affected. Reason, indeed, might suggested the propriety of an inquiry whether the authors of their being had any objection to the step they had resolved upon, antecedently to the forming of the resolution; but then reason is not invariably present to watch and control the proceedings of lovers, and Robert Cruickshank and Maud Draper plighted their troth without a thought of anything but the subject immediately in hand.

To do them justice, the first thought that occurred to them after this had been done, was what their fathers would think of the step, and Robert undertook the task of ascertaining.

So far as his own father was concerned there was no great difficulty.

"I would have been better pleased had you chosen some one else," he said, "though, so far as the girl is concerned, I have nothing to say, but her father is a stuck-up, disagreeable ass, who has never forgotten that his grandfather was beaten by mine in a lawsuit of his own raising. However if he consents, my boy, I'll raise no objection."

After his interview with his father, Robert proceeded to the Abbey Mill-house and was shown to a room used by Mr. Draper as a private office. He was received by that gentleman, who was entirely ignorant of the object of his visit, with cold politeness. Handing his visitor a chair, he said:—

"I don't think I have had the pleasure of seeing you here before, Mr. Cruickshank. Is there anything I can do for you?"

The question was a stereotyped form Mr. Draper was in the habit of using when any visitor called with whom he was not on the most cordial terms, and whom he desired to get rid of as soon as possible.

The stiffness of his reception had a somewhat chilling effect upon Robert, but as he was partly prepared for it he resolved to plunge at once into the subject which had taken him to Mr. Draper's presence.

"I should be very glad to think that you were pleased to see me here, Mr. Draper, and if you are willing, you can do more for me than any one else in the world can do."

There was an earnest ring in the young man's voice which startled Mr. Draper and made him scan the appearance of his visitor with more interest than he had done on his first appearance.

"Indeed," he said, with a chilly smile, "and what, may I ask, without in the meantime saying anything about my willingness, can I do for you so much more than any one else? At the same time permit me to say that, presuming you are aware of the relations that have existed so long between your family and mine, I am somewhat surprised you thought of applying to me for anything which seems to you of so much importance."

"Suppose I were to ask you to do something which would be the means of improving the relationship to which you have alluded, and which for my own part I have always regretted, what would be your answer? Surely there is no reason why disagreeable feelings should exist between neighbors forever because two people quarrelled more than half a century ago," replied the young man earnestly.

"Has Mr. Cruickshank sent you as an ambassador to negotiate terms of amity between himself and me? If so, I would rather defer the consideration of the subject to some future time, as I am rather busy this morning," said Mr. Draper, rising, as a hint, that he desired the termination of the interview.

"I am not here in any capacity from my father, who, I am sure, has no ill-feeling with regard to yourself," said Robert, also rising; "the object of my visit is entirely personal, although it has the knowledge and approval of my father. I will not trespass upon your time many minutes, but," and the young man hesitated a moment, at the same time glancing at the well-worn carpet which covered the floor of Mr. Draper's office, "I deemed it," he continued, "my duty to inform you of the sentiments I entertain with regard to Miss Draper—"

"My daughter!" exclaimed Mr. Draper, clutching the back of a chair. "What right have you to mention her name?"

"The right that love gives to a man to mention the name of the woman who is dearer to him than his own life," was the reply.

Mr. Draper turned purple with rage, and it was several minutes before he could command himself sufficiently to speak.

"And have you dared to address my daughter as a lover?" he exclaimed at last, glaring upon the young man as if he could have annihilated him where he stood; and Robert having signified his assent, the floodgates of Mr. Draper's rage burst open, and poured forth a torrent of invective against his visitor and all belonging to him, which required all Robert's philosophy, tempered by love, to bear.

At length the torrent exhausted itself, and Robert departed, not certainly in the most Christian frame of mind with regard to the father of his love, although he had contrived to bear his abuse without resenting it.

All that remained of the ruins of the Abbey stood in the Mill-house grounds, and in leaving the latter Robert had to pass a corner of the ruins which was heavily draped with ivy.

"What a towering rage he was in," the young man was thinking, as with knitted brows and his eyes fixed upon the footpath, he was hurrying along the latter. "What will Maud say when she knows of the reception I have had?" He had reached the ivy before mentioned as he thought this, and on looking up, as if in answer to his thought, he saw Maud in all her beauty standing before him.

"My darling!" he cried, taking her hands in his own, the dark cloud passing from his face in the sunshine of her presence, all the more precious because it had not been expected.

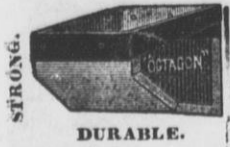
"What did he say, Robert?" inquired Maud, in a low tremulous voice, which betokened the deep interest with which she anticipated the answer.

"Say!" he replied, putting his arm around her waist, and pressing her form to his side,



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3 x 3 ..... 6 "	4 1/2 x 3 1/2 ..... 10 "	5 1/2 x 4 ..... 13 "	8 x 5 ..... 18 "
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We received your "Octagon" elevator bucket, and like it very well. Send us — MOON & BLACK, Diana, Ill.

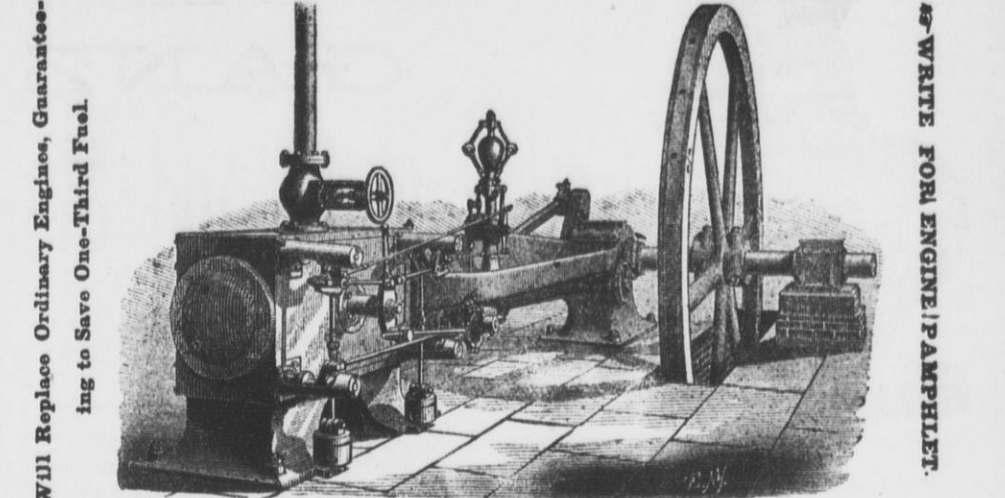
We like the form of your "Octagon" cups better than any other, so does our millwright. J. SHOUTZ & SON, Bloomville, O.

We received your "Octagon" which we think is a real good cup. Please send us the following — H. J. SOMMER & BRO., Canton, O.

Enclosed find draft — for "Octagon" cups ordered last week. They are all right. T. W. STANTON & SON, Waupun, Wis.

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Mill For Sale—A Rare Bargain.  
Desiring to turn my full attention to other business I offer for sale my Mill Property in Ripon, Wis. The mill is 40x60 and four stories high with additions 4x44 and 20x40, and cooper shop. Power: 13 feet head, 3 13-inch turbines, also 75 horse power engine with two boilers. Has 2 wheat stones, one middlings and a feed run, 2 purifiers, flour packer, separator, smutter, corn sheller, etc. Handsome dwelling house can be had with the mill. It has all conveniences and modern improvements. Good schools and college in the city. Any one desiring to go into the milling business, should not fail to examine this property. When you write me please mention the United States Miller. Address H. B. BATEMAN, Ripon, Wis.

TRIUMPH POWER CORN SHELLER!

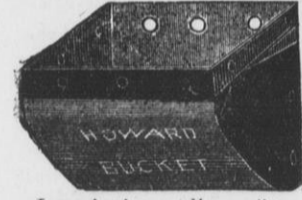
Shells and Cleans 2,000 Bushels Ears per day. The Cheapest, Best and most Simple Power Corn Sheller in use. Send for Circular and Price List. HULBERT & PAIGE, Parisville, Ohio. [Mention this paper when you write us.]

2 RUNS OF FIRST-CLASS MILL-STONES FOR SALE.

For wheat grinding. In perfect order with spindle, tram pot, fulorum, curb, lighter screw and silent feeder. Will sell one or both runs at a very low price, delivered on board cars in Janesville. Address at once. NOTBOHM BROS., JANESVILLE, WIS. [Mention this paper when you write us.]

RIVET BUCKET  
PATENT IRON CONVEYER.

For these and other Grain Handling Specialties Send for Lists and Prices to N. HAWKINS & CO., SUPPLY HOUSE 83 MARKET-ST., CHICAGO. Corrugated belt bolt. [Mention this paper when you write us.]



## Catlin's Howard Bucket.

This bucket is made entirely of one piece of metal. It is octagon shape, very smooth, neat and extra strong. They are acknowledged to be the most perfect warehouse bucket made.

I received the "Howard" bucket from your firm. I like the shape and manufacture of them first rate. When I built I had my buckets made to order, but they were much inferior to yours and cost more money. H. W. HOAG, Delevan Steam Grain Elevator, Delevan, Wis.

Quite a number of parties to whom we have furnished plans for elevators, are using the "Howard" bucket: they are well liked. CHASE ELEVATOR CO., Chicago, Ill.

We also manufacture to order four other styles of Elevator Buckets, and can make it to your interest to correspond with us when wanting buckets for any purpose.

MILL PICKS. 60 cents per lb. .... Discount..... per ct.

WOOD CONVEYOR FLIGHTS. 75 cents per 100..... Discount..... per ct.

ELEVATOR BOLTS. 85 cents per 100..... Discount..... per ct.

Order from this advertisement, and if the goods and prices are not satisfactory they can be returned at our expense.

WM. E. CATLIN & CO.  
63 Lake St., Chicago, Ill.  
Please mention the U. S. Miller when you write us.

HOWES, BABCOCK & EWELL,  
LATE HOWES, BABCOCK & CO.,  
Silver Creek. - New York.

No. 16 Mark Lane, London, Eng.  
THOS. TYSON, Melbourne, Victoria,  
General Agent for the Australian Colonies and New Zealand.

Sole proprietors and manufacturers of EUREKA Wheat Cleaning Machinery, consisting of "Smut Machines" "Brush Machines," Separators for mills and warehouses, and Flour Packers  
Also the Magnetic Separator for removing substances from grain automatically, and dealers in the genuine Dufour & Co. and Dutch Anker brands Bolting Cloth, and mill furnishings generally  
Send for circulars and price lists. Address as above [Mention this paper when you write us.]

The Duplex Safety Boiler.

This boiler cannot explode. Gives most steam for least money, and its durability is established by three years' service without repairs.

Engineers and steam users are invited to send for descriptive circulars.

Duplex Safety Boiler Co.,  
34 Cortland St., New York.  
52 South Canal St., Chicago, Ill.  
Please mention this paper when you write us.

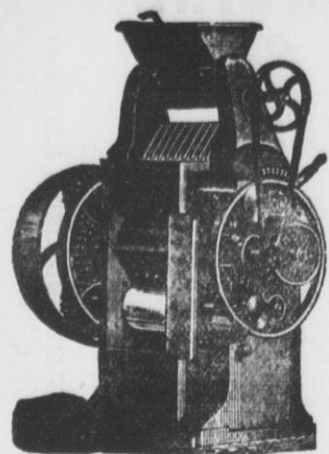
A Hungarian Head Miller.  
Having for many years had experience as head miller in Buda-Pesth, Hungary, desires to open correspondence with some American milling firm, with a view to locating in America. Address all letters as below, and they will be duly forwarded to me. Please state what wages could be expected in case entire satisfaction is given. HUNGARIAN MILLER, Care of United States Miller, Milwaukee, Wis.

Mill Property For Sale.  
Flour Mill, Saw Mill, Planer and Circular Saw Mills, located on bank of Ohio River, 400 feet from depot of C. & P. R. R., 35 miles below Pittsburgh, Pa., in a good business location and grain growing neighborhood. Good shipping facilities by river and rail. Mills, engine and all machinery in good running order. Will be sold low for cash or exchange for farm. Also large commodious dwelling house. Address J. W. ENGLE, Industry, Beaver Co., Pa.



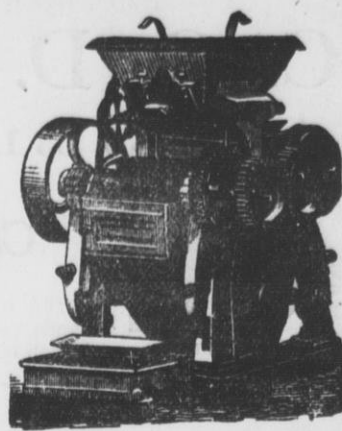
VIENNA EXHIBITION. 1873, Awarded Diploma of Honor.

PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



# GANZ & CO., Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mill, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following:

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-fanned chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wondrous as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable, I remain, etc.,

(Signed) C. HAGGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

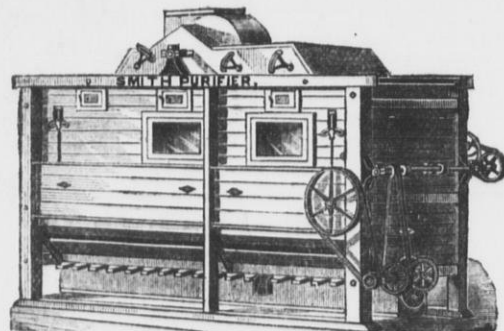
## GANZ & CO., Buda-Pesth, Hungary.

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOP GRAIN CLEANER CO., Auburn, New York.

[Mention this paper when you write us.]



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of EQUAL CAPACITY. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

### THE GEO. T. SMITH MIDLINGS PURIFIER

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery—THE LOCKWOOD MEDAL—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill-owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich.

[Mention this paper when you write us.]

HENRY SMITH, JR.

GEO. G. SMITH.

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## SMITH BROTHERS, Practical Millwrights.

Plans, Specifications and Estimates made for all kinds of

MILLWORK, MACHINERY, Etc., Etc.

Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

No. 454 Canal Street,

MILWAUKEE WIS.

[Mention this paper when you write us.]

THE LOCKWOOD MEDAL. "Awarded to the Geo. T. Smith Middlings Purifier as the machine marking the greatest progress and utility in its application to the grain and milling interests, invented within the last ten years."  
Miller's International Exhibition, Cincinnati, Ohio, 1880.



### FLOUR MILL FOR SALE.

Any one desiring to purchase a 4-run water power mill in a good wheat-growing country, four miles north of Dayton, Ohio, on the Stillwater River, CHEAP and on easy terms, will address MICHAEL SCHAEFER, 16 Market street, Dayton, Ohio.

### German and Austrian FLOUR MILL DIRECTORY.

Compiled from official sources and giving in every instance the number of runs of stone and kind of power used, just published at Leipzig, Germany. This work is of great value to all who desire to build up trade with Germany or Austria. Price, \$9 per copy. Sent by mail on receipt of price. Address

UNITED STATES MILLER,  
MILWAUKEE, WIS.



[Mention this paper when you write us.]

