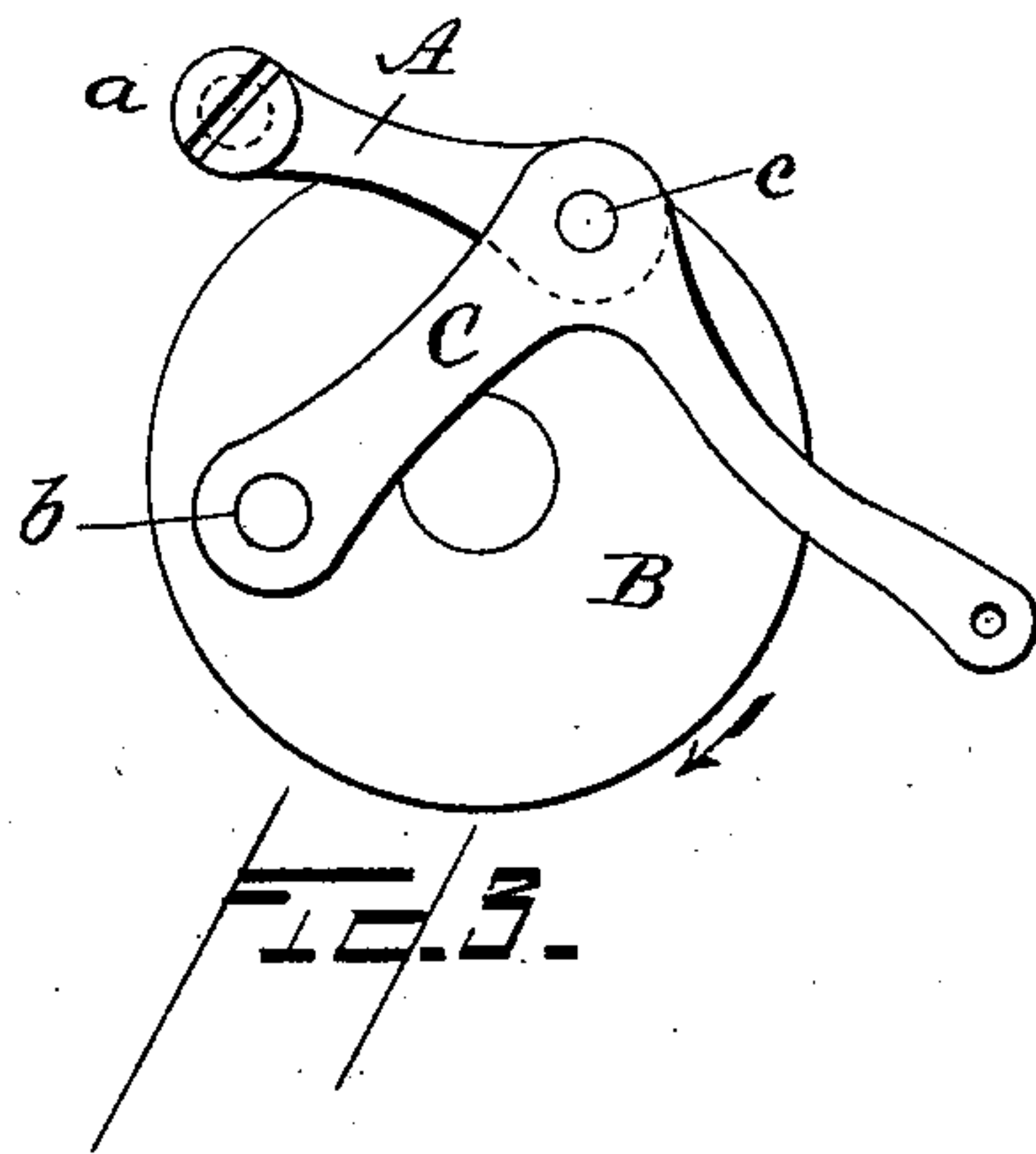
