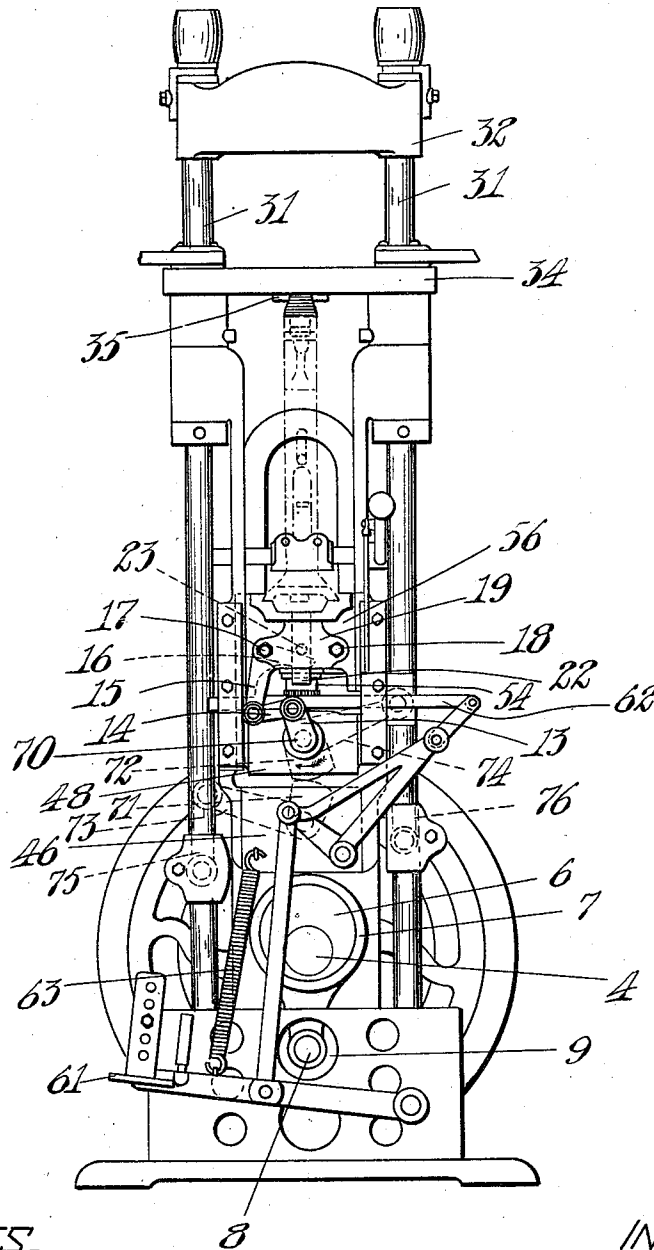


A. BATES.
MACHINE FOR INSERTING NAILS IN HEELS.
APPLICATION FILED JULY 11, 1910.

1,000,957.

Patented Aug. 15, 1911.

4 SHEETS-SHEET 1.



WITNESSES.

Elizabeth C. Coupe
Mary E. Mendum

Fig. 1.

INVENTOR.

Arthur Bates
By his Attorney
Nelson H. Howard

A. BATES.
MACHINE FOR INSERTING NAILS IN HEELS.
APPLICATION FILED JULY 11, 1910.

1,000,957.

Patented Aug. 15, 1911.

4 SHEETS—SHEET 2.

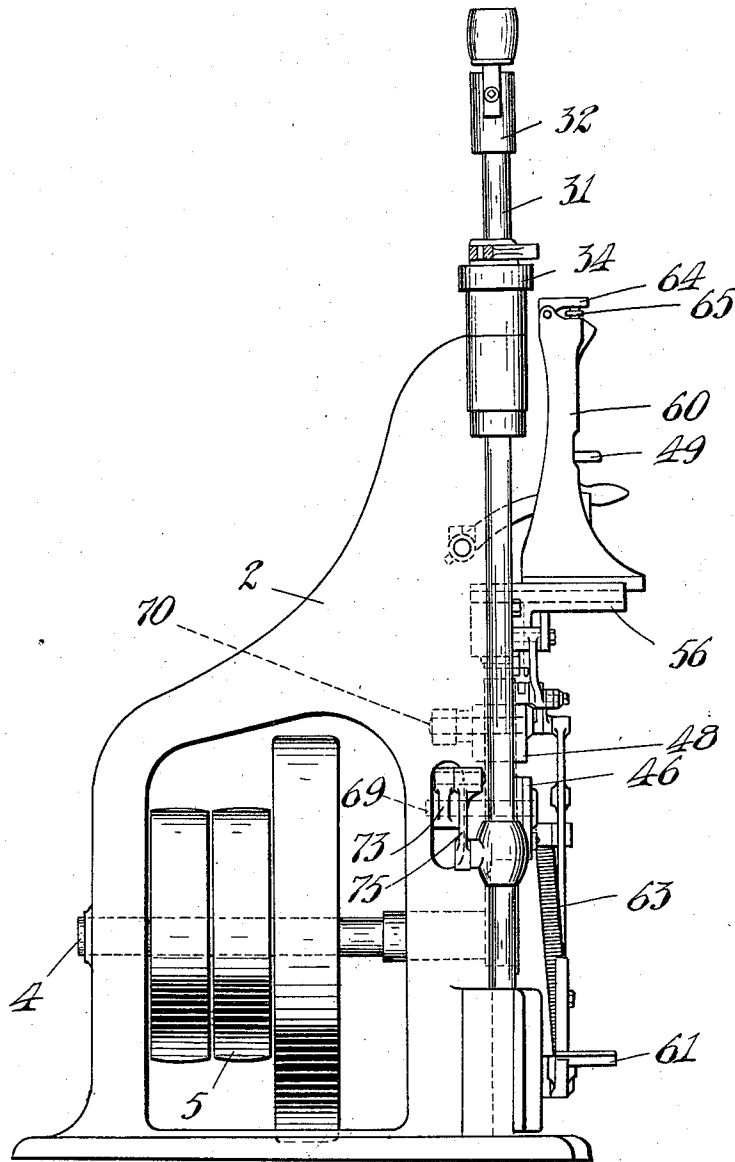


Fig. 2.

WITNESSES.

Elizabeth C. Coyle
Mary E. Mendum

INVENTOR.

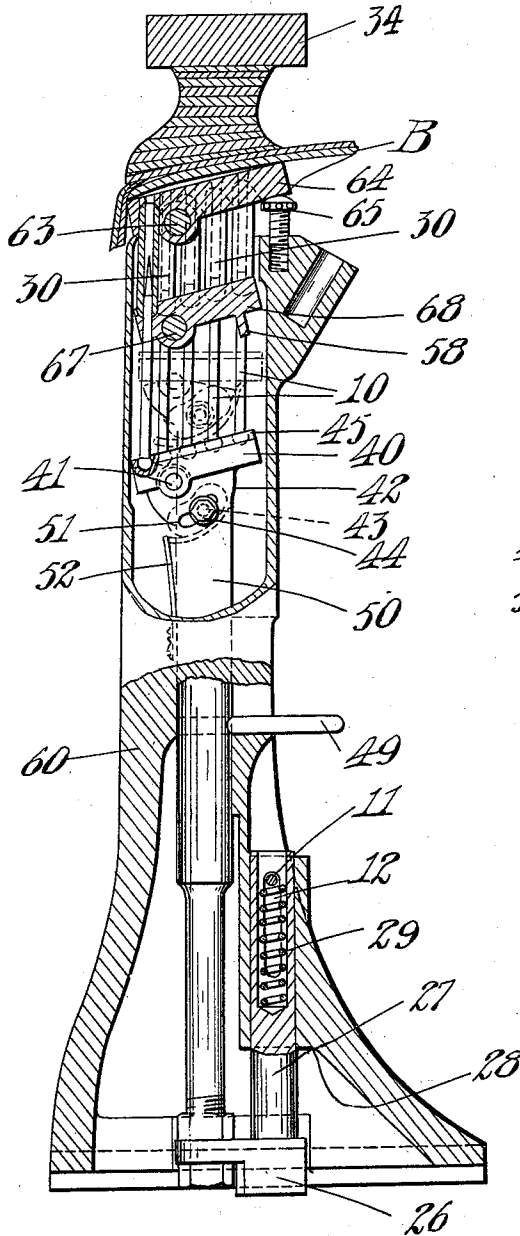
Arthur Bates
By his Attorney,
Nelson Howard

A. BATES.
MACHINE FOR INSERTING NAILS IN HEELS.
APPLICATION FILED JULY 11, 1910.

1,000,957.

