

(No Model.)

J. WIRTH.  
PROPELLING APPARATUS FOR VESSELS.

No. 448,810.

Patented Mar. 24, 1891.

Fig. 1.

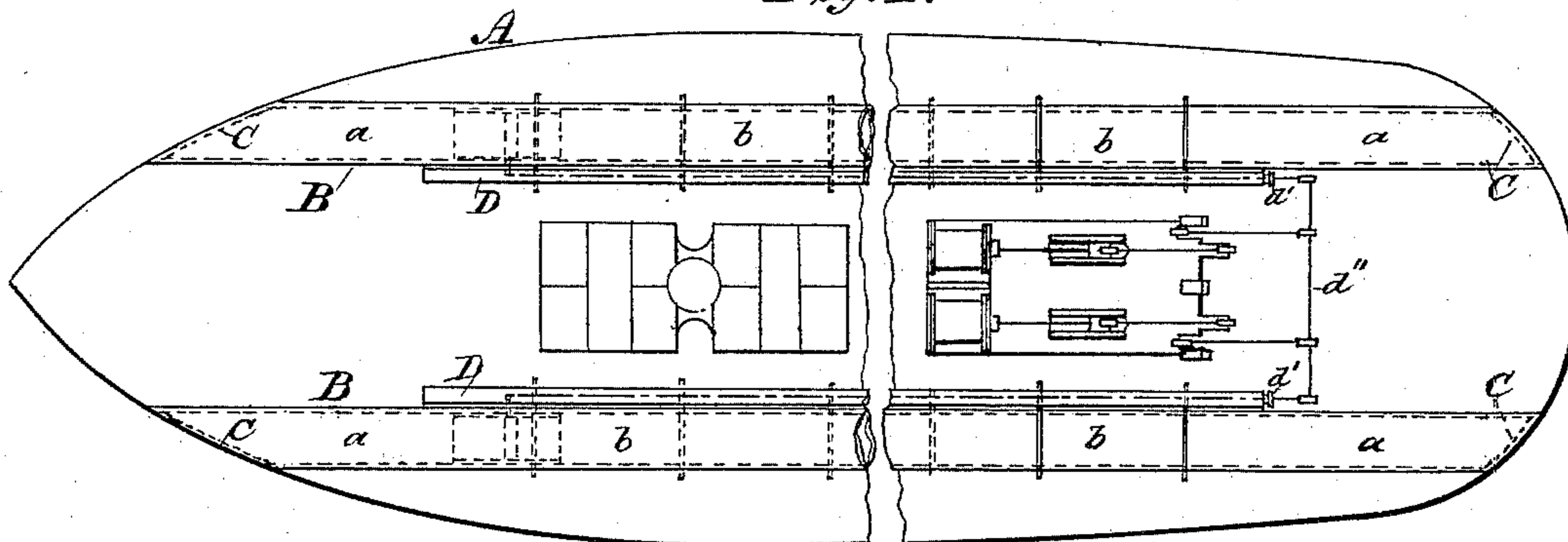


Fig. 2.

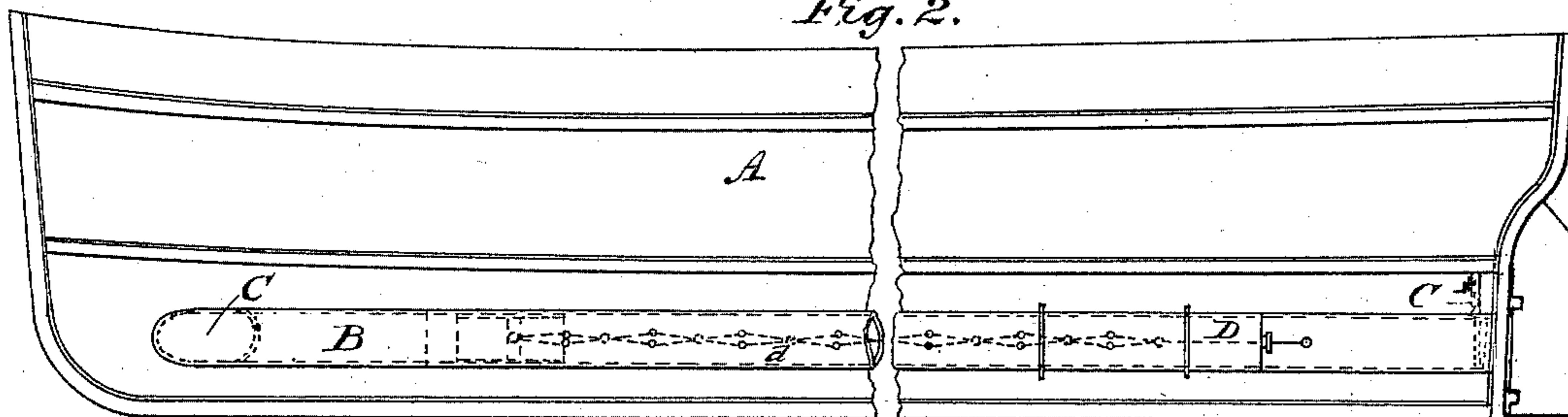


Fig. 3.

