

From the under side of the first main conduit, six penstocks, each nine feet in diameter, drop in pairs through vertical shafts and out through horizontal tunnels in the solid rock of the cliff to the power house. Each penstock supplies water for a 10,000 horse-power unit. The vertical distance from the center of the main conduit to the center of turbine is 133 feet. Two small penstocks, of 30 inches diameter, lead from the main conduit through an inclined tunnel to the power house and supply water for the two exciter turbines.

A chamber beneath the main conduit at the junction of penstocks accommodates the 108 inch penstock gate valves and operating mechanism.

#### **GENERATING STATION AND APPARATUS**

The building is 76 feet wide and 65 feet high, and for the full capacity will be about 1,000 feet in length. The roof is flat and the general style of architecture is massive and somewhat after the Egyptian order. The front wall is designed to withstand pressures that may result from ice gorging and rising in the river in front of the building. The floor level is 25 feet above the normal level of the river.

The main generators and their turbines, directly connected, are the only machines placed on the floor of the station. Each turbine unit consists of a pair of Francis turbines, mounted on a horizontal shaft, operating at 187.5 revolutions per minute, and rated at 11,400 horse-power. Before reaching the turbine, the penstock supplying it divides into two branches leading to the separate wheels that constitute one complete turbine. After passing through the wheels, the water flows through concrete draft tubes, terminating in tail races in the foundations of the generating station, which in turn discharge over a weir wall into the river. The crest of this weir wall is at elevation 349, and under full load conditions water rises on it to about elevation 353, giving as the gross head, between forebay and tail water levels, 200 feet. Of this head, 175 feet is effective on the turbines.

Six of the 20 main generators provided for by the general plan, make up the first installation. Each of these generators is rated at 7,500 kilowatts, to deliver three phase current of 25 cycles per second at 12,000 volts. They are of the rotating field type and have 16 poles each, the external diameter of the armature