

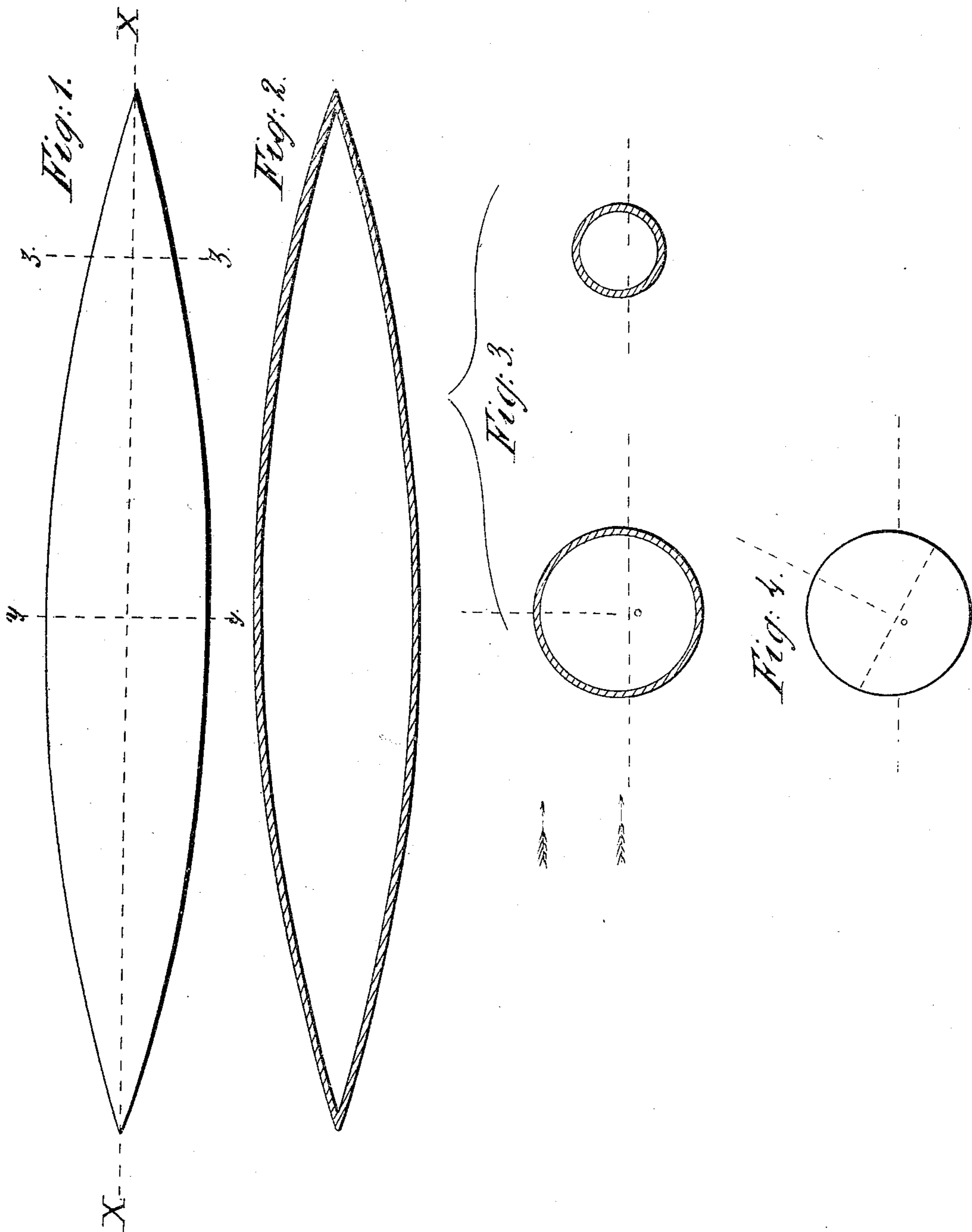
R. & T. Winans.

Sheet 1, 2, Sheets.

Form.

No. 21,917.

Patented Oct. 26, 1858



R. & T. Winans.

Sheet 2, 2 Sheets.

Form

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Fig. 5.

