L. GUGLER.

VIBRATING-PROPELLER.

No. 174,419. Patented March 7, 1876.

Fig: 1.

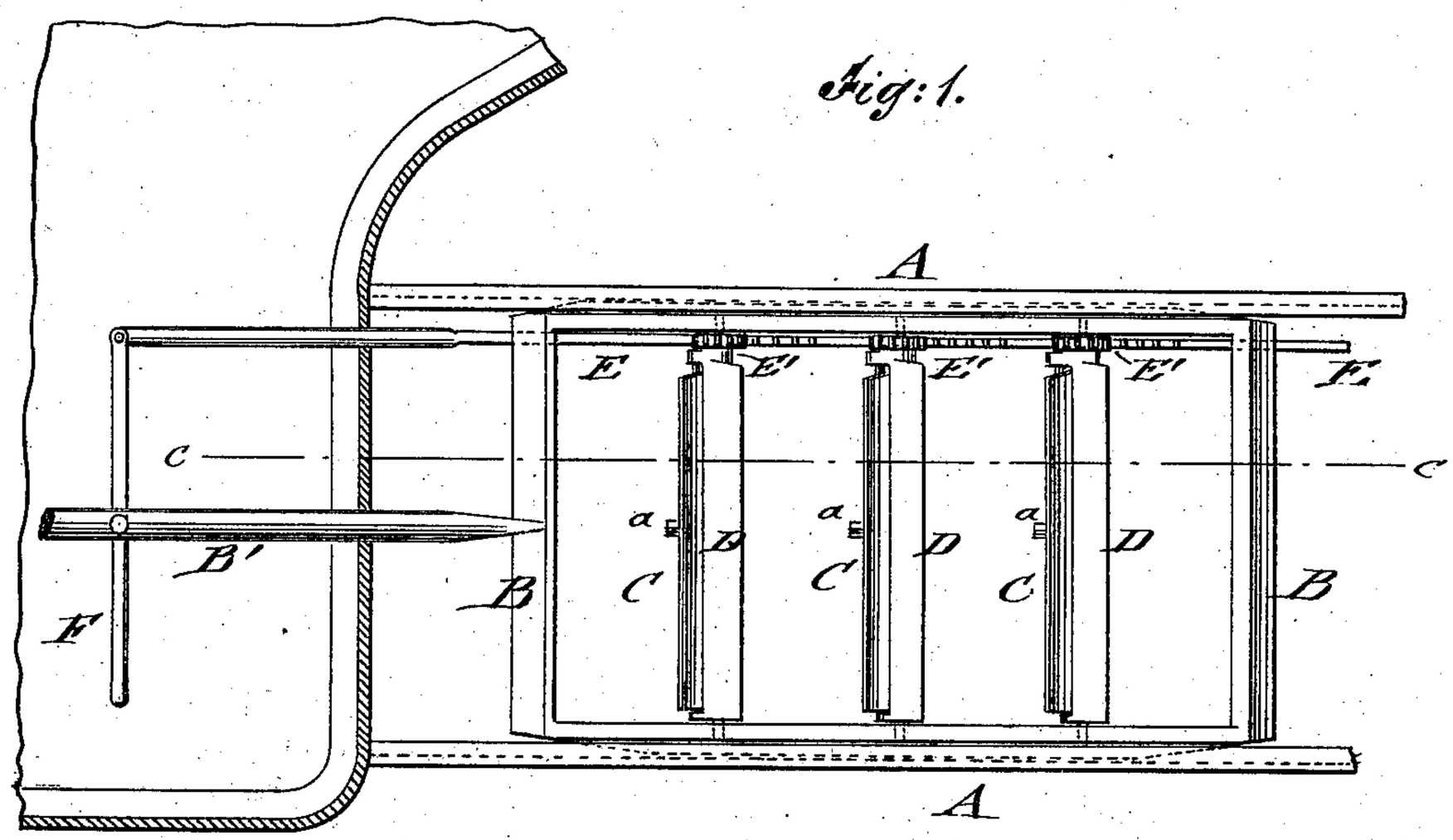


Fig: 2.

