THE MECHANICAL EQUIPMENT OF THE OTTAWA MINT.

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The mechanical equipment of this branch of the Royal Mint was completed by the end of October last—the time occupied in the manufacture and installation of the necessary machinery having been just ten months.

Many machines in the Coining Department have been designed specially for the Ottawa Mint, and in these new devices have been adopted, which are not to found in other similar institutions. In addition to the machinery in that department, where the actual minting of money takes place, the following plants have also been installed:—

(1) The Electrical Plant, for power distribution, for lighting, etc.

(2) The Oil-fuel Plant, for storing and distributing the oil-fuel used throughout the various departments in the melting, annealing, and cupel furnaces, together with the fans and blowers for the same.

(3) The Die-making Plant, for sinking, turning, annealing and hardening the dies used for coinage purposes.

(4) The Plant for the Boiler House and the Machine, Smith's and Carpenter's Shops, in which all running repairs are effected and small tools made.

(5) The Plant for the Assay Department, where all the precious metals received into and issued from the Mint are analysed; and in which experimental research work will be conducted.

To give a full and complete description of all the mechanical devices which have been installed throughout the Mint would make this paper unduly long. Each of the plants enumerated above will therefore be briefly dealt with in turn, in the order given; and then the Coining Department, which contains types of machines probably less commonly known than the rest, will be described more at length.

ELECTRICAL PLANT.

Electrical Equipment.—The electricity used for power and lighting is supplied in the form of a two-phase, alternating current, and enters the building at a potential of 2,140 volts. It then passes through the transformers, of which there are three for power and three for light. In each case one is a spare, which can be put into circuit, on either phase, by operating the primary and secondary switches.

The transformers for power operate the motor of a motor-generator set. They are single phase, step down, oil insulated, self cooled, for a circuit of 60 cycles. The primaries are wound for a potential of 2,140 volts, and the secondaries for a potential of 500 volts. Their normal full rating is 100 kilowatts each.

The transformers for light operate the electric light system of the building. They are similar to the transformers for power, but the secondaries are wound for a potential of 107-214 volts; while their normal full rating is 15 kilowatts. The primaries and secondaries of each transformer are provided with binding posts, so that any one of them may be conected or disconnected without soldering to leads, or cutting wires.

The motor-generator set for transforming the current to operate the motors throughout the Mint consists of an alternating current motor and continuous current generator. The motor is of the two-phase, alternating current, induction type, operating from the transformers at a potential of 500 volts; its normal full rating being 225 H.P., at a speed of about 800 revolutions per minute. The generator is multi-polar, compound wound, continuous current, operating at a potential of 225 volts; its normal ful lrating being 150 kilowatts. The motor and generator are on one bed plate, and supplied with auto-starter for the motor, and field rheostat for the generator.

There are 32 compound wound, continuous current motors in use, ranging in power from 1 1-4 H. P. to 30 H. P., all operated at a potential of 220 volts.

The wiring for the motors is of the parallel two-wire system, the wires being carried in steel conduits.

The wiring for the lighting is of the interior conduit system; all the main circuits being of three wires, and the branch circuits of two wires.

There are 415, 3.5 watt, 16 C. P. 102-volt incandescent lamps, and 17 arc lamps. The latter are of the enclosed type for multiple circuits, adjusted for 7 amperes and 107 volts, alternating current.

The buildings are wired for electric clocks, bells and telephones, which are in use throughout the Mint.

OIL FUEL PLANT.

Oil Fuel Equipment.—The fuel used for melting and annealing purposes, and for the cupel furnaces in the Assay Department, is crude oil; its specific gravity being .850. The plant for storing, distributing and burning this fuel consists of:—Four storage tanks (each of 2,000 gallons capacity), two rotary pumps for distributing the oil throughout the buildings, three pressure blowers, four melting furnaces for crucibles holding 90 pounds each, one strip annealing furnace, one blank annealing furnace, one die hardening furnace, and three cupel furnaces and two small melting furnaces for the Assay Department. In melting and cupel furnaces an air blast is used in conjunction with the oil; while in the annealing furnaces and die hardening furnace dry steam is used, at a pressure of 60 pounds per square inch. The oil pumps are so arranged that the fuel is delivered to the furnace at constant pressure. All oil pumped, but not used, is returned through a spring-loaded valve to the storage tanks.

The tanks are supported on concrete bearers, one at either end, and one at the centre of each tank—so that the air may circulate freely around them. The piping for these tanks is so arranged that each one may be filled or emptied separately. Each tank is also fitted with a return pipe from the pumps, and a vent pipe through which all fumes rising from the oil are lead to the roof of the building. The air for the blast used in the melting furnaces is drawn from the tank room, so that the air round the tanks is constantly changed.

This fuel is found to be very economical, and excellent results have been obtained from all the furnaces. The heat can be regulated without difficulty, and, in the