

THE MILK INDUSTRY.

The rural industries which have their bases in milk, although necessarily few, are very important. In portions of the country where the land is fertile but untillable, farmers own large herds of cows which roam the hills and dales, and which constitute the chief source of revenue. This state of things exists in some portions of almost every State, and it is interesting to note the improvements in dairies and dairy products. The farmers, instead of setting the milk to allow the cream to rise, carry the milk from one to four miles to a creamery, where they sell it for so much a pound.

The first of our engravings shows the exterior of one of these establishments, the other the interior. The farmers, in a long train, stand waiting to dispose of the milk and to receive the skimmed milk. The illustration shows a farmer receiving his proportion of the skimmed milk from the tank on the roof—after having emptied his cans into the weighing tank in the doorway. The cans are lifted by the attendant of the creamery by means of a small crane, and while in an elevated

position their contents are poured into the weighing tank.

Within the building, as shown in the second engraving, is placed a large tank not unlike a huge bath tub. Into this tank the milk is allowed to flow after it has been weighed. At the side of the tank is located a double steam pump which pumps the milk from the tank into a small reservoir raised four or five feet from the floor. At the side of the milk tank and near the reservoir is placed the separator, a very interesting piece of mechanism, which separates the cream from the milk and also removes the impurities. The separated milk flows into a tub from which it is pumped to the tank on the roof, while the cream flows through another discharge spout into the cream can. The machine is unerring in its operation, throwing off one-tenth of the volume of the milk as pure cream and nine-tenths as skimmed milk. To maintain a constant supply to the separator, the small reservoir receives a surplus of milk which flows back into the large tank. The bowl of the separator which receives the milk is mounted on a vertical shaft, to the lower end of which is directly connected a steam turbine. This turbine makes 6,500 revolutions per minute. At this enormous speed the cream is rapidly and completely separated from the milk by centrifugal force, the milk going to the outside of the bowl, the cream being discharged from the inner portion of the bowl. This machine is capable of separating 3,000 pounds of milk per hour.

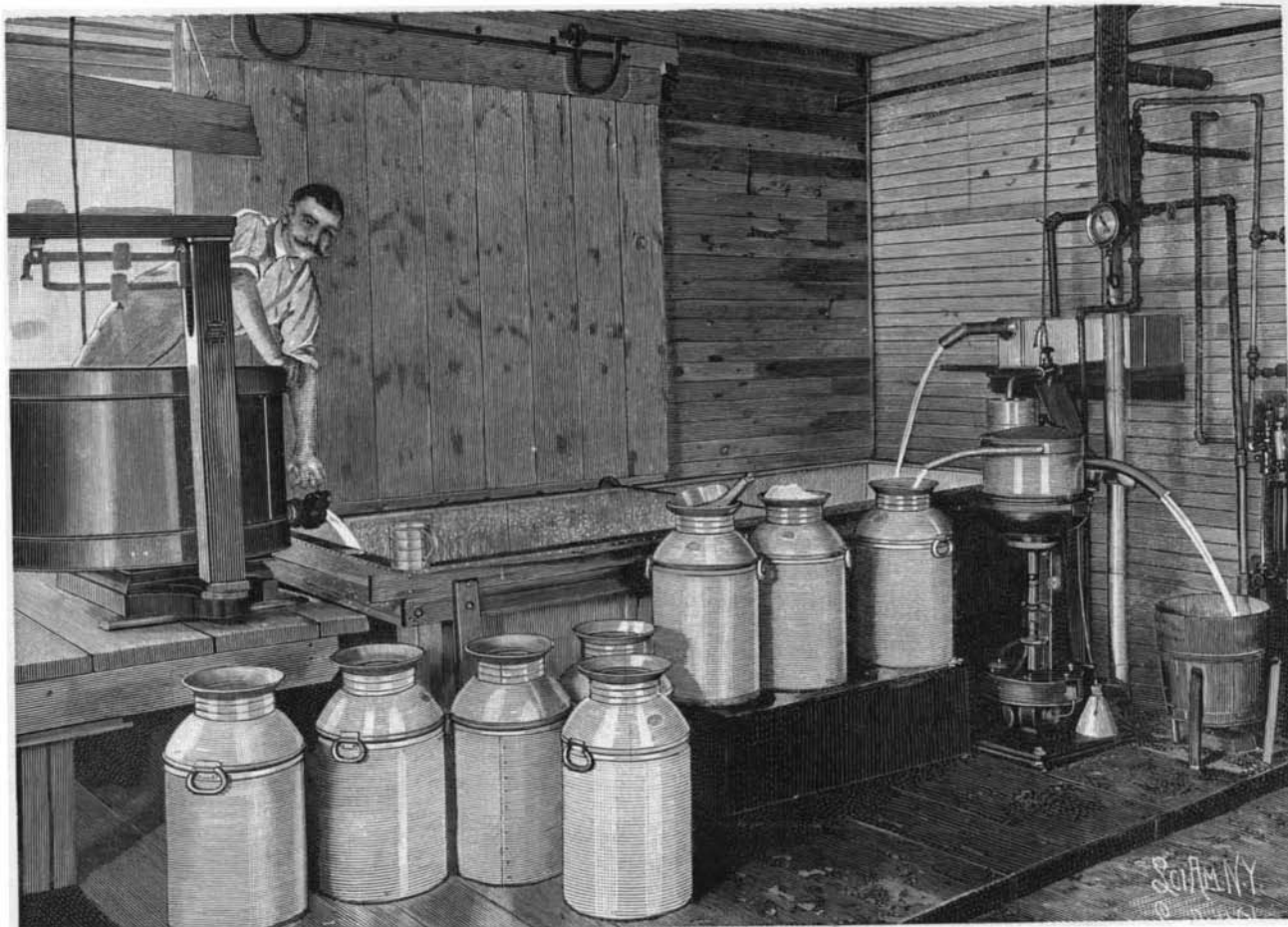
The milk is brought to the creamery between the hours of 4 and 8 or 9 in the morning, and after the day's work is done the machine is taken apart and all the pieces, including 42 cones contained in the bowl, are thoroughly scalded and cleaned. The cream is taken to a dairy and converted into fine butter. In the case here illustrated the creamery is one of four which sup-

