A. F. EELLS.

MACHINES FOR CONVERTING MOTION.

No. 184,598. Patented Nov. 21, 1876.

Fig 2

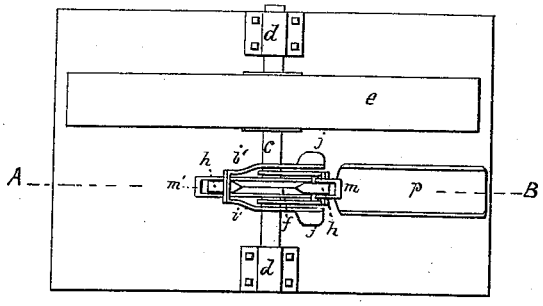


Fig 4

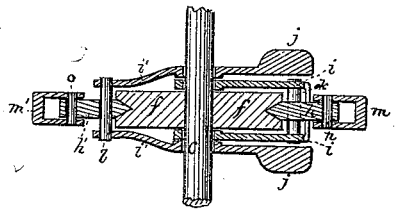


Fig 1.

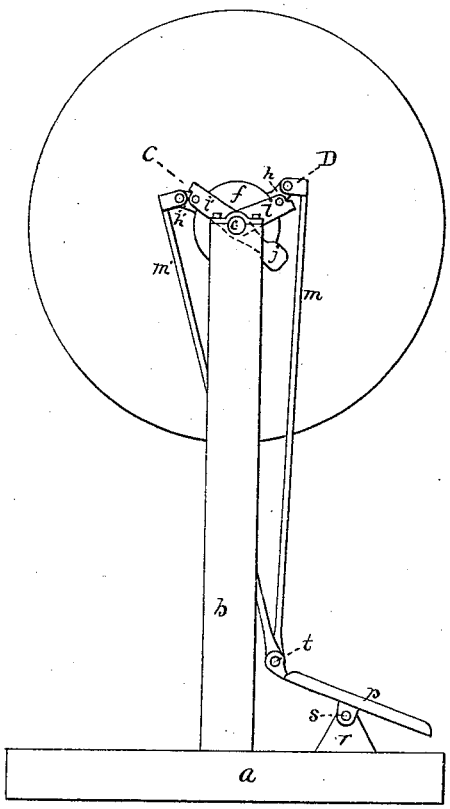
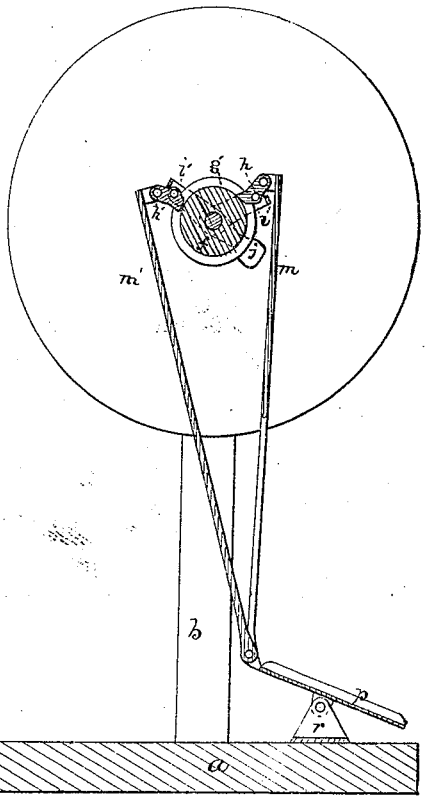


Fig 3.



WITNESSES
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UNITED STATES PATENT OFFICE.

ALBERT F. EELLS, OF CAMDEN, MAINE, ASSIGNOR TO WILLIAM H. DOLE AND FRANK B. DOLE, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR CONVERTING MOTION.

Specification forming part of Letters Patent No. **184,598**, dated November 21, 1876; application filed May 17, 1875.

