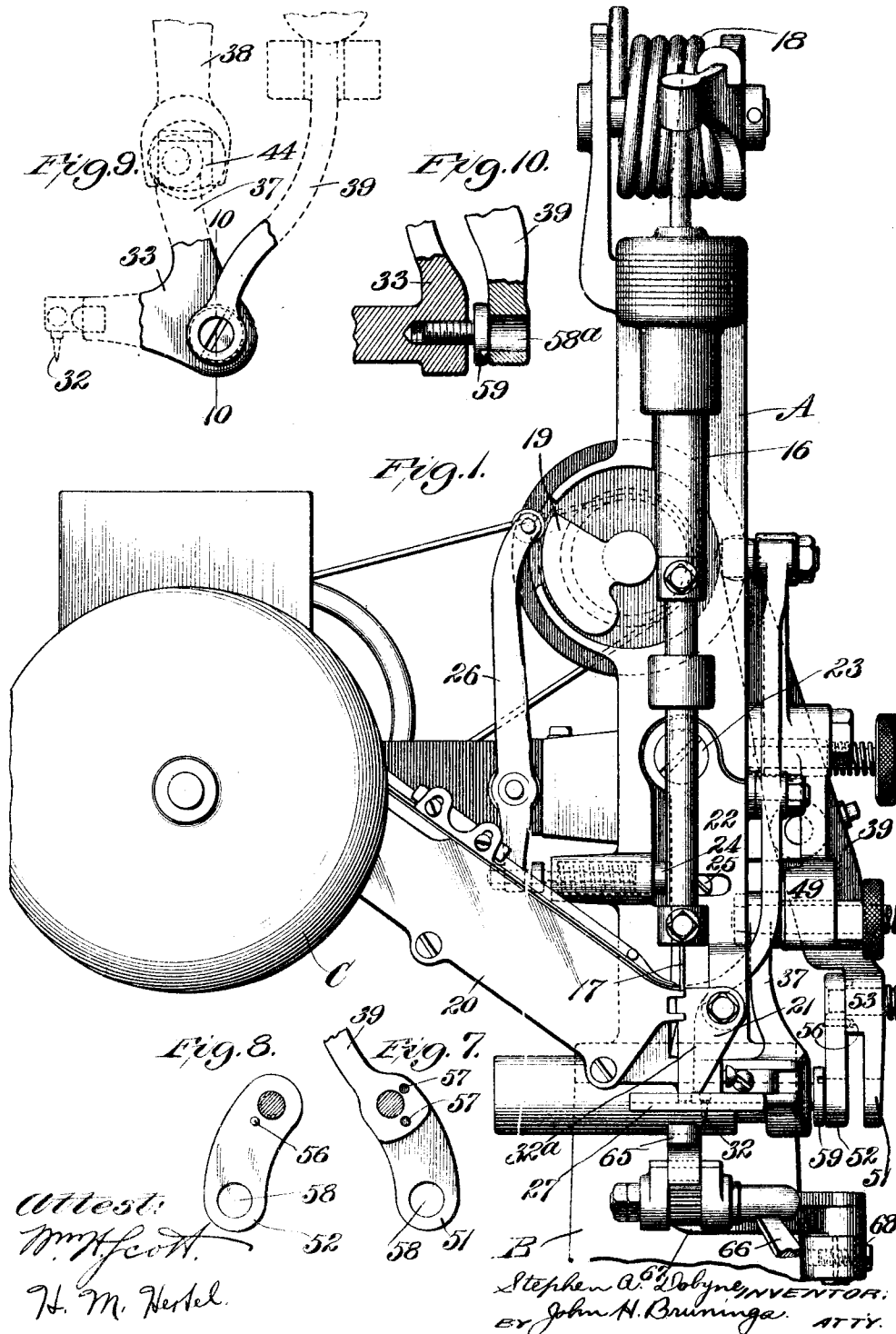


S. A. DOBYNE.
FASTENER INSERTING MACHINE.
APPLICATION FILED JAN. 26, 1911.

1,026,025.

Patented May 14, 1912.