### SITUATION WANTED.

By April 1st, or sooner. A prominent miller; one who has been milling since 1856; had full charge of a large water mill 14 years, and head miller in steam mill 12 years. Is one of the finest burr dressers in the country. Reason for changing situation, his employer is trying to sell out, and he don't know what day he may be out of work. Please address LAWYER DONALDSON, Prosecuting Attorney, Allegan, Mich.

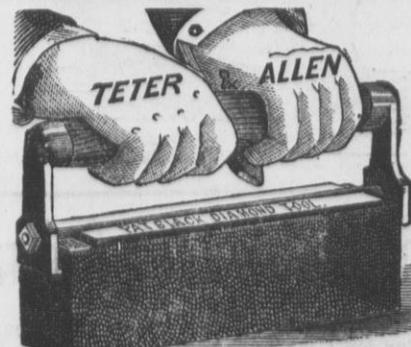
### SAWING MADE EASY.

A boy 16 years old can saw off a 3-foot log in two minutes.



Our new portable Monarch Lightning Sawing Machine rivals all others. \$50 cash will be given to two men who can saw as fast and easy in the old way, as one boy 16 years old can with this machine. Warranted. Circulars sent Free. Agents wanted. MONARCH LIGHTNING SAW CO., 163 Randolph St., Chicago, Ill.

[Mention this paper when you write us.]



Over 4000 now in use. Guaranteed the best Tool in the market for smoothing the face and furrows, removing glue, and restoring the burrs to their sharp, natural grit. It is far superior to Emery or Corundum. Used with or without water. Too large to send by mail. Price, \$3.50. Will send our Tool on trial against any other in the market. Miller's to pay for the best after a trial. Sold by Mill Furnishers throughout the world.

See that it has "Teter & Allen, Pat. Black Diamond Tool" on the plate.  
TETER & ALLEN,  
404 Commerce St., Philadelphia, Pa.

[Mention this paper when you write us.]

# The United States MILLER

Volume 10.—No. 6.

MILWAUKEE, APRIL, 1881.

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

## Review of the Market.

[Prepared expressly for the UNITED STATES MILLER.]

April 4th 1881.—The wheat market has been stimulated considerably during the past month, by the long continued cold and stormy weather, together with rumors of more or less injury in different localities to the growing crop in the winter wheat section. Prices for May delivery, in which the principal trading has been concentrated, advanced on the 17th ult. to \$1.08½, an improvement of 6@7 cents per bushel on prices ruling towards the close of the previous month. A disposition to realize profits on previous purchases, together with the fact that purchases made for April delivery would be subject to an expense of 5½ cents per bushel for carrying into May, brought a good deal of wheat on to the market, and prices gradually receded 4@5 cents per bushel. The feeling is strengthening again somewhat, but the general impression seems to be, that there is a surplus of wheat in the country, beyond the world's requirements for the current crop year, and that it is doubtful about sustaining prices at their present moderate range, should the prospects for the coming crop, both in the winter and spring wheat sections, be ordinarily favorable. The critical period, however, is yet to come, and should the transition to spring weather develop any injury of importance to the winter wheat crop, prices must improve further. The latest advices from the spring wheat section indicate that seeding will be earlier in Minnesota and Iowa than in Wisconsin, and will commence in portions of the first named States, in a week or ten days, but can hardly be expected to be general in this State for two or three weeks to come, with favorable weather from this time forward.

The statistical position is becoming more favorable for holders from week to week. Stocks in store at lake and seaboard ports and in transit between those points, have decreased in the past four weeks 4,335,000 bushels, and are now 3,000,000 bushels less than at the corresponding date last year. The quantity of wheat on passage for Great Britain and the Continent is reported, however, 4,696,000 bushels greater than at the corresponding date last year, which has a tendency, of course, to produce apathy in foreign markets. The export movement the past four weeks has been liberal, aggregating from Atlantic ports 8,487,000 bushels, against 4,942,000 bushels the preceding four weeks. Stocks in store at Atlantic ports are reduced to a low point, aggregating only 2,118,000 bushels, against 4,380,000 bushels at the corresponding date last year.

Receipts here are expected to be light for the coming month, much of the wheat now in country ware-houses having been sold for May delivery and will consequently be held back until that time, to save storage; and but little will be marketed in the country until seeding is over. Our advices from the country indicate that there is still a good proportion of the crop in farmers hands, reports varying from a quarter to one-third.

We quote this market to-day steady and quiet, closing at \$1.05½ for May delivery. Dealings in cash wheat are trifling, and we quote closing prices of the leading grades as follows: No. 2 hard \$1.07; No. 2, \$1.02½; No. 3, 93; No. 4, 84.

E. P. BACON & Co.

**THE WRONG LEG.**—There used to be a lawyer in England who wore a cork leg so gracefully that, though everybody knew he had lost a leg, nobody knew which leg it was. He was speaking in a crowded court-room once, and behind him sat an unscrupulous young lawyer. By his side in turn sat another young lawyer, just admitted to the bar, and who had never heard of the speaker's misfortune. To him the unscrupulous young lawyer said: "You see how hot old Buzfuz is over his case.

Now, I'll bet you a sovereign I'll run this pin into his leg up to the head, and he'll never notice it, he's so absorbed in his case. He's a most extraordinary man in that way." The other fellow took the bet, and his companion took a large pin, and leaning forward drove it up to the head into the orator's leg. A yell that froze the blood of all who heard it, that made the hair of the jury stand on end, and caused the Judge's wig almost to fall off, ran through the court. "By Jove! it's the wrong leg, and I've lost my money," said the young lawyer, who didn't seem to care how much it hurt.

## Why Nuts Work Loose.

Mr. Rose explains that the tendency of a nut to unwind and recede from the pressure upon its radial face is proportionate to the pitch of the thread and the diameter of the bolt; and the finer the thread upon a given diameter of bolt, or the larger the diameter of bolt with a given pitch of thread, the less will be the tendency of the nut to move back. In the case of ordinary bolts and nuts, a given diameter of bolt is given a standard pitch of thread, and these pitches are not so fine as to prevent the nuts from unscrewing in many cases, unless check nuts are used. It would appear that if the nut thread fits reasonably tight upon the bolt, and the nut is screwed well home, it should remain there; but there are palpable reasons why it should not do so. Of these the chief are the errors which ensue from the alteration of form which takes place in the screw-cutting tools during the hardening process. As a rule, all steel increases in dimensions from being hardened. What the amount of increase or expansion is we have at present no definite knowledge, because it varies considerably, although it is probably the same when the conditions are identical. Suppose, then, that a tap is made of the correct diameter to a vernier gauge, and that it increases in diameter and in length (as it almost invariably does) during the hardening, then the pitch, the thickness, the depth and the diameter of the thread will be altered and "out of true." Unless both the tap and the dye are tempered to precisely the same shade or color, the amount of error will vary. As a result of these at present irremediable errors, taps are made to suit existing solid dies, or adjustable dies are set to suit the taps; and though the nut may fit closely to the bolt, so as to be just movable by hand, or under the moderate pressure of a wrench, yet the sides of the thread do not fit properly, nor can they be made to do so under any ordinary conditions. The result is that, under vibration, the threads give way on the contact sides; for vibration is, in effect, a number of minute blows. Under reciprocating motion the result is precisely similar; for the whole pressure upon the nut is supported by that part of the surface of the thread which is in contact, which compresses or recedes. Any machinist who desires to test this matter may do so by taking a nut that fits very tightly upon a bolt, and striking upon the sides, he will find it will lose the fit to the bolt.—Iron Monger.

## The Iowa Fishway Laws.

The fishway question is again brought before the public. This time as an unconstitutional law, and commissioner Shaw's trap won't hold water, so decided by Judge Lewis in the injunction case brought by the Harrison County Miller's Protective Association, to restrain the Board of Supervisors of the county from proceeding to attach fishways to dams erected on streams in Harrison county, as the fishlaw requires them to do when the parties owning the dams failed to put them in, in accordance with the fishlaw. S. H. Cochran, of Missouri Valley, was employed by the Association as attorney in the case. His success in the management of this and other cases wherein the constitutionality of the law was in question, indicates a legal ability of high

order, and we bespeak for him a successful future in his profession. We do not know whether the county will further test the constitutionality of the law by carrying the case to the Supreme Court, which court will have to sustain the decision of the lower court before the law is void and of no effect. If all owners of dams across streams in the State have to comply with the law, by putting in fishways, or test the constitutionality, in either case it will cost them in the aggregate a large sum of money. Should they choose the former and put in the fishways, at a low estimate it will cost \$50,000. To test the soundness of the law it will be a cost of \$25,000 or \$30,000. The cost already made and paid by the several counties of the State for models and specifications furnished by Fish Commissioner Shaw, sheriff notices, etc., amounts to a large sum of money, and the State has expended some \$50,000 in hatching, importing and planting fish in the waters of the State, which have proved to be an utter failure and a total loss to the State, as no benefits have been derived from the expenditure whatever, and there is no probability that it ever will. We have conversed with several members of the legislature in relation to the law in question, and nearly all said: "We did not think much about it; everybody seemed to be in favor of the law, therefore we voted for it." Some said they thought the law would be so obnoxious that it would lead to the repeal of the entire law relating to fish culture by the State. To enact and pass a law without thoroughly investigating its merits or demerits, or knowing it to be so obnoxious as to compel interested parties to appeal to courts that they may avoid the damage they would sustain from the enforcement of the law at a cost of tens of thousands of dollars to themselves, and a like large sum to the State, is an outrage on a free people.—Reporter, Dunlap, Harrison Co., Iowa.

## Hose Pipe Nozzles.

Who is going to invent the nozzle of the future? There is no nozzle that we have ever seen that seems to us to control the stream it delivers as it should do. Instead of projecting a solid stream for a long distance, the water breaks soon after leaving the nozzle, and soon sprays and breaks up altogether. We often hear of steamers throwing 250 and 300 feet, but we recently heard a veteran chief say that he had yet to see the apparatus of any kind that would throw a solid stream 100 feet. The difficulty may be all with the water, which is naturally inclined to separate, but we are of the opinion that part of the trouble lies in the construction of the nozzle. An experiment made in Boston, by putting a core into a play pipe, and thus dividing the stream into four parts, depriving it of its rotary motion, showed a gain of 30 feet in distance playing. But even this not does seem sufficient. Our steamers give us power enough for throwing, and the hose in use gives every facility for carrying a large volume of water. There should be some means devised for delivering that volume in a solid stream at long distances. Great difficulty has been found in making nozzles operate uniformly at all times. A manufacturer of steamers once found a nozzle that gave him great satisfaction; with it his steamers could throw greater distances than any he had ever tried before. He ordered half a dozen just like it. The half a dozen were made precisely like the first, but never equaled it in delivering water. There is much to be learned yet regarding this question of delivering water on fires, and the exact relation existing between pressure, hose, play pipes, nozzles, and the friction of water.

Edw. P. Allis & Co. have contracted with Messrs. Gerlach & Co. to gut their mill entirely of its present system and introduce their thorough roller system in its place, using 16 of Gray's noiseless roller mills. The mill when complete will have a daily capacity of 250 barrels.

## A Project for the Year 2000.

Lake Mackenzie is one of these "possibilities of North America" recently suggested. The lake will result from a proposed closing of the northerly outlet of the valley of the Mackenzie River, at the line 68° north, and storing up the water of 1,260,000 square miles. And to this could be added the water of other large areas. It would be a lake of about 2,000 miles in length by about 200 of average width. Its surface would have an altitude of about 650 feet above the sea level. It would cover with one continuous surface the labyrinth of streams and lakes which now occupy the Mackenzie Valley. It would be a never failing feeder for the Mississippi. It would connect with Hudson Bay and with the "great lakes," and also with the interior of Alaska by connecting with the Yukon and its affluents. By concurrent results and other "possibilities" it would become, during some months of each year, a navigable water, adding not less than 12,000 miles of communication to the Mississippi. It would complete the interior lines of river courses by connecting them. Cutting the "divide" which now exists between the Mississippi and Mackenzie would do this. This work is small when measured by its results, and it becomes easy of accomplishment under the methods proposed. The connecting of the Upper Mississippi with the proposed Lake Mackenzie would be easily made if that lake had a surface at the proposed altitude of 650 feet above the sea. The outflow from such a lake, having a length of more than 2,000 miles from south to north, and draining a very wide range of altitudes, would be a timely enduring one. This lake would make possible and easy the straightening of the Lower Mississippi. It would also contribute to the proposed ship channel from Cairo, Ill., to the Gulf of St. Lawrence, by the almost straight line which cuts the Wabash Valley, the Lakes Erie and Ontario, and the Lower St. Lawrence. This commercial channel, receiving all the waters converging at Cairo, would complete the demand for a constantly open ship channel from the St. Lawrence to the sea by way of the Strait of Belle Isle. That demand can be complied with, and the shortest and best line of communication can be thus opened between the interior and the seaboard.—St. Louis Republican.

**THE THEORY OF THE BESSEMER PROCESS.**—There is nothing like knowing the reason for things. A writer thus explains the theory of the decarbonization of iron in the Bessemer converter: "Some inquisitive reader may be desirous of knowing why there should be this effect of the air-blast through the melted cast iron." Webster says that "it burns out a portion of the carbon." We say that the air, forced through the molten metal, blows out its impurities. The changed appearance of the flame from a dead red to a clear white light indicates this fact. Says another: "Why add spiegelisen?" After forcing the air through the liquid iron it becomes more or less porous. The spiegel contains a large per cent of manganese. This attracts, gives density, cohesion and tensile strength to the compound. Some illustrate the change by the formation of a seidlitz powder. In this the parts separated are an acid and an alkali. Combined it is a new liquid—differing entirely from its component parts. Now, it cleanses and purifies the stomach. So the cast iron, freed from its impurities, and in a fluid condition, the spiegel, highly charged with manganese, and also in a fluid state, immediately unites all its properties with the iron, and the result is a fine quality of steel, possessing great hardness and sufficient tensile strength for the best kind of steel for railroads.

SUBSCRIBE FOR THE UNITED STATES MILLER. Only \$1 per year.

PUBLISHED MONTHLY.  
OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.  
Subscription Price, \$1 per year in advance  
Foreign Subscription, \$1.50 per year in advance

## ANNOUNCEMENT:

Mr. P. SCHNEITLER, Berlin, N. Mueller St., 179 B, Germany, is duly authorized to receive subscriptions and advertisements for the UNITED STATES MILLER, from all parts of Continental Europe, and to receive payment for the same.

Mr. Wm. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLIG & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

MILWAUKEE, APRIL, 1881.

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. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

## MILLERS' DIRECTORY.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,600 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of 100 of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Five Dollars, on receipt of which Directory will be forwarded post-paid by mail. Address, UNITED STATES MILLER, MILWAUKEE, WIS.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

DEALERS in milling supplies of all kinds should advertise in the UNITED STATES MILLER.

The vigorous language of the late Zach. Chandler, as he applied it to the South, might well be used now in regard to Russia. He advised the South "to raise more corn and less hell." The South has taken the advice and is yearly increasing in prosperity. May we hope that Russia will also take the advice before another Czar is butchered.

