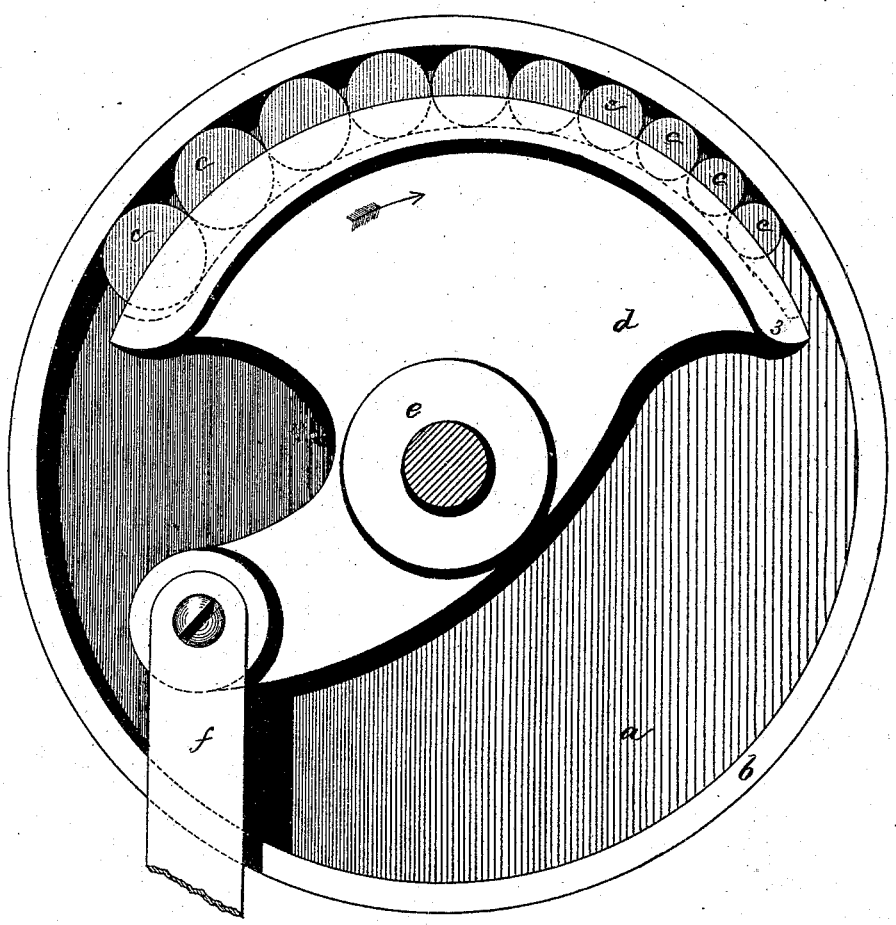
W. O. WAKEFIELD.

MECHANICAL-MOVEMENTS.

No. 184,273. Patented Nov. 14, 1876.



Witnesses.
Lesh. L. Latimer.
W. J. Pratt.

Inventor.
William O. Wakefield,
per Crosby & Gregory, Att'ys.

UNITED STATES PATENT OFFICE.

WILLIAM O. WAKEFIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **184,273**, dated November 14, 1876; application filed October 18, 1876.

To all whom it may concern:

Be it known that I, WILLIAM O. WAKEFIELD, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Mechanical Movement, of which the following is a specification:

This invention relates to a mechanical movement for converting reciprocating into rotary motion.

The invention consists in the combination, with a pulley to be driven and a vibrating eccentric carrier, of a series of contiguous friction-rollers, of graduated sizes, to operate substantially as hereinafter described.

The drawing represents, in side elevation, a mechanical movement embodying my invention.

The pulley *a* has a rim, *b*, adapted to be engaged by the rollers *c*, mounted in a groove in an eccentric carrier, *d*, loosely mounted upon the shaft *e*, to which the pulley is fixed. This carrier is connected, by lever *f*, with any suitable device to give to it a reciprocating movement, so as to vibrate the carrier.

The lever may be connected with a sewing-machine treadle, or with the piston-rod of an engine, or other motor.

The surface of the carrier, on which the rolls rest, is eccentric with reference to the inner concaved portion of the rim *b*, and the rollers *c* are of gradually-decreasing size, commencing with the roller at the left, as seen in the drawing.

When the carrier is moved in the direction of the arrow, the rollers do not engage and carry the pulley with them and the carrier; but when the carrier is moved in the direction opposite the arrow, then the rollers are wedged firmly into a smaller space between the carrier and pulley-rim, and the carrier and pulley then move together.

Two pulleys and carriers will be preferably used upon each shaft to be driven positively and steadily, (or one pulley with two rims, one at each side,) one carrier being adapted to move one pulley-rim positively forward when the other carrier is moving backward to re-engage its pulley-rim.

I am aware that it is common to use a single roller in an inclined cavity of a hub, and that I do not claim; but, by reason of the series of rollers arranged contiguous to each other, as shown, it is apparent that the rollers are made self-acting as to compensating for wear, for as the rollers are worn they gradually descend toward the end 3 of the carrier, and when the smallest roller is worn too small for effective use it drops out, the next roller of the series taking its place.

In practice, the carriers are made of hard metal, and the rollers of a softer metal, and the rollers, therefore, take nearly all the wear, and do not cut into the carrier, which is a matter of great importance; for if the carrier becomes worn, the rolls are not properly held, and cannot properly engage and move the pulley and rotate its shaft.

When the carrier and rolls are of substantially an equal degree of hardness, the roller wears into the carrier, forming seats or shoulders that prevent the rollers from moving freely in the space between the carrier and rim when the carrier is moved, as they must do to firmly and properly engage the rim and rotate the pulley without slip. By making the rolls considerably softer than the carrier, they are worn more rapidly than the carrier, and as they decrease in size they move forward in the opening between the carrier and pulley-rim sufficiently to be engaged by both the carrier and rim, notwithstanding the wearing of the carrier.

In this invention, wherein I use soft rolls, the rolls wear the carrier in a different way, because as the carrier wears a little, the rollers are worn more, and they gradually take up advanced positions upon the carrier, each roll, as it is reduced in size, gradually moving farther forward upon the carrier and wearing away what would otherwise be a ridge between adjacent rollers, and the carrier-surface worn by the rolls that move gradually forward upon its surface as the rolls are worn, is worn even and uniform. The relative degrees of hardness of the rollers and carrier is a matter of great importance. If the rollers are as hard, or nearly as hard, or harder, than the carrier, so that they wear the carrier, and do not move forward, as described, to wear away the ridges between the adjacent rollers, then the device would fail to be of value as a movement for steady or positive motions, so the

rolls softer than the carrier become an important feature of my invention.

I claim—

1. The combination, with the pulley, of the carrier and series of contiguous rollers of graduated sizes, substantially as described.

2. The combination, with an eccentric carrier, of a series of contiguous rollers adapted, as they are worn more rapidly than the carrier, to move forward upon the carrier, to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM O. WAKEFIELD.

Witnesses:

GEO. W. GREGORY,

W. J. PRATT.