Patented Aug. 15, 1911.

4 SHEETS—SHEET 3.



WITNESSES. Fig. 3.

Elizabeth C. Cooper
Mary E. Mendon

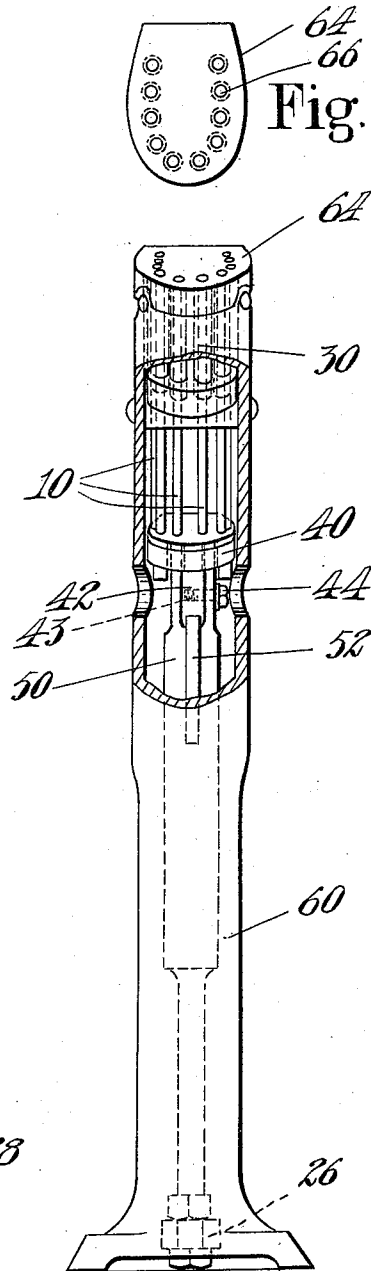


Fig. 4. INVENTOR.

Arthur Bates
By his Attorney,
Nelson W. Howard

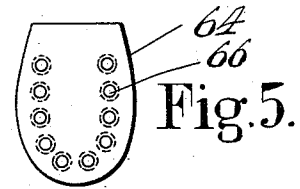


Fig. 5.

A. BATES.
MACHINE FOR INSERTING NAILS IN HEELS.
APPLICATION FILED JULY 11, 1910.

1,000,957.

Patented Aug. 15, 1911.

4 SHEETS—SHEET 4.

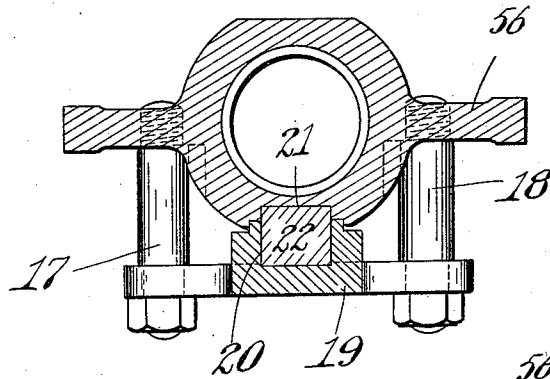


Fig. 7.

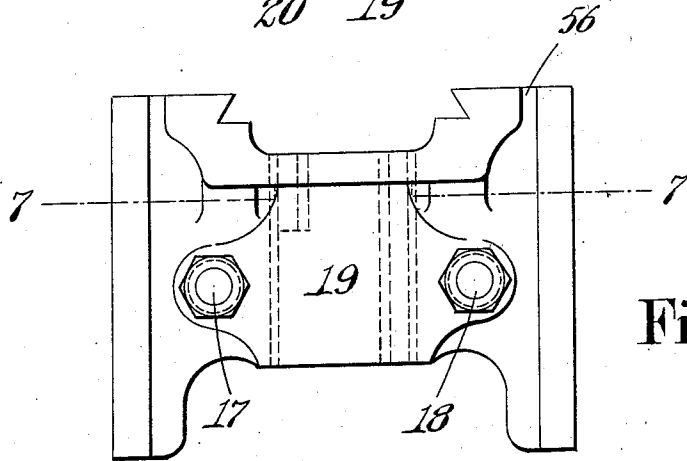


Fig. 6.

Fig. 8.

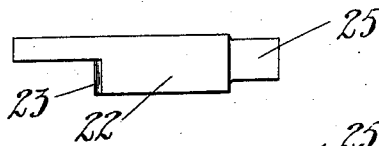


Fig. 9.

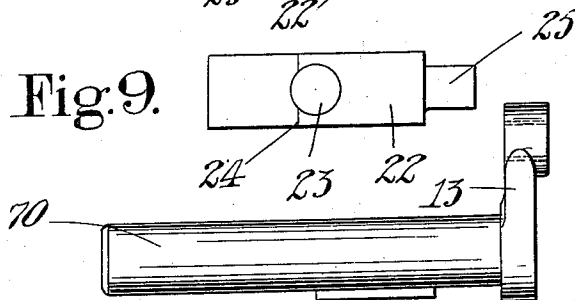
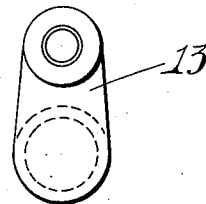


Fig. 11.



WITNESSES:

Elizabeth C. Couper.

Mary E. Mendum

Fig. 10.

INVENTOR.

Arthur Bates
By his Attorney,
Nelson W. Howard

UNITED STATES PATENT OFFICE.

ARTHUR BATES, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR INSERTING NAILS IN HEELS.

1,000,957.

Specification of Letters Patent. Patented Aug. 15, 1911.

Original application filed August 15, 1903, Serial No. 169,643. Divided and this application filed July 11, 1910. Serial No. 571,360.

To all whom it may concern:

Be it known that I, ARTHUR BATES, a subject of the King of England, residing at Leicester, Leicestershire, England, have invented certain Improvements in Machines for Inserting Nails in Heels, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for inserting nails in heels.

While the invention is shown embodied in a machine for attaching heels by nails driven from within the shoe, it will be obvious from the following description that many features may be used in other types of machines for operating on heels. For example, it is believed that heretofore a gang of tools has never been employed in a machine for operating upon heels as an element of the combination which includes oppositely disposed work engaging members, one of which comprises an apertured plate with a work engaging face arranged to be sustained at an inclination to the path of movement of the tools, all of said tools being inclined in the same general direction from normals to the work engaging face of said plate at the points at which the paths of the tools intersect said face.

It will be understood that the present embodiment is shown by way of example and that the invention is not restricted to this embodiment except as indicated by the terms of the appended claims.

According to an important feature of the present invention the nails required to attach a heel completely to the heel seat of a shoe are driven into the heel, inclined longitudinally of the heel with relation to the surface which they first enter. An advantage incident to the insertion of the nails in longitudinally inclined positions relatively to the surface wherein they enter the heel is that thereby the heel may be secured more firmly than when the nails are driven perpendicularly to said surface. As herein shown the attaching nails are driven in parallel paths and the insertion of the nails in such relation presents the advantage of permitting a machine for inserting heel attaching nails to be made more simple in construction and more reliable and durable in operation than where the nails are driven in non-parallel paths, as has heretofore been proposed and practiced. In the present embodiment of the foregoing feature, a nail block or other device having driver passages and a work engaging surface is provided, the driver passages being parallel and intersecting said surface at a uniform inclination. The outlet ends of said passages lie in a plane, and the nail engaging ends of the drivers operating in said passages are in a plane parallel to the plane of the outlets. The drivers are preferably of a uniform length to facilitate replacement in case of fracture. To this end the drivers are secured to a driver plate having a driver carrying face oblique to the drivers and parallel to their nail engaging ends.

