(No Model.) 2 Sheets—Sheet 1.

W. C. EVANS.

MACHINE FOR TREATING BOOTS OR SHOES.

No. 406,826. Patented July 9, 1889.

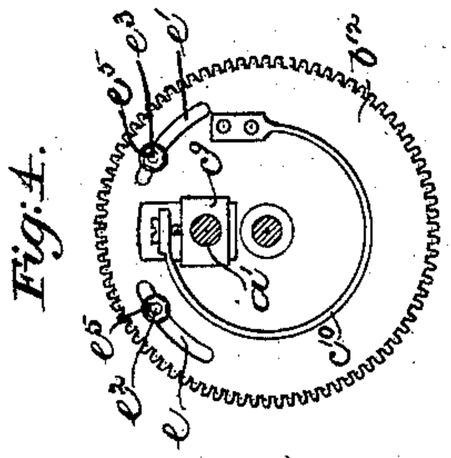
Fig. 4.

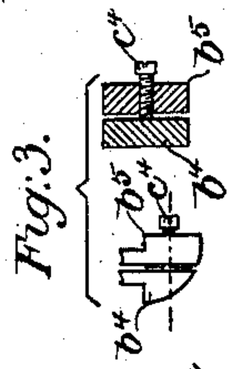
Fig. 3.

Fig. 1.

Fig. 2.

Fig. 5.

Witnesses:
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Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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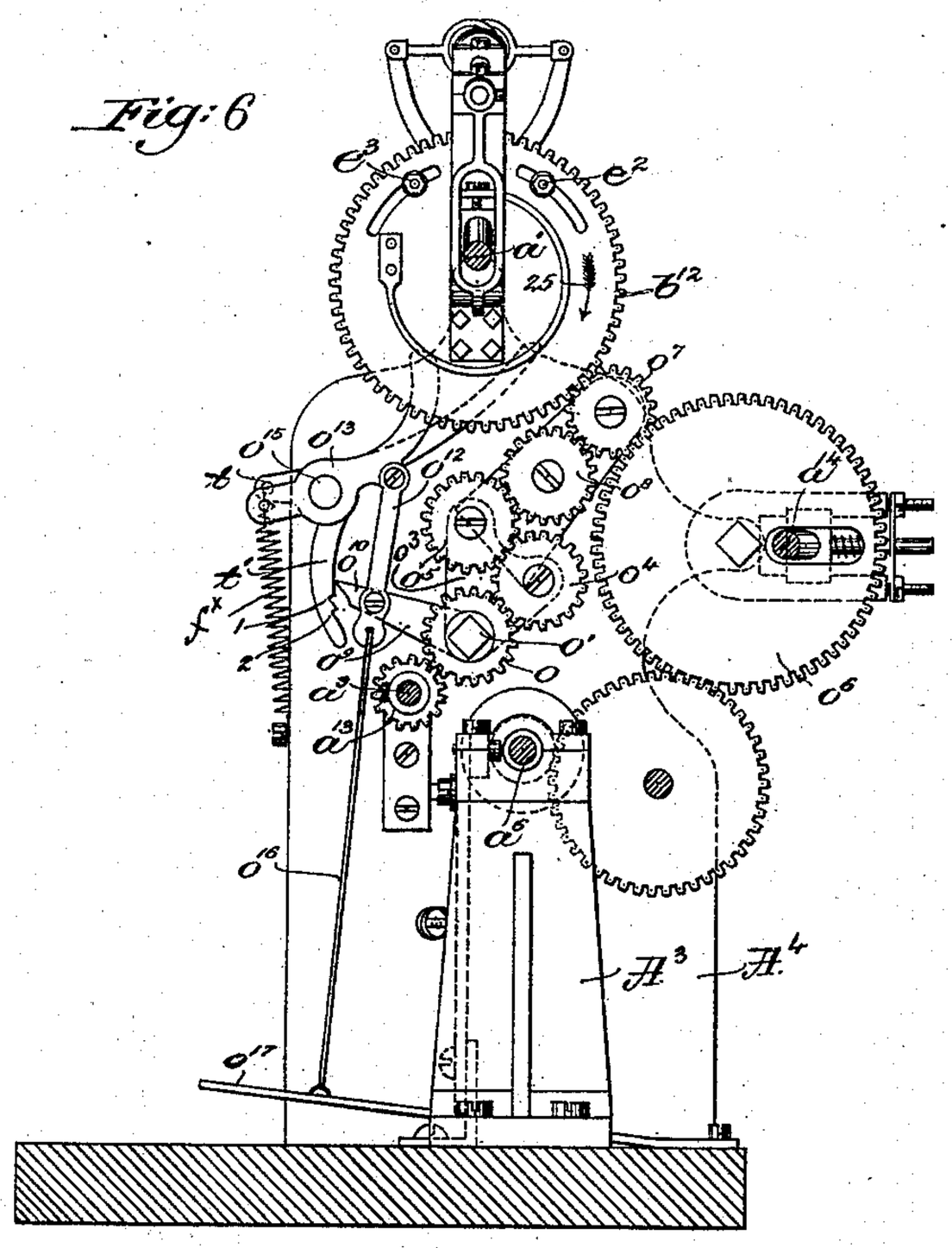
Fig. 6