## The Wheat Meal Purifier.

We desire to call the attention of our readers to the advertisement of the Wheat Meal Purifier Co. of Minneapolis, Minn. and Georgetown, D. C. on another page. The system and machine introduced by this company is said to have given the most favorable results wherever it has been introduced. In these days of improvement and competition and the strife to increase our flour export trade, it behooves all millers to investigate the claims of all valuable inventions tending to increase the yield and quality of flour from a bushel of wheat. The system and machinery of the Wheat Meal Purifier Co. has been in use for a considerable length of time and the many testimonials given from millers in high standing must be gratifying to the Company. We would earnestly recommend our readers to write to them for full particulars.

## The Mississippi Grain Trade.

Few of our readers are aware of the extent to which the transportation of grain from St. Louis to New Orleans for shipment to Europe has grown. One steamer will take

in tow a line of barges nearly a half a mile in length all loaded with grain—One fleet of barges recently were towed from St. Louis carrying 10,000 tons of grain for reshipment at New Orleans to Europe. In 1870 these shipments were only 66,000 bushels and in 1880 increased to 15,717,664 bushels and the prospects are that the present year will see these shipments doubled providing there is a good crop in the district contributing to the river trade. It has been determined to extend this system of barge transportation to Davenport, Iowa. This will perhaps interfere to some extent with the shipment of grain from Iowa to Chicago but it remains to be seen which route offers the best advantages for the least money.

## The Lake Marine.

The importance of navigation on the great chain of lakes is yearly increasing as the demands for it increase. A few years since a craft with a capacity of 600 tons was considered a large one but now there are crafts on the lakes having a capacity of 2,800 tons. A propeller will be launched shortly at Toledo that will be able to carry 140,000 bushels of grain. During the period of time when navigation is open by lake from Chicago and Milwaukee to Buffalo and thence to New York by canal and river, freights are far below what they are when navigation is closed and the railroad lines to the Atlantic seaboard have things there own way. As a natural consequence freights from the West are rushed through before navigation closes and after that there is a great falling off in shipments until it opens again unless prices advance to such a degree as to pay the difference in freight. Iron steamships will soon be put on the lakes and if the harvests should be good for a few years our lake marine will be one of the most important features of transportation in this country. It is not at all improbable that with the completion of the canal improvements in Canada, we shall see foreign vessels of large tonnage at our own docks unloading and loading their cargoes.

## Engine Tests at the Cincinnati Exhibition.

The report of the tests of automatic cut-off engines at the late millers' international exhibition held some nine months ago is at last made public. The report does great credit to the art preservative and the person who superintended its make-up. The results are summarized in a manner which will not leave anyone desirous of purchasing any of the three makes tested in doubt as to the fine and weak points of each. There can be but one opinion regarding the fairness and impartiality of this report. The report shows conclusively that so far as the excellence of workmanship and economy of performance is concerned there is but little difference, and that each is alike creditable to designer and builder. A summary of the report may be of interest to our readers: Three engines were tested, viz.: the Reynolds-Corliss, made by Messrs. E. P. Allis & Co., Milwaukee, Wis.; the Harris-Corliss, built by W. A. Harris, Providence, R. I.; and the Wheelock, built by Jerome Wheelock, Worcester, Mass. The two first named are well known to the Western trade, and the third will undoubtedly be better known in the future. The Brown and the Buckeye were also entered for trial, but were withdrawn, the Brown on account of its condenser and the Buckeye because the foundation was defective.

As condensing engines, in useful effect the Wheelock stood first, the Reynolds-Corliss second, and the Harris-Corliss third, the relative record being: Wheelock, .908845; Reynolds-Corliss, .878516; Harris-Corliss, .876183. When tested non-condensing, the Wheelock stood first, the Harris-Corliss second, and the Reynolds-Corliss third, the record being: Wheelock, .905253; Harris-Corliss, .891653; and Reynolds-Corliss, .886094. Upon economy alone the record was: Harris-Corliss, .99743; Reynolds-Corliss, .95497; and Wheelock, .94238.

The record for economy and regularity of motion combined, was: Harris-Corliss, .99416; Reynolds-Corliss, .96998; Wheelock, .96032.

In the trial as to regularity of motion under varying loads and steam pressure, the Reynolds-Corliss was first, with a variation of only .0039; Wheelock, .3864; Harris-Corliss, 1.263; the relative position as regards regularity of motion being: Reynolds-Corliss, 1.0000; Wheelock, .9962; Harris-Corliss, .9876.

The report shows that not one of the engines tested can claim to be first in all the points which go to make up the sum total of excellence, while each of them has that of which

makers may well be proud. In fact, the result of the test was so close that the expert begins his report by saying that upon the record, which was as close as skill and vigilance could make it, it appears that while one engine develops the highest economy condensing, another develops the highest economy non-condensing, while the third has a regulation under a varying load hitherto unheard of, and closes the same report by saying that, in view of the near approximation of the engines in point of steam economy and the probability of error in the meter record of condensing water, he would submit the report without making any award.

Whether the conditions under which the tests were made were such as will best indicate the performance of the engines tested in actual use is open to question. There is no doubt that the test revealed to each maker some point wherein his engine might be improved, and if another trial were made it would be seen that each maker had profited by the tests of last June and that to-day a test trial would reveal the fact that of the three engines it would be hard to decide which was the best one, taking all points into consideration, to use for any particular purpose.

## Electricity in Flour Mills.

THE ELECTRIC PURIFIER A SUCCESS.

It is now nearly a year since the announcement was made that Mr. Thos. B. Osborn, of New Haven, Ct., had been successful in applying electricity for the purpose of purifying middlings. A great deal of surprise and interest was manifested by millers throughout this country. Since that time great attention has been paid to perfecting the machine, and now the electric purifier has been brought to such a state of perfection that a company with a capital of \$300,000 has been organized in New York City for the purpose of manufacturing and introducing this wonderful and valuable machine. Mr. John Rice of 17 Monroe St., New York, formerly a well known druggist in Milwaukee, is the General Manager of the company. The process of purification is very simple. The unpurified middlings are passed into a hopper and distributed over bolting cloth sieves of different numbers. These sieves are agitated, and the bran and light particles are brought to the surface. Revolving hard rubber rollers electrified by contact with a sheep-skin cushion attract the bran to them, while the flour and middlings of different degrees of fineness drop through the sieves, and the bran is conveyed off to a proper receptacle. These purifiers require but little power to run them, and occupy very little space, and are entirely free from dust. Several of these purifiers have been in operation in the Atlantic Flour Mills in South Brooklyn, N. Y., for months, and have performed their duty to the entire satisfaction of the mill-owners. The proprietors, Messrs. F. E. & H. E. Smith, in writing to the inventor say "we have very carefully tested the saving it effects as compared with the best air purifiers in use, and find the difference in its favor to be six or eight per cent. The Electric Purifier will be on exhibition in May, in London, England, at the Millers Exhibition. Mr. Rice informs us that he has already taken a number of orders, and thinks the time is not far distant when the use of electricity will be the only means used for the purifications of middlings.

## Immigration, February, 1881.

The Chief of the Bureau of Statistics furnishes the following information in regard to immigration into the United States.

There arrived in the ports of Baltimore, Boston, Detroit, Eastport, New Bedford, New Orleans, New York, Philadelphia, Port Huron, and San Francisco, during the month ended February 28, 1881, 17,166 passengers, of whom 15,075 were immigrants, 1,482 citizens of the United States returned from abroad, and 609 aliens not intending to remain in the United States.

Of the total number of immigrants, there arrived from England and Wales, 1,984; Scotland, 492; Ireland, 896; Germany, 5,292; Austria, 324; Sweden, 169; Norway, 39; Denmark, 99; France, 214; Switzerland, 422; Netherlands, 1; Italy, 971; Russia, 94; Poland, 93; Hungary, 856; Dominion of Canada, 2,879; China, 304; Australia, 105; and from all other countries, 326.

The number of immigrants arrived at the above named ports during the eight (8) months ended February 28, 1881, was as follows;

From Germany, 82,699; Dominion of Canada, 77,218; England and Wales, 32,276; Ireland, 36,161; Scotland, 3,078; China, 3,571; all other countries, 67,073.

## A Short History of Wheat.

The varieties of wheat are numberless and their characters vary widely under the influence of cultivation and climate. There are said to be 180 distinct varieties in the Museum of Cornell University. On the slopes of the mountains of Mexico and Xalapa the luxuriance of vegetation is such that wheat does not form ears. In Japan, it is said the wheat has been so developed by the Japanese farmers that no matter how much manure is used, the straw will not grow larger, though the length of the ears increases. The height is rarely more than two feet, and often no more than twenty inches. Through selection winter wheat has been changed to summer wheat in three years, and summer wheat converted in the same time to winter wheat. In general, wheat is the most esteemed of the cereal productions, but in Abyssinia, according to Parkyns, the flour of the "teff" or "dugassa," scarcely palatable to Europeans, is preferred by the natives to any other grain.

Isis was supposed to have introduced wheat into Egypt, Demeter into Greece, and the Emperor Chin Wong into China, about 3,000 B. C. In Europe it was cultivated before the period of history, as samples have been recovered from the lacustrine dwellings of Switzerland. In England it was probably not cultivated by the ancient Britons, but the Anglo-Saxons, when Bede wrote, early in the 8th century, sowed their wheat in the spring, and in the days of Queen Elizabeth its cultivation was but partial. Indeed wheat was an article of comparative luxury till nearly the 17th century. In India wheat seems not to be native, but introducers of its Sanscrit name signifies "food of the barbarian;" yet three varieties are mentioned in the Bhavaprakasa, one of which, a large grained, is said to have come from the West, and another, a small-grained or beardless wheat, is said to have been indigenous to Middle India.

The first wheat raised in the "New World" was sown by Spaniards on the Island of Isabella, in January, 1494, and on March 30 the ears were gathered. The foundation of the wheat harvest of Mexico is said to have been three or four grains carefully cultivated in 1530, and preserved by a slave of Cortez. The crop of Quito was raised by a Franciscan monk in front of the convent. Garcilasso de la Nerga affirms that in Peru, up to 1547, wheaten bread had not been sold at Cosco. Wheat was first sown by Gosnold on Cuttyhunk, one of the Elizabeth Islands in Buzzard's Bay, off Massachusetts, in 1602, when he first explored the coast. In 1604, on the Island of St. Croix, near Calias, Me., the Sieur de Monts had some wheat sown, which flourished finely. In 1611 the first wheat appears to have been sown in Virginia. In 1626 samples of wheat grown in the Dutch colony at New Netherlands were shown in Holland. It is probable that wheat was sown in the Plymouth colony prior to 1429, though we find no record of it, and in 1629 wheat was ordered from England to be used as seed. In 1718 wheat was introduced into the Valley of the Mississippi by the "Western Company." In 1799 it was among the cultivated crops of Simos Indians of the Gila River, New Mexico.

## What Varieties of Wheat to Sow.

We trust now that seed time is so near at hand that the farmers of the North West will not fail to heed the recommendations of the millers at their convention in Ohio last season in regard to the varieties of wheat they should sow. It is important to their interests that they observe their wishes in this particular, especially when these varieties yield so well and are so profitable to the farmer. The following is a list of their recommendations: First, Minnesota sife, hard and glutenous, yielding largely in "middlings" for "purification" and manufacture into patent flour; Rio Grande, China or Monmouth, with a large and heavy berry adapted to weak lands, as it has a rank growth of straw, and the *Cap* Club, a soft wheat, which makes a first rate family flour, not remarkable for strength. The Lost Nation or Prussian Pffe, that is produced extensively in Wisconsin, Iowa and Minnesota, and which always yields a bountiful crop, was declared to be the least desirable variety grown for milling purposes, being soft, weak and poor in color.

Allis & Co. have been successful in their proposition to the Joliet Steel Works for a pair of blowing engines, size 36x54 and 76x54. Their bid for these engines was \$32,000, and \$10,500 more than their competing firm, but the superiority of the Reynolds engine satisfied the proprietors in regard to the difference in figures.

**Explosion of the Boiler at Cambridge, Mass., April, 1878.**

It was a horizontal tubular, one of the most common in use, and well known to all familiar with steam boilers. It was made for the present owners in November, 1869; was 48 inches diameter and 17 feet long. All longitudinal seams double-riveted, with the necessary man-hole on top for getting into the boiler for inspection and cleaning it out. Hand-hole in bottom of front head for clean-

by frequent overheating for considerable distance along the bottom, and the usual working pressure was sufficient to rend it and allow of the instantaneous escape of the steam, which, owing to its activity, would pass through the mass of water, driving a portion before it, and enlarging the initial opening, as shown in Fig. 6, and an instant may be

manSHIP, but when the overheating had so reduced the strength of the plate at A, which has to sustain just double the strain per ring unit, see A B, Fig. A, that it does per stove unit E F, Fig. A, there would seem to be little doubt in the minds of practical men where the fracture started, even though statistics did not, as they certainly do, clearly show that

confirm the theory above offered, and shows the difference in destructive effect between a full supply of water (in the boiler at the time of the explosion), and little or none at all.

The boiler was of precisely similar construction, shown in Fig. 8, and at the time of the explosion contained no water at all. It was in communication with two adjoining boilers of the same system by means of the steam pipe, and it was ruptured by dry steam while its bottom over the fire was red hot. It will be seen that the rupture is similar to that

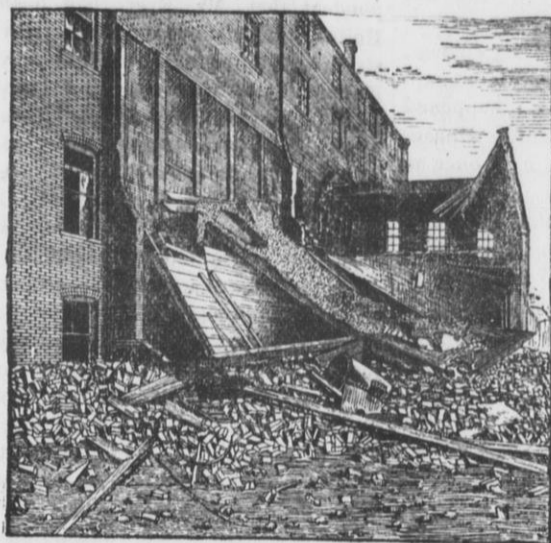


FIG. 1.—WRECK OF THE BOILER-HOUSE.

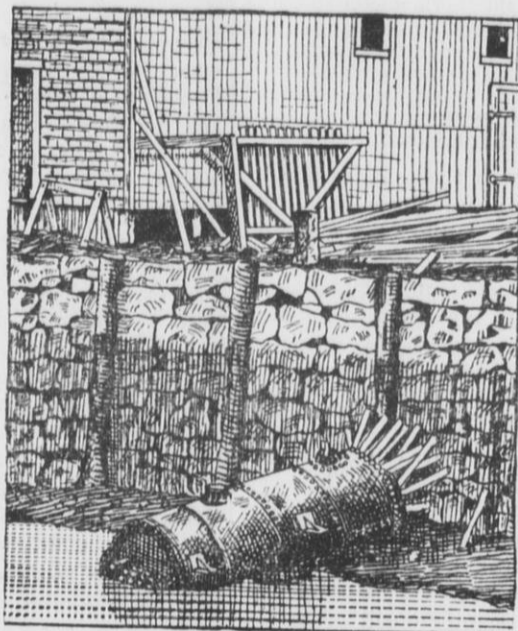


FIG. 2.—THE PRINCIPAL PART OF THE BOILER-HOUSE IN THE CANAL AT LOW TIDE.