To all whom it may concern:

Be it known that I, ALBERT F. EELLS, of Camden, in the county of Knox and State of Maine, have invented a new and useful or Improved Machine for Converting Reciprocating into Curvilinear Motion, of which the following is a specification:

This invention relates to that class of devices which are usually operated by a foot-treadle, and are employed to drive sewing-machines and other light work; and the invention consists in a smooth-faced wheel mounted upon a shaft, and having a circumferential V-shaped groove in the face thereof, in which groove, on opposite sides, two V-pointed pawls, both acting in the same direction, alternately engage. These pawls being, respectively, pivoted (as their fulcra) in two pairs of arms, which vibrate upon the wheel-shaft as a common center, and the pawls being actuated by a pair of reciprocating rods, which are, respectively, pivoted to the outer or long arm of the pawls, and to a pivot in common in the foot-treadle, by which the device is actuated, and by reason of the relative positions of the pawls, the vibrating arms, and the grooved wheel, the contact of the pawls with the wheel is assured without the use of springs or other extraneous aid.

In the drawings, Figure 1 is a side elevation, showing the vibrating arms raised. Fig. 2 is a top or plan view. Fig. 3 is a vertical section on line A B, Fig. 2; and Fig. 4 is an enlarged horizontal section, taken on line C D, Fig. 1, and showing the vibrating arms in a horizontal position.

In the drawings, *a* represents the bed and *b b* the standards. *c* is the shaft, secured in boxes *d d*, resting upon the standards. *e* is a pulley, by which (or its equivalent) the rotation of the shaft may be transmitted to any desired point. *f* is the wheel, in the face of which is the groove *g*, in which the pawls *h* and *h'* engage, as shown in Figs. 2 and 4. Pawl *h* is pivoted in arms *i i* by pivot *k*, as shown in Fig. 4. Pawl *h'* is pivoted in arms *i' i'* by pivot *l*, as shown in same figure. Both arms *i* and *i'* fit loosely upon shaft *e*, upon which they vibrate. *m* is a connecting-rod, pivoted in pawl *h* at *n*; and *m'* is a similar rod, pivoted to pawl *h'* at *o*. *p* is the treadle, pivoted in bracket *r* at *s*, and to this treadle-rods *m* and *m'* are pivoted at *t*. Thus the vibrating movement of treadle *p* will produce a simultaneous reciprocating movement of rods *m* and *m'*, and pawl *h* being operative in the ascent, and pawl *h'* in the descent, a continuous uniform rotary motion will be imparted to wheel *f*, and thence through shaft *c* and pulley *e* to any attached machine.

The distance from the pivot uniting the pawls with the vibrating arms to the V end of the pawl being greater than the distance from such pivot to the bottom of the groove, measuring in a direct line from such pivot to the center of shaft *c*, therefore the ends of the pawls are not in line with such pivot and axis; but a line passing through the pivot and end of the pawl would pass between the axis and periphery of the wheel, so that the rising movement of rod *m* and the falling movement of rod *m'*, acting upon the leverage of their respective pawls, serve to force the wedge of the pawls into the groove, and thereby carry the wheel along with the pawl. The counter-weights *j j* upon arms *i'* serve to prevent the too sudden return movement of the arms when the pawl is raised and in position to act.

I do not claim, broadly, either two pawls operating alternately and by a single treadle, nor two pawls operating alternately upon opposite sides of the same wheel; nor do I claim, broadly, a single pawl operating upon the periphery of a wheel; but

What I do claim is—

1. In combination with the grooved wheel *f*, the angular pawl *h*, vibrating arms *i i*, and reciprocating connecting-rod *m*, when the arms are pivoted upon the axis of the wheel, and the angular pawl is pivoted to the arms and the connecting-rod, relatively to each other and the wheel, as described, whereby the angular pawl is free to move in one direction disconnected from the wheel, but, by virtue of its leverage and relative position, rigidly engages the wheel when moved in the other direction, as described and shown.

2. In combination with the grooved wheel *f*, the two pairs of arms *i i* and *i' i'*, pivoted

upon the axis of the wheel, the angular pawls *h* and *h'*, and simultaneously-acting connecting-rods *m* and *m'*, when the angular pawls are pivoted to the arms and the connecting-rods, relatively to each other and the wheel, as described, whereby the angular pawls are free alternately to move in one direction disconnected from the wheel, but, by virtue of their leverage and relative position, rigidly engage the wheel when moving in the opposite direction, so as to produce a continuous rotary motion of the wheel, as described.

ALBERT F. EELLS.

Witnesses:

HENRY K. PORTER,

EUGENE HUMPHREY.