

(No Model.)

S. T. SHORTESS.

DEVICE FOR OVERCOMING DEAD CENTERS.

No. 356,558.

Patented Jan. 25, 1887.

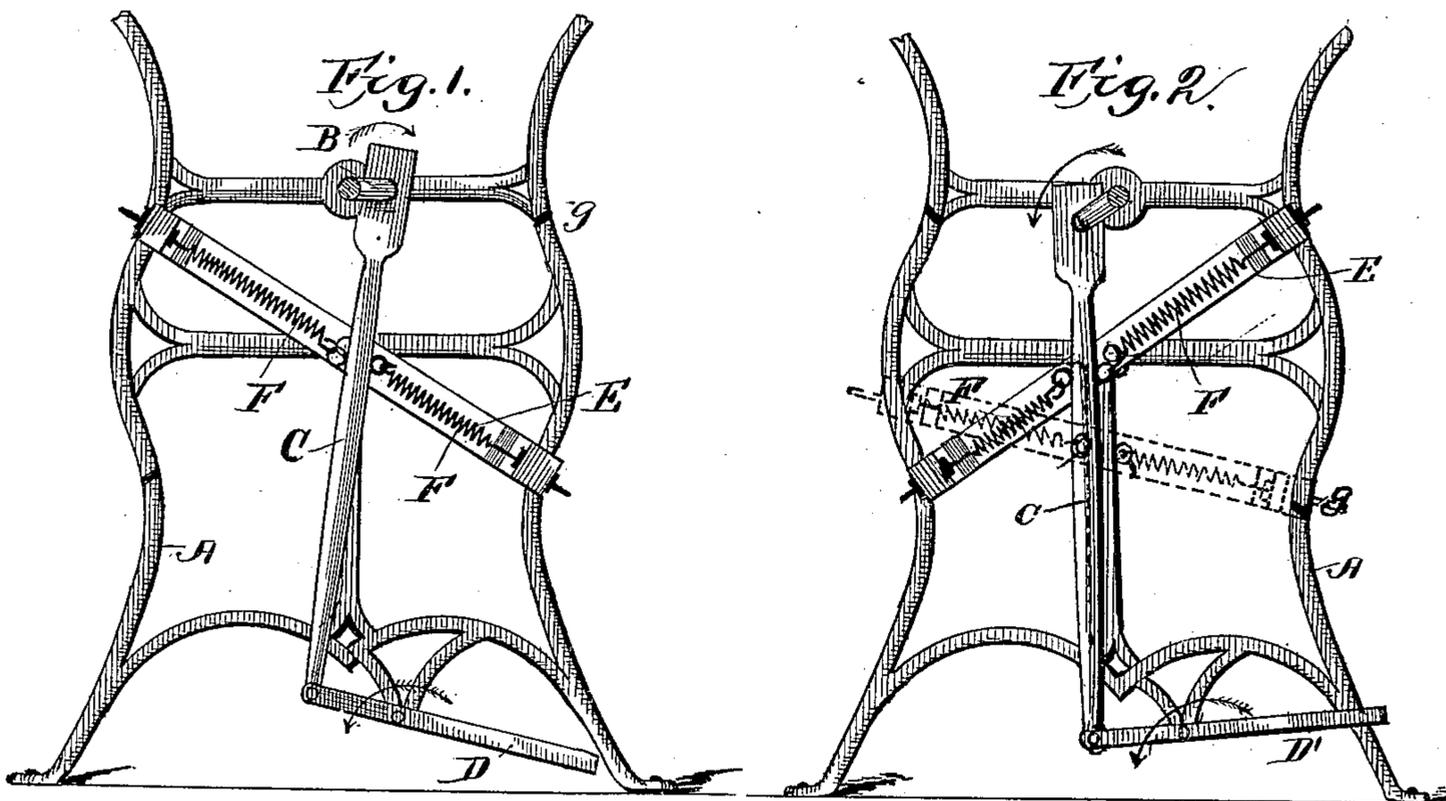


Fig. 3.

Fig. 4.