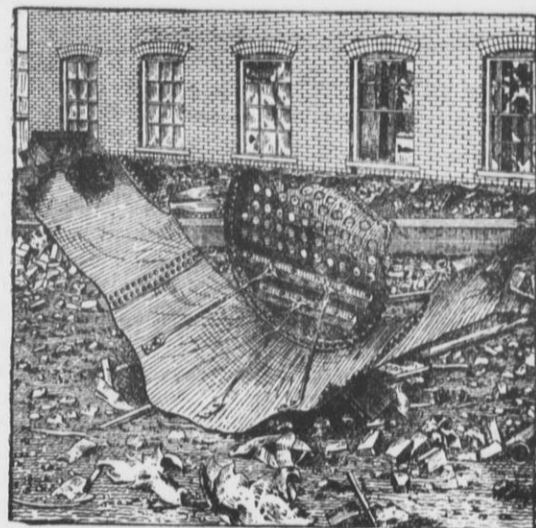


FIG. 3.—THE REAR END OF THE BOILER.

ing out under the tubes. The shell of the boiler was of best quality C No. 1 iron, 5-16 thick. The heads were best quality flange iron, 3/4 inch thick, being well braced, having angle-iron braces riveted to the heads, and stays from thence to the shell. It was furnished with the usual appliances: one safety valve 3 inch diameter, three gauge cocks, etc., and at its completion was examined and subjected to a hydraulic pressure of 150 pounds per square inch, and considered safe at a steam pressure not exceeding 100 pounds per square inch.

The above description is quoted from the report of Inspector Fairbairn of the Eastern Department.

Of the following illustrations Figures 1, 2 and 3 represent the wreck of the boiler and building. They are copies of photographs taken soon after the explosion. The cuts that follow are intended to illustrate the theory of the explosion.

Cut No. 4 is a longitudinal section of the boiler as originally made, omitting the patches which have been put on since, but showing at A the location of the deposit which permitted the iron beneath it to become overheated.

The explosion of this boiler occurred in April, 1878, by which three persons were killed, and a number more wounded. An unusual interest was excited by this accident, and a number of experts called to testify as to the cause of the disaster, and although there was no disagreement among trained boiler inspectors, still there was doubt expressed by one expert witness as to the original soundness of the iron, and the correctness of the construction and setting. The marks upon the plates of the back part of the boiler seemed, from the evidence, to plainly indicate a considerable deposit A (Fig. 4), and repeated repairs of the bottom of the shell has been made, all rendered necessary from overheating where sediment had prevented contact of the water with the iron. Whatever the character of the iron and the faults of construction may have been, there would seem to have been sufficient warning of approaching disaster to have prompted a greater degree of care in inspection and cleaning.

The boiler was worked at a pressure of about 75 lbs. per square inch, and it was allowed to come to repairs repeatedly without any inspection, till at last, on the 6th of April, it exploded with destructive force, the larger portion, consisting of about 4-5 of the shell, and containing all the tubes, was projected through the side of the building a distance of 150 or 200 feet into a canal, where at low water it was photographed (Fig. 2).

The initial rupture was undoubtedly at A (Figs. 4 and 5), the iron having been weakened

conceived in which the water is disintegrated and expanded with such suddenness as to give the character of an explosion; it fills the entire steam-room and water-room, and is projected like a charge from a cannon against the rear head of the boiler, there being little resistance in that direction. The parallel surfaces of the shell and tubes direct the mass of foamy water, which still retains a large percentage of its original specific gravity, and its inertia or momentum carries enough of it past the opening to tear the boiler apart, as shown in Fig. 7, and the principal part takes a rocket-like course, a distance which is determined by the quantity of expanding elements that it contains and the freedom with which it can

initial ruptures in shells of this form almost invariably are longitudinal.

The bracing, which was charged by the same witnesses with contributing to the weakness, is not placed in the boiler for the purpose of supporting the cylindrical part, but to prevent the bulging out of the flat end-plates or heads,

supposed to be the initial rupture in this case and had the boiler, Fig. 5, contained no water, the damage would have stopped, as it did, here.

The boiler, Fig. 8, did not leave its setting, and no lives were lost, but the fireman was driven to the wall of the boiler room. It dropped on the bridge wall, the fire front, which supported the front end, having been thrown down by the first gush of steam.

We are indebted to the Hartford Steam Boiler Inspection and Insurance Co., of Hartford, Ct., for the illustrations.

**ELECTRICITY IN THE WRONG PLACE.**—The Albany Journal records an incident that exhibits this good servant in the character of a bad master. In one corner of Weed, Parsons & Co.'s printing establishment stands the machine that furnishes the electric light for an adjacent store, the power coming from the engine of Weed, Parsons & Co. One feature of the machine is the armature, a wheel containing coils of insulated wire through which the electricity flows in powerful currents when the apparatus is in operation. This armature revolves with terrific velocity, and constitutes a powerful magnet. On the day mentioned, a young man came in and ground a pair of scissors at an emery wheel near the generator. Turning to go out past the machine, he carried the scissors carelessly in his hand, when they were immediately drawn into the armature, and were soon revolving with it at frightful speed. The young man got out of the way as quickly as possible and was unhurt. For a few minutes, the machine presented a very startling spectacle. The whirling scissors, twisted and broken, but still adhering to the revolving armature, began to cut the wires, and thus broke the electric current, which escaped in streams from the fractured ends of the wires, and in a moment or two that portion of the room was literally filled to the ceiling with whirling lightning. No one dared to approach the machinery for some little time, but the belt was finally thrown off, and the dangerous show was at an end.

**READY TO GO.**—"Bress de Lord!" fervently exclaimed an old Florida woman, raising her hands in amazement, as she saw a handsomely dressed lady driving a drag, with a colored boy on the footman's seat behind, in a Jacksonville street—"Bress de Lord! I never 'spected to see dat. Wonder what dat young cullud gemman [pays dat ar young white 'oman for driving der kerridge? I know'd it'd come, but neber 'spected to lib to see it. Dis nigga's ready to go way now."

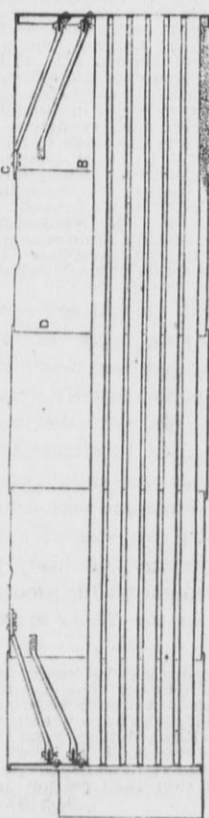


FIG. 4.

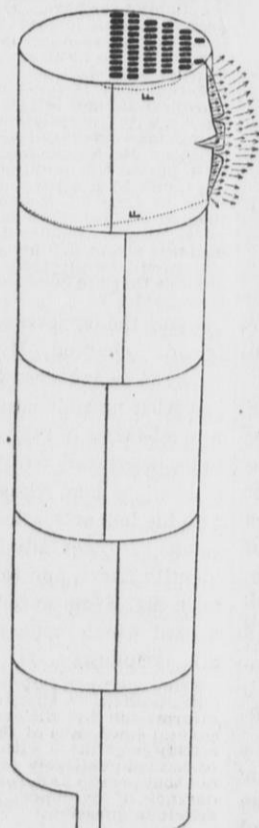


FIG. 5.

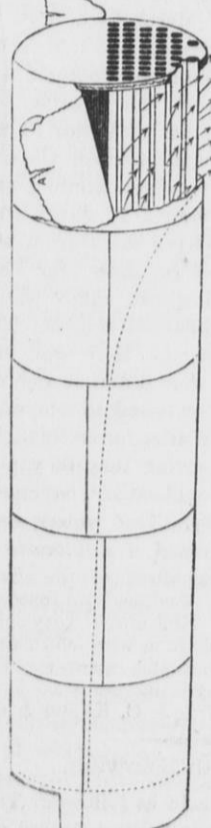


FIG. 6.

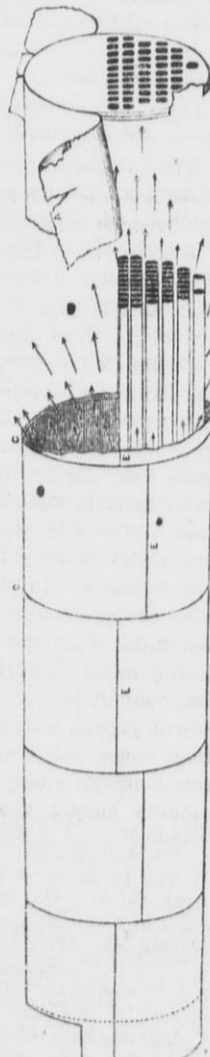


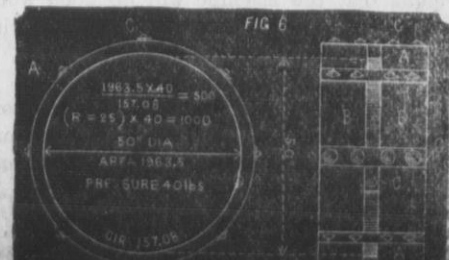
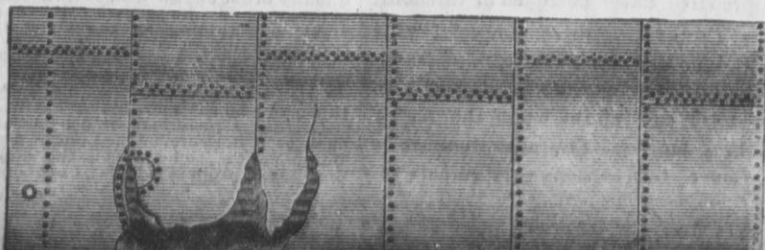
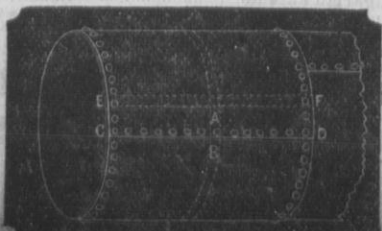
FIG. 7.

escape. The process is practically continuous, but eye-witnesses often, at coroners' inquests, have said they heard a great rush of steam followed by a loud explosion.

In this case a doubt was expressed by some of the witnesses as to the probable location of the initial rupture, but none of the practical boiler inspectors who were called expressed the least doubt as to the presence of a considerable deposit at A (Fig. 4). The weakest point, originally, may have been the seam C B, as stated by one expert, owing to faulty work-

and they are not used nor needed on heads that are sufficiently stiff to bear the load without bulging, as are ribbed, heavy cast-iron or hemispherical wrought-iron heads, in plain cylindrical boilers without tubes, then the seam C B, Figs. 4 and 7, would be called on to sustain the entire load on the area of the rear head, and even this is but half what is put upon the seams E E, etc., per lineal unit of seam measurement—not per square inch.

An explosion occurred in the same inspection district in September, 1875, which tends to





**Fire-Proof Construction.**

The effort to diminish danger by fire to our construction is one of the greatest importance, and should enlist the energy and all the solicitude of our profession; and even more so in this country, where the difficulties occasioned by the influences of our climate are indeed vastly greater than in the countries of the Old World, from whence we are apt to take our precedents.

The large conflagrations to which many of our cities have lately been exposed have at least taught us this lesson: that the most destructible of our building materials is wood, and the least destructible brick. We should, therefore, as much as possible, discard wood, and instead use brick for our principal building material. Among the many suggestions made after our large fires, there has not been mentioned one system of fire-proof vaulting especially adapted for warehouses and some kind of factories, to which I beg leave to draw your attention for a few moments. This system, which is very common in the north of Germany, where it has existed since the middle ages, is well worthy of imitation, not only on account of its easy and practical execution, but also on account of its inexpensiveness. This vaulting consists of a series of strong elliptical arches, built parallel to each other across the building at intervals, say, ten to twelve feet from centres; the spandrels of these arches are regularly built up to a level, and serve to support flat segmental arches turned between them. As a general thing the arches in all buildings (dwelling houses and others) are arched over in this manner; and in storehouses, breweries, distilleries, etc., you often find four or five stories, one above the other, arched over in this manner. These buildings are built entirely of brick, and are often finished in this manner to the very roof, for which the arches are laid with the proper inclination, and then covered directly with cement, tile or metal. With stairs of brick, walls of iron and inclosed in brick walls, and having doors, windows and shutters of iron, you have a construction as fire-proof as can be made, particularly adapted to storehouses, factories, or to cellars of dwelling houses, and one not more costly if as much as the more modern system of wrought-iron beams filled with brick arches. A fire from the outside cannot attack such a building vaulted over from cellar to garret, and a fire originating inside of it will in most cases be confined to the story in which it started.

Our system of wrought-iron beams filled with brick arches, or arches of other fire-proof materials, has some great advantages: not the least one is, that it gives more available room on each floor, and that it requires less thickness of walls than the former system of all brick. But it is not as fireproof on account of the exposure of the iron to the fire; this danger ought to be overcome.

In order to diminish this great danger to the iron beams, a thick coat of plaster of Paris can be stuck to the under side of the beam for protection. For this purpose the arches may be started one-half inch below the lower edge of the beams, and this will give a coat of at least one inch thick the requisite support from and attachment to the arches.

To protect from the heat the end beams at well holes, also iron girders composed of two X beams, and to give them at the same time an inexpensive finish, I have lately used stout hoop iron (3-16 by 3/4 inch), stretched and bound tightly and riveted around the beams

every eight inches from centres; the open channels at the sides of the beams are then filled in and built up with brick laid in cement. The hoop iron keeps the brick in their places till the cement has set; afterwards the sides and bottoms are plastered, and moldings run on them if desired. If the grinder beams are far enough apart to allow the mason to reach with his hand inside, then the cavity between them is filled in with bricks likewise. This device gives some considerable protection against heat in case of fire, and the advantage of not being costly.

For storehouses, factories, etc., where the danger of fire is greater, a good protection to cast-iron columns and wrought-iron girders might be built by inclosing the columns in brick piers. Suppose an 8-inch or 12-inch column; build an 8-inch wall around it: this would make a pier of 24 inches or 28 inches square. To protect the girders, turn, in direction of the same, from pier to pier 8-inch segmental arches 24 or 28 inches wide, the extrados of the same to touch the bottom of the girders; then level up the haunches, and build 8-inch dwarf walls on each side of the girders to the top of the same. This will give an excellent protection against fire, and where it is most wanted in this kind of buildings.

In most cases, a 4-inch instead of an 8-inch wall would be sufficient; but in extreme cases of storage of inflammable materials the 8-inch walls and arches would be necessary.

In all our buildings the effort should be to build with fire-proof materials, that is, with stone, brick, iron and some of the plaster compounds for partitions and furring. Iron beams, which are the most costly of our materials, should be used as sparingly as possible, and we ought to calculate the strength required at every step of our building operation, so that no more may enter into our buildings than is absolutely necessary. In order to economize in the right direction, let us use as little wood as possible.

A French architect completes his buildings with less than one-half the amount of wood which we put in ours in the way of finish. The less wood we have in them, the less danger of compromising them in case of fire.