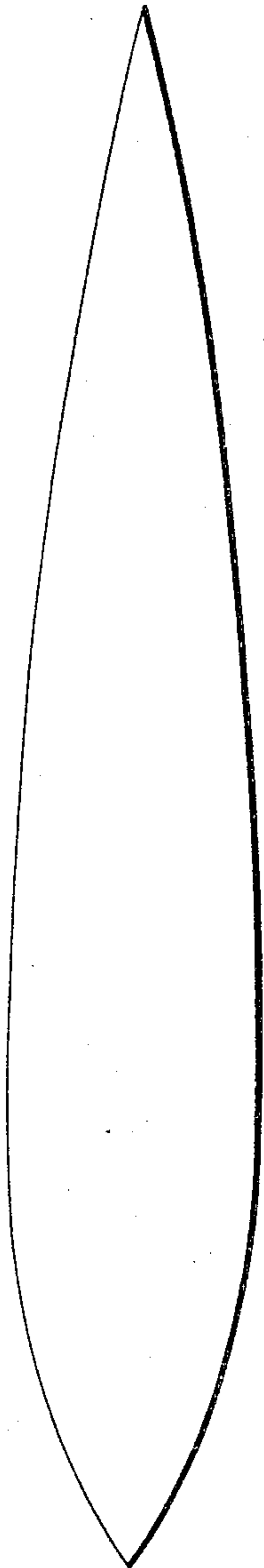


Fig. 6.

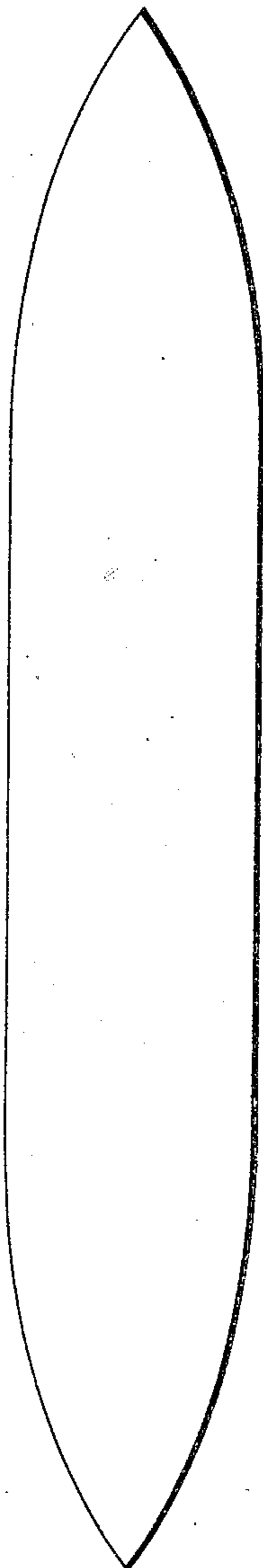
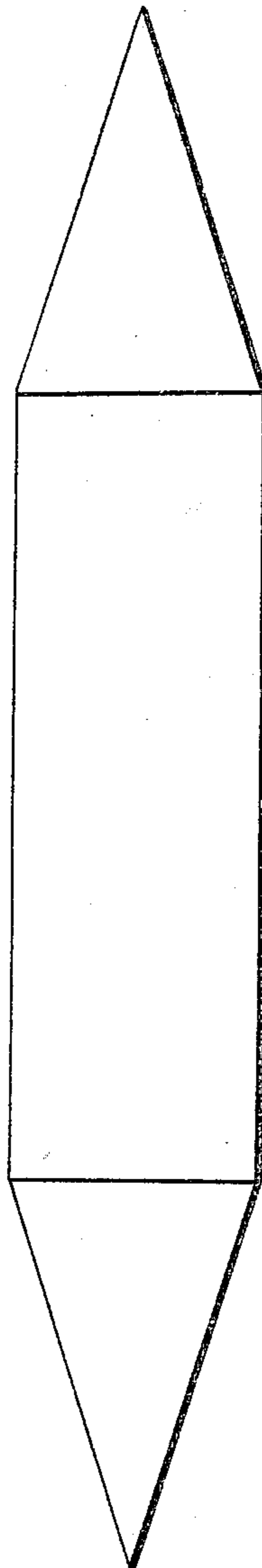


Fig. 7.



