

(No Model.)

3 Sheets—Sheet 1.

R. M. FRYER.
CONSTRUCTION OF VESSELS FOR MARINE PURPOSES.

No. 355,868.

Patented Jan. 11, 1887.

Fig. 1.

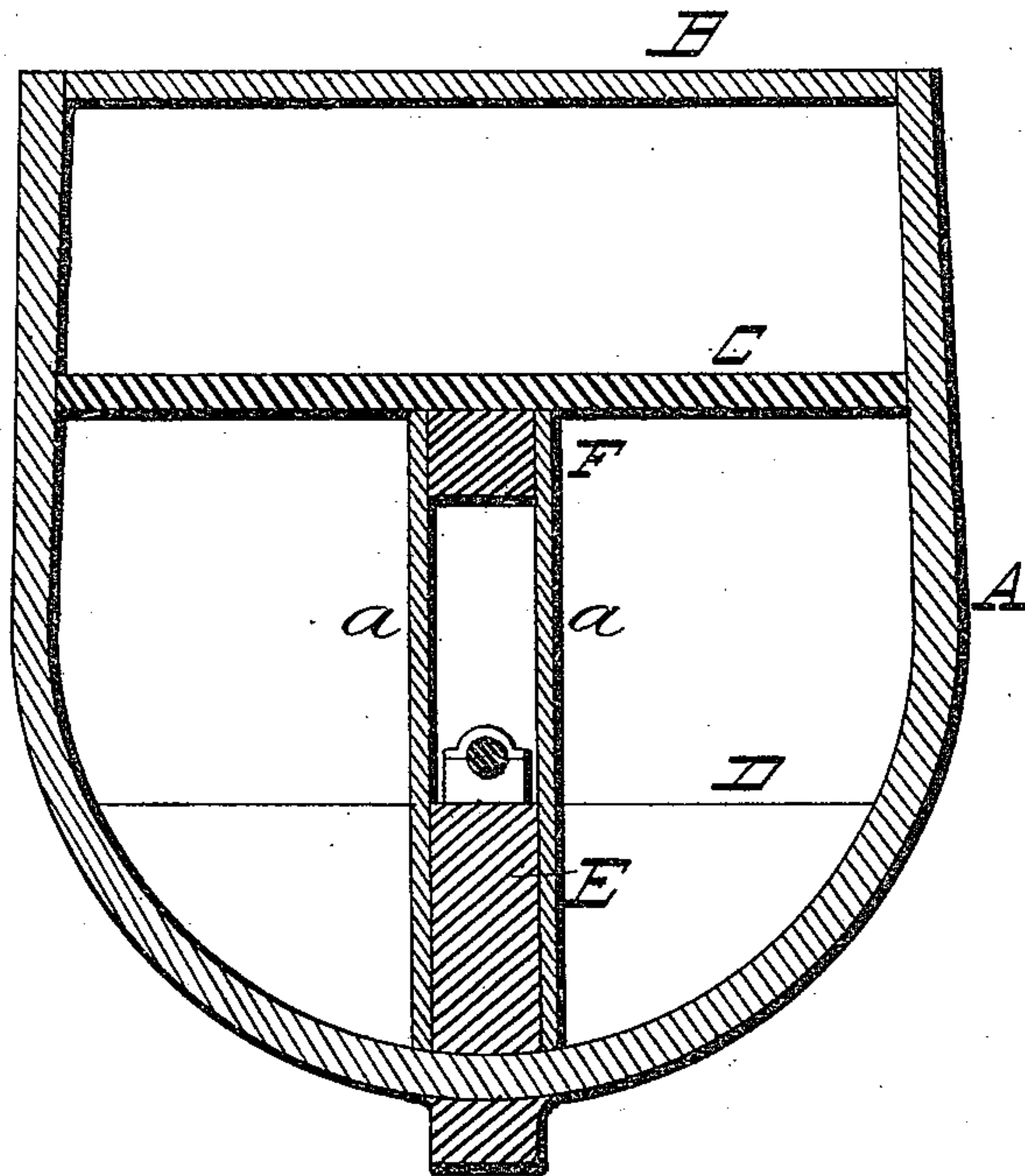
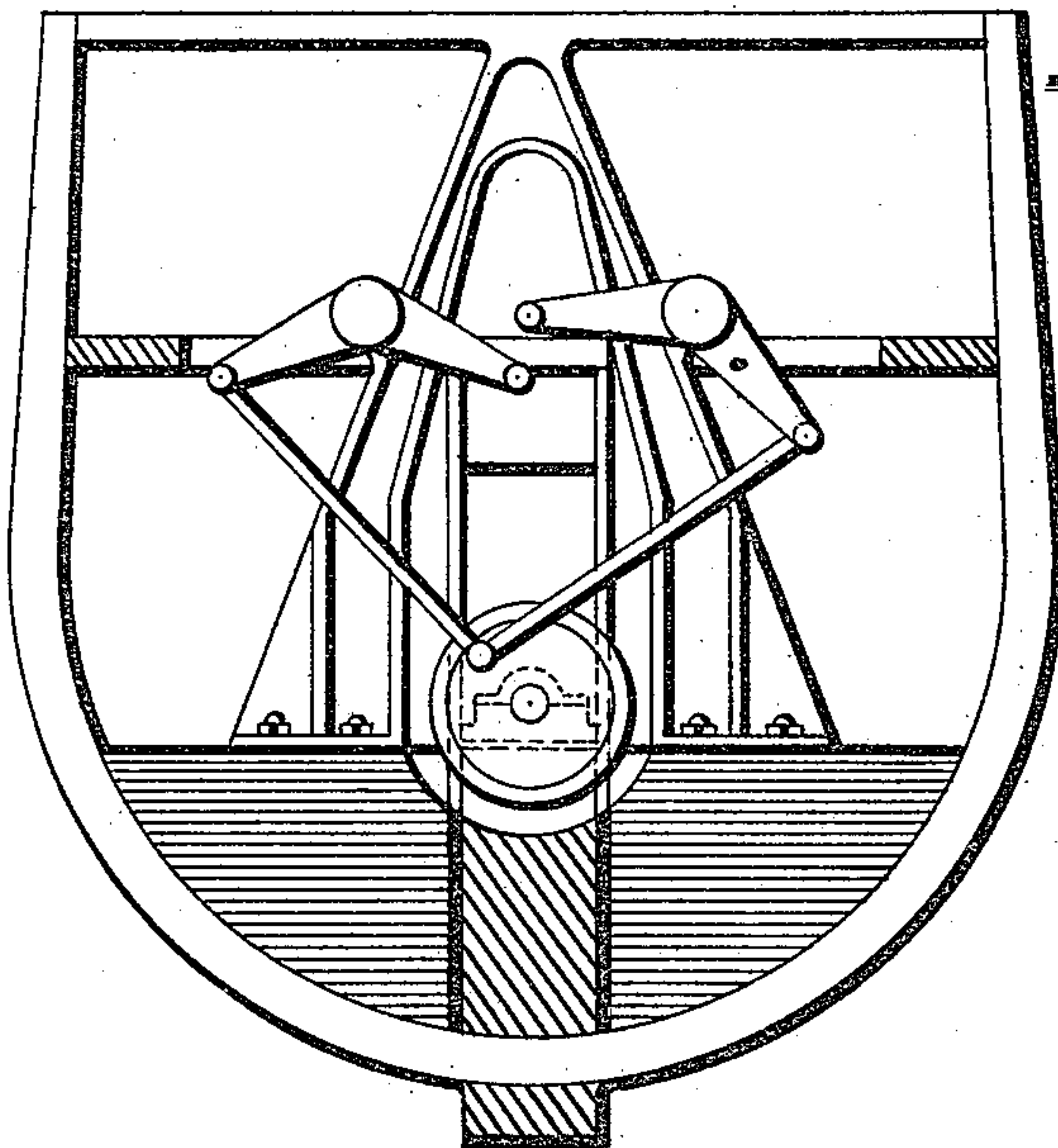


