J. B. ROOT.

Mechanical Movement.

No. 205,213. Patented June 25, 1878.

Fig. 1.

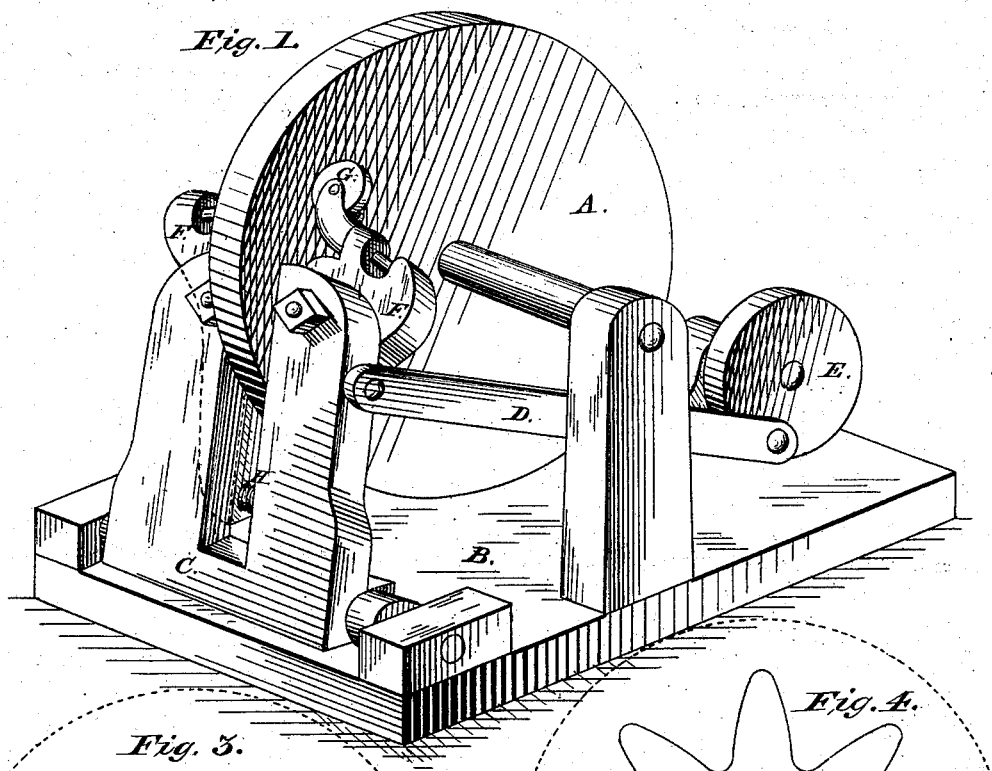


Fig. 3.

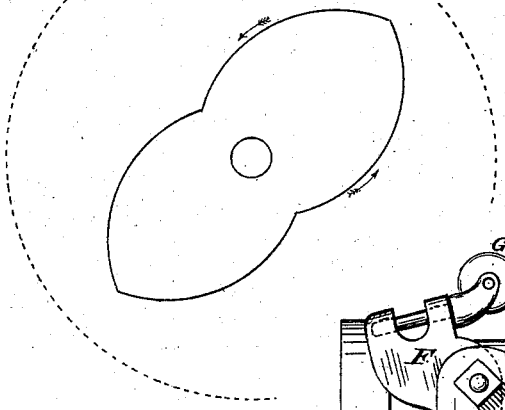
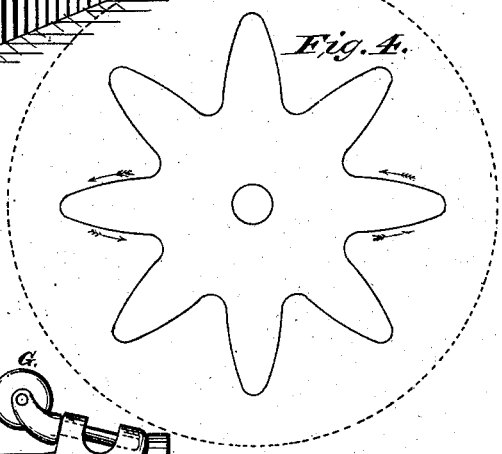


Fig. 4.



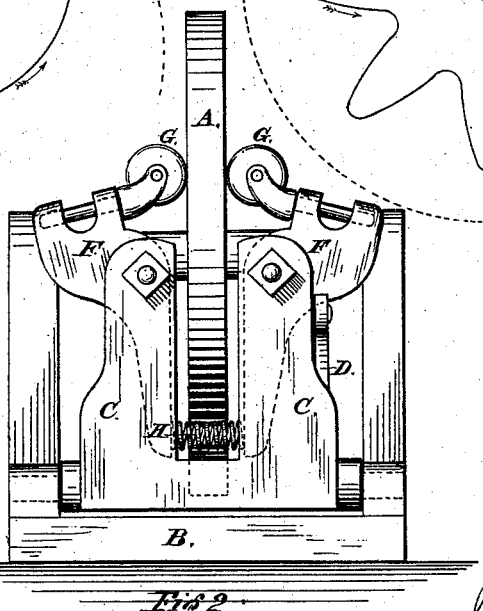


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN B. ROOT, OF NEW YORK, N. Y.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **205,213**, dated June 25, 1878; application filed January 17, 1878.

