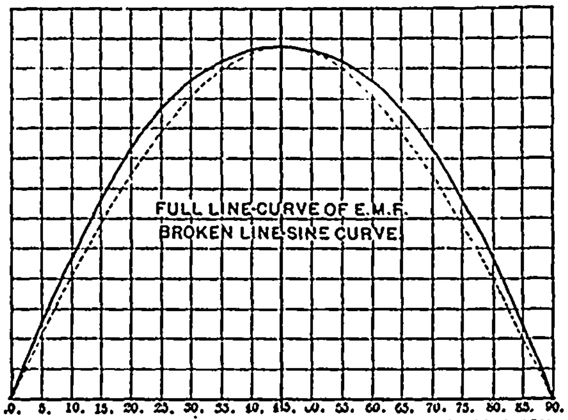
ANOTHER VIEW OF DYNAMO ROOM SHOWING 600 K. W. "S. K. C." GENERATORS.



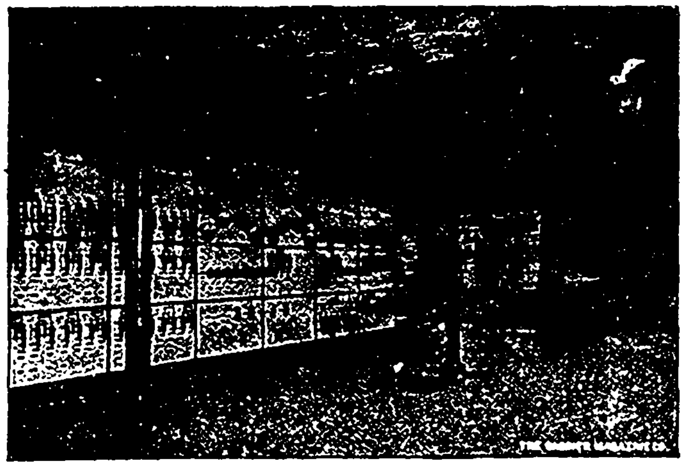
E. M. F. CURVE OF GENERATORS AT MONTMORENCY.

to the pulley of the generator, 95.1 k. w. are delivered to the line at the generating station; 87½ k. w are delivered to the terminal of the step-down transformers, and 86 k w. are delivered to the distributing mains of the sub-station.

All the motors now in use by the Montmorency Electric Power Company are the S. K. C. induction motors. These motors were described by Dr Bell in the January number of *Cassier's Magazine*. They vary in size from one horse-power to 30 horse power, and do all kinds of wo.k, running the tools of carpenter and machine shops, driving the saws and wood-planers of planing mills and handling the freight elevators in various mills and in wholesale warehouses with perfect satisfaction. It is now well understood that the magnetizing current of an induction motor lags behind the applied electromotive-force, and that a lagging current in practice involves considerable loss and expense, by necessitating the use of larger conductors and generating apparatus, while it seriously interferes with the proper regulation of the generators and increases the normal drop of the line.

In the S. K. C. motor the magnetizing current is furnished by condensers; the motor then takes current in proportion to the load. Two condensers are connected in multiple with the fields of the motor, and each has a capacity in amperes at the working voltage practically equal to the no-load current of each field of the motor If there is no distortion of the current wave, the apparent energy taken by an induction motor with condensers is equal to the real energy.

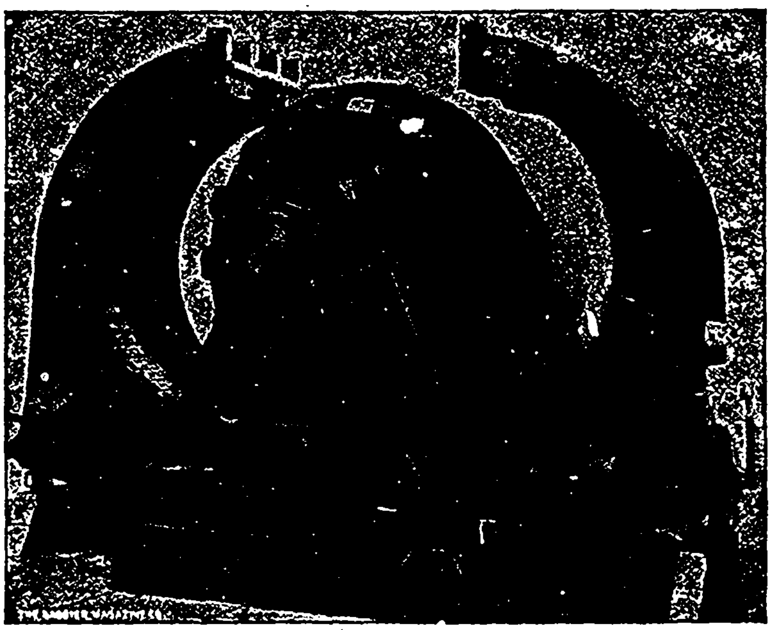
An interesting example of the value of condensers on induction motors is bown in a small plant in New England



THE DISTRIBUTING SWITCHBOARD.

The generator was a 60-ampere two-phase machine, manufactured by a large electrical company, and was furnishing power to a number of small induction motors. The motors were doing all kinds ot general factory work and running ten hours a day. The average load on the motors was about one-quarter of their maximum. The amount of current furnished by the generator to the motors was 52 amperes at 1,152 volts. The power factor was 0.505.

When the motors were supplied with condensers, the current was reduced to 28 amperes at 1,150 volts, and the power factor was increased to 0.863. The reason that the power factor was not increased to unity was the existence of harmonics in the curve of the electromotive-force of the particular machine in use.



A 600 K. W. "S. K. C." TWO-PHASE GENERATOR DRAWN APART.

ELECTRIC RAILWAY GRADES.

Editor CANADIAN ENGINEER.

SIR,—Could you inform me, at your earliest convenience, if any comparative statement has ever been published in Canada or in the States giving the various steep grades run up by electric railways? In Montreal, our electric railway goes up hills where the grade varies from five to seven feet in a hundred, and the object of my enquiry is to ascertain if, in the States, electric railways do run up steeper grades than ours.

Yours truly, JOSEPH PERRAULT, Architect.

Montreal, May 15th, 1896.

The grades of the Montreal Street Railway are steeper than those of any electric railway in America or Europe, or, so far as we know, any in the world. It is only where the cable system is adopted that steeper grades exist in the United States, such as at Minneapolis and St. Paul. San Francisco uses the cable for its steeper grades, and Providence uses the "balance" system. Edinburgh, Scotland, recently decided to adopt the cable rather than electricity for its cars, because the grades were too steep; yet the lines there will run over no grades so steep as those of Montreal. The difficulty is not to mount, but to descend in safety. The grades in Montreal on Windsor st. Hill, St. Lambert's Hill and Amherst st., are 10 in 100, and on St. Denis st. for the space of 100 ft. it is 11½ in 100. ED.