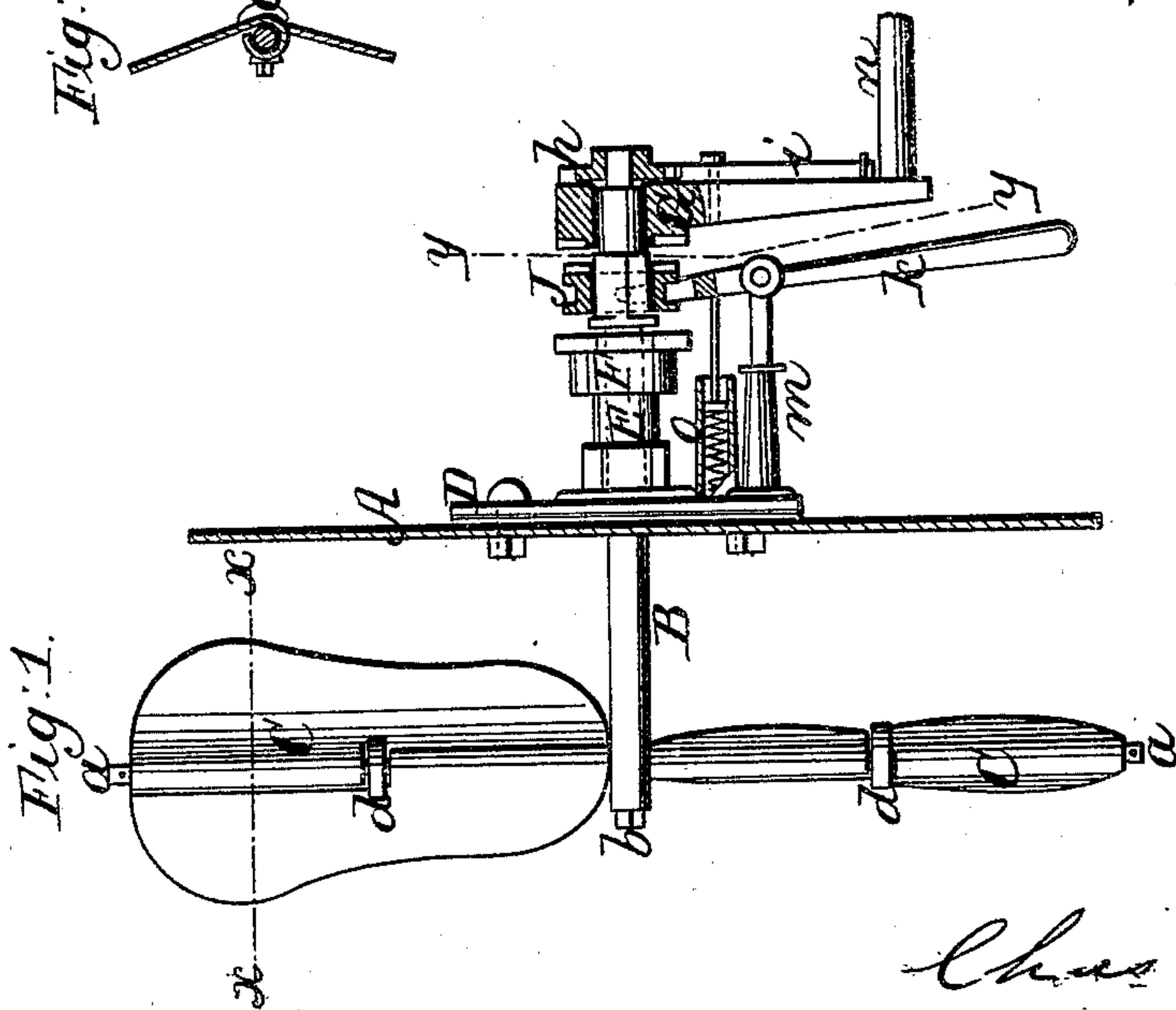
