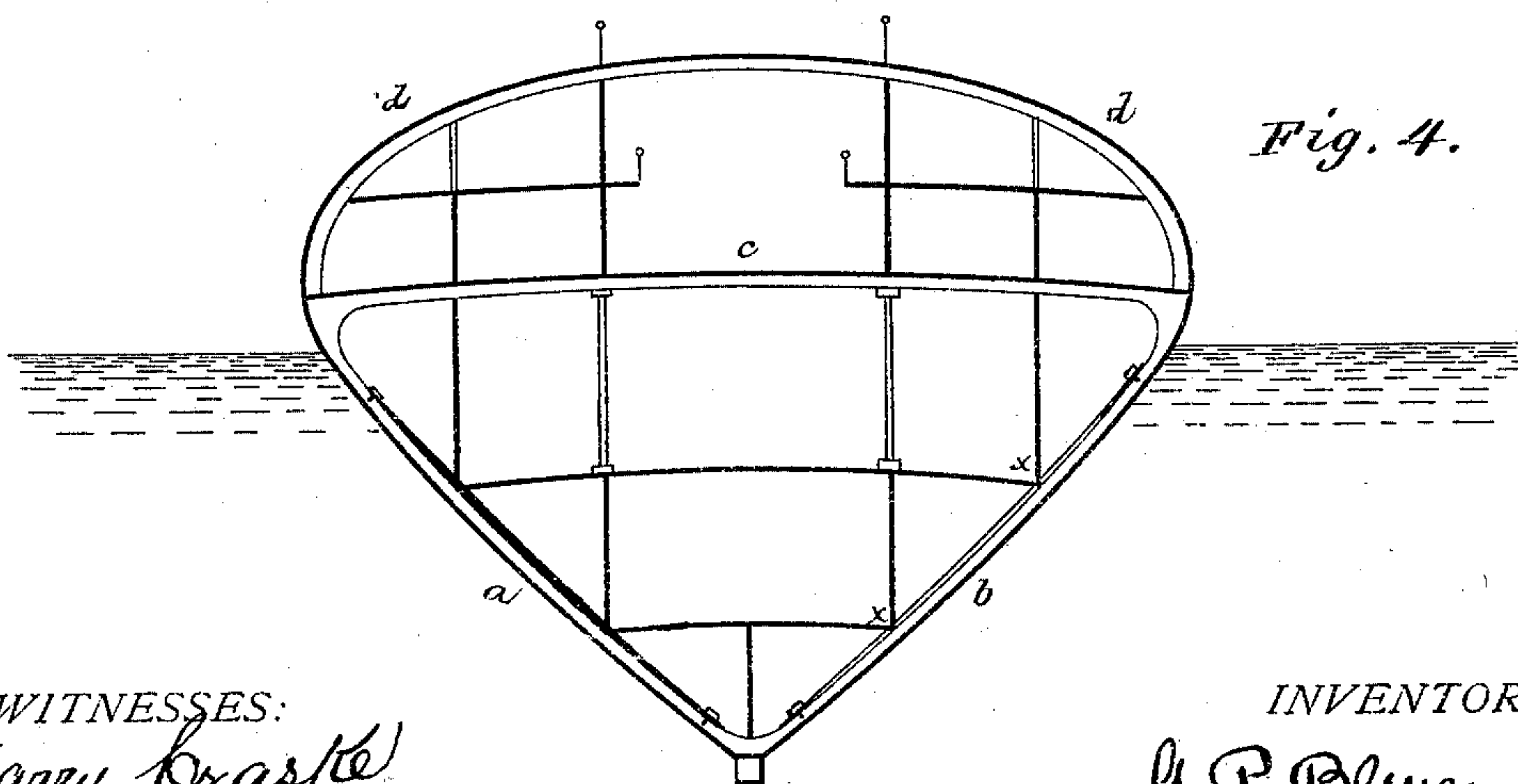
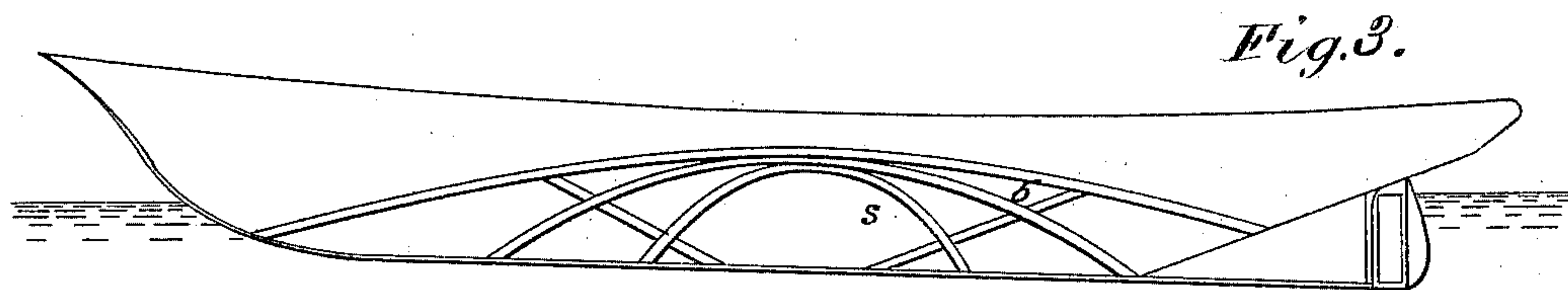
