

H. WHEELER.

Devices for Converting Motion.

No. 145,540.

Patented Dec. 16, 1873.

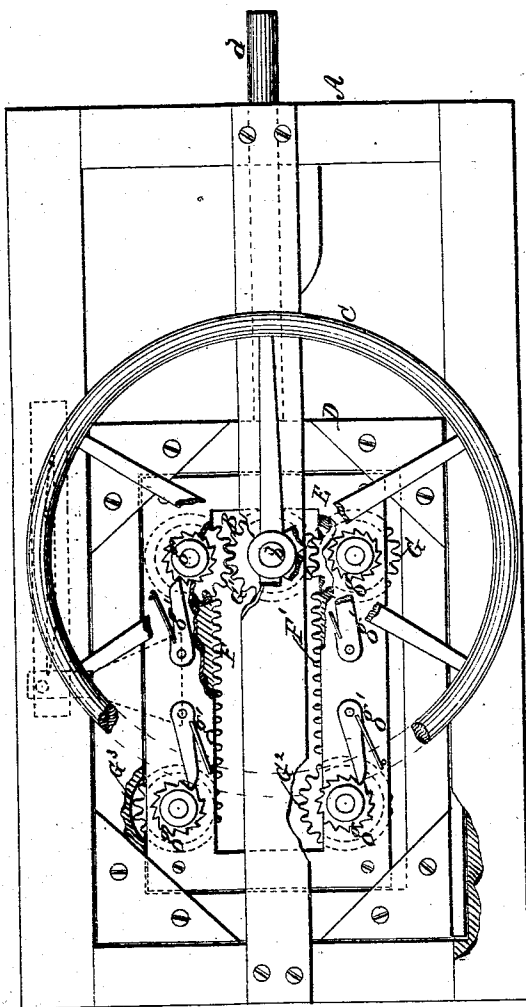


Fig. 1.

Witnesses.

Harry King.

B. H. Morse

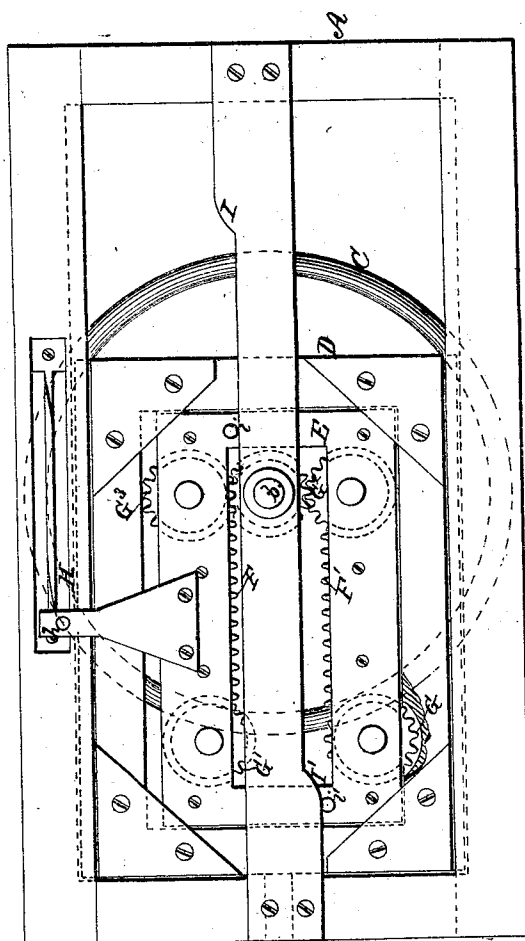


Fig. 2.

Inventor.

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by his Atty
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UNITED STATES PATENT OFFICE.

HOMER WHEELER, OF RACINE, WISCONSIN.

IMPROVEMENT IN DEVICES FOR CONVERTING MOTION.

Specification forming part of Letters Patent No. 145,540, dated December 16, 1873; application filed November 20, 1873.

