

E. DUPLESSIS.

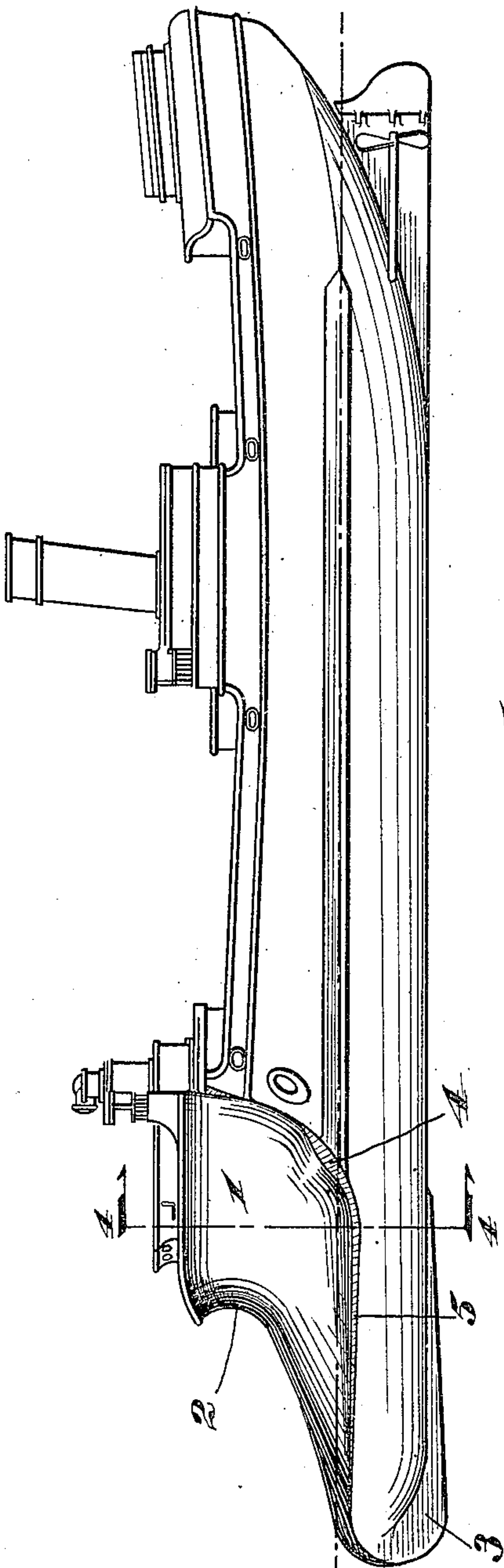
ICE BREAKER.

APPLICATION FILED OCT. 29, 1909.

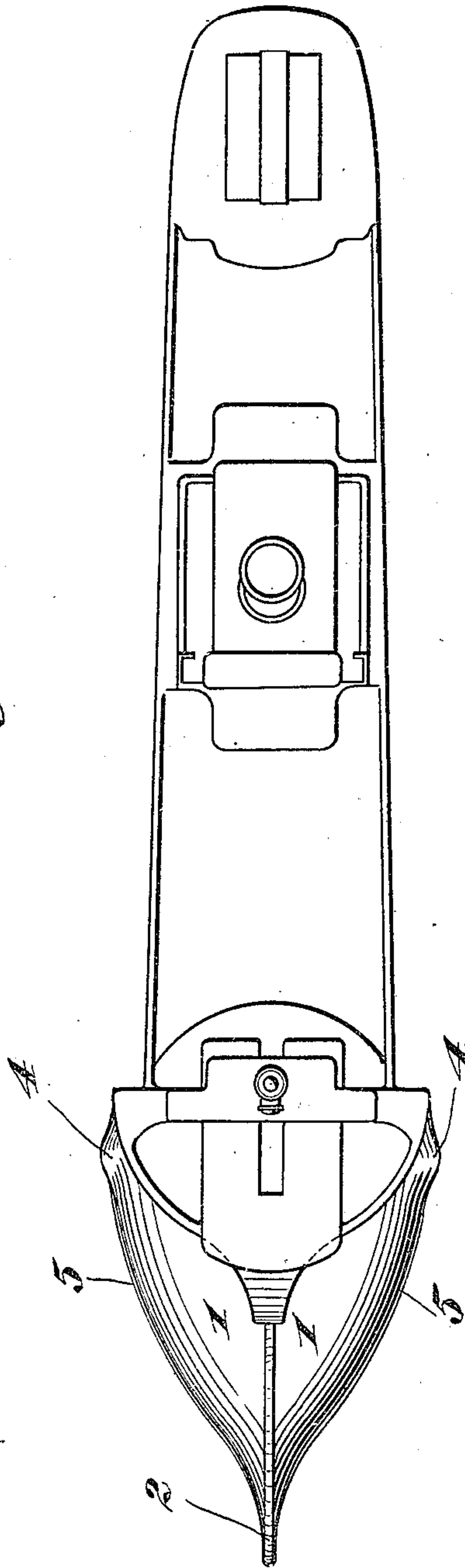
993,440.