In order to hold the work under pressure while the nails are being driven, there is provided a work engaging member between which and the nail block the work is held. Preliminary to driving the nails said member and nail block are moved relatively to subject the work to pressure, this relative movement being preferably in a direction parallel to the driver passages. In the present embodiment the work engaging member referred to is stationary and the nail block is moved toward said member to subject the work to pressure.

A further feature of the invention consists in mechanism for inserting heel attaching nails so constructed and arranged that the angle of inclination at which the nails are driven into the work may be varied to suit different conditions. This result is secured in the machine shown by constructing the nail block so that the inclination of its work engaging face relatively to the driver passages may be varied, the direction of said driver passages remaining unchanged. To accommodate change in inclination of the face of the nail block the drivers may be so arranged that they may be adjusted in position to maintain their nail engaging ends in a plane parallel with the plane of the outlets of the driver passages. The construction may be conveniently such that the drivers are adjusted together, rather than separately. Preferably adjustment of the drivers in accordance with the position of the work en-

gaging face of the nail block is insured by so arranging the parts that adjustment of the nail block causes a proper adjustment of the drivers.

5 In the embodiment of the invention illustrated the nail block is mounted upon a head arranged for movement toward and from a work engaging member adapted to resist pressure applied to the work. A driver carrying plunger is arranged for rectilinear movement upon the head in a direction parallel to the driver passages. At one side of the plunger is pivoted a lever for imparting movement to the plunger toward 10 the work, the lever being connected through intermediate mechanism with a source of power in the machine. Return movement of the plunger is preferably effected by a spring arranged upon the head, coöperating with a stop for limiting said return movement. The mechanism for imparting movement to said lever is so constructed and arranged as to permit movement of the nail block toward the coöperating work engaging 15 or pressure resisting member without causing movement of the drivers relatively to the nail block toward the work.

In the machine herein illustrated the heel attaching nails are driven from within the shoe and the nail block is accordingly formed and arranged to enter a shoe. The nail block is secured upon a shoe support or jack, mounted for movement upon the head into and out of operative position to facilitate application and removal of the shoe. The driver carrying plunger is arranged within the shoe support, and the actuating mechanism for said plunger is constructed and arranged to accommodate movement of said support into and out of operative position. 20

Other features of the invention will be hereinafter described and referred to in the appended claims.

25 The advantages above pointed out and others incident to the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings in which,—

Figure 1 is a front elevation of a heel attaching machine embodying the present invention; Fig. 2 is a view in side elevation of the machine shown in Fig. 1; Fig. 3 is a side elevation partly in section of the jack post and drivers; Fig. 4 is a similar view taken at right angles to Fig. 3; Fig. 5 is a plan view of the adjustable work support; Fig. 6 is a front elevation of the jack carriage which supports the post illustrated in Figs. 3 and 4; Fig. 7 is a sectional view on line 7—7 of Fig. 6; Figs. 8 and 9 are views at right angles to one another of a part of 30 the driver actuating mechanism; Figs. 10

and 11 are views at right angles to one another of another part of the driver actuating mechanism.

The machine illustrated in the drawings is of the general type disclosed in United States Letters Patent No. 446,885 granted February 24, 1891 on an application of J. H. Pope and in co-pending application Serial No. 169,643 of which the present application is a division. The main frame 2 of the machine is shown as provided with suitable journals for a driving shaft 4 which is arranged to be rotated from any suitable source of power by a fast pulley 5. Upon the forward end of the driving shaft is an eccentric 6 surrounded by an eccentric strap 7, the lower end of which is pivoted at 8 to a lower cross-piece 9 guided in ways formed in the lower portion of the frame 2. To the cross piece 9 are secured the upwardly extending rods 31 connected at their upper ends by a cross-head 32. A stationary cross-bar 34 is rigidly mounted in the forward part of the frame and is provided with bearings through which the rods 31 may be reciprocated. The bar 34 acts as an abutment or pressure resisting member against which the heel blank is compressed on the elevation of the jack, as will be hereinafter explained and it may be sloped or shaped in any convenient manner according to the requirements of the work. Upon the under side of this cross-bar are arranged heel-holding clamps 35 in which the heel to be attached may be placed. 70 75 80 85 90 95 100

Upon the front of the frame is formed a block or projection 46 and above this projection is arranged a vertically movable block 48 adapted to reciprocate in guides formed in the sides of the frame and referred to hereinafter as the jack carriage support. On the top of the block 48 is supported the lower end of a vertical jack screw 54, the upper end of which is threaded into a head shown as a jack carriage 56 having ways formed on its upper side in which the jack 60 is adapted to slide forwardly and rearwardly. The jack screw 54 is preferably formed with a pinion on its lower end and may be rotated from a treadle 61 suitably connected with a rack 62 meshing with the pinion, as in the construction shown in said patent above mentioned. 110 115 120

The jack 60 may be pulled forwardly in the ways on the carriage 56 to receive a shoe preparatory to the attaching operation and then pushed back into nailing position. After the jack has been positioned horizontally it is elevated to bring the heel seat of the sole against a heel held under the cross-bar 34. This movement is effected manually by the operator by rotating the jack screw 54 through the treadle 61 which moves the jack carriage 56 upwardly away from the jack carriage support 48. 125 130

Before the nailing operation takes place the jack is given a further slight upward movement which serves to place the heel and heel seat of the sole under a positive pressure. This operation is effected automatically by elevating the jack carriage support 48 bodily with the jack screw and jack carriage through mechanism comprising a shaft 69 journaled in the stationary block 46 (Fig. 2) and a similar shaft 70 journaled in the movable block or jack carriage support 48, said shafts having secured to them respectively, cams 71 and 72, as shown in Fig. 1. The cams are operated from the rods 31 by means of levers 73, 74 secured respectively to the shafts 69 and 70 and connected at their outer ends to links 75, 76, the lower ends of which are pivoted to adjustable blocks 77, 78 secured to the rods 31. The faces of the cams 71, 72 are so formed as to move the jack carriage support 48 upwardly during the first part of the revolution of the eccentric 6 on the driving shaft 4 by which movement the heel is subjected to the increased pressure. During the next portion of the revolution of the eccentric, the cams rock upon each other without imparting further upward movement to the jack and during this period the attaching operation takes place. During the last part of the revolution of the eccentric the cams are rocked in the opposite direction and the jack screw and jack carriage support 48 are lowered sufficiently to release the increased pressure on the heel after which the jack is moved to its lowest position on the release of the treadle 61 which is thereupon swung upwardly by the spring 63 causing the rack to rotate the jack screw in the opposite direction and thereby lower the jack carriage to its normal position so that the jack may be pulled forwardly for the removal of the heeled shoe.

Referring to the construction of the jack and the driving mechanism, which is best shown in Figs. 3 to 5; reference character 64 indicates a work supporting member which also acts as a nail block and which is pivoted on a transverse pin 63 extending between the sides of the jack post 60. The block 64 is adapted to support upon its upper face the heel end of the sole or insole B of a boot placed over the head of the post in the manner indicated in Fig. 3. Normally the flat upper face of the nail block 64 is inclined at an angle to the drivers in order that the attaching nails shall be driven into the heel at an inclination, the block resting at one end on a screw 65 whereby its position may be adjusted to vary the angle at which the nails are to be driven.

