

## ELECTRICAL EQUIPMENT.

The generators are all capable of a continuous overload of twenty-five per cent. and a one hour overload of fifty per cent.

The switchboard gallery is 8 feet above the engine room floor. It is 7½ feet wide, has a neat tile floor bordered on the outer side by blue Vermont marble, and is guarded with a brass railing. The switchboard panels are 9 feet high and of 2½ inches blue Vermont marble. The face of the switchboard is almost flush with the inside of the main south wall. The steel columns of the south wall of the engine room are, on the switchboard gallery, boxed in with white marble. The four generator panels, one being spare, are located in a bay between two

The negative busbar is located in the cable house gallery near the top of the switchboard, and is supported on a substantial steel framework bolted to the steel columns of the generator bay. It is carried across the cable house and down the cable house wall to the ground busbar under the cable house gallery floor. The positive and equalizer busbars are supported on a steel framework on the cable house floor (on a level with the engine room floor), and provision has been made so that a booster busbar can, if necessary, be installed at a future date.

The feeder switches are all single pole double throw, the bottom jaw—the booster connection—not being used. On each feeder and generator panel is

switchboard gallery, and are operated "direct" from the rheostat stands on the switchboard gallery floor. Besides the brass rheostat stands there are also brass voltmeter plug stands and brass annunciator stands, all mounted in line on the switchboard gallery floor in front of their respective panels.

## CONDUIT SYSTEM.

The lead covered machine cables are carried, in separate ducts, through the foundations, then down over wooden racks to concrete trenches, which cross over the discharge tunnel, located under the engine room basement floor. From these trenches the cables pass into bituminized fiber ducts of 2½ inches internal diameter. The fiber ducts lead

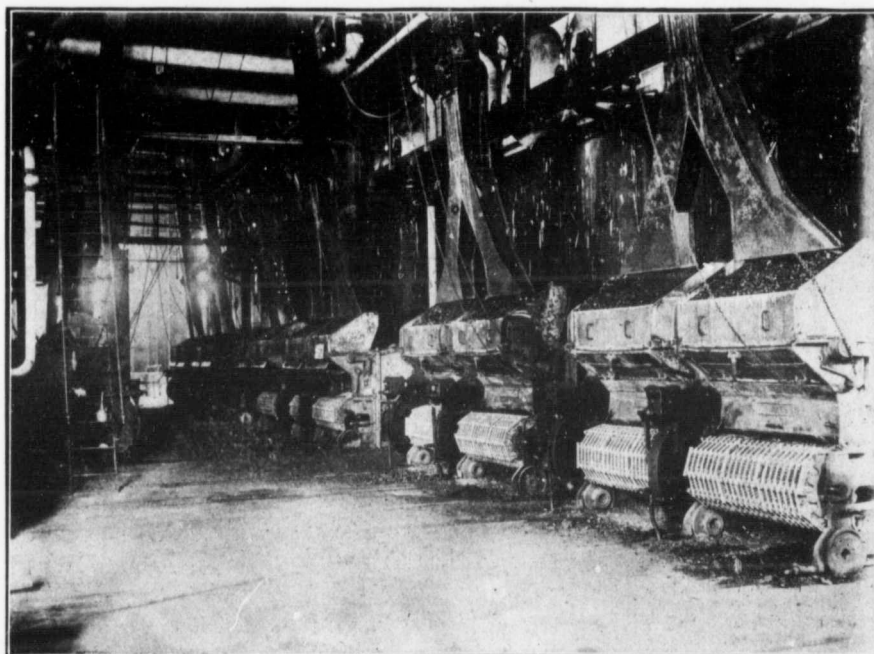


FIG. 5.—The Boiler Room.

of these columns at the west end of the gallery. The positive, negative and equalizer switches are mounted on the generator panels, all the machine cables being brought to the switchboard. The width of the generator panels, 4 feet, allowed sufficient space on the back of each panel for an accessible and substantial layout. In the bay east of the generator bay is a 4-foot totalizing load panel, a spare 4-foot future motor-booster panel, and beyond that the feeder panels, which are each 2 feet wide. On the totalizing load panel is mounted a 15,000 ampere range ammeter, a Sangamo integrating wattmeter of 15,000 amperes, and 100,000,000 K.W. H. capacity, operating from the shunt of the ammeter, and a Westinghouse D. C. recording (curve drawing) voltmeter. Duplicates of the instruments on the totalizing load panel will be mounted in the office.

mounted a choke coil and a corresponding lightning arrester connection. This insures double protection to the generators. There is also a direct connection from the positive busbar to a "water box" lightning arrester, which still further insures the safety of the apparatus. With the exception of the Westinghouse recording (curve drawing) voltmeters and the Sangamo integrating wattmeters, the instruments are all of Weston manufacture. I. T. E. circuit breakers and Walker switches are used throughout. The generator circuit breakers and generator ammeter shunts and the totalizing load ammeter shunt are all connected in on the negative side. The shunts to the series fields of the generators are located on the cable house floor, taps being carried to them from the positive and equalizer straps under the cable house floor. The field rheostats are located under the

to a common cable compartment directly below the switchboard gallery. From this compartment the cables are carried up on racks to meet the copper straps, connected to the switch studs, under the switchboard gallery. The connections to the machine terminal lugs and the lugs on the copper straps are made by cutting the lead back about 15 inches and tapping from 6 inches back on the lead sheath along the varnished cloth insulation on the cables and over the mouth of the lug. Several layers of friction and rubber tape are used, each layer being varnished. The lead covered field cables will stand a test of 10,000 volts A. C. for five minutes, from core to sheath. The exposed parts of the field cables outside the trenches and ducts are run in "circular loom," as an extra protection to the lead covering.

The bituminized fiber ducts are laid in cement grout; all bends are of 3 to 4