Witnesses.
Howard F. Eaton,
Frederick L. Emery.

Inventor.
Warren C. Evans,
by Crosby Gregory Attys

UNITED STATES PATENT OFFICE.

WARREN C. EVANS, OF EXETER, NEW HAMPSHIRE, ASSIGNOR TO THE AUTOMATIC HEEL TRIMMING AND BURNISHING MACHINE COMPANY, OF SAME PLACE.

MACHINE FOR TREATING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 406,826, dated July 9, 1889.

Application filed October 29, 1888. Serial No. 289,418. (No model.)

To all whom it may concern:

Be it known that I, WARREN C. EVANS, of Exeter, county of Rockingham, State of New Hampshire, have invented an Improvement in Machines for Treating Boots or Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to machines for treating and finishing the heels of boots or shoes, and has for its object to improve the construction of the same.

One feature of my invention consists of a novel burnishing-tool made of two blocks or pieces, preferably wedge-shaped, each of the said blocks being operatively connected, as herein shown, to an eccentric on a driving-shaft, whereby the said blocks are made to slide or reciprocate in opposite directions to produce a rubbing action of the burnishing-tool on the heel of the boot or shoe similar to the rubbing motion made by hand, by which motion a better finish is imparted to the heel. The wedge-shaped blocks of the burnishing-tool are arranged with relation to each other, as will be described, so that when the said blocks are moved by each other in opposite directions the surface of the tool acting on the heel will be enlarged, whereby heels of varying heights can be burnished with one tool. One block of the burnishing-tool is preferably made movable vertically to enable heels of different sizes and shapes to be acted upon, and especially when the top lift varies in position on the heel.

Another feature of my invention consists in making the jack adjustable, whereby heels of varying heights may be placed in proper position to be acted upon—that is, the heel-pattern plate of the jack is adjusted or brought into position to bring the heel of the boot or shoe in correct working position with relation to the operating-tool. The heel-pattern plate is preferably hinged or made movable to adjust itself to the bottom of the heel of the boot or shoe to obtain a firm or rigid bearing.

My improved burnishing-tool and jack are especially adapted to be used on a boot and shoe machine provided with a number of different operating-tools to act simultaneously on heels of different boots or shoes carried by a plurality of jacks, substantially as shown in United States application Serial No. 263,305, filed February 7, 1888.

My invention further consists in providing mechanism, as will be described, whereby on one movement of a treadle the jacks are removed from one tool, as a trimming-tool, and placed in position to be brought under a second tool, as a burnishing-tool, when the treadle is restored to its normal position.

Still another feature of my invention consists in providing an adjustable stop by which the tripping mechanism of the machine shown and described in the said application may be actuated to stop the revolution of the tool-carrying shafts about the pattern-plates at any desired point, for a purpose to be hereinafter described.

