S. J. WENTWORTH.

SOLE PRESSING MACHINE.

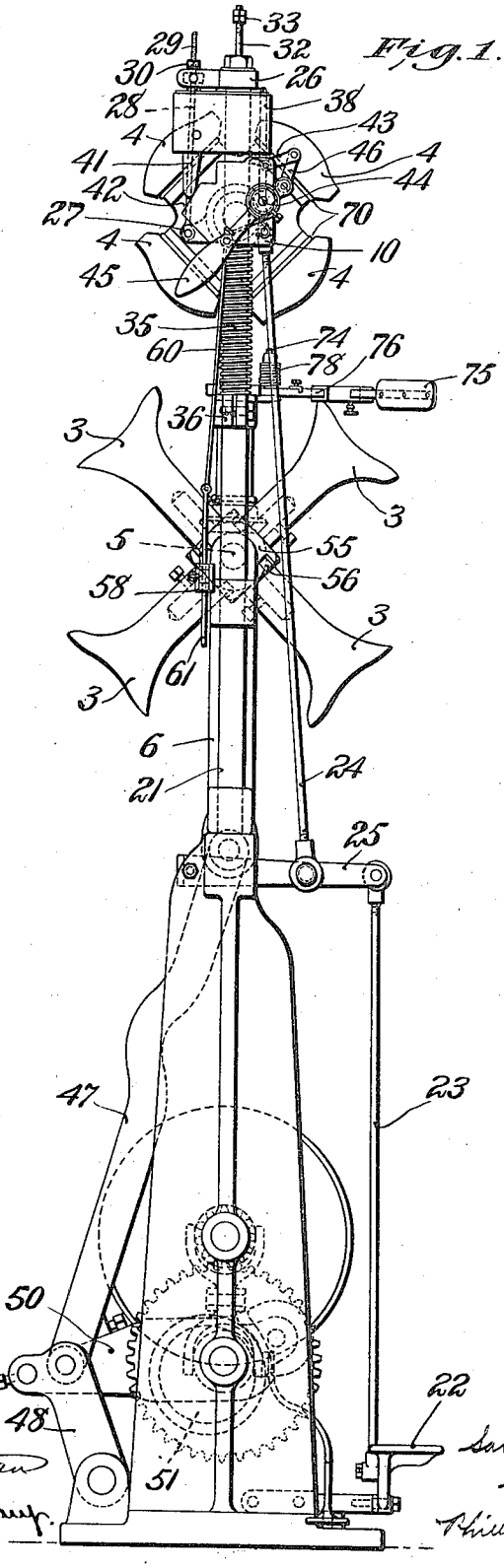
APPLICATION FILED OCT. 16, 1911.

1,236,636.

Patented Aug. 14, 1917.

5 SHEETS—SHEET 1.

Fig. 1.



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5 SHEETS—SHEET 2.

Fig 2.

