

Sheet 1, 3 Sheets.

E. S. Renwick.
Screw Propeller

No. 2,360.
33,364.

Patented Sept. 24, 1861.

Fig. 1.

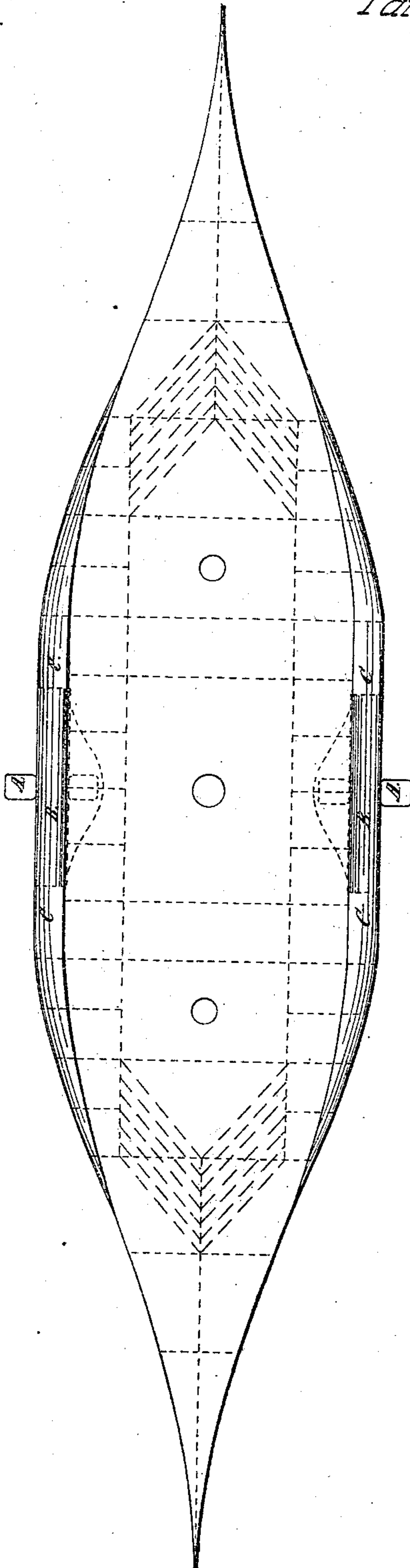
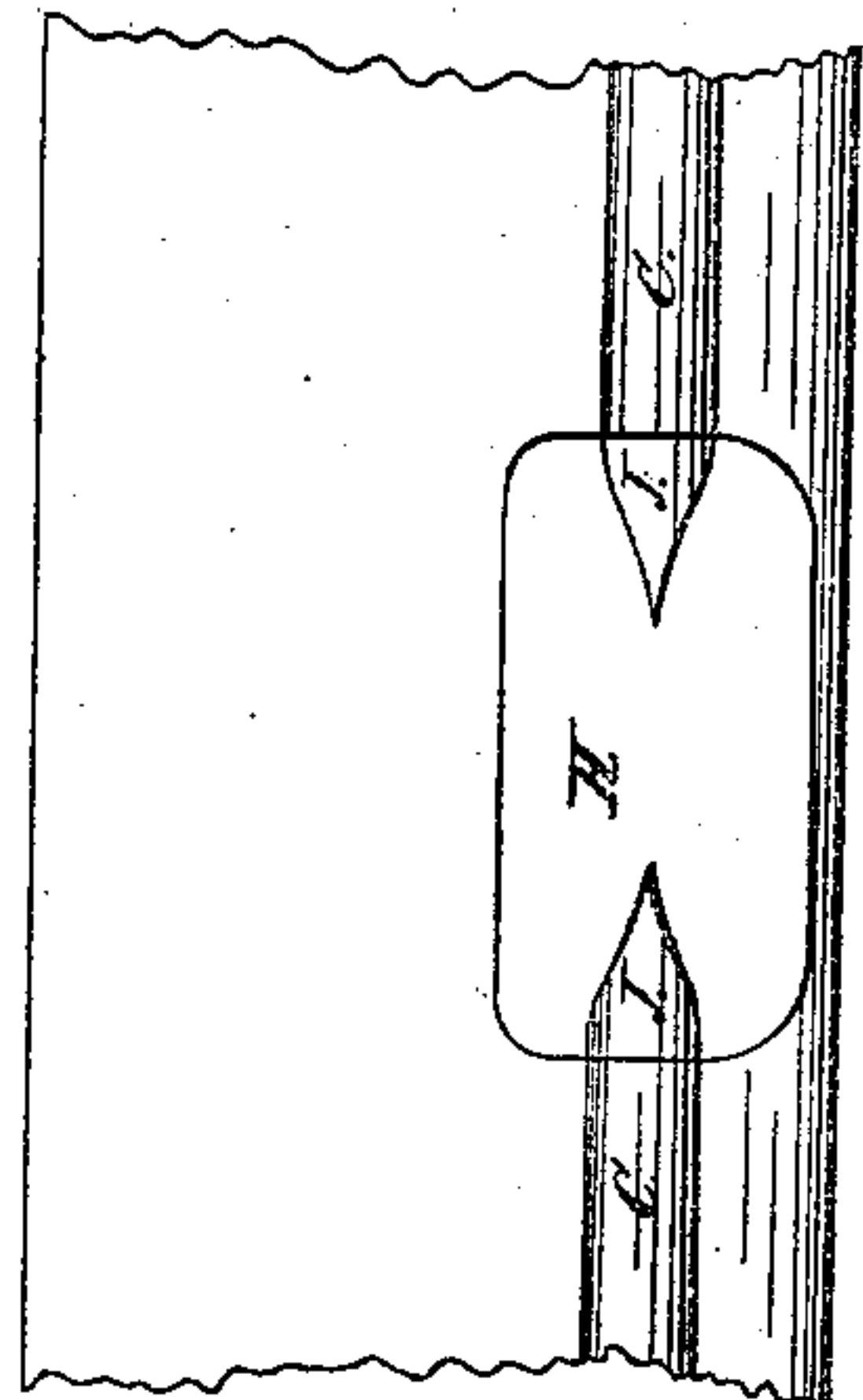