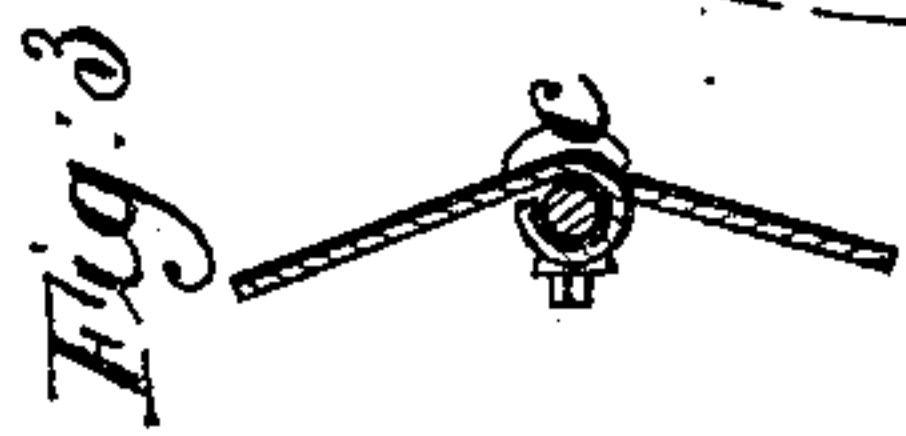
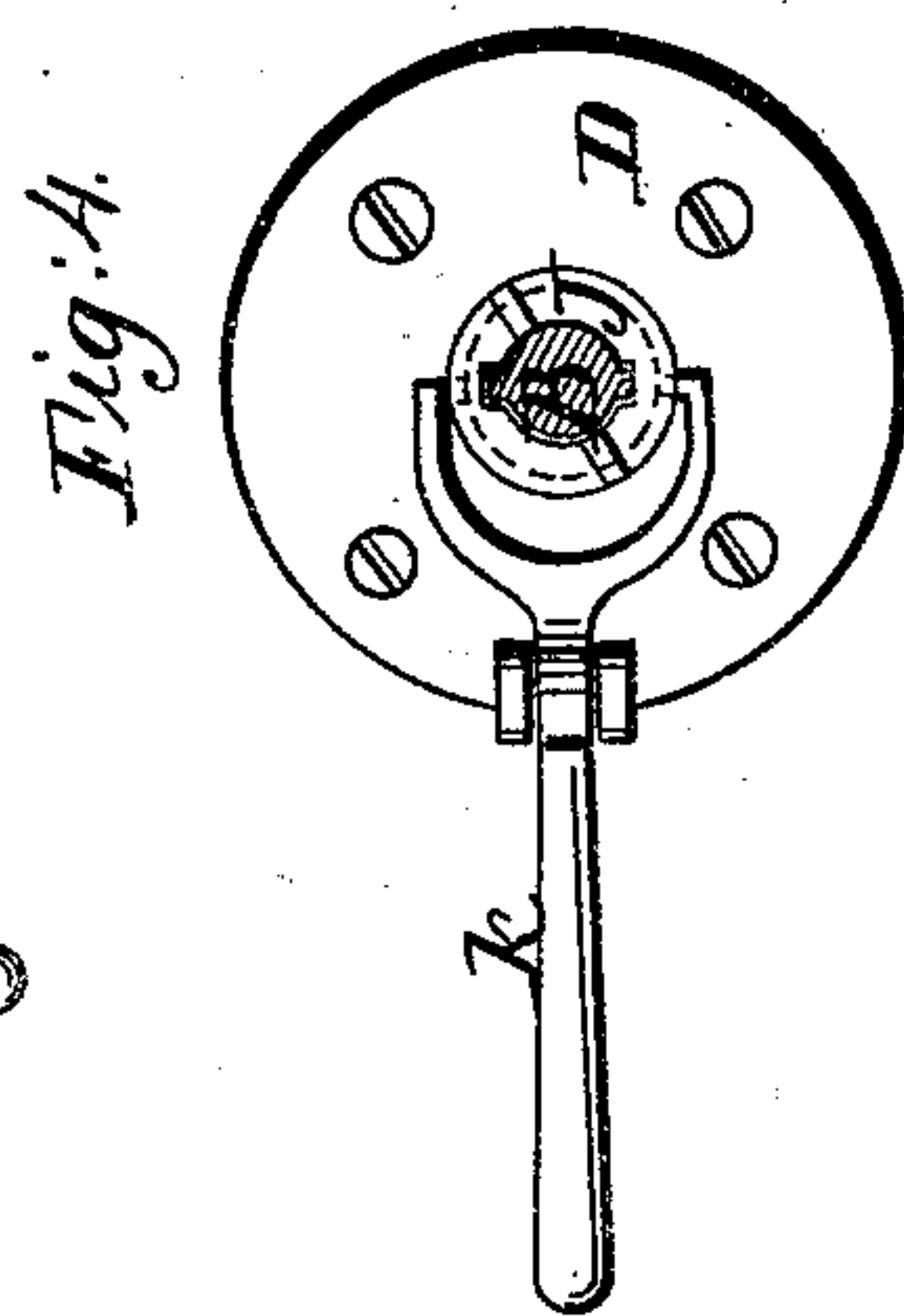
