

Vernol & Martin.

Vibrating Propeller.

N^o 41,109.

Patented Jan. 5. 1864.

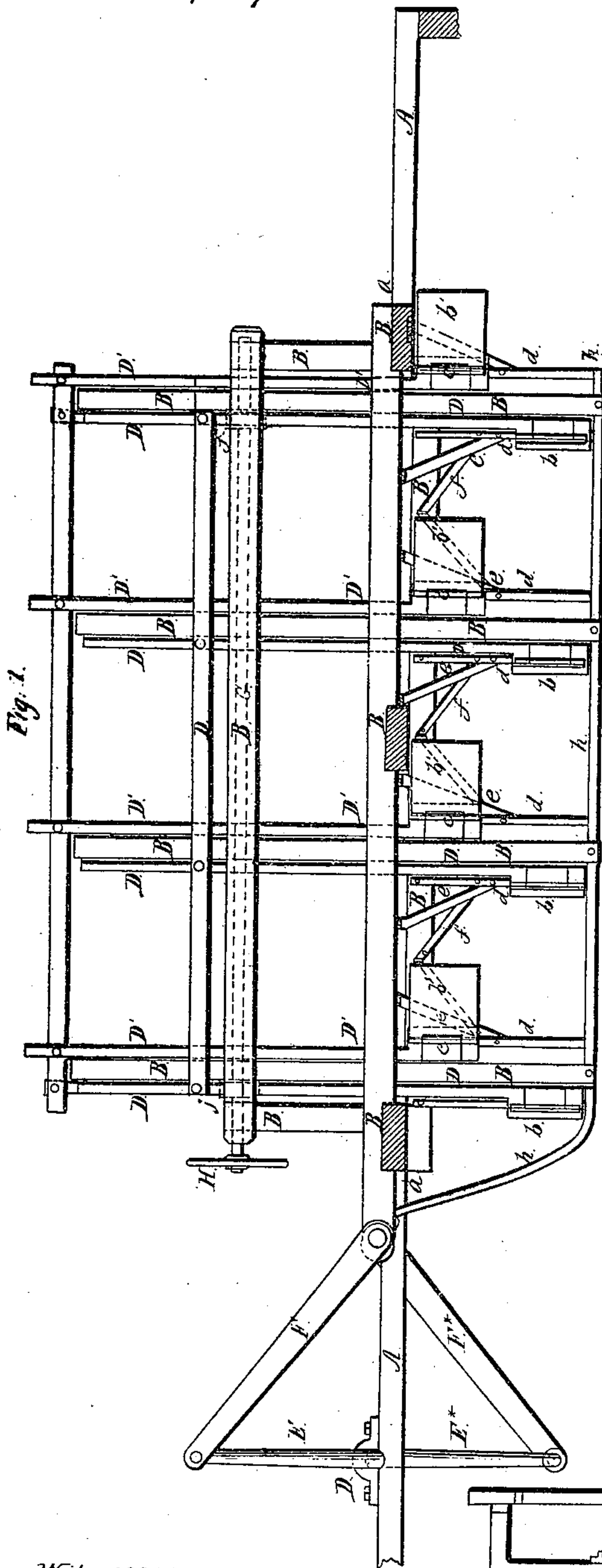


Fig. 1.