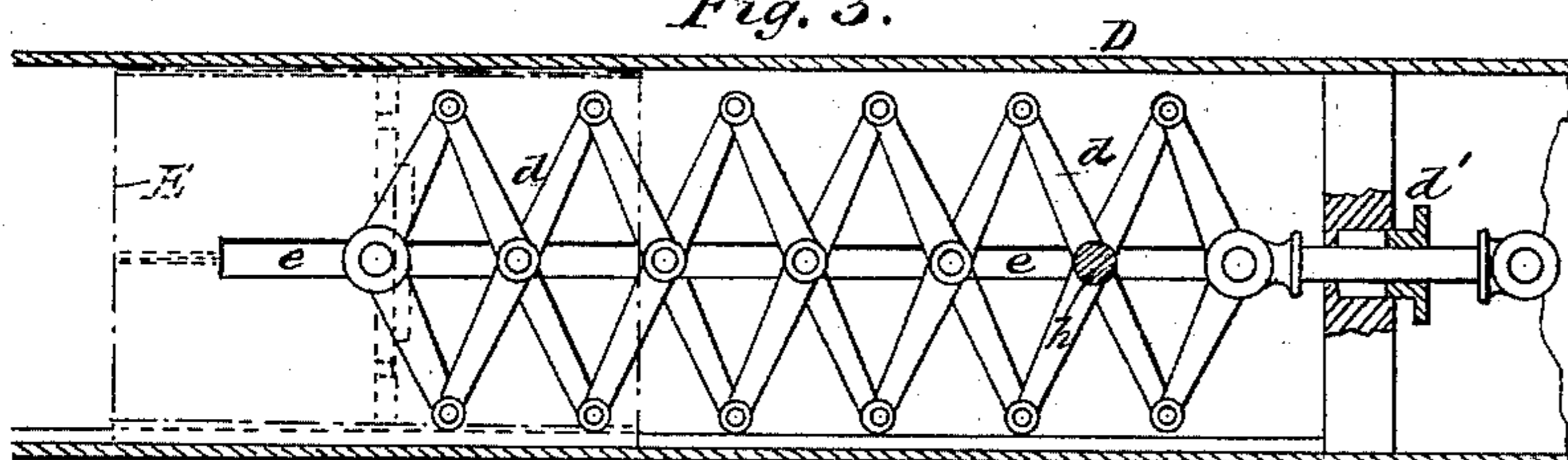


Fig. 4.