3 SHEETS-SHEET 1.

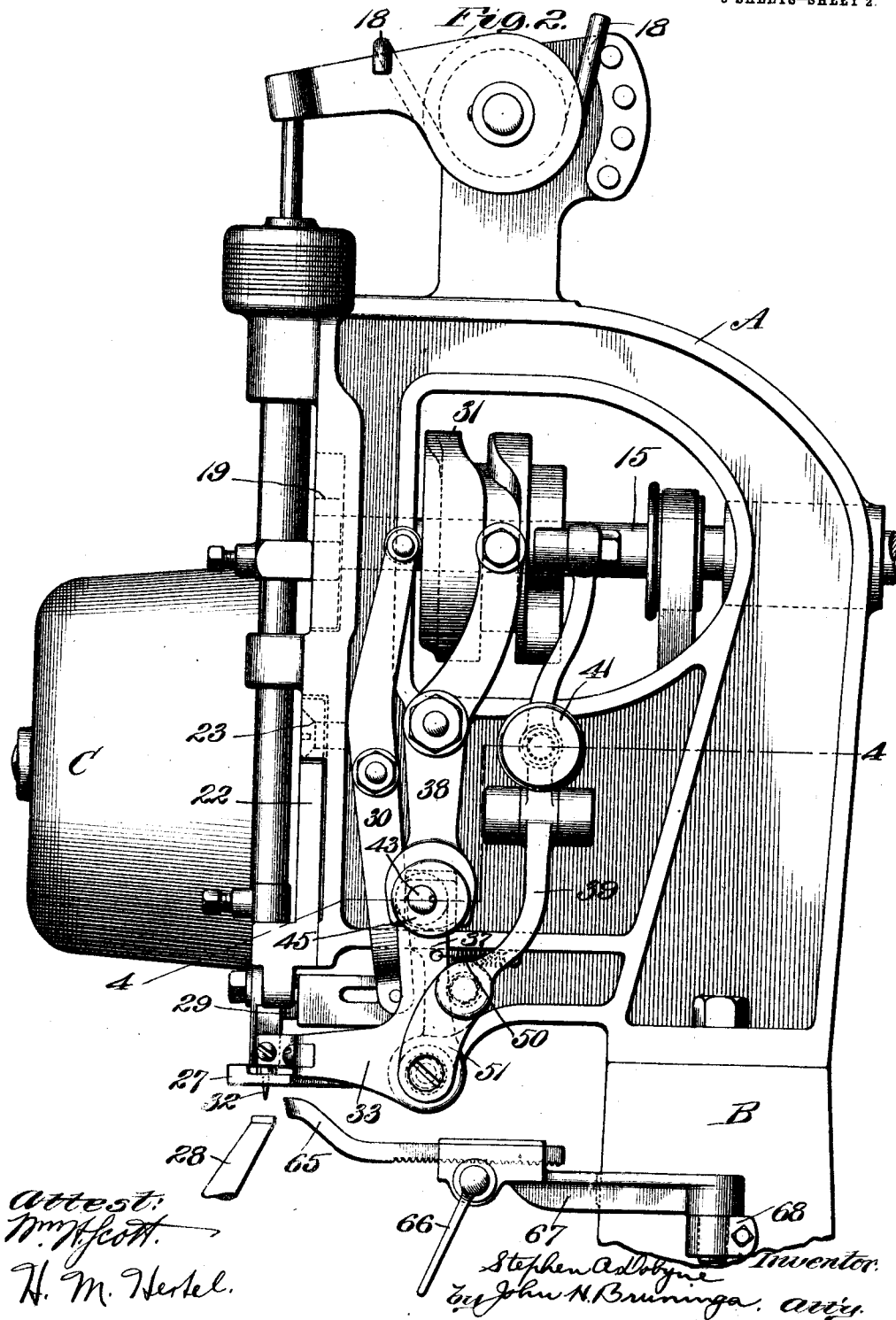


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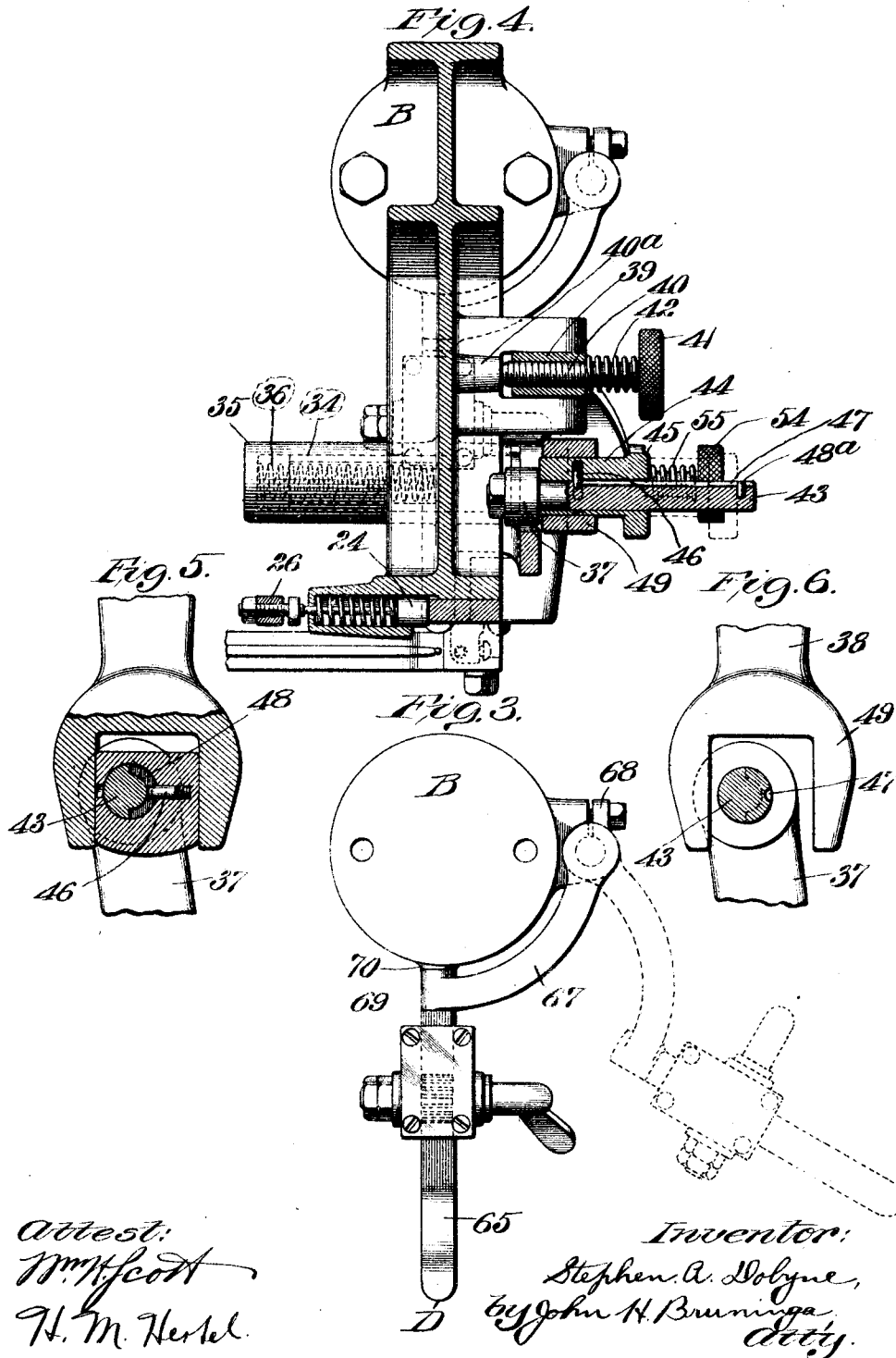


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3 SHEETS-SHEET 3.



Attest:
H. M. Herd
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UNITED STATES PATENT OFFICE.

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FASTENER-INSERTING MACHINE.

1,026,025.

Specification of Letters Patent.

Patented May 14, 1912.

Application filed January 26, 1911. Serial No. 604,906.

To all whom it may concern:

Be it known that I, STEPHEN A. DOBYNE, a citizen of the United States, and residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Fastener-Inserting Machines, of which the following is a specification.

