capacity, carried by the roof trusses. From this point the oil is delivered automatically as required to the filter tank adjacent to the engine.

The engine room is equipped with an 8½-ton hand-power crane with a 25-foot lift. The crane has a two-speed hoist and a hand-operated brake, and was supplied by the Whiting Foundry Equipment Co., Harvey, Ill.

The Diesel Engine.—The engine is the largest Diesel engine in Canada, and, as far as we have been able to ascertain, on this continent. It is a 4-cylinder, 615-h.p., Willans-Diesel, designed and constructed by Willans and Robinson, Limited, Rugby, England. It is of the inverted vertical open forced-lubrication type. Its cylinders are single-acting and work on 4-stroke cycle. The normal speed is 180 r.p.m. The engine is guaranteed for a 10% overload for two hours—it was, however, operated for four hours at this overload during the test, carrying its load with ease, and without extra attention.

Some features of the design of this type of engine deserve special mention. The crank-chamber is of the "A" frame type, favored by the makers owing to its adaptability to ready alterations to component parts, everything from the cylinder crown downwards, with the exception of the bed-plate and crank shaft, being identical for engines of from one to four cylinders. It is claimed also that this form permits of easy removal of cylinder, etc.

The cylinder wall is in the form of a tube, which is pressed into the single casting that forms the frame and the water-jacket casing.

The cylinder liner and head are held in position in the framework by studs screwed into the flange formed at the top of the water-jacket casing. These studs, passing through the cylinder head in which is formed the male portion of the tongue and grooved joint, serve also to hold the liner against a shoulder in the flange. Otherwise the liner is free to slide in the two bearings at the centre and base of the jacket casing.

The valves are opened and closed by cams and springs respectively. The cams are keyed on a horizontal shaft driven by an upright shaft and screw gearing from the compressor end of the crank shaft. The exhaust valve levers are in two parts to facilitate the examination of the valves, and the cylinder covers are so designed that the fuel valves are accessible without removing the levers which open them. None of the valves are water-cooled, but the jacket of the exhaust valve casings extend around the valve spindle guides. It is noticeable that the usual order of adjustment on the valve tappets is reversed in this engine. When the valve is on its seating, clearance is to be found between the cam and cam roller, rather than between the valve and operating arm. This is due to the design of the air and exhaust valve levers.

The cam shaft is supported by brackets bolted to the cylinder jacket casting. The bearings are ring-lubricated.

The piston is made of two castings, bolted together. The parts exposed to high temperatures are oil-cooled, by the forced-lubrication system, which is also employed for the crank shaft and connecting rod bearings. A gear pump of drum type, driven by a screw gearing, is located in the base of the engine. Oil is conducted from the main bearings through the drilled crank shaft, and from the crank end to the piston end of the connecting rod by a small pipe and thence to visible discharge cocks. Copious flooding of the cooling chamber in each piston is maintained through trombone tubes by the same oil pump. To prevent destruction of the lubricating qualities of the oil by excessive heating, the system is provided with two tubular coolers arranged in series.

There is one fuel pump, which discharges into a distribution box fitted with four outlet valves, one for each cylinder, adjustable by hand. The governor, which is mounted on the upright shaft between the crank and cam

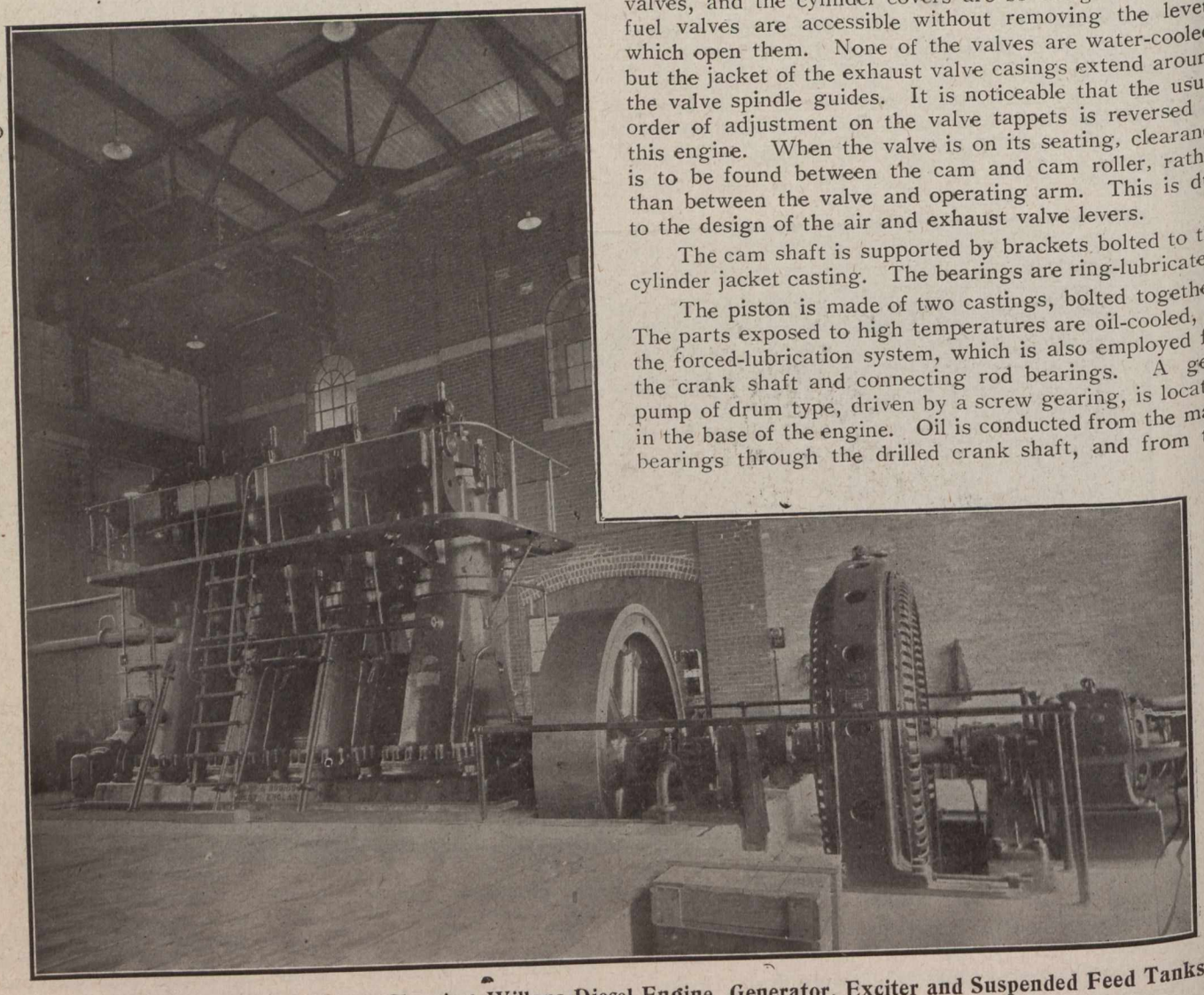

Fig. 2.—Interior of Power House, Showing Willans-Diesel Engine, Generator, Exciter and Suspended Feed Tanks.