screen is mixed like concrete in a concrete mixer. A large quantity of fine dust is taken up by the wind, and sometimes spoils neighboring properties. To avoid this loss, a light framework is put over the bin, covered with cotton or linen.

It is economical to build a large platform close to the crusher, so as to enable wagons to haul the stone up to the level of the opening of the crusher. This reduces the cost of handling.

Sprinkler .- The sprinkler is used for distributing the Water necessary for cementing the stones during the last operation of the construction of water-bound macadam. There is a pump attached to the sprinkler, but as this method of filling takes considerable time, it is preferable to use an auxiliary gasoline engine with pump and tank.

The tank is placed on a solid frame 6 or 7 feet high, near the part of the road that is under construction, and it feeds through a 3-inch pipe and valve. By this system the sprinkler is filled in a few minutes, there is always enough water on the road to do good work, and the roller is never behind.

A plant which is not so organized as to have plenty of water at all times, does poor and expensive work. If there is plenty of water and it is close to the machines, it Would be cheaper to take the pump off the sprinkler and Put it on the boiler, and it will then only be necessary to have a tank.

We have adopted a new arrangement for that part of the sprinkler which distributes the water. The old arrangement was too heavy and subject to frequent breakage, the cost of repairs each time being high. The new arrangement is much lighter, costs less and does not break. Iron wheels are replaced by wooden wheels, which are much preferable. The gear of the front wheels is arranged in such manner that it can turn completely under the sprinkler tank. In this way the sprinkler can turn in a very limited space without destroying the macadam macadam.

Grader and Drag.—With each plant there is a road grader which is drawn by horses; but it is used cheaply and advantageously when attached to the steam roller. In rural municipalities it is hard to find teams to give continuous time to this kind of work. With this machine, the road can be put in form, the roadbed made, the shoulders levelled, and, in some places, the ditches cleaned, much cheaper and quicker than with a shovel or an ordinary ordinary plough, and the work is done much better. It is necessary to have had experience to be able to use this machine to have had experience to be able to use the back in the back is a good machine, and we therefore recommend choosing a good man and always taking the same man, so as to give him more experience. The department gives to municipalities instructions as to how to make earth roads with the stade. gr_{ader} , and illustrations showing how to use the split-log dr_{ao} dr_{ag} , and illustrations showing how to use the put in f_{0rm} , which should be used after the road has been put in

form with the grader. During the construction of the Levis-Jackman road, a split-log drag was used to spread the gravel dumped $f_{r_{OD}}$ the road which was from the wagons, and to keep in form the road which was being rolled. It was also used to advantage in the main-tenance. $\frac{4}{100}$ to 5 miles in length. A sectionman was appointed to $\frac{1}{100}$ after each section. When the department deemed it advisable advisable, after a storm especially, it gave instructions to the special the special the split-log drag the sectionman by telephone, to pass the split-log drag over the section of which he was in charge. manner the drag was passed over the whole road on the same day. The superintendent would go over the road in an autom. an automobile, seeing that every one was on the job, etc.

The instructions given by the department to the sectionmen were to pass first on the side, close to the ditch, to level the shoulder, and on the second turn to pass the drag towards the centre, so as to bring the loose gravel on the road towards the centre. This makes the surface of the road very even, fills in small ruts and holes, and facilitates drainage in rainy weather. The ruts made by the wheels and the tracks made by the horses are scraped off, so that the teams do not always pass in the same place. Thus the wear of the road is more evenly divided.

Generally a gravel road, well-rolled and cemented, is so hard that it is impossible for the drag to give it a crown when it has been broken up. In that case, the grader must be used early in the spring; that is, as the earth begins to thaw, and before it hardens. Despite the rolling, certain qualities of gravel take a long time to bind. In this case, the use of the drag is necessary, so as to keep the crown of the road until it is completely cemented. The sectionman must carry a shovel, and if he discovers a rut or a hole which the drag cannot fill, he can use his shovel to fill it. During the years 1914 and 1915, split-log drags were used for the maintenance of the Levis-Jackman road. One man, with two horses weighing 1,300 lbs. each, can scrape in one day a section $4\frac{1}{2}$ to 5 miles long.

The department has distributed to municipalities an illustrated circular showing how to use the split-log drag. On the road leading to Valcartier, at the request of

the Federal Government late in 1914, the department took charge of the maintenance over a length of nearly 5 miles. The soil was sandy and of the hardest variety for an earth road. After having put the road in form with the grader, it was kept in good order by using the split-log drag, although there was a heavy traffic of automobiles, trucks and other vehicles. All the heavy artillery passed over this road. I passed a few minutes after some of the big guns. The heavy loads were pulled at a gallop, yet the road was not in very bad condition ; there were at the most five or six ruts. Generally it is thought that when the drag has gone over the road once, that it has been repaired for the whole season. This is a serious error, because, in order to obtain the best results, the drag must be used often, especially when the weather conditions are most favorable; that is, after a rain, not when the earth is all wet and muddy, but just as it begins to dry and before it becomes hard.

Experience teaches us that an earth road maintained by a split-log drag will not reach its maximum of perfection until after three years. The split-log drag was first used in 1853.

Pick Plow .- The plant has also a pick plow, which is used to tear up old macadam or to break up the ground.

In a paper entitled "Top Contact Unprotected Conductor Rail for 600-volt Traction Systems," Mr. Charles H. Jones says: The conductivity of the rail will vary inversely with the percentage of carbon or manganese allowed to remain in it. percentage of carbon of manganese anowed to remain in it. The ordinary run of Bessemer rail has a conductivity of about one-tenth that of copper, while a rail with a low per-centage of carbon has a conductivity one-eighth that of copper representing an increase of about 25 per cent. in con-The price increases from 18 per cent. to 20 per Increasing the conductivity makes the rail considerductivity. ably softer, thus requiring more careful handling to prevent ably solicit, thus requiring instellation. There is no appreit from being kniked annug installation. There is no appre-ciable difference in the rate of wear between the low carbon clable difference in the class of service referred to in this and ordinary steel in the class of service referred to in this paper. Nothing is to be gained by using a rail weighing less paper. Nothing is to be gained by using a fail weighing less than 80 lb. Above 80 lb. the question requires careful con-sideration, since the gain in conductivity will cost almost as much as equivalent conductivity obtained by adding to the much as feeding system paralleling the rol copper in the feeding system paralleling the rail.