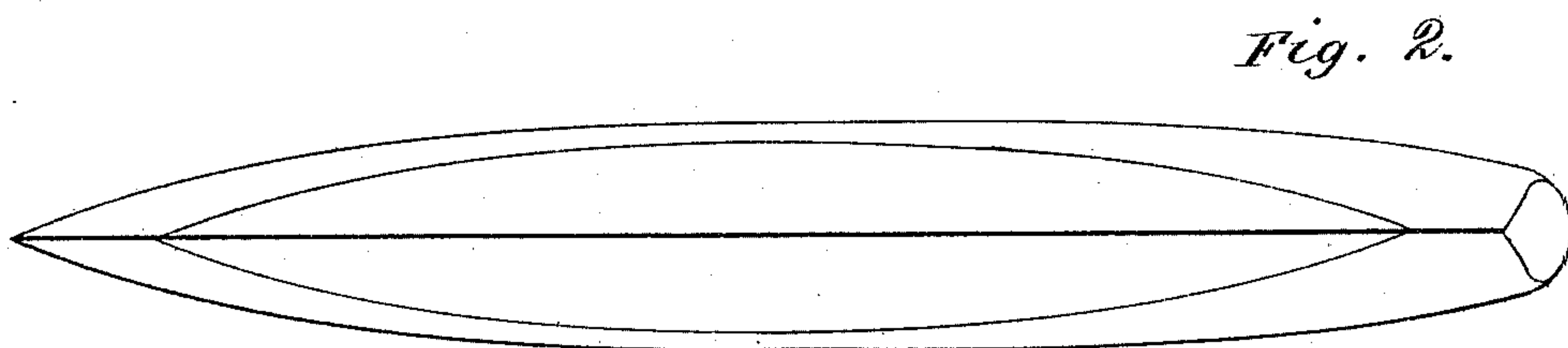
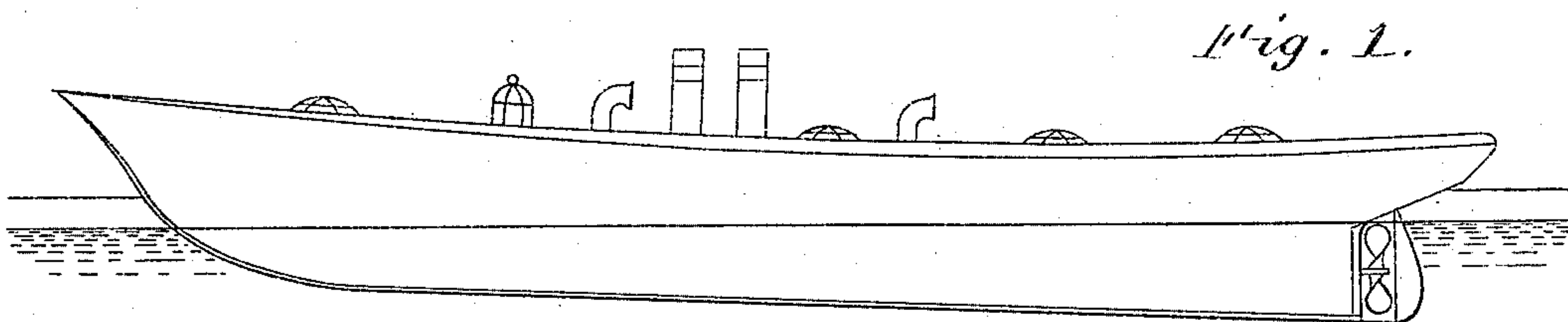