In the matter of roofing, there exists on the continent of Europe a very safe kind of tile, which might safely be adapted here. Not that new fancy tiling that has lately been introduced, and is not good for our purpose. The tile I mean is a plain rectangular tile, with a hook at the top to hook behind a wooden or iron lath, 13 or 16 inches long, 6 to 6 1/2 inches wide, 4 or 5 inches to the weather, and rendered underneath with cement or mortar; in other words, it is laid like slate. This tile roof can be laid at a pitch of 3 to 4 inches to the foot and is not only a great security against fire, but also, when of the proper material, a very lasting roof. When the sparing use of iron is advocated above, it is for the reason of reducing the cost of the iron construction, and in order to popularize the same. And that this can be done there is no shadow of a doubt. To put the beams as wide apart as their more or less length of bearing requires, would in many cases reduce the weight of iron to a very considerable extent.

The more we do in this direction, the nearer we come to the period when we can expect to have structures which will stand with credit an attack of fire from both the inside and the outside of the building.—A paper by Dellef Lienau, F. A. I. A., read at the Eleventh Annual Convention of the American Institute of Architects.

**A Milwaukee Grain Elevator.**

In order to begin at the beginning—get to the bottom, as it were, of an elevator—one must climb to the very top. The building is perhaps one hundred and fifty feet long by seventy-five feet wide, and, like all of its class, it rises eighty feet or more to the eaves, above which a narrow top part forty or fifty feet higher, is perched upon the ridge-pole. It is built of wood, sheathed with corrugated iron a little way up, and then slated the rest of the way.

Entering one end, where two railway tracks run into the building, we find a narrow wooden stairway, and begin our ascent. The flights are short ones, but eighteen are stepped over before we emerge into the topmost attic. Alongside of us, as we climbed, has been running the strong belt which carries the power from the great engine on the ground-floor to the gearing in the roof—a belt of rubber canvas four feet wide, and perhaps two hundred and fifty feet long.

When grain is brought—perhaps a hundred car-loads from the vast fields of Dakota or the wide farms between here and St. Paul—the train is backed right into the elevator, and stands so that opposite each car door is a receiver which is a kind of vat, or hopper, in the platform. By the help of steam-shovels, operating almost automatically, two men in each car will in ten minutes or less empty the whole train.

As fast as the grain is dumped, the receiver delivers it to iron buckets holding about a peck each, which are attached to endless belts, and travel up a sort of chimney, called a "leg," to this roof chamber. These buckets will hoist 6000 bushels an hour at their ordinary rate of speed. That is equal to one bucket going up 24,000 times, at the rate of 400 times a minute—tolerably lively work! To-day up here in the topmost loft there is nothing doing, and we are saved strangulation. The light hardly penetrates through the cobwebbed windows, and the most pulverous of dust lies everywhere half an inch deep, showing the marks of a few boot soles, many foot-prints of rats, and the lace-like tracks of hundreds of spiders and bugs. You step over and under broad horizontal belts as you make your way gingerly from one end of the attic to the other. They run the fans that winnow the grain as it comes up in the buckets, after which it is dropped into the hoppers, ten feet wide, and twice as deep, that open like hatchways every few feet in the centre of the floor. Now all is perfectly quiet; we are so high that even the clamor of the wharves does not reach us. But when the machinery starts in motion, then fearful roars, and clash of cogs, and whipping of slackened belts, assault the garret, until this whole upper region rocks like a ship in a gale, and chaff and dust cloud the eyes and stifle the throat.

Descending one story, we find another garret, with nothing in it but the square bodies of the hoppers. Going down a second flight shows us that the hoppers are suspended not upon pillars, but loosely on iron stirrups, so as to shake a little, and the iron gate which lets on or shuts off the fall of the grain through the tubular orifice at the bottom is operated by steam.

There are twelve of these hoppers. Sticking up through the floor underneath each one gape the flaring mouths of twelve spouts or sluices, all of which point directly at the gate in the hopper, as though earnestly begging its bounty of grain. Every one of these 144 spouts leads into a bin, near or distant, and all are

numbered, so that the superintendent knows which spout conducts to any one bin, and can distribute his cargoes accordingly, the result of his choice being recorded in cabalistic abbreviations upon a blackboard close by. A movable conductor is swung into place between the hopper and the spout, the gate pulled open, and down slides the wheat, with a musically rushing noise, into the grateful bin.

To see the bins we descend again, this time reaching the top of the wide part of the building. We walk very circumspectly, in the half-light, amid a maze of beams, stringers, and cross-pieces of wood and iron. The whole interior of the elevator below this level is now seen to consist of a series of rooms, between which there is no communication. They are ceilingless, and the only exit from them is through a spout in the bottom. Peering over the edges from the narrow foot-walks, we can only guess how far the person would fall who should lose his balance, for the eye can not reach the bottom: it is sixty-five feet below, and hidden in darkness. Of these deep bins there are 144, some twice the size of others. Sometimes they are all full at once, and hold eight or nine hundred thousand bushels, weighing fifty millions of pounds, and good for over two hundred thousand barrels of flour.—ERNEST INGERSOLL, in *Harper's Magazine* for April.

HOW TO CHOOSE A HAM.—Many have been often puzzled "how to choose a ham." The following simple directions may be of service to assist those in the dilemma:

1. Never buy a ham simply because it is offered at a low price. No really first-class ham is apt to be sold at a very low figure.

2. Never select a ham which is too lean. Although the fat is considered by many to be so much waste, still "a fat ham" always furnishes tender, juicy and fine flavored meat, while a lean ham is very often tough and dry when cooked. The joint should be well rounded and plump, rather than thin or fat. The skin should be thin and pliable.

3. Choose freshly cured hams. Wines improve by age, hams do not. The more recently the joint has come from the curing cask (other things being equal), the better it will please when cooked.

4. As regards the size of a ham, that should depend very much on what you wish to do with it. A whole ham always boils more satisfactorily than a piece. For broiling or frying, a ham of not less than twelve pounds should be selected. One from fourteen to sixteen pounds is preferable.

A REMARKABLE STATEMENT.—Rev. Allen Tibbets, who now lives at Coldwater, Michigan, aged 77 years, makes this remarkable statement: "I never swore an oath, or took a chew of tobacco, or smoked a whole cigar. I never bought or sold a drink of brandy or whiskey for myself. In a travel of over 100,000 miles by conveyances I never met with an accident, or was a moment too late when it depended upon my own exertion. I never sang a song or played a game of checkers, billiards or croquet, or any game of cards. I never skated a rod or struck a man a blow with my fist. I can repeat more of the Bible than any man living of whom I have any knowledge. I have given away more real estate in this city (Coldwater) than all its other inhabitants. I preached for over fifteen years, and traveled more than five hundred miles attending funerals, and all the salary I ever received was a pound of tea, worth seventy-five cents." Gracious Goodness! What a quantity of fun Mr. Tibbets has missed.

**E. P. BACON & Co.,**  
Rooms 27 and 28 Chamber of Commerce,  
**MILWAUKEE.**

**L. EVERINGHAM & Co.,**  
No. 130 LaSalle Street,  
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**COMMISSION MERCHANTS,**  
**GRAIN, SEEDS, PROVISIONS, ETC.**

Special attention given to the purchase and shipment of grain for milling purposes.

We have an experienced man in attendance at each elevator constantly, to see to the inspection of grain when loaded into cars for shipment, and the interests of parties ordering through us will be carefully protected in every way.

Orders for purchase and sale of grain for future delivery will be promptly and carefully executed



them. But for the existence of these terrible bills she would not have hesitated for a moment which path to take, but if these were not met, her father would be compelled to part with property which had been in the family for centuries, and it would be like parting with his life. By taking the other path, she would, of course, part with her life's happiness, but if she sacrificed her father, happiness would be equally impossible. Whatever path she selected must lead to misery more or less unendurable.

After a night of tearful and sleepless debate, Maud was no nearer a decision with regard to the path she was to choose than when the question was first thrust upon her. On the eve of the day on which she had promised to give her answer to young Draper she was equally undecided, and next morning, that of the day sacred to St. Valentine, she descended to breakfast, with a heavy heart indeed, but resolved to do her duty to her father by accepting the condition which could alone rescue him from the position in which he had been placed by an unfortunate speculative transaction.

"Here is a letter for you, my dear," said Mr. Draper, as he gave his daughter his customary morning salute; "you will have time to read it before the others come down. Have you made up your mind what to say to James?"

"Yes, papa," she replied faintly, opening her letter and glancing at its contents, which drew from her an exclamation that made her father look up from a letter he was perusing.

"What is it, my dear?" he said, evidently surprised at the transformation that had taken place in Maud's appearance. When she entered the room she was pale and sad, but now her complexion showed its fairest bloom, and her mouth and eyes were lit up by radiant smiles."

"Oh, papa," she replied, "I shall not have to give James any answer; you must tell him not to ask me for one. I have got such a valentine, and Robert will be here to-day."

"He is six weeks to late, and you must give the answer to James that he wishes, or you and I shall have to go to the workhouse."

"Read my valentine, papa!" said Maud, offering the letter she had received, with a merry laugh.

"Hang your valentine! I have no heart for such rubbish," said Mr. Draper, with more anger than he had ever shown to Maud, but his temper only made her laugh more merrily.

"Then I must read it to you," she said, crossing to her father and seating herself on his knee. "Who do you think it is from—but you will never guess, so listen."

"Dear daughter that is to be, I have known for some time that your other better known, and, as he deserves to be, better loved father, had met with some losses in business which are not unlikely to result in temporary embarrassment. I send you the enclosed as a valentine, which, if my information is correct, will meet the losses in question. It is a free gift to yourself, which you are at liberty to use as you please, and as my son intends paying his respects to you to-day, you can give him an acknowledgment in any form that is most agreeable to yourself.

"Yours very respectfully,

"JOHN CRUICKSHANK."

Little more need be said. As Robert Cruickshank entered the gate leading to Abbey Mill House he met a dog cart, by which Mr. Draper's cousin and his son were being conveyed to the railway station with all their belongings; and Maud's acknowledgment of his valentine resulted, two months later, in a peal of bridal bells, which, rung out the long-standing feud between the Drapers and the Cruickshanks, and rang in the dawn of a period of amity between the families which, it is to be hoped, will be as happy as lasting.

THE END.

### The St. Anthony Falls Water Power.

The St. Anthony Falls water power proper consists of that part of the falls of St. Anthony that is used on the St. Anthony, or East Side of the river, that of the West Side being known as the Minneapolis water power. The Minneapolis side has many large flouring mills to attest its improvements, but on the East Side the water has been permitted to spend most of its energy on the boulders and rocks lying just below the crest of the falls, and until recently very little has been done to turn the power to the assistance of man. Attempts at its development have been made from time to time by the various parties controlling it, but their efforts were limited and only its partial development resulted.

Mr. Franklin Steele, who died recently in Minneapolis, received a patent in 1849 from the Government of the land adjoining the falls on the East Side of the river and including Nicollet and Hennepin Islands. He immediately commenced its improvement by building a log dam across the east channel of the river, and although the privilege extended half way across the west channel, he proposed to use only the water flowing in the east channel. At the dam he built a small saw mill which contained only one of the old style single up and down saws. In 1854 the Island flouring mill was built, this being the first mill on the East Side of the river and the first in Minneapolis, excepting the old Government mill on the site of which now stands the Northwestern mill.

In 1855, additions were made to the dam, and in 1856 the St. Anthony Falls Water Power Company was chartered, and they then built half of the present upper dam, extending from Hennepin Island to the middle of the west channel. Shortly after this a number of saw and shingle mills and sash and door factories were built, for which the East Side falls furnished the motive power; but all of these were burned, excepting the large sash and door factory situated on Hennepin Island, which was afterwards turned into the present paper mill. Nothing more of importance was done except the rebuilding of one or two of the saw mills until 1871, when a wheel was put in to drive a line of shafting, which runs parallel to the river, and from which the Union Iron Works and several other small machine shops are now driven. The building that now is known as the North Star mill was originally built for a block of stores, but was not used long for that purpose, as it was soon bought by the North Star Iron Works company, and it was in this building that the present flouring institution bearing that name originated. Finding the premises too small, and being unable to purchase adjoining property at a reasonable figure, the works were moved to the present location on the west side of the river. The building was then converted into the present North Star flouring mill.

In 1876 Messrs. Stamwitz & Schoeber, being pinched for room in their small mill on the West Side, built the present Phoenix Mill which is now a roller mill, making about 250 barrels of flour per day, and bears a good reputation for its brands of flour.

In 1877 the Government dam, at a cost of \$200,000, was completed; this dam consists of a stupendous concrete wall 1,850 feet long, forty feet high, seven feet thick at the bottom and tapering to four feet thick at the top. The bed of the river at, and above the falls is a ledge of blue limestone, about sixteen feet in thickness, and immediately under this is about forty feet of soft sand-stone. The sand-stone is quite soft when subjected to water, but when dry becomes harder. In the limestone there are a great many cracks and crevices, and through these before the government dam was built, much water passed and washed out the sand-stone from under the ledge so as to undermine it, and the ledge being unsupported fell off at the crest of the falls in piecemeal and promised the speedy destruction of the falls. Serious apprehensions were entertained by the owners of the power as to its safety, when the government took it in hand, and put in the dam. It was built under the limestone ledge, for the purpose of shutting off any current of water that might be working its way through the sand-stone, for as long as the current was stemmed there would be no danger of washing out the sand. This of course was not only for the good of the St. Anthony Power, but also for the Minneapolis side. The dam commences 100 feet into the west bank, runs directly across the west branch to Hennepin Island, across Hennepin Island at an angle of forty-five degrees toward the south until it strikes the east channel, which it then crosses at right angles with the current and extends

100 feet into the east bank. This is to prevent washing around the ends. The wall is made of hydraulic cement, sand and broken limestone in the following proportions: One part cement, two parts sand, and five parts broken stone. This concrete after standing a few hours becomes as hard as solid rock, and the dam is one solid wall without a seam, a crack or joint in its entire surface.

In the early part of 1880 Messrs. C. A. Pillsbury & Co. completed negotiations with the water power company for power to run the large flouring mill that is now being built by them. It was the intention of the company then to build a short head race from the river near by to the site of the mill. This would not have cost much, but it would have sacrificed about ten feet of head, for by making a head race about 400 feet long the water above the first mentioned log dam could be reached and used. A month later, about the time that Messrs. Pillsbury & Co. commenced operations on the mill, the water power company sold the entire power with the exception of a few privileges to J. J. Hill, the general manager of the St. Paul, Minneapolis & Manitoba railway, for the sum of \$425,000. The few privileges excepted were bought by W. W. Eastman for \$40,000, but he shortly afterwards sold them to J. J. Hill for \$42,500, giving Mr. Hill the entire power for the sum of \$467,500. It was Mr. Hill's intention to immediately improve the power to its full capacity, and two or three different methods of its accomplishment were designed and drawn out, but owing to differences of opinion as to the best method to pursue, and the great pressure of other business, the time for commencing operations was permitted to run along until January of this year, when it was found to be too late to complete any method before the Pillsbury mill "A" would be ready for it, and as the new proprietor had promised that the water should be in readiness by the time the mill was ready to run, there was no alternative but to build a small canal for the exclusive benefit of the Pillsbury mill, and not attempt the full development of the power until later, and in consequence a small canal is now being built. The mouth of the canal is about fifty feet above the old dam; it leaves the river at right angles, and runs in that direction about seventy feet and then turns on a quadrant and runs parallel with the river about 400 feet, where it reaches the mill. The excavators are now about twenty feet deep the whole length of the canal; at this depth the limestone (or a soapstone which covers it) is reached, and there will be from five to ten feet of this to be quarried out. The upper surface of the ledge is quite uneven, and the soapstone is not found in the bed of the river at all, having probably been moved or washed away by the current of the river, and in order to get to the bottom of the canal as low as the ledge in the river all this must be quarried out. When completed the canal will be fourteen feet wide in the clear, and in low water is expected to carry ten feet in depth. It will have sufficient pitch or grade to give the water current of about six feet per second. The cross section of the water will be 140 feet, and at six feet per second will conduct 50,400 cubic feet per minute. In the forebay at the mill it will be enlarged to twice its capacity in order to arrest the rapid flow of the water, that it may go to the wheels at a rate of not more than three feet per second. The wheels will not take over 16,000 to 17,000 cubic feet per minute, but a surplus is always a good thing to have to make provision for the clogging of racks, extremely low water, slush, ice and sediment being deposited in the canal. The walls on each side are to be four feet thick, and are to be coated with hydraulic cement. The whole canal will be arched over with stone, with occasionally a man-hole left in the arch to provide for getting into it. At the head of the canal will be a large iron rack twenty-five feet long; the mouth is divided by a heavy pier of masonry, and on each side of this will be placed a set of gates, or one gate in three sections, which will be lifted by hand wheels working a worm gear and ratchets in much the same manner as all such gates.