Figure 1 is a side elevation of a machine embodying my invention; Fig. 2, a detail of the burnishing-tool and its operating mechanism; Fig. 3, an end elevation and a transverse section of the burnishing-tool detached; Fig. 4, a detail to be referred to; Fig. 5, a detail to more clearly show the adjustable jack; and Fig. 6, a sectional detail on line y^2 y^2, Fig. 1, to more clearly show the reversing mechanism.

The frame of the machine, comprising the bed-plate A, and standards A' A^2 A^3 A^4 A^5, supports the working parts of the apparatus, as in the application referred to. The power-shaft a, the tool-shaft a', driven therefrom by belt a^2 and moved longitudinally by the levers a^3 a^4, the latter being acted upon by the cam a^5 on the shaft a^6, having at its opposite end the cam a^7, by which the breasting-knife a^8 is operated, the shaft a^9, driven from the power-shaft a by belt a^{12}, and having at its opposite end the gear a^{13}, by which the gearing for revolving the tool-shafts a' a^{14} is operated, are all substantially as in the machine shown and described in the said application. The shaft a' has mounted on it two levers b b', (see Fig. 2,) having secured to or forming part of their smaller arms blocks b^4 b^5, which together form the burnishing-tool of the machine. Each block b^4 b^5 is preferably made

wedge-shaped, (see the section in Fig. 2,) and the said blocks are so placed together that the thicker or larger portion or end of one block, as b^4, is next to the smaller portion or end of the other block, as b^5, so that when the said blocks are reciprocated or moved by each other, as will be described, the acting-surface of the burnishing-tool will be enlarged—that is, as the wedge-shaped faces of the blocks b^4 b^5 move one on the other during the vibration of the said blocks by the said levers, each in a direction opposite the other and at a right angle to the length of the heel, one of the said blocks, as b^5, being at the same time made to move longitudinally in the direction of the heel by the action of the wedge-shaped face of the said block b^5 against the wedge-shaped face of the block b^4, the resultant motion of one of the said blocks—viz., that one b^5 nearest the top-lift end of the heel—being diagonal, the tool so divided working over a greater surface of the heel in the direction of its length than when the wedge-shaped faces of the blocks are omitted.

The blocks b^4 b^5 are reciprocated, as herein shown, by means of eccentrics b^6 b^7, connected, respectively, by eccentric straps and rods to the long arms of the levers b b', the said eccentrics being mounted on a shaft b^8, having bearings in uprights b^9 b^{10}, secured, as shown, to the large gear-wheel b^{12}, mounted on a stud on the upright A^4, the shaft b^8 being driven by a belt b^{13}, passed about pulleys b^{14} b^{15} on the shafts b^8 a', respectively.

The levers b b' are both movable vertically, as herein shown, they being each provided with a slot c, (see dotted lines, Fig. 2,) through which the reduced end of the shaft a' is extended.

The shaft a' has mounted on it a sleeve c', pressed against by a spiral spring c^2, encircling the said shaft, the said spring acting to keep the blocks in contact with each other, the lever b being pressed against a nut c^3 on the reduced portion of the shaft a'.

By means of the wedge-shaped blocks heels varying in height can be burnished by one tool, and to enable heels of extreme heights to be burnished by the same tool a set-screw c^4 is provided, the said set-screw being extended through one block, as b^5, and adapted to bear against the other block, as b^4, when the said screw is turned to force apart the said blocks, as shown in Fig. 3.

The levers b b' are pressed down upon the heel, as herein shown, by a spring c^5, secured at one end to the standard b^{10}, and having its other end resting on a link c^6, to which links c^7 c^8, secured to the levers b b', are fastened, as shown in Fig. 2.

To simplify construction the bearing-block c^9 for the shaft a' is fitted into a slot in the gear-wheel b^{12}, (see Fig. 4,) and is maintained in its lowest position in said slot by a spring c^{10}, having one end secured to said block and its other end to the gear, as shown.

