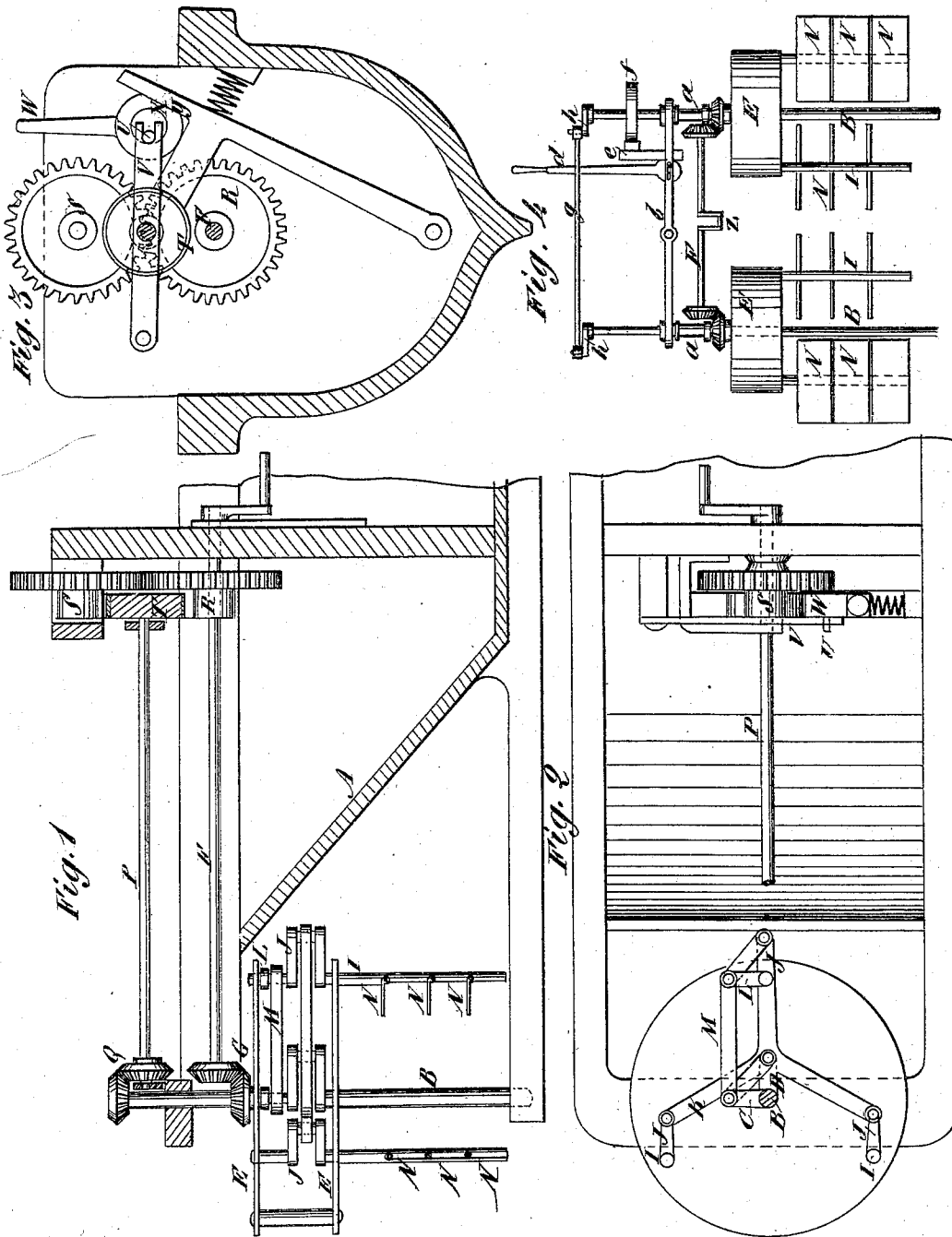


F. J. ASHBURN.
STEERING-PROPELLER.

No. 178,042.

Patented May 30, 1876.



WITNESSES:

C. Nevins
John Goethals

INVENTOR:

F. J. Ashburn
BY Munnell
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FLAVIUS J. ASHBURN, OF WEST UNION, WEST VIRGINIA.

IMPROVEMENT IN STEERING-PROPELLERS.

Specification forming part of Letters Patent No. **178,042**, dated May 30, 1876; application filed May 9, 1876.

To all whom it may concern:

Be it known that I, FLAVIUS JOSEPHUS ASHBURN, of West Union, in the county of Doddridge and State of West Virginia, have invented a new and Improved Propeller, of which the following is a specification:

My invention consists of propeller-blades arranged horizontally on and hinged to vertical crank-shafts suspended from a horizontally-revolving frame or wheel above the water, and connected by their cranks to the crank of a shaft in the center of the carrying wheel or frame, and around which they swing, causing all the paddles to face in the same direction, and being so that in the forward motion they turn upon the hinge and work edgewise, and in the back motion they work broadside against the water to propel the boat. My invention also consists of the stationary crank around which the bucket swings, made to be turned in either way, and provided with means for turning it, which may work either by the engine or by the pilot-wheel, whereby the direction in which the paddles act is changed at will to reverse the motion of the boat, and to utilize the propeller for steering it. One propeller may be used alone or two together. In the latter case they will be geared to turn in opposite directions, so that a certain oblique direction by which each alone acts on the vessel will be counteracted one by the other, thus applying the force directly in the line of the boat. They are, by preference, arranged under the stern of the boat, but may be located at the side, if preferred.

