C. WARD.
PROPELLER.

No. 88,595. Patented Apr. 6, 1869.

Fig. 1.

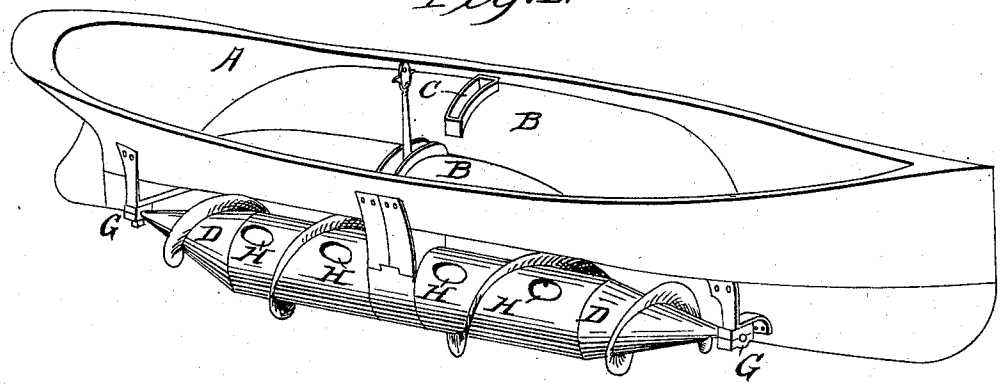



Fig. 2.

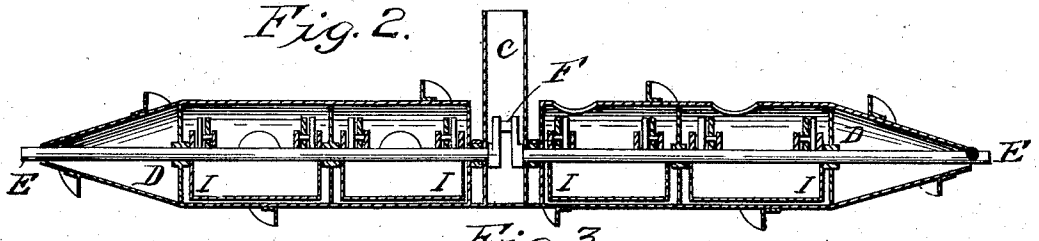
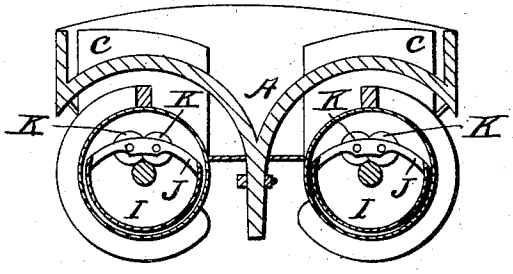



Fig. 3.




Witnesses:
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# United States Patent Office.

CHARLES WARD, OF DETROIT, MICHIGAN, ASSIGNOR TO HIMSELF AND CORYDON B. PALMER, OF SAME PLACE.

*Letters Patent No.* 88,595, *dated April* 6, 1869.

## IMPROVEMENT IN PROPELLERS.

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

*To whom it may concern:*

Be it known that I, CHARLES WARD, of Detroit, in the county of Wayne, and State of Michigan, have invented a new and useful Improvement in Method of Propelling Steam-Vessels; and do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is a perspective view;

Figure 2 is a longitudinal section of one pair of screws; and

Figure 3 is a cross-section, showing the shape of the hull of the vessel, and the interior of the screws, with their appendages.

The nature of my invention consists in the peculiar arrangement of curved bars, on which the cradles are suspended, and which are provided with rollers on the shaft of the screws, by means of which arrangement the said cradles are always maintained in a vertical position, in whatever direction the screws may turn.

A represents the hull of a vessel, provided with the recesses B, in each of which is a well, C.

D are Archimidean screws, pointed at one end, with their bases near each other, and hung on a shaft, E, which is provided with a crank, F, and supported by proper boxes G.

The screws are provided with proper man-holes H, fig. 1, by means of which they may be entered and filled with grain or other freight, when desired. Corresponding hatches are provided in the overhanging portion of the hull for this purpose.

A portion of the freight-room being taken up by the recesses B, to partially compensate for this loss of capacity, and, at the same time, to make the vessel "stiffer" in a sea-way, a metallic cradle, I, fig. 3, is placed in the interior of each screw, extending the full length of the cylindrical part of screw.

This cradle is suspended over the shaft E by the cross-beams J, in which are journalled the friction-rollers K, allowing the cradle to retain at all times its vertical position.

I do not claim all the parts herein described; but

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

The arrangement of the cradles I, on bars J, provided with rollers K, which rollers form the pivot of the cradles on shaft B, substantially as and for the purposes herein described.

CHARLES WARD.

Witnesses:

LOUIS C. HYDE,

H. F. EBERTS.