This invention relates to fastener inserting machines, and more particularly to machines adapted to operate upon shoes.

Machines of the character referred to, have generally associated with the fastener inserting machines, means for feeding the work with respect to the fastener inserting mechanism, a work support, and a gage for gaging the position where the fasteners are to be inserted in the work. The feeding means generally consist of an awl which also punctures or pierces the work to form a hole for the reception of the fastener.

It is sometimes desirable to drive a fastener or fasteners without feeding the work, for instance when utilizing the machine to lay soles on shoes, or when building up and temporarily securing lifts on heels in repair work. In such cases it is also desirable to withdraw the work gage out of operative position.

One of the objects of this invention therefore is to construct a machine in which the work feeding mechanism can be thrown into and out of operation so as to render it effective and ineffective to feed the work at the pleasure of the operator.

Another object is to combine with the above mechanism a work gage which can be moved into and out of operative position with respect to the fastener inserting mechanism.

Another object is to improve the work feeding mechanism, the gage and the fastener inserting mechanism itself as to details, and further objects will appear from the detail description taken in connection with the accompanying drawings in which:

Figure 1 is a front elevation of a fastener inserting machine showing one embodiment of this invention, Fig. 2 is a side elevation, Fig. 3 is a plan of the machine column and the gage, Fig. 4 is a section on the line 4-4 Fig. 2, Figs. 5 and 6 are sections showing the block connecting the work feeding member and its actuator in operative and inoperative positions respectively, Figs. 7 and 8 are details of the actuator lever, Fig. 9 is a

side elevation of a part of the mechanism showing another embodiment of this invention, and Fig. 10 is a section on the line 10-10 Fig. 9.

The invention is shown as applied to a fastener inserting machine of the "loose nailer" type as shown and described in my copending application Serial No. 593,330; it will be understood however that the invention may be equally well applied to other types of fastener inserting machines. In this connection it will be understood that the term "fastener inserting machine" is not to be limited to that type in which the fastener is only utilized to fasten parts together, but is intended to cover also slugging machines, that is, machines in which nails are driven for wear increasing purposes.

Referring to the accompanying drawings, A designates the machine head or frame and B the machine column upon which it is mounted. The head supports a main driving shaft which is provided with cams and pulleys to operate the different mechanisms in a manner hereinafter described. A driver bar 16 having an attached driver 17 is mounted to reciprocate in bearings on the machine head. This driver bar is driven down by means of a spring 18, and raised against the tension of the spring by means of a cam 19 on the shaft 15 engaging a cam roll on the driver bar. A raceway 20 slides in guides in a loader C, the rotary element of which is driven from the main shaft by a belt and pulley as shown in the drawings. The lower end of the raceway has rigidly secured thereto a nail block or throat 21, which is provided with a driver passage for the driver, and the nail block and raceway are pivoted to the lower end of a link 22 which is mounted for swinging movement on a pivot 23 in the machine head. A spring pressed plunger 24 operates to move the link and the attached nail block and raceway in one direction, and a stop 25 on the machine head engaging a slot in the link limits this movement. A lever 26 provided at one end with a roll engaged by the cam 19 operates through the plunger 24 to positively return the parts to initial position. A work support or presserfoot 27 is secured to the machine head, and forms a support against which the work can be held during the operation of the machine, either by hand or by being supported on a horn or other work

support 28. The fasteners are fed from the raceway to the throat or driver passage by means of a separator or picker 29 operated by means of a lever 30 from the cam 31 on the main shaft.

The support or presserfoot 27 is provided with a slot in which work the tip of the nail block and the awl 32. This awl is mounted upon an awl carrier 33, which is provided with a hollow cylindrical shank 34 sliding in a tubular guideway 35 on the machine head and is pressed outwardly by means of a spring 36. An arm 37 on the awl carrier has a connection with an actuating lever 38 which has a roll engaging a cam groove on the cam 31. This mechanism imparts a piercing movement to the awl. The feeding movement is imparted to the awl by means of an actuating lever 39 the lower end of which bears against the awl carrier, and the upper end of which is provided with a cam roll engaging a cam surface on the cam 31.

