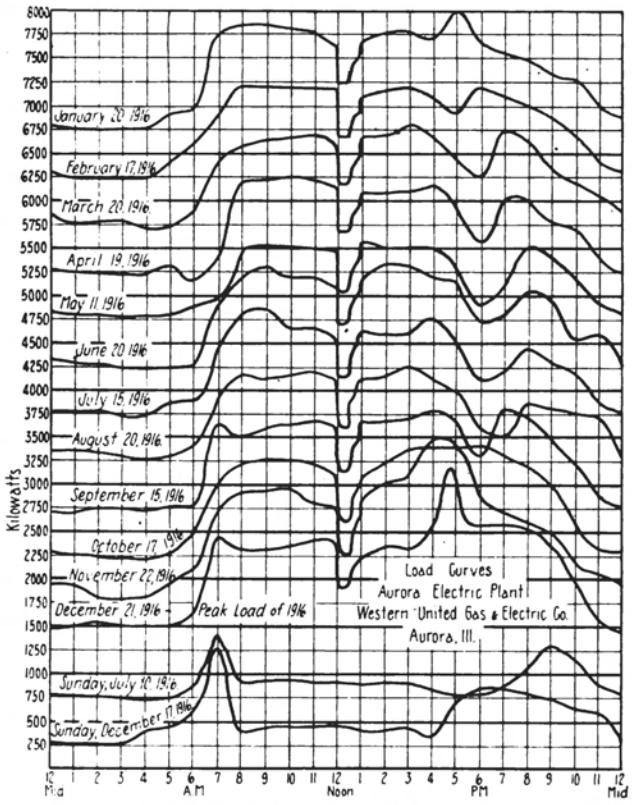
is also grounded to the water main a span or two away from the neutral-wire ground. The secondary wires are run as far as 1,000 feet for service installations. There is, of course, a notable decrease in transformer losses because of this method, and service interruptions are reduced greatly.

TRANSFORMER CAPACITIES ON GROUP INSTALLATIONS.

It was expected that the peak load on these group service installations would occur possibly on Tuesday morning when there would be a large number of electric flatirons in use, and the company was at a loss to determine just what capacity of transformers would prove adequate. Tests were made



Load Curves Plotted in a Unique Manner.

The above curves show in a comprehensive way the load conditions in the Western United Gas & Electric Company's power plant in Aurora during 1916. Each curve shows the load on a fairly average day of the month in which it was taken, the exceptions being that of May 11, showing one of the lightest loads of the year, and that of December 21, on which day the heaviest load and highest peak occurred. The lower two curves show Sunday loads, giving average Sunday conditions for the summer and winter seasons. The peak load of December 21 is typical of the season when the power load laps into the lighting load.

The method of plotting these curves is novel. The base lines of the different curves are the heavy lines, which are 500 kilowatts apart in the scale of ordinates. Thus, the base line for the curve of January 20 is at 6500, that of February 17 at 6000, and so on.

A study of the curves reveals some interesting characteristics of the load, which is mostly for commercial and residence purposes, the company supplying but little energy for street light and none for electric railways. The curve for October 17 is noteworthy because of its flatness during the afternoon hours, the lighting load increasing in the same proportion as the power load decreased.

on three group installations, one of 65 customers, one of 27 and one of 24, with a curve-drawing ammeter. It was found that the peak load occurred between 6 and 6:30 p. m. in the winter months and that the group maximum demand was about 110 watts per customer, this demand being at that figure for the three different groups. It was smaller than expected, but was accounted for because the diversity of the load was greater than anticipated. The customers were of the fairly well-to-do class, many of them being mechanics owning their own homes. Transformer capacities for these group installations are now arrived at by allowing a demand of 125 watts per customer.

EXTENSION TO C., M. & ST. PAUL RAILWAY ELECTRIFICATION PROGRESSING.

Work Started on 217-Mile Division on May 16 and Is Being Rapidly Prosecuted—Power to Be Purchased.

That part of the Chicago, Milwaukee & St. Paul Railroad between Harlowton, Mont., and Avery, Idaho, a distance of 437 miles, is now being operated as an electric line. Electric power is supplied by various plants of the Montana Power Company, the largest two of these being at Great Falls, Mont., and Thompson Falls, Idaho. The first electric train was moved in December, 1915, and the last steam-operated train was taken off the Missoula division in February, 1917. On that division is the St. Paul Pass tunnel, which cuts through the summit of the Bitter Root mountain range near the Montana-Idaho line, and has a length of 8,000 ft. This was concrete lined throughout before the line through it was electrified.

The work of electrifying another division, of 217 miles, began about May 16, 1917. The starting point is at Othello, 100 miles east of Cle Elum, and electrification will proceed westerly to Seattle and Tacoma. The character of construction will be the same as that on the Rocky Mountain division. There will be eight substations, at Taunton, Doris, Kittitas, Cle Elum, Hyak, Cedar Falls, Renton and Tacoma. Power will be furnished by the Intermountain Power Company. It is figured that the work will be completed between Cle Elum and Seattle and Tacoma before the close of 1918. This work is in direct charge of R. Beeuwkes, electrical engineer.

NEW OFFICERS OF AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.

Announcement of Election at Annual Meeting Held in New York City.

Reference to the thirty-third annual meeting of the American Institute of Electrical Engineers, which was held in New York City on the evening of May 18, is given in another portion of this issue, the main feature being the presentation of the Edison Medal to Nikola Tesla. The business matters coming up at the annual meeting consisted, first, of the report of the board of directors for the fiscal year ended April 30. This reviewed the activities of the Institute for the year and gave a financial statement of income and expenditures. The total membership as of that date was 8,170, a net increase during the year of 498.

The report of the letter ballot on the election of officers was made. The directors' nominees were elected by a large majority, as follows:

President, E. W. Rice, Jr., Schenectady, N. Y.

Vice-presidents, Frederick Bedell, Ithaca, N. Y.; John H. Finney, Washington, D. C.; A. S. McAllister, New York City.

Managers, Walter A. Hall, West Lynn, Mass.; E. H. Martindale, Cleveland, O.; William A. Del Mar, New York City; Wilfred Sykes, Pittsburgh, Pa.

Treasurer, George A. Hamilton, Elizabeth, N. J.

Competition Between Utilities Where Service Demands Require.—The Board of Public Utilities Commissioners, New Jersey, in ordering the Delaware & Atlanta Telegraph & Telephone Company to furnish service to residents in the outlying districts of Mt. Holly, holds that while competition between public utility corporations is undesirable as a general rule, and in most instances involves an added expense to the public, "the rule should not be so hard and fast as to prevent competition where the needs of service demand it." The territory in question is also served by the Farmers' Telephone Company.