2 Sheets—Sheet 1.

J. W. NORCROSS.

Sails and Rigging for Vessels.

No. 209,414. Patented Oct. 29, 1878.

Fig. 2.

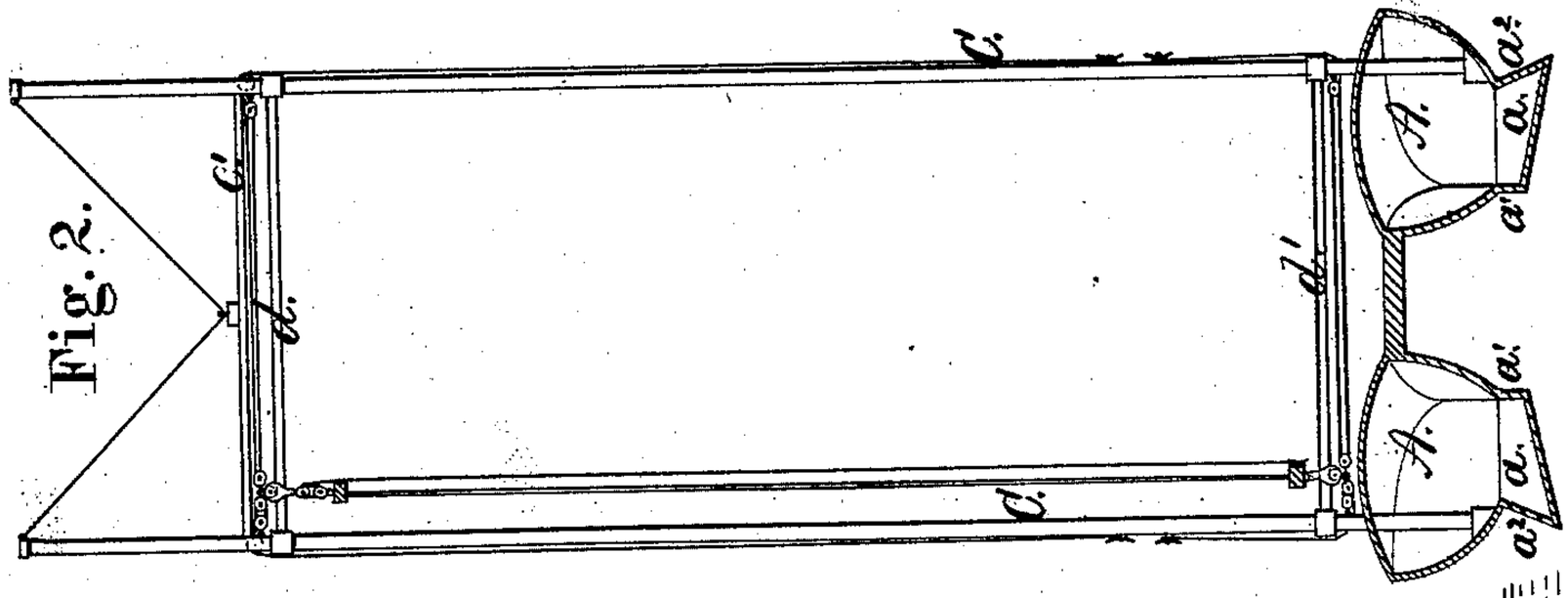

Fig. I.

