



History of Stoelting Brothers Company. Cheese making becomes a completely automated process. Monograph 13 1971

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HISTORY OF STOELTING BROTHERS COMPANY

by Olaf Lee, Vice President

CHEESE MAKING BECOMES A COMPLETELY AUTOMATED PROCESS

by Edward Ehrt

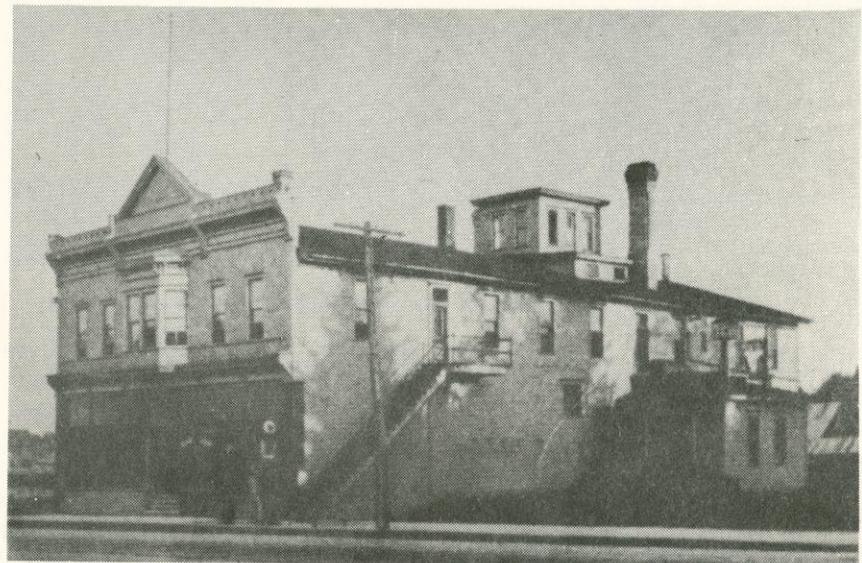
Stoelting Brothers Company of Kiel, Wisconsin, had its beginning several years after the turn of this century. The first site of operations was the present Lulloff Hardware Store in Kiel and business was begun in March, 1905 under the name of Simon Hardware and Manufacturing Company. Partners in this company were Gottlieb Simon, Otto Stoelting, Adolph Stoelting, and Louis Ebeling. As the name indicates, this company was primarily a retail hardware store, but considerable sheet metal work was also done. Four men were employed full time, and a fifth was added during the busy season. One of the more important items manufactured was a wood-jacketed, tinplate-lined, cheese vat. As time went on, other cheese making equipment was introduced by the company and these products found early and favorable acceptance by the many cheese makers in the area.

From these modest beginnings has grown a very substantial company, engaged in the manufacture of cheesemaking

STOELTING BROS. CO.



OTTO STOELTING, left
ADOLPH STOELTING, right
(1955)



STOELTING BROTHERS' FIRST PLANT

equipment and machinery, Dairy Queen freezers, frozen slush drink dispensers and industrial washing equipment. Today the firm employs 122 people of which the office numbers 23 and the engineering department 10. The company employs two full time traveling salesmen in its cheese equipment division. Stoelting equipment can be found throughout Wisconsin and the Midwest in countless cheese factories and dairy plants, and also throughout the world wherever dairy products are processed. Stoelting Brothers Company is now one of three major companies in the United States producing cheese plant equipment, and one of two manufacturers of the well-known Dairy Queen Freezer.

The name of the firm did not become Stoelting Brothers Company until 1907 when Mr. Simon sold his interests. A third brother, Gustave Stoelting, joined the organization at that time, and he served as first president of the newly-formed corporation. Otto

Stoelting was vice president and Adolph Stoelting was secretary-treasurer. For some years, Calvin Reineking had an interest in the company and served as bookkeeper.

The dairy industry was quite seasonal in the early years, and during the slack season metal roofs on barns and homes were erected. Many of these roofs are still in use on buildings in this community and surrounding territory. The first years were marked by hard work and long hours. A forty hour week was unheard of, and during the busy season every day was a long one. Business increased from year to year and the company continued to enlarge its line of equipment and its scope of operations. Dealers and jobbers for Stoelting equipment were assigned in the various territories around the country where direct sales representation could not be given. The policy continues today and the company also has an export agent for foreign business. Development work was done on various types of equipment



WORKCREW AT STOELTING BROS. IN 1916

and patents were assigned to the company on many items of cheesemaking equipment.