Fig. 2.



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Fig. 3.

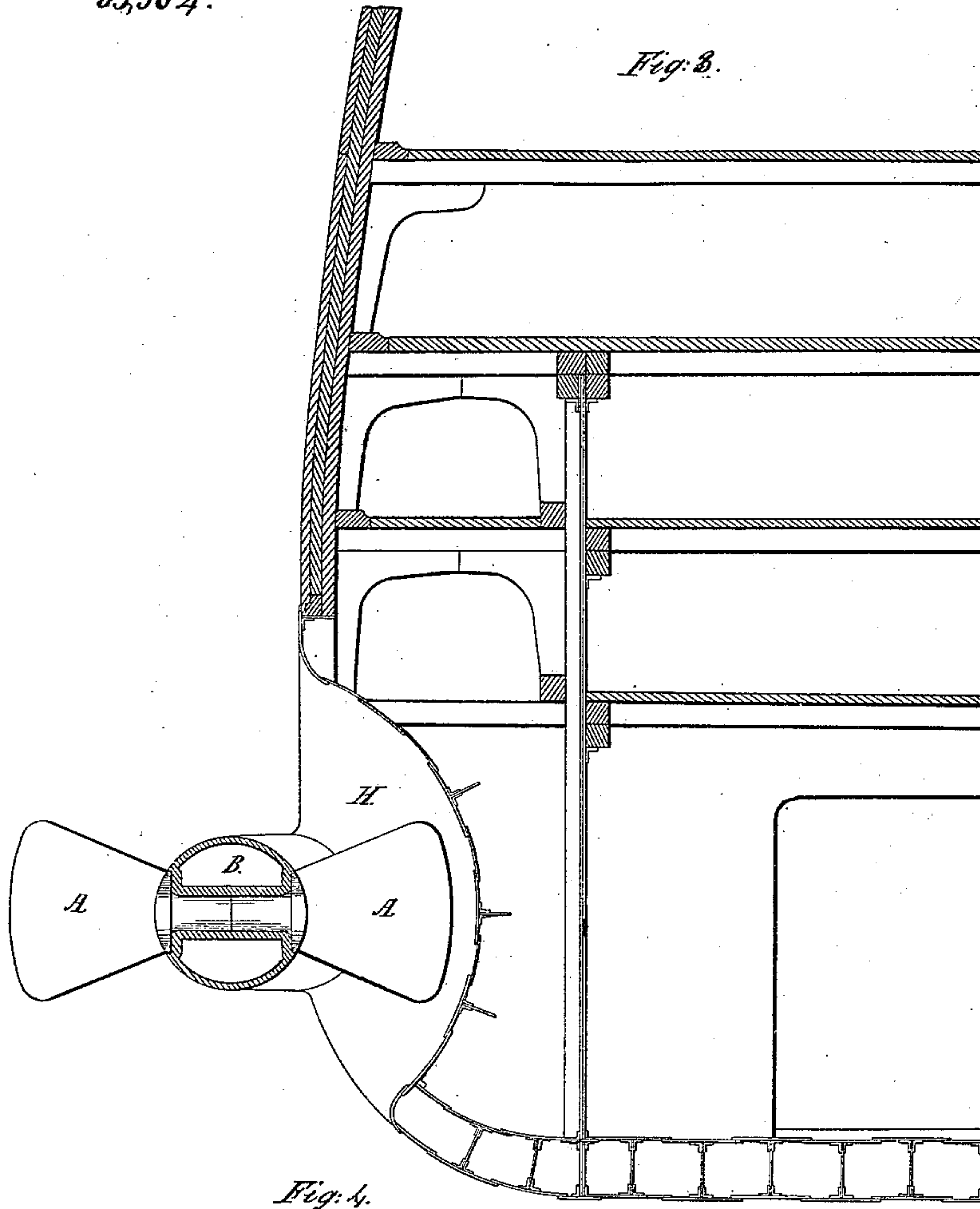
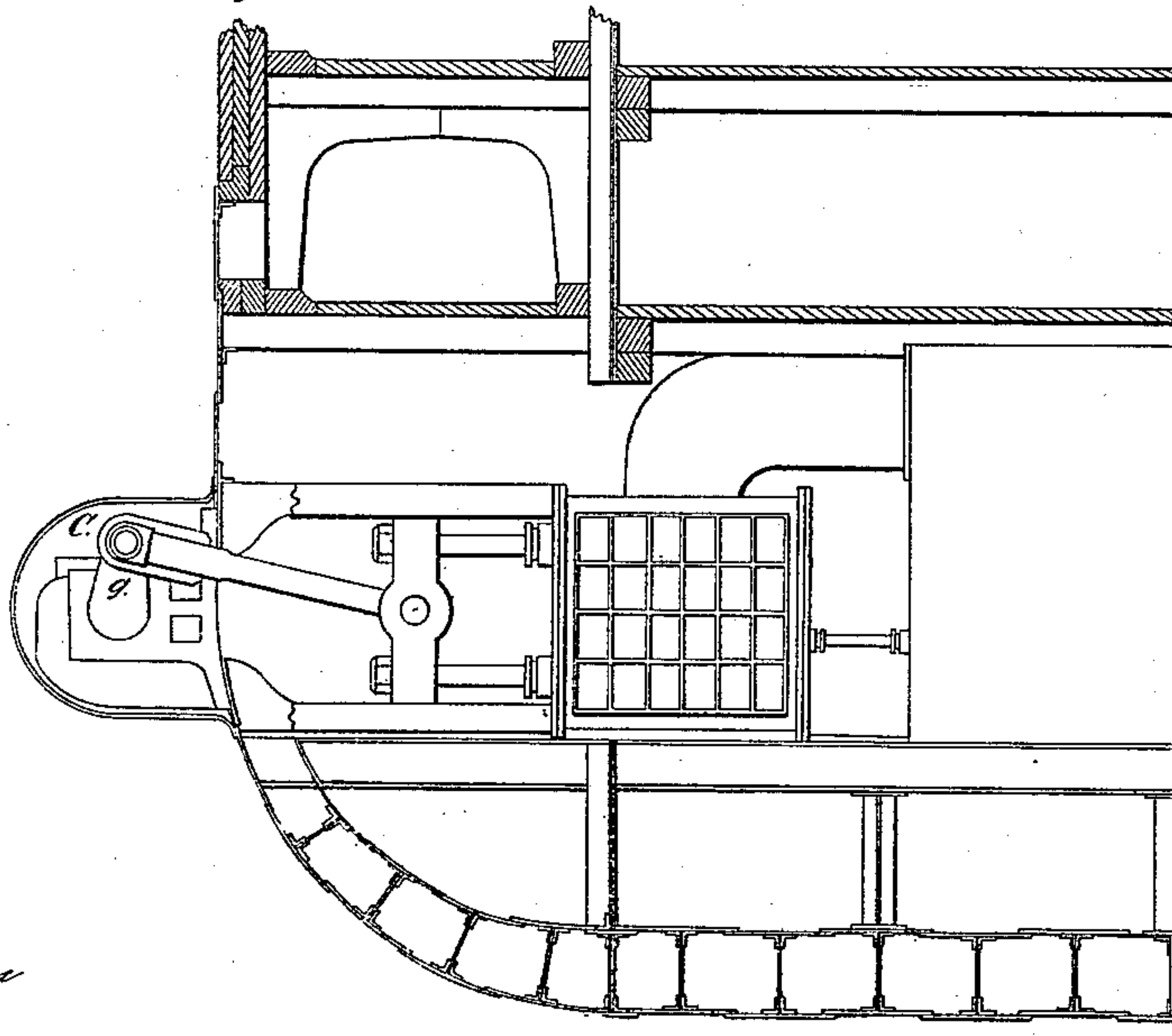