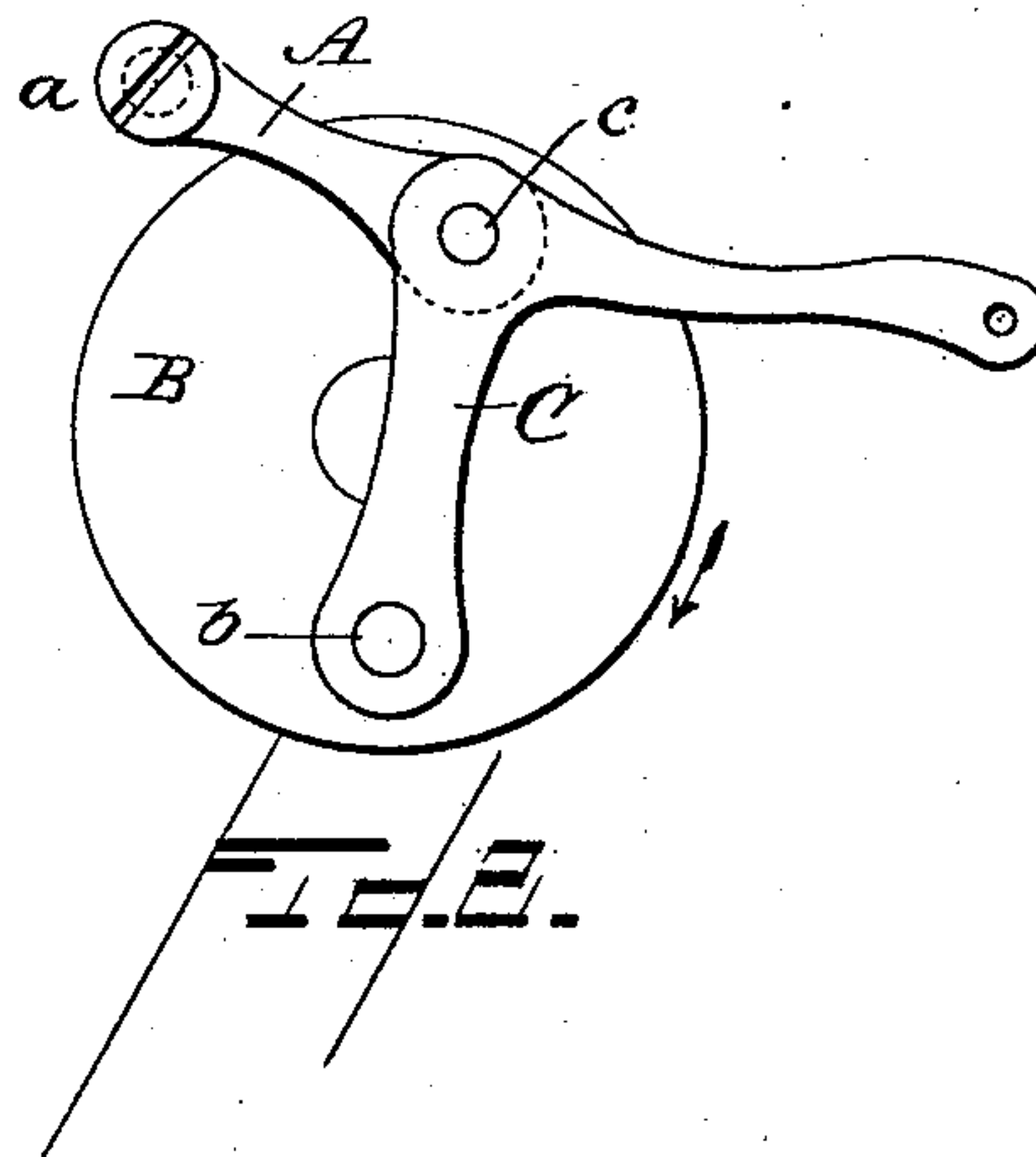