After thirteen years in the original location, the company had outgrown its building and facilities. A new one-story plant building was erected at 714 Paine Street, and the entire company was moved to this site in the spring of 1920. With modifications and many additions, the same building is in use today. The retail hardware business was discontinued at that time and efforts were concentrated on the manufacture of dairy equipment. More men were added to the sales staff, and service and installation crews were added to the payroll. To this day the company maintains several trucks and service crews who are equipped to install and service all types of dairy equipment. During the early 20's the company experienced its greatest growth, paralleling the rapid expansion of the cheese industry and the establishment of Wisconsin as a leader in cheese production. In those days, there were over 2,000 cheese factories in this state alone, and a heavy concentration of plants in east central Wisconsin made Kiel an ideal location for serving this industry.

The type of equipment produced in the early days called for craftsmen such as carpenters and tinsmiths. Cheese vat bodies and

cheese presses were still made entirely of wood. Redwood, cypress, and fir were purchased in carload lots. Dairy tinplate was the only sanitary metal known and was used for lining tanks, vats, and other receptacles containing milk and its by-products. This metal was imported from England. Today most of the equipment is constructed entirely of metal. Stainless steel has replaced tinplate as a sanitary metal. As equipment has changed and improved, so has the method of production and the abilities of the men who do the work. With the advent of stainless steel, skilled welding has come to be a required fine art. The use of heavy gauge steel has made necessary the installation of larger machines for cutting, bending, rolling, and shaping the metal.

In 1938, Stoelting engineered and built the first commercial model of the Dairy Queen freezer and today the construction of these machines and auxiliary equipment for use by Dairy Queen operators throughout the United States and other lands is an important part of the Company's business.

In 1950 Stoelting designed and patented an automatic continuous cleaning machine for the aluminum and stainless houseware utensil industry. At present, 42 of these large automatic washing machines are in operation at aluminum and stainless steel fabricating plants in

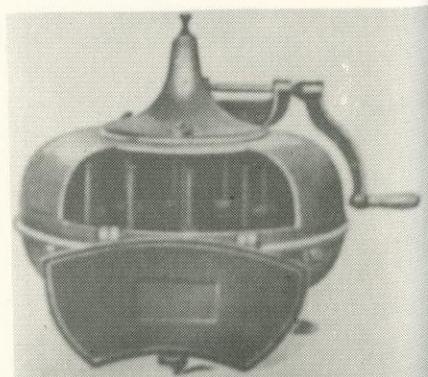
Wisconsin and other states.

Stoelting slush drink freezer another Company development, was introduced in 1959. This machine freezes and dispenses an uncarbonated drink that contains its own ice in a slushy consistency. It is sold to drive-in restaurants, soft serve stores, convenience stores, variety and drug stores, theaters, schools and to many other such markets. Today there are several thousand Stoelting slush machines located in virtually every part of the country.

Stoelting Brothers Company manufactures a complete line of cheesemaking equipment. The rapid growth of the cottage cheese industry has helped to give wider application to Stoelting cheesemaking equipment. For distribution of such equipment the Company has 38 dairy equipment jobbers throughout the country and it handles the retail sales to Wisconsin from its office in Kiel. In 1968, after many years of research and development, Stoelting introduced the first automatic device for cheddaring cheese. With this machine curds and whey are transformed into cheddar cheese without manual labor. Salting and milling of the curd, as well as weighing and hooping, are accomplished in a continuous process — all by push buttons.

Present officers of the Company are:

Fred Stoelting President
Olaf Lee Vice President
Carl Stoelting Secretary
Milton Kuether Treasurer



BABCOCK MILK TESTER

CHEESE MAKING BECOMES A COMPLETELY AUTOMATED PROCESS

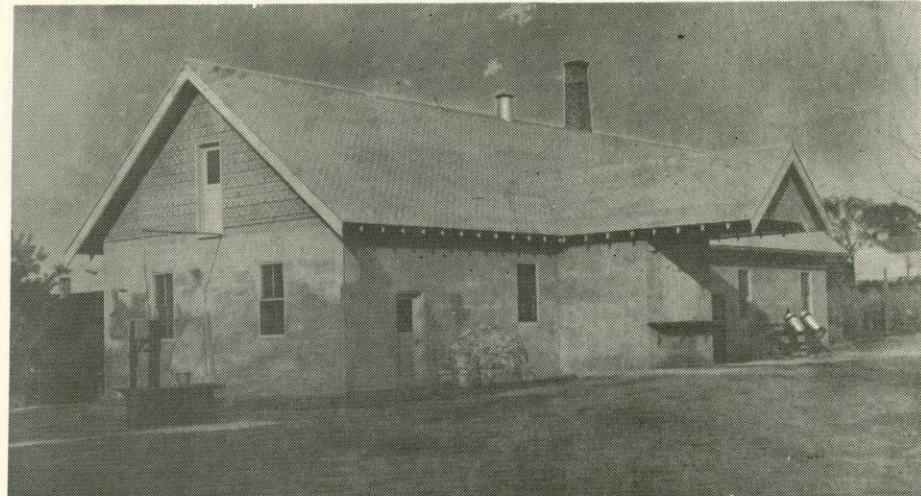
In the early years, cheese making was an occupation that was performed almost completely with hand labor. One man could handle about 4,000 pounds of milk a day. With the ever increasing volume of milk to be handled, and with the rising costs of labor, manufacturers of dairy products were looking for the time when the operation would become automated.

