

No. 834,324.

PATENTED OCT. 30, 1906.

A. L. RUSSELL.  
PROPELLING APPARATUS FOR BOATS.

APPLICATION FILED NOV. 24, 1905.

Fig. 1

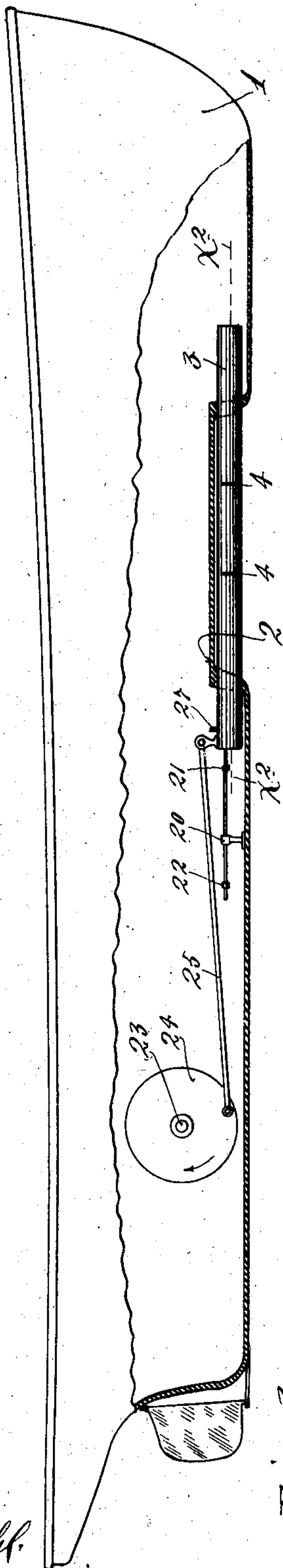


Fig. 2

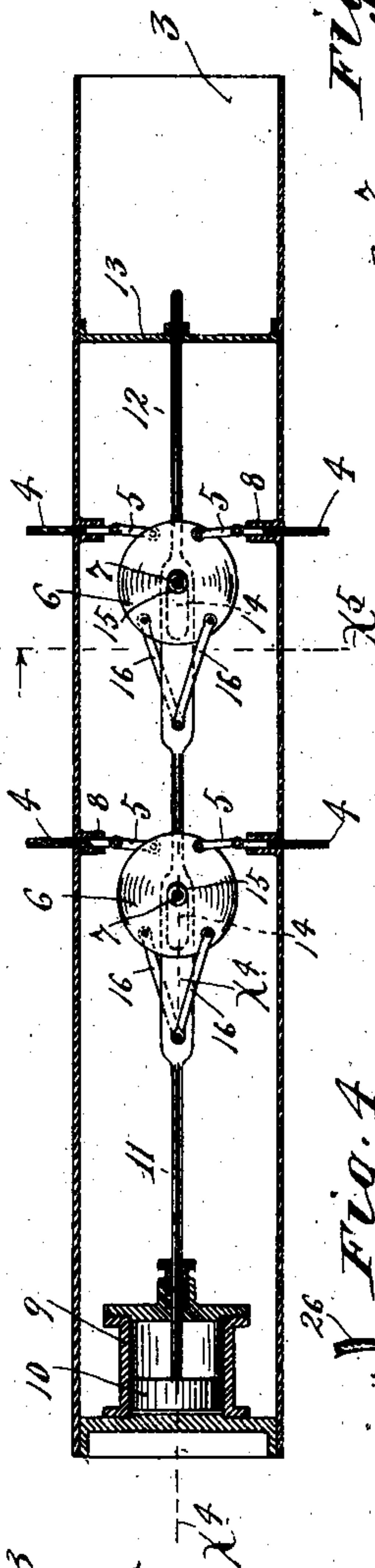


Fig. 5

