ment in reducing the comparative car shortage which would otherwise prevail. The amount of shoveling which is required in connection with unloading of cars is very greatly reduced. This is of advantage not only to the railroad companies in handling freight but also to shippers. This portion of the address was made very real by a number of excellent illustrations two of which are herewith reproduced. Some of the latest types of specialized steel equipment was shown. In conclusion Mr. Lindstrom pleaded for a standardization of types and parts which would bring about lower costs of construction and maintenance and codify the valuable features which have been evolved by various car companies and railway companies in previous years.

# Electrical

NO important electrification projects of steam railroads have been announced during the past month. It is currently reported that a number of companies are seriously considering electrifying various portions of their system. The unsettled state of the security market, making it difficult if not impossible for the companies to secure funds necessary to carry on such work, and a feeling of uncertainty in some quarters as to the probable attitude of the new Administration, of Congress and of the State legislatures, many of which are now in session, is believed to be responsible for the present situation.

### Additional Details Concerning St. Paul's Electrification Project.

IN connection with the plans for the electrification of the Chicago, Milwaukee and Puget Sound Railway from Harloton, Mont., to Avery, Idaho, the main details of which were described in the RAILWAY WORLD for February, the point which is probably of greatest interest to railway officials is the arrangement which is to be made with the various power companies who are to suppply the electrical energy for the line. The contract with the Great Falls Power Company provides that the railway company shall complete the electrification of its line before January 1st, 1918, and shall purchase from the power company energy at the rate of 10,000 kilowatts for the full period of the ninety-nine-year agreement. Two years' notice is to be given the power company of the date on which the delivery of power must commence. The company reserves the option to purchase additional power in various quantities, at specified dates, up to a maximum of 25,000 kilowatts; any additional amount taken under this option privilege is to run for the balance of the contract. The power company is not liable for interruption to the supply, nor the railway company for interruption to its consumption, owing to causes beyond their control, such as strikes, fires or floods. The railway company is made a preferential customer entitled to first service. The contract is to be broken automatically provided the Federal Government at any time enjoins the power company in the exercise of its rights in respect to either its hydro-electric plant or its transmission lines across the public domain.

Energy is to be delivered at five specified points, or less, at 50,000 volts or 100,000 volts, three-phase, sixty cycles, alternating current. The railway company is to transform the energy and distribute it along its line. Twelve months' notice will be given the power company of the location of the delivery points. The rate for energy will be $0.00536 per kilowatt-hour, subject to a minimum bill after the first year of service equivalent to 60 per cent of all the energy contracted for. The power company is required to pay the Federal Government a tax of $.005 per 1,000 kilowatt-hour, for all energy delivered over transmission lines crossing the public domain.

It is unofficially reported that the St. Paul will electrify its main line from Avery, Idaho, through to the Pacific Coast as soon as the 450-mile electric stretch in the Rockies has been completed and is found to be operating smoothly.

### President Worthington on Electrification.

PRESIDENT WORTHINGTON, of the Chicago and Alton, writing in response to an inquiry from Thompson, Towle and Company, on the outlook for the substitution of electric for steam power generally on the railroads, states that in his opinion the technical progress of electrification has not progressed sufficiently to meet the various requirements of the railway requirements under the present conditions. He holds that the pressing necessity for the expenditure of vast sums to supply the needs of commerce simply in the way of heavier track, better roadbed and greater yard accommodations, makes the great first cost of electrification a serious obstacle. Furthermore, it is extremely difficult as well as expensive to adapt the present status of electric traction to large terminal and freight yards. Finally, the experience of the few roads which have electrified on a limited scale, he says, has not been such as to establish the comparative economy of electrification.

In three classes of service, President Worthington says, electrification will take place within the next decade: suburban service, where smoke must be eliminated and frequent-stop trains operated at high speed; long tunnels, where smoke gases are dangerous, and heavy mountain grades where water power is available and the uniform pull on the draw-bar produced by electric motors, with great reserve power, is a distinct advantage.

### Probable Features of St. Paul's New Electric Locomotives.

IT is semi-offically announced that the initial order for electric locomotives by the St. Paul System will comprise 50 locomotives specially designed to meet the service conditions on that system. Each locomotive must be able to pull a maximum freight tonnage of 2,100 tons up a one per cent grade. On heavy grades helpers will be added. The locomotives will be designed to attain a speed of 30 miles per hour up grade and 25 miles per hour down grade for passenger motors, and 15 miles per hour for freight locomotives.