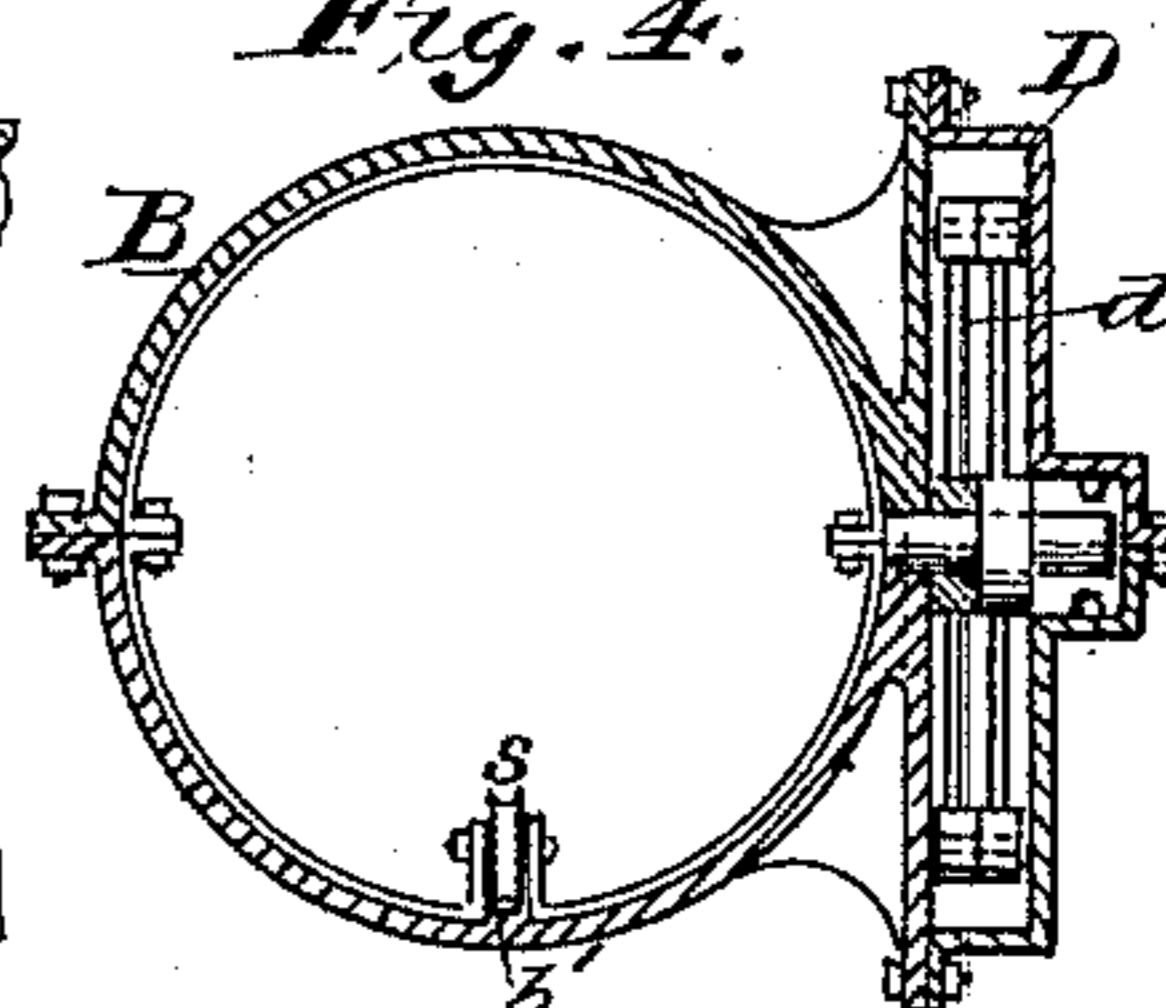


Fig. 5.

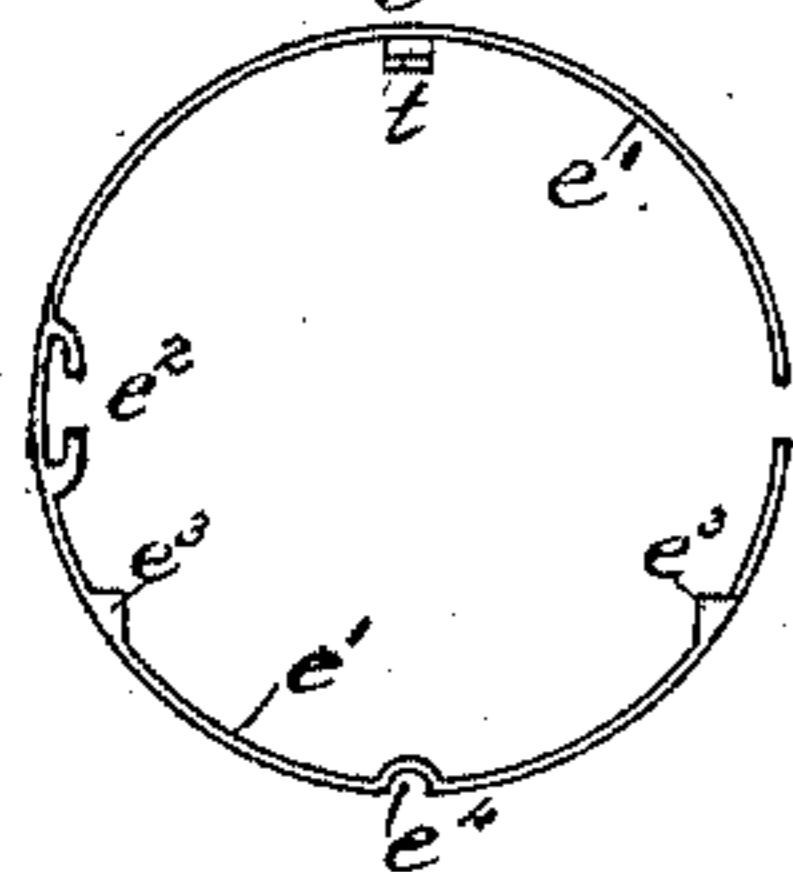


Fig. 6.

