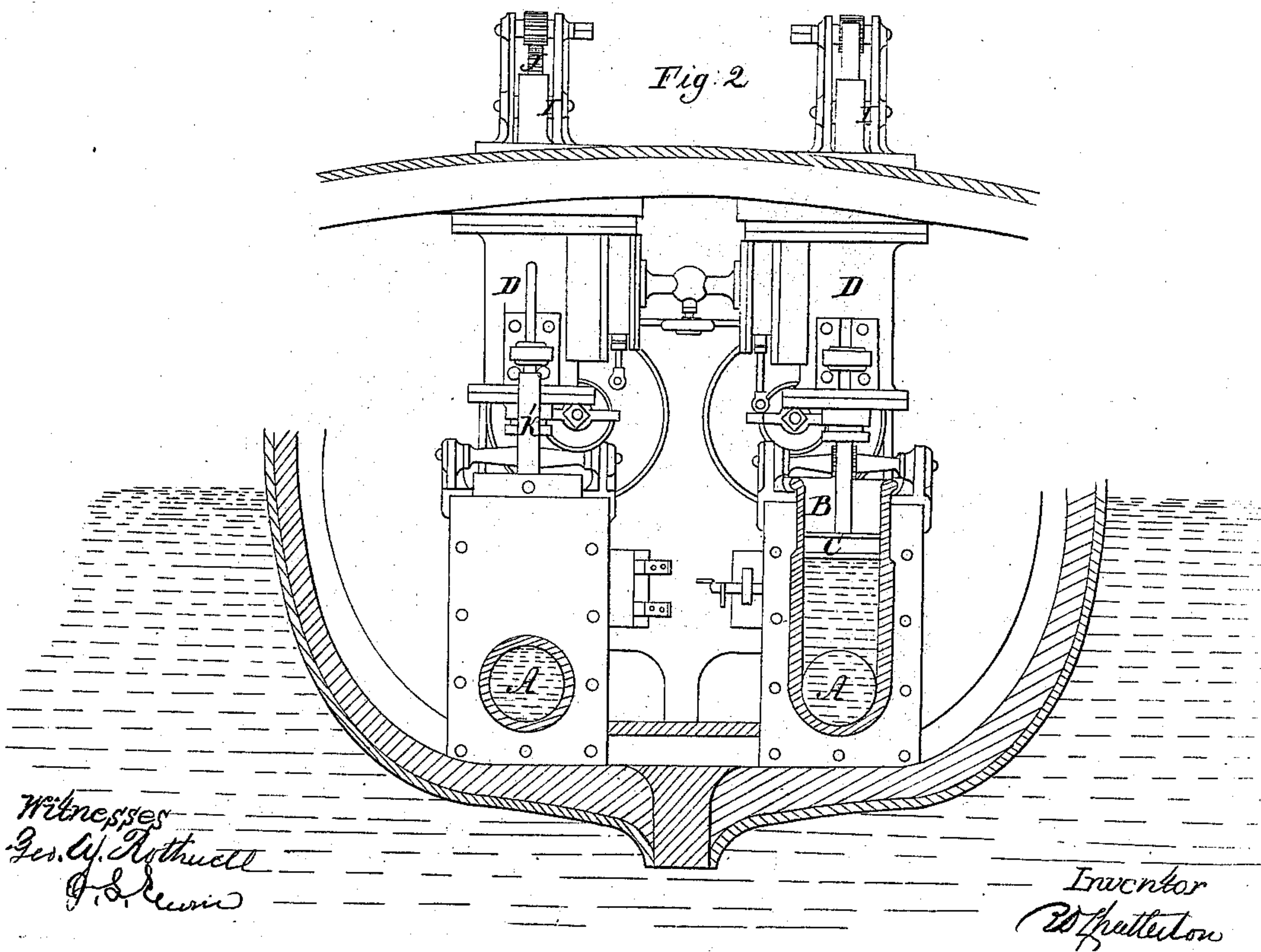