The machine preferably contains four jacks, all radiating from a common sleeve d, secured to the shaft d', which is free to rotate in bearings in the standards A^4 A^5, and also to slide longitudinally therein, substantially as in the machine shown and described in the application referred to. Each jack comprises two arms d^2 d^3; but in accordance with my invention the arm d^3 of each jack is made movable, it being herein shown as divided into two parts 2 3, the part 2 having the heel-pattern plate d^4, and the opening through which the breasting-knife a^8 passes being provided with an arm d^5, extended between the forked arms of the fixed portion 3, the said arm being pivoted to said fixed portions, as shown in Fig. 5. The arm d^5 has connected to it a link d^6, joined near its opposite end to a lever d^7, pivoted on a stud d^8 on the arm d^2 of the jack, the said lever being provided on its under side with a dog or pawl d^9 (see Fig. 1) to engage the teeth of a ratchet-bar d^{10}, secured to the arm d^2, the said dog or pawl being normally kept in engagement with the teeth of the said ratchet-bar by a spring d^{12}, encircling the stud d^8. It will be seen that by moving the lever d^7 the hinged or pivoted part 2 of the jack-arm d^3 may be moved to place the heel of the boot or shoe in correct position to be acted upon.

To illustrate: If an exceedingly high heel is to be trimmed and the boot or shoe is mounted in a stationary jack, the knife, which rotates in a fixed path or plane, will act on only a portion of the heel and will trim that portion of the heel near the counter, while the top lift and the portion of the heel near it will be unacted upon; and if a low heel be placed on the stationary jack the knife would trim or cut the upper. With my improved tack these defects are obviated, and the heel, whether high or low, may be readily placed in correct position to be acted upon by the knife without detriment to the boot or shoe. To obtain a firm bearing against the bottom of the heel, the heel-pattern d^4 is pivoted, as at d^{13}, to the portion 2 of the jack-arm d^3. To obtain a nicer adjustment of the heel with relation to the path of movement of the acting-tool, the ratchet-bar will preferably be provided with two rows of teeth set out of line with each other, as shown in Fig. 5.

The gear b^{12} is provided, as shown in Fig. 4, with two concentric slots e e', through which are extended rods or studs e^2 e^3, each provided with a collar e^4, (see Fig. 1,) which bears against one face of the gear-wheel, the said rods or studs being clamped in place in the slots by nuts e^5, screwed upon them. The rods e^2 e^3 are made of sufficient length to strike the levers e^6 e^7 of the reversing mechanism, which is such as shown in the application referred to, the said rods constituting stops by which the travel or movement of the tool-shafts about the heel is limited.

The rods or stops e^2 e^3 may be adjusted in the slots so as to act sooner or later on the levers e^6 e^7, as desired—as, for instance, if

the heel of a small-size shoe is being trimmed, then the stops will be adjusted in the slots so as to trip the reversing mechanism and reverse the travel of the tool-shaft before the knife cuts the sole of the shoe.

The tool-shaft a' is carried about the heel of a boot or shoe carried by the jack from breast to breast by and through the upright b^{10} and gear-wheel b^{12}.