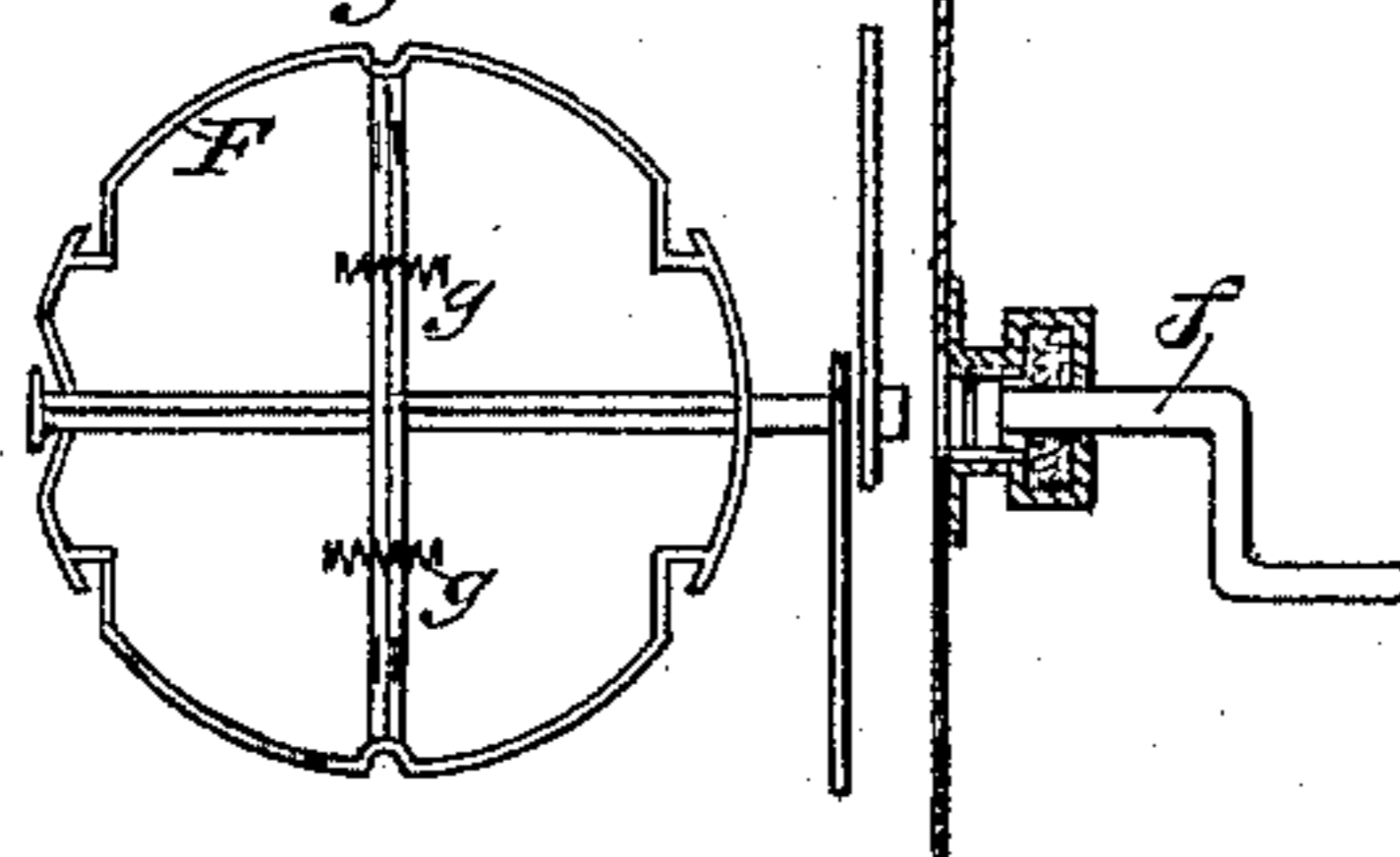


Fig. 7.