The automation of the cheese making process has been a step by step matter. In recent years conventional equipment was a two vat system of transferring the curd from cooking vats to separate "cheddaring" tables where the curd was matted, (cheddared) milled, salted, and hooped. However, this type of equipment, though improving efficiency somewhat, did not answer completely the process of plant automation. For example, turning of the curd slabs during the cheddaring process was still a hand operation; milling of the curd in most instances was still done by hand, the operation of salting the curd and mechanical "forking" was the same as it was forty years ago except for refinements and sanitary features built into the equipment; and unloading or "hooping" still involved considerable time.

The development of fully automated cheesemaking equipment was not a simple task, for it wasn't a problem involving mechanics alone, but involved chemistry as well. True cheddar cheese must develop what is known as "breast of chicken" or long strings of curd that can be torn from the cheddared slab. This curd texture develops the body in the finished cheese and gives it the desired flavor. Furthermore, the cheddar cheese sold today must have a completely closed body, no seams, no pinholes from gas formations, or no mechanical openings. This is what today's housewife wants and expects.

Stoelting Brothers of Kiel, Wisconsin, have completed the final phase of this development program and completely automatic equipment is now commercially available. The system is designed on a module principle as follows:

Module 1 — Automatic



THE ZITZELBERGER CHEESE FACTORY NEAR CHILTON
(an early cheese factory)

cheddaring machine with programming controls, closed type system for CIP cleaning.
Module 2 — Automatic curd milling equipment with power infeed conveyor.

Module 3 — Automatic curd salting machine.

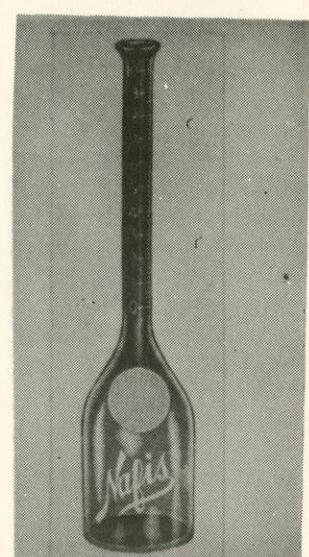
Module 4 — Automatic cheese weighing and hoop filling equipment with power infeed and hoop conveyor.

With this automated equipment the cheese curd is cooked in a conventional manner, using standard vats or the newer large vats (30,000 to 40,000 pound capacity of stainless steel) designed for greater capacity and mechanical curd cutting. After cooking, the curd and whey is pumped to the cheddaring machine where the cheddaring process is carried out on a completely automatic basis. This is done in a machine known as a "cheese maker." Upon completion of the cheddaring process the finished curd is automatically put into a continuous ribbon and carried by a conveyor to the central curd milling station. Rinsing of the "Cheddaring Machine" for the next vat of curd is then carried out through the use of a central CIP cleaning system operated by the programmer. During the entire cheddaring process only a periodic check of the equipment is required.

The continuous ribbon of curd is then fed by motorized conveyor to the central curd milling station where it is cut into cubes. Immediately at the time of curd

