

water. In this section also was located the boiler of 35 horse power and the engine 15 H. P.; the boiler being separated from the butter and cheese room by a partition. Another portion of this section contained the apparatus and machinery for the manufacture of cheese. On the second floor was the office, the curing room, and a large room in which boxes were to be made up.

The weigh-can occupies a platform 9 feet from the ground-floor. From this can the milk is drawn into 5 vats standing 4 feet lower than the scales. These vats are each divided into two longitudinal compartments. The 5 vats are each about 16 feet long by 5 feet in width, the compartments being of the same length by 2 feet in width and 20 inches deep. These compartments contain the milk, while the space around them is occupied by ice and water. A few feet from these vats, in the corner of the ice-house, a large tank supplies them with water. There are the vats in which the cream is raised, and from which the milk is drawn into two large circular vats, 5 feet lower, where it is manufactured into cheese.

The cream is not skimmed, but the milk is drawn from under it, and it is left in the bottom, from whence it is conducted into a tempering vat, also 5 feet lower. Immediately below the vats we have just described are 4 pools, each 2 feet deep, about 16 feet long, and 5 feet wide, built in the floor like tannery vats. Each of these pools will contain about 100 cans. In warm weather, these pools are used for raising cream, the milk being drawn into cans made for the purpose, holding, each, about 30 lbs; the cans are placed in the pools and surrounded by water.

The tempering vat is about the size of an ordinary cheese vat, and is supplied with both heating and cooling appliances. If the temperature of the cream is too high, it is reduced, and if too low, it is raised; from 58° F. to 64° F. being the proper points, according to the season.

From this vat the cream is removed to the churn. The churn consists of a oblong ox, about 15 feet long and 3 feet square, with bearings, at each end, and is turned at the rate of 45 revolutions per minute. I remarked to the butter maker that I thought this motion too rapid, its tendency being to create heat; he however informed me that this was the motion he required, but he gave no reasons, and I still hold to the opinion I expressed on that occasion. From 30 to 50 minutes, I was, told was the time occupied at a churning.

When churned, the butter was in a granular form of the size of wheat. The butter milk was then drawn, and its place supplied with water, in which the butter was washed. It was then removed from the churn to the power butter-washer, which consists of a table with an incline surface, over which two fluted conical rollers revolve, the one following the other. The butter was placed upon this worker, where it was drained, salted, and worked, and from which it was removed to trays upon which it was allowed to remain until the following morning. It was then reworked, packed in Welsh tubs, and sent to the refrigerator.

#### CHEESE DEPARTMENT.

Having now given a brief and very imperfect description of the butter department of this establishment, we ask the reader's patience while we attempt to follow the milk, from which, as we have seen, the cream has already been removed, through the various operations by which it is converted into cheese.

If the reader will picture in his mind two immense wash-tubs, about 12 feet in diameter by about 20 inches in depth, constructed of staves and hoops, and resting upon blocks of sufficient thickness to raise them to a convenient height, he will have formed a pretty good idea of the appearance of the vats used at this factory.

If he will then go a step further, and conceive of these tubs as lined with tin, a space being left between the tub and its lining of about 2½ inches for the circulation of steam or water, he will have a still better idea of them.

In the centre of each of these vats arises a conical shaped hollow turret, about 12 inches in diameter, and as high as the top of the vat, in the centre of which there is a perpendicular shaft, connected by gearing with a horizontal shaft under the vat. This shaft supplies the motion to a roller, one end of which rests in a wheel, which rolls around upon the edge of the vat. This roller is supplied with 180 spokes or paddles of sufficient length to reach nearly to the bottom of the vat. These paddles are arranged in rows winding about the roller like the thread of a screw. The roller has two motions, one in which its outer end traverses the whole circumference of the vat, and another in which it revolves.

The purpose of this roller is that of agitating the milk in the vat while heating; distributing the rennet, and stirring the curd after it is cut, operations which it performs very perfectly.

After the rennet is sufficiently mixed, and before coagulation begins, this roller is removed, and another put in its place, upon which curd knives are adjusted.

These knives are so arranged on the roller, that with each revolution round the vat a space of about 15 inches is cut perpendicular, until the whole surface is completed. It is then cut by hand in a direction radiating from the centre all round. The third cutting is performed by the roller horizontal, by means of knives adjusted properly for that purpose.

The process of cutting completed, the second roller is removed, and the first restored to its place, which proceeds with the business of stirring.

From the moment when the process of cutting ends and that of stirring begins, this agitator performs the whole operation, including the salting of the curd and preparing the same for the press, in a neat and very satisfactory manner.

The vats are so arranged that one side may be lowered, thus allowing the whey to pass off through a faucet in the bottom; the inclined position of the vat not disturbing in the least the working of the agitator.

The capacity of these vats is 14000 lbs; 12000 or 13000 lbs each being the amount usually worked in them.

They are the invention of Mr T. B. Wire, of Geneva, Ohio; and in my estimation are superior to any self agitating vat in use. Their superiority consists in the very effectual manner in which they stir the curd during the process of heating, airing, and salting.

From the description we have given, any intelligent cheese maker will be able to see that the very large quantity of milk we have named is worked with a comparing small outlay of named labour; no other vat of which we have any knowledge doing the business of stirring the curd unassisted.

It will be seen that all the cheese manufactured at this establishment are skims; the milk being allowed to set about 20 hours and each 100 lbs furnishing the butter department with cream for about 3½ lbs of butter.

In some particulars, the method used in the manufacture of milk of this character into cheese differs from that employed upon whole milk.

First; More rennet should be used. The reason for this being that it is desirable to have cheese of this character go into consumption as soon as possible, and the process of curing is promoted by a liberal use of rennet.

Second; That the cheese may be soft in texture, less heat is required than with whole milk, 82° being the point at which they added the rennet at this factory, scalding being accomplished at from 92° to 94°.

Third; Unlike the whole milk method, no delay is neces-