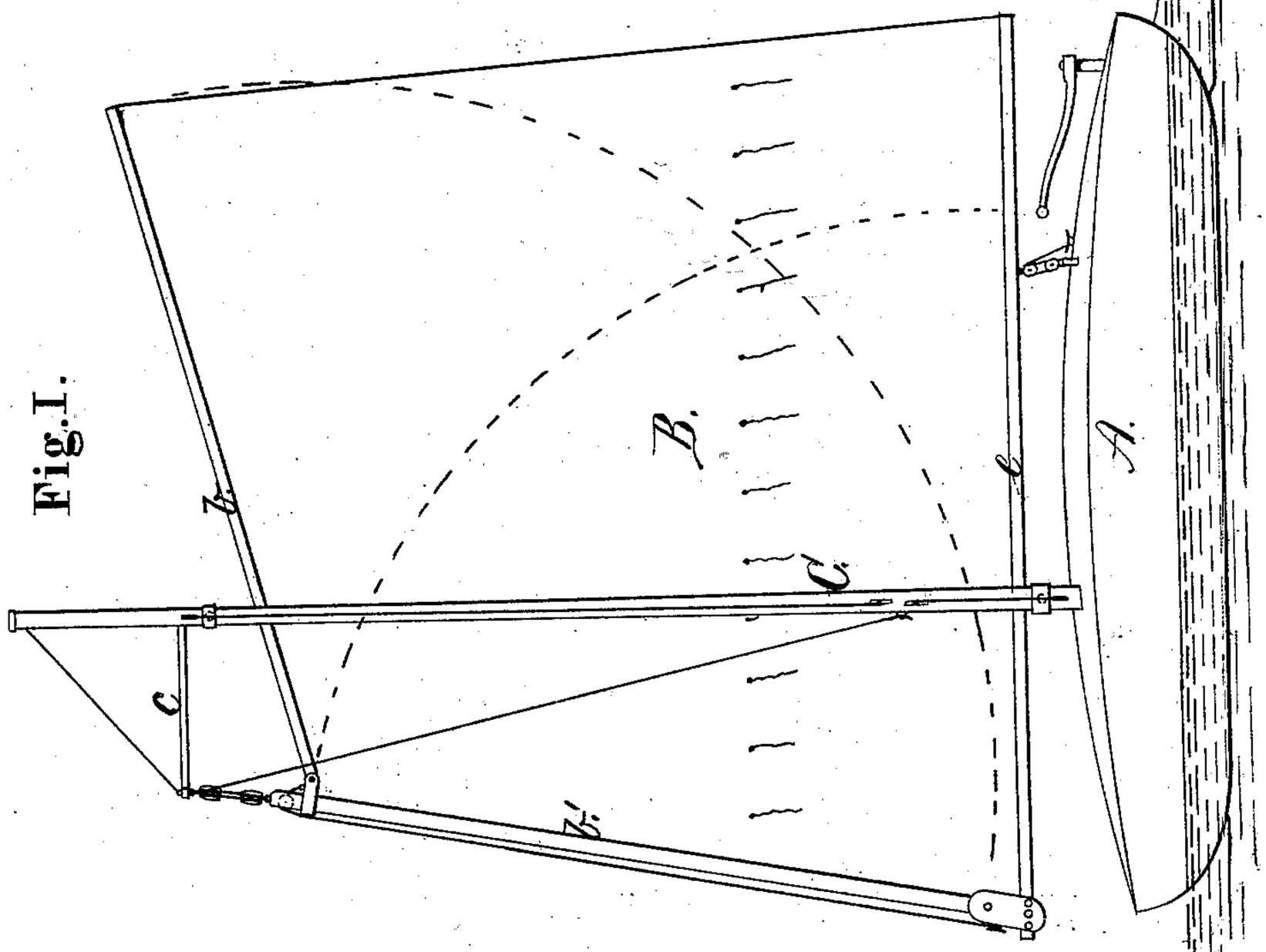

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Fig. 1.

