

J. CURTIS.  
Propelling and Dry Dock Attachment for Vessels.  
No. 198,000. Patented Dec. 11, 1877.

Fig. 1.

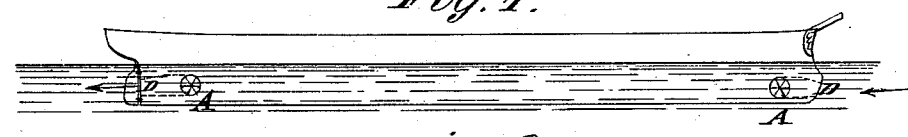


Fig. 2.

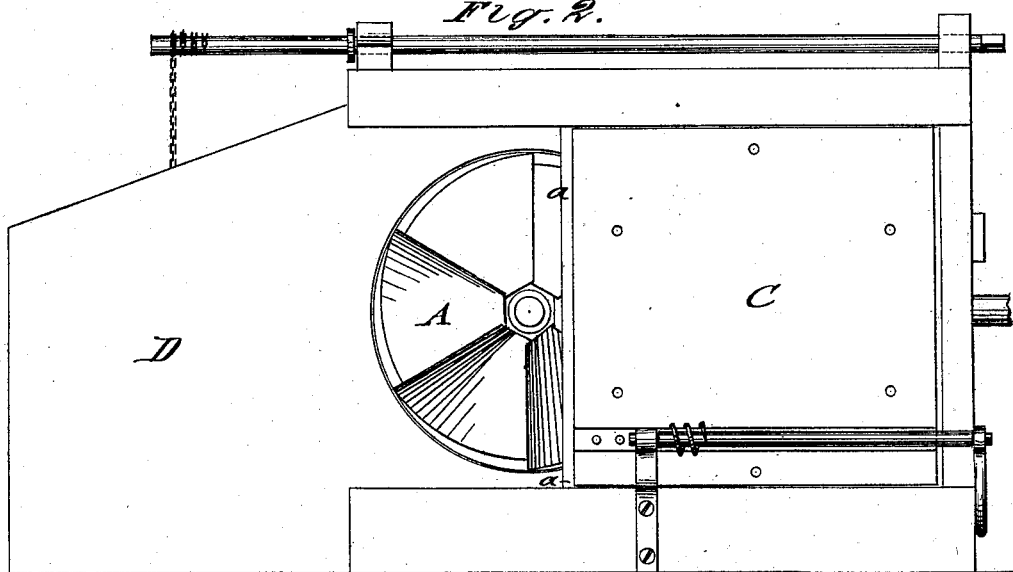
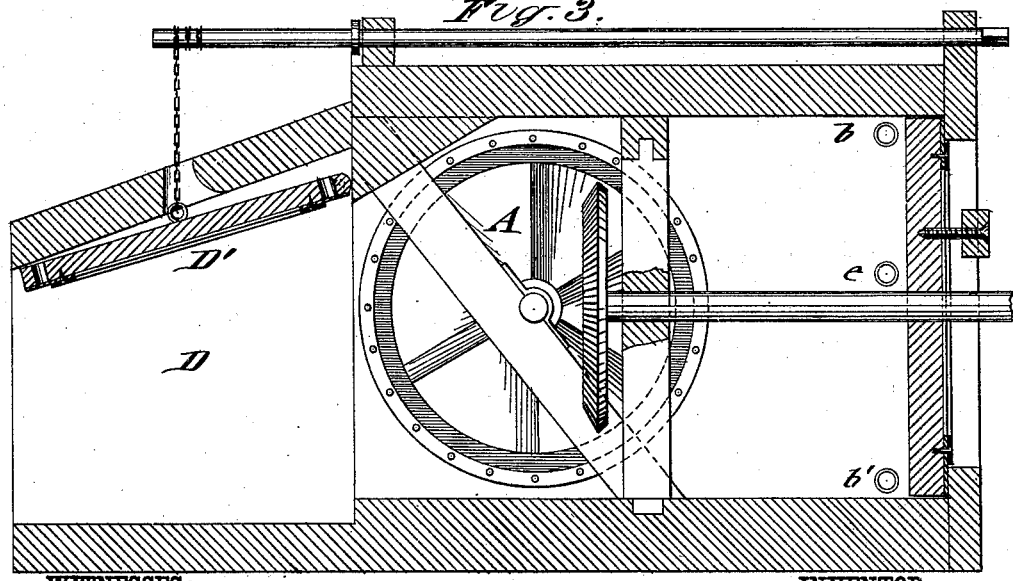