The awl actuating mechanism operates to depress the awl so as to pierce the work and then imparts a feeding movement thereto. This feeding movement takes place while the driver is in raised position, and during this feeding movement the awl carrier will engage a shoulder 32^a on the nail block and move the nail block together with the raceway to the left. After the feeding movement has been completed and when the awl is returned or retracted by the cam and the spring 36, the yieldingly and positively operated plunger 24 will operate to move the nail block and raceway back over the hole made by the awl so as to position a fastener directly above said hole, which fastener is then driven. The lever 39 is provided with an adjusting screw 40 which is provided with a knurled head 41 and has a spring 42 thereon, and this screw bears against a stationary stop 40^a on the machine head. By means of this construction the feeding movement of the awl can be adjusted. The arm 37 on the awl carrier is provided with a pin or shaft 43 which receives a block 44. This block slides on the shaft and is arranged to be moved into and out of engagement with a fork 49 on the lever 38. The block 44 is provided with a knurled head 45 and a rounded spring pressed pin 46 which engages longitudinal and circumferential grooves 47 and 48 on the shaft. A stop 48^a prevents the block from being pulled entirely off the shaft.

The lower end of the lever 39 is provided with fixed and movable lugs 51 and 52, the lug 52 being secured to a shaft 53 so as to move therewith, and the shaft 53 being provided with a knurled head 54 and a spring 55. The lug 52 is provided with a pin or lug 56 arranged to engage either of two recesses 57 formed in the lever 39. The

lug 52 is arranged to engage an adjustable screw 59 in the awl carrier and both of the lugs 51 and 52 are provided with holes or recesses so that the screw 59 may be manipulated by a screw driver for the purpose of aligning the awl with respect to the driver for different feeds without necessitating the dismantling of the lever 39.

A work gage 65 is provided as usual with a gear and rack so as to be capable of adjustment. A handle 66 on the gage carrier 67 is provided with a gear which engages the rack on the gage. The gage carrier is mounted laterally or on one side of the column or post B in split bracket 68 which is provided with a screw so as to frictionally clamp the carrier in position. The carrier is provided with a stop 69 cooperating with a stop 70 on the column, and it will be noted that these stops are in line with the gage face D, so that when the gage is in operative position any pressure brought against it will tend rather to seat than unseat it. The gage can be swung into and out of operative position underneath the fastener inserting mechanism.

When the parts are in the positions shown in the drawings the actuating mechanisms for the awl or work feeding member have an operative connection therewith so that the awl is effective for feeding the work. The awl can be thrown out of operation and its feeding action interrupted in two ways: first, by interrupting its piercing action, and second, by interrupting its feeding action, or these two methods may be used in conjunction to arrest the actions of the awl altogether.

In accordance with the first method the piercing action of the awl is interrupted by moving the block 44 from full line to dotted line position Fig. 4. When the block is so withdrawn there is sufficient play or lost motion between the members 37 and 38 so that the movement of the actuator lever 38 will have practically no effect upon the awl carrier. In order that the awl may be withdrawn from the work and placed in retracted position, a spring 50 having one end secured to the arm 37 and the other end to the machine head is arranged to swing the awl carrier and place the awl in retracted or withdrawn position out of the work. For this purpose the block is eccentric as shown, so that the shaft 43 and the awl carrier can have a movement sufficient to withdraw the awl completely from the work, even though the lever 38 is at the limit of its piercing movement. The awl carrier is arrested by engaging the nail block, or by the engagement of the pin or shaft 43 with the right inner face of the fork 49. In the latter case the awl carrier will receive a vibratory movement by the action of the lever 38 and spring 50, but

the awl will now be raised so that it will not pass through the presser foot. It is therefore not necessary that the awl carrier be completely disconnected from its actuator, provided the awl will not in its lowest position pass through the presser foot. The pin and groove connection between the block 44 and the shaft 43 is provided so that the block will be retained in correct position when withdrawn and thus can be moved into operative and inoperative positions, even while the machine is running. The groove 48 is slightly deeper than the groove 47 so that the block will be yieldingly latched in operative position. This block is, of course, long enough to permit the necessary feeding movement of the awl and its carrier when the block is latched in operative position.

