

A. W. THOMPSON.

Improvement in Steamship and Steamboat Building

No. 124,641.

Patented March 12, 1872.

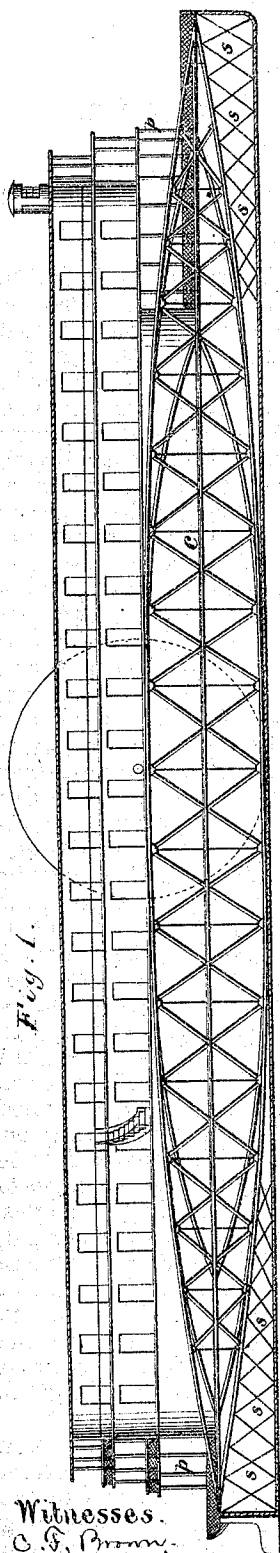


Fig. 1.

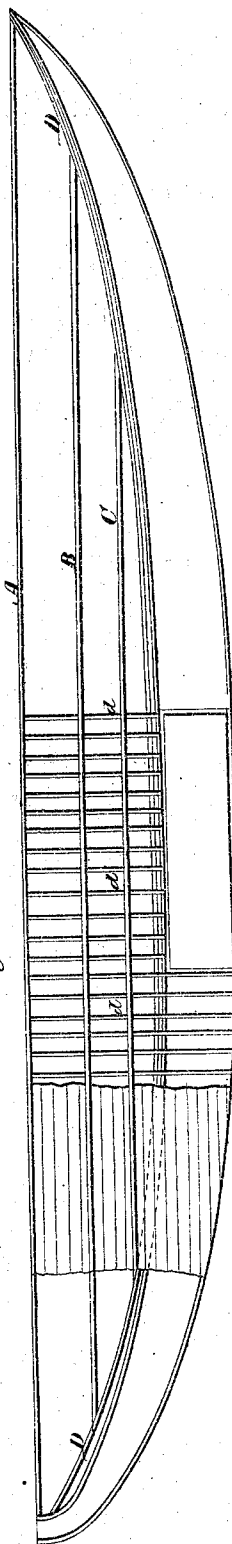


Fig. 2.

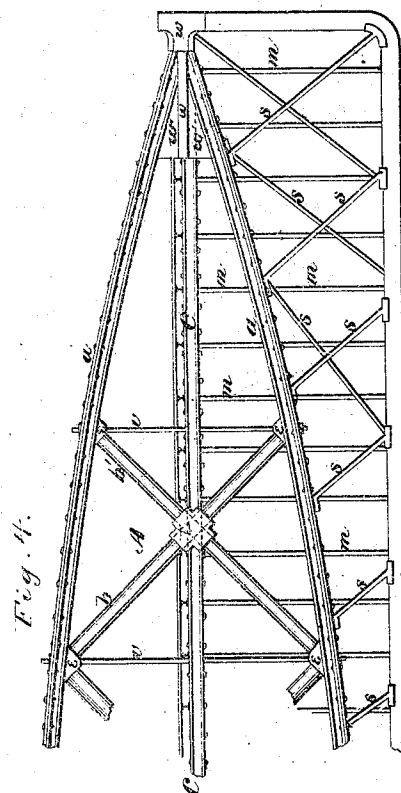


Fig. 4.