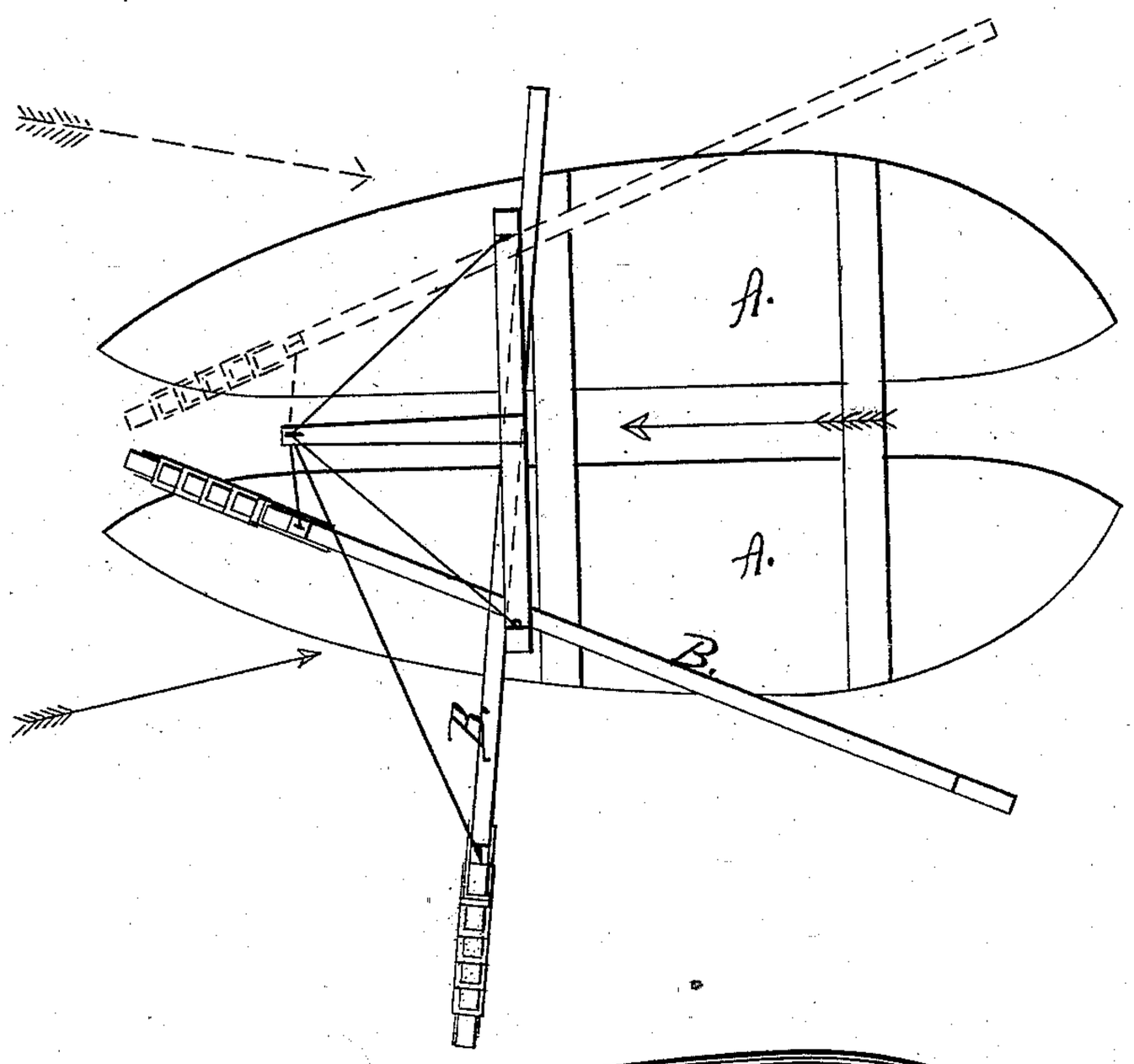