The nail block is provided with a plurality of short driver passages 66 arranged in

a horseshoe-shaped design extending into the block at a slight inclination to its work-engaging face and having outwardly flaring ends. Rounded sockets, also with flaring ends, are formed in the under side of the nail block corresponding to each of the driver passages and in each of the sockets is received the upper end of a tubular nozzle or driver guide 30 having a guiding passage in which one of the drivers 10 is arranged to reciprocate. The drivers 10 are actuated by a reciprocating plunger 50 carrying the adjustably mounted head or driver block 40. The driver block 40 is provided with a driver actuating surface having recesses or sockets formed therein to receive the lower ends of the drivers. The drivers are connected with the head 40 for independent angular movement relative thereto by ball joints, as shown in Fig. 3, and are retained on the head 40 by a perforated cover plate 45. The drivers are guided and maintained in parallel relation and also parallel with the axis of the plunger 50 by the tubes or nozzles 30 the lower ends of which are received in recesses formed in the upper surface of a block 68 pivoted to the jack post by the pin 67. Both ends of the nozzles are rounded and it will be seen that the die block 64 and block 68 may be adjusted angularly without changing the parallel relation of the nozzles. The driver block 40 is adjustably mounted on a pin 41 parallel to the pin 67 of the block 68 and also to the journal pin 63 of the nail block in order that the drivers may be adjusted to correspond with the adjustment of the nail block and nozzles 30. The sockets in the nail block 64 and block 68 are so arranged that the distance of one end of a nozzle from the journal of the nail block shall, in all positions to which the nail block is capable of adjustment, equal the distance of the other end of the same nozzle from the pivot pin 67. Also the position and depth of the sockets and the length of the nozzles are such that two equal radii from the respective pivot pins to the opposite ends of a nozzle are parallel when the nozzles are in place in the sockets.

When the adjusting screw 65 is rotated to elevate the nail block 64, it applies a thrust to the block 68 through the nozzles located to the left of the pivot 63 and this thrust turns the block 68 about its pivot 67 through the same angle through which the die block is moved and conversely when the screw 65 is turned into the post and the die block 64 tilted toward the horizontal position by the influence of gravity the nozzles at the right of the pivots swing the block 68 toward a horizontal position in a corresponding manner. The nozzles maintain their parallel relation throughout these adjustments, al-

though they may have a slight angular movement relative to the nail block and block 68.

It will be noted that the present construction permits the employment of drivers all of the same length regardless of the inclination of the work support, the ends of the drivers being maintained in a plane parallel with the work support by adjusting the driver block 40 about the pivot 41.

The axis of the pivot pin 41 is parallel with that of the nail block and in the plane containing the axes of the pins 63 and 67. From the under side of the pivoted driver block 40 extends a lug 42 which is received between forks of the plunger 50 and has threaded into it a bolt 43 which projects through a segmental slot 51 in one fork of the plunger. A leaf spring 52 is attached to the side of the plunger 50 and bears against one end of the lug 42, tending always to swing the head in a left hand direction about the pivot 41.

When it is desired to adjust the driver block 40 into parallelism with the nail block the plunger 50 may be moved into its highest position and the bolt 43 loosened. Thereupon the spring 52 acting on the lug 42 will force the head 40 to swing upwardly on the right until it is stopped by coming in contact with a boss 58 formed in the under side of the block 68. The length of the boss or stop is such that it will arrest the upward movement of the driver block 40 about the pin 41 in a position wherein the upper face of the block is approximately parallel with the plane in which the upper ends of the nozzles are located regardless of prior adjustment of the nail block 64 and block 68. The driver block 40 may then be moved by hand about the pivot pin 41 into a position in which it is exactly parallel with the plane of the upper ends of the nozzles and die block and secured in such position by tightening the bolt 43. By this adjustment of the driver block 40, when the plunger 50 is at the upper end of its stroke, the drivers 10 are brought to an approximately constant distance from the upper ends of the nozzles 80 in all positions to which the nail block is adjusted; and as, moreover, the length of the stroke of the drivers is not affected by this oblique adjustment of the nail block and the corresponding adjustment of the driver block 40, the drivers when they arrive at the lower limit of their stroke will be at a distance below the ends of the nozzles 30 unaffected by the adjustment of the nail block. It will therefore be seen that the nail receptacles afforded above the upper ends of the drivers in the nozzles have a substantially uniform depth regardless of the various adjustments.

For the purpose of manually raising the plunger 50 and the drivers carried thereby

far enough to enable the operator to ascertain whether all the nail receptacles have been properly supplied with nails and to facilitate making the adjustment above described, a handle 49 is attached to the plunger 50 and projects through a slot formed in the walls of the jack post 60.

The plunger 50 is actuated from the main shaft 4 of the machine by mechanism arranged to operate independently of the vertical position of the jack and the actuating mechanism is designed to permit the jack to be moved into operative relation therewith when it is pushed rearwardly after receiving a shoe. The actuating mechanism also permits the plunger 50 and drivers to be elevated manually out of operative relation by the handle 49.

To the lower end of the plunger is attached a plate 26 extending toward the front of the post and provided with a tubular extension 27 arranged to slide in a guide 28 forming a part of the post 60. The tubular extension 27 contains a spring 29 held in position between the bottom of the bore of the extension and a pin 11 passing through a slot 12 in the upper portion of the extension and fixed in the guide 28. The spring 29 serves to insure the return of the plunger 50 to the lower limit of its travel after each driving operation, the plunger being stopped in its lower position by the engagement of the pin 11 with the upper end of the slot 12.

The shaft 70 journaled in the jack carriage support 48 and oscillated by the vertical reciprocation of the right hand rod 31, as hereinbefore described, may be conveniently utilized in the actuation of the plunger 50. To this end there is fixed to the shaft 70, which may be termed the driver actuating shaft, a crank arm 13 connected by a link 14 to one end of a bell crank lever 15, 16 pivoted upon a stud 17 comprising one of a pair of studs 17, 18 by which a cover plate 19 is secured upon the front face of the jack carriage 56. Behind the cover plate 19 and guided partly by a groove 20 formed therein and partly by another groove 21 in the face of the jack carriage is a sliding piece 22, shown in detail in Figs. 8 and 9, in which is a hardened roller 23. The lower part of the sliding piece 22 is cut away leaving a shoulder 24 through which projects a portion of the periphery of said roller. The roller rests upon the arm 16 of the bell crank lever 15, 16 and the upper end of the sliding piece 22 bears against the under side of the plate 26 which is secured to the bottom of the plunger 50 as already explained.

When the shaft 70 is oscillated in the direction of the arrow shown in Fig. 1 it moves the bell crank lever 15, 16 through the link 14 swinging the arm of the lever upwardly and elevating the sliding piece 22.

The latter acts against the plate 26 on the plunger 50 and forces the plunger upwardly carrying with it the drivers thus effecting the nailing operation. Movement of the shaft 70 in a direction opposite to that indicated by the arrow in Fig. 1 causes the arm 16 of the bell crank lever to move downwardly allowing the sliding piece 22 to descend under the actuation of the spring 29 acting through the plunger.

The arm 15 of the bell crank lever 15, 16, or its equivalent, may be connected with the crank arm 13 by a pivoted link 14 and by disposing this connecting link 14 approximately at right angles to the path of motion of the jack carriage, which path is vertical in the embodiment of the invention herein illustrated, and approximately in the line in which the link 14 has to move in transmitting motion to the lever 15, it will be found that the amount of angular motion imparted to the bell crank lever 15, 16 by reason of its movement of translation vertically with the jack carriage is so small as to be negligible. By this construction the movement of translation is not interfered with, neither is the bell crank lever 15, 16 moved out of a relation with the arm 13 which permits the instantaneous angular movement of the bell crank lever in response to angular movement of the shaft 70, such movement taking place moreover through an angle which is approximately constant for a given angular movement of the shaft 70, regardless of the vertical position of the jack carriage and the bell crank lever pivoted thereto. This construction constitutes an important feature of the invention in that the length of stroke of the nail drivers 10 imparted by the sliding piece 22 and plunger 50 remains substantially constant in relation to the post 60 and unaffected by the different amounts of vertical adjustment received for different heights of heels.