Fig. 3.



WITNESSES:

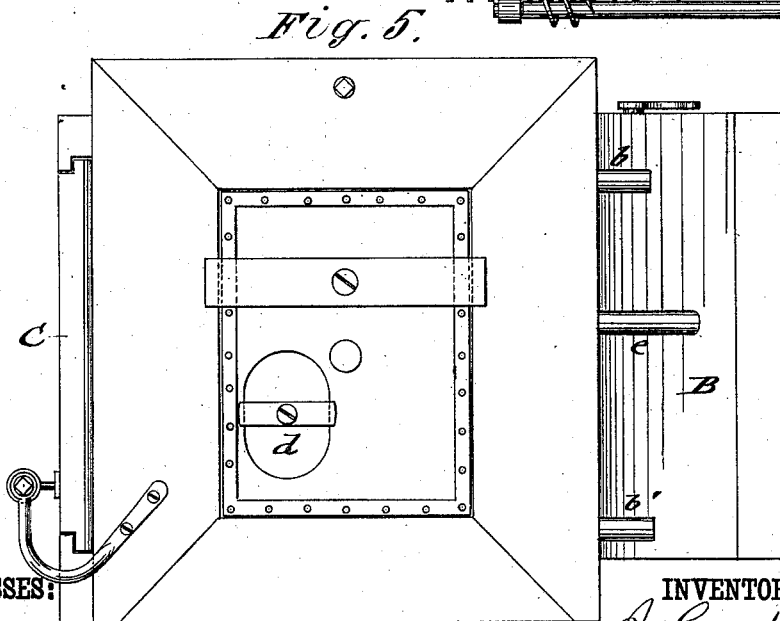
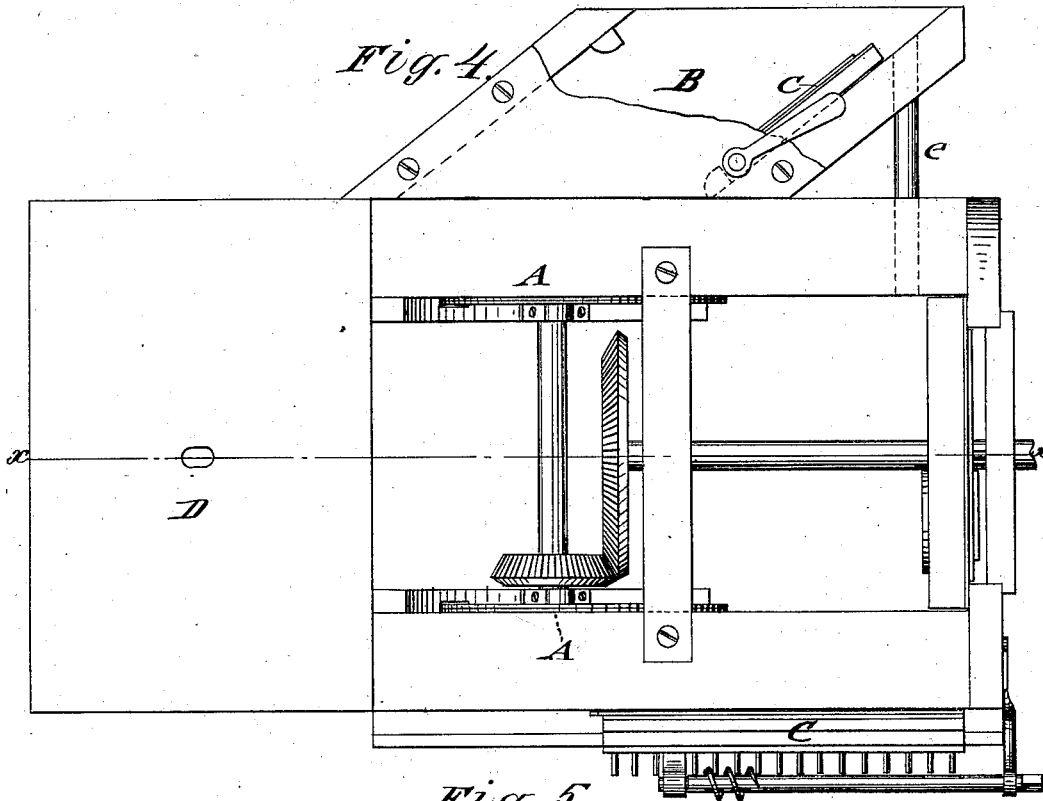
*H. Rydquist*  
*Alex F. Roberts*