To all whom it may concern:

Be it known that I, HOMER WHEELER, of the city and county of Racine, in the State of Wisconsin, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification:

The object of my invention is to convert reciprocating into continuous rotary motion, at the same time avoiding the use of cranks and their consequent dead-centers, so that the full driving-power is always effectively exerted. The subject-matter claimed is hereinafter specified.

In the accompanying drawings, Figure 1 represents a view in elevation of one side of my improved mechanism, and Fig. 2 a similar view of the opposite side thereof.

A suitable main frame, A, is fixed securely in the position desired. A main shaft, *b*, carrying a gear-wheel, B, and a balance-wheel, C, is mounted in suitable bearings in this frame near its center. A supplementary frame, D, of a length less than the main frame, is mounted therein, so as to traverse freely longitudinally on ways or friction-rollers, being driven from any suitable prime mover by a piston-rod, *d*, or in other well-known and equivalent ways. A gear-frame, E, is arranged within this supplemental frame, so as to be capable of moving freely therein in a plane transverse or perpendicular to its line of reciprocation. Racks F F' are mounted in this frame parallel to each other and to its line of longitudinal reciprocation, on opposite sides of the main gear-wheel B, and at a distance apart somewhat greater than the diameter of said wheel. At each end of each of these racks idle-wheels G G¹ G² G³ are mounted, each on an independent shaft provided with suitable backing-ratchets *g* and spring-pawls *g'*, or equivalent devices, to prevent them from turning the wrong way. The idle-wheels G¹ G², which are on opposite sides of the main gear-wheel B, and at opposite ends of the frame, are so arranged as to project much more beyond the planes of the rack-teeth than the opposite wheels, G G³, which are merely bearing-wheels. The effect of this arrangement is to cause the main gear-wheel B alternately to engage itself with either rack, as hereinafter explained.

For heavy engines, the gear-frame might be counterpoised, so as to make it move more easily, but for light machinery this is unnecessary. The thrust of the gearing is counteracted by a stud, *h*, on the gear-frame, bearing on a guide-rail, H, in the fixed frame, which guide-rail may have a spring-latch at each end, opening one way only, to prevent any possibility of backward movement. Stud *i* and inclines I I' may also be employed, if desired, at each end of the frame, although not essential to the successful working of the device.

The operation is as follows: Suppose the parts to be in the position shown in Fig. 1, and the sliding frame moving in the direction shown by the arrow 1. The main gear-wheel is now in gear with the upper rack, F, and the balance-wheel C, preferably made heavy, is rotated in the direction indicated by the arrow 2. By the time the piston *d* has reached the end of its stroke, idle-wheels G G³ have engaged with the main gear-wheel B, and as the upper idle-wheel, G¹, projects beyond the plane of the rack, the gear-frame is lifted, thus throwing one rack into and the other out of gear; and this movement takes place at every stroke of the piston.

I do not broadly claim every combination of rotary gears with traversing laterally-shifting racks, as this is old.

I claim as my invention—

1. The combination, substantially as described, of a fixed frame, in which the main gear-wheel is mounted, a frame reciprocating longitudinally in said frame, and a frame carrying the driving-gearing and racks, and reciprocating laterally in the longitudinally-moving frame, for the purposes specified.

2. The combination, substantially as set forth, of a gear-wheel, revolving in a fixed position, duplex racks reciprocated both longitudinally and laterally, relatively to said gear-wheel, and duplex idle-wheels at each end of said racks, for the purposes specified.

3. The combination, substantially as set forth, of a fixed gear-wheel, duplex, longitudinally, and laterally reciprocating racks, an idle-wheel at each end of said racks, and backing ratchets to prevent movement of said idle-wheels in the reverse direction.

4. The combination, with the racks, of the idle-wheels, arranged above the plane of the racks, on opposite sides and at opposite ends of the reciprocating frame, whereby the racks are automatically and alternately thrown into and out of gear at the end of each stroke, as specified.

In testimony whereof I have hereunto subscribed my name.

HOMER WHEELER.

Witnesses:

E. C. DAVIDSON,
B. H. MORSE.