Fig. 2.



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(No Model.)

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Fig. 3.

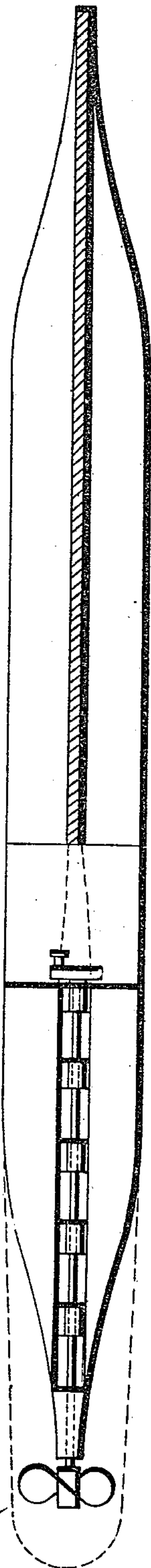
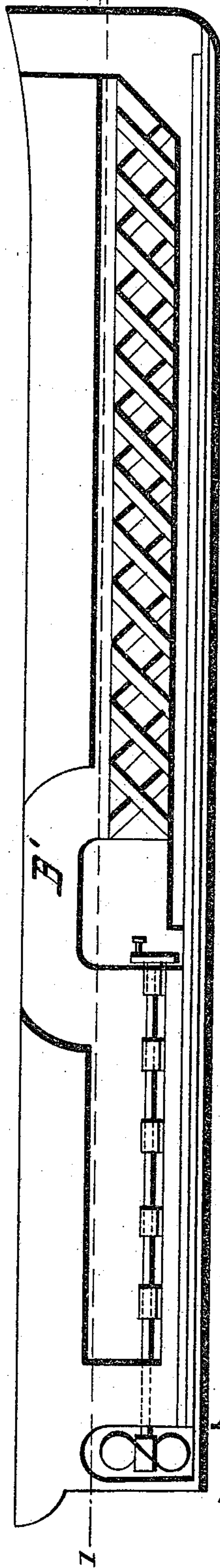


Fig. 4.



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Fig. 5.

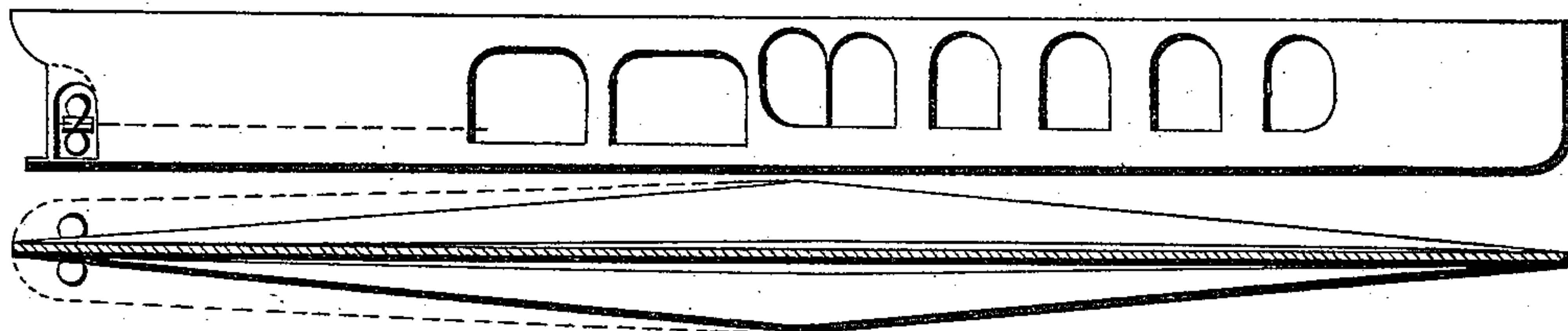


Fig. 7.