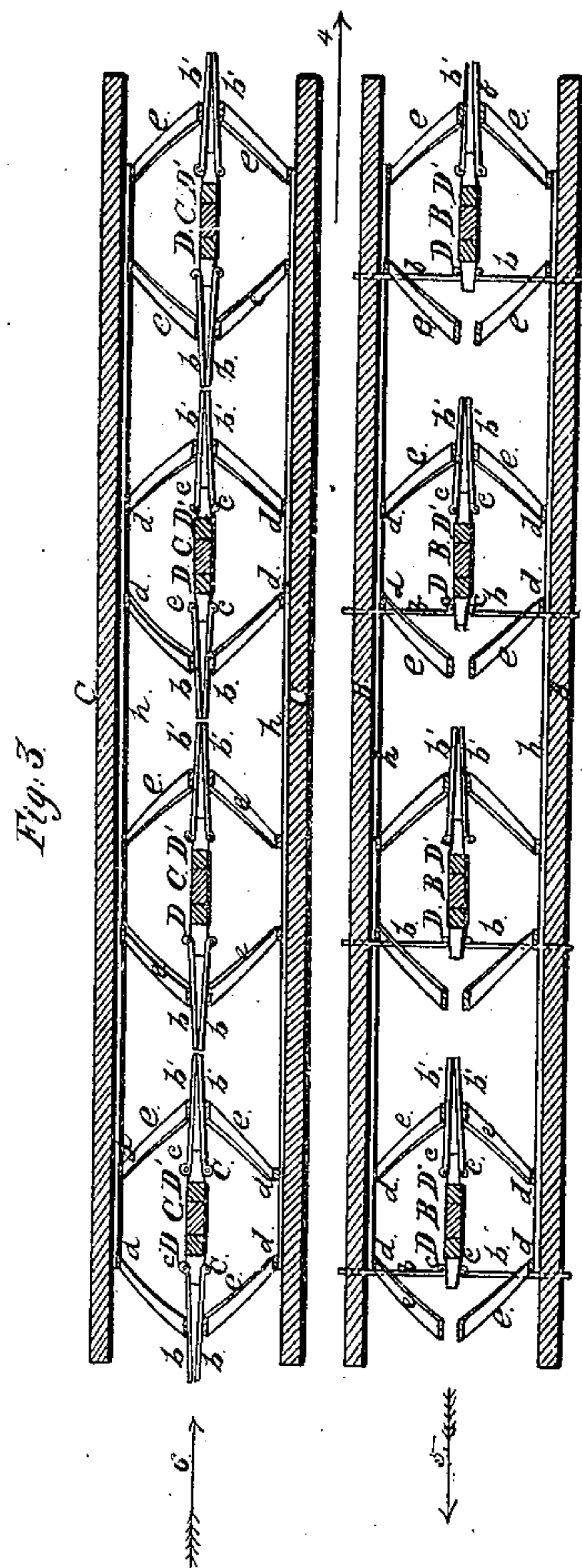


Fig. 3.

