J. Dougherty.

Vibrating Propeller.

No. 7,574. Patented Aug. 20, 1850.

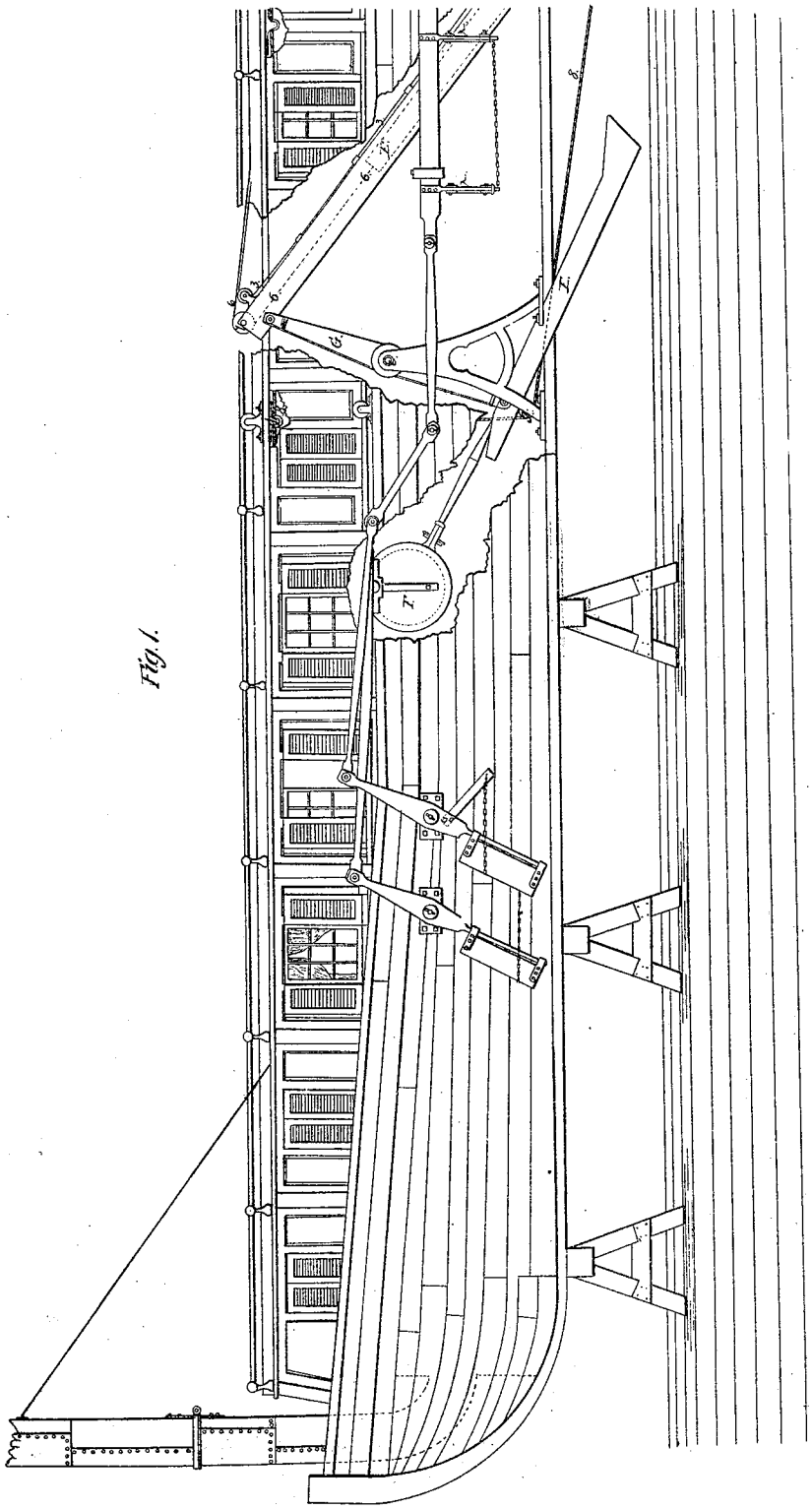

Fig. 1.

