

anxiety which has existed in the past with respect to boiler-pressures. The Department, up to the year 1909, determined the safe working-pressure of all marine boilers from the Board of Trade Rules. The Board of Trade Rules, however, are only compulsory in Great Britain for the boilers of vessels carrying more than twelve passengers; consequently most of the cargo-boats coming here had boilers built to Lloyd's rules or the rules of some other private surveying body. The pressures granted by these societies were generally higher than would have been allowed by the Board of Trade Rules. Having regard, therefore, to the freedom from explosion of the boilers of cargo-ships, the Department agreed to accept special scantlings as sufficient for these boilers. With the standardization of the rules all boilers of equal pressures will have equal or heavier scantlings. It is surprising, when one thinks of the practical benefits of standardization, that it has taken so many years to frame standard rules. The rules which we now have are no doubt the result of the getting-together of specialists in engineering-design to assist the Empire in the late war. Uniformity of design was one of the means used for the speedy building of ships.

The rules for determining the diameters of shafts for internal-combustion engines for marine purposes will be applied to all engines constructed after the 1st July, 1921. In August last copies of the rules were forwarded to the District Inspectors of Machinery, who are also Surveyors of Ships, for distribution to engine-builders, &c., and to others to whom the rules are of special interest, to enable them to make timely arrangements to comply with the rules.

The question as to how often propeller-shafts of steamships should be withdrawn for examination has recently been under consideration. The practice heretofore has been to withdraw them every two years. In future only those shafts not having continuous liners fitted will require to be withdrawn every two years. Shafts with continuous liners are to be withdrawn every three years.

New regulations have been received from the Board of Trade dealing with the bilge-pumping arrangements in passenger-steamships. The new regulations are to be substituted for paragraphs 80 to 83 of the "Instructions as to the Survey of Passenger-steamships" issued in 1913, and are to be considered as forming part of these instructions. Every passenger-steamship whose keel is laid after the 1st January, 1921, is required to comply fully with these instructions. The rules apply to foreign-going ships, home-trade ships, motor-ships, and open launches. Detailed instructions are given respecting the following matters: Arrangement of bilge-pipes, diameter of bilge suction-pipes, valves, cocks, &c., mud-boxes and strum-boxes, sounding pipes and pumps. Main bilge suction-pipes are required to be not less than $2\frac{1}{2}$ in. bore, and no branch pipe is to be less than 2 in. in bore or need be more than 4 in. bore. For small vessels employed in the home trade a concession is allowed in the minimum size of pipes; the diameter of pipes is determined from a formula taking into consideration the length and breadth of the vessel, the moulded depth of the bulkhead deck, and the length of the compartment.

SURVEY OF STEAMSHIPS AND AUXILIARY-POWERED VESSELS.

Seven hundred and thirty-two steamships and auxiliary-powered vessels were surveyed. Only one vessel of over 25 tons gross was completed in the Dominion this year. This vessel is the ketch "Motu," a light-draught scow built to carry cargo below hatches. Her dimensions are 99.1 ft. in length by 24.9 ft. breadth and 7.6 ft. depth. Her gross tonnage is 197 and her register tonnage 169. The hull is diagonally lined. The lining and outer planking are of kauri sheathed with totara.

New propelling-engines were fitted into twenty-five vessels. Sixty-six vessels had new tail-shafts, six had new stern-tubes, fourteen had new propellers, four had new propeller-blades, and one had a new propeller-boss fitted. In six vessels new crank-shafts or parts of new crank-shafts had to be fitted. Two vessels had new donkey-boilers installed, and the donkey-boilers of three vessels had to be reduced in pressure. The working-pressure of the main boiler of one vessel was reduced on account of the propeller-shaft, which was found to be too small to carry the boiler-pressure. Three vessels were converted from sailing-vessels to oil-engine vessels, and one vessel from a steam-vessel to an oil-engine vessel.

The particulars of the repairs carried out to a few vessels are as follows:—

S.s. "Ahuriri."—This vessel's hull was repaired as follows: Sheathing-plates were riveted on the forefoot, starboard side, 3 ft. 6 in. by 2 ft. 6 in. by $\frac{3}{16}$ in., and on the starboard bilge amidships 8 ft. by 2 ft. 6 in. by $\frac{3}{16}$ in. Three hundred rivets were renewed in the port scupper-plate amidships. A new plate, 7 ft. by 3 ft. 6 in. by $\frac{1}{4}$ in., and a new frame were put in under the boiler. In the port bunker an angle-plate and covering-strip were renewed. The boiler-mountings were overhauled. A new blow-down cock was fitted. The main and auxiliary steam-pipes were tested by hydraulic pressure. The high-pressure cylinder was bored out, and a new piston and rings were fitted. The air-pump liner was also bored out, and a new bucket and valves were fitted. Ten holding-down bolts were renewed in the engine-bedplate. The steering-gear chains were renewed, also three guide-blocks for the chains. Repairs were carried out to the windlass and winch.

S.s. "Apanui."—This vessel was surveyed on the slipway, where No. 2 plate of C strake on the starboard side was sheathed with a $\frac{1}{4}$ in. plate, approximately 18 in. by 8 in. On the starboard bilge 36 ft. by 10 in. by $\frac{1}{4}$ in. of sheathing-plates were riveted on, and B strake under the after hold was sheathed with a plate 3 ft. 8 in. by 18 in. by $\frac{1}{4}$ in. On the port side No. 3 plate of C strake was sheathed with a plate 6 ft. by 3 ft. by $\frac{1}{4}$ in., and 12 ft. by 10 in. by $\frac{1}{4}$ in. of sheathing was renewed at the bilge. Several rivets were renewed in various parts of the hull. Two frames in the chain-locker and four in the after-peak tank were reinforced with angle-steel, and several slack rivets in the after-peak tank were renewed. The tank was tested by water-pressure. The boiler and machinery were thoroughly overhauled. The stern-bush was renewed. New cylinders were fitted to the windlass. The defective steering-chain was renewed, also the rudder-pintles. The rudder-gudgeons were rebushed. The buoyancy-tanks were removed and tested, and two that were found leaking were