INVENTOR:

*J. Curtis*  
BY *Munn & Co*

ATTORNEYS.

J. CURTIS.  
Propelling and Dry Dock Attachment for Vessels.  
No. 198,000. Patented Dec. 11, 1877.



WITNESSES:

*H. Rydquist*  
*Alex F. Roberts*

INVENTOR:

*J. Curtis*  
BY *Muntz*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JAMES CURTIS, OF MIDDLETOWN, MISSOURI, ASSIGNOR TO HIMSELF AND  
ISAIAH NULL, OF SAME PLACE.

## IMPROVEMENT IN PROPELLING AND DRY-DOCK ATTACHMENTS FOR VESSELS.

Specification forming part of Letters Patent No. **198,000**, dated December 11, 1877; application filed  
September 1, 1877.

### *To all whom it may concern:*

Be it known that I, JAMES CURTIS, of Middletown, in the county of Montgomery and State of Missouri, have invented a new and Improved Propelling and Dry-Dock Attachment to Vessels, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side view of a vessel on small scale, with my improved propelling and dry-dock attachment arranged at bow and stern; Fig. 2, a detail side view of the propelling and dry-dock attachment; Fig. 3, a vertical longitudinal section on line *x x*, Fig. 4; Fig. 4, a top view, and Fig. 5 a rear elevation of the same.

Similar letters of reference indicate corresponding parts.

This invention has reference to an improved balanced propelling and dry-dock attachment to vessels for ocean and inland navigation, that may be arranged either at bow and stern, or at the stern merely, or at the middle of the vessel, so as to propel the vessel in steadier and more uniform manner, and at a smaller loss of power than with the common screw.

The propeller is so connected with the water-conducting trunks that they may be closed, and thereby a kind of dry-dock arrangement formed around the propelling-wheels, for conveniently repairing the wheels or machinery at any time, in case of injury to the propelling-wheels.

The invention consists essentially of balanced propelling-wheels at the end of a lateral revolving shaft, in connection with water induction and eduction trunks. The trunks are arranged with tightly-closing, hinged, or sliding gates that may be closed, forming a chamber or dry-dock, from which the water is pumped for repairing the wheels, forming a kind of submarine dry-dock.

Referring to the drawing, A represents the propelling-wheels, that are attached to the ends of a lateral shaft, turning in suitable bearings of the vessel, and being revolved by suitable gearing with the main shaft driven from the engine. The wheels balance each other as they draw the water from opposite sides under equal pressure.

The wheels draw in the water, compress it,

and issue it with force through the outlet, giving end pressure to the column of water in the same way as in ordinary propellers, but with the advantage that the column of water does not cause a loss of power.