Sheet 2, 4 Sheets.

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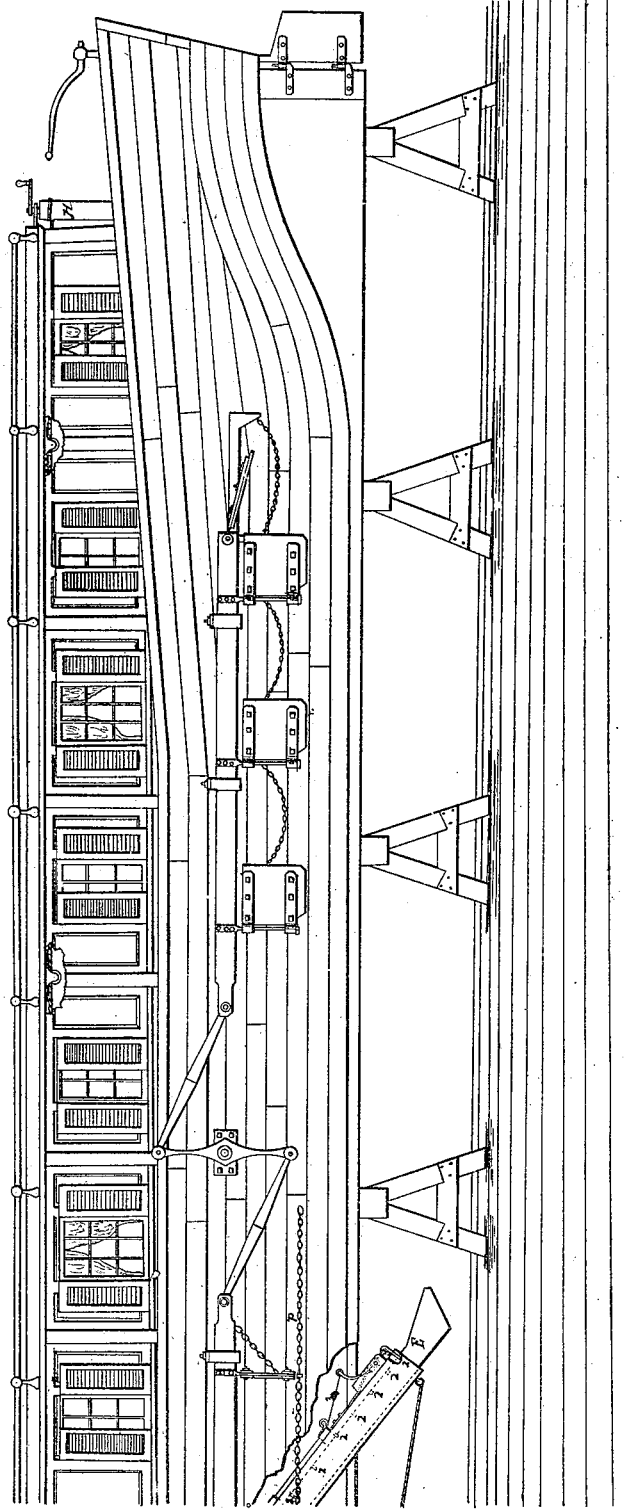

Fig. 2.

Sheet 3, 4 ...

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Fig. 2.