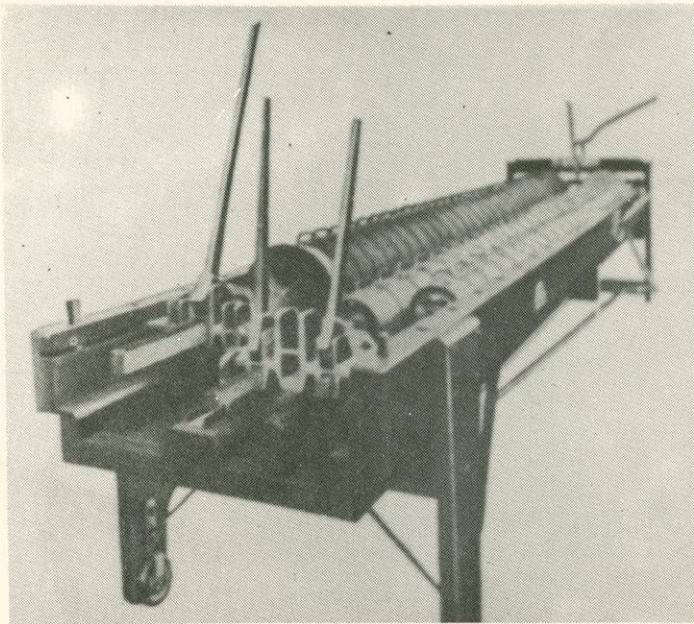
milling salt is applied. The exact ratio of salt is evenly distributed on all surfaces of the curd by means of a curd weighing belt that regulates the amount of salt required for a given amount of curd.

In the final stage, the salted curd is moved mechanically to the central weighing and hooping module. Here the curd is weighed automatically, independent of the hoop, then dropped into the cheese hoop. With the filled cheese hoops in position under the filling chute, two pressing plates are brought down automatically to pack the curd into the barrels. After pressure is applied a few seconds, the pressing plates are raised and the filled hoops are moved away automatically. This eliminates the need for hoop fillers and hand packing as other systems require.



MILK TEST BOTTLE

Thiel Cheese Plant at Sherwood, Wisconsin



A CHEESE PRESS

One of the completely automated cheese making plants is the Thiel Milk Products Plant at Sherwood, Wisconsin. This plant is located along Highway 55 about one half mile south of Highway 10. It is a plant that is able to handle about three quarters of a million pounds of milk within a period of twenty-four hours.

Milk is brought to this plant in refrigerated tank trucks. The milk is then pumped into refrigerated storage tanks. There are two such tanks at this plant. They are forty feet high and have a storage capacity of 250,000 pounds of milk each. Temperature of the milk is kept at forty degrees in the tanks. The milk then is pasteurized and transferred to 30,000 pound vats where the cheese manufacturing process begins. About four hours is required for the cheese making process to be completed.

The Thiel plant has three automatic "cheese makers." Ten years of research was required before Stoelting Brothers put this equipment on the market. These pieces of equipment were installed in the Thiel plant in May 1970. Each of these cheddaring units is capable of manufacturing 3,000 pounds of cheese every two and one-half hours. About ten pounds of milk is required to manufacture one pound of cheese.

Seven men are required on a shift to operate the Thiel plant. The cheese is put into 500-pound plastic lined storage barrels. These are

stored in a room that is kept at a temperature of 40 degrees. In eight or ten days these barrels of cheese are taken to either Green Bay or Plymouth.

Mr. Thiel remarked that the use of automatic equipment would not be economically feasible if production of cheese per man-hour of labor would not be substantially increased. He stated that under hand operation methods a man could produce 160 pounds of cheese per hour. With the automated equipment this has been increased to about 500 pounds of cheese per man-hour.

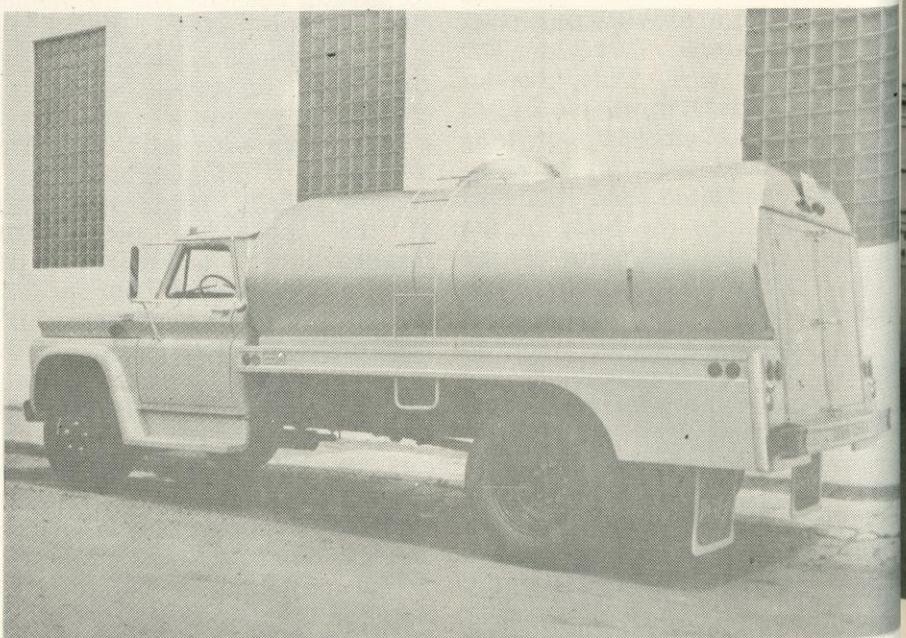
Farmers are required to keep

milk under refrigeration from the time of milking until the milk is picked up by tank truck drivers. Strict quality control of all milk is maintained through constant laboratory tests. Milk that is not up to standards set by Mr. Thiel is let at the producer for other disposition.

