

(No Model.)

J. BOND.
DEVICE FOR PROPELLING VESSELS.

No. 569,951.

Patented Oct. 20, 1896.

Fig. 1.

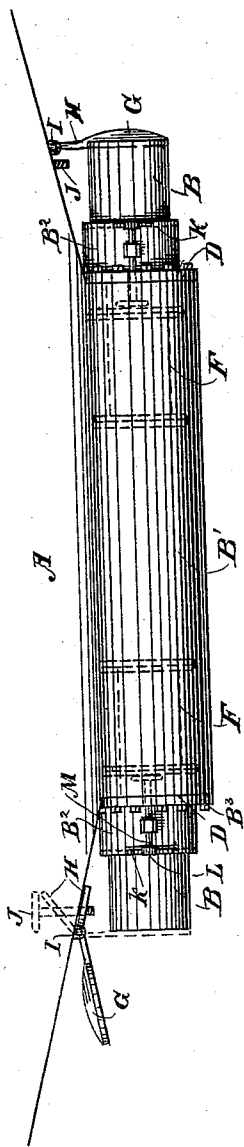


Fig. 3.

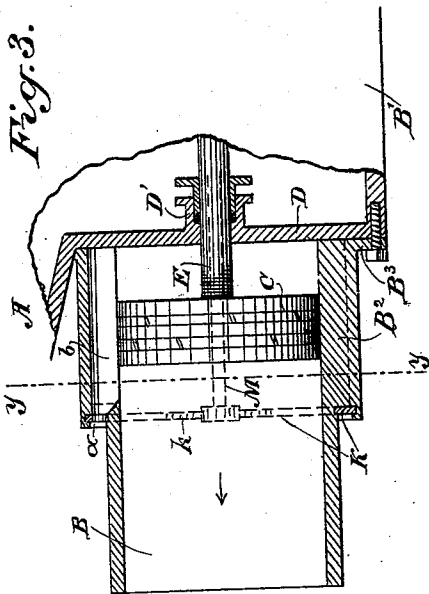
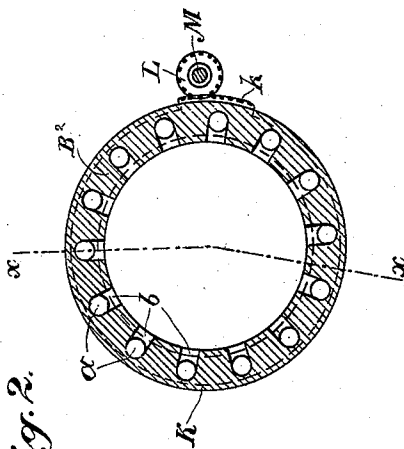


Fig. 2.



Witnesses,
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UNITED STATES PATENT OFFICE.

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DEVICE FOR PROPELLING VESSELS.

SPECIFICATION forming part of Letters Patent No. 569,951, dated October 20, 1896.

Application filed December 17, 1895. Serial No. 572,407. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOND, a citizen of the United States, residing at Turlock, county of Stanislaus, State of California, have invented an Improvement in Devices for Propelling Vessels; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in the propulsion of vessels; and it consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

My present invention is an improvement upon the device for which a patent was issued to me November 19, 1895, No. 550,037.

Referring to the accompanying drawings, Figure 1 is a general view of my propelling device. Fig. 2 is a section on line *yy*, Fig. 3, in the direction of the arrow. Fig. 3 is a section on line *xx* of Fig. 2.

The vessel A may be constructed in any suitable or well-known manner, having the floor properly formed to produce the least resistance when moving through the water. Beneath the floor of the vessel are the cylinders B, one at each end of a central compartment B', which latter is formed by a depression in the floor of the vessel. This central depressed portion serves to contain the engine-cylinders F F, which are essentially in line with the plunger-rods E, with which the engine-pistons are connected in any suitable or desired manner. The ends D of the central chamber B' are provided with stuffing-boxes, as shown at D', through which the plunger-rods E pass and by which a tight joint is formed.

The cylinders B are opened at the outer ends. At their inner ends they are surrounded by a cylinder B² of larger diameter, which forms a part of B, and this cylinder has a flange B³, by which it is bolted to the head D, thus making these cylinders practically a part of the central chamber B', but at the same time removable whenever it is necessary for any purpose. The annular head formed by the connection of the smaller cylinder B with the larger one B² has perforations or openings made in it, as shown at *a*, and these openings connect inside of the part B² with the interior of the cylinder B by slots

or channels, as shown at *b*. The object of this construction is to allow the piston to draw water in through these openings when making an outward stroke and to force it out when making an inward stroke.

