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## ENGINES OF STEAMSHIP PARISIAN.

We illustrate an example of one of the latest types of English marine engines, as built by R. Napier & Sons, Glasgow, such as are used on their ocean-going ships. The vessel which these engines propel is 450 feet long and 46 feet wide, and has 10,000 tons displacement.

As will be seen, the engines are vertical compounds, of the "tandem" type; that is, with the cylinders in line with the keel.

There are one high-pressure and two low-pressure cylinders, which are 60 inches and 85 inches respectively, with 5 feet stroke of piston. The crank shaft is of steel, 20

inches diameter, while the crank pins are 21 inches diameter, by the same length. Steam of 75 pounds pressure is used.

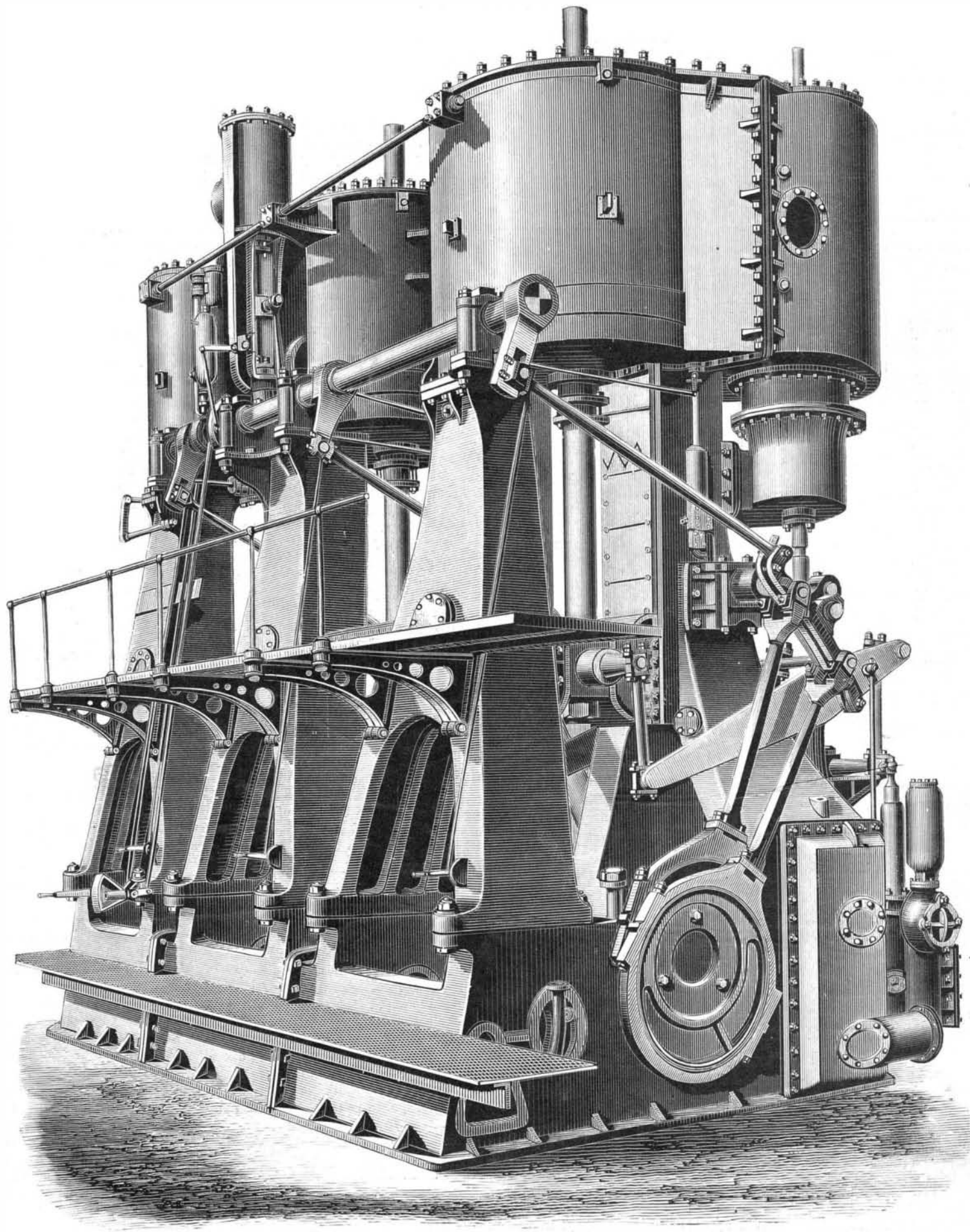
The general arrangement of the engines is well shown in the engraving, so that we need add but little by way of explanation. The valves are of the piston variety, and are worked by a link motion, which is peculiar in some details, especially the rock shaft and levers which connect the link motion with the valve stems.

These engines are handled for reversing or going ahead by a single steam cylinder which is located behind the central main cylinder, connecting directly by a rod with the

reverse shaft, the arm of which is shown in the extreme left of the engraving, and the air pumps are worked directly from the cross head of the main engines instead of a separate engine.

With the propeller blades four feet out of water (owing to light draught of the ship) these engines were run at 85 revolutions per minute, at which speed they indicated 6,020 horse power.

This is very high piston speed for such large pistons—850 feet per minute—and it shows to what perfection modern workmanship has attained when it is possible for even a short time.—*Engineer.*



COMPOUND "TANDEM" ENGINES OF STEAMSHIP PARISIAN.