The operation of the machine in attaching a heel will be clear from the foregoing description and may be briefly stated as follows:—The nail block and work support 64 is first adjusted to give the work proper inclination to the drivers, nails are inserted in the receptacles and a shoe is then placed over the head of the post 60 with its heel end over the nail block, the jack being moved to its forward position. The jack is thereupon pushed rearwardly carrying the shoe under a heel which has been previously inserted in the clamp under the cross-bar 34 in which position the plate 26 of the driver plunger 50 will be vertically over the upper end of the sliding piece 22. The operator then depresses the treadle and elevates the jack carriage 56 by rotating the jack screw 54 until the heel seat of the shoe is in contact with the heel. Power is then applied to the

machine by depressing a hand lever which operates the driving clutch as in the machine of said Patent No. 446,885 and the jack carriage support 48 is slightly elevated by the cams 71, 72 thus putting the heel under an increased pressure. Simultaneously the crank arm 13 acting through its connections with the driver plunger forces the drivers upwardly driving the attaching nails away from the surface of the nail block through the heel seat of the sole and obliquely into the heel. After the attaching operation the continued operation of the machine automatically lowers the jack carriage support releasing the increased pressure of the heel and the spring 63 lifts the treadle which, through its connection, rotates the jack screw to lower the jack carriage thus moving the heel out of the clamps and away from the cross-bar 34. The driver plunger 50 has meanwhile been returned to its lowest position and the operator may pull the jack forwardly to remove the heeled shoe.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A machine of the class described having, in combination, means for supporting a heel and nail driving mechanism including a reciprocatory plunger, a driver block pivotally mounted thereon, and a plurality of drivers carried by said driver block, said drivers being shifted axially relatively to said plunger by pivotal movement of the driver block and being maintained at all times in operative positions.

2. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism including a reciprocatory plunger, a driver block adjustably mounted thereon for movement about an axis disposed at an angle to the axis of the plunger and a plurality of drivers carried by said driver block and maintained in operative position throughout the range of adjustment of said driver block.

3. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism comprising a reciprocatory plunger, a driver block mounted thereon, and a gang of drivers loosely connected to said driver block and maintained at all times parallel with the axis of said plunger, said block being arranged for movement on said plunger to vary the angular relation of said block and the axes of the drivers.

4. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism comprising a reciprocatory plunger, a gang of drivers carried thereby with their ends in a plane inclined to the axis of the plunger, said drivers being adjustable to vary the inclination of said plane and being at all times maintained

in parallel relation with the axis of said plunger and in operative position.

5. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism including a driver carrying member, a plurality of drivers connected therewith by joints permitting relative movement of said drivers in parallel planes, and means for preventing such relative movement during the driving operation.

6. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism including a reciprocatory plunger, a plurality of drivers carried thereby with their ends in a plane inclined to the axis of the plunger, and means for shifting said drivers to vary the inclination of said plane.

7. A heel nailing machine having, in combination, means for supporting a heel and nail driving mechanism including a reciprocatory plunger, a pivoted driver block, a plurality of drivers mounted thereon and movable bodily therewith, said drivers being operative in all positions of the driver block, yielding means acting to swing said driver block on said plunger and separate means normally preventing swinging of the driver block.

8. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, a driver block pivoted thereto, drivers carried thereby and connected therewith to permit relative angular movement of said drivers and the driver block, and means pivoted on an axis parallel with the axis of said driver block for guiding said drivers.

9. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, a pivoted driver block carried thereby, drivers mounted thereon, a driver-guiding block pivoted on an axis extending transversely to the path of the plunger, and means interposed between said blocks for maintaining them in parallel planes.

10. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, relatively movable drivers carried thereby, and a separate driver guiding tube for each driver, said tubes being movable relatively to each other to correspond with the relative movement of the drivers.

11. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, movable drivers carried thereby, a pivoted driver-guide carrying block, and driver-guides having connections therewith permitting relative angular movement of said block and driver-guides.

12. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, a plurality of drivers

carried thereby with their ends in a plane inclined to the axis of the plunger, means for shifting said drivers to vary the inclination of said plane, separate driver-guiding means having their ends in a plane parallel with the ends of said drivers, and means for adjusting said driver-guiding means to correspond with the adjustment of the drivers.

13. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, a plurality of drivers carried thereby, separate driver-guiding devices arranged with their ends in a plane inclined to the axis of said plunger, means for shifting said devices to vary the inclination of said plane, and means for adjusting said drivers to correspond with the adjustment of the guiding devices.

14. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, relatively movable drivers carried thereby, guiding tubes therefor, and pivoted blocks engaging the opposite ends of said tubes.

15. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, relatively movable drivers carried thereby, parallel tubular guiding devices therefor, and means for relatively shifting said guiding devices laterally and vertically without disturbing their parallel relation.

16. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, a plurality of drivers carried thereby with their ends in a plane inclined to the axis of the plunger, said drivers being movable relatively to each other for adjustment whereby the inclination of the plane of the driver ends may be varied, and separate driver-guiding means having their ends in a plane parallel with the ends of said drivers and being constructed and arranged to permit adjustment to correspond to the adjustment of the drivers.

17. A heel nailing machine having, in combination, means for supporting a heel, a reciprocatory plunger, movable drivers carried thereby, an adjustable nail block through which said drivers are arranged to reciprocate, and driver-guiding devices having connections with the nail block arranged to permit relative angular movement of the guiding devices and said nail block.

18. A heel nailing mechanism having, in combination, means for supporting a shoe, driver-carrying means, drivers movably mounted thereon, and driver-guiding devices including a pair of plates having sockets in their opposite faces and interposed members having their opposite ends received in said sockets.

19. A heel nailing mechanism having, in

combination, means for supporting a shoe with its heel seat inclined to the horizontal, vertically movable drivers, and driver-guiding devices including a pair of plates each pivotally mounted intermediate its length and vertically interposed members connected with said plates at points on opposite sides of their pivots.

20. A heel nailing mechanism having, in combination, means for supporting a shoe, driver-carrying means, drivers mounted thereon, and driver-guiding devices including a pair of plates mounted respectively on parallel pivots, adjusting means for one of said plates, and connections between said plates whereby movement of one correspondingly affects the other.

21. A heel nailing machine having, in combination, a work support angularly adjustable to operative positions in different planes, drivers, driver-guiding means, and connections between said work support and guiding means whereby adjustment of the work support effects adjustment of the guiding means while maintaining said guiding means always in the same relation to the vertical.

22. A heel nailing machine having, in combination, a work support pivotally mounted for adjustment to operative positions in different planes, adjusting means for said support, drivers, and driver-guiding means movable relatively to the work support and arranged for adjustment simultaneously with the work support while maintaining said guiding means always in the same relation to the vertical.

23. A heel nailing machine having, in combination, a pivotally mounted work support, drivers, a pivotally mounted driver block therefor, and means, normally inoperative, for moving the driver block into parallelism with the work support.

24. A heel nailing machine having, in combination, a pivoted plate having a work engaging surface and driver passages, drivers having their ends located in said passages and below the surface of the plate thereby forming nail receptacles and provision for moving the ends of the drivers to compensate for pivotal movement of said plate.

25. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head arranged for a variable amount of movement toward and from said member, a nail block supported upon said head, drivers arranged for reciprocation in parallel paths inclined relatively to the work engaging face of the nail block and being guided for right line movement throughout their reciprocation, a driver carrying plunger, a driving shaft and connections between said driving shaft and plunger arranged

to actuate the latter independently of the amount of movement imparted to the nail block in pressing heels varying in height.

26. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, parallel drivers arranged for reciprocation in the nail block in parallel paths inclined relatively to the work engaging face of the nail block, means for moving the nail block and the drivers together toward said member to place the work under pressure, a reciprocatory driver carrying plunger and actuating means therefor, carried in part by said head, for forcing the drivers toward the face of the nail block to drive the attaching nails obliquely into the work.

27. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, a driver carrying plunger mounted in the head for reciprocation in a path inclined with respect to the work engaging face of the nail block, parallel drivers carried by the plunger and arranged for movement in the nail block, means for moving the nail block toward said member to subject the work to pressure, and actuating mechanism for said driver carrying plunger including means constructed to permit movement of the nail block toward said member without causing movement of the drivers relatively to said nail block toward the work.

28. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, a driver carrying plunger mounted in the head for reciprocation in a path inclined with respect to the work engaging face of the nail block, parallel drivers carried by the plunger and arranged for movement in the nail block, means for moving the nail block toward said member to subject the work to pressure, a driving shaft, and connections between said driving shaft and said driver carrying plunger constructed to allow movement of the nail block toward said member without causing movement of the drivers relatively to said nail block toward the work.

29. In a machine for inserting nails in heels, the combination with a nail block provided with driver passages, of a plunger arranged for reciprocation throughout its movement in a right line path inclined relatively to the work engaging face of the nail block and having at one end a driver carry-

ing face oblique to the longitudinal axis of the plunger, parallel drivers mounted in said oblique driver carrying face and extending in the line of movement of the plunger, and means for actuating said plunger and drivers to drive a gang of parallel nails obliquely with relation to the surface of the heel which they first enter.

30. In a machine for inserting nails in heels, the combination with a nail block provided with driver passages, of a plunger arranged for reciprocation throughout its movement in a right line path inclined relatively to the work engaging face of the nail block and having at one end a driver carrying face oblique to the path of the plunger and parallel with said work engaging face, drivers mounted on said oblique driver carrying face in parallel relation to the line of movement of the plunger, and means for actuating said plunger and drivers for driving a gang of parallel nails obliquely with relation to the surface of the heel which they first enter.

31. In a machine for inserting nails in heels, the combination with a nail block provided with driver passages, of a plunger arranged to reciprocate throughout its movement in a path inclined with respect to the work engaging face of the nail block, drivers operatively connected with said plunger and arranged with their nail engaging ends disposed in a plane parallel with the work engaging face of the nail block and oblique with respect to the path of the plunger, and means for actuating the plunger and drivers to drive a gang of parallel nails from the nail block obliquely with relation to the surface of the heel which they first enter.

32. In a machine for inserting nails in heels, the combination with a nail block provided with driver passages, of a plunger mounted for reciprocation throughout its movement in a path inclined with respect to the work engaging surface of the nail block, drivers operatively connected with said plunger and arranged at an inclination to the work engaging surface of the nail block, said drivers being disposed in a horse-shoe shaped figure and means for actuating the plunger and drivers to drive a gang of parallel nails from the nail block obliquely with relation to the surface of the heel which they first enter.

33. In a machine for inserting nails in heels, the combination with a perforated plate, of a plunger mounted for reciprocation in a path inclined with respect to the work engaging face of said plate, parallel drivers carried by said plunger disposed in a horse-shoe-shaped figure and arranged in alinement with perforations of said plate, all of said perforations being inclined relatively to the work engaging face of the

plate to permit a gang of nails to be driven from said plate obliquely with relation to the surface of the heel which they first enter.

34. In a machine for inserting nails in heels, the combination with a device having a work engaging face and parallel driver passages arranged at an inclination to said face, a plunger mounted for reciprocation in a path parallel with said driver passages, parallel drivers operatively connected with said plunger and arranged with their nail engaging ends in a plane at an inclination to the path of the plunger and at all times within said driver passages.

35. A machine for inserting nails in heels, having in combination, a work engaging member and a head movable to subject the work to pressure, a device carried by the head having a plane work engaging face oblique to the line or movement of said head and parallel driver passages arranged in parallel relation to said line of movement, a plunger mounted for reciprocatory movement on the head in a path parallel to said line of movement, and drivers carried by said plunger and arranged to project at all times into said driver passages.

36. A machine for inserting nails in heels, having in combination, a work engaging member and a head arranged for relative movement to subject the work to pressure, a device carried by the head having a flat work engaging face oblique to the line of relative movement of said member and said head, and parallel driver passages arranged in parallel relation to said line of movement, a plunger mounted for reciprocatory movement on the head in a path parallel to said line of relative movement, and drivers carried by said plunger and arranged with their nail engaging ends in a plane parallel with the work engaging face of said device.

37. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said nail block, a plunger for transmitting movement to said drivers arranged for reciprocatory movement upon said head, a lever pivoted upon said head at a point at one side of the plunger and arranged to impart movement to said plunger, means for moving the head toward said member, and means operating upon said lever for moving the plunger toward the nail block to drive the nails.

38. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said

nail block, a plunger for transmitting movement to said drivers, arranged for reciprocatory movement upon said head, a lever pivoted intermediate its ends upon said head at a point at one side of the plunger and arranged to actuate said plunger through a sliding connection, means for moving the head toward said member, means connected to the other end of said lever for moving the plunger toward the nail block to drive the nails, and a spring for returning said plunger to its normal position.

39. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said nail block, a plunger for transmitting movement to said drivers arranged for reciprocatory movement upon said head, a lever pivoted intermediate its ends upon said head at a point at one side of the plunger and having one end arranged to impart movement to said plunger, means for moving the head toward said member, means operating upon the other end of said lever for moving the plunger positively toward the nail block to drive the nails, and a spring for maintaining said plunger yieldingly in retracted position.

40. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said nail block, a plunger for transmitting movement to said drivers arranged for reciprocatory movement upon said head, a lever pivoted upon said head at a point at one side of the plunger and arranged to impart movement to said plunger, means for moving the head toward the member, means operating upon said lever for moving the plunger positively toward the nail block to drive the nails, a spring for maintaining said plunger yieldingly in retracted position, and means for limiting the return movement imparted to the plunger by the spring.

41. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said nail block, a plunger for transmitting movement to said drivers arranged for reciprocatory movement upon said head, a lever pivoted intermediate its ends upon said head at a point at one side of the plunger and having one end arranged to impart movement to said plunger, means for moving the head toward the member, means connected

to the other end of said lever for moving the plunger toward the nail block to drive the nails and a spring mounted for movement with the head for returning said plunger to its normal position.

42. A machine for inserting nails in heels, having in combination, a work engaging member for resisting pressure applied to the work, a head movable toward and from said member, a nail block supported upon said head, drivers arranged for operation in said nail block, a plunger for transmitting movement to said drivers arranged for reciprocatory movement upon said head, a lever pivoted intermediate its ends upon said head at a point at one side of the plunger and arranged to actuate said plunger through a sliding connection, means for moving the head toward the member, means connected to the other end of said lever for moving the plunger toward the nail block to drive the nails, a stop on the head cooperating with a stop surface on the driver actuating parts for limiting return movement of said drivers, and a spring bearing at one end upon the head for returning the drivers to their normal position.

43. A machine for inserting nails in heels, having in combination, a plurality of parallel drivers, a nail block having a flat work engaging face oblique to the drivers and provided with driver passages, all of said driver passages being oblique to said face, a work engaging member arranged in alignment with the drivers, and means for moving relatively said member and nail block in a direction parallel with the path of the drivers to subject the heel to pressure preliminary to driving the nails.

44. A machine for inserting nails in heels, having in combination, parallel drivers disposed to insert nails in a horseshoe-shaped figure, a nail block having a substantially plane work engaging face oblique to the path of the drivers and provided with passages for receiving said drivers, all of said passages being oblique to said face, a pressing member provided with a substantially plane face for supporting a heel in alignment with the drivers, and means for relatively moving said member and nail block in a direction parallel with the path of the drivers to subject the heel to pressure preliminary to driving the nails.