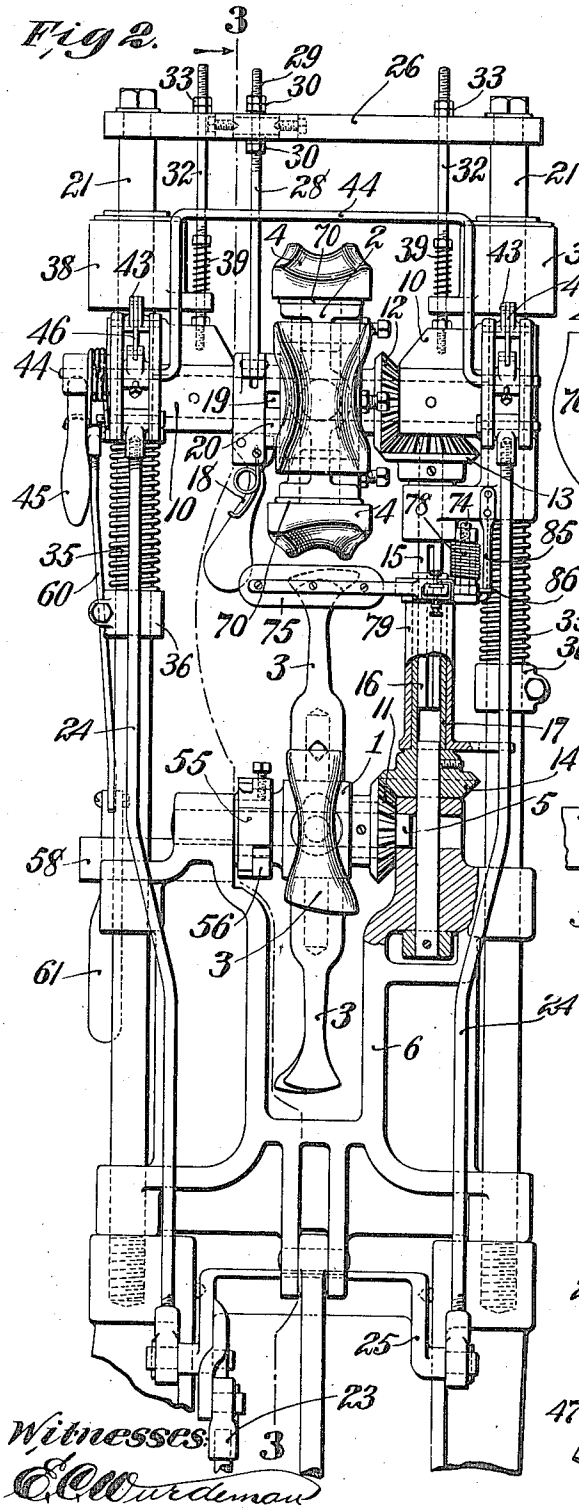
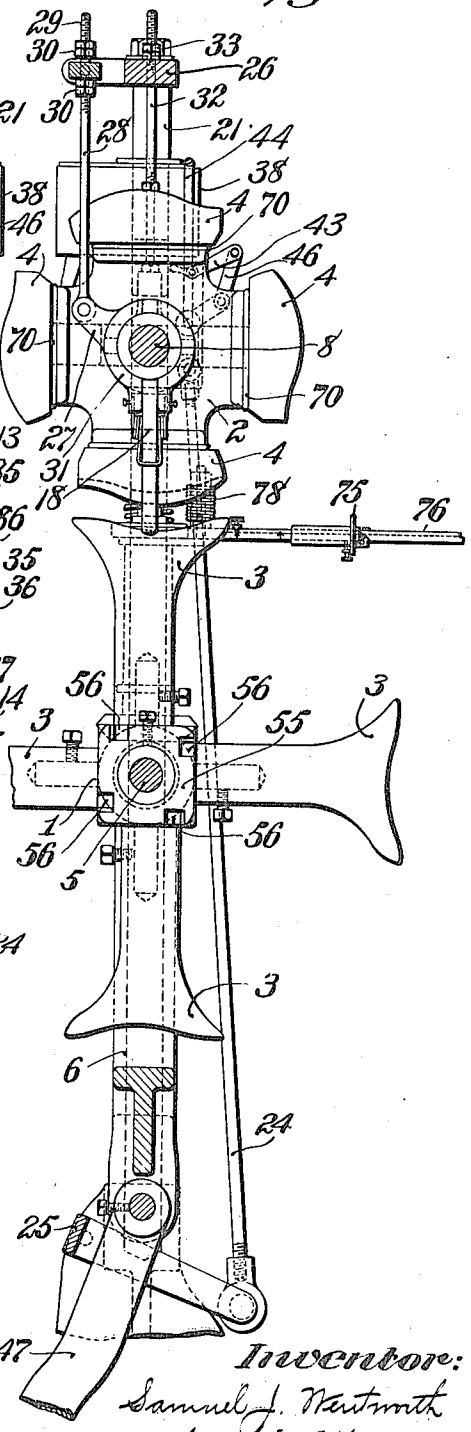


Fig. 3.