For the further development of the power it is proposed to build an open canal fifty feet wide, running it along the bank of the river, and branching off smaller canals to mills, etc., as needed. As most of the land that now belongs to the power is three blocks below the crest of the falls the water will have to be conducted a distance of over 1,000 feet before the company can use it on their own premises; but there is an offset to this grievance, and that is, that owing to the heavy grade of the bed of the river below the falls, enough head

is gained by carrying it down to pay the extra expenses.

When this work is completed there will be plenty of room and power for more mammoth flouring mills, and Minneapolis will never stop building them until she leads the world in capacity and exhausts all her wheat resources, which it is safe to say will not be for a good many years to come.

### The Driving of Nails.

BY MR. DUDLEY BLANCHARD.

[A paper read before the New York Polytechnic Institute.]

In writing an essay upon any theme, said he, the author is usually expected to give something of the origin and history of the subject—to go back, at least, a few centuries, so as to get, as it were, a good start, the impetus of which may assist in carrying him over the dryness of the subject, and save him from getting stuck upon the dusty desiccation of practical experience. But of this resort of the hard-pushed essayist I cannot avail myself. There is no open ground behind whereupon to make a run at my subject. There is really no literature upon the subject of driving nails that I can call to mind. Yes, I have a dim remembrance of some vicious Amazon driving a nail into somebody's head, once upon a time; but this I do not consider a creditable example of the mechanical skill of antiquity, and so will pass it by. Perhaps I might take a hint from Dickens' editor, Pott, of the *Eatonsville Journal*, who wrote an essay upon Chinese metaphysics, and read up in the *Encyclopaedia* under the head of D, for driving, and under the head of N, for nails. But attempting to drive a nail encumbered by two heads, in this way, would prove a disastrous failure. There would be no point to the subject. So I will not go to Pott upon the emergency, but gather up what my own recollections afford upon the subject.

The first nails were probably door nails. I infer this from the old adage which describes them as being excessively dead. No other nails are as dead as door nails. Am I not warranted in assuming, therefore, that they are the most ancient of their species? There are certainly no nails in doors of good style nowadays; but whether this is due to the extinction of the species or not, I cannot decide.

It seems a simple and easy enough matter to drive a nail, but not one person in a thousand can drive one with the greatest possible effect where considerable skill and judgment are needed to this end. Most mechanics whose peculiar trade requires the frequent exercise of this operation neglect to study the subject properly, and drive a considerable percentage of their nails in an inefficient and useless manner. And amateurs, whose operations are usually upon subjects of the most difficult kind, almost invariably fail, usually doing more harm than good, by splitting the wood and rendering it more difficult for the most skillful to insert a reliable nail. I have counted twenty-three nails driven to repair a wheel-barrow, only five which did any good at all. All the rest either split the wood or crippled or deflected at the point. And this is not an exceptional case. Examine any article of domestic use that has been repaired with nails by amateurs, and you will probably find that a large majority of them do more harm than good. Yet a little judgment and thought upon the subject would direct us where and how to insert a nail in any difficult case, so as to have the desired effect.

Not long ago I obtruded some unsought advice upon an experienced carpenter, who was vainly trying to insert a small nail effectively into the thin edge of an ornamental pattern to repair a split. The edge being only a quarter of an inch in thickness, the nail refused, in spite of his best skill, to confine itself to the limited section of the wood, but insisted upon protruding itself upon one side or the other. After repeated failures, he reluctantly consented to take a lesson upon the subject, and can now drive a nail under similar circumstances with the necessary precision.

In nailing boards upon timbers, the simplest and plainest of all the various phases of nail-driving, at least one in ten is usually lost by carelessness on the part of the operator, or defect in the nails themselves. And in the more difficult operations, as of box-maker's or joiner's work, a much larger percentage of waste is suffered. In an average lot of window frames, at least one nail in five, or twenty per cent. of all, will be found to be so driven as to be useless.

If I am anywhere nearly right in these estimates it will be seen that here is, in the aggregate, an immense loss, though I have no





## NEWS.

## EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

The new flaxmill at Appleton Wis. is completed.

Indianapolis elevators have a storage capacity of one million bushels.

Felmlee & Moore's mill at Quincy, Ill. was recently burned—Loss total.

H. C. Austerburg, miller, Ansterburg, Mich. has gone out of the business.

Jay Gould contemplates erecting a large grain elevator at New Orleans.

John W. Cook's mill at Wathena, Kansas, was burned recently. Partially insured.

W. V. Kees & Son, millers, Lebanon, Ill. are succeeded in business by Peter Kullman.

D. Neyhart & Co., owning flour-mills at Auburn and Throopville, N. Y., recently made an assignment.

A Bohemian miller named Wog'ta Stransky is the independent candidate for Probate Judge in Kewaunee Co. Wis.

Gov. C. C. Washburn has gone to Hot Springs, Ark., for the benefit of his health. His two brothers will remain there with him for some time.

Indianapolis, Ind. has 12 flour mills employing 119 persons and they turned out during the year ending May 31, 1880 a product valued at \$1,653,535.

Michael Keiser, of Clarks, Ohio, has recently purchased of C. F. Miller, of Mansfield, Ohio, one No. 1 Eureka smutter and separator, bolting cloth, and other materials.

Oelze & Bro., of Cloverport, Ky., are enlarging the mill which was built for them by Nordyke & Marmon Co., four years ago. The same firm has the contract for the new machinery.

A roller mill of 200 barrels capacity has just been finished and started up at Sand Beach, Mich. It is running night and day, and producing a grade of flour which is said to be of first excellence.

Porter & Cannon, of Deerfield, Mich., who lost their flouring mill by fire last December, are rebuilding it, and have purchased the necessary machinery of Nordyke & Marmon Co., of Indianapolis Ind.

Amos Keller, of Palo Alto, O., has added one No. 3 Excelsior purifier, bolting cloth, elevator buckets, belting, and other materials, all from the mill-furnishing house of C. F. Miller, Mansfield, O.

A neat three run new process water mill is being built at Farwell, Mich., by Geo. L. Hitchcock, and the entire machinery is being manufactured for him by Nordyke & Marmon Co., of Indianapolis, Ind.,

Messrs. Lee, Wise & Kirk, of Douglas, Kan., are building a four-run steam mill at the above place, and Nordyke & Marmon Co., of Indianapolis, Ind., are getting out the machinery for the same.

George W. Gridley, a California pioneer, whose gift of a sack of flour to the national sanitary commission was a means of putting \$50,000 in its coffers, died recently on his estate in Butler county.

J. B. Miller & Co., Ashley, Ohio, have recently purchased one No. 1 California brush smutter and separator, bolting cloth, belting, elevator buckets, etc. C. F. Miller, of Mansfield, O., placed the order.

W. H. Mitchell, of Edmonton, Ky., is about to build a three-run flour mill at a station on the L. & N. railroad, called Horse Cave. He gets all the machinery of Nordyke & Marmon Co., of Indianapolis, Ind.

The Messrs. Herzer, Millersburgh, O., have formed a partnership with M. H. Steele, formerly of Cleveland, O., under the name of H. & C. Herzer & Co., and design to build a mill of 125 barrels daily capacity.

George Schaaf, Westfield, O., has added one No. 3 Excelsior middlings purifier, bolting cloth, leather and cotton belting, elevator buckets, etc., all of which were furnished by C. F. Miller, of Mansfield, O.

The flour mill of Messrs. J. & E. A. Plank, of Butler, Ohio, has been newly furnished throughout and fitted complete as a new process mill by C. F. Miller, of Mansfield, Ohio. It is turning out fine work, and is one of the best-equipped mills in Ohio.

George W. Gridley, one of the pioneers of Butte county, Cal., is dead. He will be remembered as the man who, during the war, gave to the Sanitary Commission a sack of

flour, which was sold and resold in all the principal cities in California and Nevada, and then sent East and again resold, realizing altogether over \$50,000.

Mr. Homer Baldwin's mill at Youngstown, Ohio, had its floor covered a foot deep with water during the recent freshet. As the operatives expressed some disinclination to swim, it became necessary to stop the mill for several days. About April 1st Mr. Baldwin expects to start up the Diamond Mills, which he recently bought and fitted up.

The Pearl Hominy Co.'s mill, situated on North and John streets, Baltimore, was destroyed by fire, together with its entire working apparatus and contents on March 4th. The fire, which originated on the second floor, spread with such rapidity, that before the firemen could reach the mill, it was in ruins. The loss is estimated at \$70,000, with an insurance of \$55,450.

They have what they call winter oats, in Oregon, that are sown at any time during the year—say from the last of September up to the middle of March, provided the ground is in favorable condition. These oats are used chiefly for milling; they yield larger grain, heavier and more uniform in size, than summer or spring oats, and at the rate of from forty to eighty bushels per acre.

As an instance of the energy displayed by Americans in their business undertakings it is worthy of mention that Mr. Washburn, of Minneapolis, has recently had some Minnesota wheat shipped to Liverpool, and reshipped to Hamburg to be tested by Nagel and Kaemp's process. The result of the experiment gave 79½ per cent of flour from the uncleaned wheat, or over 80 per cent of the cleaned wheat. A very large per cent of this flour is said to have been of the finest quality.—*Corn Trade Journal.*

J. W. Birdwell, of the Victor Wheat Heater Company of Minneapolis, reports sales of the Victor wheat heater and Gate City steam generator to the following parties within the last few weeks: R. Gregg & Co., Cannon Falls, Minn.; Burton & Jones, St. Paul, Minn.; E. N. Torrey, New Prague, Minn.; Thomas Hillier, Long Lake, Minn. (one generator); G. W. Florida, Rockford, Minn. (one generator); Sidle, Fletcher & Holmes, Minneapolis; J. R. Cross & Co., Minneapolis; H. Oswald, Crystal Lake, Minn.; E. Wunsch, Afton, Minn. (one generator); Plaff & Hillger, Winnebago, Minn.; Charles Jennings, Monticello, Minn.; Crown Roller Mills, Christian Bros. & Co., Minneapolis; McHenry & Dennison, Logan City, Neb. (one generator); Dinmoody & Corson, New Richland, Minn.; John Gaddis, Fairfield, Ill.; Isaac W. Stanley, Glenwood, Mo.; Hulbert & Son, Dayton, Minn.; J. H. McAfee, Bloomington, Minn.; J. Wankey, Prior Lake, Minn.; P. H. Hughes, Menomonee, Minn. (one generator); D. A. Ward, Delano, Minn. (one generator); Moorehead Mfg. Co., Moorehead, Minn.; T. O. Kilburn, Spring Valley, Minn. (one generator); C. J. Woolsey, Baldwin, Wis.; J. H. Iseling & Co., Sheldon, Iowa; Samuel Harriman, Somerset, Wis.; Logan & DeMoot, Long Lake, Minn.; H. J. G. Crosswell, Minneapolis. From one to twelve heaters have been placed in each of the above mills, and it has been learned that the roller mills have to use them.

## Milwaukee Items.

Smith Bros., of Milwaukee, are now busily engaged in placing the machinery in S. Hansen & Bros. new malt house.

H. Nunnemacher & Co., of the Star Mill, have recently received an order from Europe for 10,000 sacks of patent flour.

Jas. K. Scribner, of Eldorado Mills, Wis., has left his order for gradual reduction rollers with E. P. Allis, all of the Gray type.

Peters & Bernhard, Fort Madison, Iowa, are making extensive improvements in their mill, and are adopting the Gray roller mills exclusively.

Smith Bros., Millwrights of Milwaukee, are putting in a new flume and water-wheel for the mill belonging to R. Hooper, at Lake Mills Wis.

Hon. Henry Herzer, member of the Wisconsin Assembly, will soon return from Madison and again be on hand at his mill-pick works on the canal.

Smith Bros., the Milwaukee millwrights are now making the plans for a new grain elevator for Asmuth & Krause in connection with their malt house.

C. L. Douglass & Co. have fallen in line with the many millers, adopting the gradual

reduction system, and are fitting their mill up with the Gray noiseless roller machine.

The old Bertschy flouring mill property, on the northwest corner of Knapp and River streets, was conveyed to Julius Zahn, by P. C. Quentmeyer and Charles Freischmidt, for \$17,000.

The proprietor of a Milwaukee grain mixing establishment, recently purchased at auction for \$2,500 the pile of grain remaining in the ruins of a burned Minnesota elevator. He has run it through separating and cleaning machinery and has cleared over \$10,000 by the operation.

Rushing into the great roller whirlpool are the following prominent millers, and all are adopting the famous Gray machine, manufactured by E. P. Allis & Co.: Buffalo Milling Co., Freeport, Pa.; Herzog & Roberts, Racine, Wis.; McDaniels & Wright, Franklin, Ind.; H. C. Gustavus, Oshkosh, Wis.

L. H. Lanier & Son, Nashville, Tenn., have contracted with E. P. Allis & Co. for a complete 300-barrel roller mill, using 21 of Gray's patent roller mills and an 18x48 Reynolds-Corliss engine. Allis & Co. will arrange all the machinery in the mill and receive in compensation for the material and other services about \$60,000.

W. D. Gray, while in New York City, lately, contracted with Geo. V. Hecker & Co. of that city to put in 40 of his machines in the Metropolitan Mills. The corrugations of these rolls are of their patent sharp form, and take the place of the ones of other make used by Messrs. Hecker & Co. This change of rolls has been made after a thorough test of both kinds.

## Flour Manufacture at Indianapolis, Ind

[By Henry C. Wilson, Secretary of the Indianapolis Board of Trade.]

The year 1880 will be remembered by millers as one of great activity and revived prosperity. It opened with business in a very unsatisfactory condition, but at its close, manufacturers were full of orders, mills running day and night, and the ledger accounts of such mills as were provided with modern machinery, showing the largest net profits, for the time, ever known to the trade in this city. During the first half of the year, only such manufacturers as had an established order trade, whose brands commanded fancy prices, were able to run their mills without a loss. These unfavorable conditions of trade were due to the high speculative price of wheat in American markets; prices in this market ranging 10 to 20 cents per bushel above its value to manufacture into flour. After harvest, these conditions changed, and values settled to a figure that afforded the manufacturer a good remuneration.