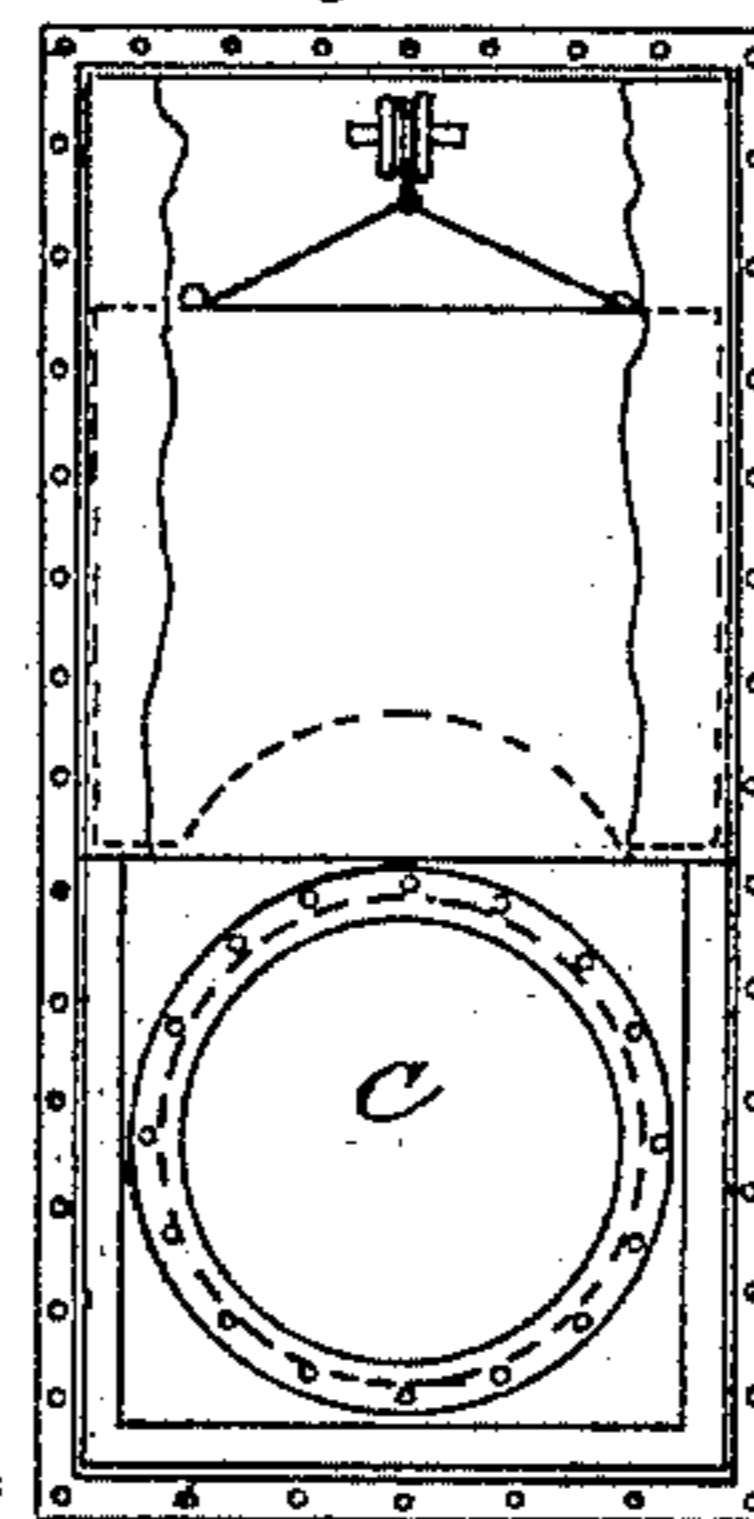


Fig. 8.

