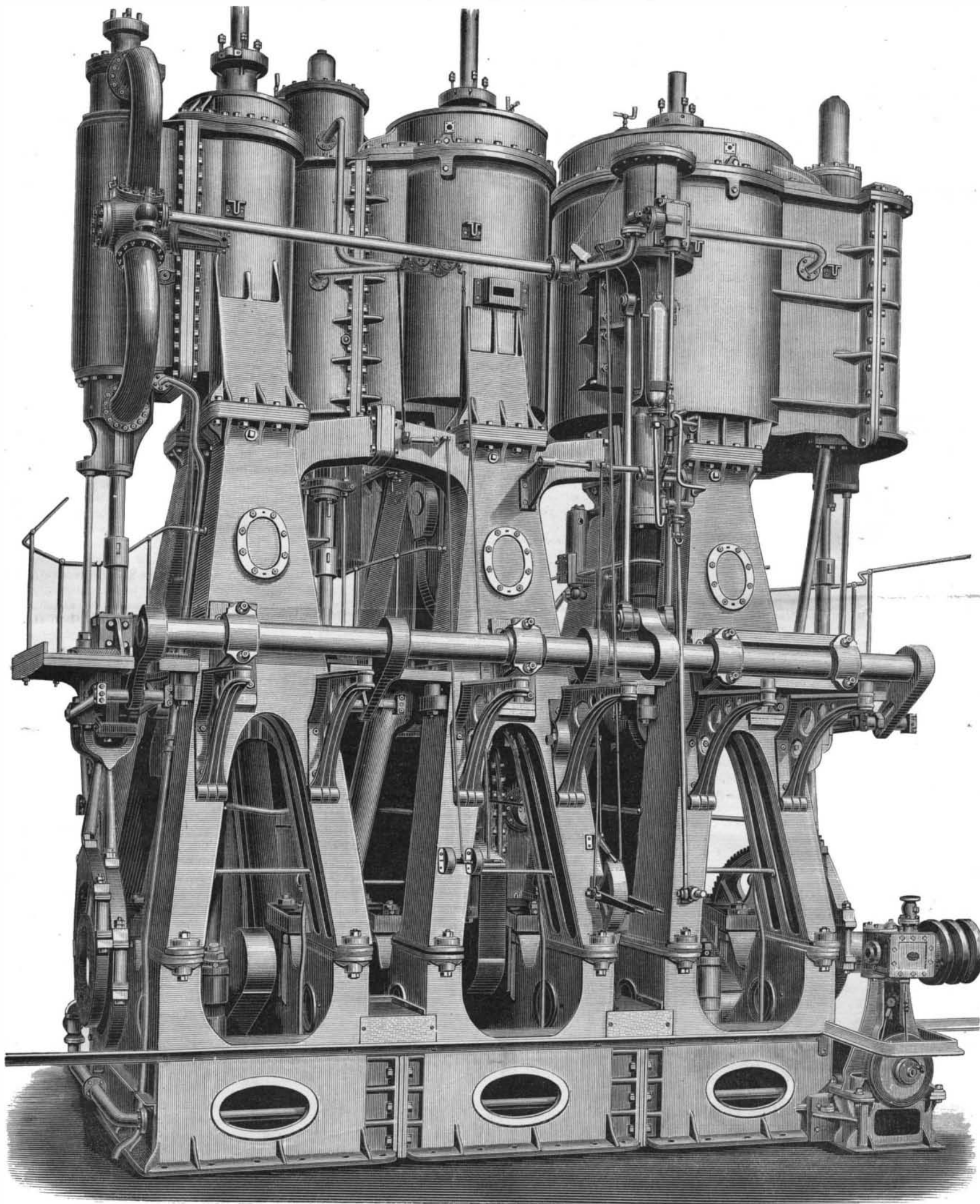


**TRIPLE EXPANSION ENGINES.**

We illustrate a very excellent example of expansion engines, designed by Mr. Kirk, of the firm of R. Napier & Sons, Glasgow. These engines were built for the steamer Aberdeen, one of those large vessels belonging to Geo. Thompson & Co., designed for long voyages, such as the line between England and Australia. For such voyages, the fuel economy is of the greatest importance.

indicated horse power. The next trial was to find the maximum speed, which on four runs on the measured mile, occupying two hours, was 13.74 knots, the mean power being 2,631, and the consumption of coal during these two hours being 1 ton 17 cwt. per hour. The weight of steam condensed in the jackets, carefully measured into a tank, was 3¼ degrees per cent of the greatest weight of steam admitted to the high pressure cylinder, by diagram, the pressure on the jacket of the

of steel, with six of Fox's corrugated furnaces in each, the total heating surface being 7,128 square feet. There is no superheater. The construction of these boilers for so high a pressure—125 lb. per square inch—was facilitated by their being built of steel and to Lloyd's, whose rules allow the shells to be made thinner than required by the Board of Trade, although the internal parts are as strong as those required by the latter. After all, the shell is the simplest and strongest part of

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The Aberdeen is a ship built of iron, both ship and engines being of the highest class at Lloyd's, 350 feet long by 44 feet by 33 feet. When the ship was complete, 2,000 tons of dead weight were put on board, and arrangements were made to test the consumption on a six hours' run at 1,800 horse power; this, however, by the owner's desire, was reduced to four only. The coal was Penrikyber Welsh coal, and Messrs. Parker & Dunlop, who happened to be on board, kindly undertook to examine the state of the fires, and see the coal weighed. The result was a consumption of 1.28 lb. per

middle cylinder being 30 lb., and on the low pressure cylinder 10 lb. In a second experiment the condensed water was still the same percentage when the pressure in each jacket was doubled. The loss of steam from the high pressure cylinder to the low pressure, just before release, plus the steam condensed in the jackets, was the same as took place inside the cylinders with the steam shut off from the jackets.

The cylinders of the Aberdeen are 30 in., 45 in., and 70 in. by 4 ft. 6 in. stroke. The boilers, two in number, are ordinary double-ended boilers, constructed entirely

a round boiler, where, even if built to Lloyd's, there is superabundance of strength; but to doubly insure success—the internal parts of a boiler being those which oftenest give trouble—they were made stronger than required by either Lloyd's or the Board of Trade, whose scantlings for these parts are practically the same. The high pressure cylinder was not jacketed, the second was jacketed with steam of 50 lb. pressure, and the low pressure one with steam of 15 lb. above the atmosphere. We are indebted to the *Engineer* for our engraving and these particulars.