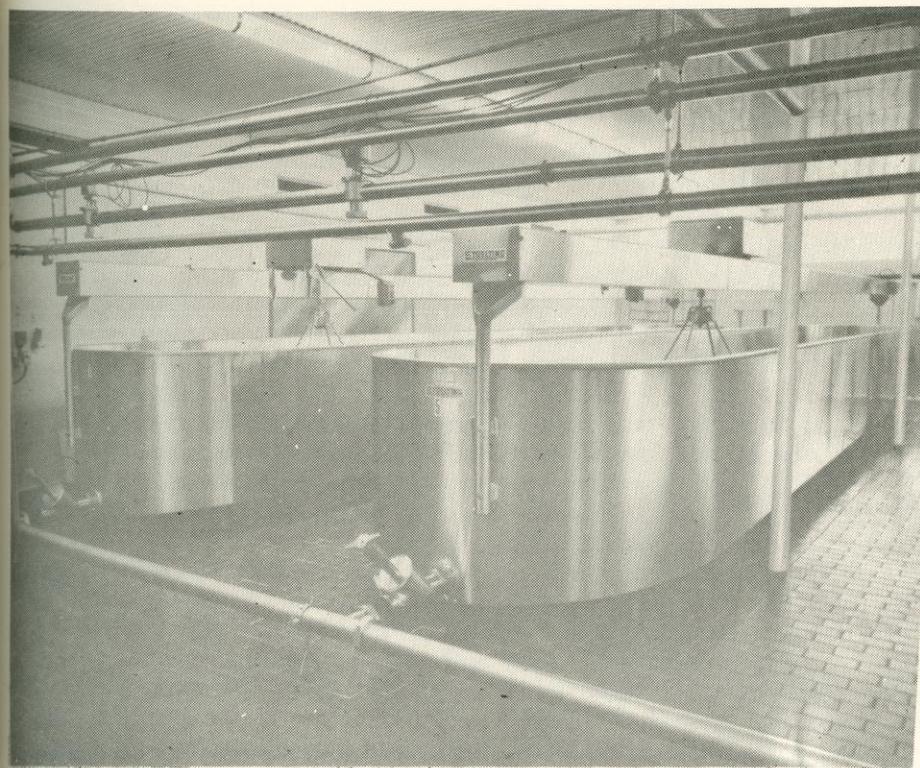
Milk delivered to the Thiel plant comes from about three hundred farms. These farms are in about forty mile radius of the plant. About 75% of the farms deliver Grade A milk. Incidentally, the average production of milk from farms delivering Grade A milk is about 1100 pounds per day. Those delivering Grade B milk deliver about 700 pounds of milk per day.

One of the problems of a dairy plant operator is to maintain an even flow of milk throughout the year. Cheesemaking is no longer a seasonal operation as it once was. (In the early days cheese factories were closed completely during the winter months because cows produced milk only during the seasons when they could be on pasture.) A dairy plant operator such as the Thiel's have, of course, could not survive with such a way of operation. The plant is equipped to handle up to three quarters of a million pounds of milk a day, and it is necessary that this figure be maintained throughout the year.