In accordance with the second method the feeding action or movement of the awl can be interrupted by swinging the lug 52 out of alinement with the screw 59 and the awl carrier, the lug being held in the second or inoperative position by the engagement of the pin 56 with the other of the recesses 57. When the lug is in this last named position there will be no feeding engagement between the lever 39 and the awl carrier so that no feeding movement will be imparted to the awl, the awl carrier remaining in retracted position in which it is placed by the spring 36. In this case the fork 49 forms a stop for limiting the retracted movement of the awl. When the lug is thrown out of the path of the screw 59, the spring 36 will move the awl carrier until the head of arm 37 abuts against and is stopped by the fork 49. The gap between 51 and 52 is sufficient so that 51 will not engage or operate the awl carrier. Any other suitable stop may of course be provided to limit the retracted movement of the awl and its carrier. In this case the piercing movement of the awl is not interrupted but the feeding movement is. This may, of course, be objectionable in certain classes of work where it is not desirable to mar the work.

It will be understood that the separate means for rendering the work feeding mechanism inoperative or ineffective may be used separately or in conjunction. Each has its advantages and disadvantages, thus the first method keeps the nail block and raceway in motion while the second does not. The former is however advantageous where the movement of the raceway is utilized to prevent clogging of the nails as in this specific embodiment.

Figs. 9 and 10 show a construction in which the lever 39 has a plain engaging portion instead of being provided with a movable lug 52. In this construction the feeding action is interrupted by the shifting block 44 as in the construction shown in the

other figures, so as to merely interrupt the piercing action of the awl, leaving its movement in the line of feed unimpaired. The end of the lever 39 is also provided with a hole or recess 58^a for a tool. Similarly the connection between lever 38 and the awl carrier may be a simple connection as in my prior application referred to. In this case the feeding operation can be interrupted by shifting the lug 52 so as to interrupt the feeding movement and action of the awl leaving its piercing action unimpaired.

It is desirable, in some classes of work when the awl is thrown out of operation, that the gage be also thrown out of the way; for instance, when the machine is used for laying soles or for temporarily securing heel lifts in position in repair work. In the sole laying operation, the sole is laid on the shoe or last and a number of fasteners driven along the center of the sole or in the channels and heel seat. This, of course, requires a machine which has no gage, and an awl feed is also not desirable in this case since it will tend to shift the loosely laid sole out of position. The same is true of heel repair work. In accordance with this invention the machine can be rapidly converted into a sole laying or lift attaching machine, and can also be converted back into a sole attaching or a slugging machine at the pleasure of the operator.

It will thus be seen that this invention provides means whereby the work feeding mechanism can be rendered effective and ineffective at the pleasure of the operator. This is accomplished by making and breaking the connection between the work feeding member and its actuating mechanism, or by raising the member out of engagement with the work and retaining it out of engagement while the fastener inserting mechanism remains uninterrupted to insert fasteners. The awl or work feeding member can also be adjusted to vary its feeding stroke and its position with respect to the fastener inserting mechanism.

The awl and the nail block or throat are moved transversely with respect to the driver through the actuating lever 39. The awl and nail block are however returned through independent means, the awl through the spring 36 and the nail block through the yielding and positively actuated plunger 24. The nail block is positioned in alinement with the driver by means of the stop 25 on the machine head or frame, and the awl carrier is arrested by the engagement of the screw or stop 40 thereon with the stop 40^a on the machine head or frame. The adjustment of the screw 40 enables the feed of the awl to be adjusted. The nail block and awl carrier are therefore arrested by independent stops. The screw 59 is adapted to accurately aline the awl with the driver as is

necessary in awl feed machines. The adjustment of the screw 40 for the purpose of varying the feed will not disturb the alinement of the nail block with the driver, and the adjustment of the screw 59 for the purpose of alining the awl with the driver will not disturb the feed of the awl nor the position of the nail block. The positioning means for the nail block and the adjustments for the awl are therefore absolutely independent so that the adjustment of one will not disturb the other.

