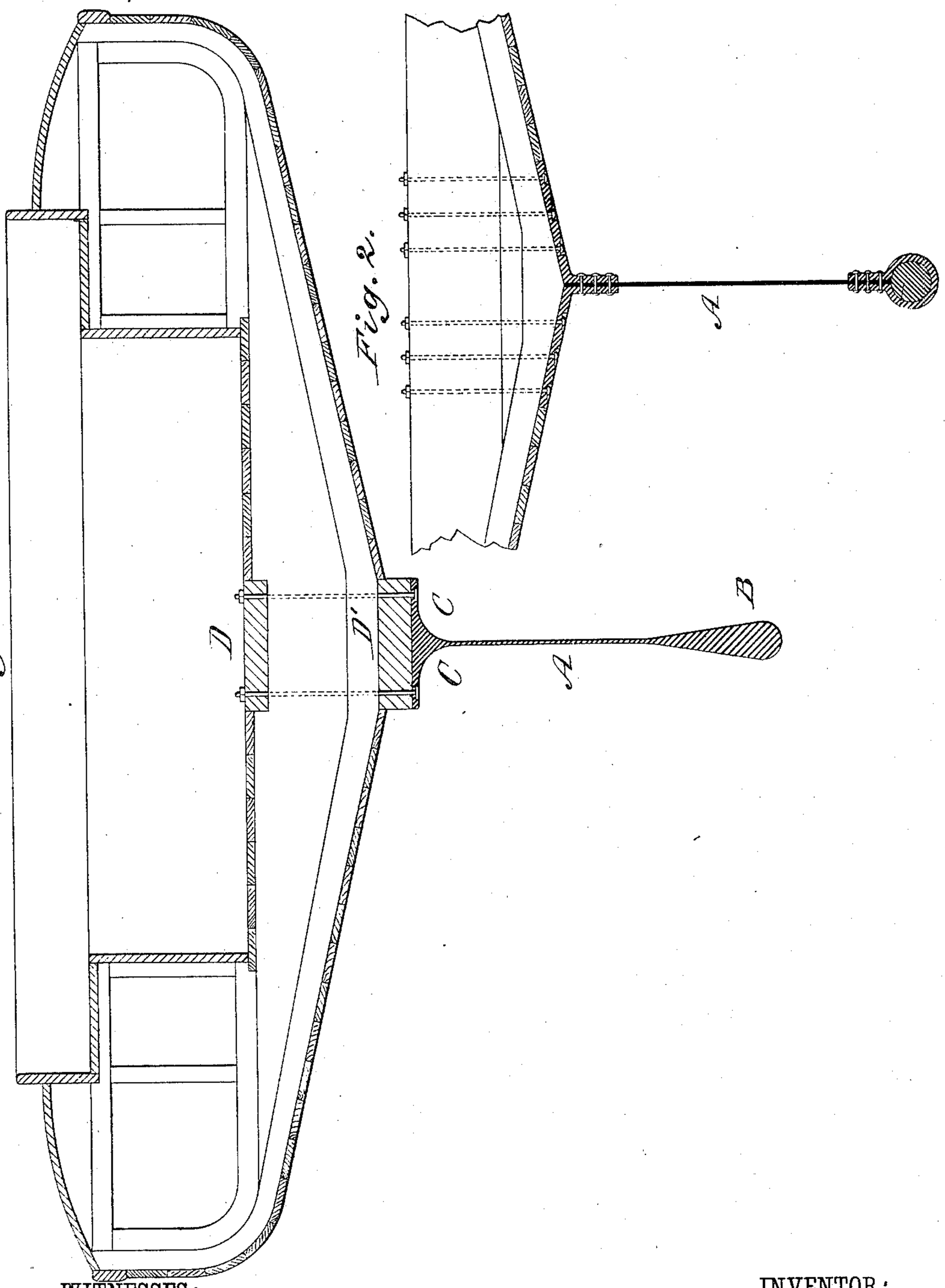
(No Model.)

2 Sheets—Sheet 1.

I. GARRARD.

SAIL BOAT.

No. 313,664. Patented Mar. 10, 1885.



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(No Model.) 2 Sheets—Sheet 2.

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SAIL BOAT.

No. 313,664. Patented Mar. 10, 1885.

Fig. 3.