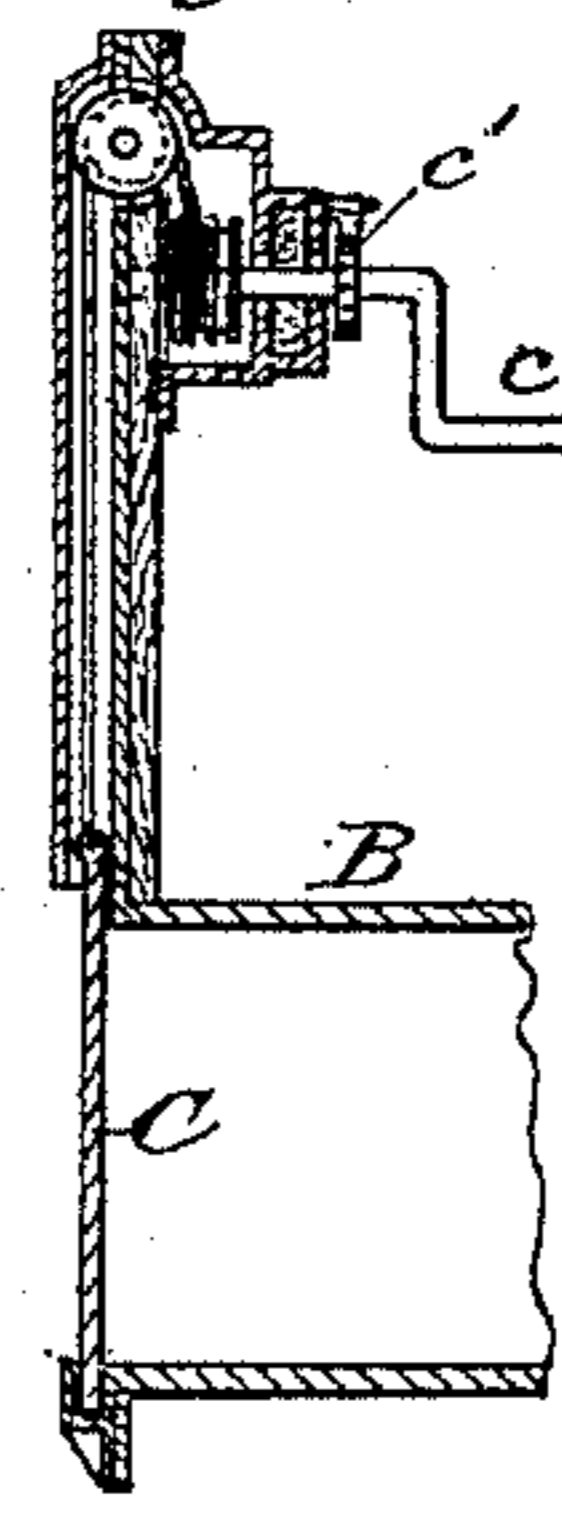
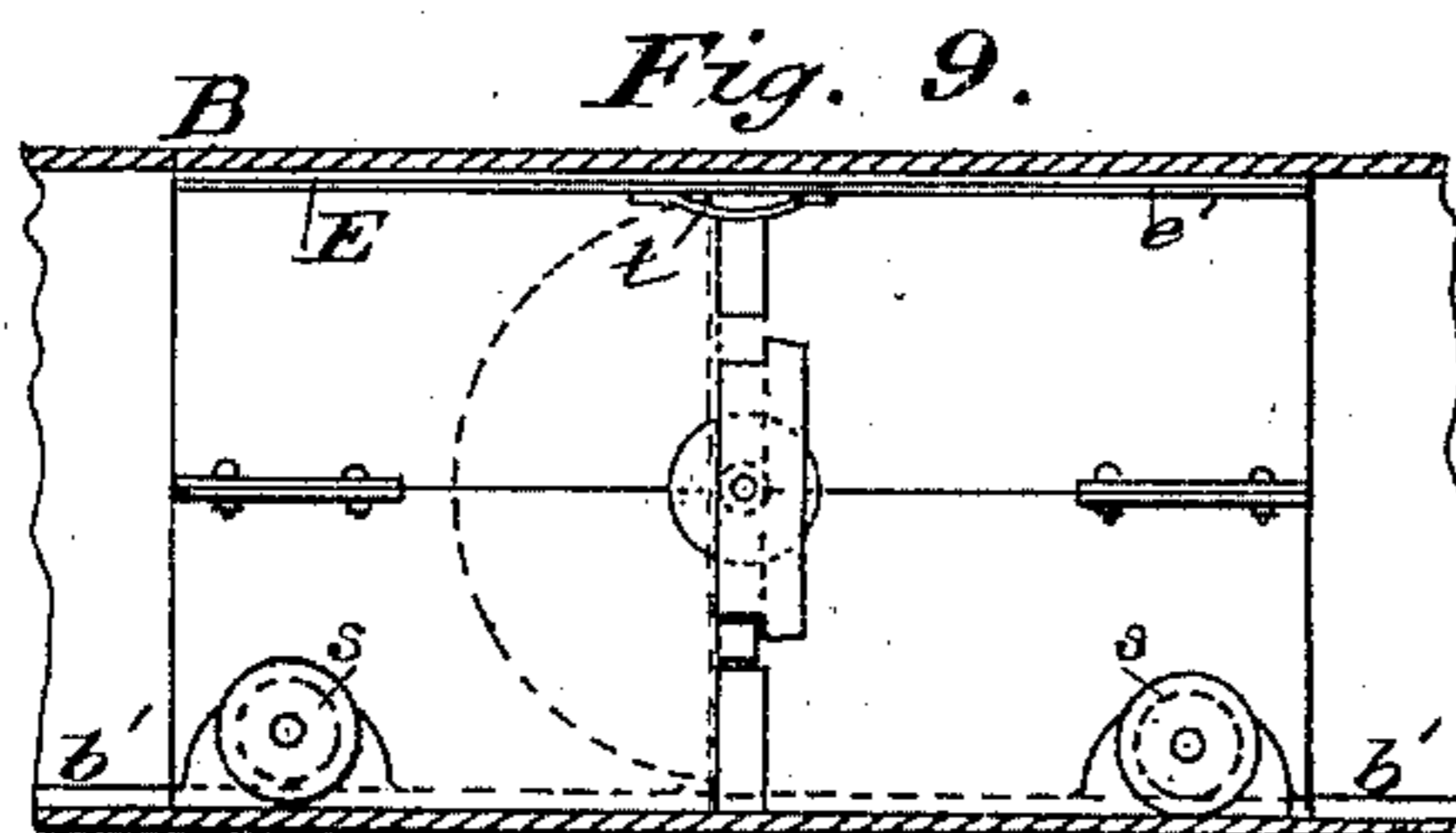


