E. E. WINKLEY.

AUTOMATIC SHOE MACHINE.

APPLICATION FILED JULY 6, 1908.

1,067,089.

Patented July 8, 1913.

5 SHEETS—SHEET 1.

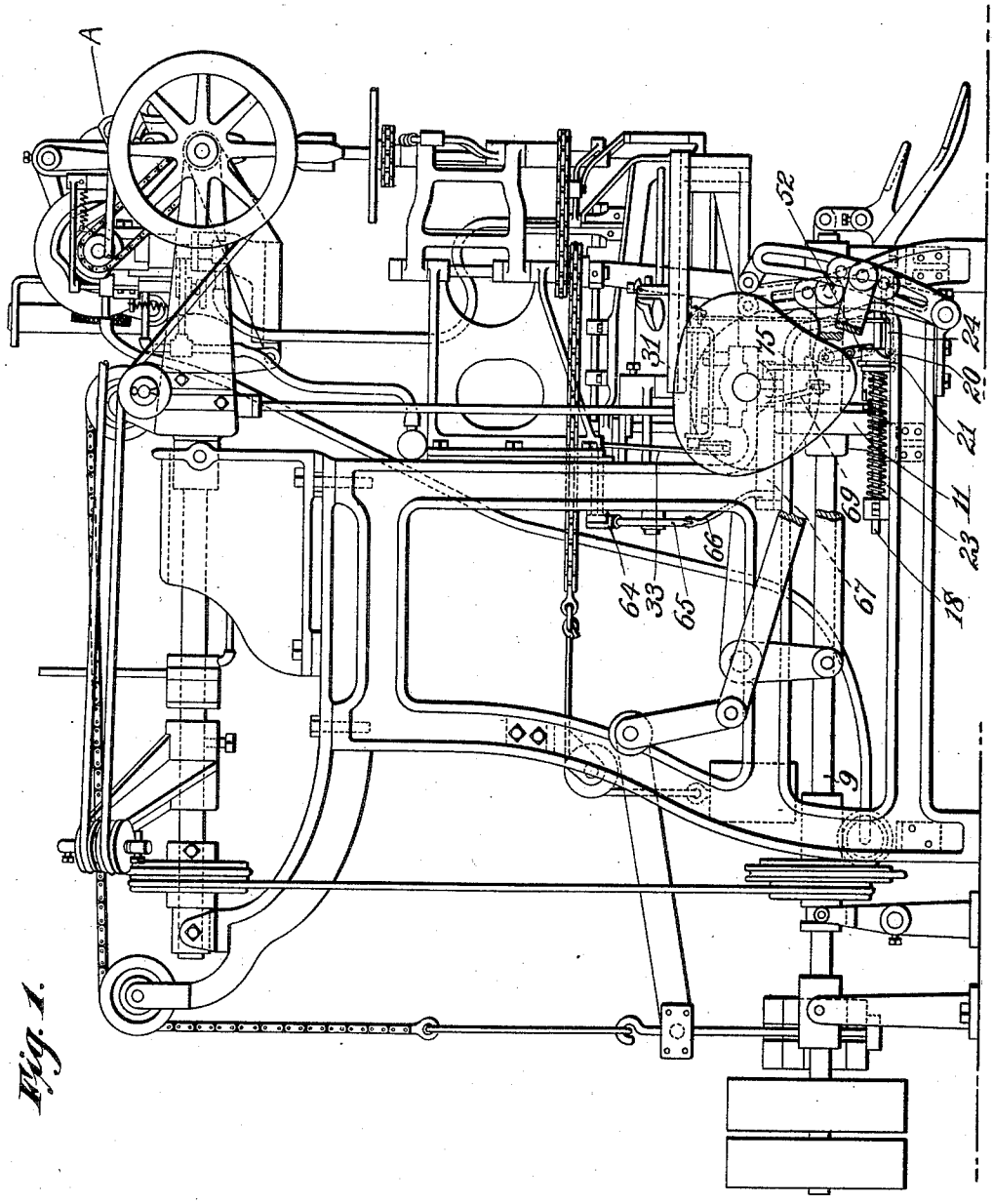


Fig. 1.