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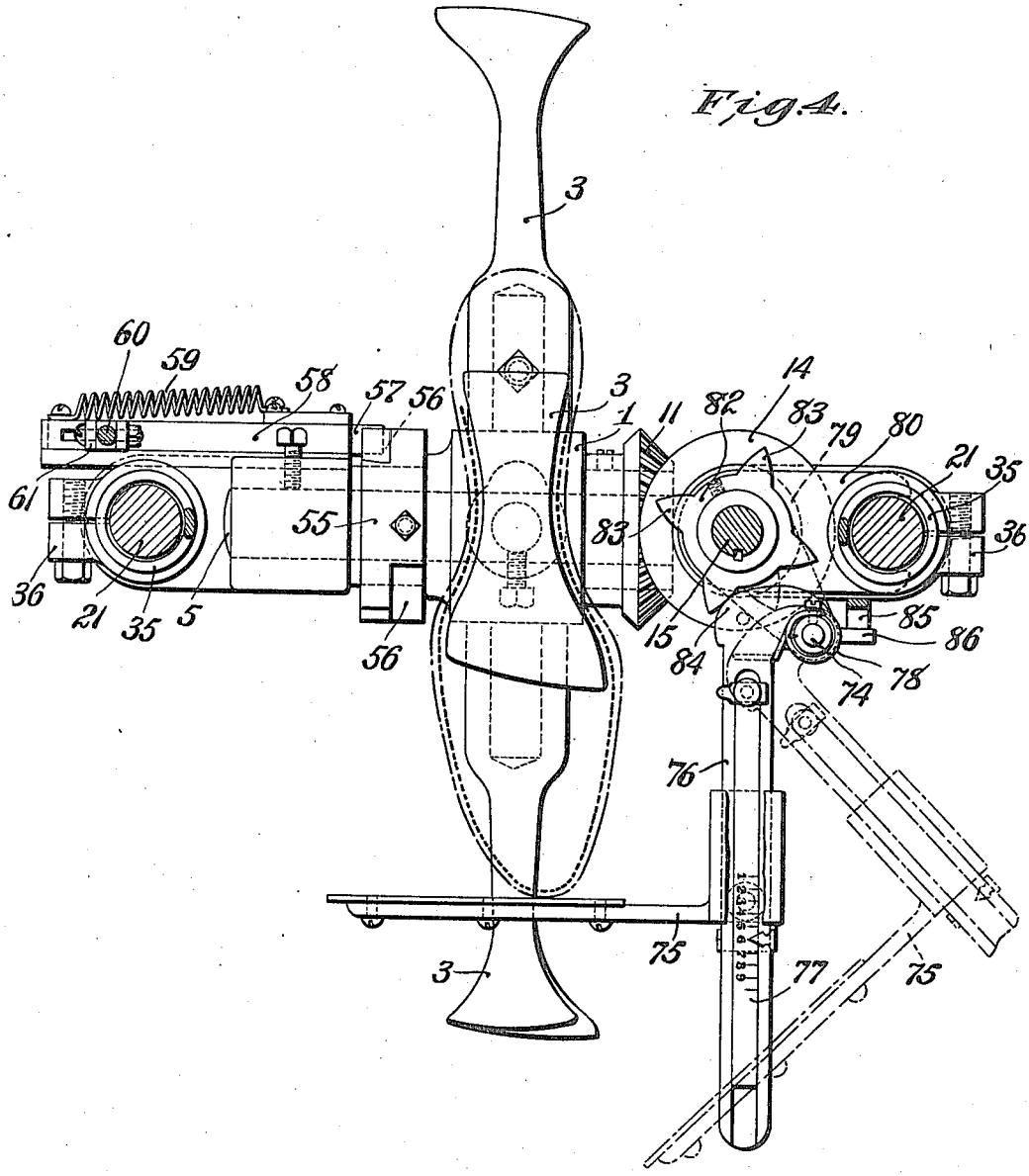
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5 SHEETS—SHEET 3.

Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 5.

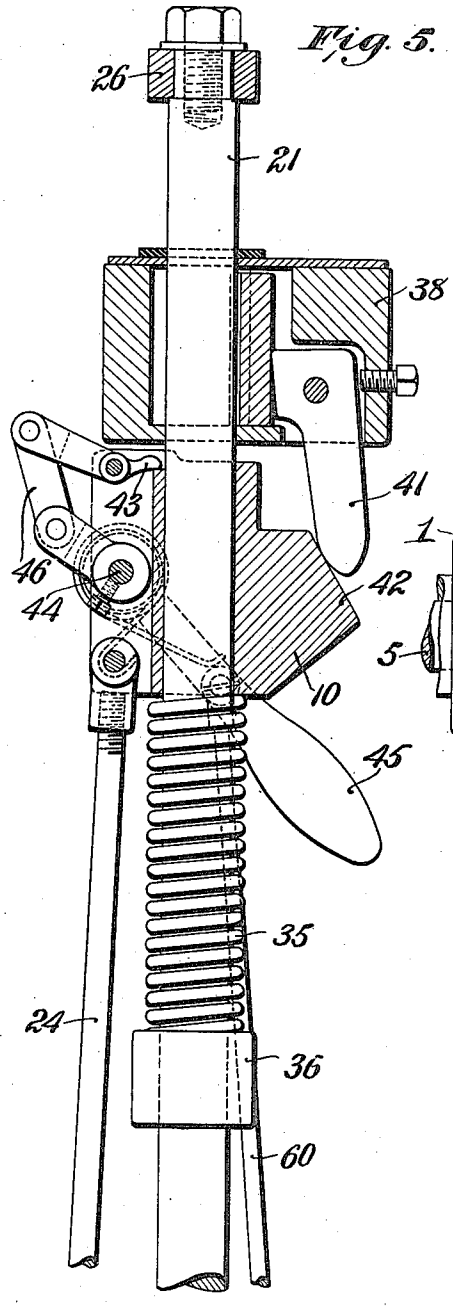
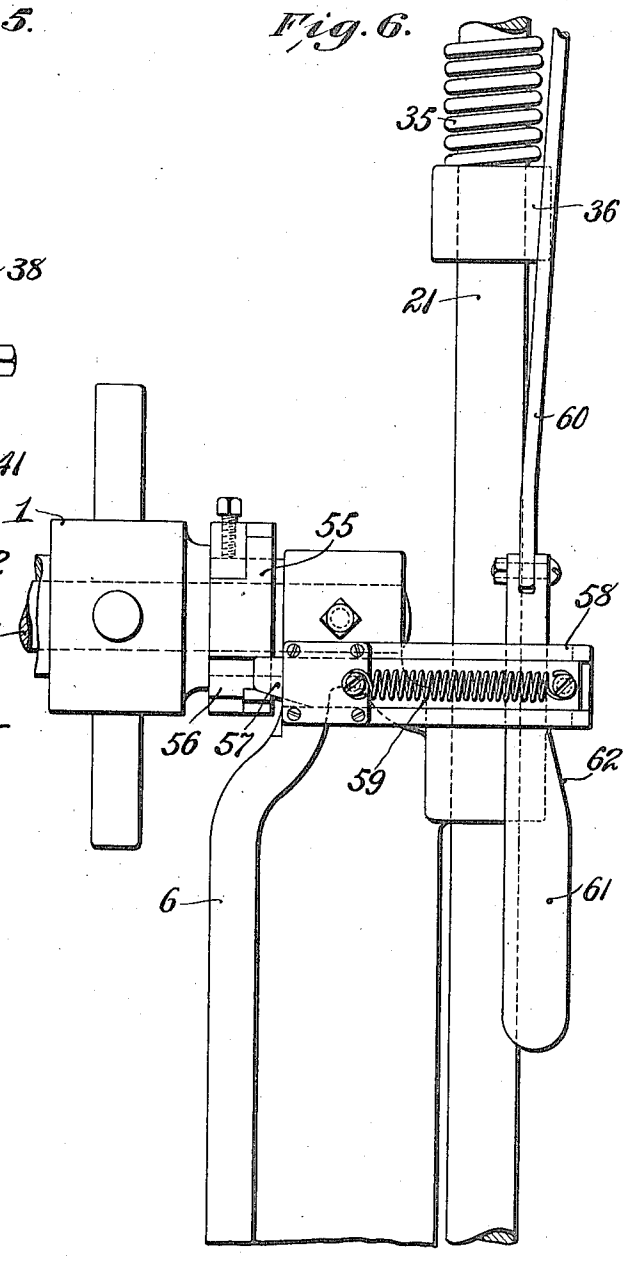