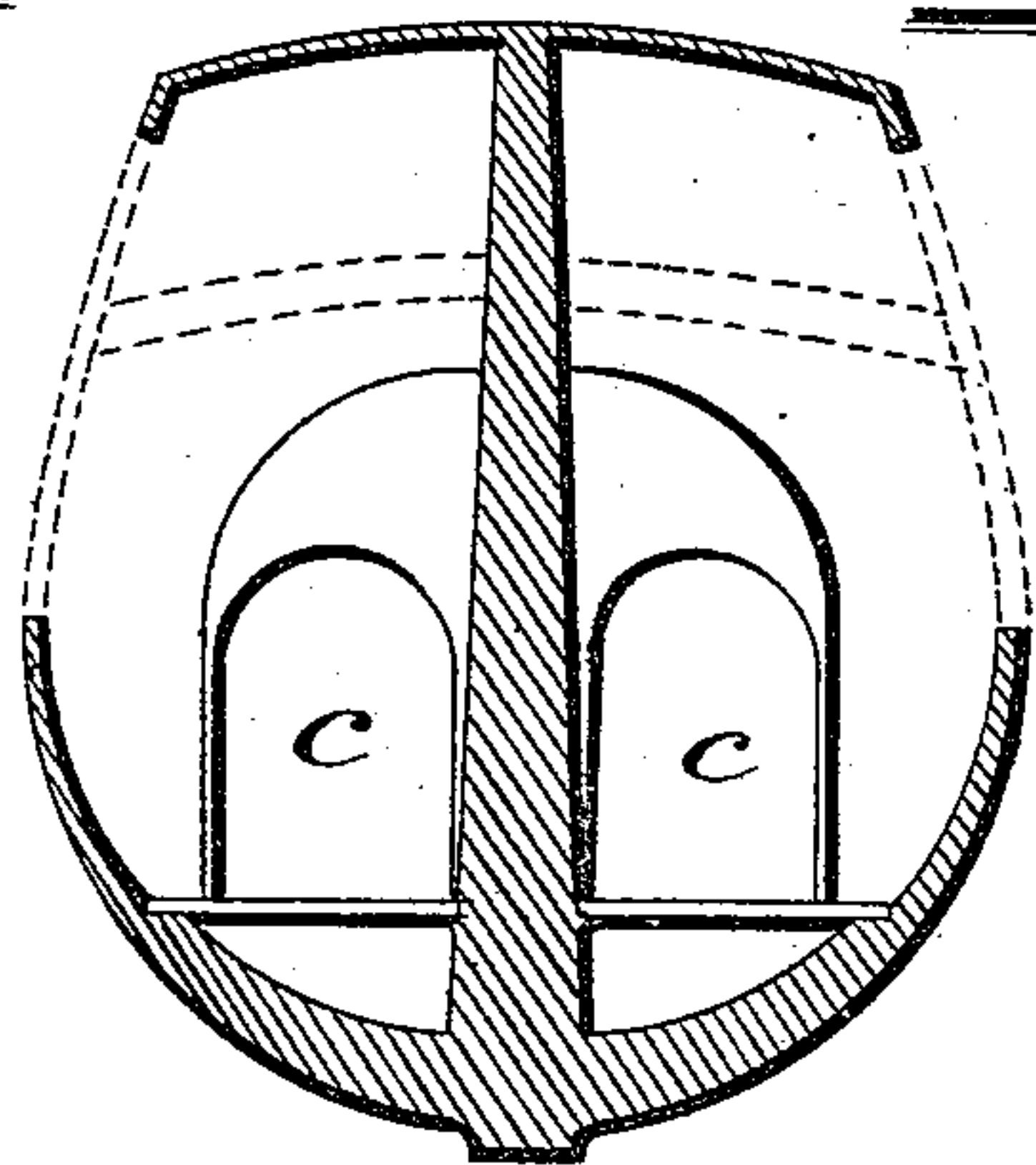


Fig. 6.