The modern dairy produc-

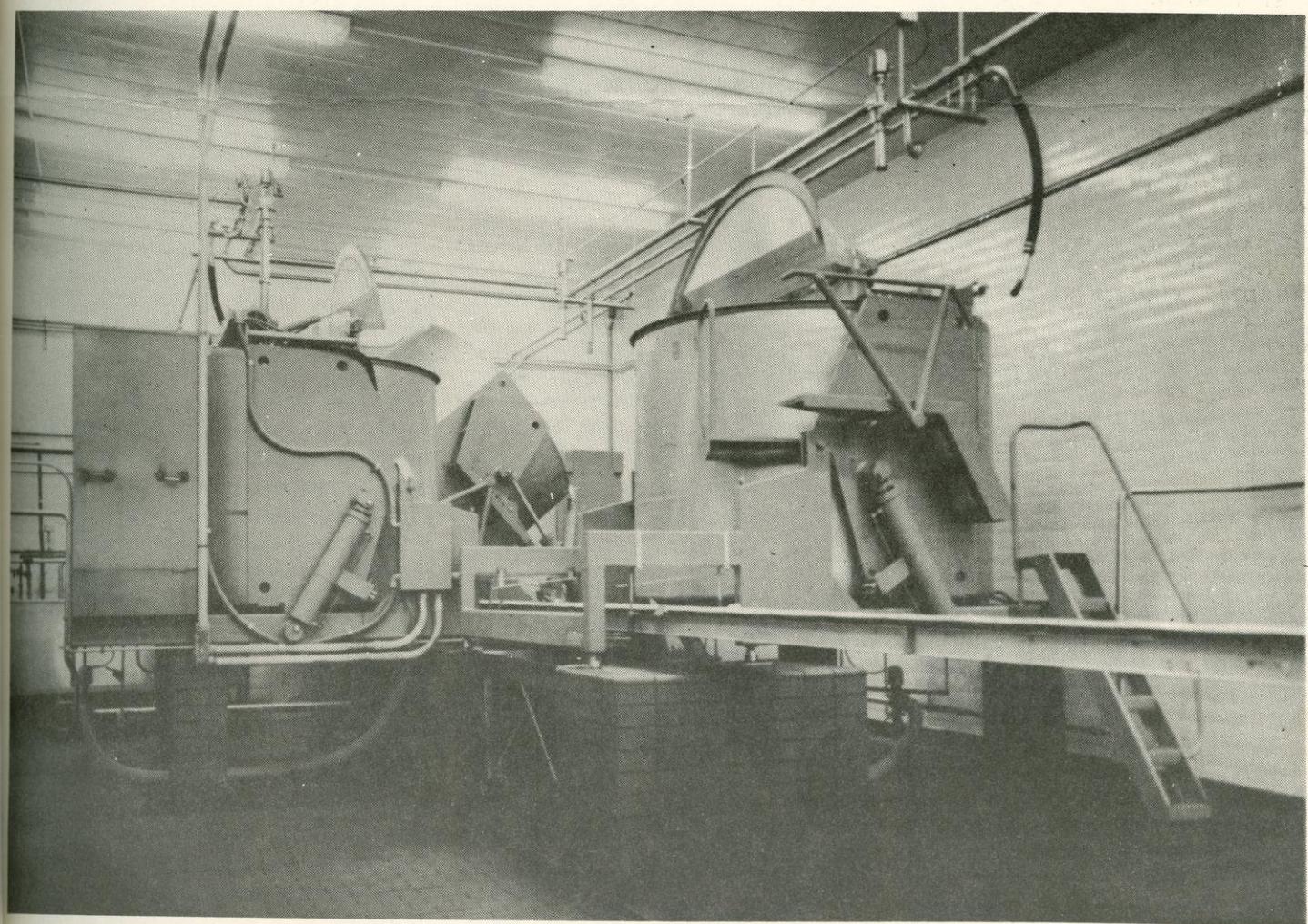
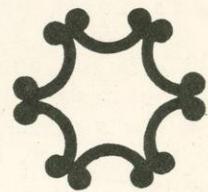


A REFRIGERATED MILK TRUCK USED TO DELIVER MILK FROM FARM TO THIEL BROTHERS FACTORY AT SHERWOOD.



TWO STAINLESS STEEL VATS IN THE THIEL BROS.
PLANT AT SHERWOOD. (30,000 pounds milk)

manufacturing plant makes use of various by-products of milk. Whey is a by-product of the cheese making process. This is run through a separator and any butterfat remaining after the cheese making process is completed is removed. This is made into butter. The protein in whey is removed and this is made into lactose sugar, a product that is used in certain food processing plants.



ONE OF THREE STOELTING AUTOMATIC "CHEESEMAKERS" IN THIEL PLANT, SHERWOOD

THE MAKING OF A FARM WAGON — in the shop of the Village Blacksmith

by EDWARD EHLERT

The first occupational monograph published by the Manitowoc County Historical Society was entitled "A Bit About Branch." It related to an interview with Joe Carbon, a blacksmith at Branch for many years.

Mr. Carbon's father began to operate a blacksmith shop in Branch in 1887. His son, Joe, began his apprenticeship in another shop; however, in a few years he joined his father in the shop at Branch. Upon the retirement of the senior Carbon, Joe took over the business, and continued to serve that community in its blacksmithing needs until about 1966.

In the monograph about blacksmithing only incidental mention was made of one of the most ingenuous and skillful of the crafts undertaken by blacksmiths: the making of farm wagons. In this issue we would like to supplement the account of early blacksmithing with a brief treatise on the making of a farm wagon.