The balanced wheels may be set inside the lines of the vessel, or back of the same, being, in the latter case, provided with inlet-trunks B, as shown in Fig. 4, in which one half of the figure represents the wheel inside the lines of the vessel, while the other is provided with a trunk at suitable inclination to the longitudinal axis of the vessel.

The balanced propellers may be arranged at the stern of the vessel, or at the center of the same, or at both stern and bow, the draw-blades of the bow-wheels being turned inside and the packing arranged outside.

The action of the bow-propellers draws in the water in front and expels it at the sides, so as to pull the vessel, while the stern-propellers push the same. When the wheels are at the center, as for canal or river boats, longitudinal inlet and outlet trunks are arranged, which may be depressed to take up and discharge the water at the lowest possible points.

The oblique trunks are closed by hinged and rubber-packed gates C, or when no side trunks are used, sliding gates C are employed, that are guided along rails of the vessel, and operated by worm screw and rack, as shown in Figs. 1 and 4.

The sliding side gates C are provided with scrapers *a* at the front edge, for cleaning the barnacles from the sides of the dock.

The central exit or inlet trunk D, according as the wheels are at the stern or bow, is provided with a hinged drop-gate, D', that is lowered by suitable mechanism when any one of the wheels has been damaged. The side gates are then also closed, and the water then pumped out of the chamber formed thereby, around the propellers, by first opening an air-pipe, *b*, with stop-cock, and then the pumping-pipe *b'*.

When the water is pumped out, a submarine dry-dock is formed of the inclosing-chamber, that may be readily entered through a man-hole, *d*, from the vessel, to make the necessary repairs. When done the man-hole is

closed again, the water-inlet pipe *e* opened, and thereby the chamber filled with water. The gates are then opened, and the vessel may proceed.

A branch pipe with stop-cock may be attached to the inlet-pipe, to be used in case of fire, for washing decks, and other purposes. The propelling-wheels may also be applied with equal advantage for pumping or air-blowing purposes.

The arrangement of the double balanced propelling-wheels at any part of the vessel renders the motion of the same steadier, and especially so when arranged at both bow and stern, in which case very little power is lost, while the dry-dock attachment formed by the closing gates furnishes a convenient means of repairing the screws at mid ocean, in case of accident, without the annoyance to which steamers are at present exposed in case their screws are damaged.

The hinged and sliding closing gates of the dry-dock attachment are metal lined, and have suitable packing along the edge of the opening to be closed; suitable holes in the gates pass from the outside to the back of the packing, and form, when the gates are closed and the water pumped out from the inside, entrance-holes for the water which presses on the packing by the vacuum formed at the inside, so as to produce a perfect closing of the gates.

The end wall of the dry-dock, through which the driving-shaft passes, is removable by taking off the driving-wheel and withdrawing the shaft. An opening large enough to pass all the propelling parts, including the wheels, is

thereby obtained, so that a vessel can have her machinery put in when afloat, or renewed, without going into a dry-dock.

The propelling-wheels being inside the lines of the vessel and incased, are not exposed to damage by coming in contact with floating bodies, and are less liable to injury than the common screw-propeller.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with water inlets and outlets, of the balanced propelling-wheels, arranged in the planes of the sides of the vessels, or within or back of said planes, as and for the purpose described.

2. The trunks or tanks B, oblique, depressible, and provided with hinged water-tight covers, in combination with the balanced propelling-wheels of a vessel, as and for the purpose set forth.

3. In a vessel having balanced propelling-wheels and tanks, substantially as shown and described, the sliding side gates C, provided with scrapers *a* at the front edge, as and for the purpose specified.

4. The combination of the chamber or dry-dock attachment, formed by the tightly-closing gates of the water-inlet and discharge openings or trunks around the propellers, with air-inlet, water-inlet, and pumping-pipes, substantially as and for the purpose described.

JAMES CURTIS.

Witnesses:

W. D. CLARE,  
P. S. WHITE.