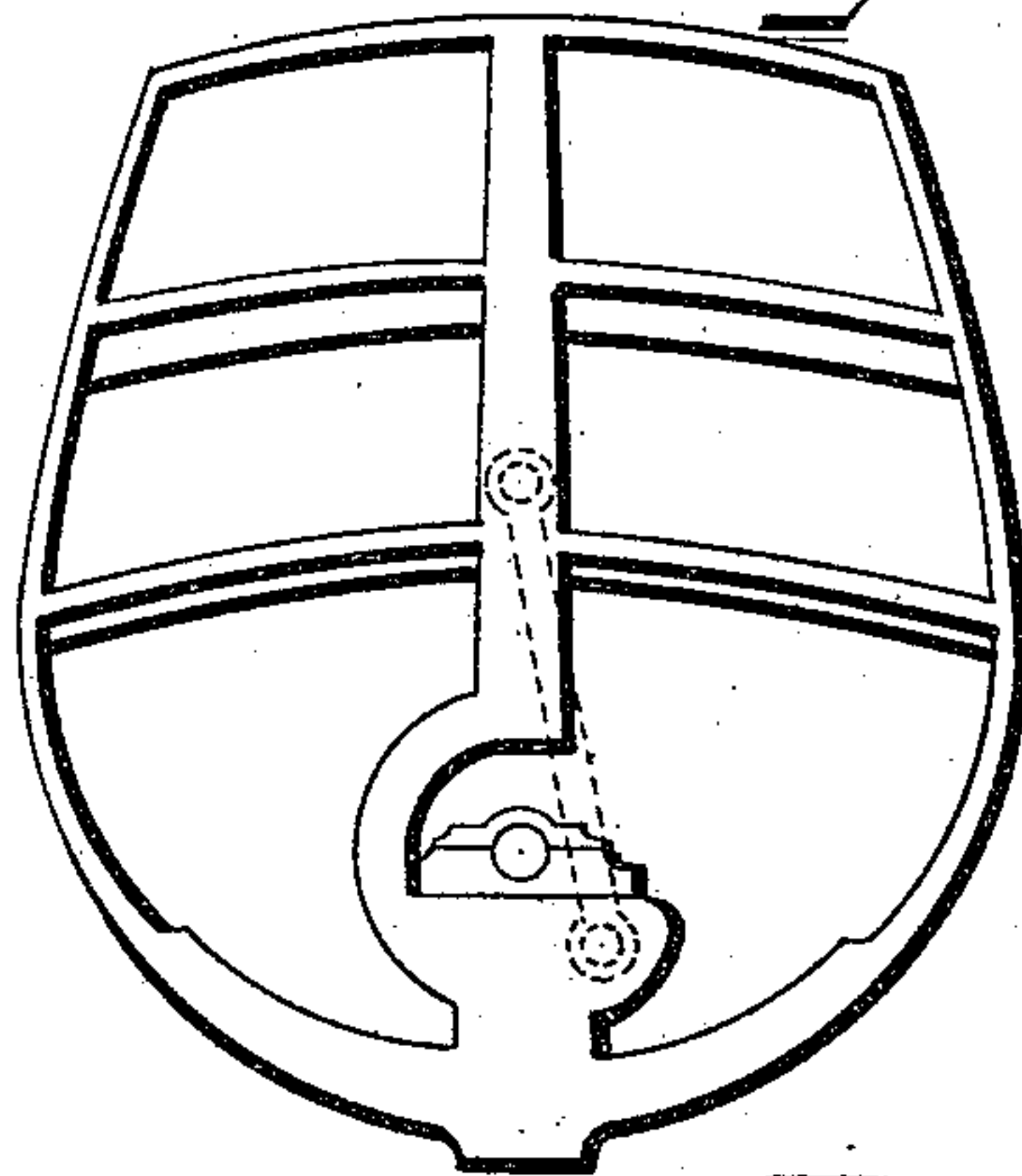


Fig. 8.

Fig. 8.