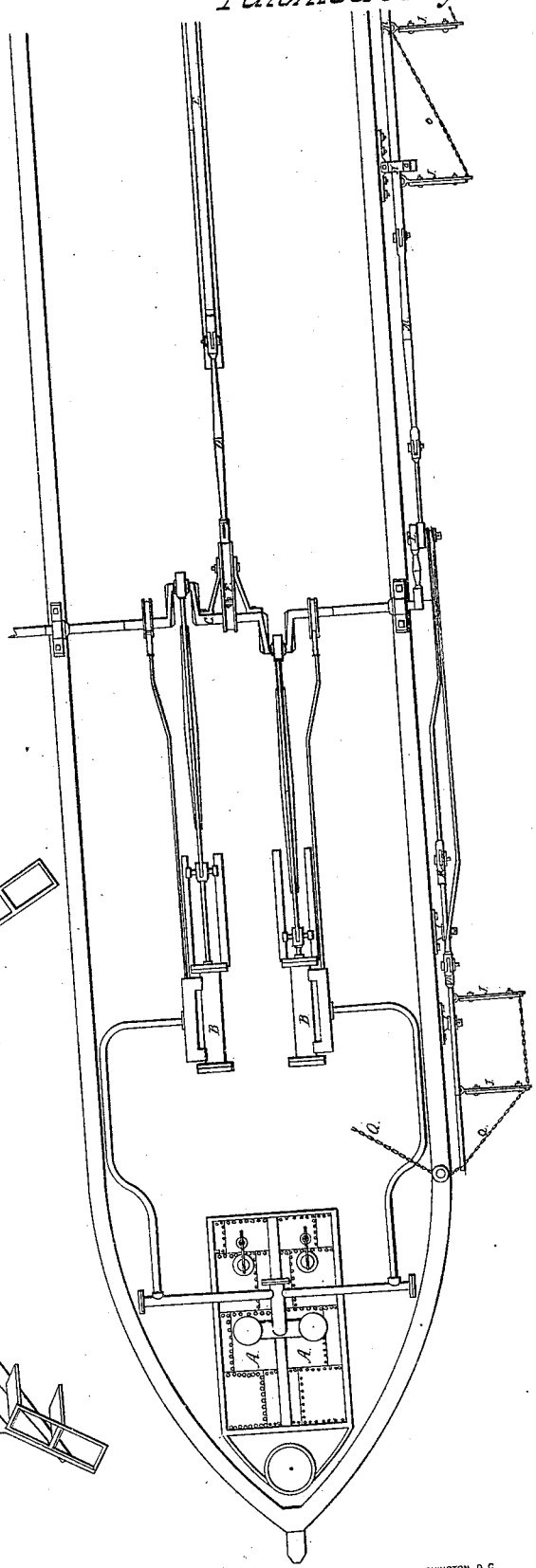
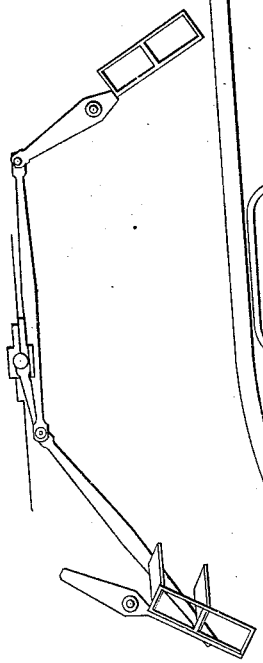


Fig. 3.



Sheet 4, 4 Sheets.

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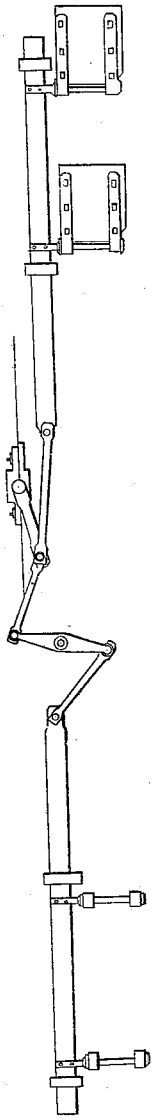

Fig. 4.

