

No. 881,537.

PATENTED MAR. 10, 1908.

W. BETHANY.  
MEANS FOR PROPELLING SHIPS.  
APPLICATION FILED OCT. 4, 1907.

Fig. 1.

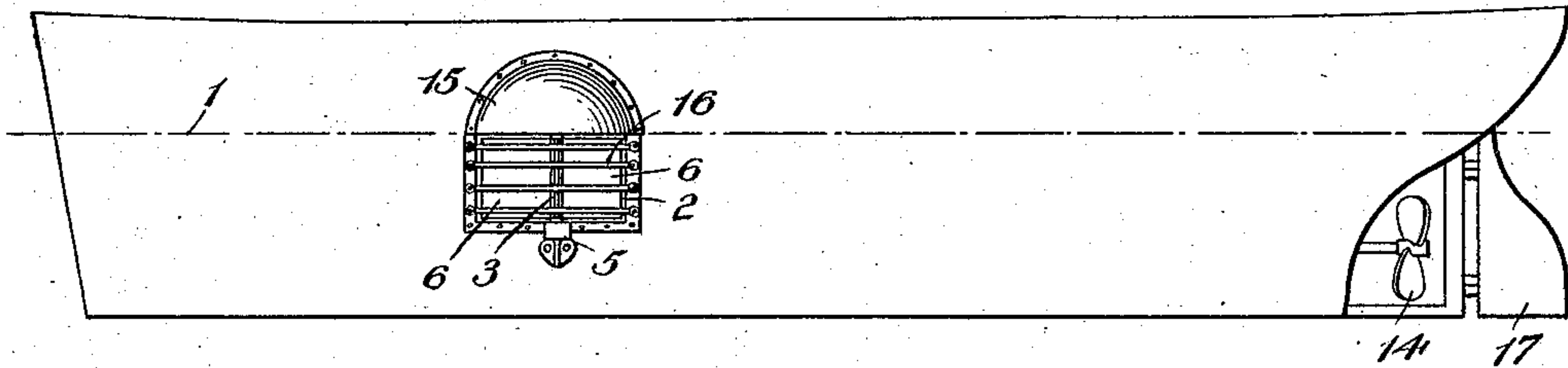


Fig. 2.