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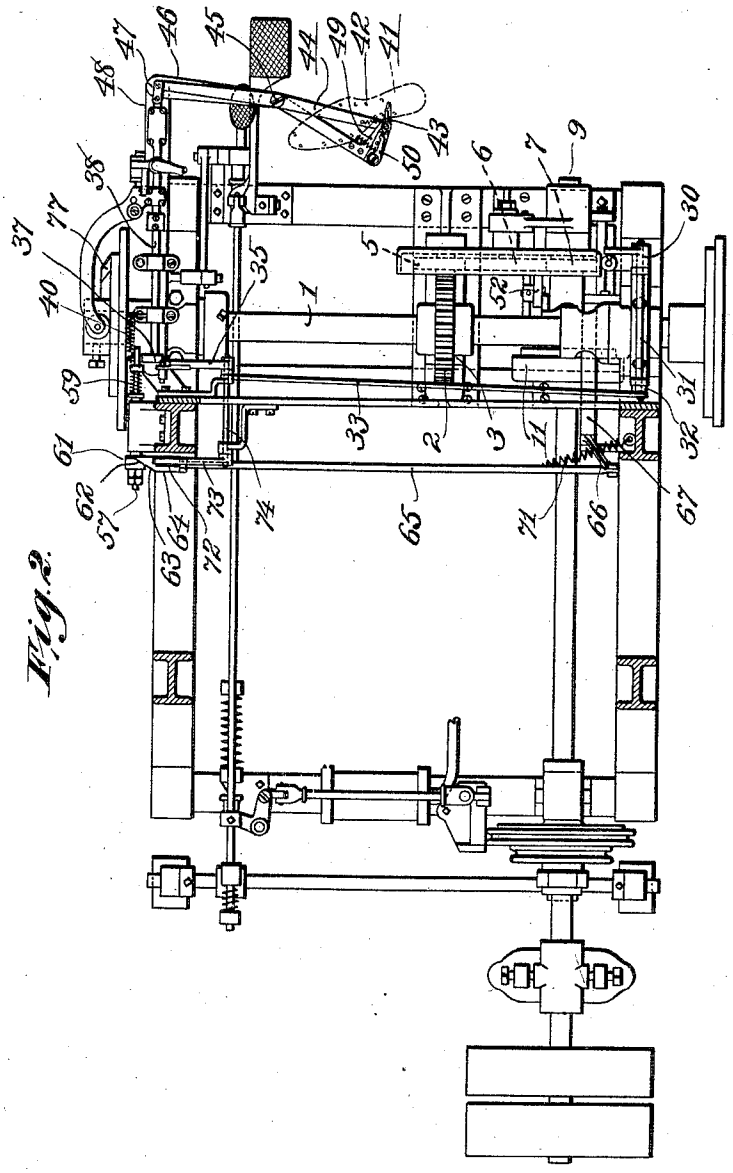


Fig. 2.

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Fig. 4.

