J. BARNES & W. F. BARNES.

Improvement in Mechanical Movements.

No. 114,514. Patented May 9, 1871.

Fig. 1.

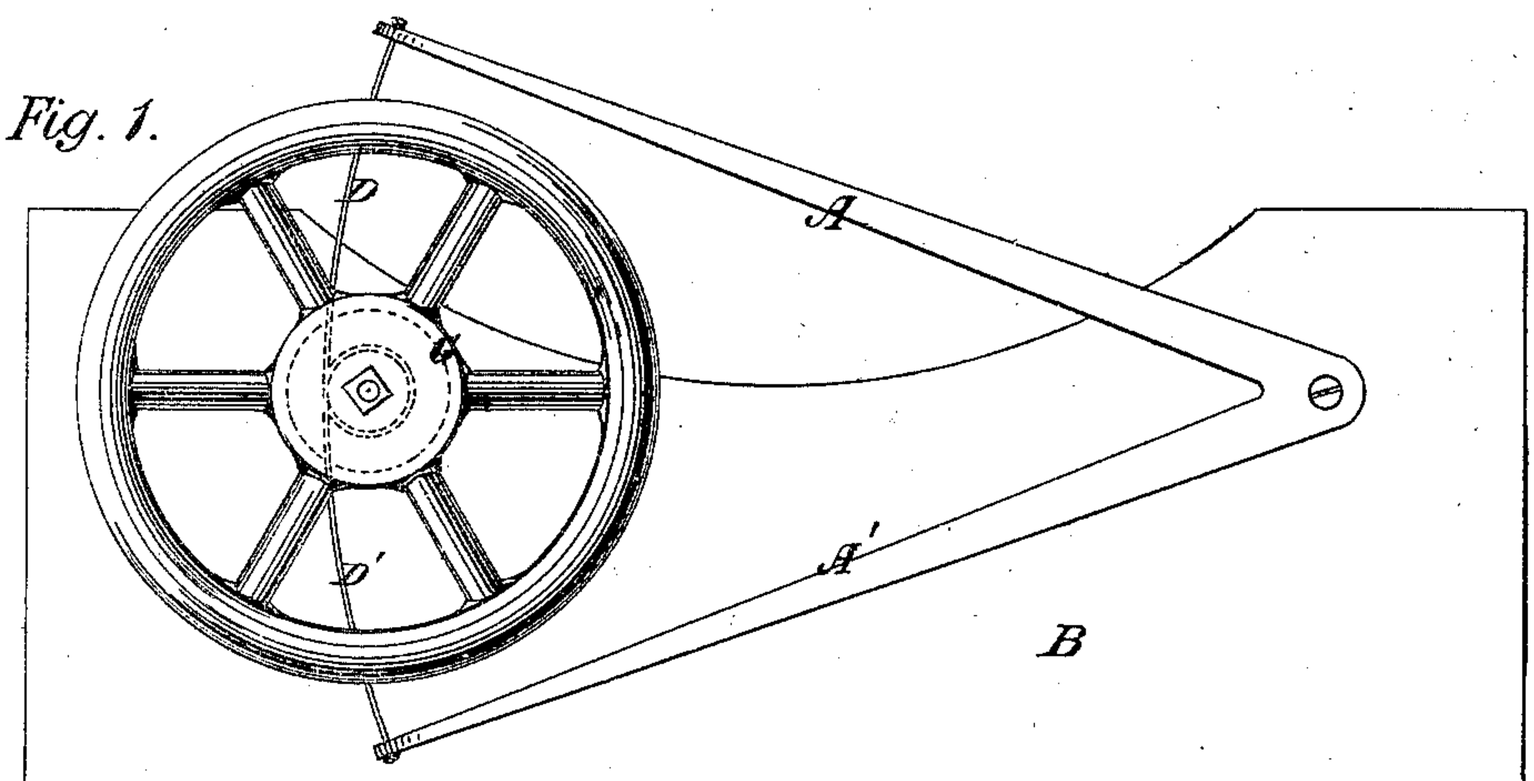


Fig. 2.