The propeller is specially adapted for shallow water, but may be worked in deep water as well as any.

Figure 1 is a longitudinal section of the stern of a boat with my improved propeller. Fig. 2 is a horizontal section. Fig. 3 is a transverse section, and Fig. 4 is a side elevation, of a couple of propellers arranged together.

A is the stern, in which is mounted an upright shaft, B, having two cranks, C and D, arranged at right angles to each other, said shaft being stationary, except as it is shifted for changing the direction of the action of the propeller on the boat to utilize it for steering. E represents a couple of disks or other suitable carrying wheels or frames mounted on

shaft B, so as to revolve freely, and being geared to the driving-shaft F by wheels or in any approved way. In these carrying-frames the paddle-shafts I are mounted, said shafts being connected by a crank, J, with a spider-frame, K, fitted on cranks D of shaft B, and one of the paddle-shafts has a double crank, one of which cranks, L, is connected, by bar M, with crank C of shaft B, so that the spider-frame holds the buckets so that all face the same way, while they are carried around in an orbit by the carrying-frame E to propel the boat. The paddles N are fixed horizontally across the paddle-shafts below the frame E, and hinged to them so that they swing vertically to go sidewise against the water to propel the boat, and edgewise when going back. The frames E are turned to work the paddles by the driving-shaft F and the wheels G, and the shaft B is adjusted to change the direction in which the paddles act against the vessel, also to reverse the motion by the shaft P and wheels Q, said shaft being turned in one direction by the friction-wheel R on the driving-shaft F, and in the other direction by the wheel S, which wheels act on the friction-wheel T on shaft R, which is shifted from one to the other of said wheels R S by the crank-pin U and lever V, the crank-pin U being operated by the lever W, which is to be worked by the pilot-wheel, or by means under the control of the engineer. The spring-pressed lever Y has a brake, A', to hold the friction-wheel T when not engaged with either of the wheels, and the hub of lever W has a cam, X, which disengages the brake when the lever is shifted either way.

Fig. 4 shows the arrangement of driving-gear and the steering contrivances when two propellers are to be used side by side; also, a brake for holding the shafts B at rest. In this case the driving-shaft F gears at each end with one of the paddle-driving frames E, turning them in opposite directions, so that the oblique action of one propeller is balanced by the other, and the connecting-rod of the engine is attached to crank Z. The adjusting-shafts B are connected to and disconnected from the carrying-frames E by clutches a, which are shifted by lever b, which is shifted by the lever d, which will, in practice, be so that it can be worked by the steam-engine when required,

and lever *b* carries a brake, *e*, which acts on the friction-wheel *f* to hold shaft B from turning when the boat is to go straight ahead. Shafts B are coupled together by rod *g* and cranks *h*, so that they both shift alike, and rod *g* will be operated by the pilot-wheel for ordinary steering purposes. The clutches *a* and the shifting-levers *b d* will be employed for shifting the paddles by the steam-engine when it may be required to do so.

When lever *b* is level the clutches are both disconnected, but when one of the clutches is shifted down it connects with the wheel which turns the paddle-carrier and causes the shaft B to be shifted thereby, and as the paddle-frames turn in opposite directions the blades will be shifted one way by one of them and the other way by the other.

When the pilot-house is located near the bow of the boat suitable connections will be extended from the lever W or *b* thereto; also, some connections from one of the adjusting-shafts B to a pointer and dial to show the position of the paddles.

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

1. The combination of two or more cranked vertical paddle-shafts, having one or more

paddles hinged transversely to them, with a revolving carrying-frame, E, and a center cranked shaft, B, the center shaft and the paddle-shaft cranks being coupled together, as described.

2. The center cranked shaft B, to which the paddle-shafts I are coupled, as described, arranged to turn either way to change the direction in which the paddles act, and having suitable means for so adjusting it, substantially as specified.

3. The combination, with the horizontally-traveling paddle-shafts I and the shaft B, for changing the direction of the paddles, of suitable means for operating shaft B by the power of the driving-engine, substantially as specified.

4. The combination of a brake with the adjusting-shaft B, or a shaft connected with it, and with the reversing-gear thereof when the latter is arranged to detach the brake when it connects the adjusting-gear, and allows the brake to act when it connects said gear, substantially as specified.

FLAVIUS JOSEPHUS ASHBURN.

Witnesses:

W. H. CHENNUT,
C. C. DAVIS.