UNITED STATES PATENT OFFICE.

ROSS WINANS AND THOS. WINANS, OF BALTIMORE, MARYLAND.

HULL OF STEAM VESSELS.

Specification of Letters Patent No. 21,917, dated October 26, 1858.

To all whom it may concern:

Be it known that we, ROSS WINANS and THOMAS WINANS, of the city of Baltimore, in the State of Maryland, have invented a new and useful Improvement in the Form of the Hulls of Steam Vessels; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a plan of the hull of a vessel of our improved form. Fig. 2 represents a longitudinal section at the line x, x , of Fig. 1. Fig. 3 represents transverse sections at the lines y, y , and z, z , of Fig. 1; Figs. 4, 5, 6, and 7 details to be referred to hereafter.

The shape of the steam ships heretofore constructed has been such that when changing from an upright to an inclined position, different figures, and consequently varying resistances are presented to the action of the winds and waves respectively, which tend to keep the vessel constantly rolling.

The object of our invention is to diminish this variation of resistance to the winds and waves, which causes a vessel to roll, and also to diminish those resistances which prevent the vessel when "careened" or inclined to one side, from "righting" or returning to its normal upright position, while at the same time we obtain increased strength and stowage, and a capacity for greater average speed. We accomplish these objects by giving to the hull such a form that the transverse section of the exterior, in any part, will be represented by a circle.

The form of hull which we propose, for our vessel is that of an elongated pointed spindle, which may be constructed of any suitable materials and with any kind of framing that may be deemed advisable. At every point in its length the cross section of the hull is a circle (as shown in Fig. 3) and its longitudinal axial section, taken in any direction is formed of two arcs of a circle as shown in Figs. 1 and 2. Such a hull when loaded may be immersed to, or nearly up to the axis of the spindle.

In an application for another patent made simultaneously with the application for this, we have described the arrangement of a propelling wheel which we consider to be the

most advantageous for use with the spindle shaped hull, but the kind of propeller used or its position may be varied at the discretion of the constructor. The stability necessary for a vessel of this form when unloaded may be given to it by placing the machinery at a point low in the vessel; or by ballast, or by both combined as may be deemed most convenient or advantageous. When loading, the center of gravity of the entire mass will be lowered as in ordinary vessels, and any required degree of stability may be given by a proper distribution of the cargo.

If by rolling the position of the vessel should be changed so that the normally vertical line (shown in Fig. 3) passing through its center, should become inclined (as shown in Fig. 4) it is obvious that the section being a circle, there will still be the same symmetrical figure presented to the action of the winds or waves; and the center of gravity having been raised (as indicated in Fig. 4) will tend to fall back to its normal position (as shown in Fig. 3) with no other resistance than the mere friction of the surface of the vessel against the air and water in which it rolls. There is little therefore to prevent the vessel from resuming its upright position when diverted from it, and there is for the same reason, but little to cause it to deviate from the upright position; the winds or the waves acting upon the sides (in the direction shown by the arrows in Fig. 3) would meet with the least possible resistance which the same sectional area could be made to present; and glancing from the round surface of the vessel, would produce the least possible effect. The action of the waves from beneath as they rise and fall, would in like manner meet in any position of the vessel, the same figure of resistance; and therefore would not tend to turn it one way more than another, except so far as might arise from the mere friction of the water against the sides. These advantages can not be attained in a vessel of ordinary construction which presents a large area of surface comparatively plane, especially to the wind.

The advantage derived from the transverse section of the vessel being at all points circular, has an effect upon the progress of the vessel equally favorable, for as the end of the spindle advances through the water,

no matter what may be the position of the vessel (even if it should roll) the same form will be constantly exposed to the water beneath, to the waves on the surface and to the
 5 wind. From this uniformity of figure arising from the equal divergence of the sides in all directions from the point of the spindle, there will be comparatively little in the action of the winds or waves to prevent
 10 the vessel from holding its course. In connection with this is the further advantage that water will pass off the vessel easily, there being no flat decks or bulwarks to retain it. This mode of construction will
 15 therefore avoid the discomfort and risk arising from shipping seas, to which all quick sailing vessels, as heretofore constructed are liable.