Wagons built in Wisconsin in the 1890's were not essentially different from those made centuries earlier in Europe. The early European craftsmen had learned the best way to construct wagons, and so one generation of craftsmen after the other followed in the practices employed in the construction of this form of transportation.

European immigrants, of course, brought the idea of wagon making to America, with perhaps the greatest change in the American type wagon being the introduction of a one-piece iron tire. The wheels were large for easy rolling on rough ground. Nowadays, of course, farm wagons have rubber-tired wheels which are smaller than the old time wagon wheel. This was a development when wagons were pulled by tractors, and terrain was not nearly as rough as in the earlier days. The height of a pioneer farm wagon was about the distance which a man could lift a heavy object from the ground and place it on the floor of the wagon box.

The working parts of a wagon's running gear are its wheels, the axle on which they turn, and the axletrees that connect the axles. A long pole, called the perch (sometimes also a "reach") positions the front and rear axles. The rear axles are positioned rigidly. The front axle is secured by a "king bolt" which passes vertically through the perch and front axle, thus making it possible for the front truck to swivel freely when corners are to be turned.

Set across the axles and the perch above the rear axle and firmly ironed to them is a timber called the bolster. There is also a bolster at the front. Since the front wheels were smaller than the rear wheels, an additional timber was placed above this bolster, in order to keep the wagon box level.

Wagon wheels were very hard to construct. Only a master craftsman could do it, and he needed a blacksmith to help him with certain parts of the operation. Most old time blacksmith shops were operated by two or more men. One of the men was skilled in wood working, and the other did the blacksmithing. Until the time came to fit the iron tire on the wagon wheel, the work of constructing the wheel was done by the man skilled in woodworking.

A wagon wheel had a more or less barrel-shaped hub from which a dozen or fourteen spokes radiated to the wooden rim. A hole through the hub was lined with a tapered cast iron tube (the box) which served as a bearing for the axle.

To make a wheel was a work of art, and could be done only by a craftsman who could do very precise and painstaking work. In its construction the craftsman employed many principles of physics which through long experience in his art he had learned were necessary to consider if the wheel was to function properly on the wagon. None of the wheels projected straight out at right angles to the wagon. They had to be "toed in", that is, they bent

forward just a little so that when the wheels were turning the iron surface would not be flat on the road. One of the reasons for this was to reduce the amount of friction resulting as the wheels turned. A wooden wheel isn't flat. Looked at from its edge, its spokes are seen to form a hollow cone with its apex toward the wagon. This counters the side thrust of a load when the vehicle tilts. The spokes below the hub carry the weight of the load. As each one reaches bottom, it has to stand vertical to endure the stress, and to make that possible, the bent-down axle tilts the top of the dished wheel slightly outward.

To make the hub of a wheel, the wheelwright had to cut evenly spaced mortises around it. At the end of the spoke was a tenon joint which had to fit perfectly into the mortised joint of the hub. In the making of these mortised and tenon joints the wheelwright had to exercise the most precise and careful workmanship. Each joint had to fit tightly, and the angles had to be exact in order to insure the proper amount of "toeing-in" of the wheel. The spoke was driven into the hub with a maul. While this sounds like a simple operation, it really involved skill of the highest order.

At the end of the spoke a curved section of wood known as a felly was placed. There were seven sections of fellies to a wheel, with each section doweled into the next one. These fellies were not bent into shape. A thick wood pattern was used to mark their curves on the side of a block of oak and they were then hewn to shape with an axe or some similar tool. The wheelwright mortised each felly to receive the tongues of two spokes. He did not shape the tongue until after he had driven the spokes into the hub so that they would not be damaged by the maul. When the work on the fellies was completed, the whole surface was smoothed and made ready for the iron tire which would be put over the fellies.

In order to cut an iron strip the right length for the tire, the smith measured the wooden rim with a tool called a "traveller." It was nothing more than a six inch wheel mounted in a handled fork. A line was marked on the wheel, and then he "trundled" it carefully around

the wheel, noting the number of turns of the wheel, and chalking any fraction of a turn of the traveller at the end. One could have gotten the same measurement by putting a string around the wheel, and measuring its length. However, this would not have been precise enough for string stretches, and so the precise measurement that was required would be lacking. When the exact measurement of the wheel was known, the iron for the wheel was cut.