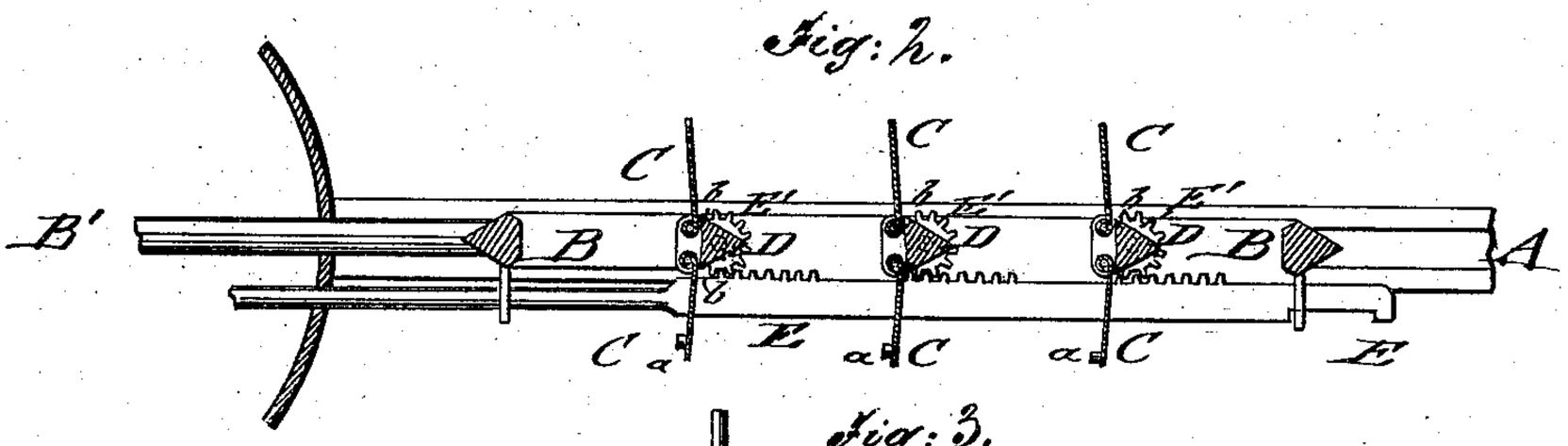


Fig: 3.

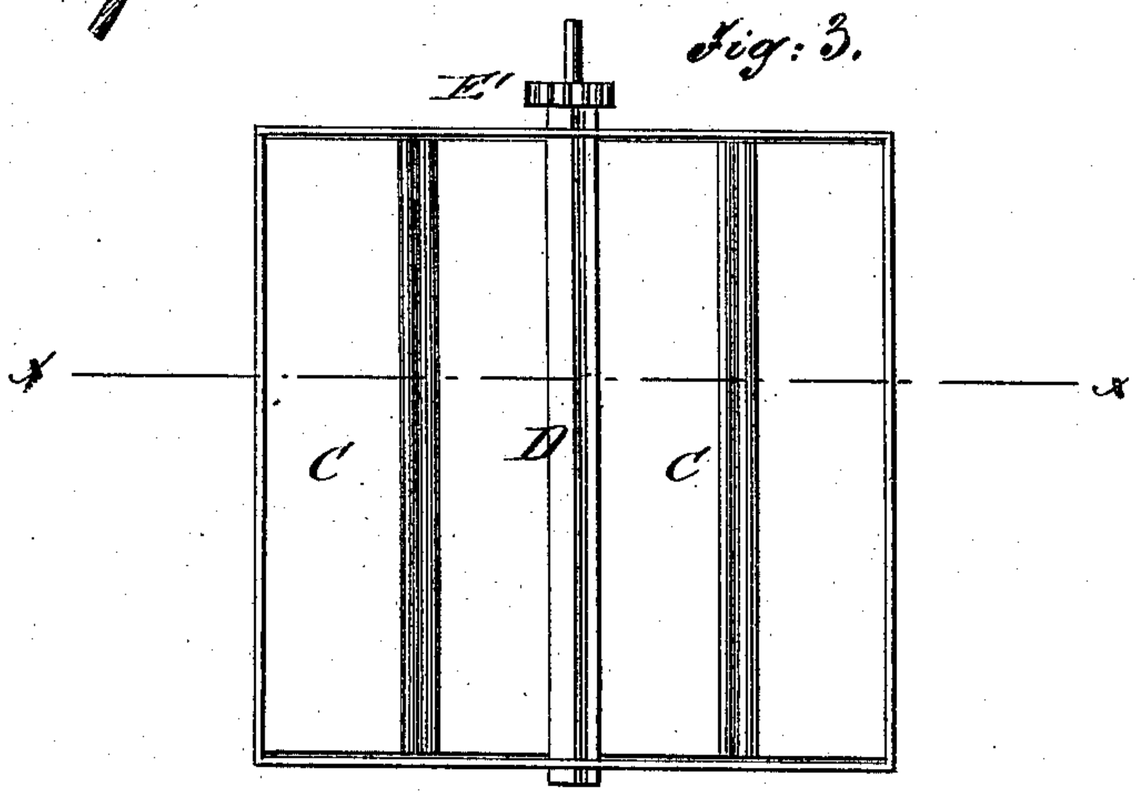
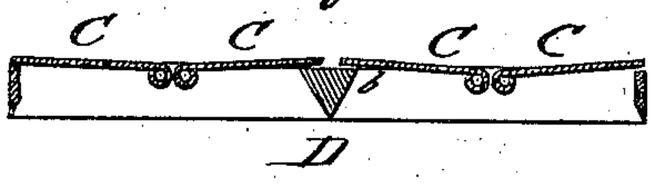