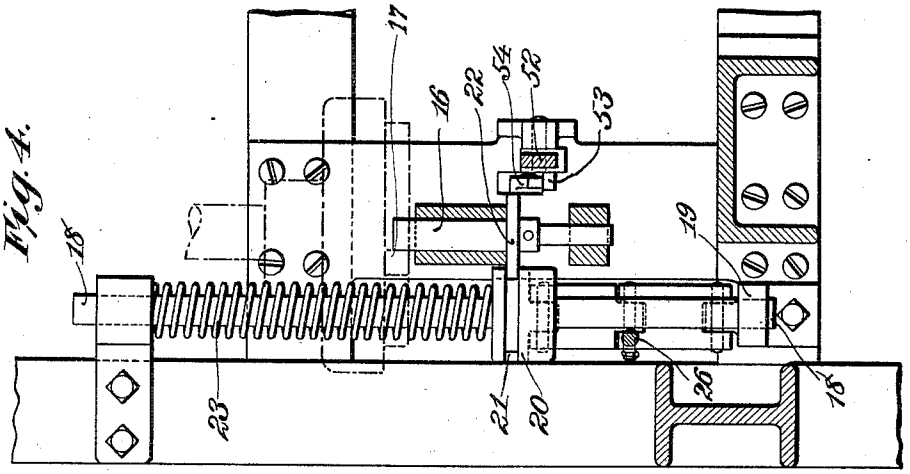
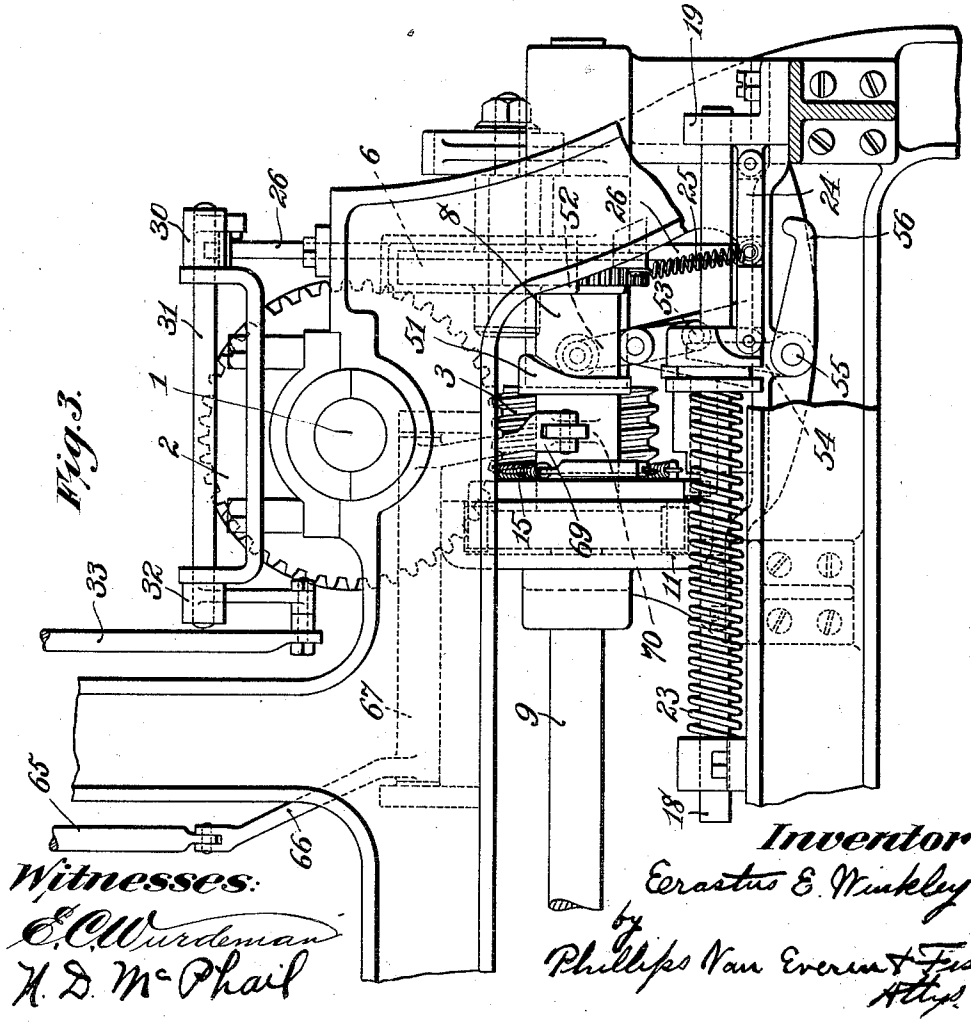


Fig. 3.



Witnesses:

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Fig. 6.