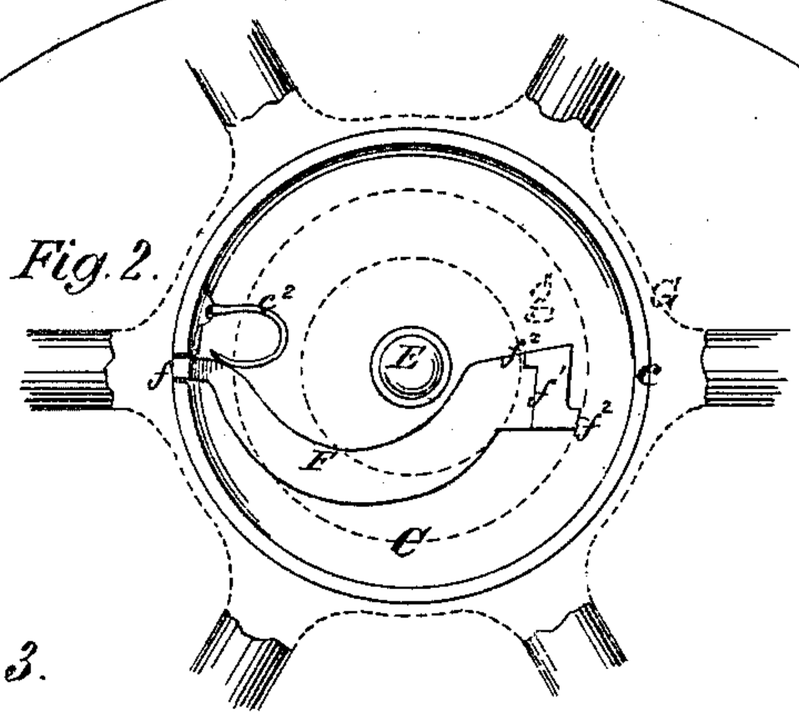


Fig. 3.

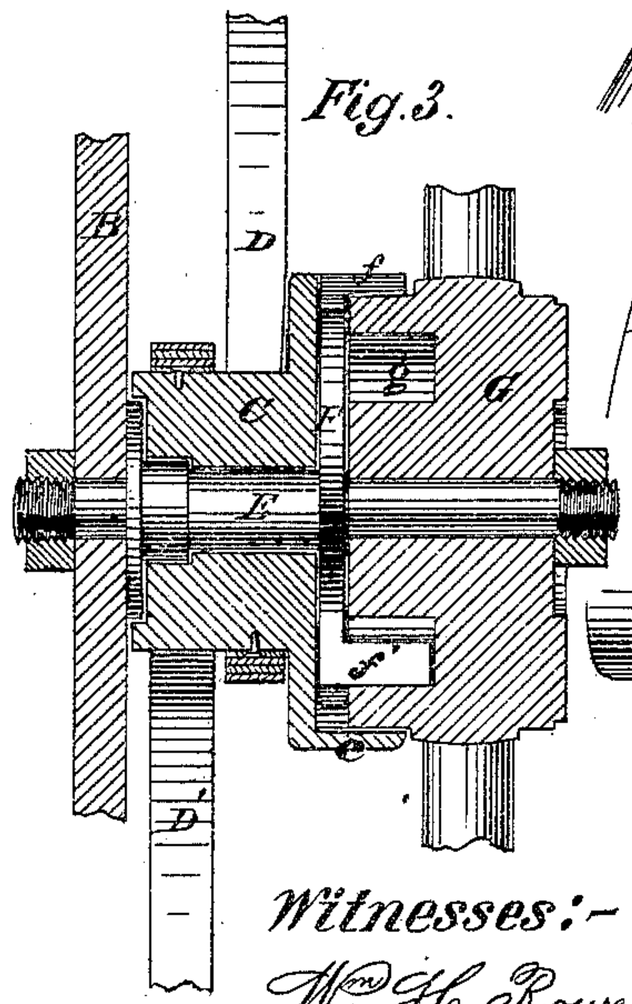


Fig. 4.

