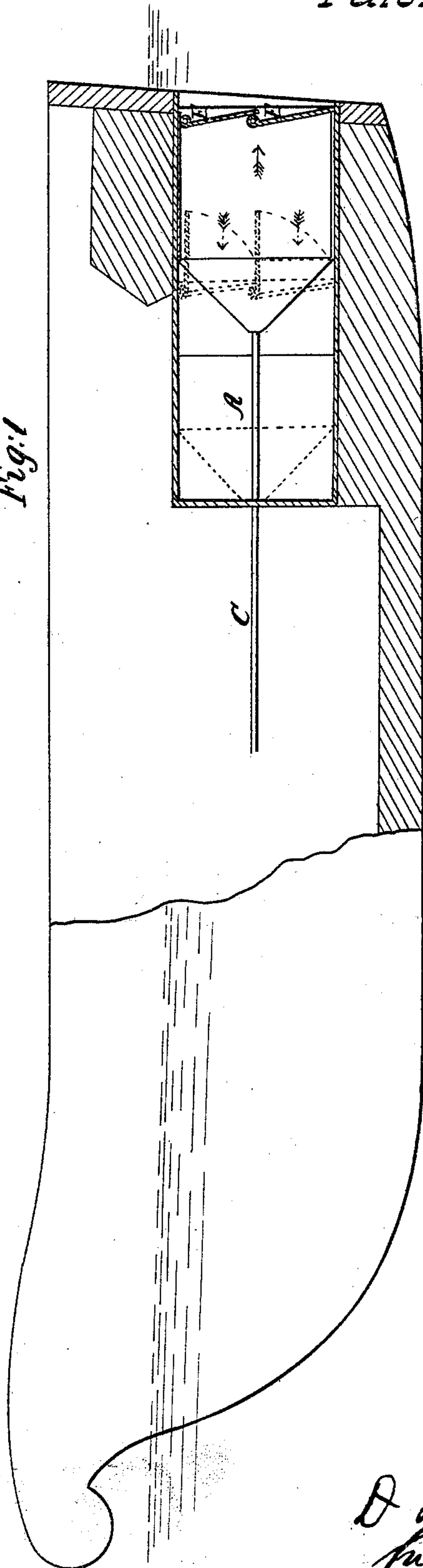


*E. Raynale.*  
*Vibrating Propeller.*

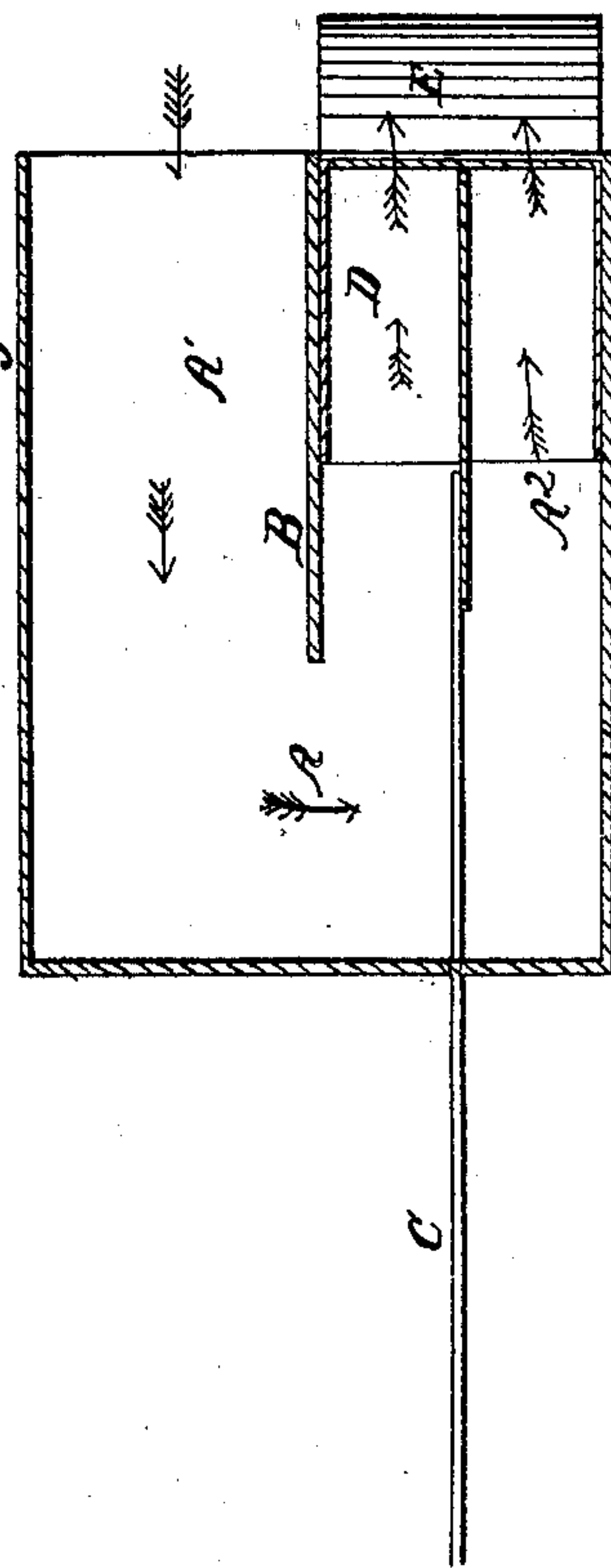
*Nº 57,569.*

*Patented Aug. 28, 1866.*

*Fig. 1*



*Fig. 2*



*Witnesses.*  
*G. F. Clausen*  
*Lawrence A. Murphy*

*Inventor*  
*E. Raynale*  
*by*  
*D. P. Holloway & Co.*  
*his attys*

# UNITED STATES PATENT OFFICE

EBENEZER RAYNALE, OF BIRMINGHAM, MICHIGAN.

## IMPROVED PROPELLER FOR CANAL-BOATS.

Specification forming part of Letters Patent No. 57,569, dated August 28, 1866.

*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 a new and useful Improvement in the Art of Propelling Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, made part of this specification, in which—

Figure 1 is a vertical longitudinal section, and Fig. 2 is a horizontal section.

The same letters in both figures refer to identical parts.

My invention is particularly applicable to canal-boats, and is intended, by giving a direction to the current directly down the center of the canal, to avoid the washing of the banks, which has prevented the general introduction of steam on canal-boats.

A water-tight recess is constructed in the stern of the boat A. This is by a partition, B, divided into two compartments, A' and A<sup>2</sup>. This partition extends only part way of the depth of the recess A, so as to allow the water to flow freely from one compartment into the other around the partition B.