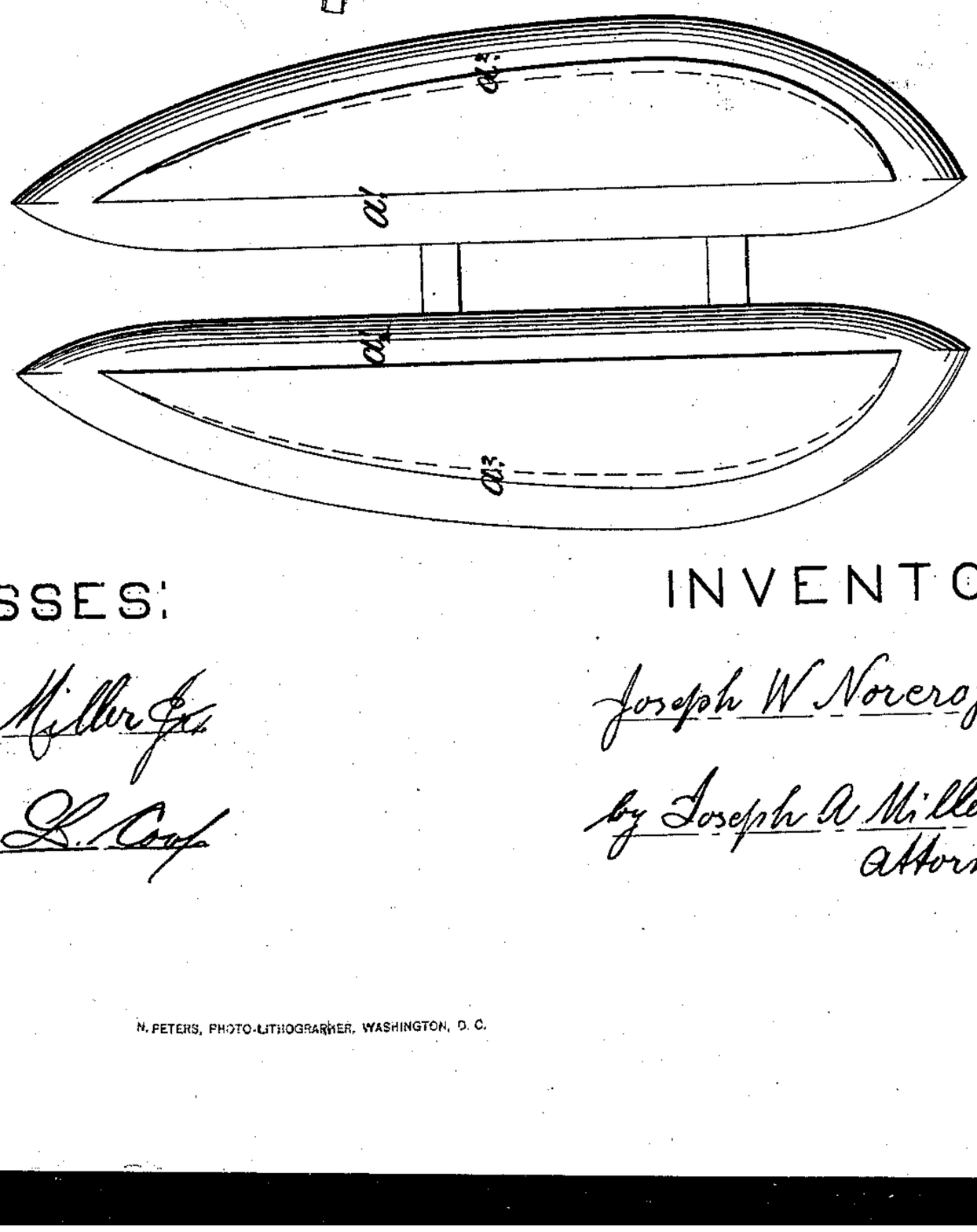