45. A machine for inserting nails in heels, having in combination, means for holding a heel under pressure, a plunger, a single driver block and drivers supported thereon, and means for actuating said plunger and driver block without relative movement for driving into the heel a group of nails disposed to attach a heel completely to the heel seat of the shoe, all of said nails being driven in parallel paths inclined longitudinally of

the heel with relation to the surface of the heel which they first enter at substantially the same angle.

46. A machine for inserting nails in heels, 5 having in combination, means for automatically applying pressure to a heel, a plunger, a driver block mounted thereon and held against movement transversely of the plunger, and drivers supported on said driver 10 block for driving into the heel a group of nails disposed to attach a heel completely to the heel seat of the shoe, said nails being driven in substantially parallel paths inclined longitudinally of the heel with relation 15 to the surface which they first enter, the largest angle formed by the intersection of the path of each nail with the surface of the heel being on the same side of all the nails.

47. A machine for operating on heels having 20 ing in combination, a pressure resisting member for engaging one side of the heel, a gang of tools located on the opposite side of the heel and mounted to reciprocate toward and from said member, and a work 25 engaging plate provided with perforations in alinement with said tools, all of said tools being inclined in the same general direction from normals to the work engaging face of said plate at the points at which 30 the paths of the tools intersect said face and moving throughout their reciprocations in right line paths.

48. A machine for operating on heels having, in combination, a tool block, a pressure 35 resisting member for engaging one side of the heel, a gang of tools located on the opposite side of the heel and mounted on said tool block in a horseshoe-shaped figure, means for actuating said block to reciprocate 40 the tools toward and from said member, and a work engaging plate provided with perforations in alinement with said tools, all of said tools being inclined in the same general direction from normals to the 45 work engaging face of said plate at the points at which the paths of the tools intersect said face.

49. A machine for operating on heels having, in combination, a pressure resisting 50 member for engaging one side of the heel, a gang of tools located on the opposite side of the heel and mounted to reciprocate toward and from said member, a work engaging 55 plate provided with perforations in alinement with said tools, guides for said tools having passages to guide the tools in said perforations, all of said passages being inclined in the same general direction from normals to the work engaging face of the 60 plate at the points at which the longitudinal axes of the passages intersect said face.

50. A machine for operating on heels having, in combination, means for holding the work comprising a pressure resisting member 65 for engaging the heel and an oppositely

disposed perforated plate having a substantially plane work engaging face, and a gang of tools mounted to reciprocate in a substantially vertical path and arranged to act 70 through the perforations of said plate, said perforated plate being arranged with its face oblique to the path of all said tools and being movable toward said pressure resisting member in the direction of the path 75 of said tools preliminarily to the operation of the tools.

51. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, 80 a gang of tools located on the opposite side of the heel and mounted to reciprocate toward and from said member, a work engaging plate provided with perforations in alinement with said tools, tool guiding tubes 85 extending into the perforations of said plate, said tubes being inclined in the same general direction from normals to the work engaging face of the plate at the points at which the axes of the tubes intersect said 90 face.

52. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, 95 a gang of tools located on the opposite side of the heel and mounted to reciprocate toward and from said member, a work engaging plate provided with perforations in alinement with said tools, tool guiding tubes 100 extending into the perforations of said plate and terminating short of the work engaging face of the plate and being inclined in the same general direction from normals to the said face at points at which the axes 105 of the tubes intersect said face.

53. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, 110 a gang of tools located on the opposite side of the heel and mounted to reciprocate toward and from said member, guiding tubes for said tools, a work engaging plate provided with perforations to receive said tubes, and means for sustaining said plate with its 115 work engaging face inclined relatively to said tubes, said means having provision for adjustment whereby the inclination of said work engaging face may be varied.

54. In a heel attaching machine the combination with a base and a work support 120 adjustable upon it, of a nail driver to drive a nail in a direction away from the work supporting face of said support into the work supported thereby, and means for retaining the support in positions in which 125 this work supporting face shall be in oblique relation to the path of the driver.

55. In a heel attaching machine the combination with an abutment, a base and a work support adjustable upon the latter, 130 of a nail driver to drive a nail in a direction

away from the work supporting face of said support into the work supported thereby, and means for retaining the support in positions in which the work supporting face shall be in oblique relation to the path of the driver.

56. In a heel attaching machine the combination with a base and a work support adjustable upon it, of a nail driver to drive a nail in a direction away from the work supporting face of said support into the work supported thereby, means for retaining the support in positions in which this work supporting face shall be in oblique relation to the path of the driver, an abutment, and mechanism whereby the distance between the abutment and work support is variable.

57. In a heel attaching machine the combination with a post, and a work support adjustably mounted upon it, of a nail driving mechanism upon the post comprising a driver to drive a nail in a direction away from the work supporting face of said support into the work supported thereby, and means for retaining the support in positions in which its work supporting face shall be in oblique relation to the path of the driver.

58. In a heel attaching machine the combination with an abutment, a post, and a work support adjustably mounted upon it, of nail driving mechanism upon the post comprising a driver to drive a nail in a direction away from the work supporting face of said support, into the work supported thereby, and means for retaining the support in positions in which its work supporting face shall be in oblique relation to the path of the driver.

59. In a heel attaching machine the combination with a post, and a work support adjustably mounted upon it, of nail driving mechanism upon the post comprising a driver to drive a nail in a direction away from the work supporting face of said support into the work supported thereby, means for retaining the support in positions in which its work supporting face shall be in oblique relation to the path of the driver, an abutment, and mechanism whereby the distance between the post and abutment is variable.

60. In a heel attaching machine the combination with a post, and a work support adjustable upon said post, of a tubular nozzle carried by the post, a nail driver in the nozzle, mechanism for reciprocating the driver, and means for retaining the support in positions in which its work supporting face shall be in oblique relation to the path of the driver.

61. In a heel attaching machine the combination of a base, a work support adjustable upon it provided with a passage for a

nail, a nail driver, means to operate it to drive the nail in a direction away from the heel supporting face of said work support into the work supported thereby, and means for retaining the support in positions in which its work supporting face shall be in oblique relation to the path of the driver.

62. In a heel attaching machine, the combination with a revoluble shaft h in bearings in the machine frame, of a post, a work support adjustably mounted upon it, a driver and a driver actuating plunger movable endwise in it, means for retaining the work support in positions in which its work supporting face shall be in oblique relation to the path of the driver, a jack-carriage supporting the post and movable in the frame of the machine transversely in relation to the axis of the shaft h , a movable member 15 mounted upon the carriage and in operative connection with the plunger, another member 13 in operative connection with the shaft h , and a link 14 pivoted to and connecting the parts 15 and 13 and disposed at approximately a right angle to the path of motion of the jack-carriage and approximately in the line in which the link has to move in transmitting the motion of part 13 to part 15.

63. In a heel attaching machine, the combination with a revoluble shaft h in bearings in the machine frame, of a post, a work support adjustably mounted upon it, a driver and a driver actuating plunger movable endwise in it, means for retaining the work support in positions in which its work supporting face shall be in oblique relation to the path of the driver, a jack-carriage supporting the post and movable in the frame of the machine transversely in relation to the axis of the shaft h , a movable member 15 mounted upon the carriage, another member 13 in operative connection with the shaft h , a link 14 pivoted to and connecting the parts 15 and 13 and disposed at approximately a right angle to the path of motion of the jack-carriage and approximately in the line in which the link has to move in transmitting the motion of part 13 to part 15, an arm 16 in operative connection with the member 15, a cover plate 19 secured upon the jack-carriage, a slider 22 in guides in the jack-carriage and a roller 23 inserted in a hole in the slider so that a portion of its periphery may project therefrom.