Another advantage peculiar to this form
 20 of construction is, that while the vessel offers the least resistance to external forces tending to roll it; at the same time it opposes the best form of resistance to such forces as tend to injure it; presenting always a
 25 complete arch to any external force. Combined with this is the further advantage that for an equal length and area of surface of the whole vessel, this form of cross section includes a greater space than any
 30 other could; affording with the least amount of building material the greatest stowage. Owing to the advantageous form which such a vessel presents laterally to external forces, it may be made, particularly when the lon-
 35 gitudinal lines are well selected, of great length; which will have the effect of diminishing its pitching when crossing the waves; this advantage is enhanced by the fact that it is not necessary for a vessel of this form,
 40 as it is for those of ordinary construction, that it should pass over the crest of the wave.

We have described the longitudinal section as represented by arcs of circles; but
 45 other curves, or combinations of curves may be advantageously employed; and if thought preferable they may be such that the vessel shall be sharper at one end than at the other, as shown in Fig. 5, or the central portion
 50 may be a cylinder and the ends bounded by cones with curved sides, giving a longitudinal section such as is shown in Fig. 6, or the central portion may be a cylinder and the ends cones with straight sides giving a
 55 longitudinal section similar to that shown in Fig. 7, but we do not deem this to be as good a form as those before mentioned. Where different curves or right lines enter into these longitudinal sections it is best
 60 that the curves should meet at a common tangent, and that the straight lines should meet the curves in a direction in which the former are tangent to the latter. But whatever may be the longitudinal lines, the con-
 65 dition of the transverse sections being cir-

cular must be observed. It may also be deemed advisable in some cases to provide the vessel with a keel; which belonging to the portion almost always immersed, will in
 70 no wise affect the above described properties of the figure of the hull, except that it will tend to check the oscillations of the vessel about its axis, and facilitate the steering.

Vessels of this form of hull might be steered in more convenient ways than by
 75 the use of the ordinary rudder, one plan for this purpose is as follows: At some suitable point along the length of the vessel, either before or abaft the center, a vertical shaft should be passed through a stuffing-
 80 box in the bottom; or through a pipe projecting from the bottom into the interior above the water line. At the lower end of this shaft a blade of sufficient size should
 85 project which should be symmetrical on both sides of the axis of the shaft; and sufficiently curved or sloped on its top to enable it to make an entire rotation without touching the curved bottom. More than one such
 90 rudder might be provided or placed in different positions. The upper end of the shaft should be connected with a tiller, wheel, or other steering apparatus. For the
 95 purposes of access to the interior of the hull and of ventilation &c., suitable entrances must be provided; which would be best arranged in pipes or towers passing through the upper part of the hull and reaching to
 100 such a distance above as may be deemed most expedient.

For the purposes of facilitating the loading and unloading of the vessel, affording additional ingress and egress, promoting ventilation and lighting the interior, a portion of the top of the hull may be fitted with
 105 hatches, dead lights or other similar contrivances, capable of being opened and closed at pleasure.

We are aware that spindle shaped bodies both solid and hollow have been called boats
 110 and have been used as mere floats for various purposes, such for example as, sustaining a bulky superstructure as decks for freight and propelling machinery, and
 115 cabins for passengers in the navigation of rivers and other still waters; but since such spindle shaped bodies or boats have never heretofore been by and in themselves, adapted to the performance of all the functions
 120 of the hull of a vessel for navigating seas, such for example as receiving and affording accommodations for propelling machinery, freight, and passengers, within themselves, in addition to floating the same; such mere
 125 floats can not perform the office of our hull, and besides and their said superstructure, must be considered as a whole, for they must be taken together to constitute a vessel for the purposes of navigation, and taken to-
 130 gether, they produce a vessel as a whole so

widely different in form from ours that the winds and waves operate upon it very nearly as upon ordinary vessels, and it is therefore necessarily subject to all the disadvantages which it is the special object of our peculiar form of hull to avoid.

What we claim under this patent as our improvement in steam vessels is—

Constructing the hull in the form of a spindle, substantially as above described. 10

ROSS WINANS.
THOS. WINANS.

Witnesses:

M. W. MEARIS,
F. MEARIS.