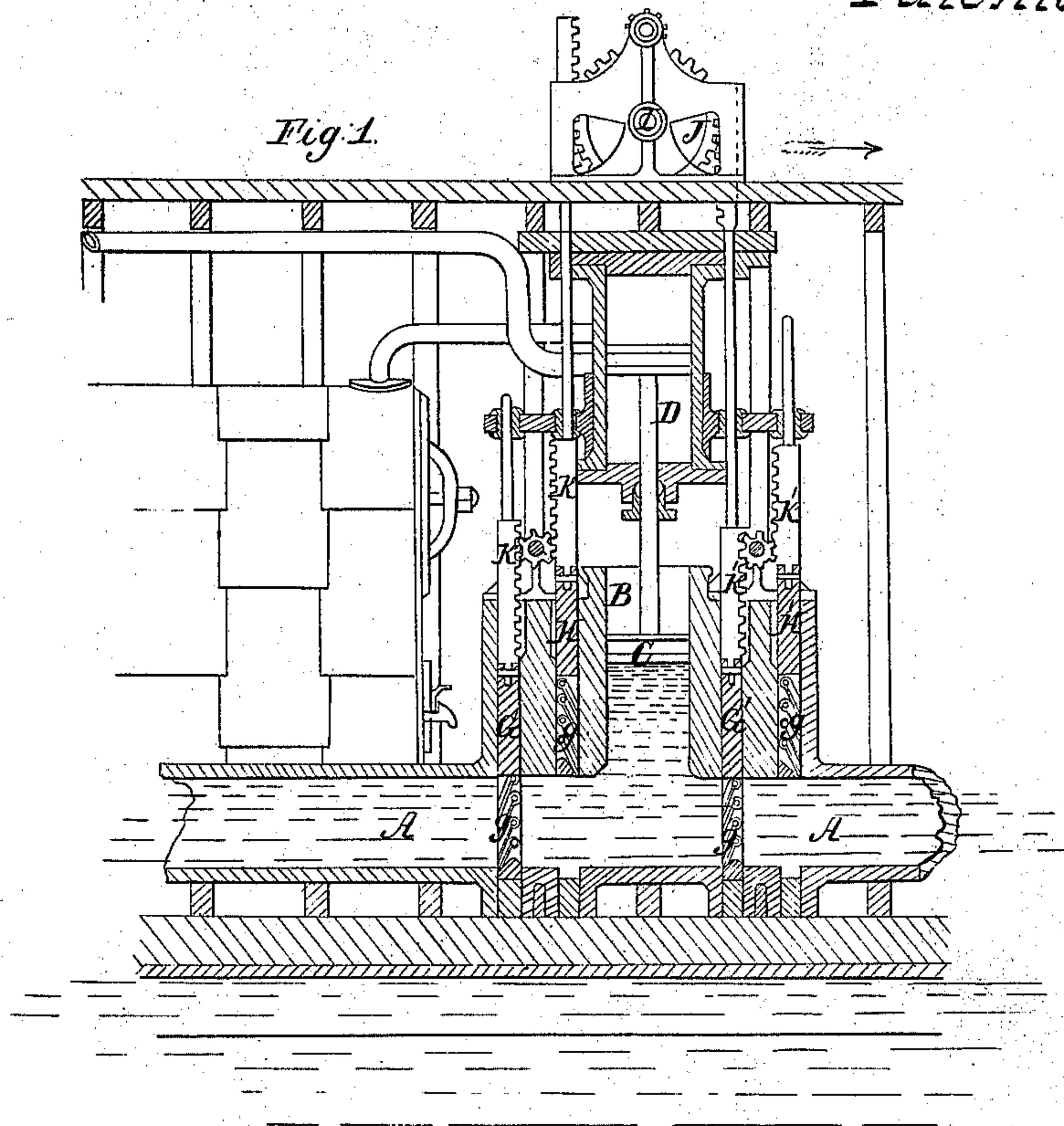


