per square inch. They are equipped with chain grate stokers. Provision has been made for the installation at a later date of two more boilers and an economizer. The feed water is passed through two heaters by two Allis-Chalmers 4-stage turbine boiler-feed pumps.

The power house, 104 ft. x 148 ft., and the chimney, 175 ft. high x 11 ft. diameter, are built entirely of concrete. The coal used is soft coal screenings and is conveyed from outside storage bins by an electrically operated monorail crane, and deposited in hoppers in front of the boilers, from which it feeds by gravity to the chain grates. The ashes are deposited into self-dumping buckets, which are conveyed to a standard flat-car outside of the power house by means of the same monorail crane which handles the coal.

The high-pressure steam line contains two 12-inch headers, one located in the boiler room and one in the engine room, connected together at three points, and provided with valves placed in such positions as to enable any part of the pipe line to be made dead for repairs without in any way interfering with the operation of the plant. The whole pipe line is covered with 2½ inches of 85 per cent. magnesium pipe covering.

The engine room contains two 1,250 kv.a., 3,600 r.p.m., 2,200-volt, 3-phase, 60-cycle generators, driven by Curtis turbines. To each turbine is connected a jet condenser with motor-driven vacuum and circulating pumps. There are also three 35 kw., 3,600 r.p.m., 120-volt, d.c. exciters, driven by steam turbines operated non-condensing, and one 25 kw., 1,200 r.p.m., 125-volt, d.c. exciter, driven by a 35-h.p. induction motor.

The switchboard is of blue Vermont marble and contains twenty panels, which include the generator and exciter panels and also the panels for the feeders going to the various sub-stations in the dock yard. The power house cables are all varnished cambric, lead covered, run in conduit.

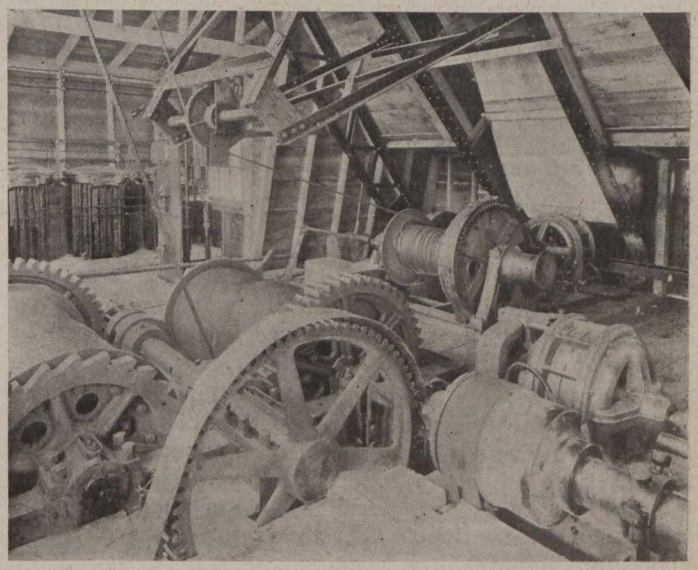
The engine room also contains a cross compound condensing air-compressor of 1,500 cubic feet per minute capacity. This supplies air to the various buildings in the dock yard. There are also two Platt Iron Works' duplex fire pumps, each with a capacity of 1,000 gallons per minute. These pumps are located in the basement and are connected to take salt water from the harbor or fresh water from the mains. They can be used as auxiliary boiler feed pumps and also to furnish water for the condensers if necessary. The engine room is equipped with a 15-ton travelling crane, which is of sufficient capacity to handle the heaviest part in the station.

The carpenter shop and ship-building shed is a steel and wood structure, 160 ft. wide, 300 ft. long and 116 ft. high, the ship-building part having an overhang of 80 ft., giving a clear space, under cover, 80 x 300 x 75 feet high. There are two 10-ton travelling cranes on this overhang, each operating over an area 40 x 300 feet. The other half of this building is used, downstairs as a carpenter shop, and upstairs as a ship hull pattern loft. The ship hull pattern loft has a floor space 80 ft. x 300 ft., entirely clear of columns or obstacles of any kind. It contains the wood-working machines, tool grinders, etc., necessary in a plant of this kind.

All the other buildings are of steel frame construction, with roof and floors of reinforced concrete. The entire equipment is of the most modern type, and the machinery installed is capable of handling the heaviest and largest repairs that may be required upon any vessel operating on the Pacific Coast.

In laying out the general plan for the present site, the possibility of future shipbuilding development was carefully considered, and, while the construction of steel vessels will not materialize for some time to come, it was nevertheless deemed advisable to construct buildings of a permanent nature. The broadside system of launching has been provided for.

The Pier Derrick.—The pier derrick stands on a piling and concrete foundation, and has a capacity of 50 tons at an outreach of 61 ft. 3 in. from the centre of the turning point, giving an outreach of 40 ft. beyond the end of the pier. The centre of the upper hoisting sheave is 100 ft. above mean high water. The derrick elevates 50 tons at a rate of 10 ft. per minute, and by changing gears, 25 tons at a rate of 25 ft. per minute. The hoisting apparatus is operated by a 52-h.p. variable speed motor, with reversing controller. The racking in and out is accomplished by a heavy steel screw, operated by a separate 52-h.p. variable speed motor, with reversing controller. There is also a 5-ton auxiliary hoist provided, operated by a 35-h.p. variable speed motor with reversing controller. The hoisting apparatus of the main derrick is 1¼-in. steel cable running through two 4-sheave blocks, each end being led to a separate drum. It is capable of removing



Interior View of 50-ton Pier Derrick.

or installing the heaviest pieces of machinery from or to the holds of any vessels in Northern Pacific waters. It is also used to transfer material from vessels lying at the dock to cars upon the pier.

Progress of Work.—Work was commenced in April, 1912, and the whole plant was started up in August, 1915, and within a few days, the wrecked vessel "Delhi" was successfully docked on the middle section. The isolated position of Prince Rupert naturally delayed the progress of the work, the nearest supply base being six hundred miles distant. To facilitate the erection of the complete plant, the structures first built were utilized in constructing the remaining buildings and docks. The first work to be completed was the pier and launching platform, followed by the erection of the power house and the installation of the necessary equipment. After the completion of the engineering and administration buildings, the final work of constructing the floating dry dock was accomplished, and the operating machinery erected.

Charles Crowell is the general manager of the dry dock. The engineers who designed the work and had charge of construction, were William T. Donnelly and Frank E. Kirby, of New York City. The resident superintending engineer was J. H. Pillsbury, of Prince Rupert.