Fig. 6.



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1,236,636.

Patented Aug. 14, 1917.

5 SHEETS—SHEET 5.

Fig. 7.

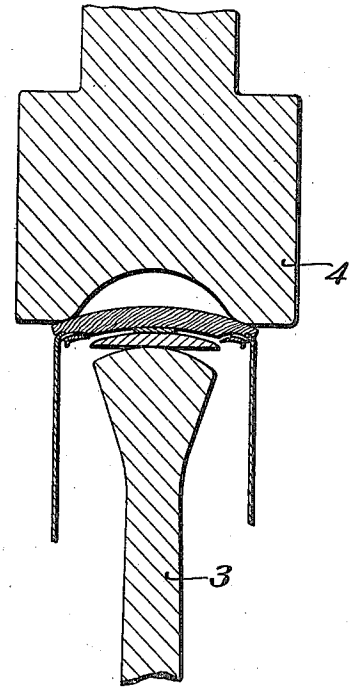
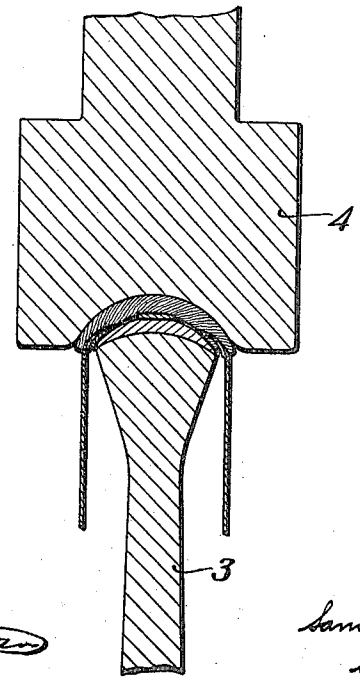


Fig. 8.



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UNITED STATES PATENT OFFICE.

SAMUEL J. WENTWORTH, OF NEWPORT, KENTUCKY, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-PRESSING MACHINE.

1,236,636. Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed October 16, 1911. Serial No. 654,980.

To all whom it may concern:

Be it known that I, SAMUEL J. WENTWORTH, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Sole-Pressing 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 present invention relates to sole pressing machines, and more particularly to machines of this type which are employed for molding the shanks of soles which have been incorporated in boots and shoes.

It is a very desirable requisite in all types of boots and shoes to have what is known as a rounded shank, as this style of shank adds greatly to the appearance and stiffness of the sole and otherwise improves the value of the finished shoe.

The object of the present invention is to secure a firm rounded shank having a greater transverse curvature than can be secured upon the ordinary last without marring the upper or otherwise spoiling the finished appearance of the shoe, or breaking the inseam fastenings which secure the upper to the sole. With this object in view, one feature of the invention contemplates the provision of an incomplete supporting form arranged to extend forward only throughout the shank of the shoe, a coöperating sole pressing form constructed to bear upon the limited area of the shoe sole supported by the first mentioned form, and mechanism for relatively actuating the two forms to secure a direct pressure upon the shank. A further feature of the invention consists in the provision of a shoe supporting form narrower than the last of the shoe to allow the upper to hang down loosely upon each side of the form, a coöperating form provided with a pressing face having a greater transverse curvature than the curvature of the shank portion of the last bottom, and mechanism for relatively actuating the two forms to secure a direct pressure upon the shank of the sole and mold the same into exact conformity with the pressing face of the last mentioned form. A still further feature of the invention comprises a pressing form provided with a transversely curved face arranged to simultaneously engage and press down opposite margins of the sole, a coöperating form for supporting the shoe inside of the inseam in order to maintain the fastenings for securing the upper to the sole unbroken, and mechanism for relatively actuating the two forms to secure a direct pressure upon the sole.