Patented May 30, 1911.

2 SHEETS—SHEET 1.



*Fig. 1*



*Fig. 2*

Witnesses:

*L. J. Gauvin*  
*E. J. Gauvin*

ELOUILL DUPLESSIS

Inventor

By

*Marion Marion*

Attorneys

993,440.

E. DUPLESSIS.  
ICE BREAKER.  
APPLICATION FILED OCT. 29, 1909.

Patented May 30, 1911.

2 SHEETS—SHEET 2.

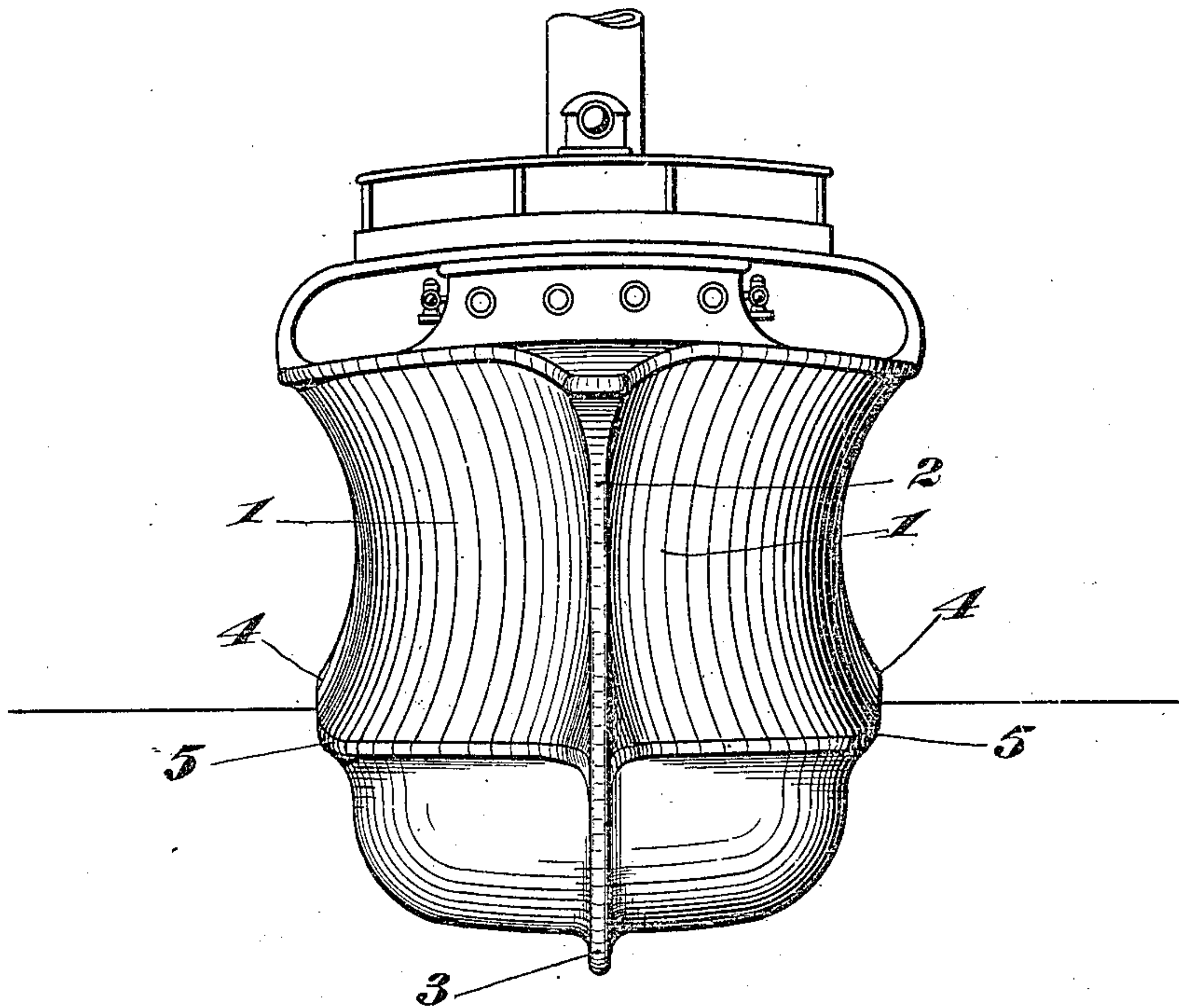


Fig. 3

