Electric Locomotives in Freight Service.

THE plant of the Chase Rolling Mill Company, Waterbury, Conn., is located about 1½ miles from the nearest railroad track and at an elevation considerably above the railroad. Heretofore all the hauling, raw material and finished product, to and from the station has been handled by eight-horse teams. This proved to be expensive, costing at least 50 cents a ton.

To replace these teams an electric line 2.3 miles length, with a maximum grade of five per cent was built from the railroad to the mill. Two Baldwin-Westinghouse 45-ton electric locomotives were employed to handle the work formerly done with 20 eight-horse teams. Each locomotive is equipped with four Westinghouse No. 301-D-E, 100 horsepower, 600-volt motors and type HL control, and weighs 45 tons completely equipped.

The control equipment of these locomotives is mounted in the center of the locomotive and surrounded by an expanded metal screen cage. This centralization of equipment is one of the important features of Baldwin-Westinghouse locomotives.

One departure from the usual construction followed in locomotives is that the motors are "outside" instead of "inside" hung. This arrangement was necessary in order to give the trucks a short wheel base so as to enable them to easily negotiate the shap curves to be encountered.

The locomotives make from eight to ten trips per day and with a load of approximately from 100 to 125 tons each. This load is governed by the five per cent grade previously mentioned which is 3,000 feet in length.

These locomotives have been in operation since the first of the year and have had a perfect record, having given no trouble whatever.

The same engineer has the same locomotive every day and is responsible for its condition. These men are perfectly competent to make ordinary inspection and keep the apparatus cleaned and oiled. In addition to this, at stated periods of approximately one month the machines are thoroughly inspected by the men in the repair shop. Aside from this no other work has been done since the locomotives have been put in service, and not one cent has been spent on repairs.

Some of the characteristics of these locomotives are given below:

CAPACITY.

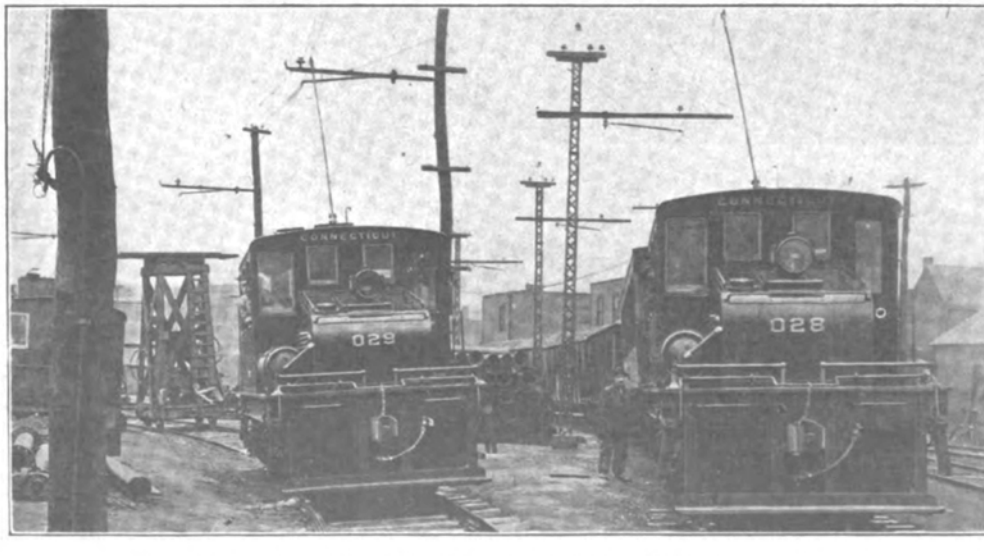
Continuous capacity—tractive effort with natural ventilation ..... 4560 lbs.
Tractive effort at one hour rating, at 7.8 miles per hour at 600 volts .....17270 lbs.
Maximum tractive effort .....22500 lbs.

RATED HAULING CAPACITY.

