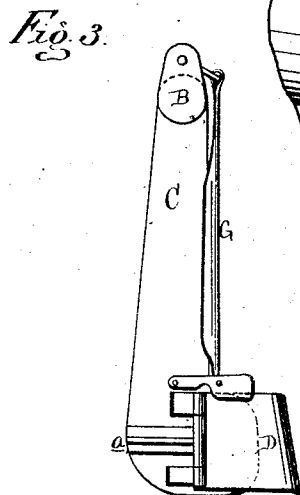
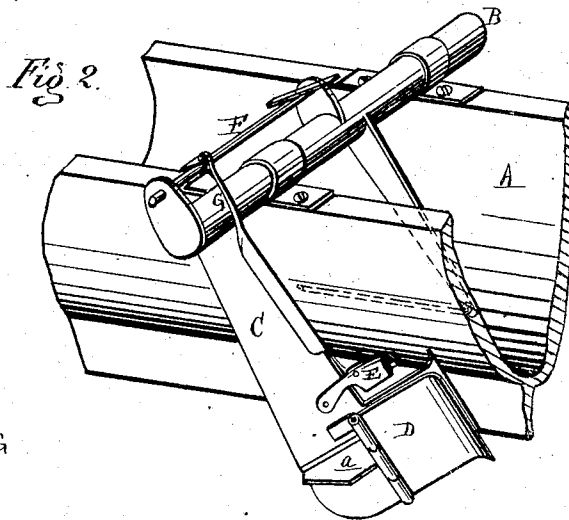
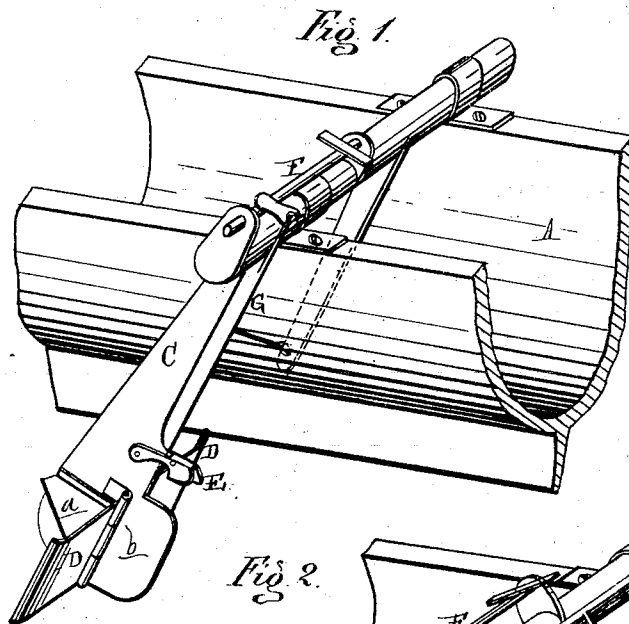


E. RAYNALE.

Mechanisms for Propelling Vessels.

No. 157,221.

Patented Nov. 24, 1874.



Attest:
W. P. Shelding
Edw. Barthel

Inventor:
E. Raynale
By Attorney
Thos. S. Sprague

UNITED STATES PATENT OFFICE.

EBENEZER RAYNALE, OF BIRMINGHAM, MICHIGAN.

IMPROVEMENT IN MECHANISMS FOR PROPELLING VESSELS.

Specification forming part of Letters Patent No. **157,221**, dated November 24, 1874; application filed July 15, 1874.

To all whom it may concern:

Be it known that I, EBENEZER RAYNALE, of Birmingham, in the county of Oakland and State of Michigan, have invented an Improvement in Mechanism for the Propulsion of Vessels, of which the following is a specification:

The nature of this invention relates to improvements in mechanism designed to be used in connection with steam or other power for the propulsion of vessels; and it has for its object to so construct such mechanism that it will effectually perform the service required with a less expenditure of power than the usual devices require, because it obviates the necessity of lifting any portion of the water, as is done in all paddle-wheels of the ordinary construction.

Figure 1 is a perspective view of my improved mechanism attached to a vessel, the latter being shown in section, and showing the wings of the bucket extended at the commencement of the stroke. Fig. 2 is a similar view, showing the wings of the bucket closed at the termination of the stroke. Fig. 3 is a side elevation of the device, showing the wings closed and locked.

Like letters refer to like parts in each figure.

In the drawings, A represents a section of the hull of a vessel, and B a rock-shaft projecting beyond the outer wall of the hull. To the outer ends of this rock-shaft is secured the arm C, to the lower end of which are hinged the wings D. This arm is broad in one direction, and narrow the other in cross-section, and is placed so as to present its narrow section to the advance of the vessel. About midway of the vertical length of these wings, and

on each side of the arm, are rigidly secured the stops *a*, against which the wings rest when extended. A vertical stop, *b*, is secured to the front of the arm, against which the wings rest when folded together. E is a crotched or bifurcated clamp, pivoted to the arm in such a manner, and in the proper place, that when the wings are folded together the clamp will secure them in place, and prevent them from being extended until the clamp is removed. This clamp is operated by means of a rock-shaft, F, and connecting-arm G, so arranged as to engage or disengage the clamp with the wings, as may be desired. The front edges of the wings are outwardly curved, so that at the commencement of the stroke the water will act as a wedge entering between the curved front edges of the wings and forcing them to extend. To the opposite edge arm, for the purpose of backing the vessel when required, the wings may be attached in reverse, so that two sets of wings are required, one to propel, as hereinbefore described, and the other to back the vessel, each set being provided with a clamping device, as described, to prevent one set of wings from interfering with the successful operation of the other.

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

In combination, the folding wings D, arm C, provided with the stops *a* and *b*, rock-shaft B, and the clamp E, the several parts being constructed and arranged substantially as described, and operated in the manner set forth.

EBENEZER RAYNALE.

Witnesses:

H. S. SPRAGUE,
EDW. BARTHEL.