The gear-wheel b^{12} is rotated as follows: The gear a^{13} engages an intermediate gear o, loose on a stud o', secured to the upright A^4, the said stud at the rear of the loose gear o supporting a sleeve o^2, having an arm or arms o^3, (see Fig. 1,) upon which are pivoted two gears o^4 o^5, the loose gear o engaging and driving positively the gear o^4, the gear o^4 in turn engaging and rotating the gear o^5, the gears o^4 o^5 rotating in opposite directions at the same speed. Between the slotted gears b^{12}, carrying the shaft a', and the gear-wheel o^6 (see Fig. 6) on the shaft a^{14} is an intermediate gear o^7, in mesh with a gear o^8. The sleeve o^2 has at one end an arm o^9, (see Fig. 6,) provided with a toe o^{10}. The arm o^9 is jointed to a link o^{12}, carried upward and connected to an elbow-lever o^{13}, pivoted, as at o^{15}, the upper end of the lever being extended up within the range of movement of one of the stops, as e^3. The lower end of the link o^{12} is connected by rod o^{16} with a foot-treadle o^{17}. The screw o^{15}, serving for the fulcrum of the elbow-lever o^{13}, also supports an elbow-lever t, one end of which is turned upward and left in the range of movement of the stop e^2, the end of the lever t being bent in a direction opposite to that of the upper end of the lever o^{13}, so that when the gear b^{12} moves in one direction, as indicated by arrow 25, Fig. 6, the rod e^2 meets the rod t, and the rod e^3, on the movement of the gear b^{12} in the direction opposite to that indicated by arrow 25, meets the upper end of the lever o^{13}. The lower end or arm t' of the lever t has two notches, (see Fig. 6,) No. 1 of which engages the toe o^{10} of the arm o^9 when neither of the two gears o^4 o^5 is to engage the intermediate gear o^8. The notch No. 2 engages the toe o^{10} when the gear o^5 is to engage the intermediate gear o^8 and rotate the gears b^{12} o^6 in one direction, as to the right in Fig. 6, the treadle being at such time depressed.

As shown in Fig. 6, the gear o^5 is in mesh with the gear o^8 and the gears b^{12} and o^6 are rotating in a direction opposite to that indicated by arrow 25.

In the rotation of the gear b^{12} the stop e^3 strikes the upper end of the lever o^{13} and pushes it down against the action of the spring $f^\times$, and through the link o^{12} forces the toe o^{10} down into engagement with the notch 1, thus throwing the gear o^5 out of engagement with the gear o^8.

If it is desired to start the gears b^{12} o^6 rotating in the direction of arrow 25, the treadle will be depressed to engage the toe in the notch 2, thus throwing the gear o^4 in engagement with the gear o^8. When the stop e^2 strikes the upper end of the lever t, the toe is disengaged from the notch 2 and the gear o^5 engaged with the gear o^8, thus producing reverse rotation of the gears b^{12} o^6—that is, in a direction opposite to that indicated by arrow 25.

To enable the jack-carrying shaft d' to be moved longitudinally and be rotated by one movement of a treadle, the said shaft has fast on it a disk f, provided with holes or sockets f' in its periphery, there being as many sockets or holes as there are jacks. The shaft d' is prevented from rotating by a pin f^2 on a lever f^3, pivoted, as at f^4, to an arm f^5, secured to the upright A^5, the said pin entering a hole f' in the disk f.

The lever f^3 has connected to it a link f^6, pivoted, as at f^7, to the end of a lever f^8, which is pivoted, as at f^9, to an arm f^{10}, attached to the upright A^5, the lever f^8 being connected by link f^{12} to a foot-treadle f^{13}, pivoted, as at f^{14}, to a bracket f^{15}, attached to the upright A^5. The lever f^8 is also connected by a link f^{16} to one end of a lever f^{17}, pivoted, as at f^{18}, to a block f^{19}, secured to the bed-plate, the other end of the lever f^{17} having connected to it a link f^{20}, secured to the elbow-lever f^{22}, common to the said application and mounted on a stud secured to the bracket A^4, the said elbow-lever engaging the tool-shafts a' a^{14} to move them away from the heels of the boots or shoes when the foot-treadle is depressed, as will be described.

The disk f is provided with an elongated hub having an annular groove $g^\times$, into which is fitted a block 20, provided with a stud g, extended into a slot g' in the curved arm g^2 of an elbow-lever g^3, pivoted, as at g^4, to the bracket g^5, secured to an upright A^5, the said elbow-lever being secured, as at g^6, to the link g^7, and having fastened to it the link f^6, as at g^8. The pivot f^7 has mounted on it a guide-bar g^9, which bears against the upright, and which has secured to it, as at g^{10}, a rack-bar g^{12} for a portion of its length, with teeth to engage circumferential teeth on the face of a disk g^{13}, provided, as shown, with a hub g^{14}, secured to the shaft d' by set-screw g^{15}, the said screw being extended into a longitudinal slot g^{16} in the shaft to permit the said shaft to be moved longitudinally independently of the disk g^{13}, the latter being held, as herein shown, by forks g^{18} of an arm fastened to the upright A^5, the said arm acting merely to prevent longitudinal motion of the hub g^{14}.

