C. Seymour,

Paddle Wheel.

No. 85248. Patented. Dec. 22. 1868

Fig. 1.

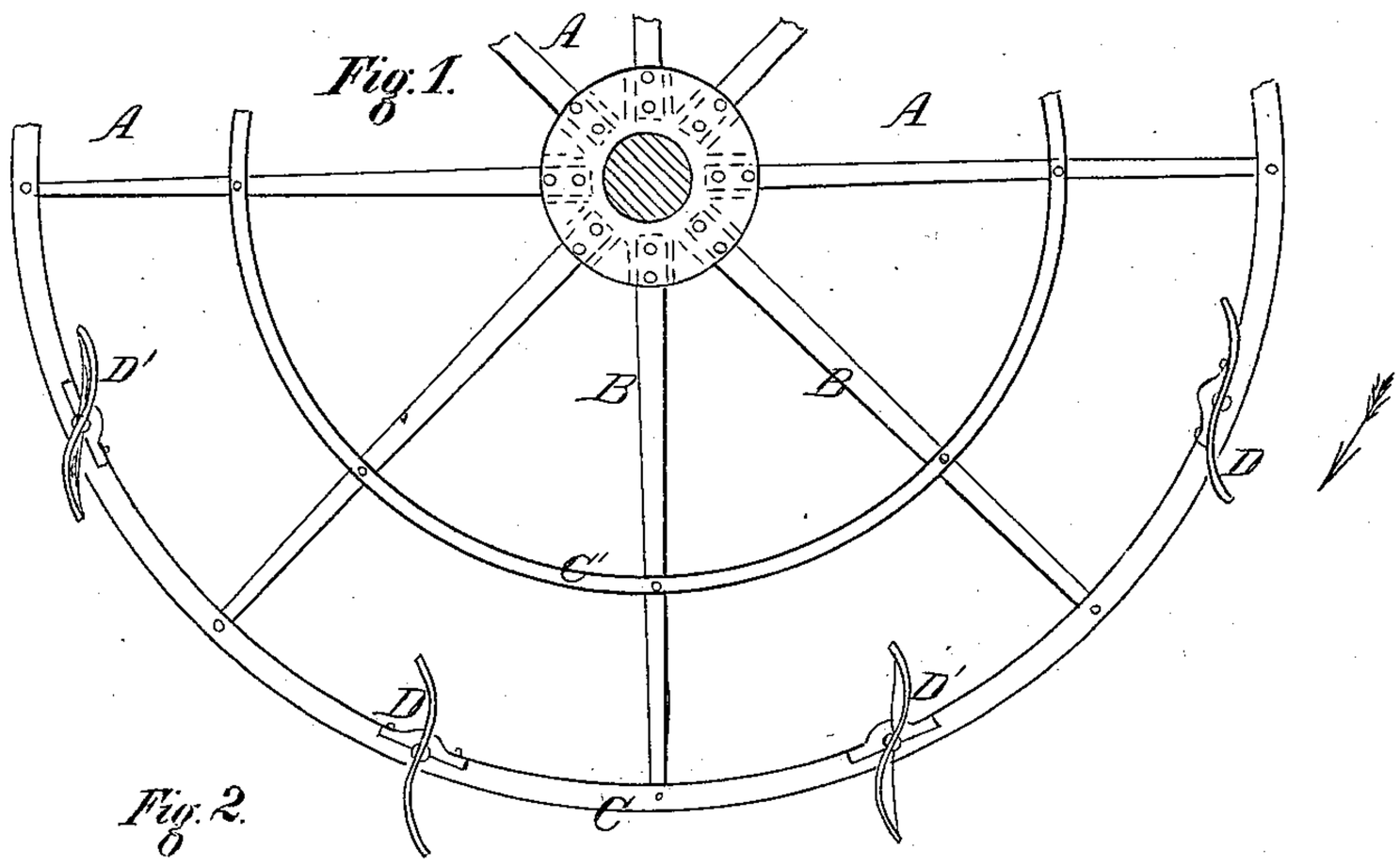


Fig. 2.

