short distance above the Government maintains a wooden dam for the purposes of the Trent Valley canal system, two locks of which are at this point, thus forming a beautiful sheet of water called Balsam Lake. This dam and the falls provide a total nominal head of 24 feet. The water is drawn off the upper level through a head race on the west side of the dam, and is led to the power house, which is situated immediately below the falls. The head race is substantially built in rock, the river side being formed by a heavy concrete retaining wall, the short side cut in rock, and the whole being about 150 feet in length. The head gates consist of a set of heavy stop logs with convenient raising devices, and the minimum section of race is 10 by 26 feet. Racks and seats for lower stop logs are provided at the piers and head wall in the north side of the power house, the steel flumes leading directly from the race at this point.

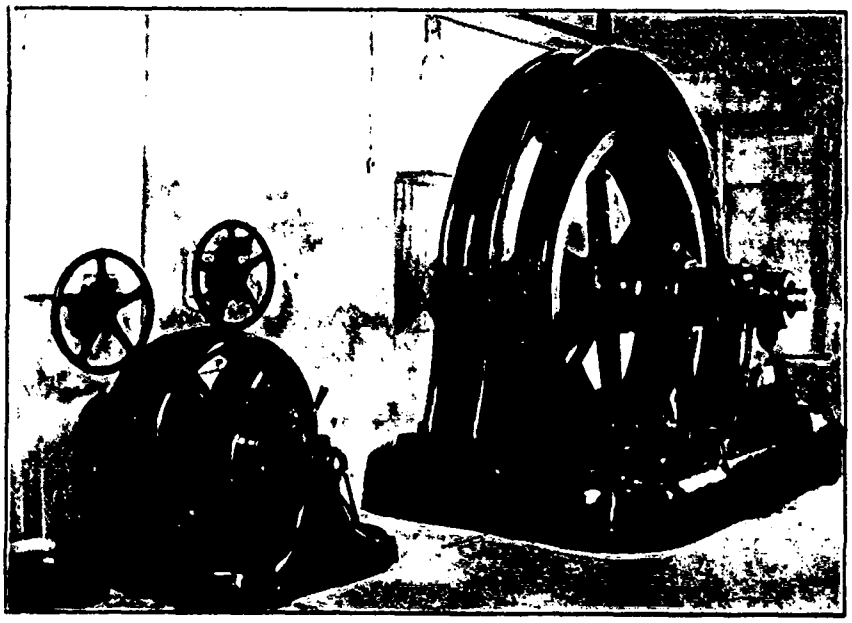

FIG. 2.—GENERATOR AND EXCITER.

THE POWER HOUSE.

The power house occupies the site of the old Smith saw mill, in fact, it was built up inside of the mill, the latter being torn down afterwards. The building is 37 x 52 feet inside, and all available space is occupied, as the location is cramped owing to the rocky bank of the river. A splendid view of the power house and falls is shown on the previous page. The power house is of plain but substantial construction, built of brick with stone foundation, and consists of two floors, the lower one containing the hydraulic machinery and generators, the upper having the lighter equipment, such as high potential switchboard, transformers, blower, stores, offices, etc., access to which is had directly from the bank level above the falls.

The head wall of the forebay, with its piers, forms the upper foundation wall of the building, and through this the three flumes lead the water to the wheels. Two of these are 11 feet in diameter and the third is 4 feet in diameter. The large flume next the river and the small one are already in use, the other large flume not being yet completed, but it will be used when future extension is made.

The hydraulic plant already in operation consists of a pair of 40-inch Samson turbines, of the Leffel type, for the generator, and a 20-inch turbine of the same make for the exciter. The turbines were manufactured by the William Hamilton Manufacturing Company, of Peterboro, Ont. The pair of power turbines are connected with the generator by a 7-inch horizontal shaft, and will generate together upwards of 650 horse power under a head of 24 feet, using about 300 cubic feet of water per second, and running at 200 r. p. m. The small wheel to run the exciter will develop about 60 h. p., only about half of which will be used by the exciter. The company are, therefore, using less than one-half of the water to which they are entitled by their franchise. At present the water wheel governor is not installed, but it is the intention to put in a high-class governor at an early date. The discharge of the water from the wheels is into a tail race cut into the rock below the falls, by which it enters the swift waters of the river, thus flowing rapidly away, a feature which is very important. Another promising feature of this plant is the absence of the formation of anchor ice, as the conditions for such cannot arise in the head race or in Balsam Lake above.

The intention of the company is to duplicate the present power plant as soon as the demand for power makes it advisable to do so. There is ample provision made for this in the power house and general works, and the water privileges of the company and consequent power obtainable are quite sufficient for a total output of some 1,000 h. p.

ELECTRICAL EQUIPMENT.

The generator building, as it stands at present, contains but one of the two direct connected generators

FIG. 3. GENERATOR SWITCHBOARD.

which it is proposed shall form the ultimate equipment of the plant. This machine is a 400 kilowatt, 550 volt, three-phase revolving armature generator of the Canadian General Electric Company's standard design, driven at 200 revolutions per minute by the wheels described above, to the shaft of which it is directly coupled without any insulating device. The field frame is cast