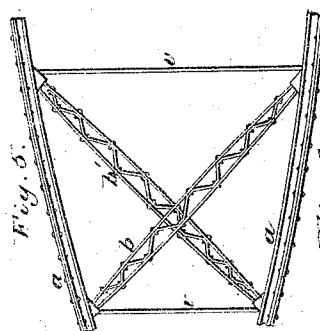


Fig. 5.

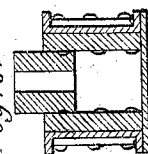


Fig. 6.

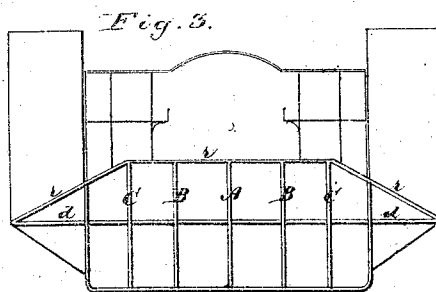


Fig. 3.

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UNITED STATES PATENT OFFICE.

AMBROSE W. THOMPSON, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAMSHIP AND STEAMBOAT BUILDING.

Specification forming part of Letters Patent No. 124,641, dated March 12, 1872.

To all whom it may concern:

Be it known that I, AMBROSE W. THOMPSON, of the city and county of New York, and State of New York, have invented certain Improvements in Steamships and Steamboats; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of a steamboat for river or lake navigation embodying my invention; Fig. 2, a plan of the same; Fig. 3, a transverse vertical section; Figs. 4 and 5 show the manner of connecting the elliptical bracing; and Fig. 6 represents a sectional view of one of the braces.

Similar letters of reference in the accompanying drawing indicate the same parts.

The object of my invention is to render practicable the construction of large iron steamboats and steamships of light draught and great passenger-carrying capacity; and to this end the invention consists in an improved method of strengthening the hull by a system of elliptical iron bracing, substantially as hereinafter set forth.

In the drawing, A B C represent a series of elliptical iron trusses, arranged in vertical planes, extending longitudinally of the boat, and of different lengths, according to its lines and their own lateral distance from its center. Each of these trusses consists of two equal arcs, *a a*, joined at both ends, and springing outward at the center, as shown in Figs. 1, 4, and 5, the curves of the arcs being elliptical, circular, parabolic, or of any other form that may be preferred. A central chord, C, common to both arcs, extends from end to end of the truss, said chord and the ends of the arcs being connected by strong iron castings *w w*. The chords, arcs, and castings, plate or block *w*, may be fastened together in a variety of ways, so as to render the connection very firm and strong. For example, the casting may be made with an enlarged end, against which the arcs abut, their proximate faces being chamfered to rest squarely upon the smaller portion of the casting, as shown. Triangular blocks *w'* may then be inserted between the arcs and the casting for the purpose of adding greater strength and solidity to the connection; and the chord may be bolted or riveted

firmly to the side of the casting, or to its upper or under surface, as preferred. When the chord is made double it may embrace the casting. All the parts are riveted through and through, so that they cannot give way under any circumstances. Or the smaller portion of the casting may be omitted, and the chord may run clear through and be bolted directly to the enlarged portion *w*, the arcs coming down to the chord and being bolted thereto, and the triangular blocks being inserted and secured by rivets or bolts, as before described. The method of fastening is, however, immaterial, and any construction may be adopted that will answer the purpose. The arcs *a a* are further connected by crossed braces and counter braces *b b'*, and by tie-rods *v v*, secured to the arcs at the points where the braces abut against them. The elliptical frame is formed of channel-bars and plates riveted together, and at the points where the ends of the segments abut I introduce a casting, *e*, for the double purpose, first, of connecting the segments by rivets passing through the casting, channel-bars, and external strengthening-plate, thereby imparting strength to the joint; and, secondly, to form a seat for the struts *b b'* when drawn into position by the rods *r r*. The braces may be of any suitable construction, the forms represented in Figs 4 and 5 being, perhaps, among the best. As there shown, the braces cross each other at the line of the chord, and at the point of contact a plate, *t*, is applied to each side of them, the pair of plates being connected by bolts or rivets. The plates may be cast or struck up so as to fit over the edges of the braces and come together in the angles. Their office is to render the braces more rigid, and prevent them from working or yielding in any direction whatever. The chord, if single, lies against one of the plates, and is bolted to it and the braces; if double, it embraces the struts and plates, and is bolted through and through, thus still further strengthening the braces.

