

The Board of Control will now decide whether the work should be continued by the contractor, or whether the city will undertake the work. Mr. McLeod has expressed his willingness to proceed with the construction, and during the six weeks in which the board of experts executed their careful investigation, he has been continuing the work on other sections of the plant.

MECHANICAL AND ELECTRICAL EQUIPMENT OF THE WINDSOR HOTEL, MONTREAL.

The power equipment for the new Windsor Hotel, designed and installed under the supervision of Mr. Kelsch, Consulting Engineer, is more complete than usual because of the problems to be met. The power plant, which is in charge of Mr. Winkworth, Chief Engineer of the Windsor Hotel Company, is one of the most up-to-date isolated power plants in Canada. The main object of the power plant is to furnish light and heat to the hotel and power for the various motors used in the laundry, for ventilating fans and in other parts of the hotel.

The steam equipment consists of three 200 H.P. Robb water tube boilers each with a heating surface of 2,143 square feet. Two of the boilers are set in a battery and one is installed singly. The boilers, which are built for 175 pounds working pressure, are equipped with Cotton blowers for burning anthracite screenings. This type of boiler consists of two horizontal cross drums with headers which are connected by a main bank of inclined tubes. The drums are connected by two rows of horizontal tubes which complete the path of circulation for the water. At the extreme top, superheating tubes connect the drums so that the steam which is separated in the front drum is thoroughly dried and slightly superheated when it enters the rear drum from which it is piped to the engines.

This boiler is distinguished from other water tube boilers by the large throat area where the front header joins the front drum giving a free and unrestricted passage for the large volume of water and steam passing from the main bank of inclined tubes into the drum. As the drums extend crosswise and the headers are as wide as the length of the drum, there is no contraction at the throat as is necessary in many types where longitudinal drums are used.

Great flexibility is another feature of this new boiler not only from the way it is placed in the setting on the supporting framework, but also because of the construction of the boiler itself. All the tube surfaces run in one direction and the plate surfaces in another, thus eliminating the strains caused in boilers where the longitudinal drums, headers, and tubes are connected rigidly together. A thoroughly modern design, this boiler has ample provision for cleaning, a hand-hole being placed in the header opposite each tube.

In the engine room of this power plant there are installed three Robb vertical compound engines which are run non-condensing. Each engine is direct-connected to a 150 k.w. electric generator made by the Canadian Westinghouse Company. These engines will operate the generators at 25 per cent. overload for two hours and 50 per cent. overload for one hour. With steam at 150 pounds pressure they will carry the normal load at a speed of 425 r.p.m. These engines are entirely enclosed so that working parts are protected from accident and there is no danger of oil being thrown about the engine room. Every revolving and sliding part is automatically lubricated by a system which consists of a pump and distributing pipes in which a pressure of from 10 to 20 pounds per square inch is maintained. Of the vertical type, these engines have many features which have been

very successful in marine practice and modified for stationary practice enable the engines to maintain the speed desired for direct connection.

The electrical equipment had to take into account the fact that for some few years the hotel is under contract with the Montreal Light, Heat and Power Company for current, so that electrical machinery will be used only as a stand-by during this period. This situation called for especial skill in design because the Power Company operates with alternating current generators which means that the direct current switches of the hotel must remain open, except in the event of a shut down on the part of the Power Company. Should this happen the engines in the new power house will be started, the bus bars made alive therefrom and the circuit breakers and the switches on the feeders closed. Signal lamps indicate when the alternating current switches are closed and the direct current switches are open. These signals will enable the station operator to properly manipulate the switches so that the entire lighting system of the hotel will be transferred from the dead alternating current bus to the working direct current.

THE LOTSCHBERG TUNNEL.

The new Lotschberg Tunnel through the Alps was opened officially on June 20. The tunnel is the third longest in Europe, measuring over 9¼ miles, and the cost of the new line was over \$17,000,000, the tunnel alone costing nearly \$10,000,000. Electric traction will be used on the new route from Spiez to Domodossola, Italy. The weight of the locomotives is 112 tons, and they are fitted with two motors of 3,000 horsepower, weighing 27 tons each, the cost of construction being about \$40,500, or twice that of an ordinary steam engine. The overhead or trolley system is employed, a current of 15,000 volts being carried. The locomotives are capable of pulling a train weighing 310 tons up the maximum grades of 27 per thousand at the rate of 31 miles an hour. According to the anticipations of the French press, the new railway will greatly increase the volume of trade between France and Italy, as it will bring the northern and more industrial part of France into direct communication with the peninsula. Italy lacks iron and articles made therefrom, and these have hitherto been imported through the St. Gothard Tunnel route from Germany, but the French iron works in the basin of Briey and Longwy may now be able to compete. At present the imports into Italy from Germany under this head amount to 237,000 tons annually, as compared with 17,000 tons from France.

A new Diesel oil-engine towboat of the Italian navy has a displacement of only 170 tons, but is equipped with a four-cylinder, two-cycle engine of 280 horse-power, running at 250 revolutions per minute. Compressed air at low pressure compared with that required for normal running is used for both starting and reversing. Only a few seconds are necessary for these operations, and a tank on board carries sufficient compressed air for starting or reversing sixty times.

A special bulletin has been issued by the University of Illinois Engineering Experiment Station, discussing the tests and methods employed in measuring deformations of steel and concrete in buildings. Extensive tests have been made on eight buildings in the last three years and they have shown the entire practicability of measuring deformations, or strains in critical parts of a reinforced concrete structure under load. As a direct result of the tests one company has modified its design of the floor slab adjacent to the column cap.