A further object of the invention is to provide a machine of this character which is efficient in its operation and which may be readily manipulated by an unskilled operator to mold the shanks of boots and shoes with precision and certainty. With this end in view, a feature of the invention contemplates the provision of a pair of turrets, each carrying a plurality of coöperating forms, the turrets being readily turned to bring any two forms into alinement, and mechanism for relatively actuating the forms to secure a direct pressure upon the sole. A further feature of the invention consists in the combination of an incomplete form for supporting the shank of the sole after it has been incorporated in a boot or shoe, and means for gaging the relative longitudinal position of the sole and form prior to the pressing operation.

Still further features of the invention consist in certain novel features of construction, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be apparent to those skilled in the art from the following description.

In the accompanying drawings illustrating the preferred form of the invention—

Figure 1 represents a side elevation of a machine embodying the several features of the invention in their preferred forms;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a section taken upon the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a detail view illustrating a plan of the lower turret with a shoe shown in dotted outline upon one of the forms and the toe gage supported in operative relation thereto;

Fig. 5 is a detail showing an elevation partly in section of one of the supporting standards and the mechanism for clutching

the crosshead supporting the upper turret to the standard;

Fig. 6 is a detail showing a front elevation of the mechanism for locking the turrets in position;

Fig. 7 is a cross section of two of the forms and a sole held between them and illustrating the position of the two forms at the commencement of the molding operation; and

Fig. 8 is a view similar to Fig. 7 and illustrating the forms in their final position with the sole molded into exact conformity with the pressing surface of the upper form.

The machine shown in the illustrated embodiment of the invention consists of a pair of vertical turrets, each carrying four cooperating forms which are detachably secured thereto in any suitable manner. These turrets are operatively connected so that by rotating one of the turrets different coöperating forms may be brought into position to be utilized, and locking means are provided for retaining the turrets with the forms in this position. The lower turret is indicated at 1 and the upper turret is indicated at 2, and each turret carries a plurality of forms indicated at 3 and 4 respectively. The turret 1 is mounted upon a shaft 5 journaled in the sliding frame 6 and the turret 2 is mounted upon a shaft 8 journaled in the crosshead 10. In order to preserve the proper operative relation between the coöperating forms, the turrets are connected together by suitable mechanism so arranged that upon rotating one of the turrets, the second is rotated a corresponding amount. A bevel gear 11 is fixed to the shaft 5 and a second bevel gear 12 is fixed to the shaft 8, and these bevel gears each mesh respectively with bevel gears 14 and 13 mounted upon opposite ends of a vertical shaft indicated at 15. The shaft 15 is formed of a pair of telescoping members 16 and 17 splined together to prevent a relative rotation of the two gears, but to allow a relative vertical movement during the operation of the machine. The turrets are locked with any two coöperating forms in working position by a pivoted spring latch 18 engaging with one of a series of recesses 19 formed in the periphery of the disk 20 which is fastened to the turret 2. The supporting form that is being employed is inclined outwardly in a position of presentation, as is also the coöperating pressing form, so that the work may be readily applied and removed by the operator. Upon pressing a treadle, a partial rotation is imparted to the two turrets to bring two cooperating forms into alinement and a downward movement is simultaneously imparted to the upper turret to bring the forms into close proximity and seat the shoe upon the lower form. Power actuated mechanism is then set into operation to impart a pressure producing movement to one of the forms and exert a direct pressure upon the shoe. The crosshead 10 carrying the upper turret is slidingly mounted upon a pair of supporting standards 21 and is connected to an operating treadle 22 by a connecting rod 23 and a pair of rods 24 which are pivotally connected at their inner ends to a U-shaped rocker arm 25 supported in the frame of the machine. The turret 2 is connected to a cross bar 26 by a crank 27 and a link 28, as shown clearly in Figs. 2 and 3, so that upon a downward movement of the crosshead 10 a partial rotation is imparted to the turret 2. In order to determine the extent of this rotation accurately and to accommodate for different vertical movements of the turret, the upper end of the link 28 is threaded at 29 and a plurality of clamp nuts 30 are mounted upon opposite sides of the cross bar 26 so that the effective length of the link 28 may be varied as desired. The crank 27 is formed integral with a collar 31 loosely journaled on the shaft 8, and the spring latch 18 is pivotally mounted upon the collar 31 so that the latch 18 normally locks the turret 2 to the crank 27. The downward movement of the turret is limited by a pair of stop rods 32 threaded in the crosshead 10 and passing loosely through the cross bar 26, the top face of which is arranged to engage with the clamp nuts 33 threaded upon the upper ends of the rods 32. With this arrangement the downward movement of the turret is gaged exactly and the clamp nuts 30 upon the rod 28 may be adjusted to bring the forms exactly into alinement upon reaching the limit of the crosshead. The mechanism for automatically retaining the upper turret in its depressed position is substantially the same as that shown in the patent to Davenport, No. 781,636, February 7, 1905, and is only briefly described herein in consequence thereof. The crosshead 10 is normally held in a raised position by springs 35 interposed between the crosshead and collars 36 secured to the standards. A pair of clutch collars indicated at 38 are slidingly supported upon the standards above the crosshead and are forced down by springs 39 surrounding the rods 32. When the crosshead 10 has reached the limit of its downward movement, it is retained in this position by the clutch collars 38, each of which is rendered operative by a rocker arm 41 connected to the clutch collar 38 and engaging with a cam face 42 formed upon the crosshead 10, as clearly described in the patent above referred to. The clutch collars are released by a pair of dogs 43 which are actuated to secure a relative movement of the clutch collars and crosshead by a