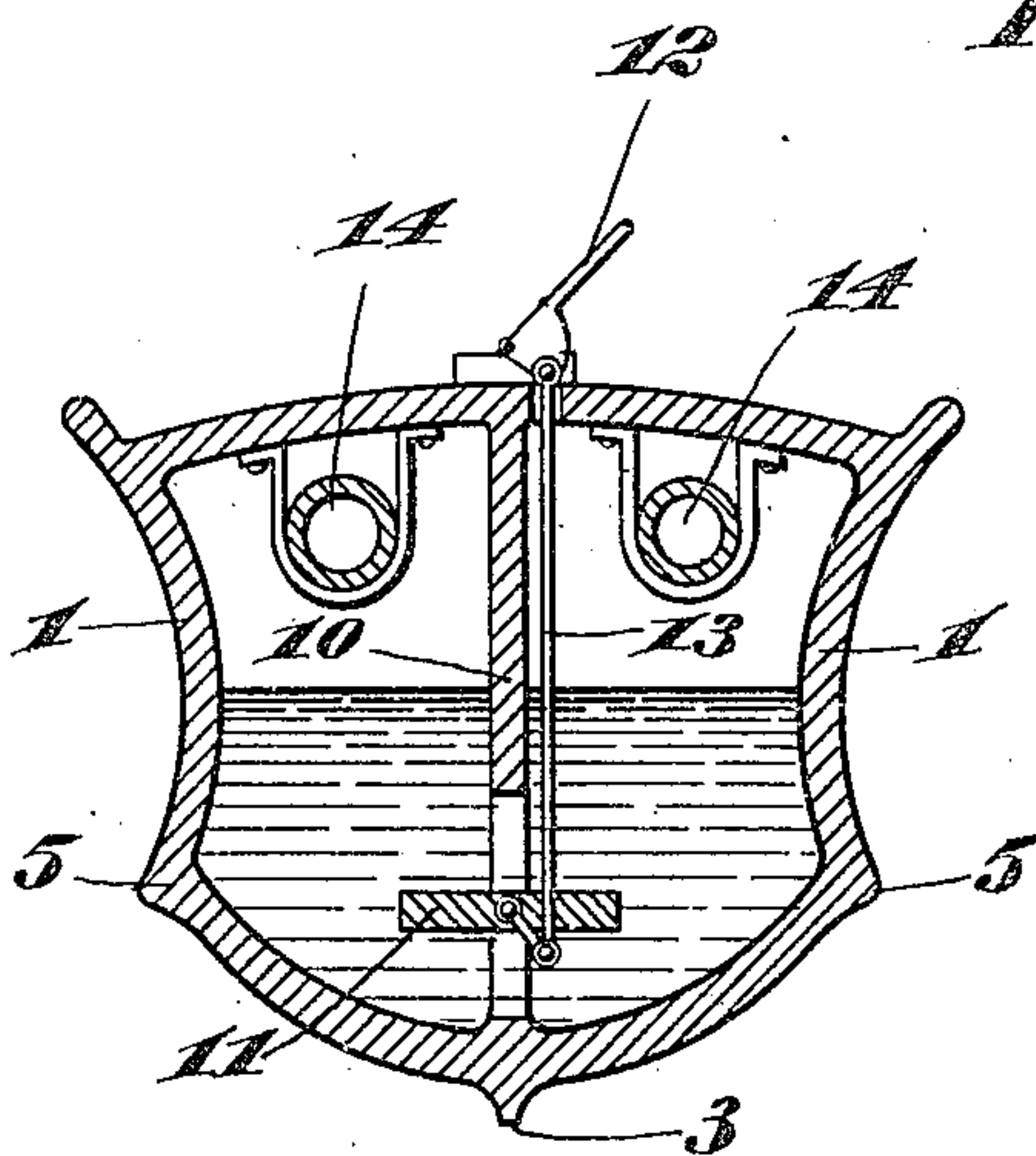


Fig. 4

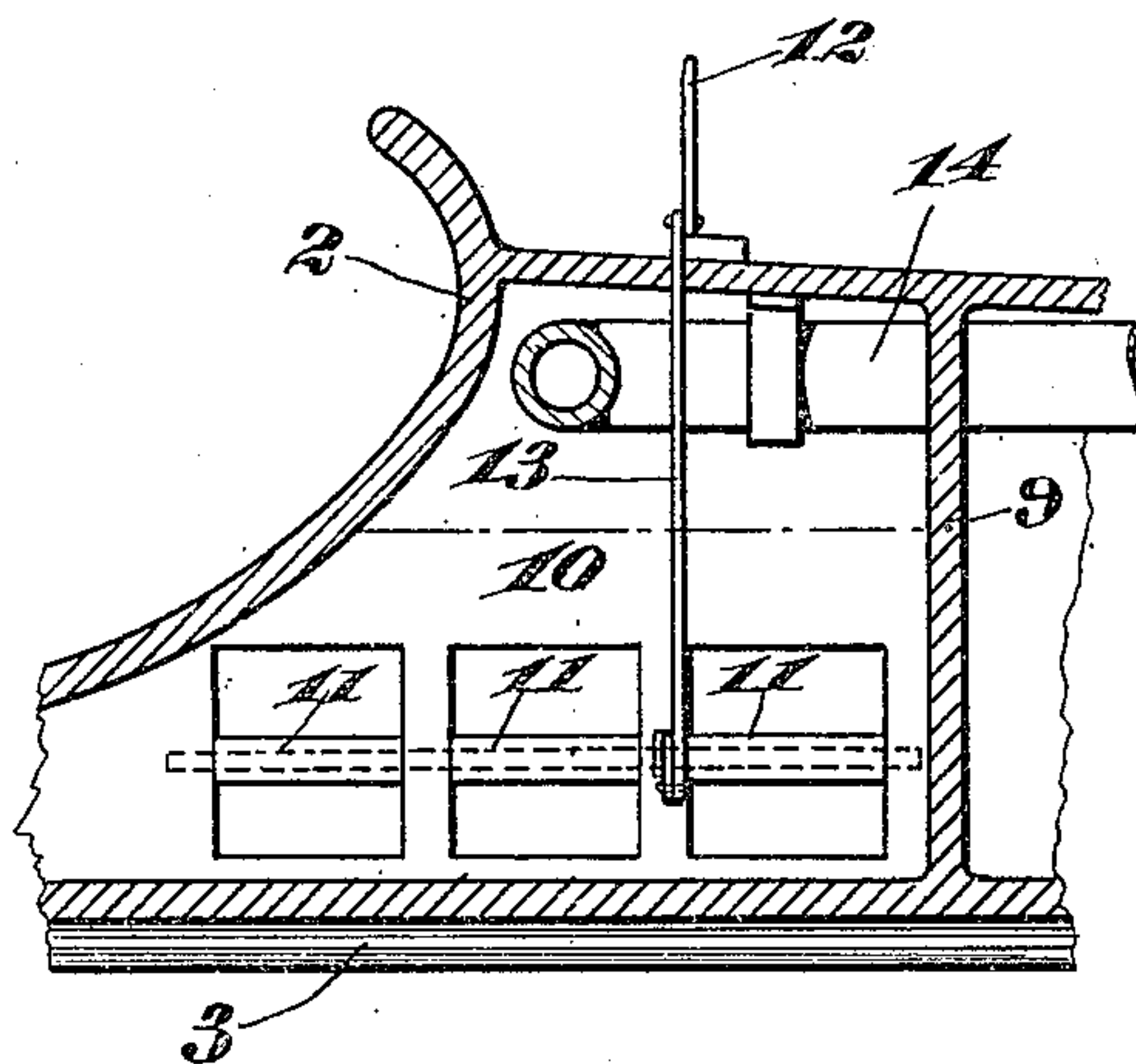


Fig. 5

ELOUÏD DUPLESSIS

Witnesses:

*E. J. Gawwin*  
E. J. Gawwin

Inventor

By

*Marion Marion*

Attorneys



# UNITED STATES PATENT OFFICE.

ELOUILD DUPLESSIS, OF SOREL, QUEBEC, CANADA.

## ICE-BREAKER.

993,440.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed October 29, 1909. Serial No. 525,396.

*To all whom it may concern:*

Be it known that I, ELOUILD DUPLESSIS, a subject of the King of Great Britain, residing at Sorel, county of Richelieu, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Ice-Breakers; and I do hereby declare that the following is 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.