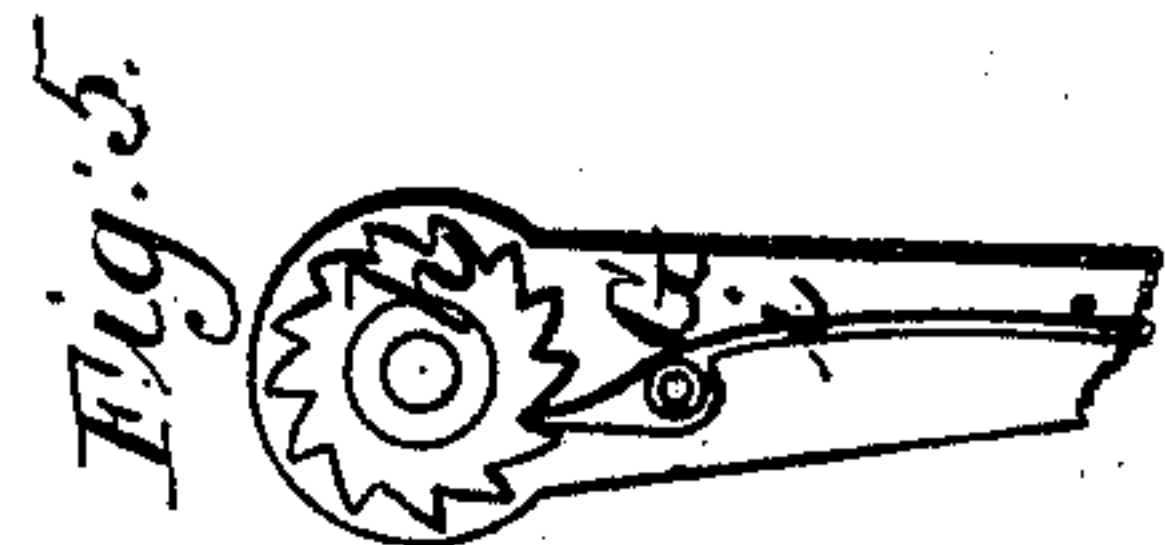