Fig. 4.



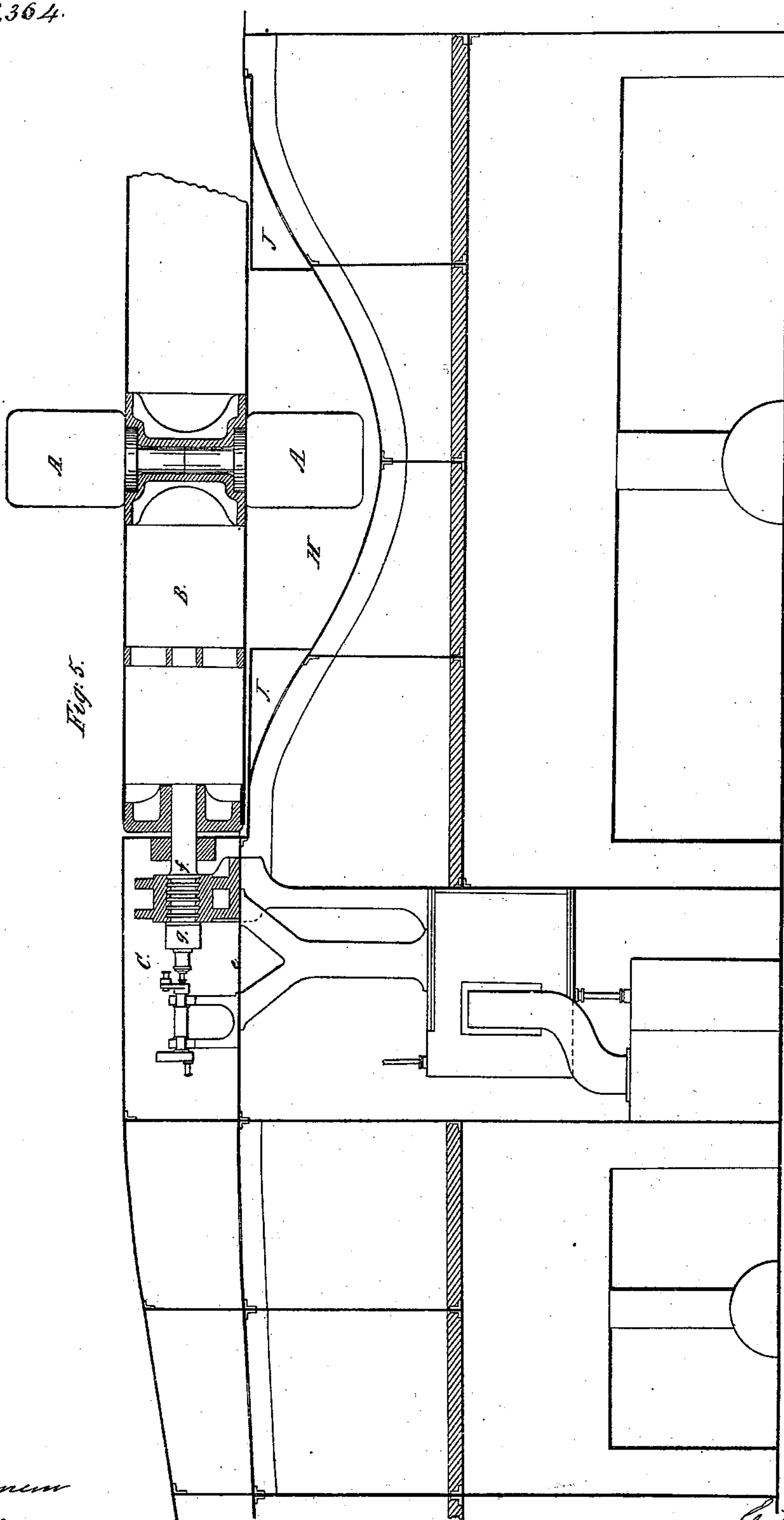
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UNITED STATES PATENT OFFICE.