It is obvious that various changes may be made in the details of construction without departing from this invention, and it is therefore to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention what is claimed is:

1. In a fastener inserting machine, the combination with a shoe support, mechanism for inserting nails into the shoe on said support, shoe feeding mechanism, and an independently mounted gage for the shoe, of means for rendering said shoe feeding mechanism effective and ineffective to feed the shoe, constructed to leave the nail inserting mechanism uninterrupted to insert nails, the said gage being movable into and out of operative position.

2. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support and a work feeding member, of mechanism for moving said member to engage the work and in the line of feed of the work, and means for controlling the work engaging movement adapted to place the work feeding member in withdrawn position to interrupt the feed and constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

3. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support and work feeding mechanism positively operated in one direction and yieldingly retracted, of controlling mechanism for throwing said mechanism out of action constructed to leave it in retracted position and leave the fastener inserting mechanism uninterrupted to insert fasteners.

4. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support and work feeding mechanism positively operated in one direction and yieldingly retracted, of controlling mechanism for throwing said mechanism out of action to interrupt the work feeding operation and constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

5. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support and awl feed mechanism,

of means for interrupting the feeding action of said awl feed mechanism constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

6. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support, an awl, and means for moving the awl to pierce the work and in the line of feed of the work, of means for controlling one of said movements constructed to interrupt the feeding operation and leave the fastener inserting mechanism uninterrupted to insert fasteners.

7. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support, an awl, and means for moving the awl to pierce the work and in the line of feed of the work, of means for interrupting the piercing action of said awl constructed to interrupt the feed of the work and leave the fastener inserting mechanism uninterrupted to insert fasteners.

8. In a fastener inserting machine, the combination with fastener inserting mechanism including a movable nail block, of a work feeding member engaging said block, and means for rendering said member effective and ineffective to feed the work constructed to leave the nail block effective for the insertion of fasteners.

9. In a fastener inserting machine, the combination with fastener inserting mechanism including a movable nail block, of a work feeding member engaging and moving said block, and means for interrupting the feeding movement of said member constructed to leave the nail block effective for the insertion of fasteners.

10. In a fastener inserting machine, the combination with fastener inserting mechanism including a driver and a nail block movable into and out of alinement with said driver, of an awl movable toward the work and in the line of feed of the work, and means for holding the awl in retracted position out of the work constructed to interrupt the feed of the work and leave the nail block effective for the insertion of fasteners.

11. In a fastener inserting machine, the combination with fastener inserting mechanism including a driver and a nail block movable into and out of position under the driver, of an awl movable toward the work and in the line of feed of the work and constructed to engage and move said block, and means for interrupting the movement of the awl in the line of feed constructed to leave the nail block under the driver.

12. In a fastener inserting machine, the combination with fastener inserting mechanism including a movable nail block and a raceway connected thereto to move therewith, of a work feeding member movable toward the work and in the line of feed of the work, and means for controlling the

movement toward the work constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

13. In a fastener inserting machine, the combination with fastener inserting mechanism including a movable nail block, a loader, and a raceway connected to said nail block and moving in said loader, of an awl carrier movable toward the work and in the line of feed and constructed to engage said nail block and move it and said raceway, an awl on said carrier and means for holding the awl carrier in retracted position with the awl out of the work.

14. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support and work feeding mechanism adapted to engage and feed the work, of means for adjusting said work feeding mechanism, and means for throwing said mechanism into and out of operation constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

15. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support, a work feeding member, and means for moving said member toward the work and in the line of feed of the work, of means for adjusting the feeding movement of said member, and means for rendering said member effective and ineffective to feed the work constructed to leave the fastener inserting mechanism uninterrupted to insert fasteners.

16. In a fastener inserting machine, the combination with fastener inserting mechanism, a work support, a work feeding member, and means for moving said member toward the work and in the line of feed of the work, and means for moving said member to retracted position and away from the work constructed to interrupt the feed and leave the fastener inserting mechanism uninterrupted to insert fasteners.

17. In a fastener inserting machine, the combination with a work feeding member, of an actuator therefor, and an adjusting member between said feeding member and actuator, said actuator being recessed to permit manipulation of said adjusting member.