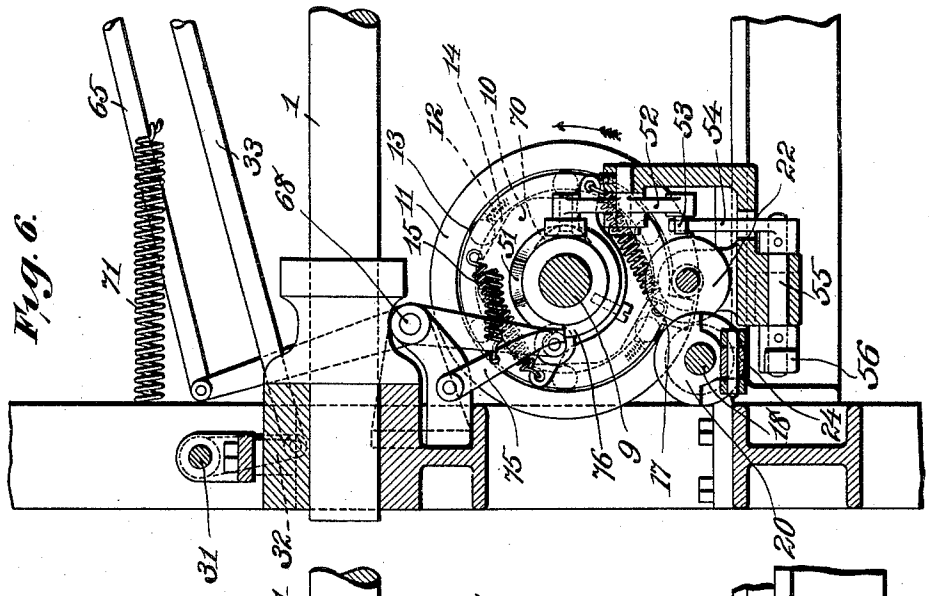
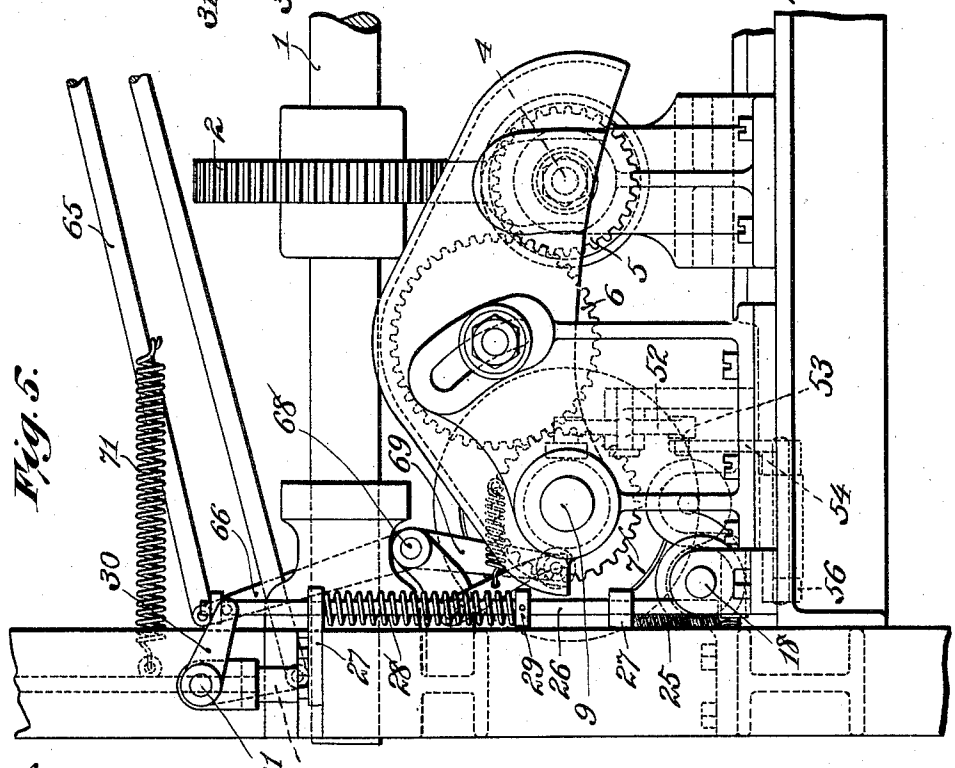


Fig. 5.



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5 SHEETS—SHEET 5.

Fig. 8.

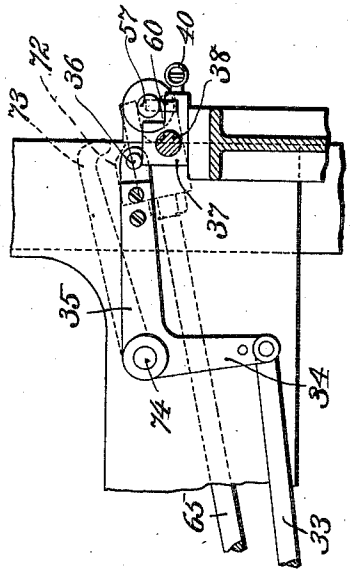


Fig. 9.