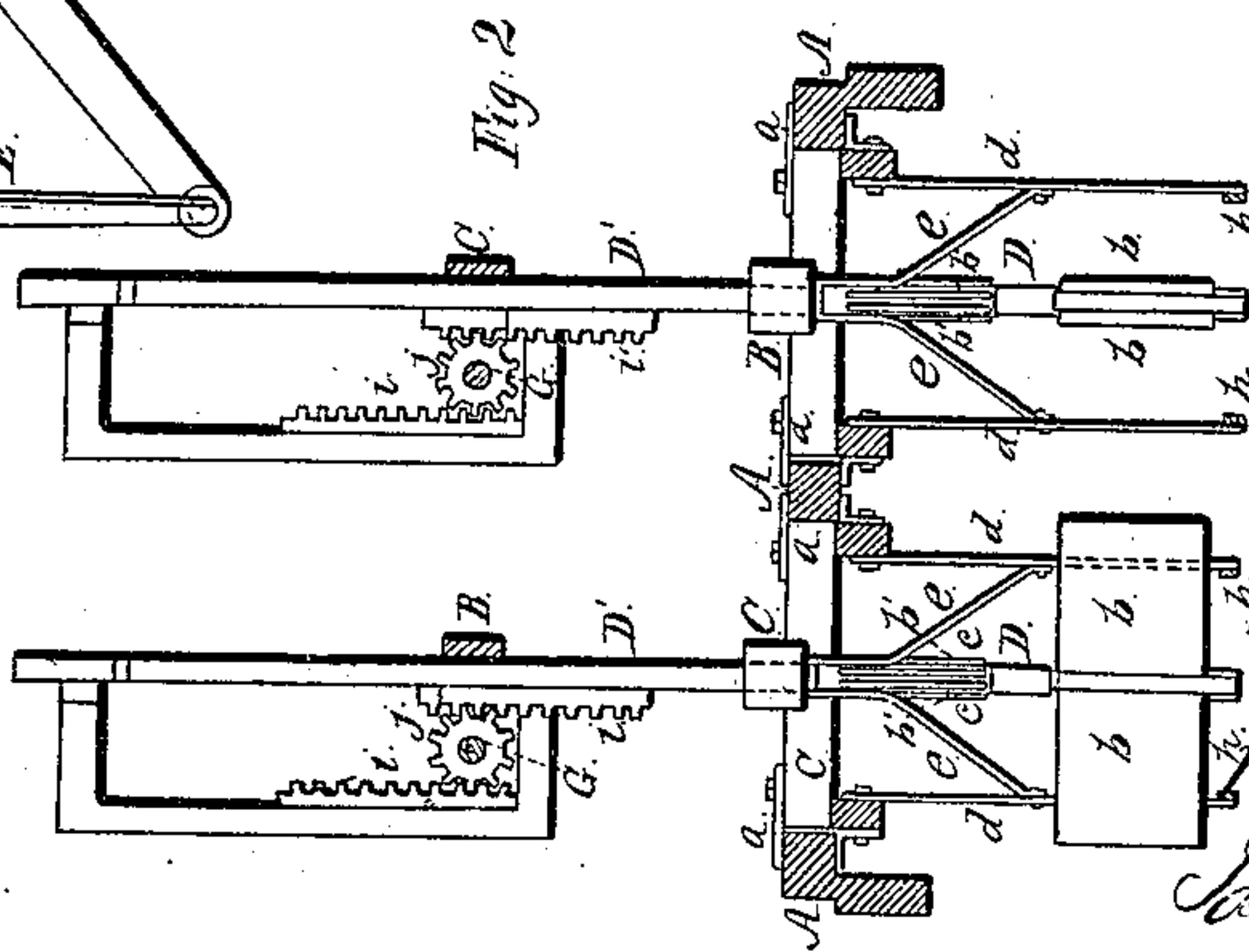


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

REUBEN C. VERNOL AND JOSEPH T. MARTIN, OF NEW YORK, N. Y.

IMPROVED MARINE PROPELLER.

Specification forming part of Letters Patent No. 41,109, dated January 5, 1864.

To all whom it may concern:

Be it known that we, REUBEN C. VERNOL and JOSEPH T. MARTIN, both of the city, county, and State of New York, have invented a new and useful Improvement in Reciprocating Propellers for Propelling Vessels; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of a pair of reciprocating propellers with our improvement. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the use of folding buckets in a reciprocating propeller; and it consists in certain novel means for providing for the reversal of the direction of the propulsion without reversing the engine.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A is one of two strong horizontal frames, which are to be attached securely, one to each side of a vessel, for the purpose of supporting the propellers, of which there are two on each side of the vessel. This frame is constructed with parallel ways *a a*, which are arranged lengthwise of the vessel and serve as guides to the two upright horizontally-sliding frames B and C of the two propellers, which are arranged side by side and connected by connecting-rods *F F** with two cranks, *E E**, on the driving-shaft D. This shaft is arranged cross wise of the vessel, like a paddle-wheel shaft, and the cranks are set in opposite positions, so that they will give motion to the propellers in opposite directions, and cause each one to move forward while the other is moving backward. Each of the frames B C is fitted with two vertically-sliding frames, D and D', and each of these frames has attached to its lower end a separate set of floats, the floats belonging to D D' being marked *b b* and those belonging to D' D' being marked *b' b'*, and these floats are arranged in pairs, which are attached to their respective frames by hinges *c c* in such manner that they may fold up into vertical planes parallel with the movement of the frames B C, or spread out into vertical planes perpendicular to the move-