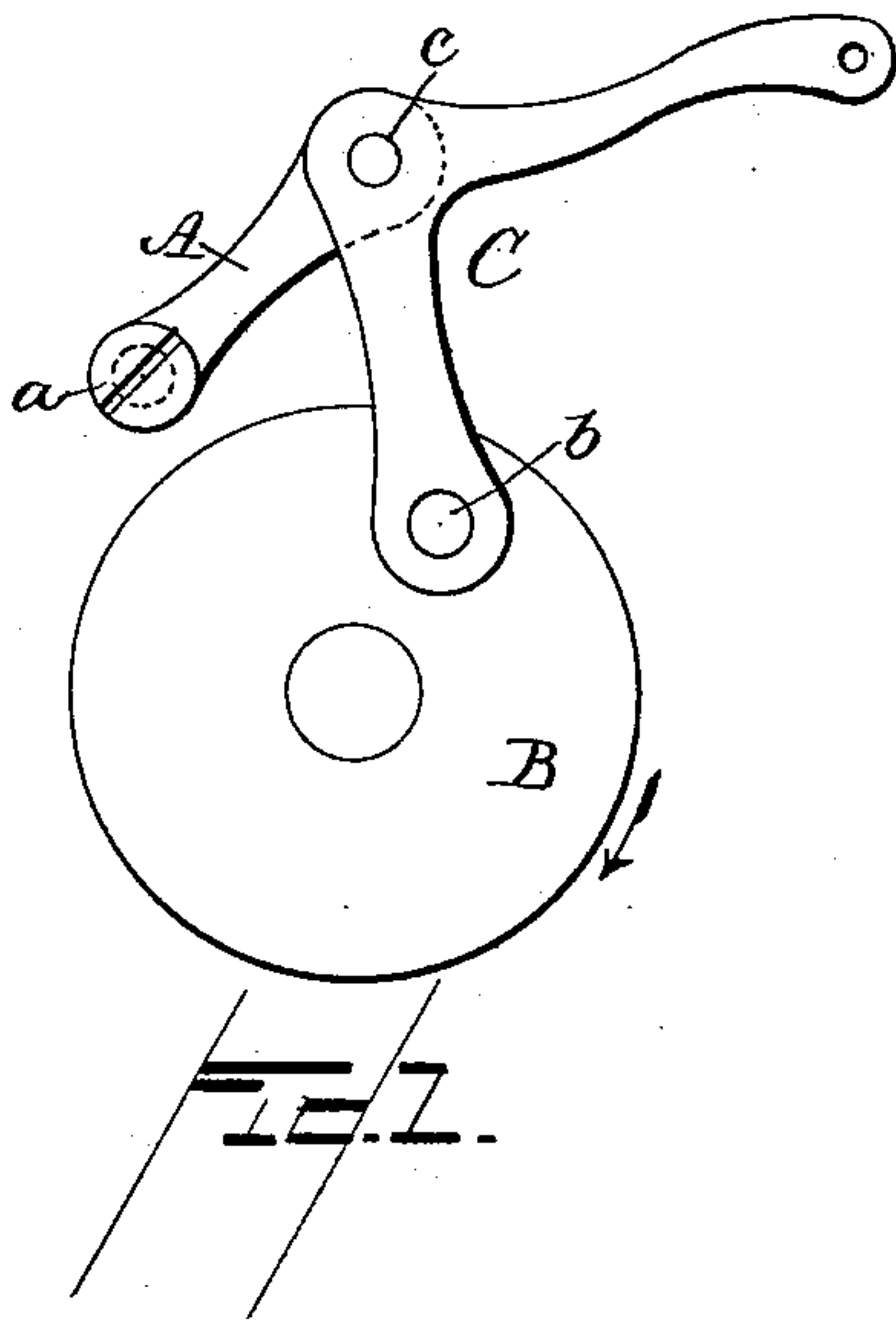