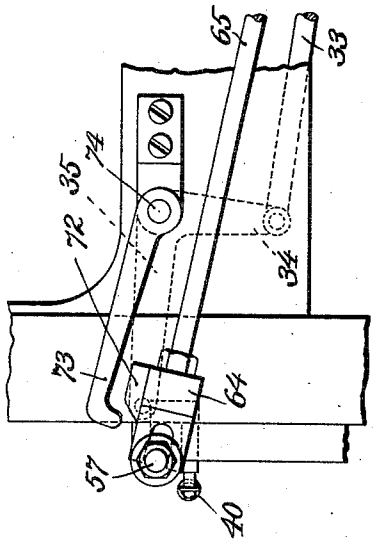
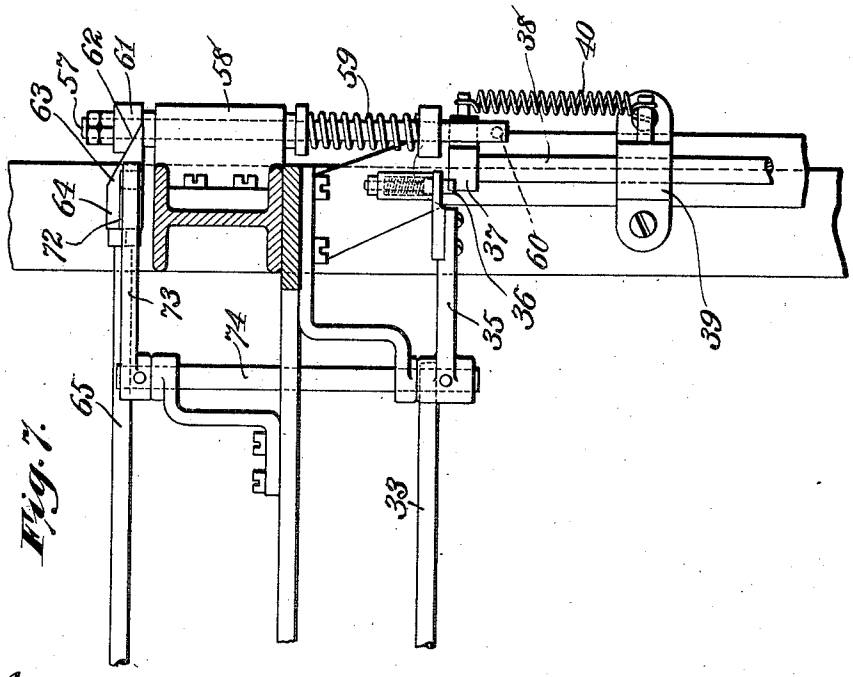


Fig. 7.



Witnesses:

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AUTOMATIC SHOE-MACHINE.

1,067,089. Specification of Letters Patent. **Patented July 8, 1913.**

Application filed July 6, 1908. Serial No. 441,977.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Shoe-Machines; and I do hereby 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.

The invention relates to machines for operating upon boots and shoes in which the relative movements between the shoe and operating means are automatically effected and controlled as the point of operation of the operating means is transferred around the shoe so that the shoe is acted upon automatically without any attention on the part of the operator. In machines of this type the shoe is supported upon a jack and mechanism is provided for automatically correcting the relative position of the jack and the instrumentalities operating upon the shoe as the point of operation is transferred about the shoe.

The object of the invention is to provide a mechanism for controlling the correcting mechanism of this type of machine which shall be simple in construction, and which shall operate in a certain and reliable manner and with little strain and wear upon the parts.

To this end the invention consists in certain features and combinations set forth in the claims, the advantages of which will be obvious to persons skilled in the art from the following detail description of a machine which embodies the various features of the invention in their preferred forms.

The invention will be readily understood from an inspection of the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the invention; Fig. 2 is a sectional plan view with certain of the parts removed to show the mechanism for operating and controlling the movements of the shaft which carries the cams of the correcting mechanism; Fig. 3 is a detail elevation of the driving mechanism, the parts being broken away; Fig. 4 is a sectional plan view of the parts shown in Fig. 3; Fig. 5 is a detail elevation of the driving mechanism, looking toward the left in Fig. 2; Fig. 6 is a transverse sectional elevation of the parts shown in Fig. 3; and Figs. 7, 8 and 9 are detail views of parts of the latching mechanism.

In the drawings the invention is shown embodied in a machine similar in many respects to the machine illustrated in my prior Patent No. 1,030,627, dated June 25, 1912, and application, Serial No. 325,567, filed July 11, 1906. In this machine the means for operating upon the shoe consists of a sewing mechanism indicated at "A" in Fig. 1 of the drawings which is the same in construction as the well known Goodyear welt and turn shoe sewing machine disclosed in Patent No. 412,704, October 8, 1889. The shoes to be operated upon are carried upon a jack, and correcting mechanism is provided for changing the relative position of the sewing mechanism and the shoe as the sewing operation progresses. This correcting mechanism includes a series of cams secured upon a cam shaft to which intermittent movements are imparted at proper intervals during the transfer of the point of operation of the sewing mechanism about the shoe. The construction and arrangement of these parts of the machine are the same as in the machine shown and fully described in the above patent.