rock shaft 44. The rock shaft is conveniently manipulated by means of a handle 45 and is connected to the dogs 43 by a pair of links 46. Upon moving the handle 45 the dogs 43 engage with the under side of the clutch collars 38 and produce a relative vertical movement of the clutch collars and crosshead, allowing the arms 41 to ride off the cam faces and release the clutches. The pressure producing movement of the lower form is imparted by a toggle connected to the sliding frame and consisting of a pair of links 47 and 48 which are connected centrally to an arm 50 actuated by an eccentric 51, as clearly described in the patent to Holland, No. 362,447, dated May 3, 1887.

It is essential that the turrets be locked with the forms in pressing position in order to prevent a movement of the forms out of alinement during the pressing operation. To this end a block 55 is secured upon the shaft 5, adjacent to the turret 1, and is provided with four recesses 56, each recess corresponding to one of the forms 3. When the lower turret is swung into the position shown in Figs. 2 and 3 one of the recesses alines with a spring pressed latch 57 which is pressed into the recess to lock the turret against a further rotation. As shown clearly in Fig. 6, the latch is slidingly mounted in a retaining member 58 fixed to the sliding frame 6 and a tension spring 59 operatively connects the latch 57 with the retaining member 58 and serves to normally force the latch 57 into one of the recesses 56. Mechanism is provided for automatically disengaging the locking means when the handle 45 is manipulated to release the clutch members in order that the supporting form may be allowed to swing out into a position of presentation simultaneously with the upward movement of the pressing form. To this end a rod 60 connects the handle 45 with a sliding plate 61 provided with an inclined cam surface 62. The plate 61 passes through a slot formed in the latch 57 and the cam surface 62 engages with the end of the slot as the cam plate 61 is raised, to withdraw the latch member from the recess 56. This withdrawal of the latch member 57 takes place coincidently with the release of the clutch members 38, so that as the crosshead 10 is raised the turrets are free to be rotated by the crank 27 and link 28.

In the illustrated embodiment of the invention, each turret is provided with four forms which are designed to operate upon right and left shoes of different sizes. As the four sets of forms differ merely in shape and size and are otherwise identical, a description of a single pair of coöperating forms will suffice for a clear understanding of the construction and mode of operation of the machine. The supporting form 3 is an incomplete form, extending forward only throughout the shank of the shoe and having a width narrower than the last of the shoe, in order to allow the upper of the shoe to hang down loosely upon each side of the form. The coöperating pressing form is constructed to bear upon the shoe over the limited area supported by the first mentioned form, and is provided with a pressing face having a greater transverse curvature than the curvature of the shank portion of the last bottom. The degree of curvature of the pressing face of the lower form varies and is dependent upon the style of the shoe and upon whether the shank of the shoe is molded before or after the shank stiffener has been inserted. As these machines operate upon the shoe when the last is removed therefrom, a greater transverse curvature of the sole is secured than is possible with any method of manufacture which contemplates leveling the sole with the shoe supported upon the last. It will be clear from an inspection of Figs. 7 and 8 that the edges of the upper form engage first with opposite margins of the sole and as the two forms are moved into closer proximity, the opposite margins of the sole are bent downwardly until the form engages with the entire surface of the sole at the shank and the surface of the sole conforms exactly with the curvature of the form. This initial pressing down of the opposite margins of the sole as the forms are moved together stretches the surface of the sole laterally and solidifies the same, imparting a highly finished appearance to the surface. The supporting form shown in Figs. 7 and 8 is designed to accommodate shoes in which the shank stiffener has already been inserted, and for this purpose the upper surface of the form is slightly flattened with respect to the coöperating surface of the pressing form. As a heavy pressure is necessary to properly mold the shank, it is desirable that some means be provided for protecting the inseam fastenings which secure the upper and sole of the shoe together. For this purpose the lower form is arranged to support the shoe inside of the inseam, as illustrated in Figs. 7 and 8, and when pressure is applied to the sole the margins of the sole in which the inseam is located are bent down without exerting a positive pressure upon opposite sides of the fastenings. Thus the inseam fastenings are maintained unbroken and the efficiency of the molding operation is not impaired. The face of the pressing form is of polished metal, having a smooth unbroken surface, and is arranged to rub and smooth the surface of the sole when it engages therewith. In order to accommodate the pressing form, however, to slight inequalities in the thickness of the sole or in the construction of the supporting form, a rubber pad 70 is interposed between each pressing form and the