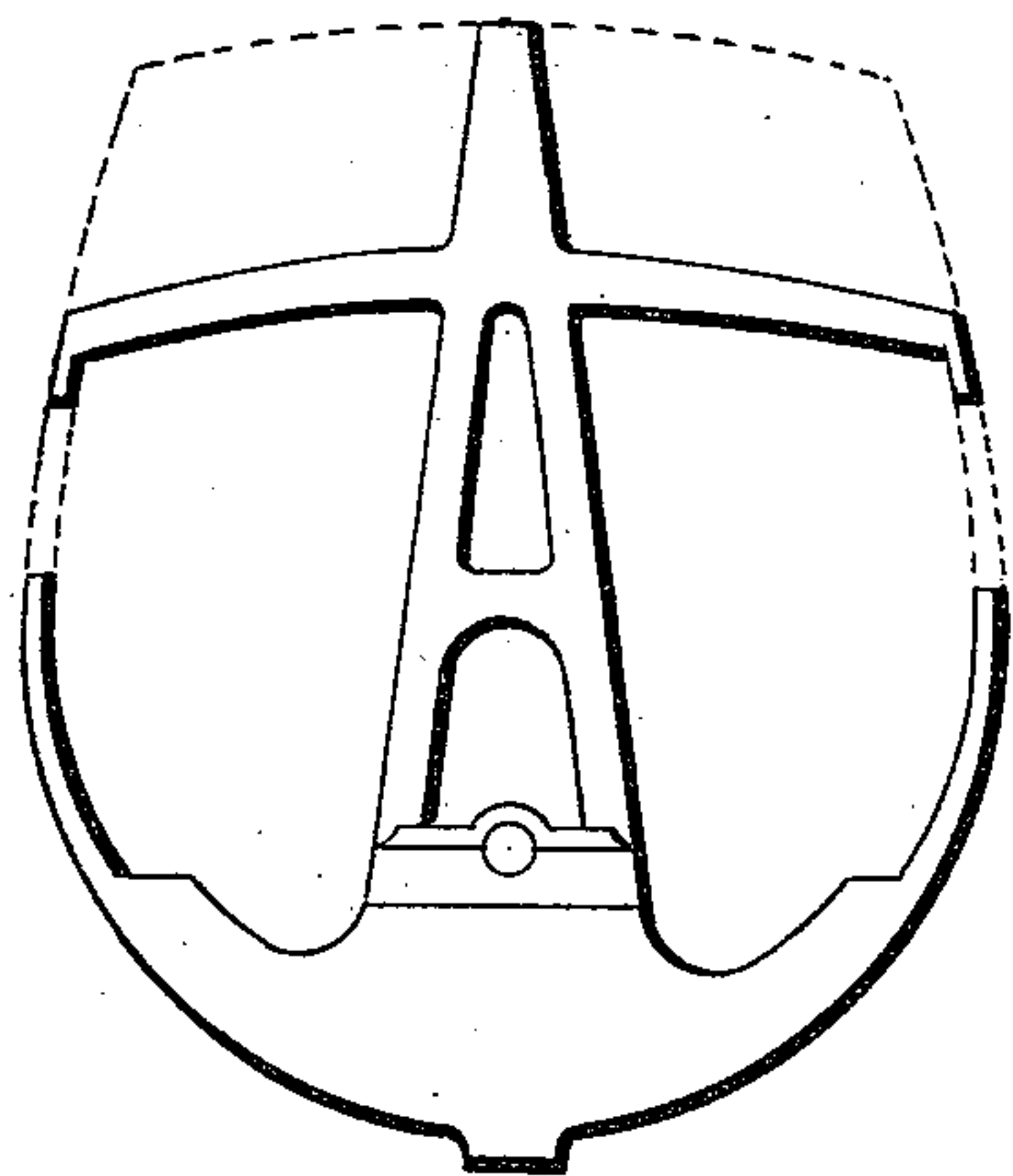
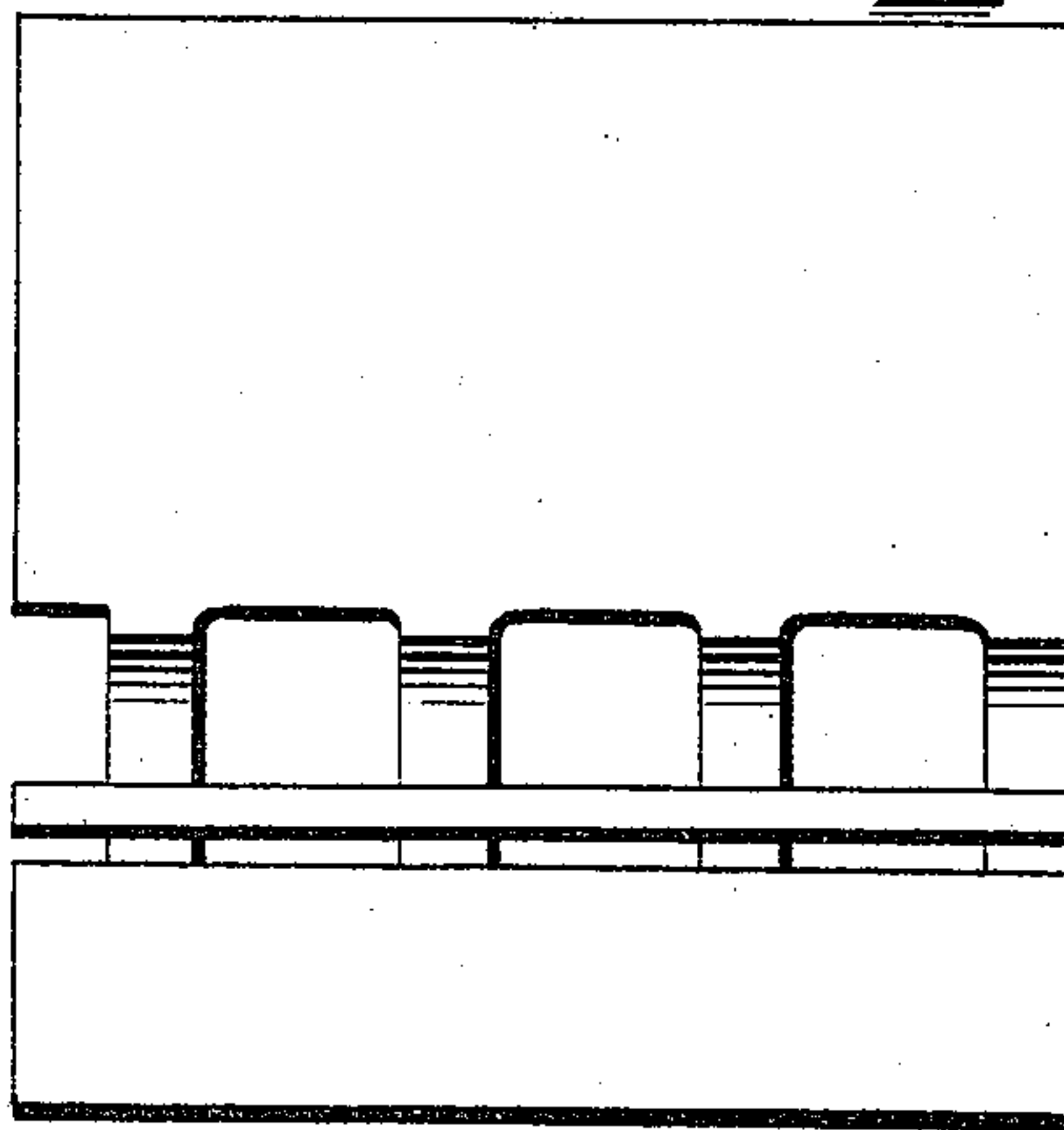