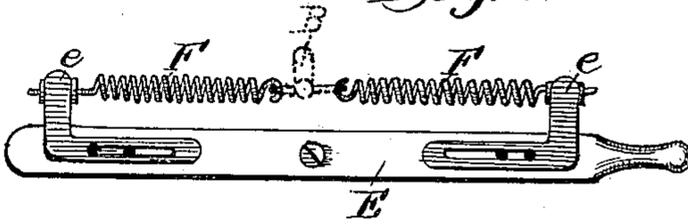
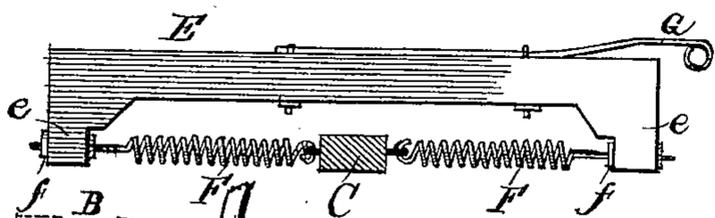
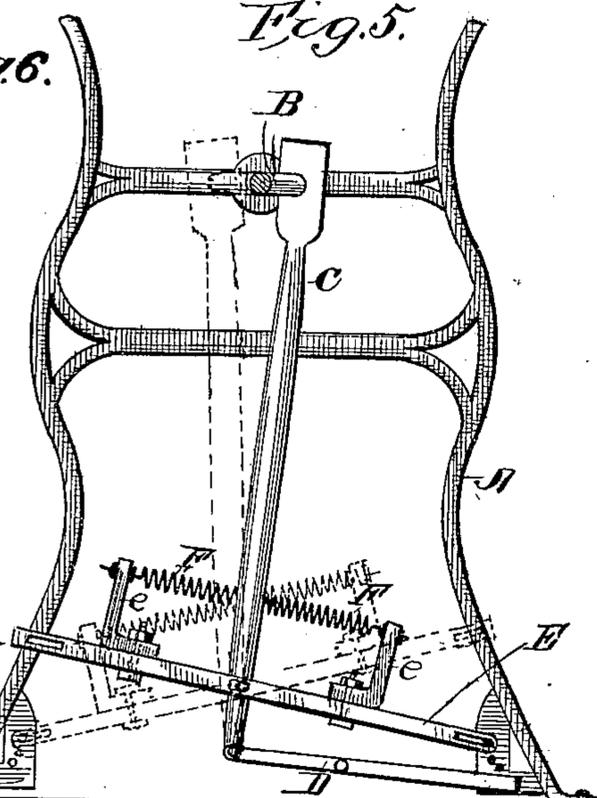
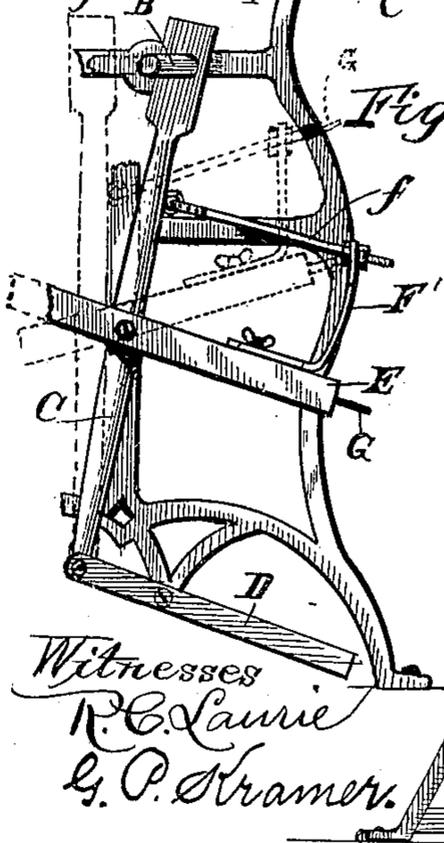


Fig. 6.

Fig. 5.



Witnesses  
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# UNITED STATES PATENT OFFICE.

STEPHEN T. SHORTESS, OF VINTON, IOWA.

## DEVICE FOR OVERCOMING DEAD-CENTERS.

SPECIFICATION forming part of Letters Patent No. 356,558, dated January 25, 1887.

Application filed June 24, 1886. Serial No. 206,152. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN T. SHORTESS, a citizen of the United States, residing at Vinton, in the county of Benton and State of Iowa, have invented certain new and useful Improvements in Devices for Overcoming Dead-Centers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improved means for overcoming dead-centers; and it consists in the novel features more fully hereinafter set forth, claimed, and shown in the annexed drawings, in which—

Figure 1 is a side view of a treadle movement provided with my device. Fig. 2 is a similar view showing the position of the parts changed, and showing a modified form in dotted lines. Fig. 3 is an enlarged detail plan view of the improvement, showing the relative position of the pitman by a cross-section. Fig. 4 is a modified form, shown in side elevation. Fig. 5 is another modification. Fig. 6 is still another modification.

The frame A, crank B, pitman C, and treadle D are of well-known construction, and are simply shown as a means to illustrate the application of my improvement, which consists, essentially, of a yieldingly-connected reversible bar, so disposed that the crank is normally held off a dead-center, and in practice is carried past such points.