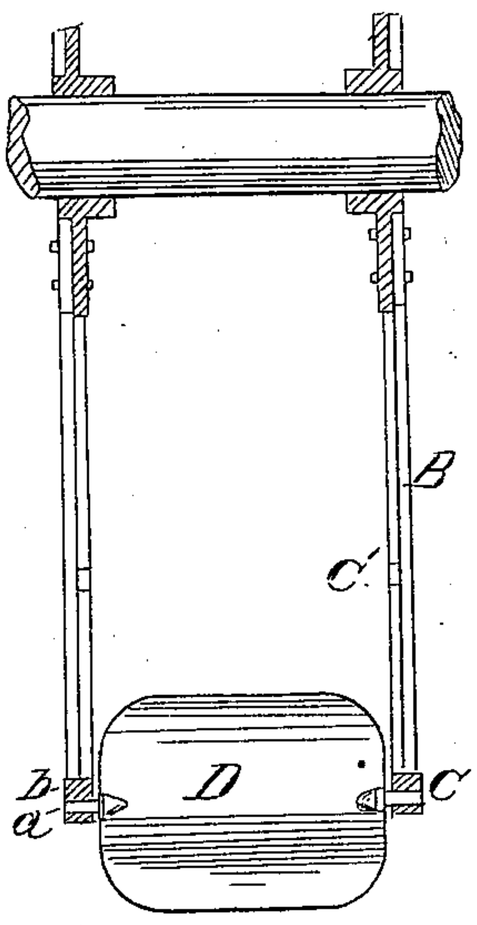


Fig. 3.

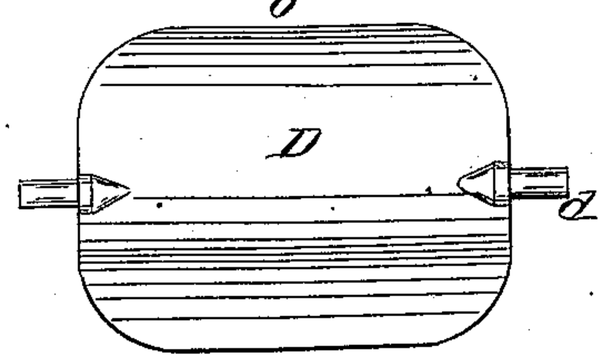


Fig. 4.

Fig. 5.

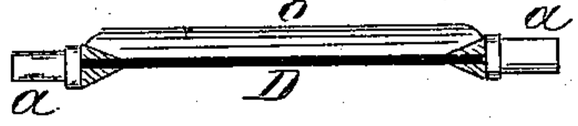


Fig. 6.

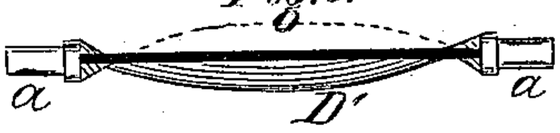
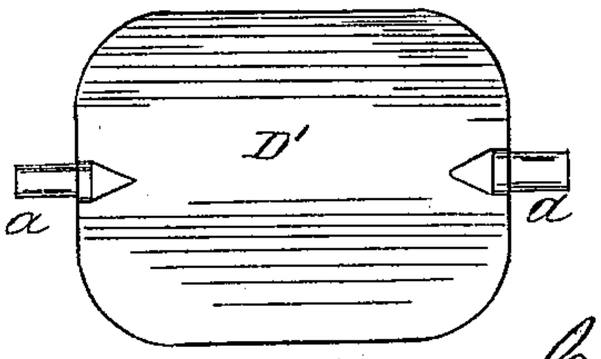


Fig. 7.

Fig. 8.



Witnesses.

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CHARLES SEYMOUR, OF LA PORTE, INDIANA.

Letters Patent No. 85,248, *dated December* 22, 1868.

IMPROVEMENT IN PROPELLING-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, CHARLES SEYMOUR, of La Porte, in the county of La Porte, and State of Indiana, have invented certain new and useful Improvements in Blades for Steamship-Wheels; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making a part of this specification.

The object of this invention is to construct the blades or paddles of steamship-wheels in such form as that they will, when completely submerged in water, assume and keep a perpendicular, or nearly perpendicular position during or while the paddle is so submerged; and

It consists in forming the paddles or blades in the ogee or S-form, in cross-section, and pivoting or journalling the blade or paddle in the centre of its width or transverse line.