Fig. 10.



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UNITED STATES PATENT OFFICE.

ROBERT M. FRYER, OF BROOKLYN, NEW YORK.

CONSTRUCTION OF VESSELS FOR MARINE PURPOSES.

SPECIFICATION forming part of Letters Patent No. 355,868, dated January 11, 1887.

Application filed May 18, 1886. Serial No. 202,517. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. FRYER, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Construction of Vessels for Marine Purposes, as fully described and claimed hereinafter.

In the construction according to my plan I attain the threefold object of producing a strong vessel, providing a foundation for the engines and boilers, and providing a continuous and solid bearing for the propeller-shaft throughout the entire length thereof within the vessel, whereby vibration or springing of the shaft (which is frequently the principal cause of the breaking of the latter) is avoided.

A frequent cause of disaster at sea is insufficient strength of the frame of the vessel to resist the transverse strain occasioned by rough water, which results in the breaking open of the hull. In a rough sea the hull is not equally submerged. For example, the vessel is sometimes poised upon the crest of a wave with the ends projecting over. Again, the ends may be supported by two waves, while the center of the hull extends across the trough between the two waves, and is in a great measure unsupported. In either case the incidental strain has a tendency to break the vessel in two, and it is to resist this strain and tendency to break that an auxiliary frame or frames, denominated "hog-frames," are frequently employed.

Again, in rough water, when the vessel is rolling and pitching, the screw-propeller is often partially or wholly out of the water. It is obvious that when only one side of the screw is working, or when it is working unequally, there is a tendency to bend or spring the shaft, and this is in some cases sufficient to break the shaft and leave the ship at the mercy of the sea.

In order to overcome these difficulties I provide the vessel throughout its entire length with a keelson, and give its side walls a peculiar construction, the latter extending upward from and beyond the keelson and the entire length of the ship to the first or second deck, where it firmly unites, forming a T-brace, or to any other deck or height desired to support the keel, the engines and boilers, and the propeller shaft or shafts. This construction

takes the place of the ordinary hog-frame as a means for strengthening the vessel, and is at the same time admirably adapted to serve as a support for the engine for which I have secured a patent dated August 21, 1883, and numbered 283,704.

It will be observed that in the construction of vessels according to my plan the displacement may be gained by increasing the length of the vessel, while its breadth is diminished, by which means a long narrow or sharp vessel is produced; and, furthermore, the keel may be heavily loaded to stiffen the action of the vessel without weakening the bottom, as would be the case if the ordinary vessels were provided with heavily-loaded keels.

In the accompanying drawings, Figure 1 represents a cross section of a vessel embodying my invention, and showing the T-brace system gained by the union of keel and deck. Figure 2 is a similar view showing the arrangement of the engine and connections. Figure 3 is a horizontal section on the line 11, Fig. 4. Figure 4 is a sectional elevation. Figure 5 is an elevation of the keelson and keel combined; Figure 6, a horizontal section of the same, showing also the continuous union of these members to the bottom; Figure 7, a transverse section showing the location of the boilers, also the features of the keel, bottom, and keelson, as shown in Fig. 6. Figure 8 is a similar view showing arrangement of keelson, keel, and bottom, the former for the reception and support of a single wheel-shaft. Figure 9 is a similar view of a modified construction, and Figure 10 a section of an elevation of the same.

