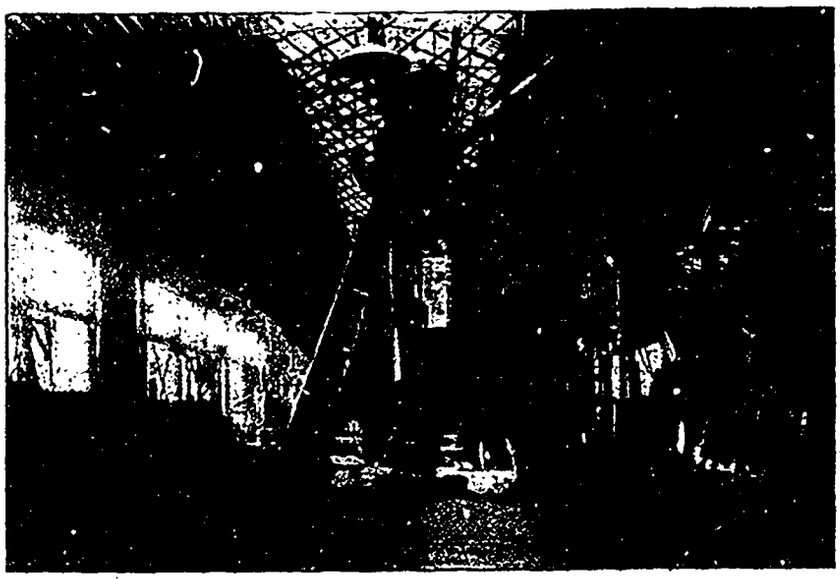
hands, and the cost of maintaining the rolling stock—exclusive of engines—is $2,100,000 a year.

The locomotive shops of the London and North-Western are at Crewe, and to the mechanical mind this is the centre of attraction of the system. It is marvellous to think of a town of this size being solely the creation of a railway company, and fulfilling the needs of only one department of it at that. On the 4th July, 1837 (the year the Queen came to the throne), the first train passed through Crewe, then a hamlet of 148 souls;



EIGHT-TON STEAM HAMMER, CREWE WORKS.

now it is what Canadians would call a "city" of over 30,000, the whole population depending on or working in the shops of this railway. In 1843 the shops occupied less than three acres of ground, and employed 161 hands; now they cover over 120 acres and employ over 7,000. The town has a Mechanics' Institute, built and maintained by the company, and connected with it is a Science and Art School, whose students have won more Whitworth scholarships than any other place in England. It has a volunteer engineer corps, 600 strong, composed entirely of men in the works. The shops have their own fire brigade, and similar organizations, all very efficiently maintained. The parliamentary division is now named after the town, which contains more than half the electorate.*

The first locomotive superintendent at Crewe was F. Trevithick, son of the great Trevithick, who, in 1805, brought out his wonderful "steam coach" and exhibited it on the very site now occupied by Euston station, the London and North-Western's London headquarters. In Trevithick's time the company had only 75 engines in stock.

At the Crewe shops, which now employ over 7,000 men, the company makes its own steel, has seven furnaces for steel of the Siemens-Martin process. The London and North-Western is the only English company that rolls its own rails, and a view of one of the rail mills is shown in one of the illustrations. The plant has a capacity of 45,000 tons of rail per year, and actually produces about 30,000 tons. The mill is driven by a 700 h.p. Corliss engine. An ingot of steel 3 feet long and 10½ inches square is taken out of the furnace and fed to the jaws of the swiftly revolving rollers of the mill. The ingot in passing to and fro in these grooves becomes longer and thinner with each squeeze; and finally, when it is formed into rail shape in the last pair of rollers, it is carried on smaller rollers to a circular saw, where the ends are cut off as easily as a scantling of wood is sawn off in a lumber mill, and we behold a finished rail 30 feet long and weighing 90 lbs. to the yard, the whole process of making the rail occupying only a minute. "Within the works," writes W. J. Gordon in an article on this town in *Pearson's Magazine*, "there are five miles and more of the pigmy track of 18-inch gauge which covers the floor of its shops like a spider's web, on which run the miniature engines that once replaced the horses on the Shropshire Union Canal. Anything in the metal way used in railway practice you can get at Crewe from start to finish. You can see the steel made in the converters with all their roaring pyrotechny, and you can follow it from point to point, until it moves off by itself on the rails (made from the same converter), and flies north or south on its trial trip at 50, 60, 70, aye, 80 miles an hour." To build an engine in the ordinary way takes four weeks, but one engine was built here in the space of 25½ hours. The process of erecting an English engine is as follows: The different parts, such as boilers, frame plates, cylinders, axles, etc., being previously made in their respective shops, are brought here to the erecting shops, where first the frame plates are fixed by temporary cross-bars into the place they will occupy when the engine is complete. The cylinders and foot plate are then fixed in position, and when the skeleton is complete the boiler is

BOILER SHOP, CREWE WORKS.

lifted on by a crane. Then the cylinders are fitted in, and the wheels (which are usually of cast steel, and to which the axles have already been fitted) are then run under and the frame lowered down on them. The

*For a fuller description of Crewe and its shops see article in *English Illustrated Magazine*, Feb., 1892, by C. J. B. Cooke.