R. D. Chatterton,
Hydraulic Propeller
N^o 62,723. *Patented Mar. 5, 1867.*



Witnesses
Geo. W. Rothwell
J. D. Lewis

Inventor
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RICHARD D. CHATTERTON, OF BATH, ENGLAND.

Letters Patent No. 62,723, dated March 5, 1867.

IMPROVED PROPELLER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, RICHARD D. CHATTERTON, of Bath, in the county of Somerset, and United Kingdom of Great Britain and Ireland, have invented a new and improved Mode of Propelling Vessels; and I do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable one skilled in the art to which the invention appertains to make use of it, reference being had to the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a longitudinal vertical section.

Figure 2 is a transverse vertical section.

A pipe or pipes being laid longitudinally through the vessel, below the water line, a steam pump is employed in connection with each to admit the water forward and discharge it aft. Valves are arranged to restrain the flow of water to the desired direction. Forward and abaft each pump are two sets of valves, opening in different directions, one or the other being brought into use according to the desired direction of motion, forward or astern. The reversal is performed by simultaneous shifting of the valves, the motion of the pump being continuous, and the water being discharged in the wake of the vessel. Each pipe is thus provided with four valved diaphragms, the valves of two opening forward and those of the other two aft. The reversal of the direction of motion necessitates the simultaneous motion of all. The respective valves of a given pair are connected by racks and pinion so as to move in contrary directions, and the respective pairs are connected by racks and a spur-wheel, so as to make the operation of reversal simultaneous forward and abaft the pump.

In the drawings, A A are pipes laid longitudinally of the vessel, below the water line, and as they are counterparts, I shall describe one alone, merely stating, first, they may discharge alternately, so as to make the discharge practically continuous; second, they may be worked in contrary directions, so as to turn the vessel; third, one or more may be used at discretion. Communicating with the interior of tube A is a pump-chamber, B, in which reciprocates a plunger, C, worked by a steam engine, D, which, having no particular points of novelty, I do not desire otherwise to describe than that it has a direct action. The vessel is supposed to be moving in the direction of the arrow, fig. 1, which may be considered as the forward direction. The diaphragm G is down, and has self-acting valves, *g g*, which open towards the rear, and admit water to flow aft through the forward portion of the tube so as to supply the pump-chamber on the upward stroke of the plunger C, the water on the rear portion of the pipe A being prevented from coming forward, as the valves in the diaphragm G' do not open in that direction, so that the water only comes in from the front as the plunger rises. When the plunger C descends, the valves in diaphragm G' are closed against its passage forward, and the valves in diaphragm G open and admit its passage aft. As the pressure in the pipe A meets with the resistance of the diaphragm G' the vessel is urged forward, the water escaping aft to the extent of the displacement of the plunger C, on the familiar principle known as reaction, and demonstrated in the turbine water-wheel and other mechanical devices.

The operation in brief may be described as follows: In the downward stroke of the piston, the self-acting valves in the diaphragm G' close, the pressure against them within being then greater than from without, and the ship, with its tube A, and column of water therein, is urged forward with a force proportionate to said pressure, said pressure being simultaneously and equally exerted against the column of water in tube A, abaft the diaphragm G, which was previously travelling with the ship. The up-stroke of the piston is effected by pressure of the water from the bow (through the forward portion of tube A) opening the valves to admit the requisite fresh supply for the pump-cylinder, and no adverse current is created, as the direction of the water is from the bow aft, or at least from that end of the vessel which is in the advance at the particular time. Again, the cumulative force of the descending piston is exerted upon the column of water in the rear portion, for the time being, of tube A, which, in the character of an eddy, is flowing with a momentum equal to that of the ship; and not, as with the paddle or screw, upon the outside water, which, relatively to the ship, is passing aft constantly. The diaphragm G connects by a rack and pinion with the rack of the valved diaphragm H, so that as the former is raised the latter is lowered; the same is true of the valved diaphragms G' H', and these duplicate sets are moved by the rotation of the shaft I, which rotates the wheel J, and elevates and depresses respectively the racks K K', according to the direction in which it is turned. When the valved diaphragms

H H' are lowered, G G' are raised, and the water flows in the other direction, as the plunger reciprocates in its chamber, having the effect of driving the vessel astern, the reversal being made by a simple motion of the crank by the officer on deck. The reversal may be effected either by elevating rods attached to the diaphragms and moved by cog-wheels, as shown in the drawings, by chains and pulleys, or equivalent devices.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The arrangement of the valved diaphragms G G', in the tube A, constructed as described, and operated simultaneously by means of a connecting device of rack and wheel, or equivalent, for the purpose specified.

2. The arrangement of the valves G G', H H', the racks and pinions, and the reversing apparatus I J K, or equivalent device, as set forth.

3. I claim the combination, with the longitudinal tube A, of the direct-action engine, and pump acting between valved diaphragms, connected for simultaneous adjustment and reversal, substantially as described.

R. D. CHATTERTON.

Witnesses:

SOLON C. KEMON,

GEO. W. ROTHWELL.