C is a reciprocating rod attached to the cross-head of a steam-engine, entering the chamber in front of the center of the compartment A<sup>2</sup> through a water-tight stuffing-box. The rod C is attached to the plunger D, which is a cylindrical or prismatic shell fitting within the sides of the compartment A<sup>2</sup> neatly, but so as to permit a free reciprocating motion.

The outer end of the plunger D is closed by the doors E, hinged above and opening only outwardly.

The boat or other vessel thus constructed resting in the water so that the entire recess A shall be below the water-line, as the rod C draws back the plunger D the doors E open, as shown by the red lines, passing through the water without resistance. On the return of the plunger the doors will close instantly, and the plunger present the solid head of a piston to the water, pushing against which with the full force of the engine the boat will be driven forward. The water entering through the compartment A' fills the compartment A<sup>2</sup> as the piston passes toward the stern, and the sides of the compartment and the piston-head give a direction to the ejected water directly in the wake of the boat.

I claim—

A vessel constructed with a submerged recess, A, at the stern, divided through part of its length by a partition, B, and having in one of its compartments, A<sup>2</sup>, a reciprocating propeller, D, constructed with valves E, the said parts being respectively constructed and arranged for use substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EBENEZER RAYNALE.

Witnesses:

GEORGE L. LEE,  
C. BRUSH.