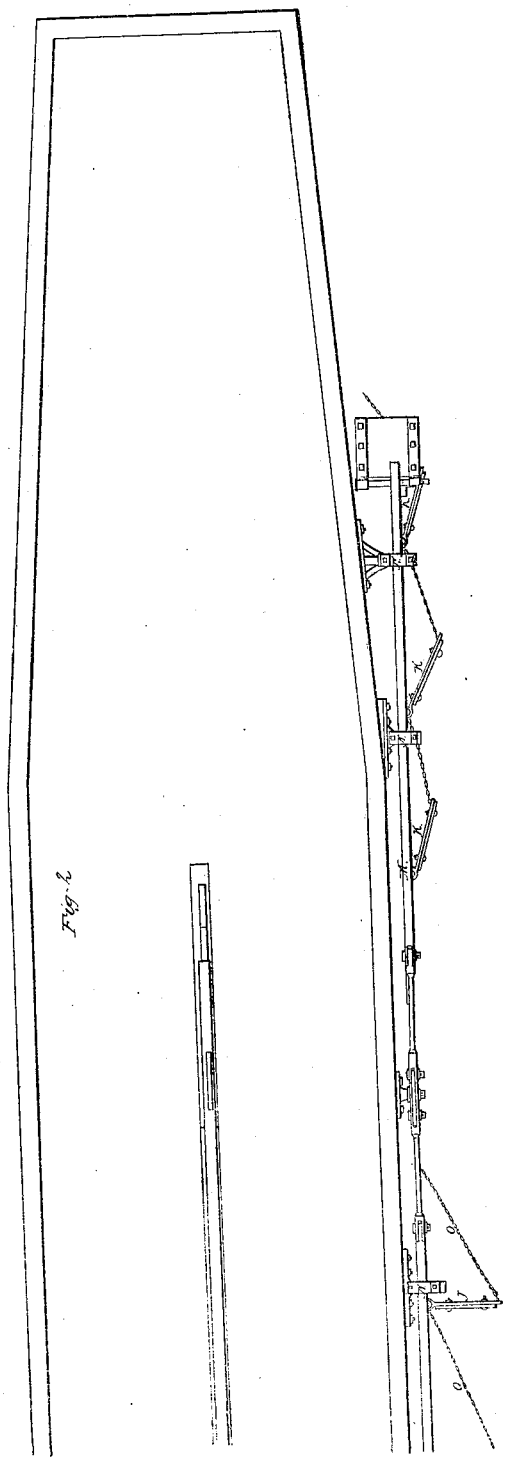

Fig. 2.

UNITED STATES PATENT OFFICE.

JOHN DOUGHERTY, OF MOUNT UNION, PENNSYLVANIA.

METHOD OF PROPELLING BOATS IN SHALLOW WATER.

Specification forming part of Letters Patent No. **7,574**, dated August 20, 1850.

To all whom it may concern:

Be it known that I, JOHN DOUGHERTY, of Mount Union, Huntingdon county, Pennsylvania, have invented a new and Improved Mode of Propelling Steam Canal-Boats and other Vessels; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of the same, in which—

Figure 1 represents a canal-boat complete, with a part of the side removed to show the operation of the setting-poles and other propelling machinery. Fig. 2 represents a top plan of the boat, showing the arrangement of the machinery used for propulsion, also the arrangement of the steam-engine as placed in the bow of the boat as I purpose using it. Figs. 3 and 4 represent one of the side propellers with its connections.

In navigating canals with steam-power a difficulty always presents itself in confining the dimensions of the boat to the width of the locks and in placing or arranging the propelling power so as to be able at all times to bring it within the limits of locks, bridges, and other contracted places common in canals; also, to use such propellers as will be least likely to wash the banks. To overcome these difficulties, as well as to adapt the boat to the various depths of water found in the pools of dams or in crossing or running in rivers, I have arranged and combined my machinery as follows:

On a canal-boat of ordinary construction I place in the bow the boilers A A, Fig. 1, as far forward as possible. The cylinders B B of the steam-engine are sufficiently elevated above the keel of the boat, so as to bring the crank-shaft C about flush with the top of the boat, leaving space below them for storage, as well as to place the connection within the reach of the hands on deck. To the crank-shaft C and in the middle thereof is the connecting-rod D, which is attached to the "setting-pole" E, Figs. 1 and 2, passing through a water-tight case in the bottom of the boat, and which receives its motion by means of the eccentric F, Figs. 1 and 2, on the crank-shaft C, before described.