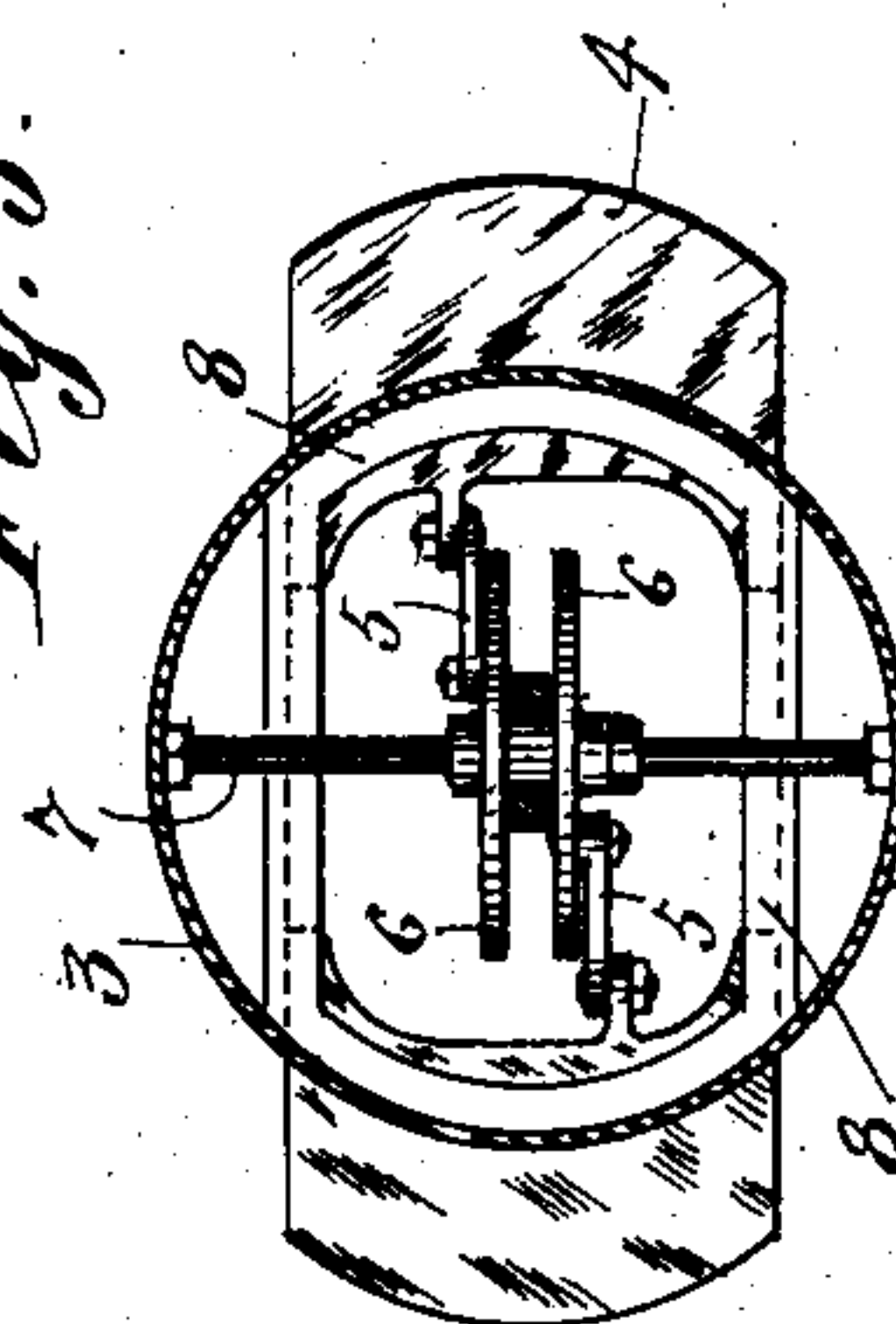


Fig. 4

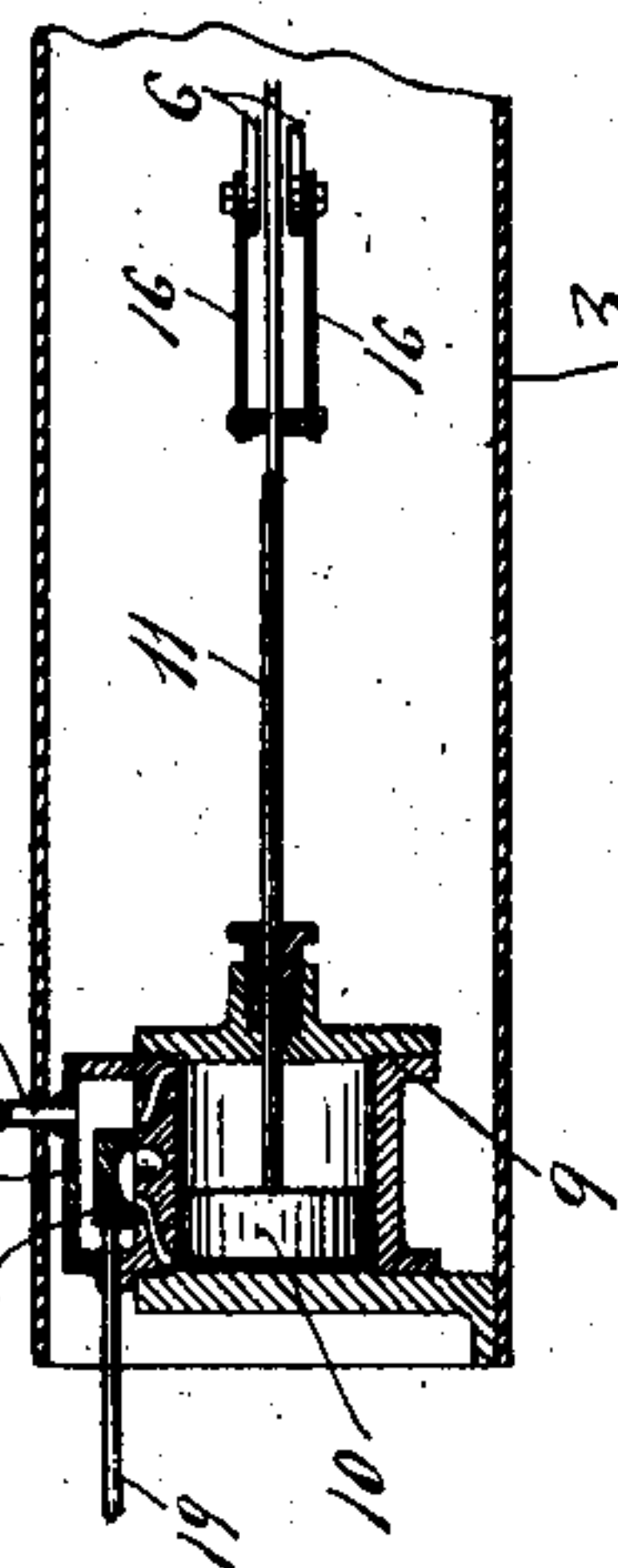
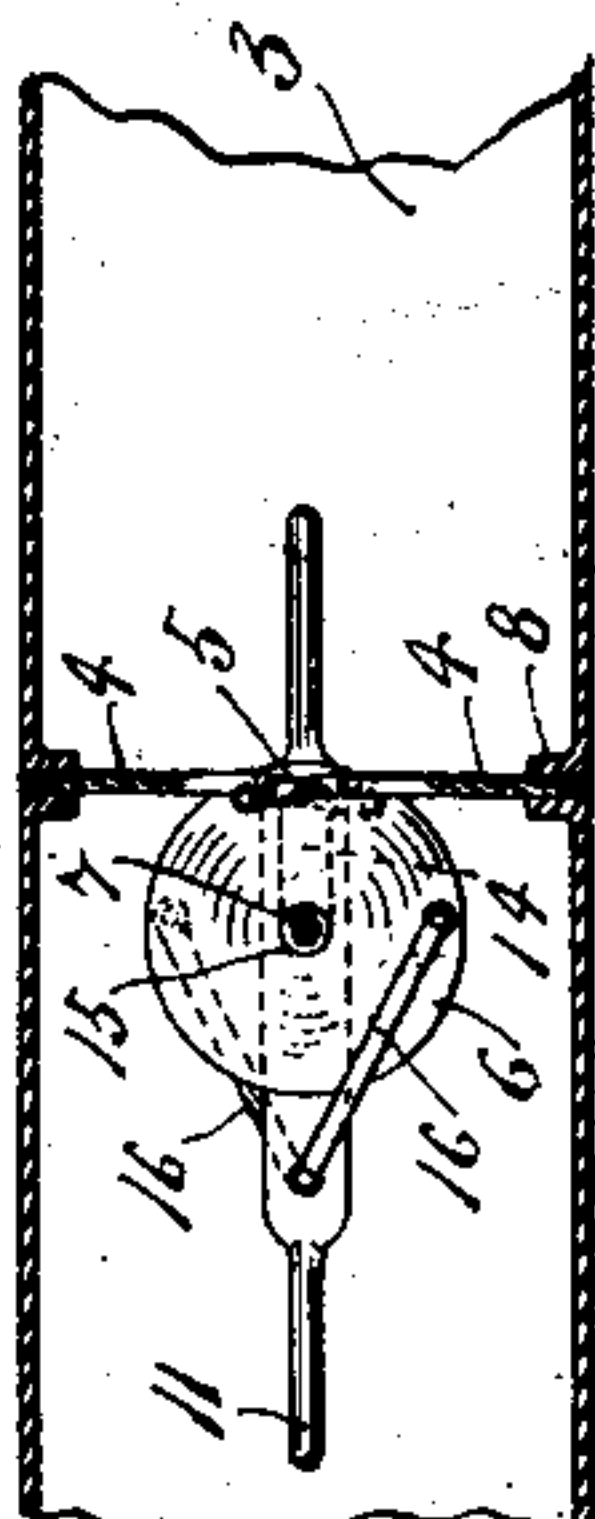