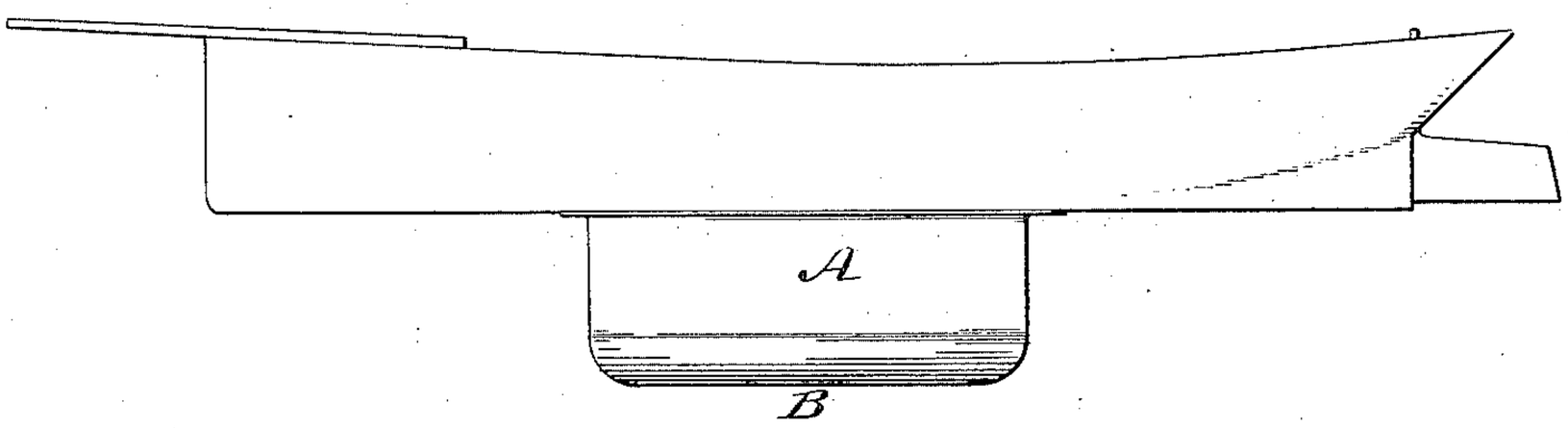


Fig. 4.

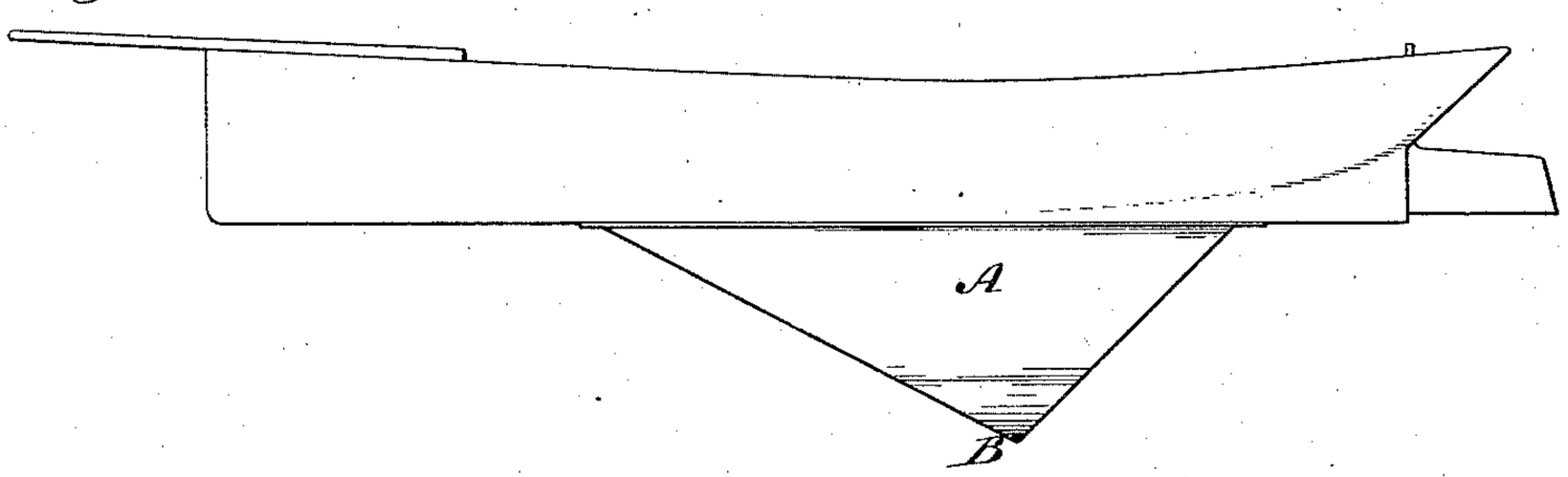


Fig. 5.

