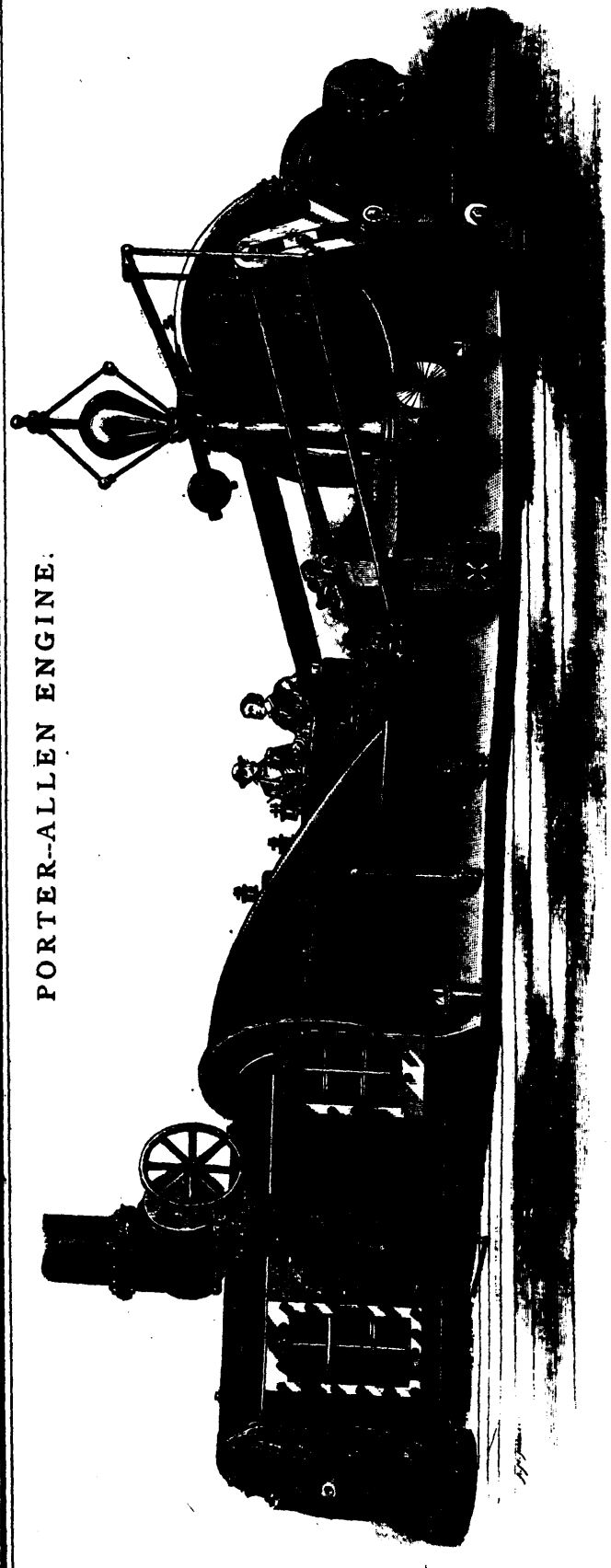

PORTER-ALLEN ENGINE.

PORTER-ALLEN ENGINE.

The engraving of the Porter-Allen Engine, represents the one built for the Lackawanna Iron and Coal Company, who have kept it in constant use for about a year in one of their mills at Scranton, Pa., where it is driving, through direct connection—that is to say, without intermediate gearing of any kind—a "three high" train of 36 inch rolls for rolling steel ingots blooms.

As can be seen from the engraving, this engine is massive, and admirably calculated to withstand the enormous strains it is subjected to, which are occasioned by the shocks which the peculiar kind of work required of it gives rise to.

The engine has a cylinder with a bore 44 inches diameter, and a stroke of 5½ feet. It was started at 45 revolutions per minute, but is of suitable proportions to work well at 70 revolutions, at which speed, and with 80 pounds' steam pressure, the engine will develop over 2,000 horse-power. At present however, it is worked up to little more than half the power it is capable of developing.

The following extract from a letter from Mr. W. F. Mattes, chief engineer of the Lackawanna Iron Company, gives particulars respecting this engine's performance and the capacity of the train it is attached to, which are interesting:

"The steel ingots rolled, when intended for 60 pound rails, are 12½ inches square at top by 14½ inches square at bottom, by 6 feet long, and are reduced to blooms 7 inches square in 12 passes. We have never blown sufficient steel to discover the ultimate capacity of the train, but it probably would be reached in the neighborhood of 5,000 tons per week. With 65 pounds boiler pressure the engine develops ample power, and the regulation under the abrupt changes from zero to full power is very satisfactory."

Some of the principal proportions of the engine are as follows:

Space occupied—Length, 45 feet; width, 22 feet. Diameter of flywheel, 30 feet; diameter of crank disk, 8 feet; diameter of crank shaft, 25 inches. Greatest width of bed plate, 7½ feet. The nearly flat top of the bed is about 6 feet wide for a considerable part of the length.

The total weight is 140 tons; and the weights of some of the heaviest parts are:

Flywheel, 48 tons; bed plate, 24 tons; cylinder, 14 tons; shaft, 12 tons; crank, 5½ tons; outer pillow block, 7½ tons.—*Ex.*

THE UNITED STATES makes one-fifth of the iron and one-fourth of the steel in the world. Of the gold supply this country furnishes one-half, and of the silver, one-third. The United States represents 36, Great Britain 33, and all other nations, 31 per cent. of the mineral industries of the world.

KEENNESS OF SIGHT.—At a recent meeting of the Society of Arts in London, a paper was read on the subject of aids to the eye-sight. Dwellers in towns, it was remarked, rarely looked at a distant object, and the townman's eyesight is hopelessly inferior to that of the average Scotch forester.

THE Edison Central Station in New York for the distribution of electricity for incandescent lighting has been in continuous operation for two years and a half, with the exception of a stop of about two hours. The use of the lamps is less than two and a half hours per day and the operating expenses 1½ cents per lamp per day. The price charged is on the basis of gas at $2 per thousand, and during the year 1883, the station earned 3 per cent. on the investment.

Dr. Colier, the State geologist of Indiana, has been experimenting on the changes in the scructure of even the best iron. He finds that iron bars and bolts subjected to vibration were "rotten." Inserted in immovable rocks they were found to be fibrous and strong. The examples of these changes are to be sent to the Stevens Institute of Technolgy, where an investigation of this subject has been in progress for several years.