EDWARD S. RENWICK, OF NEW YORK, N. Y.

IMPROVED PROPELLER.

Specification forming part of Letters Patent No. 33,364, dated September 24, 1861.

To all whom it may concern:

Be it known that I, EDWARD S. RENWICK, of the city, county, and State of New York, have invented certain new and useful Improvements in Machinery for Propelling Water-Craft; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a horizontal section of a vessel with propelling machinery constructed according to the principles of my invention. Fig. 2 represents a fragmentary side view of the same with the propeller removed. Fig. 3 represents a half vertical transverse section of the vessel at the longitudinal center of the propeller-shaft, upon an enlarged scale. Fig. 4 represents a corresponding fragmentary half-section of the vessel near the end of one of the propeller-shafts; and Fig. 5 represents a corresponding fragmentary horizontal half-section at the center of one of the propeller-shafts.

The object of my invention is to enable screw-propellers to be located at or near the longitudinal center of a vessel and at the same time to be wholly or partially submerged.

To this end the first part of my invention consists in combining a screw-propeller with a recess in the side of the vessel in such manner that a portion of the propeller revolves in the recess and a portion thereof revolves outside of the recess.

The object of the second part of my invention is to enable the shaft of a screw-propeller to be sustained in bearings under the surface of the water and outside of the vessel's side. This part of my invention consists in combining a screw-propeller with a chamber located on the outside of the vessel's side and with an opening through the vessel's side into said chamber, the chamber being located in such a position that it contains within it the pillow-block of the propeller-shaft, and the opening permitting access to the pillow-block or the propeller-shaft from the interior of the vessel.

The third part of my invention consists in the combination of the first and second parts thereof.

I believe that the best result will be obtained when the first two parts of my invention are used in combination, and the vessel represented in the accompanying drawings

embodies such a combination. This vessel, as represented at Fig. 1, has two screw-propellers located at its opposite sides. Each propeller has in this instance two screw-formed blades A A, which are secured to a tubular cylindrical-shaft B. The heads of this shaft are fitted with gudgeons that are sustained in pillow-blocks located outside of the vessel's side and firmly secured thereto. The pillow-blocks are covered by metal plates, which form water-tight D-shaped chambers C upon the vessel's side, and as in this instance the propeller-shaft is parallel with the central longitudinal line of the vessel there are two of these chambers, the one extending from the front end of the propeller-shaft toward the bow of the vessel and the other extending from the hinder end of the propeller-shaft toward the stern of the vessel. Suitable openings *e* are made through the vessel's side into these chambers to permit access to be had to the gudgeons *f* and to the pillow-blocks.

I prefer to drive each propeller by means of a pair of engines, the one located (as represented at Figs. 4 and 5) at the front end of the propeller-shaft and the other at the hinder end thereof, the connecting-rod of each engine working through one of the openings in the vessel's side upon a crank *g*, secured to the adjacent gudgeon of the screw-propeller shaft. The screw-propeller thus described revolves partly outside of the vessel and partly in a recess H, formed in the vessel's side. This recess is sufficiently deep at its center to permit the free revolution of the screw-propeller, and I prefer to make it of progressively less depth toward the bow and the stern of the vessel until it vanishes into the vessel's side, the lines being curved to permit the water to flow easily into and out of the recess.