Figure 1 represents a sectional view of a flat-bottomed iron boat, in which the bottom plates amidships are secured directly to the truss-frame by means of angle-iron fastening pieces attached thereto, while the stem and stern plates are connected to the truss-frame by means of a system of struts and braces, *s s s*.

The main-deck beams rest upon and are supported by the chords *c c*. The boiler deck rests amidships upon the upper arcs of the truss-frames, and at the ends upon posts *p p*, standing upon the main-deck beams or the chords; and the upper decks upon posts throughout their entire length. The main deck may be further supported by posts *m m* underneath, said posts being either in line with the truss-frame, so as to constitute a part thereof or not, as the constructor may prefer. The boat is, of course, divided by bulkheads into as many water-tight compartments as it may be thought desirable to construct. The boilers are supported upon the main deck, and the wheel-shaft upon the upper arcs of the truss-frames.

To give further rigidity to the frame I may construct a similar elliptical truss-frame, *D*, and place it horizontally in line with the chords *c c*, the curvature of its arched beams corresponding to the sides of the vessel at that elevation from the keel. To this horizontal frame I attach the deck-beams *d d*, which overhang the sides, as seen in Figs. 2 and 3. The horizontal frame and the vertical frames are united in any suitable manner at their points of junction, and it has a common chord with the central vertical frame *A*. The vertical frames are tied to the deck-beams by means of the rods *r r*, as shown in Fig. 3.

My object in thus constructing a vessel is to brace and strengthen every part of the hull in such a manner that the strain upon it, however applied, shall be divided up and distributed equally throughout its entire length.

The bracing herein described completely effects this purpose, so that if the vessel were loaded and suspended upon two points at the ends, or a single point anywhere between the ends, the strain throughout her entire length would be equal and uniform, and she would suffer no injury. The system of bracing not only strengthens the hull against upward strains, when applied under her bottom, as in case of stranding, or when riding over heavy seas, but also lateral strains of any kind, as

well as the downward strains from the weight of the cargo, engines, or upper works, so that a vessel, whether designed for inland or outside navigation, can be given a much greater carrying capacity than if constructed in any other manner. At the same time, since her strength depends more upon the truss-frames than upon the skin, she can be made exceedingly light; and the form of the hull, no longer requiring a certain shape for safety, can be molded to any shape that may be necessary for lightness of draught and speed.

Having thus described my invention, what I claim as new is—

1. A central vertical truss frame *A*, consisting of two equal arcs, *a a*, joined at their extremities, springing apart at their centers, provided with a common chord, *c*, and tied and braced as shown at *b b' v*, when combined with the hull of a vessel in such a manner that the ends of the frame are connected directly to the stem and stern of the vessel, while the lower arc rests upon and is attached to her bottom, and the chord *c* supports the main deck, substantially as described, for the purposes specified.

2. The system of vertical truss-frames *A B C*, all constructed as described, when the members of different lengths, according to the shape of the hull, are of substantially the same diameter, so that the chords of the several frames unite in directly supporting the main deck, substantially as described, for the purposes specified.

3. In ship building, the combination of the system of vertical truss-frames herein described, with a horizontal frame of similar construction, so arranged with relation to each other that the horizontal and the central vertical trusses have a common chord, substantially as described, for the purposes specified.

AMBROSE W. THOMPSON.

Witnesses:

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