The soul of my invention is the combination, with a crank or pitman, of a reversible bar, and a yielding connection interposed between it and said crank or pitman to normally hold the crank off a dead-center. For convenience of reference, the yielding connection in the following description will be designated and referred to as the spring F. It will be noticed that there may be one or more of such springs, as desired, and when two are made use of one is located on each side of the pitman, for the purpose presently to be made known.

The reversible bar E is pivotally supported, and springs F, extending in opposite directions

from arms *e*, have the inner ends connected with the pitman, or they may be directly connected with the crank, as shown by dotted lines in Fig. 4. The bar and springs are so disposed that the pitman is normally held off a dead-center. The bar is at an angle to a line passing through its pivotal support, so that by changing the position of the bar and elevating the end previously lowered the position of the crank will be changed so that it may be run in an opposite direction. If the bar is changed so as to cross the line of pitman at right angles, the crank is released from the control of the springs. This may be easily understood by reference to the figures of the drawings, in which the bar is shown oppositely arranged, or in different relative positions, and the parts correspondingly changed. The upper spring draws the crank toward itself past the lower point of the dead-center, and the lower spring draws the crank toward itself at the upper point of the dead-center. One spring may be used by so adjusting it that it will push at one and pull at the other point of dead-center; but two are preferable, as by their use the degree of tension can be regulated and a smoother and more reliable motion secured. Any suitable fastening device may be made use of to hold the bar in either position; but that shown is preferred, owing to its simplicity and the facility with which it may be operated. It consists of a spring-latch, G, secured to that side of the bar adjacent to the frame of the machine, adapted to engage the notches *g* in the frame.

The tension of the springs may be varied, as occasion may require, by nuts *f*, located on each side of the arms on threaded extensions of the springs passing through said arms, or by moving the arms bodily to and from each other, or by both said adjustments. Instead of passing the end of the spring through the arm, it is preferable in some cases to use a bolt, the bolt being threaded and provided with nuts for regulating the tension, and having an eye in one end to which a link is fastened, the spring being fastened to the link.

The reversible bar may be provided with a handle to be grasped while changing the position, as shown in Fig. 4. The bar may be pivoted to the pitman and held in position by

the spring-latch, and the springs attached to a frame at the side of the pitman with the same result, as shown by dotted lines in Fig. 2.

In another modification the bar is pivoted 5 to the pitman near its lower end, so that the arms extend upward on either side of the pitman. The springs are then fastened to arm and pitman, as already described. There should be slots running lengthwise of the bar, at each 10 end of it, for pivoting to the frame. In use one end of the bar is fastened to the frame by bolting through the slot, so that the bar will play freely on the bolt. The slot is to prevent binding from the reverse motion of the bar 15 and treadle. Changing the pivotal support to the other end of the bar reverses motion of the crank, which may be done in the manner indicated by full lines, Fig. 5.

This invention has a decided advantage over 20 other devices, in that by the use of a spring on each side of the pitman or crank, each spring controlling its own point of dead-center, and reversible bar, it is far easier to reverse motion, and it also provides for regu- 25 lating the degree of tension of the springs, as each can be regulated independently and only given sufficient tension to carry the crank past its point of dead-center.

Fig. 6 shows the reversible bar yieldingly 30 connected with the pitman C by the spring F' and the rod f.

In the use of this device, where it is not desirable to reverse motion, the reversible bar may be dispensed with and the springs fast- 35 ened to any convenient points in the proper direction to give the desired motion. Instead of the coil-springs shown, the arms may be

made of elastic material and may be connected to the pitman by chains or straps, which may be fastened to arms by threaded bolts, as already 40 described.

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

1. The combination, with the crank or pit- 45 man, of the reversible bar yieldingly connected with the crank or pitman, substantially as described, and for the purpose specified.

2. The combination, with the crank or pit- 50 man, of the pivotally-supported reversible bar yieldingly connected with the crank or pitman.

3. The combination, with the crank or pit- 55 man, of the reversible bar having arms projecting therefrom, which arms are yieldingly connected with the crank or pitman, substantially as and for the purpose set forth.

4. The combination, with the crank or pit- man, of the reversible bar, the arms adjust- 60 ably connected with the bar, and the springs connecting the arms and the crank or pitman, substantially as described.

5. The combination, with the crank or pit- man, of an independent spring located on each 65 side of the crank or pitman, each exerting a force to carry the crank past its dead-points, and means, substantially as described, for regulating the tension of each spring, substan- tially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

STEPHEN T. SHORTESS.

Witnesses:

W. P. WHIPPLE,  
JOHN CHRISTIE.