The upper portion of the rack-bar is made smooth—that is, without teeth—so that when the foot-treadle is depressed the pin f^2 will be withdrawn from its socket in the disk f before the teeth on the said rack-bar engage the teeth on the disk g^{13}, the said rack-bar being normally pressed against the disk g^{13} by the spring g^{20}. When the treadle f^{13} is depressed, the rack-bar g^{12} and link f^6, secured to the lever f^8, are moved upward. As the link f^6 is moved upward the lever f^3, to which

it is connected, is turned on its pivot and the pin f^2 withdrawn from its socket. The disk f and shaft d' are now free to be rotated. On the further downward movement of the treadle the shaft d' is rotated by the teeth on the rack-bar engaging the teeth on the disk g^{13}, and at the same time the shaft is being rotated it is moved longitudinally by the slotted curved arm g^2 of the elbow-lever g^3, which is turned on its pivot by the upward movement of the link f^6.

As herein shown, the shaft is given a quarter-turn to bring the proper jacks into position to be moved under their respective tools when the shaft is moved back into its normal position, which in the present instance is accomplished by a spring g^{24} when the pressure upon the foot-treadle is removed.

I do not desire to limit myself to the particular means shown for producing a reciprocation of the blocks or pieces of the burnishing-tool, as it is evident any well-known cam movement might be substituted for the eccentrics.

I claim—

1. In a machine for treating the heels of boots or shoes, a tool-shaft and a burnishing-tool consisting of two blocks or pieces, combined with levers secured to said blocks and with means to move said levers to produce a reciprocation of the said blocks, substantially as described.

2. In a machine for treating the heels of boots or shoes, a tool-shaft and a burnishing-tool consisting of two blocks or pieces, combined with eccentrics connected to the said blocks to reciprocate the same one with relation to the other, substantially as described.

3. In a machine for treating the heels of boots or shoes, a rotating shaft, a burnishing-tool consisting of two wedge-shaped blocks or pieces vertically movable one with relation to the other, levers secured to said blocks, and a second shaft, combined with eccentrics on said second shaft connected to and so as to operate the said burnishing-tool, substantially as described.

4. In a machine for treating the heels of boots or shoes, a rotating tool-shaft and gears to produce travel of the said shaft about the heel of a boot or shoe, and a reversing mechanism consisting of gears to produce travel of the tool-shaft in opposite directions, combined with the adjustable stop carried by the said gears to operate the reversing mechanism and reverse the travel of the tool-shaft, substantially as and for the purpose specified.

5. In a machine for treating the heels of boots or shoes, a jack consisting of arms, as d^2 d^3, the arm d^3 having its heel-seat portion hinged or pivoted, combined with a lever pivoted on the arm d^2 and operatively connected to said hinged portion of the arm d^3, and with a pawl on the said lever and ratchet on the arm d^2 to lock said hinged portion in adjusted position, substantially as described.

6. In a machine for treating the heels of boots or shoes, a shaft and a plurality of jacks mounted thereon, a disk, as f, provided with holes or sockets, a pin to engage said sockets, a disk g^{13}, having teeth, a rack-bar to engage the teeth on the said disk, and means, substantially as described, to produce longitudinal movement of the shaft, combined with a treadle and with intermediate levers connected to the said treadle, whereby the shaft is rotated and moved longitudinally at one operation, substantially as described.

7. In a machine for treating the heels of boots or shoes, a shaft and a plurality of jacks mounted thereon, a disk, as f, provided with holes or sockets, a pin to engage said sockets, a disk g^{13}, having teeth, a rack-bar to engage the teeth on the said disk, and a slotted lever g^3, combined with a treadle and with intermediate levers, to operate substantially as described.

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

WARREN C. EVANS.

Witnesses:

JAS. H. CHURCHILL,

M. RAY.