supporting turret. With this construction and arrangement the sole is molded by a smooth metallic surface which bears upon the sole with a yielding pressure, imparting a highly finished appearance to the surface without liability of breaking the forms.

As the shoe is supported by the form only at the shank, it is necessary to provide some means for automatically gaging the relative longitudinal position of the sole and forms. A toe gage 75 is supported upon an arm 76 and is arranged to engage and position the shoe when the two forms are in alinement with one another. A scale indicated at 77 in Fig. 4, is mounted upon the arm 76, and the gage 75 is adjusted longitudinally of the arm to accommodate different size shoes in accordance with the reading of the scale. With this arrangement, by adjusting the toe gage to correspond to the size of the shoe, the shank of the shoe will always be positioned in the proper operative relation to the pressing forms. As the same size number is employed to designate different lengths of shoes with different styles it is necessary to provide a bodily adjustment of the scale relatively to the arm 76 in order that the zero reading of the scale may be properly positioned for each different style. The arm 76 is journaled upon a vertical rod 74 and a coiled spring 78 surrounds the rod and normally tends to retain the gage in an operative position. The rod 74 is secured to a sleeve 79 surrounding the shaft 15 and is provided with a laterally extending forked arm 80 embracing the standard 21 to prevent a rotation of the sleeve 79. The gage is moved into an inoperative position by a cam 82 provided with a plurality of projections 83 and coöperating with the cam face 84 formed upon the arm 76. The cam 82 is keyed to the shaft 15 and when the shaft is rotated by the movement of the lower form into a position of presentation, one of the cam projections 83 is moved into engagement with the cam surface 84 to swing the gage into an inoperative position. In order to positively lock the gage 75 in engagement with the toe of the shoe during the pressing operation, a depending rod 85 is secured to the crosshead 10 and is arranged to contact with a laterally projecting finger 86 upon a downward movement of the crosshead 10. The finger 86 is fixedly secured to the arm 76 and upon the downward movement of the rod behind the finger, the toe gage 75 is positively locked in an operative position.

The operation of the improved machine is as follows: the latch 18 is first unlocked and the turrets are rotated to bring any desired pair of forms into an operative position. A shoe is then placed upon the supporting form 3 and the treadle 22 is depressed. The depression of the treadle moves the crosshead 10 downwardly until the movement is stopped by the clamp nuts 33 and simultaneously swings the upper and lower forms into alinement through the crank 27, link 28, and the gear connections between the two turrets. A pair of clutches 38 serve to lock the turret 2 at the limit of its downward movement with the two coöperating forms in close proximity, in what is termed for convenience, a position of clearance. At the same time that the forms are swung into alinement, the cam 82 releases the toe gage and allows the same to swing into an operative position under the action of the spring 78, and upon the downward movement of the cross-head 10, the toe gage is locked in this position by the rod 85 and finger 86. Immediately upon the two forms alining with one another, they are locked by the latch 57 engaging with one of the recesses 56 to prevent any longitudinal displacement of the forms and shoe. After the forms have reached a position of clearance, the power actuated mechanism is set into operation to impart a pressure producing movement to the lower form, which movement is secured by straightening a toggle consisting of the two links 47 and 48. After the shoe has remained under pressure the required length of time, the power actuated mechanism is again set into operation to bring the lower form back to a position of clearance. The handle 45 is then moved to release the clutch members 38 and simultaneously withdraw the latch 57 from the recess 56. This allows the crosshead 10 to move upwardly under the action of the springs 35 and at the same time swinging the forms outwardly into a position of presentation so that the shoe may be conveniently removed.

Having thus described the invention, what is claimed is:—

1. A sole pressing machine, having in combination, a shoe supporting form which is narrower at the shank supporting portion than the shank portion of the last of the shoe to allow the upper to hang down loosely upon each side of the form, a sole pressing form coöperating with the shoe supporting form to press the shank portion of the shoe sole and impart the desired curvature thereto, and mechanism for relatively actuating the two forms to secure a direct pressure upon the shank of the sole, substantially as described.