Following this a brisk demand sprung up. Several years of short crops abroad had reduced stocks very low, and the high prices prevailing the early part of the year deterred dealers from replenishing beyond immediate wants. With the decline in wheat, large foreign and American orders began to come in for flour, which was found to be in light supply throughout the world. The demand continued uninterruptedly throughout the remainder of the year.

Supplementing these favorable conditions, were comparatively steady markets for wheat; but producers have not been free sellers, and large stocks are still held in first hands and come slowly to market, despite the active milling demand.

This valuable industry should be quadrupled at this point. Flour is manufactured here more cheaply than anywhere else in America. The reasons are obvious; we are located in the center of immense wheat fields, and the raw material and products are handled in this city without drayage. Slack coal is delivered at mills in car loads on the track at \$1.05@ \$1.15 per ton.

Our export trade in flour shows a healthy and satisfactory increase. Large sales are made direct to principal ports of Great Britain, Holland, Belgium, and to many ports in Germany.

Flour for export is mostly packed in jute or cotton sacks, of size to suit the trade of the country whence destined; and these advantages of direct sale, affording perfect duplication of orders, have greatly stimulated the foreign trade. The total manufacture in 1880, was equal to 259,500 barrels. But for the loss of the Hoosier State Mill, which was destroyed by fire in July (now being rebuilt), the product for the year would have reached a grand total of 300,000 barrels. As it was, it exceeded by 50,000 barrels, that of any year in our history.

## Personal.

Messrs. N. Hawkins & Co. and Messrs. Charles & Swenson, of Chicago, have recently sold out their respective mill-furnishing businesses to Messrs. Thornburgh & Glessner, now located at Nos. 47 and 49 West Lake street, Chicago.

Among our visitors during March, we are pleased to note the following names:

R. L. Downton, St. Louis, Mo.  
Tom Miller, St. Louis, Mo.  
A. Syme, Menasha, Wis.  
S. H. Seamans, Milwaukee, Wis.  
B. H. Evers, London, England.  
M. Buck, Delafield, Wis.  
Henry Hamper, Silver Creek, N. Y.  
W. Kuhn, Delafield, Wis.  
Notbohm Bros., Janesville, Wis.  
S. Potts, Minneapolis, Minn.  
W. W. Beardsley, Silver Creek, N. Y.  
P. G. Monroe, of the *Millers Journal*, Chicago, Ill.  
Albert Hoppin, Esq., editor of, the *Northwestern Miller*, Minneapolis.  
E. P. Bacon, Esq., Milwaukee.  
Mr. T. M. Knox, of Chicago, Ill.  
Wm. Lehman, Milwaukee, Wis.  
Mr. H. Smith, of Smith Bros., Millwrights, Milwaukee, Wis.

## Grain and Flour Trade Notes.

GERMANY.—The Berlin market has admitted a decline in wheat, but Hamburg is firm. Rye remains very dear. 42 shillings is quoted at Hamburg, and 43 shillings 3d at Berlin. Highest prices, however, are thought to be past.

AUSTRIA-HUNGARY.—The recent firmness and advance in the wheat market has given place to a decided retrograde tendency. Trade has become slow; grain is cheaper, and difficult to move.

THE recent Australian wheat crop was not more than three-fourths of the previous yield, so that Europe must not look for such shipments as characterized the year 1880. New Zealand, however, has a good crop, and will export satisfactorily. Wheat will also be shipped to Cape Colony.

ST. LOUIS.—Several tow boats and barges left March 31st with 170,000 bushels of wheat and 137,000 bushels of corn for New Orleans, there to be transferred to Europe. They also had about 4000 tons of general merchandise.

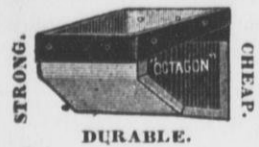
RATES are reduced from Chicago to New York on grain, provisions and live hogs 5 cents, commencing April 1, thus making rates on grain 30 cents, and on provisions and live hogs 35 cents. These rates remain in force during the summer months.

THE prospects for a good crop of winter wheat in Wisconsin is said to be very good. The snow has kept the plant from freezing out.

ALBERT RHODES, United States Consul General for the Northern District of France, states that the importation of American cereals in France has increased almost beyond all calculation. So far as wheat and corn are concerned the Americans have driven European competition out of the field. According to the reports of his agents, the importations of American wheat, in his district alone, amounted to between \$25,000,000 and \$30,000,000, an enormous increase over the preceding years. Indeed, on his starting from Rouen a fortnight ago a prominent friend, a wheat merchant, assured him that if the price of American wheat were to fall 10 per cent more it would drive French wheat completely from the market. And that since his departure this fall has already begun. This fear of American competition in wheat has been a veritable sword of Damocles over the heads of the French agriculturalists in the North. Slowly but surely the day is approaching when they will be obliged either to turn their wheat fields into beet beds or to starve.

THE Board of Managers of the New York Produce Exchange adopted the following new rule regulating the flour trade, March 3. The same will be in force after it has been posted ten days: "When flour is sold to arrive within a specified time, lighterage free, tender as to time shall be given on notice from seller to buyer of arrival at railroad terminus or transportation line dock in the port of New York; when sold to arrive within specified time, delivered alongside vessel or free on board, in the absence of special agreement, the buyer shall furnish a place for delivery within twenty-four hours from notice from the seller of arrival, and tender as to time shall be arrival alongside. When flour is purchased lighterage free or free on board, the buyer shall have twenty-four hours from the day of sale or notice of arrival to examine as to its quality."

Wm. E. Catlin & Co.,  
C. O. D. Mill Furnishers,  
No. 63 Lake St, CHICAGO, ILL.



**Catlin's Octagon Bucket.**

**BEST MILL BUCKET IN THE WORLD.**

The ends of these buckets are fastened by a double fold. The bands double lap the ends, leaving the front of the bucket smooth. If you have not used them, please give them a trial.

TIN.		IRON.	
2 1/2 x 2 1/2	5 Cents	4 x 3	8 Cents
3 x 2 1/2	5 1/2 "	4 x 3 1/2	9 "
3 x 3	6 "	4 1/2 x 3 1/2	10 "
3 1/2 x 3	7 "	5 x 3 1/2	11 Cents
		5 x 4	12 "
		5 1/2 x 4	13 "
		6 x 4	14 "
		6 x 4 1/2	15 Cents
		7 x 4 1/2	16 "
		8 x 5	18 "
		9 x 5	20 "

**SPECIAL FIGURES ON LARGE QUANTITIES. SAMPLES FREE.**

Odd sizes made to order. A large stock of "Octagon" Mill Buckets always on hand.

**UNSOLICITED TESTIMONIALS.**

I received my "Octagon" cups to-day. Am well pleased. J. M. BURKHOLDER, Casstown Mills, O.

The "Octagon" buckets you sent us have just arrived. We are fully pleased. They are strong and durable—the very kind we want—and at one-third the cost of as good an article here. JAS. CAMP, Fort Jones, Cal.

Your "Octagon" cups meet the approbation of all millers. They have been paying double your price for an inferior article. W. A. McMULLEN, Traveling Salesman.

We have been buying our buckets of— but we like the looks of your "Octagon." Please send us the following— HARDESTY BROS., Canal Dover, O.

The "Octagon" buckets came to hand and look equal to sample sent us before ordering. UNION MILLS FLOURING CO., Van Wert, O.

Please find enclosed draft for the "Octagon" buckets ordered on the 16th inst. They do their work nicely, and we are well pleased with them. STRAUS, ELSTON CO., Marietta, O.

"Octagon" buckets ordered the 14th and billed the 18th, just received. We are well pleased with them and will order another supply ere long. MITCHELL & BROWN, South Toledo, O.

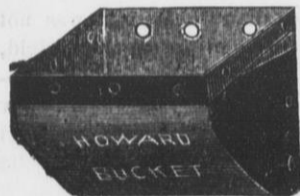
We received your "Octagon" elevator bucket, and like it very well. Send us— MOON & BLACK, Diana, Ill.

We like the form of your "Octagon" cups better than any other, so does our miller. J. SHOUTZ & SON, Bloomville, O.

We received your "Octagon" which we think is a real good cup. Please send us the following— H. J. SOMMER & BRO., Canton, O.

Enclosed find draft—for "Octagon" cups ordered last week. They are all right. T. W. STANTON & SON, Waupun, Wis.

We got some "Octagon" buckets of you last year, and now we want some more. Please ship us as follows— HOOD & BRADLEY, Belmont, N. Y.



**Catlin's Howard Bucket.**

This bucket is made entirely of one piece of metal. It is octagon shape, very smooth, neat and extra strong. They are acknowledged to be the most perfect warehouse bucket made.

I received the "Howard" bucket from your firm. I like the shape and manufacture of them first rate. When I built I had my buckets made to order, but they were much inferior to yours and cost more money. H. W. HOAG, Delevan Steam Grain Elevator, Delevan, Wis.

Quite a number of parties to whom we have furnished plans for elevators, are using the "Howard" bucket: they are well liked. CHASE ELEVATOR CO., Chicago, Ill.

We also manufacture to order four other styles of Elevator Buckets, and can make it to your interest to correspond with us when wanting buckets for any purpose.

60 cents per lb.	Discount.....per ct.
75 cents per 100.	Discount.....per ct.
85 cents per 100.	Discount.....per ct.

Order from this advertisement, and if the goods and prices are not satisfactory they can be returned at our expense.

**WM. E. CATLIN & CO.**

Please mention the U. S. Miller when you write us. 63 Lake St., Chicago, Ill.

**"THE GREAT ROCK ISLAND ROUTE"**

Calls your attention to the following REASONS WHY, if about to make a Journey to the GREAT WEST, you should travel over it:

As nearly absolute safety as is possible to be attained. Sure connections in UNION DEPOTS, at all important points. No change of cars between CHICAGO, KANSAS CITY, LEAVENWORTH, ATCHISON or COUNCIL BLUFFS. Quick journeys because carried on Fast Express Trains. Day cars that are not only artistically decorated, but furnished with seats that admit of ease and comfort. Sleeping cars that permit quiet rest in home-like beds. Dining cars that are used only for eating purposes, and in which the best of meals are served for the reasonable sum of seventy-five cents each. A journey that furnishes the finest views of the fertile farms and pretty cities of Illinois, Iowa and Missouri, and is afterwards remembered as one of the pleasant incidents of life. You arrive at destination rested, not weary; clean, not dirty; calm, not angry. In brief, you get the maximum of comfort at a minimum of cost.



That the unremitting care of the Chicago, Rock Island & Pacific Railway for the comfort of its patrons is appreciated, is attested by its constantly increasing business, and the fact that it is the favorite route with delegates and visitors to the great assemblies, political, religious, educational and benevolent, that assemble from time to time in the great cities of the United States, as well as tourists who seek the pleasant lines of travel while en route to behold the wonderful scenes of Colorado, the Yellowstone and Yosemite. To accommodate those who desire to visit Colorado for health, pleasure or business, in the most auspicious time of the year, the summer season and months of September and October, the Company every year puts on sale, May 1st, at all coupon ticket offices in the United States and Canada, round trip tickets to

DENVER, COLORADO SPRINGS AND PUEBLO, At reduced rates, good returning, until October 31st. Also to San Francisco, for parties of ten or more, good for ninety days, at great reduction from regular fares. REMEMBER, this is the most direct route for all points WEST and SOUTHWEST. For further information, time-tables, maps or folders, call upon or address

R. R. CABLE, Vice-Prest and Gen'l Man'gr, Chicago. E. ST. JOHN, Gen'l Ticket and Pass' Agent, Chicago.

[Mention this paper when you write us.]



Nickle FLOUR TESTERS mailed for 25c.

**Mill For Sale—A Rare Bargain.**

Desiring to turn my full attention to other business I offer for sale my Mill Property in Ripon, Wis. The mill is 40x60 and four stories high with additions 44x44 and 20x40, and cooper shop. Power: 13 feet head, 3 13-inch turbines, also 75 horse power engine with two boilers. Has 2 wheat stones, one middlings and a feed run, 2 purifiers, flour packer, separator, smutter, corn sheller, etc. Handsome dwelling house can be had with the mill. It has all conveniences and modern improvements. Good schools and college in the city. Any one desiring to go into the milling business, should not fail to examine this property. When you write me please mention the United States Miller. Address H. B. BATEMAN, Ripon, Wis.

**2 RUNS OF FIRST-CASS MILL-STONES FOR SALE.**

For wheat grinding. In perfect order with spindle, tram-pot, fulcrum, curb, lighter screw and silent feeder. Will sell one or both runs at a very low price, delivered on board cars in Janesville. Address at once.

**NOTBOHM BROS., JANESVILLE, WIS.**

Mention this paper when you write us.

HE NEVER SMILED AGAIN.—They were very fond of each other, and had been engaged, but they quarreled and were too proud to make it up. He called a few days ago at her father's house to see the old gentleman on business, of course. She was at the door. Said he: "Ah, Miss. Blank, I believe; is your father in?" "No," she replied, "pa is not in at present. Did you wish to see him personally?" "Yes," was the bluff response, feeling that she was yielding, "on very particular personal business," and he turned proudly to go away. "I beg your pardon," she called after him as he struck the lower step, "but who shall I say called?" He never smiled again.

BUT WHERE'S THE CAT.—The skeleton of a cat walked into Ryan's store at Hohokus. Ryan, seeing her, bawled out, "Mickey, didn't I tell ye a month ago to fade that cat a pound of mate a day until ye had her fat?" "You did; and I'm just after fading her a pound." "Has that cat ate a pound this morning?" "Yes, sir." "Shure, I think it's a lie ye're telling. Bring me thim scales. Now bring me that cat." The cat turned the scale at exactly one pound. "There didn't I tell ye she had eaten a pound of mate this mornin'?" "All right, my boy; there's yer pound of mate; but where's the cat?"

Gunn & Co., of Minneapolis, Minn., are building a 500-barrel roller mill for Porter & Co., Cincinnati, O.

**C. C. PHILLIPS,**  
MANUFACTURER OF  
VERTICAL and HORIZONTAL  
**French Burr Mills.**  
GREATLY IMPROVED.  
Adapted to all kinds of Grinding.  
Send for circular before purchasing elsewhere.  
C. C. PHILLIPS, Cor. 13th and Buttonwood Sts., PHILADELPHIA, PA.

**ATLAS-CORLISS ENGINE**

Will Replace Ordinary Engines, Guaranteeing to Save One-Third Fuel.

ATLAS ENGINE WORKS, INDIANAPOLIS, INDIANA.  
BUILDERS OF ALL CLASSES OF  
**Engines and Boilers.**  
We build The Best Farm Engines and Small Engines for Warehouses and Elevators. Janly  
[Mention this paper when you write us.]

**Porcelain Rollers!!**

THE INVENTOR AND MANUFACTURER,  
**WILHELM BRAUN,**  
ENGINEER,  
Carlsbad, - Bohemia,  
Offers the BEST and HARDEST in existence, of all sizes, in a rough state, mechanically fitted on their shafts, and ground ready to be laid in the Roller Mills.