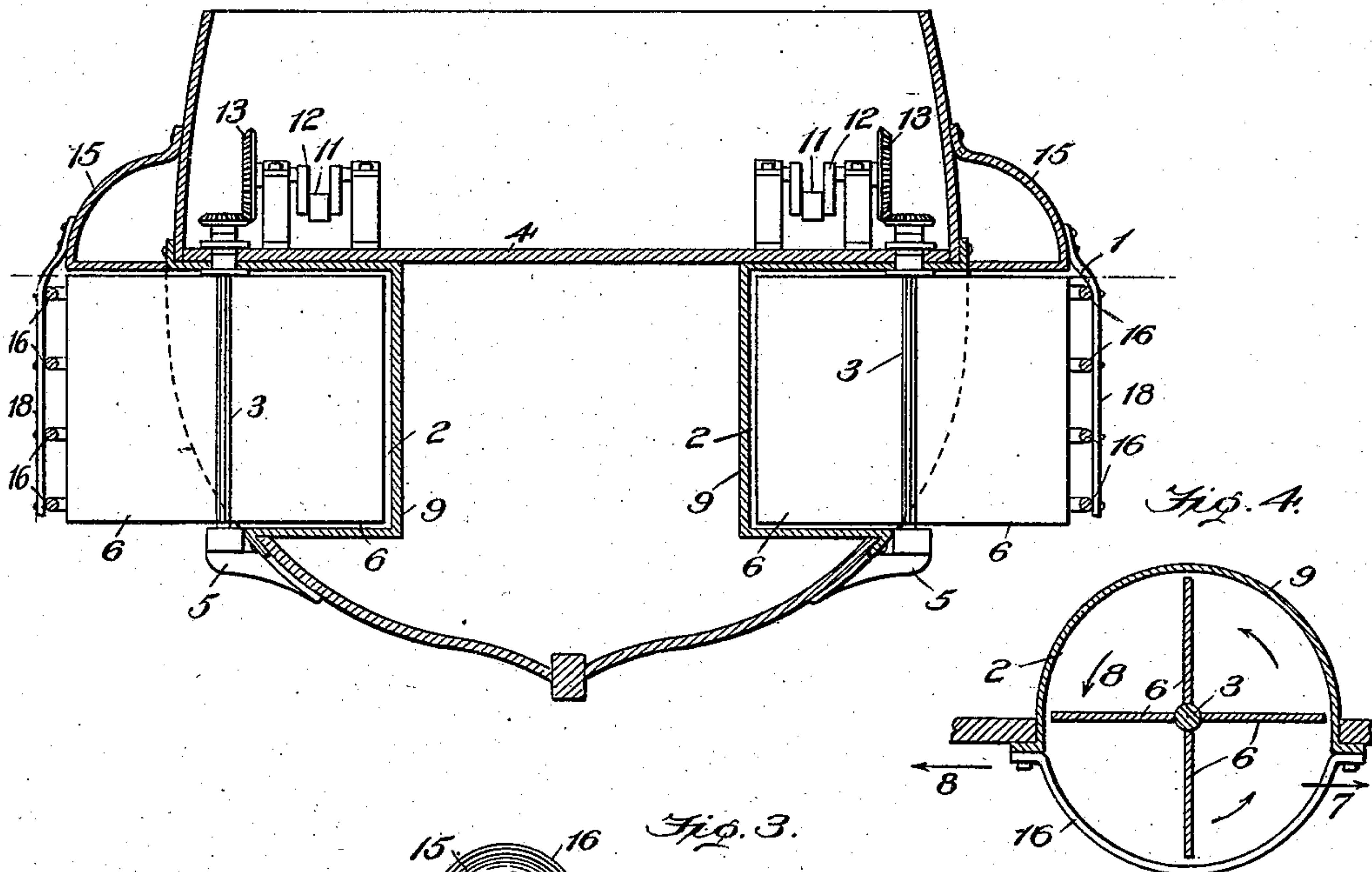
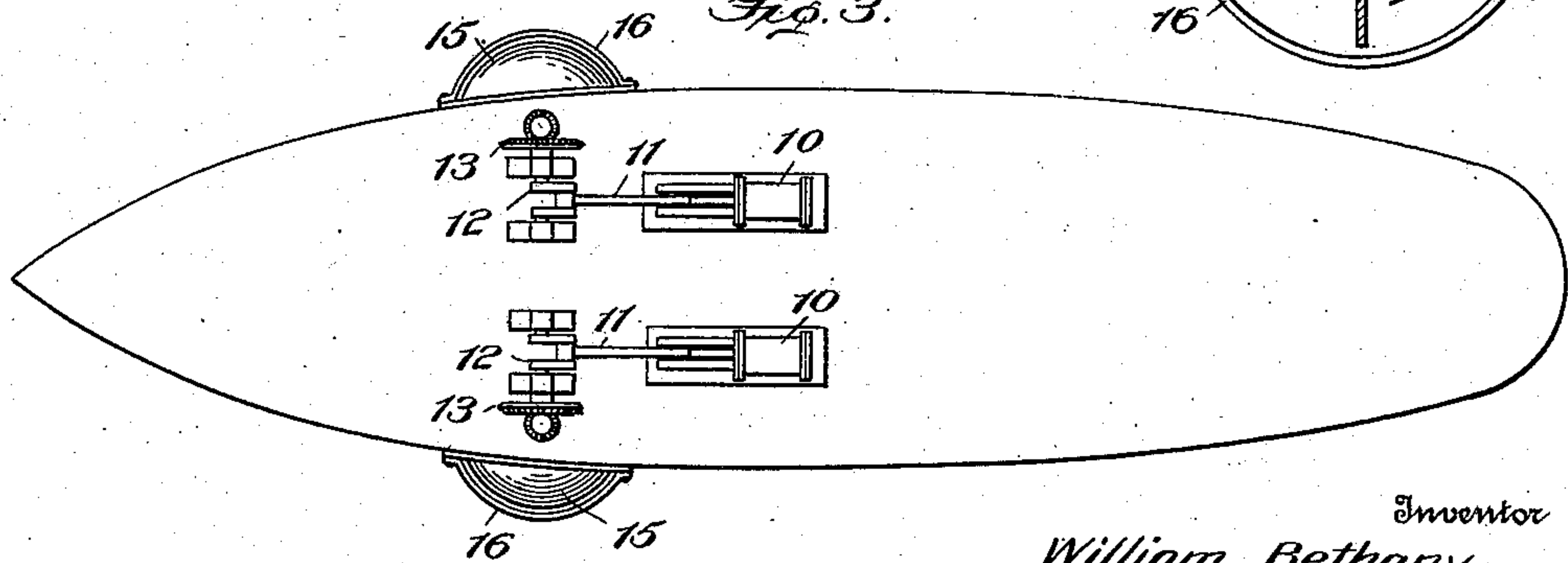