(No Model.)

P. DIEHL.
MECHANICAL MOVEMENT.

No. 465,363.

Patented Dec. 15, 1891.



Witnesses:

A. Cushman.
C. M. Sweeney.

Inventor:

Philip Diehl,
by Henry Laew,
Att'y.

UNITED STATES PATENT OFFICE.

PHILIP DIEHL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER
MANUFACTURING COMPANY OF NEW JERSEY.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 465,363, dated December 15, 1891.

Application filed June 25, 1891. Serial No. 397,482. (No model.)

To all whom it may concern:

Be it known that I, PHILIP DIEHL, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide a novel mechanical movement by which a differential vibratory motion may be imparted to a bell-crank lever, the movement of the said lever to be utilized for any desired purpose.

To this end my improved mechanical movement comprises a link one end of which is connected to a stationary pivot-pin, a rotating crank, and a bell-crank lever pivoted at its central or angular portion to the free end of the said link and having the outer end of one of its arms jointed to the said crank, said stationary pivot-pin being arranged adjacent to the said rotating crank. When mounted and operated in this manner, the said bell-crank lever will have a movement bodily up and down and will also be vibrated on its pivotal connection with the link, so that the operated arm of the said lever will have a comparatively slow downward movement, requiring the time occupied by about two-thirds of the rotation of the crank-pin or slightly more, and will then move quickly upward during the time required for about one-third of the rotation of the crank-pin or slightly less. In other words, the operated arm of the bell-crank lever will move downward comparatively slowly and upward comparatively quickly.

My invention may be utilized in sewing or other machines where the above-described peculiar movements of the bell-crank lever may be desired.

In the accompanying drawings, Figure 1 is an elevation to illustrate the construction of my improved mechanical movement; and Figs. 2 and 3 are views similar to Fig. 1, but showing the parts in different positions.

A denotes a link secured at one end to a stationary screw or pivot-pin *a*.

B is a rotating crank, herein shown as consisting of an ordinary crank-disk provided with a crank-pin *b*.

C is a bell-crank lever, jointed at its middle or angular portion at *c* to the free end of the link A and having its lower arm connected to the crank-pin *b*.

The pivot-pin *a*, it will be observed, is adjacent to the disk carrying the crank-pin *b*.

The operation of the above-described construction is as follows: When the crank-disk is rotated as denoted by the arrows, the outer end of the horizontal arm of the bell-crank lever will be in its highest position when the parts are as represented in Fig. 1. As the crank rotates the bell-crank lever will be caused to descend bodily, while the crank-pin *b* moves from the position shown in Fig. 1 to the position shown in Fig. 2, in which latter figure the said crank-pin is represented as being in its lowermost position. As the said crank-pin moves upward from the position shown in Fig. 2 to that shown in Fig. 3, the bell-crank lever will be vibrated on its pivotal connection with the free end of the link A so that its outer arm will continue to descend, Fig. 3 showing the free end of the said outer arm as being in its lowermost position. Thus the free end of the said outer arm will have been descending comparatively slowly during rather more than two-thirds of the revolution of the crank, and while the said crank is moved from the position shown in Fig. 3 to that shown in Fig. 1 the said lever will be moved upward bodily, and will also be vibrated on its pivotal connection with the link A, thereby causing the free end of its outer arm to move upward quickly or in about one-half of the time or a little less occupied by it in its descent.

From the foregoing it will be apparent that I am enabled to impart a differential vibratory movement to the operated arm of the bell-crank lever from a uniformly-rotating crank-pin. This differential movement may be utilized for any purpose for which it may be adapted in machines of any kind.

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

A mechanical movement consisting of the combination, with a rotating crank, of a link one end of which is connected to a stationary pivot arranged adjacent to said crank, and a
5 bell-crank lever pivoted at its middle or angular portion to the free end of said link and having one of its arms connected to said crank.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP DIEHL.

Witnesses:

J. G. GREENE,
W. W. COVELL.