to be as high as 600 pounds, has bearings of the same proportions as the best marine practice in steam engines, and to be of the aforementioned width. After having run this motor over 1,000 miles it was taken apart and carefully examined. Not the slightest sign of wear could be noticed, and it is believed that this motor will last from eight to ten years, with ordinary use and reasonable care. This machine will carry any rider of average weight from 3 to 30 miles an hour and up any ordinary hills, without the use of the feet.

NEW FORM OF ELECTRIC AUTOMOBILE.

This automobile was constructed by Mr. D. L. Davis, superintendent of the Salem Electric Light Company, of Salem, O., who has been engaged in work upon it for the past thirteen months. Its trial trip has been made, and we are told it proved most satisfactory in its workings. In the construction some new ideas have been carried out that are departures from those adopted by the American manufacturers of horseless vehicles. This new auto has a wheel base of 54 inches, and, owing to its different construction from other vehicles, its body is small and lower than customary, and the batteries of 40 cells are below the axle line, thus doing away with the clumsy and top-heavy appearance of many horseless vehicles. The wheels are of steel, with heavy rubber tires inflated. Two springs only are used, one on either side of the body and directly beneath the passengers. This feature proves a success, as the carriage is easy riding. In the application of power is where the auto differs radically from American machines generally. The power is supplied by two one-horse electric motors, which are connected with the front wheels, working independently of each other. The vehicle is also steered by the front wheels, which swing on pins close to the inside of the wheels, carrying the motors back and forth with them, the connection being made with brass contact plates which allow for the swing of the wheels. The frame work is of tubing, which is carried from the body up to the top of front axle, and through this tubing is carried the wiring from the batteries to the motors. The brake is stationary, the wheels being drawn up to the shoe when brake is applied. The reversing lever also applies the brake. The general appearance of the vehicle is handsome, owing to its compact construction. Its weight is about 1,400 pounds.

NEW FORM OF ELECTRIC AUTOMOBILE.

THE MOST POWERFUL LOCOMOTIVE EVER BUILT.

Judging from the accompanying illustration of the latest locomotive to hold the record for size, weight, and power, there is at present no evidence that we have reached the limit of possibilities in these gigantic engines. One would have thought that with a limitation of gage of 4 feet 8½ inches, and of height of 15 to 16 feet, the extreme size had been reached in such engines as were built by the Baldwin Company for the Lehigh Valley road, or by the Brooks Company for the Illinois Central Railroad. Yet a comparison of the principal dimensions of these two engines, and of the big locomotive constructed for the Union Railroad shortly afterwards, with the engine now under discussion, shows that the growth in size and power of the biggest freight locomotives still proceeds apace, as may be judged from the accompanying table.

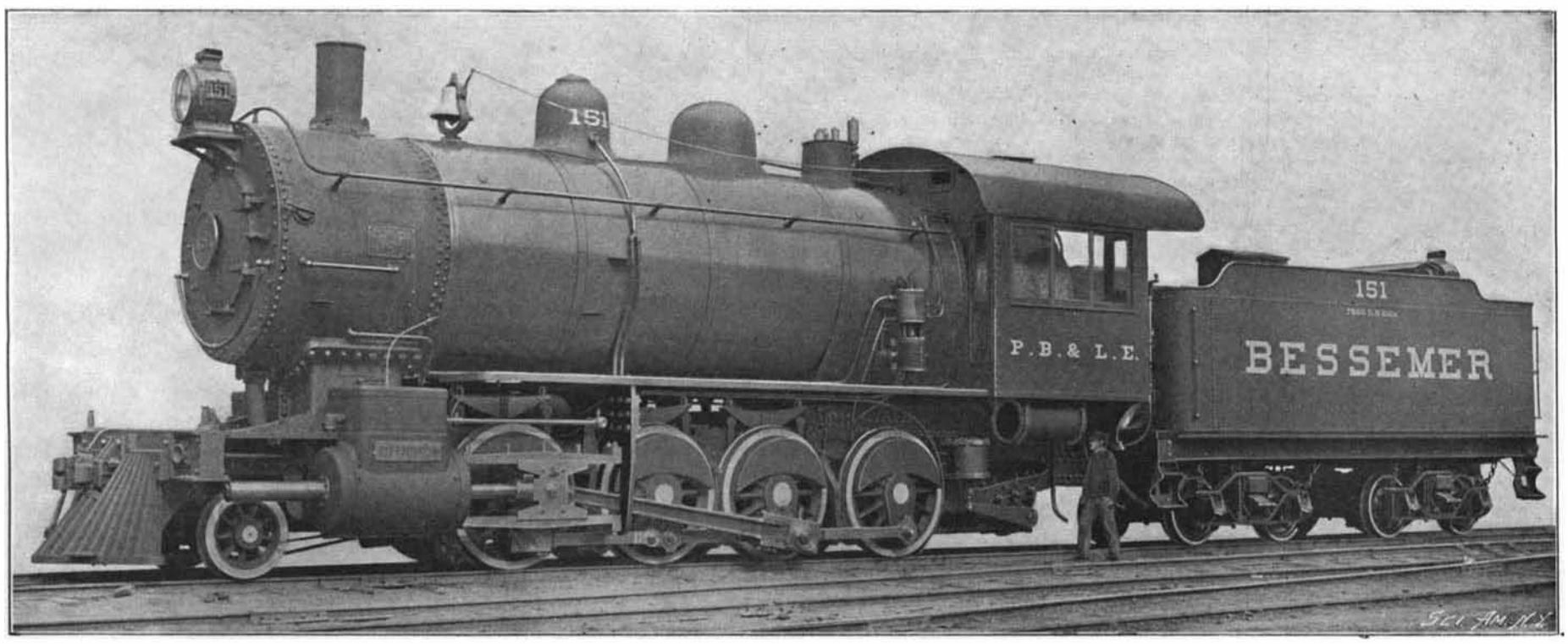
COMPARISON OF RECENT POWERFUL LOCOMOTIVES.

