STEAM AND HYDRAULIC MACHINERY.

For many years Messrs. W. H. Allen, Son & Co., Ltd., of Queen's Engineering Works, Bedford, England, (and who are now represented in Canada by Messrs. Chapman & Walker, of Toronto) have occupied a prominent position as makers of high-speed vertical steam engines, steam condensers and their accessories, centrifugal and turbine pump and water power turbines. We therefore give below an illustrated account of some of the types of machinery just referred to which is certain to prove of interest to our readers, especially as Messrs. Allen's engines and pumps are to be found on all the leading ships in our navy, and on practically all the largest liners afloat.

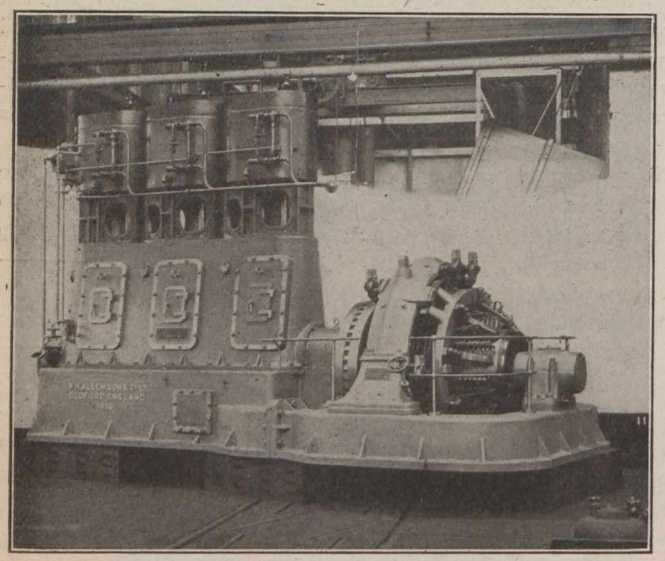

Fig. 1.

Engines.—These are built in both the open and the enclosed high-speed types. The enclosed high-speed engines are of the vertical forced lubrication type, the oil being supplied under pressure by a small valveless plunger pump driven direct from one of the main eccentrics. The cylinders stand upon a massive cast iron trunk, which completely encloses the working parts, the whole resting on a substantial cast-iron box section bedplate containing the oil pump, reservoir and filter, to which oil is supplied under pressure to the various working parts.

These engines are exceedingly neat in appearance and occupy the minimum floor space for the power developed, and are designed for use in connection with electric driving, and have been installed in large numbers in many of the leading British power stations where they are called upon to run for many months at a time without a stop.

The governor is of Allen's standard crankshaft type, and is fitted at one end of the crankshaft. It operates a double beat throttle valve situated next to the high-pressure valve chest. Hand gear is also provided by which the speed of the engine can be regulated while running through a considerable range above and below the average speed. A tachometer is fitted in close proximity to this wheel, which indicates the speed of the engine.

Figure 1 shows a three-crank compound high-speed enclosed engine in which the three cylinders are cast separately with their valve chambers.

The stuffing box packings, except where otherwise specified are of special metallic type.

Special care has been devoted by the makers to the question of balancing, the arrangement of the cranks and the disposition of the weights of the various parts being such as to ensure the very least possible amount of vibration. In the larger engines, especially those of the 3-crank type, both compound and triple expansion, special balancing weights are attached to the crankshaft, thereby reducing the unbalanced forces and couples to their least possible values.

Condensers.—For many years Messrs. W. H. Allen, Son & Co., Ltd., have made a specialty of condensing plants, and have built surface condensers together with air-pumps and circulating pumps, arranged to be driven either electrically or by steam, up to the very largest sizes required for modern power plant.

The condenser body and the water box are usually made of cast-iron, the tube-plates of rolled brass and the tubes solid drawn brass and fixed in the tube plates by means of tape packings and screwed brass ferrules.

The circulating water is drawn through the tubes by means of one of the "Conqueror" type centrifugal pumps either electrically or steam-driven, and the condensed steam and air are removed by means of an Allen-Edwards air-pump, which may be a single-cylinder, twin, or triple, according to requirements. Where the condensed water has to be delivered to a hot-well at a considerable height, an extra water force pump is provided for this purpose to relieve the air-pump valves of any water pressure.

The covers of the condenser water box are fitted with inspection doors, through which the water boxes can be cleaned.

The top of the condenser body is also fitted with a soda cock through which soda solution can be admitted to the condenser for the removal of any grease from the surface of the tubes.

Figure 2 shows a steam driven surface condensing equipment arranged to deal with 66,000 lbs. of steam per hour and maintaining a vacuum of 28 in. of mercury, with the barometer at 30 in.

The company also construct jet-condensers of a variety of patterns specially adapted to suit local conditions.

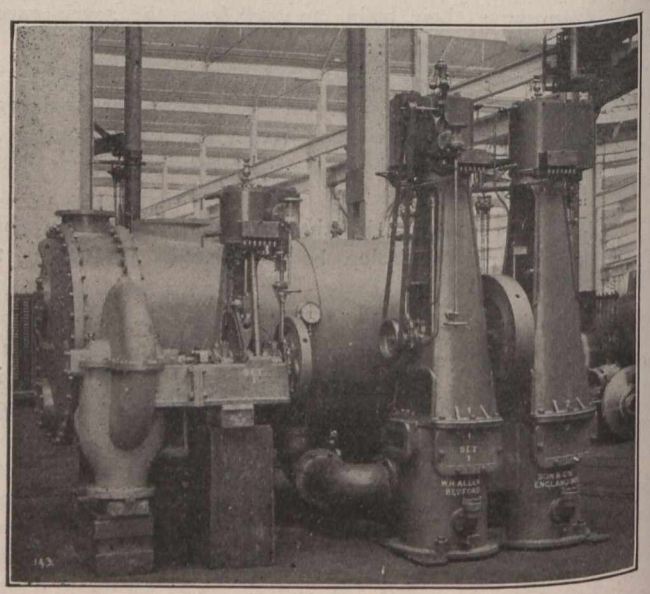

Fig. 2.

Centrifugal Pumps.—These pumps are particularly well adapted for conditions where the plant is required to run for long periods with the minimum of attention, and where limited space only is obtainable. Furthermore, with their large experience, Messrs. Allen have been able to continually improve the design of these pumps so that their efficiency is now brought to the very highest possible figure, while the design of the various parts has been improved along with the production of various improvements in the materials available for construction.