Fig. 3.



Witnesses

Edwin L. Bradford  
Anne B. Johnson

Inventor

*William Bethany*

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John A. Hanson

Attorneys



# UNITED STATES PATENT OFFICE.

WILLIAM BETHANY, OF MARS, ARKANSAS.

## MEANS FOR PROPELLING SHIPS.

No. 881,537.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed October 4, 1907. Serial No. 395,906.

*To all whom it may concern:*

Be it known that I, WILLIAM BETHANY, a citizen of the United States, residing at Mars, in the county of Lafayette and State of Arkansas, have invented certain new and useful Improvements in Means for Propelling Ships; 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.

For increasing the speed of and controlling ships by increasing the propelling and directing force, is the purpose of my invention, and in the claims appended hereto I will point out the construction wherein my invention resides in connection with the accompanying drawings, in which,—

Figure 1 shows in side view a ship embodying my invention. Fig. 2 is a transverse section of the same taken through the side propellers. Fig. 3 is a top view. Fig. 4 shows enlarged, a horizontal section illustrating one of the propellers and its relation to a chamber in the side wall and wherein the propeller practically rotates within a dead space in presenting its blades to the water outside of said chamber and it is this construction which gives the power to the propeller to increase the speed of the ship.

At a point a little below the water line 1, of a ship and about one third of the ship's length astern of the bow, is formed in its side wall, a chamber or cavity 2, formed by a steel casing about eight feet in vertical depth, preferably of semicircular form and having a semi diameter of about five feet. These proportions it will be understood however, will be governed by the constructor as he may determine according to the draft of the ship, and it will be understood that there is an identical chamber or cavity formed in each side wall of the ship. Within each chamber or cavity a propeller is mounted on a vertical shaft 3, and preferably of a radial bladed form.

By reason of the vertical position of the shaft its upper end will be supported in bearings in the floor 4 and in the top of the chamber casing at the inner side of the ship's wall; while the lower end of the shaft may be supported by a suitable bracket 5, at the outer side of the ship's wall at the bottom of the chamber casing. The propeller is preferably constructed of four blades 6, and its mount-

ing will cause each blade to act on the water at the outer side of the ship's wall in the rotation of the propeller; while the chamber or cavity will serve as a dead space within which the blade will rotate with comparatively little resistance and in this lies the secret of the speeding power of the side propellers. For, it will be noted, that the ship being in motion the water displaced by the propeller blades will be forced back along the sides of the ship, as indicated by the arrows 7, while the blades returning in the chamber will deliver the water therefrom at the front edge of the chamber with comparatively little resistance, as the direction of the outflow of the body of the water from the chamber will be the same as the direction of the rotation of the propeller blades in the chamber as indicated by the arrow 8. This advantage is enhanced by reason of the vertical mounting of the propeller which allows the blades to rotate within the chamber very near its back walls 9, so that the body of water in the chamber will be chiefly that between the blades, and the water being caused to pass into and out of the chamber in the same direction as the rotation of the propeller blades, the latter will have no churning effect upon the water in the chamber.