Fig. 9.



Witnesses:

Genl. Swallow.  
W. M. Lytle

Inventor:

Joseph Wirth,  
By J. C. Bruchtz  
Attorney.

# UNITED STATES PATENT OFFICE.

JOSEPH WIRTH, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PROPELLING APPARATUS FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 448,810, dated March 24, 1891.

Application filed July 29, 1890. Serial No. 360,304. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH WIRTH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Propelling Apparatus for Vessels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in propelling apparatus for vessels; and the object of the invention is to produce a propelling apparatus by which vessels, especially steamers of any kind, can be propelled through the water at a greater speed than can be obtained with the devices now employed; also, to facilitate the steering and turning of said vessels, allowing them to be revolved on their center; also, to prevent accidents to the propelling apparatus, as often occurs now with the paddle-wheels, propellers, &c., furthermore, to increase the buoyancy and stability of the vessels, as well as to diminish the rolling or vibrating of the vessel, and, finally, to provide means for repairing or examining the propelling machinery without docking the vessel, or, if necessary, when at sea.

The invention consists in the construction of certain detail, and arrangement of parts, as will be more fully described hereinafter, and specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters of reference indicate similar parts in the different figures of the drawings, in which—

Figure 1 represents a plan view of a vessel containing my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is an enlarged sectional view of part of the propelling apparatus. Fig. 4 is a cross-section of the same. Figs. 5 and 6 are detail views of the operating-piston on an enlarged scale. Figs. 7 and 8 are detail views of the gate-valve for closing the ends of the water-cylinders. Fig. 9 is a longitudinal section of part of the cylinder and of the piston.

In the drawings, A represents a vessel of any suitable size and construction, in the lower part of which two strong metallic cylinders B, extending from bow to stern, are arranged longitudinally. The ends of these cylinders *a a* are preferably made of one piece; but the intermediate lengths *b b* are made in halves or sections, provided with flanges and bolted together, as best seen in Fig. 4, so as to gain access to the pistons or the lazy-tongs connecting-rods. One or more of the lengths *b* are provided with man-holes to permit workmen entering into said cylinders B when the water is pumped out.

At the extreme ends of the cylinders B are placed the gate-valves C for closing said cylinders when repairs, &c., are required. These valves C are operated by a crank *c* and wire rope passing over suitable pulleys, as seen best in Figs. 7 and 8. A ratchet *c'* and pawl holds the valves in elevated position until released, when they will drop or descend by their own weight. A rectangular casing D is either cast or bolted to the cylinders B and contains the lazy-tongs connecting-rod *d*, attached at one end to a piston E and at the other end passing through a stuffing-box *d'* and connected to a cross-head *d''*, operated by any suitable engine or motive power. The pin or bolt connecting the piston and lazy-tongs connecting-rod *d* passes through a slot *e* in the side of the cylinders and casing, and may be provided with a friction-roller, if desired.

It will be obvious to those skilled in the art that a very short-stroke engine can in this manner produce a very long stroke of the piston. The piston E consists of a cylinder made in halves and bolted together, and a lining *e'*, provided at one side with a cavity *e<sup>2</sup>* and at each side with the lugs or stops *e<sup>3</sup>*, while its lower side is provided with a groove *e<sup>4</sup>* to fit on the rail *b'* in the cylinder. The piston is provided with the sheaves *s* or their equivalent to prevent friction on the rail and facilitate its movements. About midway of the piston is placed a frame F, which is revolved by a crank-shaft *f* for reversing the stroke of the piston, and to said frame the semicircular valves are hinged, so that, revolving the frame with its valves, the vessel can be forced backward or forward, as de-

sired. Said crank-shaft passes through a stuffing-box at one side, and it may be provided with means to operate it from the engine-room by the engineer. The opposite end  
 5 has a T-head, which fits into the cavity  $e^2$ , and it is placed in it and secured in place, so that the frame F can be revolved when desired, being held by the T-head at that end. Suitable springs  $g$  are arranged to assist the  
 10 valves in closing against the action of the water when running. If it is desired to revolve or turn the vessel on its center, one piston with its lazy-tongs and engine is run in one direction and the other one in the op-  
 15 posite direction.