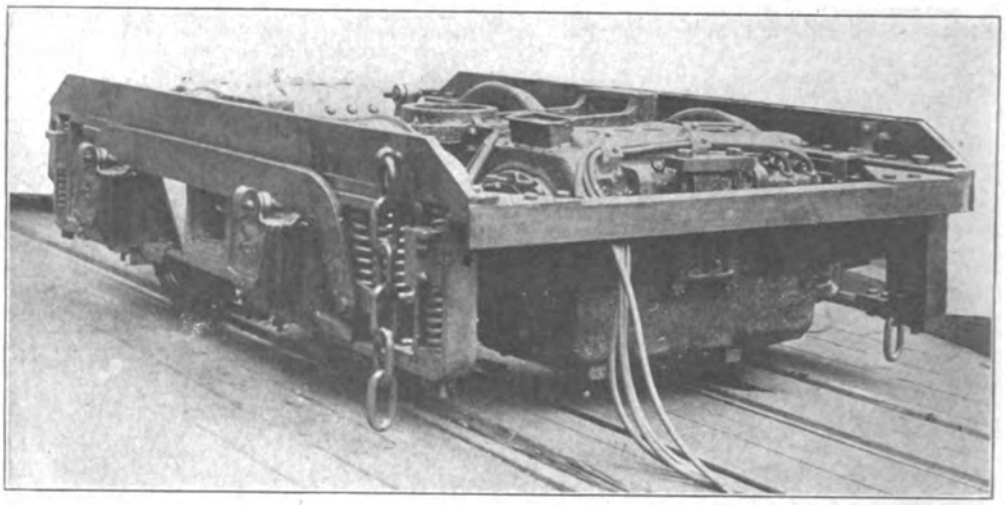
Track profile.	Number of cars each weighing 45 tons with load.	Max. Speed M. P. H.
Straight level track	38	9.2
½ per cent grade	21	7.8
1 per cent grade	13	7.8
2 per cent grade	7	7.8

Main Line Electrification of the Chicago, Milwaukee and St. Paul.

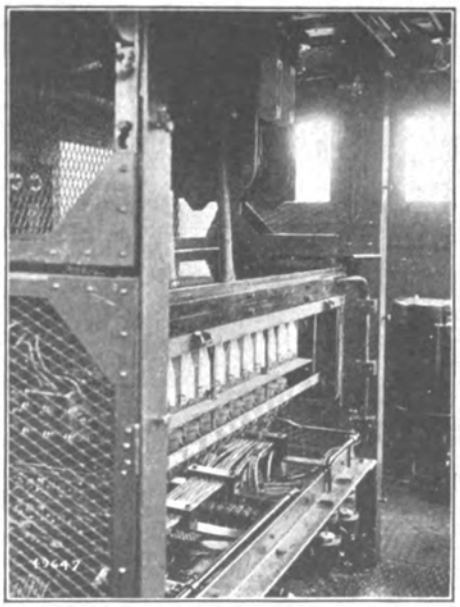
THE *Electric World* states that the Chicago, Milwaukee and St. Paul Railway Company will probably before January first reach a decision as to the type of equipment to be employed for the extensive main-line electrification of its railroad over the mountains in Montana. It is practically certain that the overhead trolley system will be used to convey the electrical energy to the motors on the electric locomotives. Either the 14,000-volt, 25-cycle alternating current system will be used or the direct current 2400-volt system. Plans which have been submitted by the General Electric Company and the Westinghouse Electric and Manufacturing



BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVES USED IN YARD SERVICE.



METHOD OF INSTALLING MOTORS WHICH ARE OUTSIDE HUNG IN SUCH A MANNER AS TO ALLOW A SHORT WHEEL BASE FOR TRAVERSING SHARP CURVES.



INTERIOR OF BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVE.

Company are now under consideration. For the railroad company the entire matter of electrification has been placed in the hands of Mr. C. A. Goodnow, vice-president in charge of operation and construction.

At first it is proposed to electrify a division of the railroad 113 miles long, extending over the Rocky Mountains between Three Forks and Deer Lodge, Mont. This work will be begun early in 1914. Ultimately the electrification will be extended to that portion of the main line between Harlowton, Mont., and Avery, Idaho, a main-line distance of 440 miles and, including sidings, a total of 450 miles of track. This work will mean an outlay on the part of the railroad company of perhaps $6,000,000 or $8,000,000, and the electrical construction work will proceed at such a rate that the annual expenditure will be about $1,500,000 or $2,000,000.

Experience with heavy railroad operation in and near New York City shows that electric locomotives can be run 2,000 miles without inspection under the conditions existing there. The locomotives which will be placed in service on the mountain divisions of the Chicago, Milwaukee and St. Paul can be relied upon to make from 250 to 300 miles at the outset. As there will be no delays for coaling, taking on water, cleaning fires or waiting for steam, it seems a fair conclusion that the tonnage will be handled with fewer locomotives, higher average speed and with a regularity which will result in better operating conditions. Passengers will be able to enjoy the mountain scenery without the annoyances incident to steam locomotion. Another point of interest is that while the steam locomotive is at its worst in freezing weather the electric locomotive is at its best at that time, since practically the only difficulty with the electric locomotive is to keep the motors from heating when doing maximum work.

One of the important benefits to result from electrical operation is the regenerative control of trains descending mountain grades by means of which energy will be returned to the line.

Energy will be purchased from the Montana Power Company.

A High-Tension Direct-Current Railway.

THE *Electric Railway Journal* of November 1st, contains an interesting account of a high-tension direct-current German railway of 17.6 miles in length, which operates in the Rhine Valley between Cologne and Bonn. This road is noted as being the first railway on which