A is the hull of the vessel. B C D are the decks. E is the keelson proper. *a a* are metal plates bolted to the sides of the keelson E and extending upward to the deck C. Between the upper parts of the plates *a a* is a timber, F, attached to said deck, and to which the said plates are bolted, and which serves to hold them in place.

The keelson E may extend upward to or past the deck C, and the plates *a a* be dispensed with, as shown in Fig. 7; but I prefer the construction just described, for the reason that it provides a longitudinal passage-way through the ship, by which access is permitted to any part of the propeller-shaft and to the various compartments of the ship, which compart-

ments may be greatly increased in number, as the same may be reached through doors or passages in the plates *a a*, as shown in Figs. 5 and 10. This passage-way may also be utilized for the location of the various steam and water pipes leading to the various compartments and other parts of the vessel, by which ready access is afforded in case of leakage, and damage to the cargo be prevented.

I have invented a marine engine which is described and claimed in my patent above referred to, to which this construction is particularly adapted, the keelson *E*, or its extension, forming a solid foundation or support for the same, and serving to distribute the weight of the engine more widely than when placed directly upon the bottom of a ship, as in the ordinary manner.

The construction shown in Fig. 1 may extend through only a portion of the ship's length, as shown in Fig. 3, to provide a support for and access to the propeller-shaft, as above described, while forward of the engine the keelson may be made narrower, and solid, if desired, as by bringing the metal plates *a a* close together and omitting the parts *E* and *F*.

In Figs. 3 and 4 I have shown a system of braces applied to the sides thereof to give additional strength. An arch, *B'*, extends over the engine-space and connects the front and after parts of the keelson, and to this arch the top of the engine-frame may be connected, as described in my patent above referred to.

In Fig. 7, *c c* represent the boilers arranged upon opposite sides of the keelson, and partially supported by the latter and partially by the sides of the vessel. These boilers may, however, be supported entirely by the frame.

Fig. 8 shows a skeleton frame, which may be employed when the keelson is made of metal.

Fig. 9 represents a solid keelson with a notch in the side, to provide a support for the propeller-shaft.

Fig. 10 shows a section of the keelson in side elevation when two propeller-shafts are used, as in the case of twin-propellers. A ledge or shelf may be formed on each side of the keelson, and upon these ledges the shaft may be supported.

It will be seen that in the construction of a vessel according to my plan the bracing can be made very strong without overloading the ship. For instance, the longitudinal central wall or frame can be made a part of the

keel and bottom, and also a part of the deck, which latter in turn becomes a part of the sides, which are again strengthened by the transverse portion leading from the sides to the central wall and one of the decks, (at least,) dividing the lower hold into a great many compartments, and rendering this part of the vessel sufficiently strong to resist the terrific action of the ocean with greater ease than any design now in use.

Where a vessel is designed principally for speed, the bottom may be made heavy enough to ballast the ship and receive all the necessary support from the central wall already described. However, as above stated, a long, narrow, or sharp vessel can be made to take the place of the wider vessels, which spread out in breadth to gain the displacement needed for cargo and ballast, which adds nothing to the strength of the ship.

Having thus described my invention, I claim—

1. In the construction of vessels, central longitudinal walls extending the entire length of the vessel on each side of the keelson, and from the bottom of the vessel to the deck or decks, the portion from the stern to the engine being double to admit the propeller-shaft, and forward of the engine a single or double wall or frame, the two portions being united by an arch or wall placed high enough to receive the engine, the same being permanently connected with the engine-frame, substantially as set forth.

2. As an improvement in the construction of vessels, a keelson provided with side walls or plates, *a a*, which rise to the deck and have a space between them for the reception of the propeller-shaft, and the keelson forming a bearing or support for said shaft, as and for the purposes set forth.

3. The improvement in the construction of vessels herein shown and described, which consists in a keelson rising and secured to the deck and provided with a seat for the engine, and forming a continuous bearing for the propeller-shaft, as and for the purposes set forth.

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

ROBT. M. FRYER.

Witnesses:

WILLIAM H. CLARKSON,
T. O'MEARA.