In the machine shown in the drawings the shaft 1 on which the cams of the correcting mechanism are secured is driven through a worm wheel 2 secured to the shaft, and engaged by a worm 3 secured to a worm shaft 4. The worm shaft is provided with a gear 5 which is connected through an intermediate gear 6 with a gear 7 secured to a sleeve 8 which is mounted to turn loosely upon the main driving shaft 9 of the machine. The sleeve 8 is intermittently driven through a clutch, one member of which consists of a disk 10 formed on the sleeve, and the other member of which consists of a clutch body 11 surrounding the disk 10 and secured to the driving shaft 9. A ball carrying disk 12 is loosely mounted upon the sleeve 8, and is provided with a laterally extending flange which lies between the inner surface of the clutch member 11 and the disk 10, and is provided with a series of recesses in which the spring pressed clutch balls 13 are carried. The disk 10 is provided with a series

of wedging surfaces 14 for coöperating with the balls in connecting and disconnecting the clutch members. The ball carrying disk is connected by springs 15 with arms which project from the sleeve 8, and these springs tend to rotate the ball carrying disk in a direction to cause the balls to wedge between the surfaces 14 and the inner surface of the clutch member 11 and bind the clutch members together.

The clutch is normally held out of action by means of a controlling stop in the form of a pin 16 which normally projects into position to be engaged by a radially projecting lug 17 on the ball carrying disk and prevent rotation of the disk. When the pin 16 is withdrawn, the springs 15 act to immediately move the clutch balls into position where they are wedged between the surfaces 14 and the inner surface of the clutch member 11, and securely unite the parts of the clutch so that motion is imparted to the cam shaft 1 through the sleeve 8 and connected gearing until the clutch is again disengaged by the engagement of the lug 17 with the stop pin.

The withdrawal of the controlling pin 16, and the engagement of the clutch which drives the correcting mechanism, is effected at intervals during the transfer of the point of operation of the sewing mechanism around the shoe by the action of a controlling mechanism, and the pin is automatically returned into position to disengage the clutch after the clutch has made a single revolution. In the construction shown, the mechanism for operating the controlling pin 16 to cause the engagement of the clutch comprises a bar 18 mounted to slide in the bearings 19, and carrying a collar 20 which is provided with a groove 21 engaged by the flange 22 of a collar secured to the controlling pin 16. The pin operating bar 18 is forced in a direction to withdraw the pin and cause the engagement of the clutch by a spring 23 interposed between one of the bearings 19 and the collar 20. The bar is held in normal position against the tension of the spring 23 by a latching toggle 24, the links of which are held in position when the toggle is straightened by a spring 25. The devices for breaking the toggle and thus releasing the bar 18, so that the spring 23 may act to quickly withdraw the controlling pin 16 and cause the engagement of the clutch, comprises a vertically arranged rod 26 mounted to slide in bearings 27, and having its lower end arranged above the pivotal connection between the links of the toggle 24. The rod 26 is actuated to strike a blow upon the toggle links, and thus quickly break the toggle and release the spring 23 by a spring 28 arranged between the upper bearing 27 and the collar 29 secured to the actuating rod. The upper end of the rod 26 is connected to an arm 30 secured to one end of a rock shaft 31, the other end of which is provided with an arm 32 which is connected by a link 33 with the arm 34 of a bell crank lever. The other arm 35 of the bell crank lever is provided with a laterally projecting spring pressed pin 36 which is normally supported upon a block 37 (Figs. 7 and 8). By the engagement of the pin 36 with the block 37, the rod 26 is supported against the tension of the spring 28 in normal position with its lower end above the toggle 24. When the latching block 37 is disengaged from the pin 36, the rod 26 is released and is actuated by the spring 28 to break the toggle. The block 37 is secured upon a bar 38 which is mounted to slide in supports 39, and is forced in a direction to move the block out of engagement with the pin 36 by a spring 40.

The bar 38 is held in normal position against the tension of the spring 40 by mechanism which is tripped at intervals during the transfer of the point of operation of the sewing mechanism about the shoe by tripping devices carried by a controller which is connected to move with the shoe supporting jack. The controller is in the form of a plate 41 indicated in dotted lines in Fig. 2, which has the general shape of a shoe sole, and is connected to move with the shoe supporting jack in the manner shown and described in the applications above referred to. The controller plate is provided with a series of trip pins 42 arranged to act upon a spring pressed latch 43 which is mounted upon the free end of a lever 44, the other end of which is connected to actuate the latch bar 38. The latch lever 44 is pivoted at 45 to a supporting arm 46, which is in turn pivoted at 47 to the support 48 on which the latch bar 38 is mounted. The free end of the supporting arm 46 is provided with a lateral extension 49 arranged to bear against the edge of the controller plate 41, and held in engagement therewith by a spring (not shown) which is coiled about its pivot. When the latching mechanism is in normal position the latch 43 is in engagement with a detent 50 mounted on the end of the supporting arm 46, so that the latch bar 38 is held in normal position against the tension of the spring 40, and the forward end of the latch 43 is held in the path of the pins 42. When one of the pins 42 engages and trips the latch 43, the latch bar 38 is released and is moved forward by the spring 40 to disengage the block 37 from the pin 36, so that the driving mechanism for the correcting mechanism is thrown into operation through the connections described.

