W. A. HARP.

TREADLE-MECHANISM FOR OPERATING MACHINERY

No. 192,257. Patented June 19, 1877.

Fig. 1.

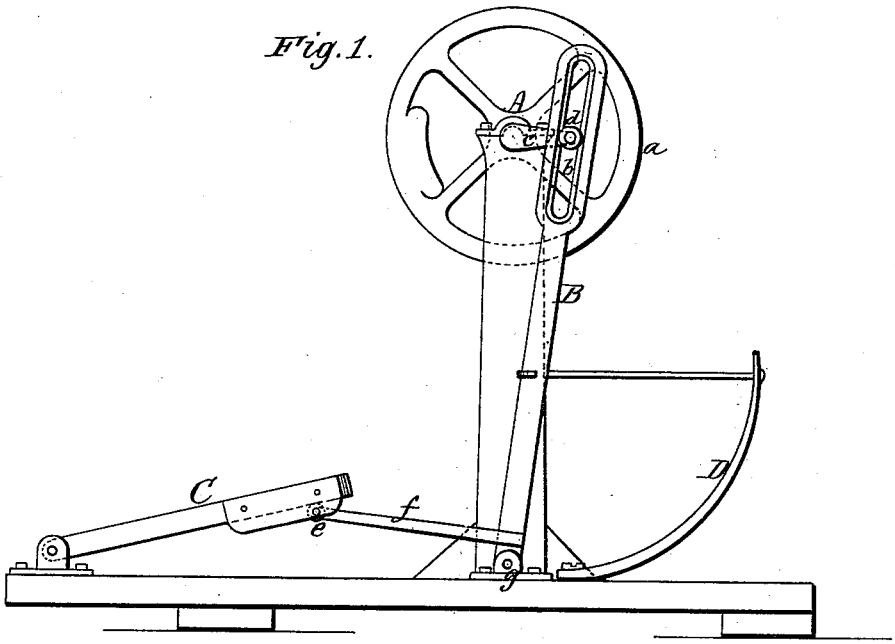
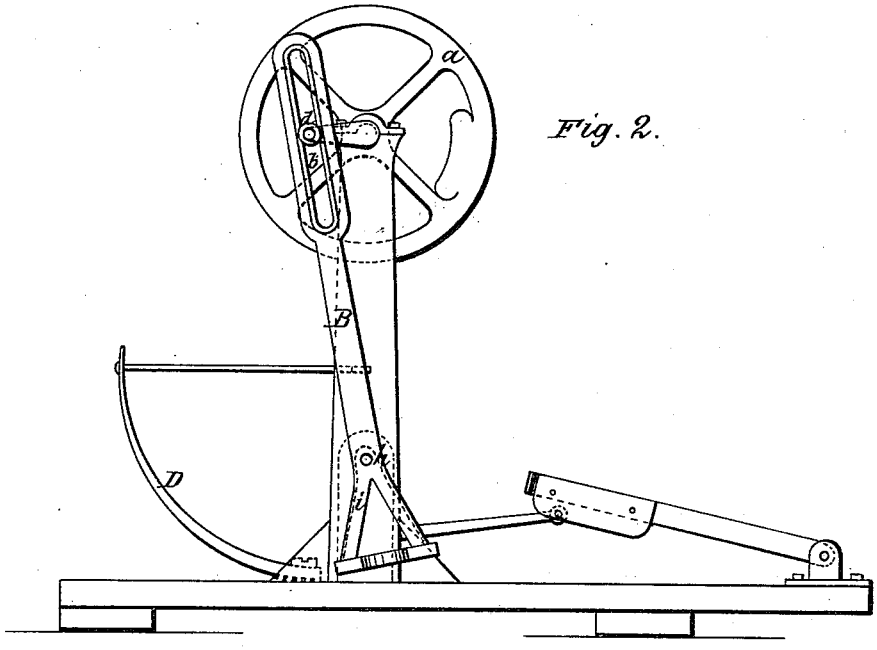


Fig. 2.



Witnesses
Philip F. Larner
A. B. Caldwell

Inventor
William A. Harp
By Wm. C. Wood
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM A. HARP, OF COVINGTON, GEORGIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO ENOCH STEADMAN, OF SAME PLACE.

IMPROVEMENT IN TREADLE MECHANISM FOR OPERATING MACHINERY.

Specification forming part of Letters Patent No. **192,257**, dated June 19, 1877; application filed November 2, 1876.