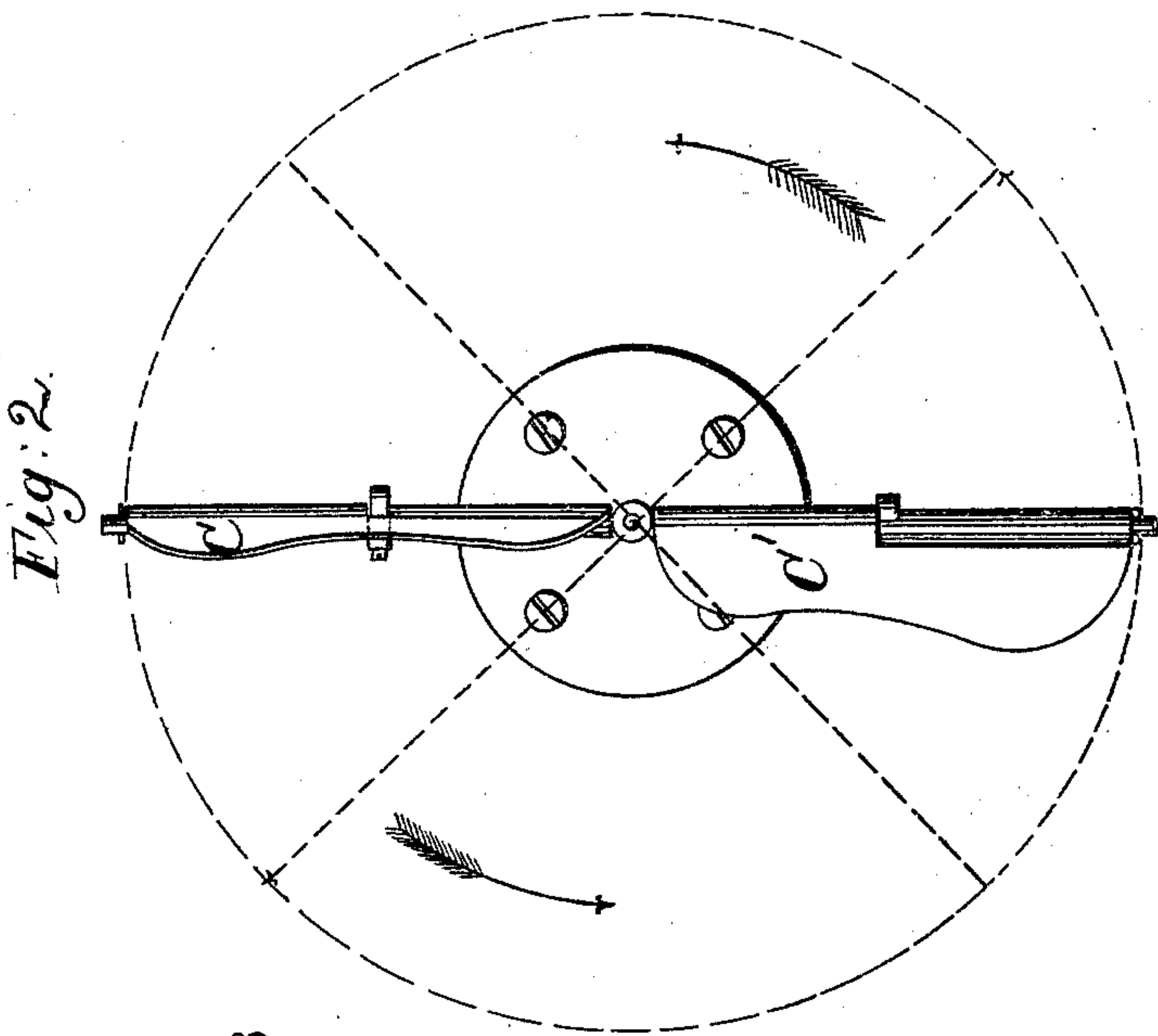