When the driving clutch for the correcting mechanism is thrown into action by the withdrawal of the controlling pin 16, it will remain in action until the pin is again ad-

vanced into position to be engaged by the lug on the pawl carrying disk of the clutch, when the rotation of the disk will be arrested, and the clutch will be disengaged and thrown out of action. The advance of the controlling pin is automatically effected before the clutch has completed a single revolution, so that whenever the clutch is engaged through the action of the tripping devices of the controller it makes a single revolution and is then automatically disengaged. The devices for advancing the controlling pin 16 and thus disengaging the clutch after it has made a single revolution comprise a cam 51 formed on the sleeve 8 and arranged to engage a roll carried on the upper end of a lever 52. The lower end of the lever is provided with a laterally projecting pin 53 arranged to engage an arm 54 secured to one end of a rock shaft 55, the other end of which carries an arm 56 arranged to underlie the toggle 24. When the toggle 24 is broken in the manner above described to cause the withdrawal of the controlling pin 16, the toggle links are supported upon the arm 56, and after the clutch and sleeve 8 have made a partial revolution, the cam 51 acting upon the lever 52 rocks the rock shaft 55 in a direction to raise the arm 56 and thus straighten the toggle. The straightening of the toggle forces the bar 18 back against the tension of the spring 23, thus returning the controlling pin 16 to normal position, and re-sets the toggle so that the bar 18 and controlling pin are latched in position against the tension of the operating spring 23.

During the rotation of the clutch, and prior to the resetting of the toggle and return of the clutch controlling pin 16, the latching mechanism which restrains the toggle breaking rod, and which is tripped by the controller mechanism, is re-set. The devices for re-setting the latching bar 38 and controller operated tripping mechanism comprise a rod 57 (Figs. 2, 7 and 8) which is mounted to slide in the bar 58, and is held in normal position by a spring 59. The front end of the rod 57 is provided with a pin 60 arranged to engage a lateral projection on the latching block 37. The rear end of the rod 57 carries a collar 61 which is provided with an inclined surface 62 arranged to be engaged by an inclined cam surface 63 on a block 64. The block 64 is secured to one end of a rod 65, the other end of which is connected to the end of an arm 66 which extends upward from a sleeve 67. The sleeve 67 is mounted upon a rock shaft 68, and is provided with a second arm 69, the end of which carries a roll arranged to be engaged by a cam 70 formed on the sleeve 8. A spring 71 holds the rod 65 and cam block 64 in retracted position, so that the pin 60 on the rod 57 normally stands at some distance in advance of the latch block 37, and does not interfere with the unlatching movement of the bar 38 when the latching mechanism is released by the engagement of one of the tripping pins 42 with the latch 43. After the driving clutch for the correcting mechanism has made about a half revolution, the cam 70 rides against the end of the arm 69, thus advancing the rod 65 and cam block 63 so that the rod 57 is moved in a direction to retract the latching bar 38 and reset the latching mechanism. The cam immediately passes beyond the end of the arm 59, so that the cam block 63 is retracted and the rod 57 is advanced to normal position where it will not interfere with the next unlatching movement of the latch bar 38. When the latch bar 38 is thus retracted, the pin 36 is back of the block 37, and this pin yields to allow the retracting movement of the latch bar and block 37. When the cam block 63 is advanced to reset the latching mechanism, and during the final forward movement of the block, a cam surface 72 rides under the free end of an arm 73 which is secured to the rock shaft 74 which carries the bell crank lever 34, 35 and acts to raise the arm 35 of the bell crank lever, thus re-setting the toggle operating rod and bringing the pin 36 in the arm 35 of the bell crank lever above the latching block 37. The pin immediately springs forward so that it is supported by the latching block, and thus the toggle operating rod is latched in position until the trip mechanism is again operated to throw the driving mechanism for the correcting mechanism into operation.

When the driving clutch is thrown out of operation, the sleeve 8 and clutch member 10 are retained in position by a locking pawl 75 which is arranged to engage a notch formed in the flange 76 on which the cam 51 is formed (Fig. 6).

In addition to the tripping mechanism already described, the machine is provided with a mechanism for tripping the latching bar 38 during each cycle of operations performed by the sewing mechanism when sewing around the toe. This mechanism is the same in construction as the corresponding mechanism shown and described in the patent above referred to, and is controlled by a cam 77 secured to the cam shaft 1, and acting through connections which are fully explained in said patent.