It will be readily perceived that this propelling apparatus is especially adapted for war-vessels, as there is no possibility of injuring or fouling the propelling-pistons. In  
 20 case of needed repairs or a breakdown at sea the engine is first stopped, the valves are then closed down, and the water can be soon pumped out of the cylinders, and the workmen can then enter through the man-holes,  
 25 or the side of the casing can be removed to get at the lazy-tongs or pistons, &c., by merely removing the bolts that secure said casing to the cylinder.

If desired, one or more tubes, lazy-tongs  
 30 connecting-rods, and accessories may be employed, according to the size of the vessel, although I prefer two. In the largest vessels—men-of-war, &c.—four tubes may be employed, so that two of them work in unison with each  
 35 other, one on each side, thus augmenting the speed of the vessel. In canal boats only one cylinder is required, resting just above the keel, and as their speed is limited the motion of the piston will produce no waves on the  
 40 surface, thus preventing washing of the banks.

It will be readily understood that the first bolt  $h$  must be firmly secured to two strong plates attached to the casing and cylinder, as  
 45 it has to resist the whole force of the lazy-tongs connecting-rod and piston.

A stiff spring  $t$  is arranged at the upper side of the piston E, and serves to hold the frame, with its valves, from one side to the  
 50 other until again operated by the crank  $f$ , and also serves to close the opening  $e^1$  for the rail-space.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—  
 55

1. In propelling apparatus for vessels, the combination of cylinders containing pistons provided with revoluble frames having hinged valves, and said pistons operated by lazy-  
 60 tongs connecting-rods arranged in casings secured to said cylinders, as shown.

2. The combination of one or more cylinders and the pistons provided with revoluble frames having hinged valves operated as described,  
 65 with the lazy-tongs connecting-rods placed in

casings having removable covers and attached to the sides of the cylinders, all constructed as shown and specified.

3. The combination of the cylinders made in sections with flanges, and the casings containing lazy-tongs connecting-rods and provided with removable covers to gain access thereto, and the hollow elongated pistons made in halves, bolted together, and provided with revoluble frames carrying hinged valves, all  
 70 as and for the purpose specified. 75

4. The combination of cylinders extending from bow to stern of a vessel, the revoluble frames arranged in hollow elongated pistons and provided with semicircular hinged valves  
 80 having their shafts extending through stuffing-boxes, and the springs to assist in opening said valves, all arranged as shown and set forth.

5. The combination of lazy-tongs connecting-rods placed in casings having removable covers, and said rods connected to the side of the hollow pistons provided with revoluble frames having hinged valves and arranged to facilitate the vessel to go in either direction.  
 90

6. The lazy-tongs connecting-rods arranged in a rectangular casing and connected to hollow elongated pistons provided with revoluble frames having pivoted valves, in combination with cylinders extending from bow to  
 95 stern and provided with drop-valves at each end, all arranged as and for the purpose set forth.

7. The combination of one or more cylinders extending from bow to stern and provided with drop-valves at each end with hollow elongated pistons provided with friction-rollers, and revoluble frames having hinged valves and operated by lazy-tongs connecting-  
 100 rods placed in a casing having a longitudinal slot in its side for the pin of the piston, as shown and specified. 105

8. The combination of coupled cylinders having rails at their base for the rollers of the pistons and the casings in which the lazy-  
 110 tongs operate and by their end links connected to said pistons, and said cylinders provided with openings for pumping out the water when the drop-valves are closed, as set forth. 115

9. The propelling apparatus herein described as an entirety, consisting of one or more cylinders extending from bow to stern, having hollow pistons with revoluble frames to which the valves are hinged and said pis-  
 120 tons operated by lazy-tongs placed in casings, and the cylinders provided with drop-valves at each end, all constructed and operating as and for the purpose specified.

In testimony whereof I affix my signature  
 125 in presence of two witnesses.

JOSEPH WIRTH.

Witnesses:

BENJN. SWALLOW,  
 W. M. LYTLE.