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH W. NORCROSS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SAILS AND RIGGING FOR VESSELS.

Specification forming part of Letters Patent No. **209,414,** dated October 29, 1878; application filed April 15, 1878.

To all whom it may concern:

Be it known that I, JOSEPH W. NORCROSS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Vessels; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side view of my improved vessel. It is shown provided with sails, which are rigged in a peculiar and novel manner, so as to allow of a large spread of canvas and simplicity in the manipulation. Fig. 2 is a cross-section near the widest midship section, showing two hulls of peculiar section secured together, and provided with two masts, firmly secured together near the top. Fig. 3 is a plan view of the bottom of the twin vessel. Fig. 4 is a top-plan view of my improved vessel, showing the different positions of the sails in solid and in broken lines.

The object of this invention is to provide a vessel with greater buoyancy, keep her more closely on her course, prevent drifting laterally, and enable the vessel to carry more sail with safety than was possible heretofore.

The invention consists in the peculiar construction of the hulls and the arrangement of the two masts, sails, and the peculiar method of rigging the same, as will be more fully set forth hereinafter, and pointed out in the claims.

In the drawings, A represents one of the twin hulls, two of which are rigidly secured together and form the vessel. *a* is the submerged part of the hulls, the outer side of which, on each hull, is arranged to be submerged deeper than the inner side of the hulls, so that the bottom of the two hulls forming the vessel will slope upward toward the center, as is shown in Fig. 2. The submerged portion *a* unites with the hull at a^1 by a vertical face running straight fore and aft on the two inner sides, while the outer sides form the sloping face a^2, which enters under the water, and thus secures a hold on the same. This face a^2 unites with the straight narrower face a^1 at each end, forming a curved line, as shown in Fig. 4.

The deck of each of the hulls is raised amidship, where the greatest cross-section is provided, and both stem and stern are contracted both by sloping the deck downward and by so narrowing the cross-section that the main buoyancy is located at the central portion of the vessel. The vessel will, therefore, enter a wave with her bows, without a shock, jar, or tremble, quietly, until the section presenting excess of buoyancy is reached, when the thin sheet of water will run off from the curved deck as from the back of a duck. The large buoyant power at midship will also prevent a wave from rising above the deck at the center, as there the water is met by the floating power of the large section.

The arrangement of the sails differs from the usual arrangement, first, in having two masts, one on each side of the vessel; or there may be two or more masts on each side of the vessel. The drawing shows the sail on one side of the vessel. This side is always to be the windward side. The sail is shown as supported on ways extending from one mast to the other, upon which the sail can be moved from one side to the other. This arrangement is used on small vessels, so as to allow the sail to be always carried on the windward side. In large vessels I use two sets of sails, one on each side, the windward sail being used only in high winds; but in light winds, beating to windward, both can be used.

I do not confine myself to any particular kind of sail or rig, as the masts may be arranged so as to adapt them to all kinds of sails or rigs.

The drawings represent a new kind of sail, which, instead of sliding on the mast proper, slides upon a sheer-boom at the front edge of the sail, technically called the "loff." The gaff *b*, or top edge of the sail, is hinged to the upper end of the sheer-boom b', at the head of the sheer-boom.

At the end of the arm *c*, which projects forward from the center of the cross-piece c^1, which connects the two masts, is a tackle block to hoist the boom, and below the cross-piece c' is the rod *d*, on which the sail is secured by any kind of sliding bearing or car-

riage, provided with suitable blocks to hoist or lower the sail. When the sail is set this forms the main support of the sail. Near the deck is another rod, d', on which the lower boom, e, is secured the same as the upper, b, is on the rod d, and arranged to slide from side to side in the same manner as on the upper rod. The advantage of this is that it (the sail) is practically balanced, as it is supported toward the center, and not at one edge, like a door.

The gaff b is hinged to the boom b'; but it may be arranged to slide down on the boom b'. In either case the sail is supported on the rod d, and thus partially balanced. In lowering the sail, the gaff may be let down on the hinge at the upper end of the boom, and the gaff will fall alongside the boom, as shown in broken lines, when the boom is let go, and both double on the lower boom, e.

I do not wish to confine myself to the particular manner of construction shown, as various modifications will be required under peculiar circumstances.

In vessels as heretofore constructed the curved sides of the lower part of the hull displaced all the water downward, and as water is practically incompressible and its atoms very mobile, a vessel rolls easily on this fluid support. To give steadiness, I project the lower part of the hull outward and downward, and thus present the face a^2 to the water, which is deflected upward and sideward from the face a^2, and this portion of the hull enters the water and passes through the same like a plowshare does the soil, thus giving a firmer hold on the water and greater steadiness to the vessel.

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

1. The combination, with a twin vessel, of two sets of masts, one or more on each side, arranged to carry the sail or sails on the weather side of the vessel, substantially as and for the purpose set forth.

2. In combination with a twin vessel provided with one or more masts on each side, a sail and means, substantially as described, by which the sail is shifted from one side to the other, as and for the purpose specified.

3. In a vessel, substantially as described, provided with two masts, the combination, with the gaff and lower boom, of means, substantially as shown and described, by which the sail is supported and free to swing on supports balancing or partially balancing the sail, as and for the purpose described.

In testimony that I claim the foregoing as my invention I have affixed my signature in presence of two witnesses.

JOSEPH W. NORCROSS.

Witnesses:
JOSEPH A. MILLER,
JNO. D. PATTEN.