64. In a heel attaching machine, the combination with a revoluble shaft h journaled in bearings in the machine, of a jack-carriage movable in the frame of the machine transversely in relation to the axis of said shaft, and a driver actuating device carried by and movable in relation to the movable jack-carriage, of a movable member mounted upon the carriage and in operative con-

nection with said driver actuating device, another member in operative connection with the driver actuating shaft, and a link pivoted to and connecting said two members and disposed at approximately a right angle to the path of motion of the jack-carriage and approximately in the line in which the link has to move in transmitting the movement of one of the two members aforesaid to its companion.

65. In a heel attaching machine, the combination with a driver actuating means movable in bearings in the machine relatively to the machine frame, of a jack-carriage movable in the said frame, and a driver-actuating device carried by the movable jack-carriage, a link pivoted to and connecting said driver actuating means with said driver actuating device and disposed at approximately a right angle to the path of motion of the jack-carriage and approximately in the line in which the link has to move in transmitting the movement of the aforesaid driver actuating means to the driver actuating device.

66. In a heel attaching machine, the combination with a nail driver having a path in a fixed direction, of a member having a driver passage and provided with a face inclined relatively to the path of the driver and adapted to have contact with the work, said driver passage leading to said face, and means permitting variation in the inclination of said face.

67. A heel attaching machine, having in combination, a plurality of members arranged to hold a heel between them in position upon a shoe, means for moving relatively said members to press a heel upon the shoe, and a nail driver having a path in a fixed direction parallel to the line of relative movement of said members, one of said members being provided with a work-engaging face inclined with relation to the path of the driver and constructed to permit the angular inclination of said face to be varied and having a driver passage terminating in said face.

68. The combination with an abutment, of a post movably mounted to clamp the work between itself and the abutment, nail-guiding means carried by said post, a driver adapted to reciprocate in said nail-guiding means, means to adjust said post to clamp the work, means for imparting to the post a predetermined further movement and for actuating said driver, and means providing connection between said driver and its actuating means arranged to maintain the position of the driver substantially constant with relation to said nail-guiding means, while permitting adjustment of said post.

69. A machine for attaching heels, having in combination, a jack, a member for engaging the tread face of the heel, a jack

carriage, means for moving said jack carriage relatively to said member to press a heel upon the shoe, said jack being arranged for movement upon the carriage transverse to the line of relative movement of jack carriage and member to permit the application and removal of the shoe, a driver bar contained within the jack and means upon the jack carriage for actuating said driver bar independently of the relative movement of the jack carriage and said member.

70. In a heel attaching machine, the combination with a support bodily movable in the frame of the machine, a jack mounted in adjustable relation therewith, an oppositely disposed member for engaging the tread face of a heel, means for moving said support toward and from said member, a driver bar contained within said jack, operating mechanism therefor, and means upon said support for uniformly actuating said driver bar operating mechanism independently of the position of said support.

71. In a heel attaching machine, the combination with a support bodily movable in the frame of the machine, a jack carriage mounted in adjustable relation therewith, a relatively stationary member for engaging the tread face of a heel, means for relatively moving said jack carriage and said support, means for moving said jack carriage and said support in fixed relation toward and from said stationary member, a driver bar contained within said jack, a lever pivotally mounted upon said support and mechanism connected therewith for actuating said driver bar in any adjusted position of the support.

72. In a heel attaching machine, the combination with a jack, of a jack carriage, a movable jack carriage support, means for adjusting said jack carriage relatively to said jack carriage support, means for bodily moving said jack carriage and jack carriage support in fixed relation, a driver bar contained within said jack, and mechanism for uniformly actuating said driver bar in any position of said jack carriage support and independently of the adjusted position of said jack carriage with respect to said jack carriage support.

73. A heel nailing machine having, in combination, a movable driver block and drivers mounted thereon, associated work pressing members, one of which comprises a plate apertured to permit the passage of the drivers, said plate being pivotally mounted on an axis extending transversely to the path of said drivers, an apertured block to which said apertured plate is connected, driver actuating means, and automatically acting means for bodily moving said block and pivoted plate with their apertures in alinement toward the other work pressing member to

subject a heel to pressure before the operation of the drivers.

74. A heel nailing machine having, in combination, drivers, actuating mechanism therefor, separate driver-guiding tubes arranged to receive the nails to be driven, a recessed plate into which the outer ends of said driver-guiding tubes project, a supporting block for the opposite ends of said tubes, a pressing member oppositely disposed with respect to said recessed plate, said recessed plate being arranged for movement toward said oppositely disposed pressing member preliminarily to the operation of the drivers.

75. A heel nailing machine having, in combination, a vertically movable driver block and drivers, a supporting block, tubular driver-guiding nozzles supported therein, and a plate apertured to receive said nozzles and having a work-engaging surface, a vertically stationary work-engaging member, said supporting block, nozzles and plate being constructed and arranged for movement toward said stationary work-engaging member to press a heel on the shoe preliminarily to the operation of the drivers.

76. A heel nailing machine having, in combination, a vertically movable driver block and drivers mounted therein, vertical driver-guiding tubes, a supporting block for said tubes, a plate having a work-engaging face and apertures to receive the outer ends of said vertical guiding tubes, said apertures being shaped to permit angular movement of said plate relatively to said tubes, a pressing member and automatic means for controlling the position of said plate, said plate being movable toward said member to subject a heel to pressure prior to the operation of the drivers.

77. A heel nailing machine having, in combination, a vertically movable driver block, a gang of drivers mounted therein, vertical guiding tubes arranged in alinement with said drivers, a supporting block for said guiding tubes, a plate having a work-engaging face and apertures to receive the outer ends of said guiding tubes, said apertures being flared in order to permit angular movement of said plate while the ends of the tubes are projecting into said apertures, said apertured plate being movable in a direction parallel to said guiding tubes to engage the work prior to the operation of the drivers.

78. A heel nailing machine having, in combination, a driver block mounted for reciprocation, a gang of drivers carried thereby, a pressing member disposed in the path of said drivers, a plate having a work-engaging face and apertures with flaring openings, said plate being interposed between said driver block and said member, a block having apertures in alinement with

said drivers and being disposed between said plate and said driver block, and connections between said apertured block and said plate comprising separate guiding tubes arranged in alinement with the respective drivers, said tubes projecting into the apertures of said plate, angular movement of which relatively to said tubes being permitted by the flaring openings of said apertures.

79. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, a plate located on the opposite side of the heel and having a substantially plane work engaging face, said plate being mounted for movement toward said member to press the work against said member and arranged with its work engaging face oblique to its path of movement, and a plurality of tool guiding devices associated with said movable plate and having guiding passages inclined in the same general direction from normals to the work engaging face of the plate at the points at which the axes of the guiding passages intersect said face.

80. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, a perforated work engaging plate located on the opposite side of the heel, a series of tool guiding tubes arranged in substantially parallel relation with their outer ends in the perforations in said plate, said plate being sustained with its work engaging face oblique to the guiding tubes and being movable in the direction of said tubes toward said pressure resisting member to effect engagement with the opposite faces of the work and away from said member to release the work.

81. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, a plate located on the opposite side of the heel and having a plane work engaging face and a series of perforations arranged in a horseshoe-shaped figure, and a series of similarly arranged tool guiding tubes extending into said perforations, said perforated plate being sustained with its work engaging face oblique to the guiding tubes and being movable in the direction of said tubes toward said pressure resisting member to effect engagement with the opposite faces of the work.

82. A machine for operating on heels having, in combination, a pressure resisting member for engaging one side of the heel, a perforated work engaging plate located on the opposite side of the heel, a plurality of tool guiding tubes associated with said perforated plate and disposed in substantially parallel relation, and means for sustaining said plate with its work engaging

face inclined with respect to said guiding tubes, said means having provision for adjustment whereby the inclination of said plate may be varied, said plate being movable bodily together with said tubes toward said member to engage the work.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

ARTHUR BATES.

Witnesses:

JOE LEE,

ARTHUR ERNEST JEMAIN.

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