Fig. 3



Witnesses  
A. H. Opsahl.  
E. W. Jeppesen

Inventor.  
Austin L. Russell.  
By his Attorneys  
Williamson & Michaud



# UNITED STATES PATENT OFFICE.

AUSTIN L. RUSSELL, OF MINNEAPOLIS, MINNESOTA.

## PROPELLING APPARATUS FOR BOATS.

No. 834,324.

Specification of Letters Patent.

Patented Oct. 30, 1906.

Application filed November 24, 1905. Serial No. 288,828.

*To all whom it may concern:*

Be it known that I, AUSTIN L. RUSSELL, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Propelling Apparatus for Boats; and I do hereby 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.

My invention has for its object to provide an improved propelling apparatus for boats, the term "boats" being used broadly to include crafts of all sizes and character.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view, partly in side elevation and partly in vertical section, illustrating my invention as applied to a launch. Fig. 2 is a horizontal section taken on the line  $x^2 x^2$  of Fig. 1. Fig. 3 is a view corresponding to Fig. 2, but with parts broken away and with the parts shown in different positions. Fig. 4 is a vertical section taken approximately on the line  $x^4 x^4$  of Fig. 2; and Fig. 5 is a transverse section taken approximately on the line  $x^5 x^5$  of Fig. 2, but showing the parts on a larger scale.

The numeral 1 indicates the hull of a boat, the same having in its bottom a raised portion 2 for a purpose which will presently appear.

The numeral 3 indicates a long and quite large tube which operates as a plunger or blade-carrier and which works longitudinally through suitable seats formed in the end walls of the raised portion 2 and which seats may, if desired, be provided with stuffing-boxes. (Not shown.) Mounted to work radially through seats in that portion of the tube 3 that works between the end walls of the raised portion 2 of the boat-hull is a plurality of flat propelling-blades 4. These propelling-blades 4 are arranged in pairs that set endwise in vertical planes for movements in opposite directions on horizontal lines. At their inner ends these blades 4 are connected by short links 5 to crank-disks 6, which disks are arranged in pairs one directly above the

other and are loosely journaled on vertical rods 7, secured at their upper and lower ends to the upper and lower portions of the sleeve 3. The radial movements of the blades 4 are guided by bearing-brackets 8, rigidly secured within the tube 3. The outer edges of said propelling-blades 4 are formed on such curved lines that they will lie flush with the outer surface of said tube 3 when the blades are drawn inward, as shown in Fig. 3.