(No Model.)

A. P. BLIVEN.
CONSTRUCTION OF SHIPS.

No. 271,213.

Patented Jan. 30, 1883.



WITNESSES:

Harry Grasko
P. H. Vernon

INVENTOR

A. P. Bliven

by
M. Kemble Hall
ATTORNEY

UNITED STATES PATENT OFFICE.

ALONZO P. BLIVEN, OF BROOKLYN, N. Y., ASSIGNOR TO THE AMERICAN
QUICK TRANSIT STEAMSHIP COMPANY, OF BOSTON, MASSACHUSETTS.

CONSTRUCTION OF SHIPS.

SPECIFICATION forming part of Letters Patent No. 271,213, dated January 30, 1883.

Application filed February 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALONZO P. BLIVEN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in the Construction of Ships, of which the following is a specification.

My invention relates to the external form or model of the vessel with regard to the passage through and over the water, to its construction with regard to strength, and to the arrangement of its internal parts and accessories with reference to the convenience and safety of the passengers and freight.

The accompanying drawings show a large steam-vessel; but the invention, either wholly or in part, is equally applicable to sailing-vessels and small boats.

Figure 1 is an external longitudinal elevation of a ship built according to my said invention. Fig. 2 is an inverted plan of the same, and Fig. 3 is an internal elevation made to show the arrangement of the longitudinal arches and braces. Fig. 4 is a midship section of the ship on an enlarged scale.

The midship section *a b*, from the keel to the main deck *c* at about the load water-line, is angular in form, so that the deck and the two parts of the bottom constitute a triangular figure, of which the three sides mutually brace and sustain each other. A circular section offers but little resistance to external force on either side, and tends to collapse by its own weight. A rectangular figure yields readily to diagonal forces that open one set of opposite angles and close the other, the amount of the resistance being measured simply by the strength of the joint. In a triangular figure, however, all the parts mutually tie and brace each other in resistance to any force short of actual destruction.

In the ship illustrated in the drawings each of the three sides of the self-sustaining figure of the immersed portion of the hull derives additional strength from the slight curvature of the deck and the two parts of the bottom. Above the main deck the sides of the vessel are extended in a form approximating a quarter of a circle, *d d*, that are merged together at the middle in a slightly convex crown, that forms a spar-deck of about one-half the width

of the vessel. In a hull, therefore, which is made with a triangular immersed body built continuous with an arched crown and extending the whole length of the vessel, there is inherent strength in the form alone, independent of the special bracing that is ordinarily required to correct the defects of weakness inherent in forms of ordinary construction. In addition to the strength arising from this form of transverse section, it affords to a vessel great stability. In a circular section with the center of gravity in the middle of the section the center of displacement is also in the middle at any inclination, and there is no tendency due to the shape of the section itself by which a vessel so formed will retain or return to an upright position. It has no stability. It may be rolled readily to either side and will have no tendency to recover. With the form of section shown in the drawings, however, a force that heels a vessel over lifts the emerging side with an increased leverage of weight and depresses the immersed side opposite against an increased leverage of buoyancy, so that it meets with an increasing resistance from both sources, which, on the removal of the disturbing force, causes the vessel to right itself immediately, without regard, within reasonable limits, to ballast or anything other than the form alone of the midship section. Other peculiarities of this form of section are that the larger part of the displacement is at the surface of the water, where the pressure and resistance to motion is least; that the variations of the water-line at the load-lines are less than with any ordinary form of equal section, and that the stability due to the form of section is further increased by the rising sheer and flaring ends shown in Figs. 1, 2, and 3.

For the purposes of longitudinal strength, diagonal braces have been hitherto built into the sides; but when they have been laid in the concave bilges of the ordinary form the curvature draws upon the bolts and loosens the fastenings before the braces themselves can be of much use. Attempts have also been made to apply them outside the timbers; but this manifestly interferes with the placing of the outer planking or plates, and, moreover, does nothing to conform the length of the brace to the direction of the strain.

The vertical trusses or arched frames that are of service in river-boats that are always upright are not only of little use when the vessel is heeled over in a seaway, but they are likely to become self-destructive when placed in an inclined position. In the form of section shown in Fig. 4 the internal diagonal braces and arches, *e* and *f*, are built directly upon the straight immersed sides and bottom from the keel to the main deck, as shown in Fig. 3, and all their parts, being built practically in a right plane, offer a direct resistance to the strains they are intended to meet. A similar arrangement of bracing is also applicable in the same way with advantage to the main deck.

Of the internal arrangements and accessories, the vessel is fitted with longitudinal and transverse bulk-heads around the engines and elsewhere throughout the hull, for strength and in anticipation of accidents, and for the storage of freight and boats, and for other purposes, access to the compartments being had through internal doors and external ports, as may be required.

The main deck is represented in the drawings as a lofty saloon fitted with a double row of rooms on each side, and with an upper single tier opening on a gallery above.

The longitudinal bulk-heads or their exten-

sions are framed to intersect with the lower decks at the flat immersed sides of the vessel, as at *xx*, so that any external violence at those points will be transferred and diffused horizontally and vertically as much as possible.

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

1. A vessel with the angular bottom *a b* and the main deck *c* at about the water-line, constructed to form in cross-section a triangle of nearly straight lines.

2. The construction of a vessel with the immersed portion *a b* of a triangular form, and connected with bilges *d d*, rounded above the main deck and joined in the manner described.

3. The arrangement of the longitudinal bulk-heads and the lower decks of a vessel to converge, in the manner described, to form together horizontal and vertical braces to the flat immersed surface at the points *xx*.

4. The combination of the straight sides and bottom *a b* and deck *c* of a vessel with diagonal or arched braces *e* and *f*, substantially as described.

ALONZO P. BLIVEN.

Witnesses:

CHAS. E. LANSING,
WM. KEMBLE HALL.