Fig: 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LOUIS GUGLER, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN VIBRATING PROPELLERS.

Specification forming part of Letters Patent No. **174,419**, dated March 7, 1876; application filed October 16, 1875.

To all whom it may concern:

Be it known that I, LOUIS GUGLER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and Improved Propeller, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of my improved propelling device for vessels; Fig. 2, a horizontal section of the same, on the line *c c*, Fig. 1; and Figs. 3 and 4, respectively, front view and horizontal section on line *x x*, Fig. 3, of a modification of the paddles or wings.

Similar letters of reference indicate corresponding parts.

My invention relates to improvements in propelling devices for vessels, which may be arranged either at the sides or stern, and being of special advantage for canal and smaller boats.

The invention consists of a series of vertically-hinged paddles or wings that are mounted to a reciprocating frame, sliding in horizontal guides of the vessel. The position of the paddles for forward or backward motion is produced by a lever-operated rack-bar engaging pinions of the bucket-standards.

In the drawing, A A are the horizontal guide-bars, which are attached to the side, stern, or other suitable part of the vessel, and made of sufficient length for the stroke of the paddle-frame B. The paddle-frame B is operated by means of a horizontal shaft, B′, that slides in a stuffing-box of the vessel, reciprocating motion being imparted to shaft and frame by suitable power. The vertical stiffening-pieces of the paddle-frame are made tapering or wedge-shaped, to furnish as small a degree of resistance to the water as possible. The paddles or wings C are hinged to vertically-mounted standards D, which are also of tapering or wedge shape, and pivoted, at top and bottom, to the reciprocating frame B.

The paddles C swing according to the position of the standards and the motion of the frame, folding up in one direction, and spreading out at right angles to the frame in opposite direction for acting on the water.

The paddles offer, in folded position, no resistance to the water, and are provided with rubber or other cushioning devices *a*, for smoothening the folding up, and holding the paddles in parallel position for the ready entrance of the water that opens them for the propelling action on the water.

The standards D are provided with flanges or seats *b*, that furnish an even support along the entire length of the paddles, which are made narrow for passing more readily through the water.

If it is desired to obtain a more powerful stroke, lateral paddle-frames with two sets of hinged paddles, as shown in Figs. 3 and 4, may be employed, by which the action of the paddles is increased, while the width of the paddles is not increased.

The paddles C are adjusted for forward or backward propulsion of the vessel by means of a sliding rack-bar, E, that engages pinions E′ of the rack-standards. The rack-bar E is guided in a stuffing-box of the vessel and in supports of the paddle-frame B, and operated by a lever, F, fulcrumed to the driving-shaft B′.

By throwing lever F in one direction, the paddle-standards swing into position for forward propulsion. By moving the lever in the opposite direction, the standards are turned and the paddles carried in position for propelling the vessel in backward direction, in which position they are shown in the drawing.

This system of paddles may also be made available for the purpose of steering the vessel by making the guide-bars movable, and carrying the whole paddle-frame, by suitable mechanism, to one side or the other, so that the paddles serve for propelling and steering the vessel in a very effective manner.

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

The combination of grooved frame A, reciprocating frame B, the standards D, pivoted in the latter, and having seats *b*, and the paddles C, hinged to the standards, and having cushions *a*, as and for the purpose specified.

L. GUGLER.

Witnesses:

ERNST KRAUBS,

CHAS. P. CORNILLIE.