A straight-line reciprocating motor, such as a simple air-engine comprising a cylinder 9 and a piston 10, is mounted in one end of the tube 3, the said cylinder being rigidly secured to said tube. The rod 11 of the piston 10 has an extension 12, the outer end of which works through a bearing afforded by a transverse bar 13, rigidly secured within the tube 3. The intermediate portion of the rod extension 12 is flattened and is provided with longitudinal slots 14, that embrace the rollers 15 of the connected pairs of crank-disks 6. Reversely-inclined links 16 independently connect the crank-disks 6 to the rod extension 12.

The engine 9 10 is provided with the usual steam or air chest 17 and distribution-valve 18, which distribution-valve coöperates with the usual admission and exhaust ports and is provided with a long stem 19. The valve-stem 19 works through a guide-bracket 20 on the bottom of the boat-hull 1, and it is provided with stop-collars 21 and 22, that coöperate with said bracket 20 in a manner to be hereinafter described.

The numeral 23 indicates a power-driven shaft which may be assumed to be driven by a steam or a gas engine and is mounted in suitable bearings (not shown) in the hull of the boat. This shaft 23 carries a crank-disk 24, that is connected by a pitman 25 to one end of the tube 3.

The operation is as follows: Under a rotary movement of the shaft 23 and crank 24 the tube or blade carrier 3 will be reciprocated from front toward the rear of the boat, and vice versa. When the tube 3 reaches its extreme rearmost position, the collar 21 of the valve-stem 19 is thrown against the bearing or guide bracket 20 and the distribution-valve is moved forward in the steam-chest 17, thereby admitting steam or air into the left-hand end of the cylinder 9, and thereby causing the piston to move toward the right, which movement of said piston through the rod extension 12, crank-disks 6, and links 5



and 16 causes the propelling-blades 4 to move inward into the inoperative positions shown in Fig. 3. Hence when the tube 3 is moved toward the front of the boat the propelling-blades 4 make their inoperative stroke and do not act upon the water. When the tube 3 reaches its extreme position toward the right or toward the front of the boat, the collar 22 of the valve-stem 19 is thrown against the bracket 20, thereby moving the distribution-valve 18 toward the left, admitting steam into the right-hand end of the cylinder 9 and causing the piston 10 to move toward the left, which movement of said piston through the rod extension 12, crank-disks 6, and links 5 and 16 moves the propelling-blades 4 outward into operative positions, as shown in Figs. 2 and 5. Hence when the tube 3 is moved rearward the said propelling-blades act with a direct thrust upon the water and cause the boat to move forward.

The engine 9 10 may be operated either by steam or air and such motive fluid may be supplied thereto from any suitable source through a flexible connection, such as a hose 26, which, as shown, is applied to a nipple 27, which in turn opens into the steam-chest 17, as shown in Fig. 4.

The device described is thought to be efficient for the purposes had in view.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a boat-body, of a reciprocating tube, the intermediate portion of which is exposed to the water, propeller-blades mounted to move radially into and out of said tube, mechanism within said tube

for moving said propeller-blades alternately inward and outward at the limits of said tube's reciprocating movement, and means for reciprocating said tube, substantially as described.

2. The combination with a boat-body, of a reciprocating tube mounted on said boat-body and having its intermediate portion exposed to the water, means for reciprocating said tube, crank-disks arranged in pairs within said tube, a reciprocating rod, links connecting said rod to said crank-disks, other links connecting said crank-disks to said propeller-blades, and means for moving said rod at the limits of said tube's reciprocating movement, to alternately move said blades outward and inward, substantially as described.

3. The combination with a boat-body, of a tube mounted thereon and having its intermediate portion only exposed to the water, propeller-blades mounted to move radially into and out of said tube, a cylinder and piston-engine mounted in said tube, the piston thereof having an extended rod, crank-disks mounted in said tube and arranged in pairs, the members of the pairs one over the other, links connecting said propeller-blades and said extended piston-rod to said crank-disks, and means for reversing the action of said engine at the limits of said tube's reciprocating movements, substantially as described.

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

AUSTIN L. RUSSELL.

Witnesses:

MALIE HOEL,  
F. D. MERCHANT.