To all whom it may concern:

Be it known that I, JOHN B. ROOT, of the city, county, and State of New York, have invented a new and useful Mechanical Movement, of which the following is a specification:

The main element in the mechanical movement which forms the subject of this invention is a caster-wheel so mounted in a vibrating frame that causes it to travel back and forth over the surface upon which it rests that its spindle shall stand at an inclination to such surface. Springs or weights constitute an auxiliary element, serving to maintain frictional contact between the caster and the surface which it traverses.

The accompanying drawings represent a pair of such wheels, supported upon vibrating arms which are mounted upon a stationary frame, while the surface upon which the wheels act is made movable.

Figure 1 is a perspective view of the mechanism. Fig. 2 is an elevation of the vibrating arms and the connected parts; and Figs. 3 and 4 are diagrams of the paths which one of these wheels will describe, under varying conditions, upon the disk which is put in revolution by their vibratory motion.

A is a disk whose axle rests on standards rising from the stationary frame or bed-plate B. Attached to this bed-plate is the swinging frame C, journaled in suitable bearings, so as to vibrate freely under the action of the connecting-rod D, one end of which is attached to the wrist-pin on the pulley E. Pivoted to the swinging frame C are the two arms F F, each of which carries at its upper end a caster-wheel, G, the spindle or axis about which this wheel swivels being inserted in the arm F, so as to stand at an inclination to the plane of the disk A. The lower ends of the arms F F are pressed apart by means of the spring H, and thus the casters are made to embrace the opposite sides of the disk A.

The operation is as follows: The revolution of the pulley E communicates a reciprocating motion to the caster-wheels, causing them to move back and forth over the two faces of the disk, and, as their spindles or axes are inclined to the plane of the disk, the paths of the wheels will be diagonal to the radii of the disk, and thus the disk will be caused to revolve on its axle. The angle at which the caster-wheel will cross the radii of the disk will depend upon the load put upon the disk, or, in other words, upon the resistance to be overcome, the angle diminishing as the load increases, and vice versa. This is illustrated in Figs. 3 and 4, Fig. 3 representing approximately the path which the caster-wheel will describe on the surface of the disk when the resistance is slight, and Fig. 4 the path when the resistance is great. It is obvious that what is thus lost in speed is gained in leverage. Whenever, under an increased resistance, the caster-wheels are swung around, so as to diminish the angle at which they cross the radii of the disk, the upper ends of the supporting-arms F F will be pushed outward, and the lower ends inward, which will compress the spring H. The tension of this spring exerts a constant tendency to restore the arms F F and the caster-wheels to their normal positions.

Instead of the spring H, a weight may be attached to the arm F, in such mode as to control it in substantially the same way; and instead of the two wheels operating on opposite faces of the disk A, it is plain that a single wheel may be used operating on one face only; or two or more wheels may be arranged to operate against the same face.

Moreover, instead of having the vibrating arms that carry the caster-wheels mounted upon a stationary frame, and the wheels acting upon a movable surface, the surface acted on may be stationary, while the frame supporting the arms that carry the casters is mounted upon wheels or any equivalent device that will permit it to move. In such case the reciprocation of the caster-wheels will impart a progressive motion to the frame or carriage to which they are attached, and cause it to travel over the surface on which the casters act.

The pulley E may be driven in any desired or convenient way; and instead of the pulley E and connecting-rod D any other appliances that will give proper vibration to the arms that carry the casters may be used, at the pleasure of the constructor.

Instead of caster-wheels, blades of metal or other material may, under some circumstances,

be used as propelling devices, acting by frictional contact upon the underlying surface; but these also, like the wheels, must be mounted in vibrating arms by means of inclined axes or spindles.

What is claimed as new is—

1. The combination of one or more vibrating arms or frames and a corresponding number of caster-wheels, or equivalent devices, mounted in such arms by means of spindles or axes inclined to the surface on which the wheels are designed to act, substantially as described.

2. In combination with one or more vibrating arms and caster-wheels, or equivalent devices, mounted thereon, as set forth, springs or weights arranged to hold the casters in contact with the surface on which they are designed to act.

3. In combination with a movable surface and one or more vibrating arms attached to a stationary frame, a caster wheel or wheels, or equivalent devices, mounted in such vibrating arms by means of axes or spindles inclined to the movable surface upon which the wheels rest, substantially as and for the purpose described.

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Witnesses:

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