

Steam Turbine. The new General Electric 25,000-kw 3600-rpm turbine, designed for 850 psig, 900 F, drives a hydrogen-cooled generator. Steam to the turbine passes through an emergency stop valve to two control valve chests mounted on the upper and lower halves of the high-pressure shell. From here ten control valves distribute steam to the turbine nozzles. The 19-stage single-flow turbine extracts steam from the fourth, ninth, thirteenth and seventeenth stages for feed-water heating.

Chrome-iron alloy was chosen for the turbine buckets to resist corrosion and erosion by steam. Stellite shields fastened to the outer portions of the last-stage buckets provide an additional safeguard against erosion.

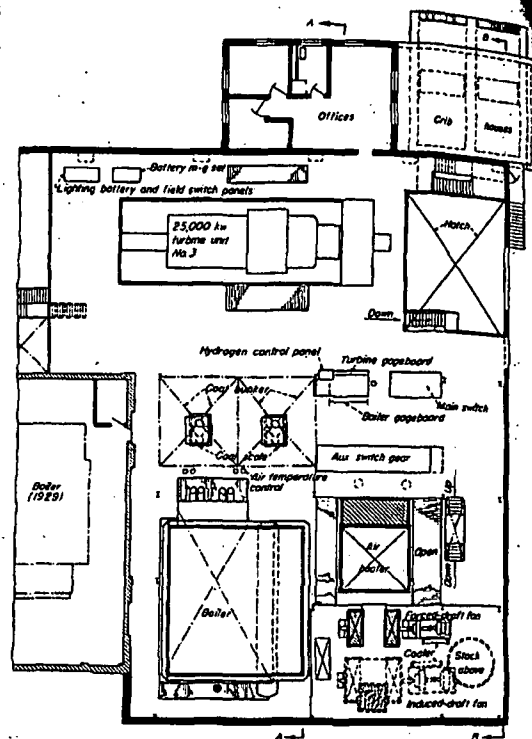
Main Condenser. A 35,000-gpm circulating-water pump takes water from the upstream side of a dam across the Rock River and forces it through the 2-pass surface condenser. The condenser has 4770 Admiralty-metal 1-in. dia tubes with 20 feet effective length providing a total cooling surface of 25,000 sq ft. The condenser outlet discharges downstream from the intake, and sheet metal piling directs this water to a small hydro unit. When the flow in the Rock River drops to a point that does not permit operating the hydro unit, the piling causes the discharge water to spread over a large area. The river water varies from 32 to 90 F.

Steam Generator. Pulverized coal

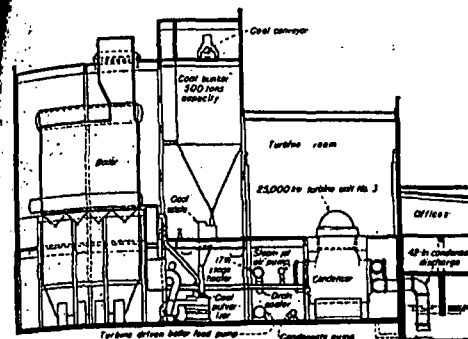
The burners mount horizontally in the front wall of the furnace. The wall tubes bend to form an annular opening through which the coal and air pass on their way into the furnace. Each burner assembly consists essentially of a pri-

mary nozzle, inlet elbow, directional vane, secondary air damper and burner nose life. A steam-atmosphere oil-burning element installed through the inlet elbow and primary nozzle lights-off the pulverized coal. The directional vane causes turbulence in the burner throat. An impeller mounted on the end of the oil-burning element makes it possible to maintain the best possible turbulence for varying loads. The secondary air damper, of the register type, controls the quantity of secondary air to the individual burners and shuts off the air supply if any burners are out of service.

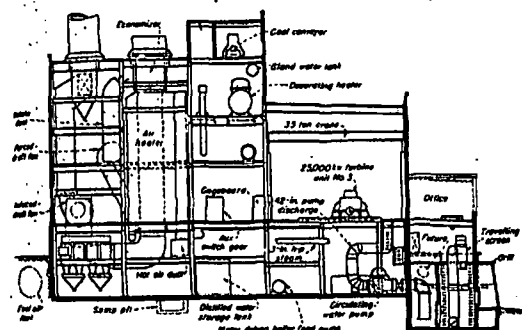
Two B&W pulverizers serve the boiler and use the ball-grinding principle with spring loading of the grinding elements. One row of balls rides between a sta-



NEW PLANT EXTENSION abuts original building at left with machine shop of upper left partly shown. Second h-p unit will be housed in extension to right



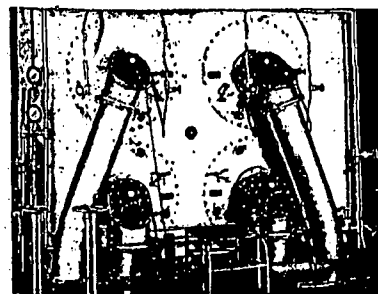
PLANT SECTION A-A shows arrangement of boiler, pulverizers, bunker, coal scales, 10 heater, pumps, turbine, main condenser and circulating water discharge



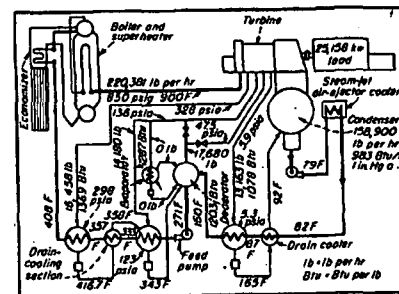
PLANT SECTION B-B (see plan view) shows location of air heater, f-d and l-
ins dust collector at left; heaters and evaporator, center; turbine room, right

Air from a 100-hp motor-driven blower enters a windbox surrounding the lower part of the grinding chamber. After passing through a throat region, the air picks up the pulverized material which has passed through the balls and lifts it to the top of the pulverizer. The classifier separates the coarser coal particles and rejects them to the grinding zone for further pulverization. Powdered coal of the desired fineness then passes to the burners with the air stream.

The master controller of the automatic combustion control system receives air-loading impulses from the steam pressure element, and then dispatches corresponding air loading pressures to each fuel and air regulator on the boiler. At the master controller, the air pressure dispatched to the various regulators can be controlled either



PULVERIZED-COAL BURNERS and secondary air box for firing the 275,000-lb-per-hr boiler use fuel oil for ignition.



HEAT-BALANCE DIAGRAM shows steam conditions for unit carrying 25,158-kw load at 11,806 Btu per kwhr total heat rate