The work of bending the iron was then begun. In this process three men were required, and when the final bending was completed, the two ends had to be welded together. At this point the traveller was used again, and if the measurement was off by as little as a quarter of an inch, the whole job had to be done over again. The iron tire in reality had to be a little smaller than the wheel on which it was to be fitted, otherwise it would not remain on the wheel. To expand it, the iron tire had to be heated. The smith built a fire on the ground and placed the tire in it. It took about a half hour to get the iron to a dull red color. At the appointed time when the iron was to be put on the wooden wheel, rapid and precise movements were required. Each of the three men had to do his part of the work at an exact moment and had to work rapidly and very skillfully. As hot iron came into contact with dry wood, there was smoke and sometimes fire. There were sprinkling cans of water near by, and these were then used to douse the fire. But this could not be done until the iron tire had been fitted perfectly on the wheel. The "ironing" of the wheel wasn't finished until the smith had shrunk four iron bands on the hub; the two narrow ones were placed on the largest diameter against the bases of the spokes; a wider one of somewhat smaller diameter on the inner side, and a still wider and a smaller one on the outside. The last one had a slot on its outer edge, matched to a slot in the wood to allow the removal of a pin that kept the wheel on its axle. This pin was later replaced with a large nut which was screwed on the end of an iron axle.

There were smaller wagons in use on the farm, such as buggies and

surreys. The construction of these was the same as for a farm wagon; however, it was a much lighter type of construction. Instead of a four or five inch tire, the buggy or surrey had a tire only an inch or two in width. While the basic construction was the same, and while a light-weight kind of construction was involved, the same skilled workmanship was involved in these vehicles, too.

The front wheels were placed on axles which were constructed very similar to that of the rear axles and wheels. However, over the front axle was a bolster through which a swivel pin was inserted, and which permitted the front wheels to turn in any direction in a kind of arc. The rear wheels had no such movement. They were bolted to the body of the wagon.

The perch, or reach, which connected the two sets of axles could be extended, if necessary. A wagon box was often placed on the bolsters so that produce, etc., could be hauled. Or "dump planks" might have been put over the bolsters with planks on either side to serve the same purpose as a box. The wagon box, and dump planks were of a fixed length, so the perch had to be fitted in such a way to accommodate the box so that it would extend a couple of feet beyond the front and rear bolster. Hay racks were usually a bit longer, so the perch then had to be extended to a greater length so that the distance between the bolsters would be greater.

Attached to the front axle was the wagon tongue to which a team of horses was hitched. There were two pieces of wood called "hounds" which extended from the wagon tongue at angles to a point where they ended about two feet beyond the front axle. The hound was attached with bolts to the timber across the front axle. This arrangement fitted the wagon securely to the tongue, and permitted beasts of burden like oxen and horses to pull heavy loads. A whiffle tree was attached to the tongue, with a "king pin" inserted to keep it securely attached to the tongue. The "king pin" in later years was also used as a wrench with which the wheel nut could be removed from the axle.

Axles required lubrication from time to time. The pioneers did not

have access to lubricants as we know them. They concocted their own lubricants, a mixture of tallow and pine tar being a common formula.

Blacksmiths also engaged in the manufacture of sleds and cutters. Although very often farmers made their own wagon boxes, the time came when the blacksmith made these, too.

The craftsmen of the pioneer days made many of their own tools. These were made to take care of the requirements of a particular operation, and were made with the same painstaking care that their larger productions were given. As one looks at these tools, one can see in them the ingenuity that these pioneer craftsmen had. One would have only great admiration for their skill and craftsmanship.

The wagon builder in blacksmith shops in the late 19th century and years following felt the impact of the machine age. In such details as turning hubs and spokes and sawing out part of the connecting gear, mechanical power and power tools offered a real advantage. There was a considerable transition in the source of power. Power furnished by windmill "horse power", the gasoline engine, and later the electric motor, was the transition.

The wheelwright of this century was able to purchase factory-made hubs, spokes and fellies. He needed only to make in his own shop the straight pieces. However, in due time mass production methods prevailed, and the art of wagon making passed from the small shop to the large factory.

The modern day farm wagon, of course, has iron wheels and rubber tires, and with the sole exception of the wagon tongue or pole, there is no single bit of timber in its make-up. This change represents an almost incredible evolution. It made for the demise of the old time wheelwright and his partner and helper, the blacksmith.

When the pioneer craftsmen took up residence in our area, they were compelled to make many sacrifices. They deprived themselves of much, but in their writings one sees little of murmuring and complaint. Instead one reads much of the hope that they had for a better tomorrow. Many of them did not live to see the realization of their

dreams and hopes. However, their children have seen this better day. Thus, history usually characterizes the age in which we live as one having the highest standard of living of people in any age of history. Would that those who spent themselves in the realization of this hope, could share the blessings with us.

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