18. In a fastener inserting machine, the combination with a work feeding member, of an actuator therefor engaging the same, and an adjusting screw between said feeding member and actuator, said actuator being provided with a recess to permit manipulation of said screw.

19. In a fastener inserting machine, the combination with a work feeding member, of an actuator lever therefor, and an adjusting screw on said member against which said lever bears, said lever being provided with a recess opposite said screw to permit manipulation thereof.

20. In a machine of the class described, the combination with a support, fastener inserting mechanism thereon having a presser foot, and a shoe horn, of a work gage mounted on said support rearwardly of said fastener inserting mechanism and horn and adapted to swing horizontally into and out of position underneath the presser foot and the fastener inserting mechanism.

21. In a machine of the class described, the combination with a support, fastener inserting mechanism thereon having a presser foot, and a shoe horn, of a work gage mounted laterally on said support rearwardly of said fastener inserting mechanism and horn and adapted to swing horizontally into and out of position underneath the presser foot and the fastener inserting mechanism, and cooperating stops on said gage and support located rearwardly of and in the line of the work face of said gage.

22. In a machine of the class described, the combination with a column, fastener inserting mechanism thereon having a presser foot, and a shoe horn, of a work gage pivoted laterally on said column rearwardly of said fastener inserting mechanism and horn and adapted to swing horizontally into and out of position underneath the presser foot and the fastener inserting mechanism.

23. In a fastener inserting machine, the combination with fastener inserting mechanism, and an awl having piercing and work feeding actions, of means for actuating said awl, and means for interrupting the work feeding action of the awl without interrupting the piercing action and constructed to interrupt the feed of the work and leave the fastener inserting mechanism uninterrupted to insert fasteners.

24. In a fastener inserting machine, the combination with fastener inserting mechanism, and an awl having piercing and work feeding actions, of means for holding the awl in retracted position and out of the work constructed to interrupt the feed of the work and leave the fastener inserting mechanism uninterrupted to insert fasteners.

25. In a fastener inserting machine, the combination with fastener inserting mechanism, and an awl having piercing and work feeding actions, of means for positively actuating the awl in both directions, and means for controlling the operation of said awl by said actuating means constructed to interrupt the feed of the work and leave the fastener inserting mechanism uninterrupted to insert fasteners.

26. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in

said loader, means for moving said throat into and out of alinement with said driver, and a stop on the machine frame for positioning said throat in alinement with said driver.

27. In a machine of the class described, the combination with a frame and a driver thereon, of a plate pivoted at its upper end to said frame and provided at its lower end with an elongated driver passage adapted to receive said driver therein and guide a nail while being driven by said driver, means for moving said plate to move said driver passage into and out of alinement with the driver, said plate being provided with a slot, and a pin on said frame and in said slot.

28. In a machine of the class described, the combination with a frame and a driver thereon, of a throat mounted on said frame for movement into and out of alinement with said driver, a raceway movable with said throat, a stop on said frame, and means for moving said throat out of alinement with said driver, and for positively moving said throat into alinement with said driver and into engagement with said stop.

29. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, and stops on the machine frame, one for said awl mechanism and the other for positioning said throat in alinement with said driver.

30. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, means for adjusting said awl mechanism to vary the feed, and means for alining said awl with said driver.

31. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat

mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, means positioning said throat in alinement with said driver, means for adjusting said awl mechanism to vary its feed, and means for alining said awl with said driver.

32. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, and means independent of each other for positioning said throat, for adjusting said awl mechanism to vary its feed, and for alining said awl with said driver.

33. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, independent stops for said throat and said awl mechanism, and means for alining said awl with said driver.

34. In a machine of the class described, the combination with a frame, and a driver and a nail loader thereon, of a throat mounted for transverse movement on said frame, a raceway movable with said throat and in said loader, awl mechanism including an awl, means for moving said awl and throat into and out of alinement with said driver, said throat being moved through said awl mechanism, and means independent of each other for positioning said throat, for adjusting said awl mechanism to vary its feed, and for alining said awl with said driver.

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

STEPHEN A. DOBYNE.

Witnesses:

J. H. BRUNING,

GERTRUDE HESSING.