The invention to be hereinafter described relates to ice breakers, and particularly to ice breaking boats.

Broadly speaking, it comprises a strongly built boat, having a specially constructed hull and prow, means for canting or listing the entire hull to one or the other side, and means for moderately heating the outer shell of the prow.

In order to more clearly disclose the construction, operation and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings, like reference characters designate the same parts.

In the drawings: Figure 1 is a side elevation of the invention; Fig. 2 is a plan view of the same; Fig. 3 is a front view of the boat; Fig. 4 is a section on line 4—4 of Fig. 1; and, Fig. 5 is a central vertical longitudinal section through the prow.

As heretofore constructed, the great majority of ice breaking boats have been adapted to run up onto the ice and break it simply by their weight. Such an operation is, of course, very slow. According to the present invention, a totally different principle is involved. The boat, according to this invention, is built to act as a plow. For this purpose, it is provided with a long, forwardly projecting prow 1. This prow extends a considerable distance forward of the body of the boat, and its forward end lies, normally, about three feet below the surface. The upper face of this prow is formed into a rearwardly and upwardly extending concave guard, blade or plate 2. The guard or plate 2 acts to catch and turn any ice which may be forced too far upward toward the top deck of the bow. The ice so caught will be turned back upon itself. The lower face of the prow is provided with a centrally disposed longitudinally extending forwardly

and downwardly inclined blade or keel 3 to maintain the boat in a straight line while cutting on one side only. The sides of the prow, of course, are given only a very gradual rearward taper in order to render the passage of the prow easy. The keel does not extend beyond the rear end of the prow above described. Its greatest depth is under the tip of the prow. It is at all points deeper than the normal keel or boat bottom. At the point of greatest width of the hull, its extreme bilge, and at just about the normal water line, convex deflectors 4 are provided to break the ragged edges near wharves or the like or for trimming. The entire prow 1, extending back as far as the hawse hole, is convex on each side of the blade 2, one edge of the convexity following the line of the base of the blade 2, and the other edge extending rearwardly and slightly upwardly from the point of the prow to the deflector 4. This second edge forms a projecting rim 5, which runs along the hull just slightly above the plane of the bottom of the hull. Consequently, as the ice is broken above the prow, it will be caught on the convex faces at either side of the blade 2 and forced upwardly and outwardly to either side of the boat.

The bow of the vessel is divided from the rest of the hull by a vertical partition 9. The large compartment thus formed is subdivided into two smaller compartments by a centrally disposed vertical longitudinal partition 10, provided with a series of passages adapted to be closed by a number of pivotally mounted bulk head doors 11. These doors are normally open to allow any water in the bow to rise to the same level in both compartments. If it is desired to close the doors 11 to separate the two compartments, it is simply necessary to operate the lever 12 which is connected by a rod 13 to the door. When the doors have been closed, the vessel may be listed to one side or the other, as desired, by simply pumping water into one of the two compartments thus formed. The whole vessel may be thoroughly heated inside by the large steam pipes 14, which may be connected to the engine boilers in any suitable way.

As the vessel advances toward the edge of the ice, its long prow, considerably below the surface of the water, causes a large displacement wave. Most of the prow being under the ice, the formation of the dis-



placement wave takes place under the ice, causing an upheaval and breaking of the ice directly above the forward portion of the prow. In this way, the displacement wave does the greater part of the work of the actual breaking of the ice. When the prow itself actually performs the breaking function, its operation is not that of a simple wedge entering the edge of the ice. It does not actually enter the body of the ice. The prow, by its gradual upward taper, as the vessel advances, engages the lower face of the edge of the ice and exerts a very powerful upward lifting action, which forces the ice upward to the splitting point. The combined up-lifting action of the displacement wave and the prow, will act to break the ice as fast as the vessel advances.

Changes may be made in the construction, arrangement and disposition of the several parts of the invention, without in any way departing from the field and scope of the same, and it is meant to include all such

within this application, wherein only a preferred form has been disclosed.

25

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

An ice-breaking boat provided with a projecting prow adapted to extend under the ice and lift and break the same said prow also having laterally extending parts 4 for scraping the ice from wharves and the said ice breaking boat being further provided with a keel 3 which is deeper in the water than the body of the boat and is located only under said prow and has its bottom line inclined forward, its greatest depth being under the tip of the prow.

30

35

In witness whereof I have hereunto set my hand in the presence of two witnesses.

40

ELOUILD DUPLESSIS.

Witnesses:

T. MYNARD,

E. J. GAUVIN.

---

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

---