Any suitable motor may be provided for operating the side propellers and I prefer to have a separate motor for each propeller so that each will be under separate control so that they may be utilized as means for steering the ship, and the motor connections with the propeller shafts may be by spur or sprocket gearing.

As shown in Fig. 3 an engine 10, is provided and by means of its piston-rod 11, and crank-shaft connections 12, which engage by gear 13, the propeller shaft, operate it either forward or backward as may be found necessary in steering or holding the ship steady in its course and against counter-winds.

It will be understood that the side propellers are supplemental to the stern propeller 14, and in case of accident to the latter the side propellers will safely propel the ship. The casing of the chamber or cavity is preferably of steel and may be supported and stayed in any suitable manner as a part of the ship's wall.

To protect the propeller a metal guard or hood 15, is secured to the ship's side so as to overhang the propeller; while an open guard



forming a cage of horizontal rods 16, is secured to the ship over the open side of the chamber or cavity to protect the propeller blades from injury and to prevent obstructions from passing into the chamber. The hood and the open guard may be united and form a protecting cage for the propeller.

The ship is caused to have its speed increased and its direction controlled over that due to the stern propeller and the usual rudder 17, by the mounting of a propeller upon a vertical shaft within a chamber in the side wall of the ship, so that one half the number of the blades in their power producing function, will act on the water at the outer side of the ship; while the other half the blades will be housed within the chamber and pass through a body of water moving therein in the same direction as the propeller blades.

For increasing the speed of the ship the side propellers are caused to be rotated in opposite directions, and are operated independently as may be found necessary; and the propeller shafts may be suspended by ball bearings on the ships floor to diminish friction and give smooth working to the propellers.

A stuffing box at the top of the chamber casing will render the bearing of the shaft water-tight at its power driven end. The hood or guard has a closed bottom to prevent resistance of the water which the overhanging hood-chamber might cause and the upper edges of the propeller blades rotate in close proximity to the closed bottom. The metal hood forms an empty closure so that it cannot be filled with water and prevents the water being thrown up on the deck by the propellers.

The strength and security of the casing is an important matter and the fastening of its top as a double wall to the ships floor has the effect of suspending the casing from the floor; while suspending the propeller shaft from the floor gives the advantage of relieving the bracket bearing into which the pro-

PELLER shaft is stepped, of the weight of the propeller.

I have stated that the hood and the open guard may be united and form a protecting cage, and referring to Figs. 1 and 3 the protecting cage is shown as being formed of horizontal semi circular rods and in Fig. 2 I have shown a vertical tie-bar 18, as the means of uniting the rods forming the open guard with the lower edge of the hollow hood whereby the rods are kept in proper relation to the propeller blades.

I claim:

1. In propelling means for a ship, a casing of semi circular form within each side of the ship forming a chamber having an extended top about at the water line, and its open side in the plane of the outer wall, the flooring of the vessel and the top of the casing forming a double wall, a chambered hood secured to the ship's side and connected to the outer edge of the extended top of said casing and forming a water tight chamber overhanging the open side of the casing, and a propeller suspended by the flooring and supported in a bearing at the outer wall of the ship, and means for rotating said propeller.

2. In a ship, a casing of semi circular form within each side, the top of the casing secured to the ship's floor above the water line, and forming a chamber, the top of the casing being extended and overhangs the top of said chamber the open side of which is in the plane of the outer wall, a propeller mounted in said casing and having its shaft suspended from the floor and stepped in a bearing, and a metallic hood secured to the ship's side and to the outer edge of the top case extension and forming a closed chamber overhanging the open side of the casing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM BETHANY.

Witnesses:

A. E. H. JOHNSON,  
ANNE B. JOHNSON.