Paddles or blades of steamship-wheels, when constructed and arranged in the usual manner, on radial lines, or nearly so, and having a plane face on straight lines, have never either entered the water or left it, in the revolution of the wheel, without a waste of power, by reason of their rigidity and the direction that they enter and leave the water, and their continued change of position, with relation to the water-line, while they are in contact with the water, for, as the blades first strike the water, the angle is such that it causes great strain upon the wheel and shaft, and as the blade is raised out of the water, their angle of direction is such that it lifts much of the water, and in doing so as much power is expended as would raise the weight of the water at the end of the arms of the wheel. At only one point in the revolution of such wheel does the blade have the best position, and that is when the blade and arm of the wheel are vertical, and such position is only for a moment, for as the wheel revolves, the position of the blade is changed, and then commences the loss of power, for as soon as the blade begins to rise, more or less of water is lifted by the blades, while, with the construction of the blades after my invention, by reason of their being pivoted in the centre of their width, and can freely turn to accommodate themselves to such position as will offer the least resistance to their entrance into the water, and as soon as submerged assume and maintain the perpendicular position until the wheel, in its revolution, raises the upper edge out of the water, when the blade will directly assume the best possible position to pass up out of the water with the least resistance, which will be an incline, so that it raises no water, and consequently no loss of power.

One method of using this invention is to have the convex side of the blade, or that part that is below the axial line, forward, so that the convex curvature will be in advance of the terminus of the curve at the lower edge of the blade, and the upper wing of the blade will have the concave side forward, and the result will be that when completely submerged, the blade will assume the perpendicular position, and keep such position as long as it is so submerged.

The reason for the blades taking such position is, that the wheel in its revolution and carrying the blades with it, the outer edge of the blade, by being at the outer periphery of the wheel, necessarily travels a greater distance in the same space of time than does the inner or upper edge of such blade, and of course is impinged against the water with greater force than is expended upon the upper half of the blade, and in order to prevent such blades from leaving the perpendicular position, the curvature of the blade below the axis is made to curve back, and that of the upper part of the blade, above the axis, curves forward, the radius of such curvature being proportional to the diameter of the wheel. Wheels of larger diameter require the curvature of the blade to be formed on a greater radius than smaller, or wheels of less diameter.

Another method of using this same construction of blade, with substantially the same effect, is to reverse the blade, or the direction that the wheel may revolve, bringing the concave side of the blade forward, and at the under side of the axis of said blade, and the convex wing at the upper side of said axis, the only difference in the two methods being that in the latter case the blade, at the under edge, being concave, will not shed off or pass through the water quite so readily as if convex. The blade will be slightly inclined from the perpendicular position, until the resistance is equal on both sides of the axis, but not enough to in any case change the nearly perpendicular position in its effects, and may be said to have better results by reason of the blades having a more positive hold of the water, by reason of the concavity of the lower wing of the blade, and consequently the resistance is greater, and the ship will be moved in the water with increased velocity by the same power.

Other constructions of blades may be used as modifications of my invention, without departing from the principle and operation as described; as, for instance, the blade may have a longitudinal curvature in each wing, in opposite directions, on each side of its axis, in addition to the transverse curvature on each wing.

Figure 1, of the drawings, is a section of a wheel showing the blades;

Figure 2 is a cross-section of the same;

Figure 3 is a side view of a blade;

Figure 4 is a cross-section of same, showing the curvature of blade;

Figure 5 is a view looking at the edge of the blade, figs. 3 and 4;

Figure 6 is an edge view of a blade having a longitudinal curvature, as seen in shaded and dotted lines;

Figure 7 is a cross-section of figs. 8 and 6; and

Figure 8 is a side view of figs. 6 and 7.

A, in the drawings, represents a portion of a wheel, with the blades or paddles attached.

B B are the ordinary arms.

C, the outer rim, to which the blades are pivoted.

C′ is an inner rim or brace.

D is the blade, as seen in figs. 3, 4, and 5, and is made of metal, either cast or formed from plates of wrought-metal, and having journals, *a*, at each longitudinal extremity, in the centre of their width, and on which they freely revolve.

These blades have projections or wings upon either side of the axial line of said journals, which wings are curved in their cross-sections, and straight upon their outer edges, as seen in figs. 4 and 5.

Journals *a* work in metal boxes *b*, in rim C, and turn freely therein.

D′ is a modified form of blade D, and only varies in its construction in giving it a longitudinal curvature, as seen in figs. 6, 7, and 8.

I am aware that blades or paddles in wheels have been pivoted at the centre of their width. Such pivoting of the blade I do not claim; but

What I do claim, and desire to secure by Letters Patent, is—

A pivoted paddle, the face of which is in ogee-form in cross-section, or concave on one side of its longitudinal axis, and convex on the other, constructed to operate in the manner and for the purpose set forth.

Witnesses: CHARLES SEYMOUR.

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L. A. COLE.