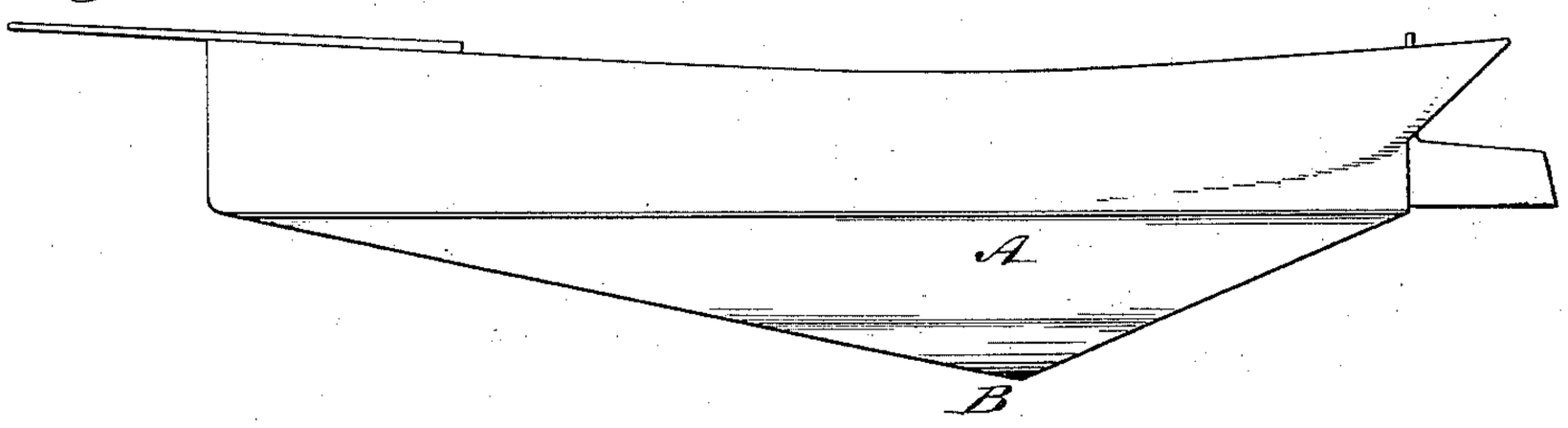
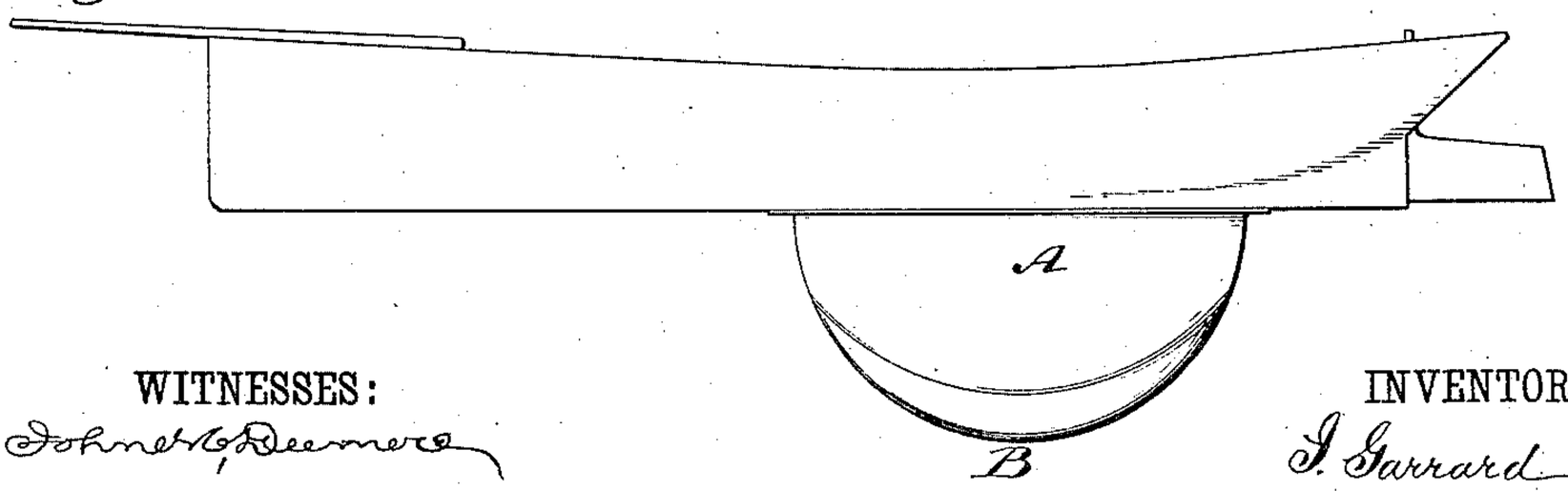


Fig. 6.