ments of the said frames, as shown in Fig. 3, where the floats *b b* of the frame B are spread out, but the others are folded. When the floats are spread, they rest against upright rigid stops *d d*, secured to their respective frames B C, a separate pair of stops being provided for each pair of floats. By the arrangement of the hinges *c c* and stops *d d* of the two sets floats *b b* and *b' b'* of each propeller are reversed, so that *b b* open in one and *b' b'* in the opposite direction. The opening and closing, when the floats are immersed, are effected by the resistance of the water as the floats are moved back and forth with their respective frames B C. Between each pair of stops *d d* there are rigidly secured in the frames B C two bars, *e e*, which have an upward inclination toward each other, as shown in Fig. 2, but the upper parts of which are parallel, as shown in the same figure, and have just room enough between them to receive their respective pair of floats when in a closed condition. The closing of the floats is effected by the operation of raising the frames D D' to lift the floats out of the water, the act of closing them being produced by the upper edges of the floats being brought into contact with the edges of oblique bars *f f*, which are attached to the frames B C until they are closed about half way, after which the closing is completed by their upper edges passing up along the surfaces of the inclined portions of the bars *e e*. When the floats have been closed, they enter between the upper parallel portions of the bars *e e*, (shown in Fig. 2,) and are thus secured in a closed condition. The bars *e e* and *f f* are secured in place by being bolted or riveted to the upright stop-bars *d d*, the upper parts of which are secured to the frames C D, and the lower parts secured together by a horizontal brace, *h*.

The two frames D D', which carry the two sets of floats of the two propellers, are geared by means of toothed racks *i i* and *i' i'*, secured to the frames with pinions *j j*, on one of the two horizontal shafts, G G, which work in bearings secured to the frames B C, and these shafts are furnished with hand-wheels H or cranks by which to turn them for the purpose of raising one of their frames D D' and its attached set of floats and lowering the other, the racks being arranged on opposite sides of their respective pinions, so that one of the said frames will be caused by the operation of

the pinions to rise while the other is caused to descend, and hence that one set of floats will be in and the other out of the water. The two sets of floats, (one belonging to each propeller,) which open and close in the same directions, are always immersed.

In the drawings, the frames *D D* of both propellers are lowered, and those *D' D'* raised, and the floats *b b* are immersed, while those *b' b'* are out of water and secured in a closed condition, and the horizontal reciprocating movement of the two propeller-frames *B* and *C* causes the vessel to be propelled in a direction parallel with the arrow 4 in Fig. 3 by the alternate action of the two sets of floats *b b*, which are opened, as shown in the propeller *B* in Fig. 3, by the resistance of the water. When their respective propellers move in the direction of the arrow 5 and are closed, as shown, in the propeller *C*, by the resistance of the water, when their respective propellers move in the direction of the arrow 6, it will be proper to have the two cranks for driving the two propellers on one side of the vessel set at right angles to those on the opposite side, so that the operation of propelling will be continued on one side, while the cranks on the other side are passing the dead-points.

In the above-described operation the direction in which the vessel is propelled is not dependent upon the direction of the revolution of the engine or the driving-shaft, but upon the direction in which the immersed floats open and close, and the reversal of the direc-

tion is effected by turning the shafts *G G* to raise the immersed floats from the water-immersed and those which open and close in the opposite direction.

One advantage of this invention is that with one shaft or engine the propellers on one side of the vessel may be made to back while those on the other side are propelling the vessel ahead, and consequently the vessel may be turned around and landings made without any, or with very little, aid from the rudder. Another is that the floats may be easily raised or lowered to suit variations in the draft of water of the vessel, or to the depth of water which the vessel is navigating; and while possessing these advantages, the propellers are as strong and as little liable to get out of order as the common paddle-wheel, and are free from the objections of back-lift and concussion.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The racks *i i'* and pinions *j j*, in combination with the two sets of reversed floats *b b* and *b' b'*, substantially as and for the purpose herein specified.

2. The bars *f f* and *e e*, in combination with the frames *B C*, the floats and the frames *D D'*, substantially as and for the purpose herein specified.

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Witnesses:

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