The Czar's Imperial Train.

The imperial train of the Czar of Russia is one of the finest specimens of car building which Europe has ever been treated to the sight of. It was begun in 1892 at the Alexandrofsky works, which are located near St. Petersburg, and was completed in 1894. As the gage of Russian railways is different from that in other countries of the Continent, special trucks were built to admit of being used on railways outside of Russia, the change being quickly effected. The train has been used considerably since it was built, and this last journey of the Czar is probably the longest trip in which they have taken part. In Russia a train identical with this as to the exterior is used. The two trains are changed at various points on the road, so that it is impossible to tell in which train the sovereign travels. This is rendered necessary by the danger from Nihilists. The train is composed of eleven cars, and is 990 feet long, the largest car being reserved for the dining room and the saloon, which is beautifully decorated with rich brocade and contains a religious picture. The dining room is somewhat simpler, but the whole train

is an example of the most rigorous attention to the smallest details. The service of the train is in the hands of twenty-six persons, under the charge of the chamberlain of the Czar. Special attendants are employed to care for the Czar's train. Compartments for sleeping are provided, so that the entire force can rest at some period of the day if long journeys are to be made. The car body is high above the rails, so that steps are let down when stops are made. The entire train is lighted by electricity generated by a special plant on one of the cars, the capacity of the system being two hundred lamps. The boiler to supply the lighting engines is in the same car and also serves to heat the train. Each car of the imperial service has also its own heating system. The cooking arrangements are perfect, a spacious galley being provided. Most of the cars are corridor cars, so that it is impossible from the outside to tell where the Czar is at any one time. In case of a breakdown, a small shop stocked with tools is provided.

ACCORDING to researches on tungsten, by M. H. Moissan, the pure metal is readily obtained by the reduction of tungstic acid with carbon in the electric furnace. With a large excess of carbon the carbide CW_2 is formed, which, in the fused state, readily dissolves more carbon, graphite crystallizing out on cooling. Pure tungsten can be readily filed and forged, it welds easily, has no action upon a magnetic needle, and has a melting point higher than chromium and molybdenum.

**BRINGING MILK TO THE CREAMERY.****INTERIOR OF CREAMERY.**

ply the dairy. The creameries are so located as to accommodate the greatest number of farmers. The skimmed milk is taken away by the farmers and used for feeding calves and hogs. The creamery naturally does the greatest amount of work during the summer months. The amount of butter made in the summer months from the cream furnished by four such creameries is as follows: May, 50,751 pounds; June, 62,661

pounds; July, 55,254 pounds; August, 58,660 pounds; September, 54,840 pounds.

The creamery which we illustrate is located at Middletown Springs, Vt.

MARSEILLES has just finished its drainage system on the model of that of Paris, at a cost of \$4,600,000.