T. W. PRATT.

Construction of Vessels.

No. 162,859. Patented May 4, 1875.

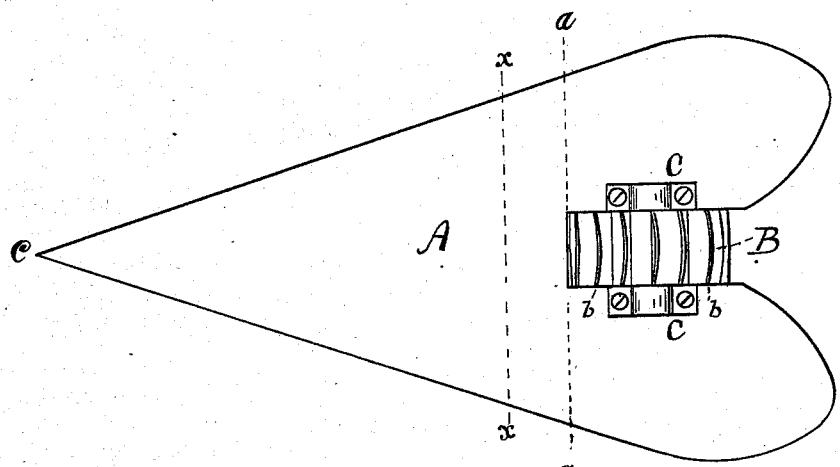


Fig. 1

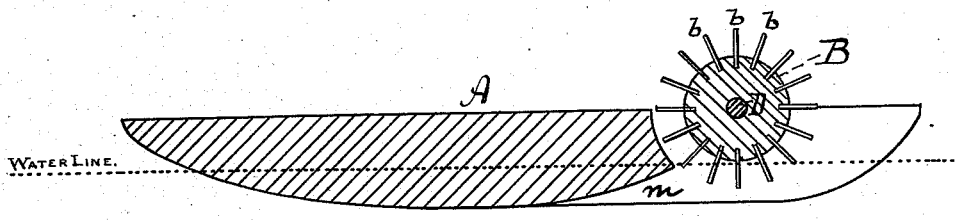


Fig. 2


Fig. 4.

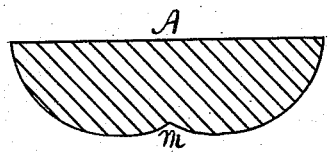


Fig. 3

Witnesses:
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# UNITED STATES PATENT OFFICE.

T. WILLIS PRATT, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN THE CONSTRUCTION OF VESSELS.

Specification forming part of Letters Patent No. **162,859**, dated May 4, 1875; application filed March 5, 1875.

*To all whom it may concern:*

Be it known that I, T. WILLIS PRATT, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in the Method of Constructing and Propelling Steamboats, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a plan view; Fig. 2, a central longitudinal section; Fig. 3, a vertical lateral section, taken on the line *x x*, Fig. 1; and Fig. 4, a vertical lateral section, taken on the line *a a*, Fig. 1.

Like letters of reference indicate corresponding parts in the different figures of the drawing.

My invention relates more especially to the larger classes of steamboats, and consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which far better results are attained than in boats of this character as ordinarily constructed.

It is well known that when motion is given to a vessel afloat, friction is engendered between the surface of the hull and the water, technically called "the friction of the skin." The result is, that a considerable amount of water is "dragged" or forced to move in the same direction as the vessel, a large proportion of the propelling power being wasted in carrying this water, and more than what is due to the friction of the skin. My invention is designed to utilize the power thus wasted or lost, and to attain other advantages, and to this end I construct and arrange the various parts of the hull of the vessel and its propeller, in a manner fully illustrated by the drawings, in which it will be seen (Fig. 1) that the horizontal water-lines have a sharp angle at the stem or cutwater *c*, and continue in regular divergence to a point nearly opposite the paddle-wheel center, whence they run into two semi-ellipses, *c c*, which would, if continued, join each other near the center of the wheel. The vertical longitudinal sections are parts of ellipses, and the vertical cross-sections would be two semicircles, were they not cut off in mitering or joining the same. These lines give a peculiarly-shaped cavity, *m*, extending and enlarging from the point of deepest immersion backward to the paddle-wheel B, being less or nearer shallowest on the line *x x*, and greatest on the line *a a*. The water in this cavity or run moves in the same direction as the vessel, and with accumulated force as the space enlarges. The paddle-wheel should be so placed as to act to the greatest advantage, and its width should be such as to nicely fill the space in which it is disposed, as shown. The paddles will thus work in water, moving in the same direction as the vessel, and with considerable momentum, so that there will be less "slip" than with side-wheels. The action of the propeller, when placed in this position, will also be more effective, being nearer to the center of gravity of the mass to be moved, and so inclosed in the hull as to be almost perfectly protected from injurious contact with foreign substances, a valuable feature in river navigation. It will also be obvious that the rolling or pitching of the vessel in a rough sea will not affect the speed of the wheel, as it always works in the same amount of water. The peculiar form of the vein of water in the path of the wheel is also such that the paddles strike the thinnest part first, so that no shock is felt, as they gather their full hold of the water gradually. A paddle-wheel thus arranged may be of smaller diameter, thereby reducing the weight of all parts of the steam machinery. The main shaft may also be less in size, and project only so far beyond its bearings as to allow a crank at each end. The position of the wheel also enables an entirely different arrangement of the inboard works, as the boilers, coal-room, fire-room, engine-room, kitchen, steward's room, smoking-room, barber's room, and water-closets may be concentrated around the wheel-house, and all forward of the same kept more cleanly and better ventilated, as well as being rendered more convenient for either freight or passengers. The amount of hull or bulk around the wheel is such that there is very little or no jar or noise arising from the movements of the machinery. Water-tight bulk-heads, to cross the hull just forward of the engines, and

a bulk-head just aft the wheel above the main deck, rising as high as the wheel-house, to stiffen the hull where divided by the wheel-space, may be employed, if desired. The wheel-frame is made in the usual manner, but may be in the form of a hollow cylindrical body of plate-iron, if preferred. The outside edges *b b b* of the paddles are on radial lines, but the middles of these edges, on the periphery of the wheel, are bent backward from the direction of motion while the inner edges are on straight lines, so that the water will be more readily discharged in emersion. The vein of water produced by the peculiar formation of the hull of the vessel at *m* renders this style of paddle available, as it strikes only the thin part of the vein first, and thus obviates the shock which would otherwise occur.

Having thus described my invention, what I claim is—

A steamboat or vessel, the hull of which is constructed in such a manner that the horizontal water-lines form a sharp angle at the stem and continue in regular divergence to a point nearly opposite the paddle-wheel center, whence they run into semi-ellipses, as shown in Fig. 1, substantially as and for the purpose set forth.

T. WILLIS PRATT.

Witnesses:
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