To all whom it may concern:

Be it known that I, WILLIAM A. HARP, of Covington, in the county of Newton and State of Georgia, have invented certain new and useful Improvements in Treadle Mechanism for Operating Machinery; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description thereof.

My invention consists in the combination, with the crank-shaft, slotted lever, and treadle, of a spring or counterweight, which is arranged to exert its force upon the slotted lever during the rising movement of the treadle, whereby the crank is assisted past its center and the force of the spring or weight is exerted upon the crank while the treadle is making its upward movement.

To more particularly describe my invention I will refer to the accompanying drawings, in which—

Figure 1 represents, in side elevation, treadle mechanism embodying my invention, with which a vertically-reciprocating treadle is employed. Fig. 2 represents, in side elevation, similar mechanism, with which a swinging treadle is employed.

A denotes the crank-shaft, carrying the balance-wheel *a*. B denotes a vibrating lever, which is slotted longitudinally, as at *b*. The crank-pin *c* is provided with a grooved friction-roller, *d*, which occupies the slot *b* in vibrating lever B.

When a vertically-reciprocating treadle, as at C, is employed, it is hinged at its front end to a floor or other suitable foundation. Its front end rests upon the friction-roll *e*, which is carried at the end of the arm *f* of the vibrating lever B, which is pivoted at its base to the floor or to a platform, as shown at *g*. When thus constructed it will be seen that pressure upon the treadle will cause the crank-shaft to revolve by the pressure of the lever upon the crank-pin roller at the side of the slot farthest from the treadle. The crank-pin will thereby be moved downward from a point adjacent to its dead-point to the lower end of the slot during half the downward movement of the treadle, and as the treadle continues downward the same portion of the lever will continue its pressure upon the crank-pin as it moves upward in the slot until it reaches its other dead-point. After passing this the crank is carried by the momentum of the wheel to the point at which the lever can again press thereon when the treadle is next depressed, and the operation described is repeated. From this it will be seen that the treadle is moved to an extent which only equals the length of the crank-arm, instead of having a movement equal to twice the length of the arm, as when a treadle of this kind is connected by a pitman to a crank in the ordinary manner, and it will also be seen that the pressure upon the treadle is imparted to the crank from dead-point to dead-point throughout the same extent of its movement as would be the case with the ordinary crank, treadle, and pitman.

In order that the centers or dead-points may be readily passed when the treadle has completed its downward movement, I employ the spring D, which may be of any desired form and connected with the lever B in any desired manner, provided that the power of the spring will be overcome, during the downward movement of the treadle, and be free to exert its force upon the lever during its return stroke, while the treadle is rising. As shown, said spring is in the form of a bow, secured at its base to the platform and connected to the lever B with a rod or link. It will be seen that the downward movement of the treadle to an extent equal to the length of the crank-arm carries the crank from one center to the other, and at the same time sets the spring, which not only assists in carrying the crank past its center, but also exerts its force through the slotted lever upon the crank during that portion of its travel which is not induced by pressure upon the treadle, and that by exerting a force upon the treadle sufficient to move the crank and set the spring, the crank is actuated by the slotted lever throughout its movement, except at its dead-points. I therefore attain a driving control of the crank during all its movements, except

at the dead-points, by means of a hinged treadle, which has only a downward movement equal to the length of the crank-arm.

Various forms of treadle may be employed in this connection. In Fig. 2, I show a vibrating treadle, whereby power is imparted to the crank at all points, except at its centers, without the aid of a spring or counterweight. With this form of treadle the slotted lever is pivoted, as at *h*, to a suitable standard, and one end of the treadle is firmly attached to the lower end of the lever. At the opposite end of the treadle is a hanger, *i*, pivoted at a point opposite the pivot *h* of the slotted lever. When pressure is applied alternately to the front and rear of this treadle it is vibrated to and fro, which imparts a like movement to the slotted lever, and rotates the crank, as already described.

I have shown two forms of treadle in combination with the slotted lever and crank, but it is to be distinctly understood that I do not limit my invention to a treadle of any particular construction, so long as it is connected with a slotted lever in such a manner that it will impart to the lever the requisite vibratory movement for effecting the driving of the crank-shaft.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with a treadle, crank, and slotted lever, of a counterweight or spring, substantially as and for the purposes specified.

WILLIAM A. HARP.

Witnesses:

EDWARD L. THOMAS,

H. W. SMITH.