The heads of the water-tight chambers C are furnished with stuffing-boxes, through which the gudgeons of the screw-propeller pass. The kind of stuffing-box usually employed for packing the shafts of ordinary stern screw-propellers may be used for this purpose; but I prefer to use stuffing-boxes constructed upon the plan patented by Ross and Thomas Winans. The water-tight chambers C should diminish in cross-section as they extend farther from the head of the

propeller-shaft until they vanish into the vessel's side.

In order to facilitate the passage of water into and out of the recess in the vessel's side, I prefer to use two wedge-formed water-tight chambers J, each of which extends from one of the flat heads of the chambers C toward the center of the recess. The outer side of these supplementary chambers is curved concentrically with the propeller-shaft, and is sufficiently far therefrom to insure the free turning of that shaft.

The first part of my invention may be used without the second by making the recess so deep that the pillow-blocks of the propeller-shaft may be located on the inside of the vessel, or by locating the propeller-shaft at an angle with the vessel's keel. On the other hand, the second part of my invention may be used without the first by making the chambers project so far from the side of the vessel that the propeller-blades will revolve outside of the curve of the vessel's side.

The propellers represented in the accompanying drawings are entirely submerged; but if deemed expedient a portion of one or both propellers may be arranged to project above the surface of the water.

The propellers represented in the accompanying drawings have two screw-formed blades or palms. The peculiar form of these blades may be varied as deemed expedient by constructors who make use of my invention. The number of blades may also be varied as deemed expedient.

The two propellers at the opposite sides of a vessel may be driven by the same engine by fitting the engine with duplicate sets of piston-rods and connecting-rods, one connecting-rod being arranged to act upon the crank of one propeller and the other connecting-rod upon the crank of the other propeller.

It is believed that the following useful results are attained by this invention when compared with the usual stern propeller now generally used: The power may be applied at or near the longitudinal center of the vessel instead of at the stern thereof. The use of a long shaft to extend from the propeller to the engine is avoided. The space occupied by a tunnel around such shaft is saved. The power is applied at the shell of the vessel instead of the axis thereof, and the weight and cost of the framing generally used to propagate the thrust of the propeller to the shell are saved. The propeller may have two bearings—one in advance and the other behind it—both of which can be easily got at by the engineer. The tubular shaft of the propeller may be of such dimensions that its buoyancy will counterbalance the weight of the propeller, thus relieving the pillow-blocks

of this weight. The vessel need not be constructed so strong and heavy at the stern. The straining of the stern of the vessel is avoided. The vibration of the stern incident to the location of a propeller thereat is avoided. The employment of an outside rudder-post is rendered unnecessary. The propellers being amidships, or thereabout, are not materially affected by the pitching of the vessel, and the vessel will be in trim at all times as the weight of the propellers and machinery is at or near her longitudinal center. The vessel can be turned with great ease by turning one propeller backward while the other is turned forward, and the vessel can be maneuvered by her propellers in case the rudder is shot away or injured. All these advantages may be attained with as complete an immersion of the propellers as is attained when the propeller is located at the stern of the vessel.

If the size of the shaft at the blades is deemed too large, it may be made smaller there and may increase in diameter as it approaches its ends.

If a chamber is employed at each end of the propeller-shaft and the propelling force is applied to but one end of the shaft, then the chamber at the other end may be made merely large enough to contain the pillow-block and the propeller-shaft may be tapered down at that end.

In order to get rid of the water that may leak into the tubular shaft, each gudgeon may have a hole bored through it at its center, and a spiral pipe may be fitted to the inner end of this hole, so as to void water at each revolution of the propeller.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a screw-propeller with a recess in the side of the body of the vessel to which the screw-propeller is applied, the propeller revolving partially in said recess, substantially as set forth.

2. The combination of a screw-propeller with a chamber upon the vessel's side to contain the pillow-block of the propeller-shaft, substantially as set forth.

3. The combination of a screw-propeller with both a recess in the side of the vessel (to receive a portion of the propeller) and a chamber upon the vessel's side, (to contain a pillow-block of the propeller-shaft,) substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

E. S. RENWICK.

Witnesses:

JAS. S. FERGUSON,
W. L. BENNEM.