

# POWER AND ELECTRICAL DEPARTMENT

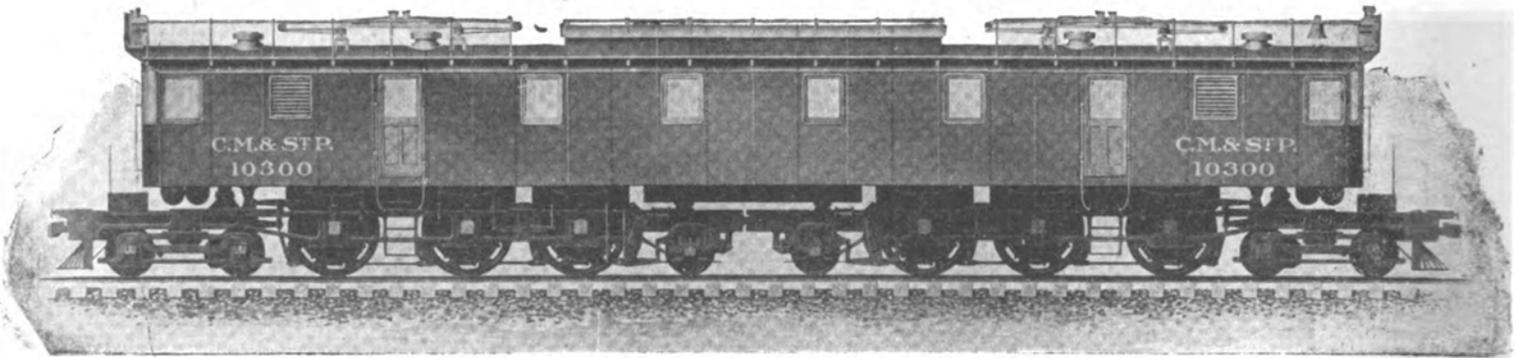
## THE VALUE OF ELECTRIC POWER IN RELIEVING COAL SHORTAGE

Now that the question of coal shortage has been brought so prominently to the attention of the public by the recent closing order of the Fuel Administrator, it is interesting to note the splendid work being done and savings effected by the railroads that have adopted electricity as a motive power on a part of their lines.

On the Elkhorn Grade Electrification of the Norfolk and Western Railroad, one of the biggest coal carrying roads in the country, a 270-ton Baldwin-Westinghouse Electric Locomotive hauls a 3250-ton train of steel cars loaded with coal en route for eastern points. Previous to the electrification it required three of the biggest modern type of mallet locomotives

by this use of water power instead of coal has been very gratifying to the state officials.

The commissioner states: "To give an idea of the value of the power which is being generated by these plants it may be stated that to produce 160,000 kilowatts from coal would require the yearly consumption of 2,500,000 tons, which at the average price of \$4.00 which would apply at the points where the power is used, would amount to \$10,000,000. When it is considered that the value of this coal is, by means of water power, being saved each year for future generations, and that during the next ten years this saving will, in all probability be increased seven or eight times, it is not difficult to understand that true conservation consists in encouraging the rapid development of water



One of the 226-ton Electric Locomotives for the Chicago, Milwaukee & St. Paul Railway

equipped with mechanical stokers to haul a train of this tonnage up the Elkhorn Grade at a speed of seven miles an hour. Now two electric locomotives haul it up the same grade at fourteen miles per hour or double the speed formerly obtained by the steam locomotives. As a matter of fact, in cold weather it was frequently necessary to reduce the tonnage of the train considerably in order to permit the steam locomotives to get it up grade.

With electric propulsion, the same coal traffic can, therefore, be handled with about one-third the former number of locomotives and half the number of engine and train crews. Such economies in rolling stock and labor are particularly effective at this time in lessening the traffic congestion and hastening the movement of coal to the eastern points. Of equal interest is the statement recently made by the Commission of Agriculture of the State of Montana in regard to the use of electric power by the Chicago, Milwaukee & St. Paul Railroad, which recently awarded a contract to the Westinghouse Electric and Manufacturing Company for ten electric locomotives as shown above.

The railroad is now obtaining 160,000 kilowatts of electric energy from the hydraulic plant of the Montana Power Company and the saving in fuel effected

power, which unless developed and utilized becomes lost for all time."

### Disadvantage of the Small Power Station

The disadvantage of railways relying for their power supply upon small isolated power plants is forcibly shown by tests made by a western property. These tests demonstrated the fact that these plants require from 12 to 20 lb. of coal to produce 1 hp. of mechanical energy. This use of fuel compares with the development of 1 hp. of energy from 2 to 3 lb. of coal in the modern steam turbine plant of the company. In other words, it was found that the small isolated plants use approximately six times as much coal to perform a given amount of work as the larger and more efficient plant of the central power station.

Companies relying entirely upon the small isolated station for their power supply, as many of the smaller ones are, are thus greatly handicapped, and the only logical conclusion seems the abandoning of these stations and the purchase of power from modern central stations, where possible. Not only will this policy be of immediate advantage to the companies themselves, but will be in the interest of general efficiency, toward which we as a nation are so eagerly striving.