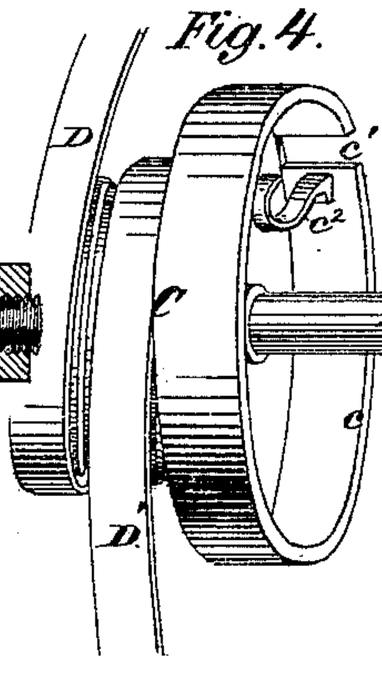


Fig. 5.

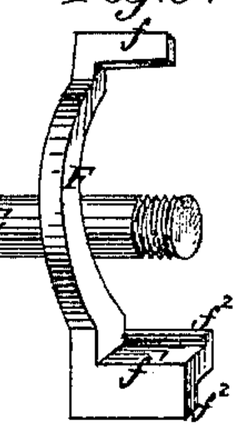
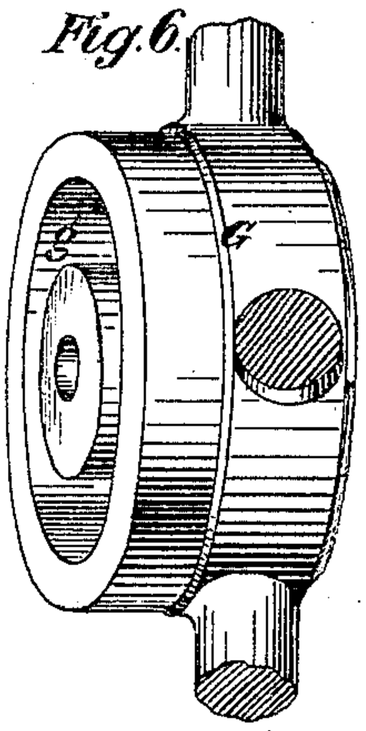


Fig. 6.



Witnesses:-

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Wm. F. Barnes } Attorney

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UNITED STATES PATENT OFFICE.

JOHN BARNES AND WILLIAM F. BARNES, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. 114,514, *dated May* 9, 1871.

To all whom it may concern:

Be it known that we, JOHN BARNES and WILLIAM F. BARNES, both of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification:

Our invention relates to such mechanical movements as are used for converting an oscillating or treadle motion into a rotary motion, and is more especially designed for driving scroll-saws, hand-lathes, and such light machinery requiring little power but a quick movement.

The object of the first part of our invention is to provide a simple and direct connection between the treadle and balance-wheel; and our improvement consists in combining a vibrating bifurcated treadle with driving-belts passing in opposite directions around the pulley, and a pulley actuated by the belts in alternately opposite directions, moving freely upon its shaft, and carrying with it a locking-lever, which operates upon the grooved hub of a balance-wheel, as hereinafter described.

The object of the second part of our invention is to secure a more perfect connection between the pulley and the grooved hub of the balance-wheel, so that the wheel may be impelled at a higher speed than that of the driving-pulley without being retarded by the action of the locking mechanism; and the invention consists in a driving-pulley rotating alternately in opposite directions, and a locking-lever having one of its ends attached to and actuated by the driving-pulley, and provided with an arm that projects into a groove and locks in a peculiar manner with the hub of a balance-wheel, as hereinafter more fully described.

Our invention further consists in combining a driving-pulley rotating alternately in opposite directions, an axle, a grooved wheel, and a locking-lever, extending partly across the face of the wheel, so that its ends are nearly diametrically opposite each other, and bent to avoid the axle, in such manner that the axle forms a stop to limit the movement of the lever, as hereinafter more fully described.

In the accompanying drawing, Figure 1 is a side elevation of our improved mechanism; Fig. 2, a detached view of the face of the driving-pulley and the locking-lever, with the grooved hub of the balance-wheel shown in dotted lines; Fig. 3, a central longitudinal vertical section of our device; Fig. 4, a view, in perspective, of the driving-pulley and belts; Fig. 5, a similar view of the locking-lever; and Fig. 6, a view, in perspective, of the hub of the balance-wheel—all the other figures being upon a larger scale than that of Fig. 1.

