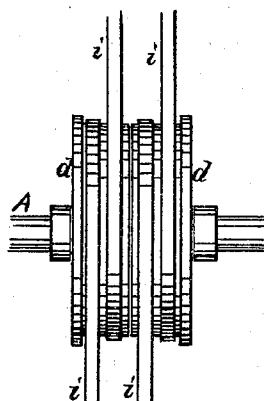
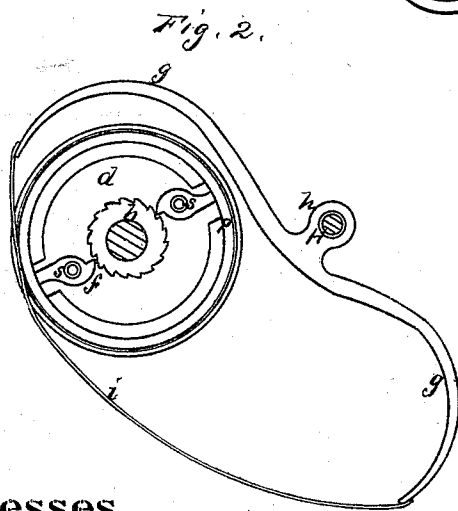
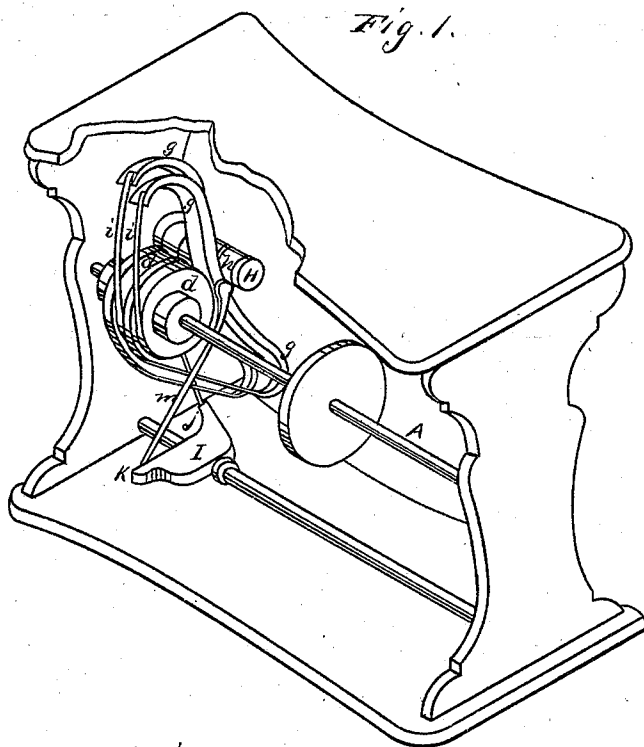


E. DUFFY & R. SWARBRICK.
Treadles.

No. 150,840.

Patented May 12, 1874.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD DUFFY AND ROBERT SWARBRICK, OF OAKLAND, CALIFORNIA.

IMPROVEMENT IN TREADLES.

Specification forming part of Letters Patent No. **150,840**, dated May 12, 1874; application filed February 4, 1874.

To all whom it may concern:

Be it known that we, EDWARD DUFFY and ROBERT SWARBRICK, of Oakland, Alameda county, State of California, have invented an Improved Mechanical Movement; and we do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use our said invention or improvement without further invention or experiment.

Our invention relates to an improvement in the mechanical movement which is known as a substitute for crank-motion, in which a continuous rotary motion in one direction is obtained from a reciprocating rectilinear or pedal motion; and it consists in the combination and arrangement of the several devices, as hereinafter described.

In the present instance we have represented our invention as adapted for driving a sewing-machine; but it will be readily seen that it can be applied in all places where a crank is ordinarily used to produce a rotary motion of a shaft.

In the drawings, Figure 1 is a perspective view of our machine. Fig. 2 is a section, showing one of the ratchets. Fig. 3 is an edge view of the ratchet-cases, showing the operating-bands.

A is a shaft to which it is desired to communicate a rotary motion. Upon this shaft we fix two ratchet-wheels, *b*. We prefer to place these wheels close together, but their position is not material. Outside of each ratchet-wheel we place a loosely-revolving case or drum, *d*, which carries one or more pawls, *f*, inside of the case. The pawl or pawls engage with the ratchet-wheel when the case is turned in one direction, and carry the ratchet-wheel and shaft with it, while the case moves freely in the opposite direction without engagement. To give to the case *d* a reciprocating or alternate semi-rotary motion, we employ for each case a metallic bow, *g*, which has an arm, *h*, extending from its middle, as shown. This arm has a hole through it, so that it can be placed upon a journal or shaft, H, at a point opposite the shaft A which is to be driven. When thus secured, one half of the bow extends above and the other half below the case.

A flat spring or cord, *i*, is then wrapped once around the case *d*, and its opposite ends secured to the opposite ends of the bows, thus forming what is known as a watchmaker's-lathe; or, as in the present arrangement, two pieces of spring can be used, one end of each piece being fastened to the case, and then carried partially around the case in opposite directions, and thence carried to the ends of the bow, to which their opposite ends are secured.

Various arrangements of the wrapping spring or cord could be used, and all accomplish the same end.

Now, by giving the bow a reciprocating or semi-rotary motion about the shaft H, the spring or cord *i* will cause the case to make a semi-rotation each way alternately. This alternate rotation of the case will cause the pawl or pawls to act upon the ratchet in one direction and rotate the shaft, while it moves freely in the opposite direction.

When two ratchet-wheels and two cases are employed upon one shaft, the pawl or pawls of each case will act upon their ratchets alternately, so as to produce a continuous rotary motion of the shaft.

The treadle I we provide with a short arm, *j*, at one side of the toe, and another, *k*, at one side of the heel. We then connect the arm *j* with one of the bows, and the other arm, *k*, with the other bow, by means of connecting-rods *m*, so that the motion of the treadle will give to the bows an alternate reciprocating motion, such as is required to produce a continuous rotary motion of the shaft A.

It is evident that, instead of bows, straight pieces of metal would answer.

Each of the pawls *f*, which engage with the ratchet-wheels, we suspend upon a short pin, *s*, which projects inside of the case from its side, and pass the end which is opposite the engaging-point out through a hole in the rim *p* of the case, as shown. This rim is placed loosely upon the case, so that the pull of the bands as they are alternately drawn upon will cause the rim *p* to move slightly back and forth independent of the case, and thus raise and lower the point of the pawl, so that it will move back noiselessly after each engagement without raking upon the teeth.

By this arrangement we greatly improve the

ordinary mechanical movement which is used as a substitute for the crank, and render it applicable for driving light machinery by treadle-power. Having no dead-point, it can be started from any position; and when used for driving sewing-machines, it possesses the additional advantage of driving the shaft in one direction only, so that a stop or reverse brake is unnecessary.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

The bows *g*, with their flat springs or cord *i*, ratchet-wheels *b*, and pawl-carrying cases *d*,

provided with an independently-moving rim, *p*, and the pawls *f*, in combination with the treadle *l*, having toe connected with one of the bows *g*, while its heel is connected with the other, substantially as and for the purpose set forth.

In witness whereof we hereunto set our hands and seals.

EDWARD DUFFY. [L. S.]
ROBERT SWARBRICK. [L. S.]

Witnesses:

WM. HOSKINS,
I. C. HOLLAND.