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UNITED STATES PATENT OFFICE.

ISRAEL GARRARD, OF FRONTENAC, MINNESOTA.

SAIL-BOAT.

SPECIFICATION forming part of Letters Patent No. 313,664, dated March 10, 1885.

Application filed August 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, ISRAEL GARRARD, of Frontenac, in the county of Goodhue and State of Minnesota, have invented certain new and useful Improvements in Yachts and Sail-Boats of the Shallow-Model or Center-Board Type, of which the following is a full, clear, and exact description.

The object of my invention is to provide certain new and useful improvements in that class of yachts or sail-boats known as the "shallow-model" or "center-board" type, whereby the roominess and convenience of the boat are increased by the removal of the center-board trunk from the boat. A further object is to avoid the necessity of loading the boat with ballast, so that the draft is deeper than the most desirable sailing-lines; and another object is to avoid the necessity of using sand-bags and a crew to handle them to the windward, and to accomplish these results by a device which will perform the functions of the ordinary center-board in preventing leeway, and will also perform the functions of the fixed ballast used for its weight and the functions of the shifting ballast used for its power of leverage, by its increase of the mechanical power of leverage as the boat is careened by the sail-pressure.

The invention consists in a web or device of suitable area to prevent leeway and of the least thickness compatible with the strength of the material, which web or device is firmly held to the hull of the boat by flanges and bolts of sufficient strength, and is provided at or near the lower edge with such an enlargement that the entire web or device will have sufficient weight to draw the boat down to the desired lines of flotation. The said web is to be of any desired form, and the enlargement at the lower edge of the web may also be of any desired form, thus securing the greatest preponderance of weight at the greatest possible length of leverage. The enlargement is to be made integral with the web and flanges by casting the enlargement, web, and flanges in one piece; or the said enlargement can be secured to the web by means of straps, or in any other suitable manner, and the web or device and the enlargement may be made of metal, or metal and wood combined.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a cross-sectional elevation of a boat provided with my improved ballast-fin made of cast metal and held on the keelson. Fig. 2 is a cross-sectional elevation of a boat, showing the ballast-fin constructed of metal parts and hung in the floor-timbers. Figs. 3, 4, 5, and 6 show side views of some of the different possible forms of my improved ballast-fin, all indicating a combination of the greatest weight with the largest leverage, and with an area sufficient to prevent or reduce leeway.

The ballast-fin A B C consists of the web A, the enlargement B at the bottom edge of the web, and the flanges C at the top edge of the web, cast in one piece and firmly secured to the bottom of the boat by bolts passed through the keel D′ to the keelson D. The cross-section of the enlargement B may be circular, conical, pyriform, or guttate, with the ends or edges of the enlargement and web beveled fore and aft, as desired, the objects to be attained being to secure the greatest practicable weight at the greatest practicable leverage and ease of movement through the water. In case the ballast-fin is made of cast metal, the enlargement and flanges are made integral with the web, as shown in Fig. 1; or the enlargement can consist of a separate bar firmly held to the bottom edge of a sheet of metal or other web. The web is then held to the hull by angle-straps and bolts which pass through the floor-timbers, as shown in Fig. 2. If desired, the web may also be made of wood. The ballast-fin may be attached to the boat in whatever manner will successfully resist the strain of the weight and leverage, these factors depending on the depth and weight of the ballast-fin.

Fig. 3 shows a parallelogram form of the fin; Figs. 4 and 5, triangular forms, and Fig. 6 a semicircular form, all of them carrying the greatest practicable weight at the lowest practicable point, and all having areas sufficient to prevent or diminish leeway.

All the figures from 1 to 6 present the same quality of increasing mechanical power to maintain stability as the increase of sail-pressure careens the boat from the perpendicular.

The mechanical power of leverage, which increases with the demand for it, is impondera-

ble, and does not load the boat, as would the fixed or other ballast necessary to accomplish the same results of stability.

A further improvement over fixed or stowed ballast is, that the whole power of the ballast device, as shown, is effective both by the force of gravity and the leverage to maintain stability, whereas a large percentage of fixed ballast contributes by the force of gravity to instability when by careening of the boat it is on the lower side.

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

In a vessel or boat, the continuous flexible or yielding fin or plate secured to the bottom of the vessel or boat, said plate or fin having at its lower longitudinal edge a solid enlargement of approximately conical form, with its convergent surface uniting and forming one piece with said plate or fin, substantially as and for the purpose set forth.

ISRAEL GARRARD.

Witnesses:
WM. SCHNEIDER,
H. LORENTZEN.