The operation will then be as follows: The engine being set in motion, the plunger moving inwardly will draw water in through the open outer end of the cylinder, and when the plunger moves outwardly it forces the water out again through this outer end, and when the high piston-speed is maintained the momentum of this jet of water thus forced outwardly will act against the body of water in line with the cylinder and serve to propel the vessel in the opposite direction. As the piston C moves outwardly it produces a vacuum in the interior end of the cylinder, and water will thus be drawn in through the passages *a*, and the rear portion of the cylinder will thus be filled with water. When the piston returns in its stroke, it again forces this body of water out through the openings *a* and in the same direction with the opening in the outer end of the cylinder, thus again creating an impact of the jets of water against the body of water in which the vessel is immersed. By this operation it will be seen that both strokes of the piston serve to force the body of water outwardly and the apparatus becomes double-acting.

Whenever for any purpose it is desirable to close the openings to the cylinder, I employ gates for the purpose. The outer gate G is in the form of a disk or cone, of sufficient diameter to cover the exterior opening of the cylinder, suitably braced and having a lever-arm H fulcrumed at I and extending to a point within the vessel or a chamber therein, by which arm it may be actuated.

The inner end of the lever-arm H is connected with a screw or other actuating mechanism, as shown at J, by which it may be moved in an arc of a circle, so as to close against the outer end of the cylinder B. When it is opened, the disk G is swung up against the bottom of the vessel and entirely out of line of the cylinder.

In order to close the openings *a* in the cylinder B², I have shown an annular ring K, having holes made in it which are coincident with the holes *a* when the apparatus is in

condition to operate, but which, by a slight movement of the disk K, may be moved out of line with the openings, so that the unperforated portion of the ring will cover the holes 5 a and thus close the opening into the cylinder. This device may be operated in any suitable manner. A convenient way is here shown by forming a portion of the interior or exterior circumference of the ring K with 10 teeth k, which are engaged by corresponding teeth on a pinion L. This pinion is fixed to a shaft M, which extends through the head D to a point in the central chamber B' and by means of a hand-wheel or other connection fixed to the interior end the ring may 15 be turned to either open or close the passages a, the object being to temporarily prevent the water from entering the piston-chamber.

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

1. In a vessel, open-ended cylinders located below the bottom of the vessel essentially in line with each other, an intermediate engine-compartment, connections between the engines and plungers which are adapted to reciprocate in the outer cylinders, cylinders of larger diameter intermediate between the 30 outer ends of the plunger-cylinders and the central compartment having annular heads connecting them with the smaller plunger-cylinders, perforations extending longitudinally in annular series within said heads, 35 with transverse slots or channels connecting the perforations with the interior of the enlarged cylinders whereby the water is admitted to the interior end of the plunger-cylinders and expelled therefrom by each reciprocation of the plunger and water is admitted 40 to the outer end of the plunger-cylinders and

expelled therefrom by the opposite movements of the piston and gates whereby the end of the cylinder and the annular openings of the larger cylinder may be closed or opened. 45

2. In a vessel open-ended cylinders located below the bottom of the vessel, essentially in line with each other, other cylinders of larger diameter connecting with the inner ends of the first-named cylinders, with heads at their 50 junction, provided with an annular series of passages with slots or channels leading from said passages to the interior of the enlarged cylinders, plungers reciprocating within the smaller cylinders, a central engine-compartment and mechanism by which the plungers 55 are reciprocated, a perforated rotatable ring at the outer ends of the passages, and mechanism by which said ring is turned so that its perforations coincide with those of the 60 annular cylinder-head, or close them, as described.

3. In a vessel, a central engine-chamber located beneath the bottom of the vessel, open-ended cylinders of different diameters 65 extending in line with said chamber, plungers reciprocating in the outer and smaller cylinders and connected with the engines of the central chamber, annular perforated rings, and mechanism by which they are rotated over the openings in the heads of the 70 larger cylinders, and swinging gates and operating mechanism connected with a lever-arm thereon by which the outer ends of the smaller cylinders are closable. 75

In witness whereof I have hereunto set my hand.

JOHN BOND.

Witnesses:

S. H. NOURSE,
WM. F. BOOTH.