Although the invention has been described as embodied in a machine for sewing shoes, it will be understood that it is applicable to machines for performing operations of various kinds where the services of a skilled operator are usually necessary to guide the shoe, and it will also be understood that the invention is not limited to the details of construction and arrangement illustrated and

described, and that the specific construction and arrangement of the parts may be varied or modified without departing from the invention.

Having set forth the nature and object of the invention, what I claim is:—

1. An automatic shoe machine, having, in combination, means for operating on a shoe, a jack, mechanism for correcting the relative position of the operating means and jack, a driving clutch therefor, a spring operated device and mechanical connections controlling the clutch, means for latching the device in clutch disengaging position, and controlling mechanism acting to operate the latch at intervals, substantially as described.

2. An automatic shoe machine, having, in combination, means for operating on a shoe, a jack, mechanism for correcting the relative position of the operating means and jack, a driving clutch therefor, a spring operated device and mechanical connections for controlling the clutch, means for latching the device in clutch disengaging position, a controller connected to move with the jack and provided with a series of trips, and connections between the trips and latching means, substantially as described.

3. An automatic shoe machine, having, in combination, means for operating on a shoe, a jack, mechanism for correcting the relative position of the operating means and jack, a driving clutch therefor, a spring operated device for controlling the engagement and disengagement of the clutch, means for latching the device in clutch disengaging position, a spring operated device for releasing the latching means, means for latching the latter operating device, and tripping mechanism acting to operate said latter latching means at intervals, substantially as described.

4. An automatic shoe machine, having, in combination, means for operating on a shoe, a jack, mechanism for correcting the relative position of the operating means and jack, a driving clutch therefor, a device for controlling the engagement and disengagement of the clutch, a tripping mechanism for controlling the movement of the device into clutch engaging position, and means acting to automatically re-set the tripping mechanism and to return the clutch controlling device into clutch disengaging position, substantially as described.

5. An automatic shoe machine, having, in combination, means for operating on a shoe, a jack, mechanism for correcting the relative position of the operating means and jack, a driving clutch therefor, a spring operated device for controlling the engagement and disengagement of the clutch, a latching toggle for holding the device in clutch disengaging position, tripping mechanism for breaking the toggle at intervals during the transfer of the point of operation of the operating means around the shoe, and means acting to automatically re-set the tripping mechanism and the toggle, substantially as described.

6. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, a driving clutch therefor, a stop for controlling the engagement and disengagement of the clutch, a spring for operating the stop to cause the engagement of the clutch, devices for restraining the spring and controlling mechanism acting to release the spring at intervals during the transfer of the point of operation around the shoe, substantially as described.

7. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, a driving clutch therefor, a stop for controlling the engagement and disengagement of the clutch, a spring for operating the stop to cause the engagement of the clutch, latching devices for restraining the spring, a controller connected with the shoe and provided with a series of trips and connections between the trips and latching means, substantially as described.

8. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, a driving clutch therefor, a stop for controlling the engagement and disengagement of the clutch, a spring for operating the stop to cause the engagement of the clutch, a latching device for restraining the spring, a spring-operated device for releasing the latching device, means for restraining the spring of the operating device, and tripping mechanism acting to release the latter operating device at intervals during the transfer of the point of operation around the shoe, substantially as described.

9. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, a driving clutch therefor, a device for controlling the engagement and disengagement of the clutch, a tripping mechanism for controlling the movement of the device in clutch-engaging position, and cams connected with the clutch for resetting the tripping mechanism and returning the clutch-controlling device into clutch disengaging position, substantially as described.

10. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, a driv-

ing clutch therefor, a spring operated stop for controlling the engagement and disengagement of the clutch, a latching toggle for restraining the spring, tripping mechanism for breaking the toggle at intervals during the transfer of the point of operation of the operating means around the shoe, and means acting to automatically reset the tripping mechanism and toggle, substantially as described.

11. An automatic shoe machine, having, in combination, means for operating on a shoe, mechanism for correcting the relative position of the operating means and shoe, mechanism for intermittently operating the correcting mechanism including a clutch, a controlling device for controlling the engagement and disengagement of the clutch, controlling mechcanism acting to move the device into clutch engaging position at intervals, and cams driven by the clutch and connected to re-set the controlling mechanism and return the controlling device to clutch disengaging position, substantially as described.

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

ERASTUS E. WINKLEY.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."