G is a rock-shaft having its bearing at *i*, Fig. 1. One end of this rock-shaft is attached to the setting-pole E and the other end to the setting-pole E′, as represented in Fig. 1, and is so arranged as to always have one of the setting-poles propelling while the other is being drawn forward preparatory to its being placed in proper position for forcing the boat forward.

To adapt the setting-poles to the various depths of water I construct them as follows: I make an iron sheath, (shown by dotted lines at E″, Fig. 1,) into which I slide the setting-pole, and secure it in place by means of the bolt *y*, which is forced by a spring into notches in the setting-pole, as fully shown by the dotted lines 2 2 2, &c., Fig. 1, where the setting-pole is shown at its shortest length and suitable for the ordinary depth of water. To lengthen this pole there is a cord or chain 3 3 3, which is fastened to a lever on the bolt *y* and passing over pulleys on the sheath of the pole which may run to a winch or windlass at the stern of the boat or other place convenient to the helmsman and so as to be operated by him while steering the boat. By turning this winch or windlass the boat is drawn out of the notch and the setting-pole runs down within the sheath by its own weight until it strikes the bottom of the canal or river, when by slacking the cord the bolt is again by means of the spring 5 thrown into one of the notches 2 2 2, &c., and is held firm in its place. When the water becomes shallow and it is necessary to shorten the setting-pole, the cord 3 is tightened up to draw out the bolt *y*, as before described, when by means of the cord or chain 6, running over the pulley 7 and attached to the before-described winch or windlass H, the pole is raised to the desired height, when the bolt being released again holds the pole firm in its place.

For the purpose of checking the headway of the boat when entering a lock or snubbing the boat, I attach a cord 8 8 8 to the foot of the setting-pole E′, which passes over pulleys 9 9, &c., thence under the deck of the boat to the windlass H, placed at the stern of the boat and convenient to the helmsman, and so as to be easily operated by him, thereby saving the expense of a hand who always performs this duty. When the boat is to be checked or stopped, the helmsman turns the windlass H, drawing the setting-pole by means of the before-described cord and pulleys down tight against the bottom of the canal or river, and

by this means checks the headway or entirely stops the boat as less or more power is applied.

For the purpose of propelling the boat when the water becomes too deep for the setting-poles, I have arranged on the same crank-shaft C which operates the poles side propellers, which are represented as open when used for propelling at J J J, &c., Fig. 2, and closed at K K K, or nearly so, as they are drawn forward through the water. These side propellers are connected to the crank-shaft C by means of the crank L and connecting-rods M M M, &c., Fig. 2, which slide through and are kept in their places by means of the guides fastened to the side of the boat and shown at N N N, &c., Fig. 2, a side view of which is also represented in Fig. 1. The paddles of these propellers are so arranged as to swing freely on their arms *x x x*, &c., Fig. 1, as they are drawn forward through the water, but held while propelling perfectly rigid by means of the chain O O O, Fig. 2. These paddles are connected or attached together by a chain or cord, a part of which is shown at P, Fig. 1, and another part at Q Q, Fig. 2, passing over a pulley where it enters the boat, and is fastened to the engine or by any other means is drawn tight, bringing the paddles close up against the boat when they are not used for propelling.

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

1. The combination and arrangement of the setting-pole E′, sliding in the sheath E″, with the spring-bolt *y* and cords 3 3 3 and O for the purpose of shortening or lengthening the setting-pole, substantially as herein fully described and shown.

2. The manner herein described of checking or snubbing the boat by means of a chain or cord attached to the foot of the setting-pole and passing over pulleys to a windlass placed in the stern of the boat near to the helm, as herein described.

JOHN DOUGHERTY.

In presence of—
JOHN ROBERTSON,
JOHN RAMSEY.