2. A sole pressing machine, having in combination, a pressing form provided with a transversely curved face arranged to simultaneously engage and press down opposite margins of the sole, a coöperating form projecting within the shoe and supporting the shank portion of the sole inside of the inseam while leaving the shank portion of the sole outside of the inseam unsupported in order to maintain the fastenings which secure the upper to the sole un-

broken, and mechanism for relatively actuating the two forms to secure a direct pressure upon the sole, substantially as described.

3. A sole pressing machine, having, in combination, a plurality of coöperating forms, a pair of turrets carrying the forms and arranged to be readily turned to bring different forms into alinement, and mechanism for relatively actuating the turrets in a linear direction to secure a direct pressure upon the sole, substantially as described.

4. A sole pressing machine, having, in combination, a plurality of coöperating forms, a pair of turrets carrying the forms arranged to be readily turned to bring different forms into alinement, operative connections between the turrets for turning them together, and mechanism for relatively actuating the turrets to secure a direct pressure upon the sole, substantially as described.

5. A sole pressing machine, having, in combination, a plurality of coöperating forms, a pair of turrets carrying the forms and arranged to be readily turned to bring different forms into alinement, means for locking the turrets with the forms in alinement, and mechanism for relatively actuating the turrets to secure a direct pressure upon the sole, substantially as described.

6. A sole pressing machine, having, in combination, an incomplete form for supporting the shank of the sole after the sole has been incorporated in a boot or shoe, and means for gaging the relative longitudinal position of the sole and form prior to the pressing operation, substantially as described.

7. A sole pressing machine, having, in combination, an incomplete form for supporting the shoe at the shank, a coöperating pressing form, mechanism for moving the two forms into a position of clearance, and a gage for positioning the shoe upon the supporting form arranged to be moved into engagement with the shoe upon a movement of the forms into a position of clearance, substantially as described.

8. A sole pressing machine, having, in combination, an incomplete form for supporting the shoe at the shank, a coöperating pressing form, mechanism for moving the two forms into a position of clearance, a gage for positioning the shoe upon the supporting form, and means for locking the gage in engagement with the shoe and upon a movement of the forms into a position of clearance, substantially as described.

9. A sole pressing machine, having, in combination, a pressing form, an incomplete shoe supporting form, a toe gage coöperating therewith to position the shoe upon the form, a spring for retaining the gage in an operative position, and means operative upon movement of the supporting form into a position of presentation to move the toe gage into an inoperative position, substantially as described.

10. A sole pressing machine, having, in combination, a pair of turrets, operative connections between the two turrets for turning them together, means for moving one of the turrets in a vertical direction, and mechanism for rotating the turret when a vertical movement is imparted to the same, substantially as described.

11. A sole pressing machine comprising a turret, a vertically movable crosshead supporting the turret, a crank, and a link connecting the crank with the machine frame to rotate the turret upon a vertical movement of the crosshead, substantially as described.

12. A sole pressing machine comprising a turret, a vertically movable crosshead supporting the turret, a collar, means for locking the turret to the collar in different angular positions, a crank formed upon the collar, and a link connecting the crank with the machine frame to rotate the turret when the crosshead is moved vertically, substantially as described.

13. A sole pressing machine, having in combination, a plurality of coöperating forms, a pair of turrets carrying the forms arranged to be readily turned to bring different forms into alinement, operative connections comprising bevel gearing and a telescoping shaft between the turrets for turning them together, and mechanism for relatively actuating the turrets to secure a direct pressure upon the sole, substantially as described.

14. A sole pressing machine, having in combination, a plurality of shoe supporting forms, a plurality of sole pressing forms to coöperate therewith, a pair of turrets carrying the forms, connections between the turrets for turning them together to bring different forms into coöperative position, and means for turning the turret carrying the supporting forms to move a form from a position of presentation to a position of clearance and for relatively actuating the turrets to secure a direct pressure upon the sole, substantially as described.

15. A sole pressing machine, having in combination, a plurality of shoe supporting forms, a plurality of sole pressing forms to coöperate therewith, a turret carrying the shoe supporting forms rotatable to bring any form into coöperative position, and means for turning the turret to move a form from a position of presentation to a position of clearance and for relatively actuating the shoe supporting form and its coöperating form to secure a direct pressure upon the sole, substantially as described.

16. A sole pressing machine, having in combination, a plurality of shoe supporting

forms, a plurality of sole pressing forms to coöperate therewith, a turret carrying the shoe supporting forms rotatable to bring any form into coöperative position, means for turning the turret to move a form from a position of presentation to a position of clearance and for relatively actuating the shoe supporting form and its coöperating form to secure a direct pressure upon the sole, and means for locking the turret from rotation in its position of clearance, substantially as described.

17. A sole pressing machine, having in combination, a pivotally mounted shoe supporting form, a coöperating sole pressing form, mechanism for moving the coöperating form toward the shoe supporting form and for swinging the shoe supporting form from a position of presentation to a position of alinement with the coöperating form, and mechanism for moving the supporting form toward the coöperating form to secure a direct pressure on the sole, substantially as described.

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