A bifurcated treadle, A A′, is pivoted to a bracket or upright, B, which may usually be the frame of the machine. The diverging ends of the levers A A′, which form the treadle, are connected with a driving-pulley, C, by belts D D′, which pass around the pulley in opposite directions, so that the pulley is alternately moved in opposite directions by the vibrations of the treadle. The driving-pulley C is journaled and turns freely upon a stud-axle, E, which is secured upon the upright or frame of the machine. A flange, *c*, is formed upon the driving-pulley, and encircles a part of the hub of the balance-wheel. A notch, c^1, is formed in this flange to receive an arm, *f*, on the locking-lever, which arm extends partly across the periphery of the hub of the balance-wheel, and a spring, c^2, is secured to the collar, and presses against the locking-lever to keep it in proper position. The locking-lever F extends across the face of the driving-pulley, and is bent to avoid the axle, so that its ends may always be nearly diametrically opposite each other. The axle thus serves as a stop to limit the movement of the lever, and prevent its being carried too far around by the balance-wheel; and by this means we are enabled to form the groove in the wheel of less diameter, and thus lessen the distance to be traveled by the locking-lever. The end of the lever opposite the arm *f* is provided with another arm, f^1, which projects into an annular groove, *g*, that is formed in the face of the hub of the balance-wheel G. The arm f^1 on the locking-lever is formed in a peculiar manner, of a rectangular shape, and having projecting edges $f^2 f^2$ at two of its obliquely opposite angles, so that the shortest distance between these angles is greater than the distance between the other two angles of the arm. When the long axis of the arm is

placed crosswise in the slot *g* by the action of the lever, the projecting edges are jammed against the walls of the slot, and the balance-wheel is revolved in the same direction as the driving-pulley. When the driving-pulley is moved in the opposite direction the short axis is thrown crosswise in the slot, and as the distance between these angles is not sufficient to jam them against the opposite walls of the slot by the limited action of the lever, the balance-wheel is released from the driving-pulley and free to continue its revolution until its momentum is overcome. The balance-wheel, when started by the driving-pulley and locking-lever, has a tendency to move with an increasing velocity relatively to the driving-pulley, because of its greater diameter and weight, and its continuous rotation, and, but for the peculiar form of the locking-lever, would be retarded in its action.

When the lever is constructed as above described, it is evident that when the balance-wheel moves at a greater velocity than the pulley the pulley causes the short axis of the arm f^1 to cross the slot in the hub of the wheel, and releases it from the driving-pulley. We are thus enabled to secure a very high degree of velocity of the balance-wheel without much effort upon the treadle, or a continuous and corresponding degree of velocity of the driving-pulley; and by the arrangements and combinations above described we are enabled to secure a device that is positive in its action, that is either instantly griped or released by the locking mechanism, and that is not liable to be accidentally locked and wedged by unusual strains.

A further description of the operation is unnecessary.

A suitable spring or retracting mechanism may be employed for raising the treadle when it is depressed by the operator, and a friction-brake may be applied to the balance-wheel to retard or stop its motion when desired; but these form no part of our invention, and need not be shown or further described.

We claim as our invention—

1. The combination of the vibrating bifurcated treadle, the driving-belts passing in opposite directions around the driving-pulley, the pulley actuated by the belts and carrying the locking-lever with its projecting arms, that act upon the hub of the pulley, as described, and the balance-wheel with its concentric groove in the face of the hub, all these parts being constructed for joint operation, substantially as and for the purpose described.

2. The combination of the driving-pulley, rotating alternately in opposite directions, the locking-lever extending across the face of the pulley, and having an arm with projecting edges formed upon two of its angles, and the balance-wheel, with a concentric groove formed in the face of its hub, all these parts being constructed substantially as and for the purpose specified.

3. The combination of the axle, the reversible driving-pulley, the grooved wheel, and the locking-lever extending across the face of the wheel, all these parts being constructed and operating as described, so that the axle forms a stop to limit the play of the lever, as set forth.

In testimony whereof we have hereunto subscribed our names.

JOHN BARNES.
W. F. BARNES.

Witnesses:
J. G. MANLOVE,
EZRA CARPENTER.