

W. H. HORNUM.
MECHANICAL-MOVEMENT.

No. 171,132.

Patented Dec. 14, 1875.

Fig. 1.

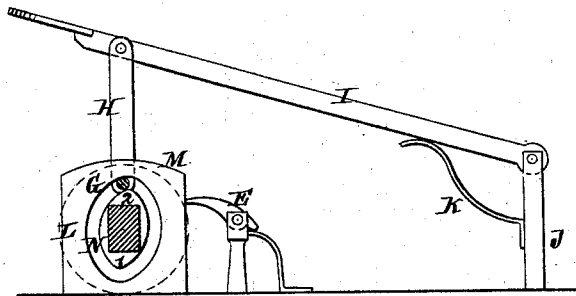


Fig. 2.

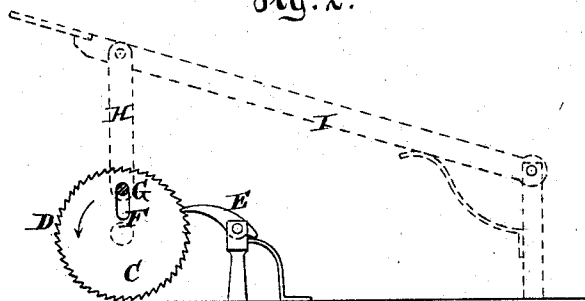
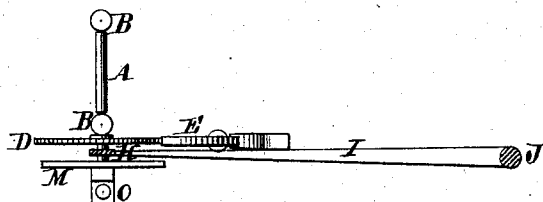


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **171,132**, dated December 14, 1875; application filed November 27, 1875.

To all whom it may concern:

Be it known that I, WILLIAM H. HORNUM, of the city, county, and State of New York, have invented a new and useful Improvement in Mechanical Movements, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation, partly in section, of an apparatus which contains my invention. Fig. 2 is a side elevation thereof, the cam device being removed. Fig. 3 is a plan view, the lever being removed.

Similar letters indicate corresponding parts.

This invention relates to means for converting reciprocating into rotary motion; and it consists in the combination of the shaft to be rotated and the reciprocating device by means of a swinging arm, which is pivoted at one end to the reciprocating bar, and has at its other end a pin, which extends through the bar, so as to project from both its sides, one end of said pin playing in a radial slot made in a disk fixed on the rotating shaft, and the other end of the pin, which projects from the opposite side of the bar, playing in an elliptical groove formed in a plate arranged adjacent to and parallel with the slotted disk. This groove is arranged in such a manner that its longer axis is inclined with respect to the vertical plane which passes through the axis of the rotating shaft, or to the path of the reciprocating device, the inclination being either to the right or to the left, according as the direction of rotation of the shaft is to be in one direction or the other. By inclining the groove in this manner, the pin of the swinging arm, when at its highest point, and in a state of rest, is brought at one side of the axis of the groove, so that, in its descent, it will follow that side and complete its course through the groove in that direction, returning at the end of the reciprocating movement to the same position in the groove. The movement is prevented from being reversed by means of a spring-detent, which engages ratchet-teeth formed on the periphery of the disk, the ratchet-teeth being formed so as to point in a direction opposite to the direction of rotation. The direction of rotation is changed at pleasure by changing the inclination of the axis of the

groove, and this I accomplish in practice by making the heart of the groove, or that part whose periphery forms the inner surface of the groove, of a separate piece from the rest of the plate, and by inclining it in one direction or the other, the groove being made of such a width as to allow of such a change without making the passage too narrow for the pin.

The letter A designates the shaft to be rotated, and B B designate standards in which it has its bearings. Upon one end of the shaft is fixed a disk, C, whose periphery is provided with ratchet-teeth D, pointing in a direction opposite to the direction in which the shaft is to be rotated. A spring-detent, E, is arranged in such a position as to engage the ratchet-teeth and prevent the reverse movement of the shaft, while it does not oppose the motion in the direction of the arrow. The disk C has on it a radial slot, F, into which extends a pin, G, that projects from one side of an arm, H, which is pivoted to a lever, I, whose fulcrum is on the standard J. The slot F is elongated sufficiently to allow the pin to adjust itself therein, and to accommodate itself to the shape of the groove. The lever H is pressed upward by a spring, K, which restores it to the proper position after it has been operated to rotate the shaft one complete revolution, so that it is ready to be again operated.

I do not restrict myself to the reciprocating device here shown for carrying out and using my invention; but the same is given to illustrate how my invention can be used and applied.

The pin G, which extends from the swinging arm H into the slotted disk, extends through the swinging arm and projects from its opposite side into a groove, L, formed in a plate, M, arranged parallel with the disk C.

The groove is, in this example, elliptical, its longer axis extending in an upward direction; but its axis is inclined away from the vertical plane which passes through the shaft, or the plane of reciprocation, so that the apex of the groove (see Fig. 1) is to the right of such plane, whereby the pin G, in its normal position, is brought to the left of the apex or highest point of the groove, and consequently is compelled to descend the groove on that side when the reciprocating device is operated, and

when the pin is pushed down in its reciprocation to its lowest position it passes the lowest projection 1 in the groove, and the ascent of the pin takes place in the right-hand portion of the groove, the completion of the ascent taking the pin past the projection 2.

The plate N, whose periphery forms one side of the groove, is separate from the plate M, and can be adjusted so as to set its longer axis to the right or left of the plane of reciprocation, or of a vertical plane passing through the shaft, without disturbing the plate M, care being taken that enough room is left for the passage of the pin.

The combination of the ratchet-teeth D and spring-detent E with the apparatus enables me to prevent the return of the reciprocating device to its higher position, unless it has first completed its descent, so that the pin has passed the projection 1 in the groove. If the lever I or reciprocating device is pushed down only part way, and the force exerted against it is then removed, the shaft and ratchet-wheel will be turned to a corresponding degree, and will be held stationary in that position by the operation of the detent, the lever being also

held stationary in its partly-depressed position, because the pin G of the reciprocating device is locked in the slot F of the ratchet-wheel. The letter O represents a standard, which supports the plate M and the heart or central part, whose edge forms one side of the groove.

What I claim as new, and desire to secure by Letters Patent, is—

1. The shaft A, slotted disk C, lever I, or similar device, having reciprocating motion, and guide-plate N, combined and operating substantially as above described.

2. The combination of the ratchet-wheel C, mounted on the shaft A, and the spring-pawl E, with the lever I, or similar reciprocating device, substantially as described.

3. The adjustable guide-plate N, within the opening or slot in groove-plate M, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 23d day of November, 1875.

WILLIAM H. HORNUM. [L. s.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.