Railroad.....	P. B. & L. E.	Union Railroad	Illinois Central	Lehigh Valley
Builders.....	Pittsburg	Pittsburg	Brooks	Baldwin
Size of cylinders...	24 x 32 in.	23 x 32 in.	23 x 30 in.	18 and 30 x 30 in.
Total weight.....	250,300 lb.	230,000 lb.	232,200 lb.	225,082 lb.
Weight on drivers..	225,200 lb.	208,000 lb.	195,200 lb.	202,232 lb.
Total weight of engine and tender	391,400 lb.	334,000 lb.	364,900 lb.	346,000 lb.
Tractive power based on 25 per cent of adhesive weight.....	56,300 lb.	52,000 lb.	48,800 lb.	50,558 lb.
Net hauling capacity on level at 10 miles per hour	7,847 tons	7,261 tons	6,717 tons	7,049 tons
Ratio of tractive power to adhesive weight.....	4	4	4	4
Percentage of efficiency	100	92 5	85·6	89·8

Engine No. 150, which is herewith illustrated, was the first of the large engines of this class to be finished, and it is, by a considerable margin, the largest and most powerful locomotive yet built. These engines will be used in hauling exceptionally long, heavy trains of ore and iron at moderate speeds. The net hauling capacity on a level and nearly straight track is 7,847 tons, which is equal to the capacity and speed of a fairly large freight steamer of the present day. When the engine is working up to its full power, the drawbar pull is 56,300 pounds, or a little over two tons greater than that of the big Union Railroad locomotive which comes next to it in power.

The total weight of the engine alone is 125 tons, and of the tender 70 tons, the total weight of the engine and tender being thus only 5 tons short of 200, or fully equal to the weight of an average passenger train. The boiler is of exceptional size, measuring 88 inches in diameter at the throat-sheet. There are four hundred and six 2¼-inch tubes in the boiler, each measuring 15 feet over the sheets, and the total heating surface in the tubes is 3.564 square feet. The heating surface in the firebox is 241 square feet and the grate area 26·8 square feet. The total heating surface is 3,805 square feet. The driving journals, on the front intermediate, and back axles measure 9 by 13 inches, while the main driving journals measure no less than 10 by 13 inches; the main crank pin, moreover, is 7½ inches in diameter by 8 inches in length. The cylinders are 24 inches in diameter by 32 inches in length, and in themselves are as big as many a small stationary boiler; while the piston rods have a diameter of 4⅛ inches. The tender has a tank capacity of 7,500 gallons and carries 14 tons of coal. Big as this engine is, we suppose it will only be a matter of a few months before its dimensions are surpassed. Just in what direction the increase can take place it is difficult to say, as the width over the cylinders and the height of the smokestack must have about reached the limit of the loading gage. Any considerable increase in size must necessarily take place in a longitudinal direction.

BREAKAGE of propeller shafts at sea costs an immense sum annually in salvage. Mr. Justice Barnes, of the British Admiralty Court, said recently that during the past two years the amount awarded by that court for salvage of steamers thus crippled was £135,406, while the total awarded in other cases of salvage amounted to only £95,630.



THE LARGEST LOCOMOTIVE IN THE WORLD—RECENTLY BUILT FOR THE PITTSBURG, BESSEMER, AND LAKE ERIE RAILROAD.

Cylinders, 24 × 32 inches; drivers, 54 inches diameter; steam pressure, 220 pounds; diameter of boiler, 88 inches; total heating surface, 3,805 square feet; weight of engine, 125 tons; weight of tender, 70 tons; tractive power, 28 tons; net hauling capacity on the level at 10 miles per hour, 7,847 tons.