C. E. Foley.
Paddle Wheel.

N^o 67,376. Patented July 30, 1867.



Witnesses,
Theo Truske
N. Brown

Inventor;
Chas C Foley
Per Munroe
Attorneys.

United States Patent Office.

CHARLES E. TOLEY, OF BROOKLYN, NEW YORK.

Letters Patent No. 67,376, dated July 30, 1867.

IMPROVED PROPELLER.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES E. TOLEY, of Brooklyn, Kings county, New York, have invented a new and improved Oscillating Marine Propeller; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved method of propelling marine vessels of all descriptions where steam or other artificial means are used as a motive power; and the invention consists in attaching to a shaft which passes through the side of a vessel propelling wings, which are jointed or hung to a bar or bars which are attached to the shaft, and which stand at right angles therewith, the wings being hinged in pairs, and operating against the water alternately. It also consists in the manner of reversing the action of the propelling wings as will be hereinafter described.

Figure 1 represents a vertical sectional view of the whole arrangement.

Figure 2 is an end view looking from the left of the drawing.

Figure 3 is a cross-section of the wings through the line *x x* of fig. 1.

Figure 4 is a detached view of the reversing arrangement, it being through the line *y y* of fig. 1.

Figure 5 is a side view of the crank, showing the position of the ratchet and pawl.

Similar letters of reference indicate corresponding parts.

The blue line *A* represents the side of a vessel. *B* is the shaft, which passes through the side, with a transverse bar passing through it near its end. The ends of this bar or rod are seen at *a a*. It is secured in the shaft by a set-screw, *b*, or in any other suitable manner. *C* represents the propeller wings. They are slipped on to the bars *a* in pairs, and are made similar to a butt hinge. The parts lap by each other and open and close on the rod; but between the parts, as seen at *d*, there are stops or collars, which are fastened with a screw, and which are formed with shoulders, against which the wings strike when they open, and which receive the back force of the wings as they are forced against the water. When the wings close on the back stroke this collar *d* prevents them from closing entirely together, so that at the commencement of the forward stroke the water rushes between them and throws them open. A side view of the collar *d* is seen in fig. 3, with the propelling wings open or thrown back against the shoulders of the collar. The shaft *B* is an oscillating shaft, consequently the propelling wings are vibrated back and forth in the water, and stand as represented in fig. 2. Operating in the water, the pair of wings marked *C* are open, as seen in fig. 3, while the pair marked *C'* is closed. The distance through which the wings pass in their vibration may be a quarter of a revolution, more or less, or about to the red lines in the figure. Both pairs of wings being entirely submerged, by giving them an oscillating motion it will be seen that while they acted or propelled alternately they would propel in one and the same direction until reversed. *D* is a plate, firmly secured to the vessel's side, and *E* is a sleeve-box, attached thereto, in which the shaft *B* oscillates. *F* is a stuffing-box around the shaft, which screws on to the box *E*. *G* is a crank on the shaft *B*, which is not rigidly attached to the shaft but turns on it. *h* is a ratchet-wheel, which is rigidly attached to the shaft outside of the crank. *i* is a spring pawl, which is fast to the crank. *J* is a sleeve-clutch or coupling, which works on feathers on the shaft, and which couples with the crank. This coupling is operated by a shifting lever, marked *k*, which has its fulcrum on the end of the stud *m*. The shifter is forked at the end, and works in the groove in coupling *J* in the usual manner, as is more plainly seen in fig. 4. The connecting-rod or pitman of the engine is attached to the wrist-pin of the crank *n*.

When the propeller is at work the crank is coupled to the shaft by the sleeve *J*. This coupling together takes place when the propelling wings are standing in a vertical position, as seen in fig. 2. To reverse the action of the propeller the sleeve coupling is thrown back from the crank, as seen in the drawing. In this condition the crank vibrates loosely on the shaft until the pawl which is attached to the crank turns the ratchet (and consequently the shaft) a half revolution. When this is done, and the position of the propelling wings is reversed so that they again stand vertical, the sleeve-coupling is thrown into gear with the crank by the action of the spiral spring, seen at *o*. It will thus be seen that the action of the propeller is reversed without reversing, stopping, or in any manner interfering with the engine. The end of the shaft *B* may be supported by a stand and pillow-block within the boat if desired.

It will be seen that by this arrangement a reciprocating engine can be attached directly to the crank without any loss of power from "dead-centres," and that much of the machinery now used in applying power to propelling wheels can be dispensed with.

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

The arrangement of the shaft B, sleeve-box E, plate D, crank G, ratchet-wheel *h*, spring *i*, clutch J, shifting-lever *k*, spring O, and stud *m*, substantially as described and for the purpose specified.

CHARLES E. TOLEY.

Witnesses:

WM. F. McNAMARA,

ALEX. F. ROBERTS.