**READ THIS!**

THE Purifier is capable of losing or saving the miller more than any machine in the mill. A poor one is a bad investment at any price. A good one is indispensable to modern milling. The CASE PURIFIER gives about double the capacity at about half the price of any on the market. These statements guaranteed. We can make the whitest middlings with the least waste of any machine now made.

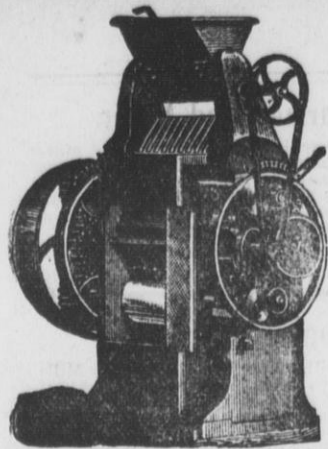
Note, We Offer { Double Capacity.  
Half Price.  
Best Results.

Note This { Our Machine is Double.  
We Put Two Purifiers in the Space of One.

Send for Circulars and Low Price List to

VIENNA EXHIBITION, 1873, Awarded Diploma of Honor.

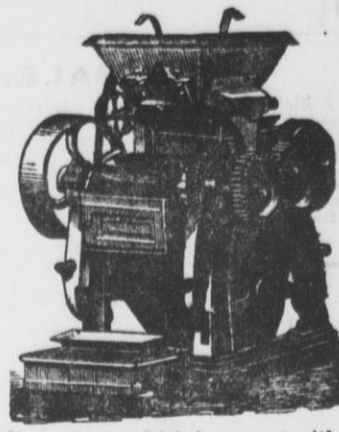
PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



**GANZ & CO.,**

**Iron Foundry and Manufacturing Association,**

Buda-Pesth, Hungary; or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS with chilled cast iron rollers, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely grinding on mill-stones, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these Roller Mills with chilled cast iron rollers, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mills, and all work satisfactorily. Our crushing mills may now be regarded as absolutely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their absolute discharge bearings, by means of the newly-devised Anti-Friction Pressure Rings. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following :

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, i. e., your generally well-famed chilled iron, as the best within my experience, and its adoption has satisfied me in every respect, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered a considerable service to the milling art. Your material is equally well adapted for rough grinding, softening or grinding. Owing to its great hardness I cannot characterize it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repairs for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can be absolutely no question of discoloring unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers is very lively and has remarkable baking qualities. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, not only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, i. e., the Rotary Anti-Friction Spring Pressure Ring, solved the problem of discharged bearings, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wondrous as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction which, usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communication for use as you may deem desirable, I remain, etc.,

(Signed) C. HAGGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers

Address all communications to

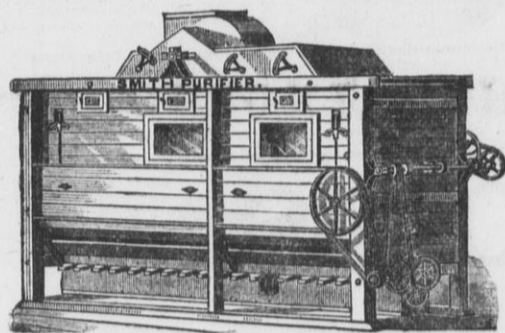
**GANZ & CO., Buda-Pesth, Hungary.**

Cable Address "GANZ, Kaiserbad."

Or GANZ & CO., Ratibor, Germany.

Or THROOP GRAIN CLEANER CO., Auburn, New York.

[Mention this paper when you write us.]



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of EQUAL CAPACITY. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

**THE GEO. T. SMITH MIDLINGS PURIFIER**

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery—THE LOCKWOOD MEDAL—at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill-owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

**GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich.**

[Mention this paper when you write us.]

HENRY SMITH, JR.

GEO. G. SMITH.

F. A. SMITH

**SMITH BROTHERS, Practical Millwrights.**

Plans, Specifications and Estimates made for all kinds of

**MILLWORK, MACHINERY, Etc., Etc.**

Flour, Sawmill, Tanners' and Brewers' Machinery, and General Mill Furnishers.

No. 454 Canal Street,

**MILWAUKEE WIS.**

[Mention this paper when you write us.]

THE LOCKWOOD MEDAL, Awarded to the Geo. T. Smith Middlings Purifier, as the machine marking greatest progress and utility in its application to the grain and milling interests, invented within the last ten years. Miller's International Exhibition, Cincinnati, Ohio, 1880.



1865. 1881.

**C. A. FOLSOM & SON,**

Manufacturers of the Purest and Best

**Lubricating and Burning Oils**

GREASES, ETC.

For Flour Mill Machinery, SPECIALTIES,

**MILLERS' CASTOR Machinery Oil.**

A compound oil, warranted better than Lard or Sperm Oil for machinery uses, and will last longer. Guaranteed not to heat or gum, and to give satisfaction when used on steps, spindles, etc.

**MILLERS' LAMP OIL.**

Warranted free from Petroleum. Burns equal to Lard or Sperm Oil. Will not chill at 32° above zero, and much cheaper than Lard Oil.

**GLOBE A, Natural W. Virginia Rock Oil.**

A perfectly natural oil, just as it comes from the earth. Thoroughly settled and refined of high fire test, and will not congeal at zero. It is the best Black Oil produced.

*Peerless Mill Doap.*

A compound Grease for use on cogs and all heavy gearing. Put up in kegs, half barrels and barrels.

**CAPITOL CYLINDER OIL.**

Manufactured for Steam Cylinders, especially for use in Patent Lubricators. Warranted not to foam, heat or gum, and endorsed by manufacturers of Corliss Engines.

We also have all grades of Sperm and Golden Machinery, Lard, Engine, and several grades of Cylinder and Black Oils, Plumbago, Cotton Waste, etc., etc., which we will offer at prices that defy competition, when quality is considered. Orders and correspondence solicited.

**C. A. FOLSOM & SON,**

130 WEST WATER STREET, MILWAUKEE, WIS.

Mention this paper when you write us.

All parties who desire to obtain

**EUROPEAN PATENTS**

Will do well to consult the undersigned, who is a thorough milling expert as well as

**Solicitor of Patents.**

Unquestionable references furnished in Europe or America on application. Address all communications to

P. SCHNEITLER,

april Berlin N., Muellerstrasse 179 B., Germany.

N. B.—I respectfully ask that manufacturers of American milling machinery and agricultural machinery will favor me with their catalogues. Address as above.

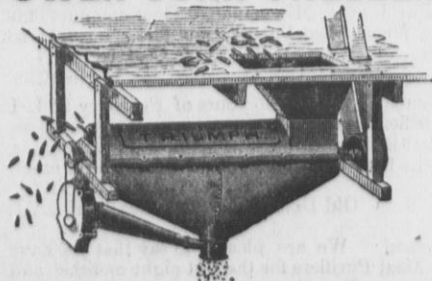
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**SITUATION WANTED.**

By a practical miller as head miller, or would rent or run a good custom mill. Address LEAD MILLER, Care of the United States Miller, Milwaukee, Wis.

**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. HULBERT & PAIGE, Painesville, Ohio.

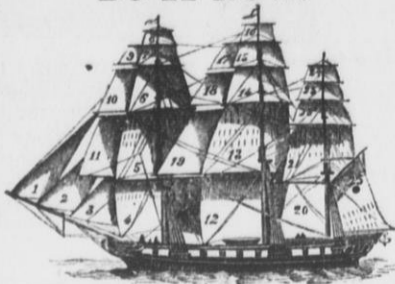
[Mention this paper when you write us.]

**FOR SALE.**

A Flouring Mill of the latest improved gradual reduction roller system, together with 80 acres of good land, good house and barn, located on the Iowa River, 8 miles northeast of Cresco, at Kendallville. The property must be sold, and a great bargain will be given. Death of my husband, S. S. Kendall, is the reason for offering the above property for sale. For further particulars address  
**MRS. S. S. KENDALL**, Administratrix,  
 Kendallville P. O., Winneshiek Co., Iowa.

**WEBSTER'S UNABRIDGED.**

If you intend sometime to get a copy of Webster's Unabridged Dictionary,  
**"DO IT NOW."**



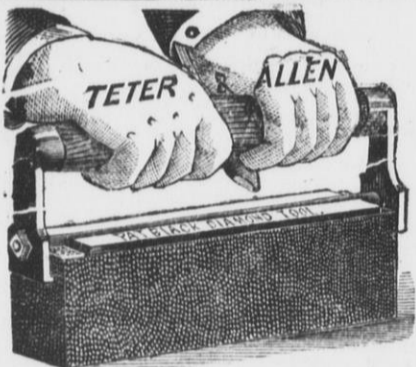
See Webster's Unabridged, page 1164, giving the name of each sail,—showing the value of DEFINITIONS BY ILLUSTRATIONS.

The pictures in Webster under the 12 words, Beef, Boiler, Castle, Column, Eye, Horse, Moldings, Phrenology, Ravelin, Ships, (pages 1164 and 1219) Steam engine, Timbers, define 343 words and terms far better than they could be defined in words.

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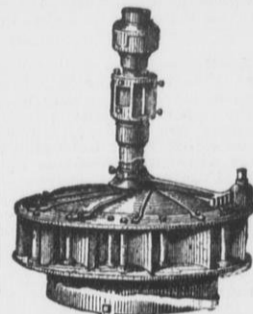
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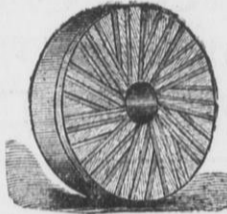
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Having for many years had experience as head miller in Buda-Pesth, Hungary, desires to open correspondence with some American milling firm, with a view to locating in America. Address all letters as below, and they will be duly forwarded to me. Please state what wages could be expected in case entire satisfaction is given

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Flour Mill, Saw Mill, Planer and Circular Saw Mills, located on bank of Ohio River, 400 feet from depot of C. & P. R. R., 35 miles below Pittsburgh, Pa., in a good business location and grain growing neighborhood. Good shipping facilities by river and rail. Mills, engine and all machinery in good running order. Will be sold low for cash or exchange for farm. Also large commodious dwelling house. Address **J. W. ENGLE,** Industry, Beaver Co., Pa.

**For Sale—A Rare Bargain.**

Desiring to turn my full attention to farming, I offer for sale my mill property. The Mill is 40x50 and 3 stories high. Power, 11 feet head. It has one set of wheat burrs, and one of corn, all in good order; also a first-class cotton gin and 80 acres of land well improved, a good two story dwelling, cost \$700 to build. This property is situated on Elk River. I can grind 280 bushels at the lowest tide of water. I would sell for half cash, the balance on time. For further particulars come and see the property or address the undersigned.

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Picks will be sent on 30 or 60 days' trial to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canada. Send for Circular and Price List.

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**NEW MILLING PROCESS.**

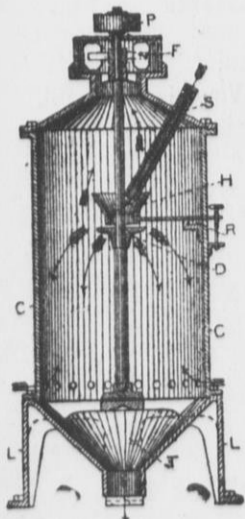
**DO NOT THROW ASIDE THE MILL-STONES UNTIL YOU HAVE INVESTIGATED THIS IMPORTANT INVENTION.**

We have discovered and perfected a **New Process** by which, by the aid of our machine—light running, durable, requiring little power and space—we can successfully purify the meal of ground or crushed wheat, thereby bringing the **straight flour**, or first bolting (without waste) to the highest standard of excellence. By the use of our process and machinery we extract from the meal of ground or crushed wheat, all the low grades, the dead or overground flocculent material (which exists in **all meal**, however well prepared) before bolting, leaving nothing in the chop but the best quality of flour for the bolts to operate on and separate.

**THE ADVANTAGES** obtained by these machines are as follows:

1. They thoroughly eliminate all low grades or coloring material before bolting, thus enhancing the value of the straight flour, both in strength and color.
2. No clogging of cloths, freer bolting, and, consequently, more granular flour.
3. Middlings purifiers greatly assisted, as a large percentage of specular and fine offal is deposited in fan-room by the machine.
4. A better low grade flour, without consuming power by regrinding.

Our process and machinery are fully covered by letters patent. Will ship the Machine to any responsible party on thirty days' trial, and, if the results are not perfectly satisfactory, the same can be returned to us or held subject to our order.



**TESTIMONIALS.**

The following testimonials speak for themselves. We have others, but think the following sufficient as they show that both spring and winter wheat regions will be greatly benefitted by the use of our machinery and process:

**MINNEAPOLIS, Minn., March 15, 1881.**—Wheat Meal Purifier Co., Minneapolis—Gentlemen: This is to certify that we have lately tested the merits of the Wheat Meal Purifier, and find the results so satisfactory that we have adopted them. Respectfully yours,  
**COLBURN & CHRISTIAN,**  
 Eagle Mills.

Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: In reply to yours of February 2nd, I have the pleasure to inform you that your Wheat Meal Purifier has been in constant use in my mill for the past four months, and am now prepared to advise you that it gives entire satisfaction. By extracting the impurities from the chop before bolting it, we find the flour greatly enhanced in value and much more saleable at better prices. Yours truly,  
**D. G. WATKINS CO.,**  
 Old Dominion Mills, Alexandria, Va.

Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: We are pleased to say that we have been using in our mill at this place two of your Wheat Meal Purifiers for the last eight months, and have fully realized all you represented to us in regard to them. They thoroughly remove all the light, fine impurities from the meal before going to the bolts, and the result is a vast improvement in our flour. Consequently, we would not think of running our mill a day without the Wheat Meal Purifier. Respectfully yours,  
**NALLS & CO.,** Alexandria, Va.

**ALEXANDRIA, Va., Jan. 3, 1880.**—Wheat Meal Purifier Co., Georgetown, D. C.—Gentlemen: This certifies that I have been Inspector of Flour of this place for the past eight years, and having fully examined the operation and merits of your Wheat Meal Purifier I am prepared to add my endorsement of its very superior work. The difference in the flour when treated by your machine is fully fifty cents per barrel and more, according to percentage of light coloring matter extracted from the wheat chop before it goes to the bolts. The material taken out passes for a good article of super, and in my judgment has no business in the chop going to the fancy flour bolts. Very respectfully,  
**JNO. W. TAYLOR,**  
 Flour Inspector, Alexandria.

Wheat Meal Purifier Co., Georgetown, D. C.—To whom it may concern: This is to certify that I have carefully examined the operation of your Wheat Meal Purifiers in Nalls & Co.'s mill, in Alexandria, Va., and am free to acknowledge their great utility. As Flour Inspector of Washington City, D. C., I can safely pronounce their flour worth fully fifty cents per barrel more than it was formerly. This improvement is the result of the chop being purified before it is bolted, and the material so extracted is a fair saleable "super" flour. I would recommend the use of the Wheat Meal Purifier to all millers desiring to raise the quality of their work.  
**B. F. CRABBS,** Flour Inspector,  
 Washington City, D. C.

Address all communications to

**WHEAT MEAL PURIFIER CO.,**

Minneapolis, Minn., or Georgetown, D. C.

Please mention this paper when you write us.