

W. A. BOND.
 LASTING MACHINE.
 APPLICATION FILED FEB. 25, 1907.

1,005,929.

Patented Oct. 17, 1911.

6 SHEETS-SHEET 1.

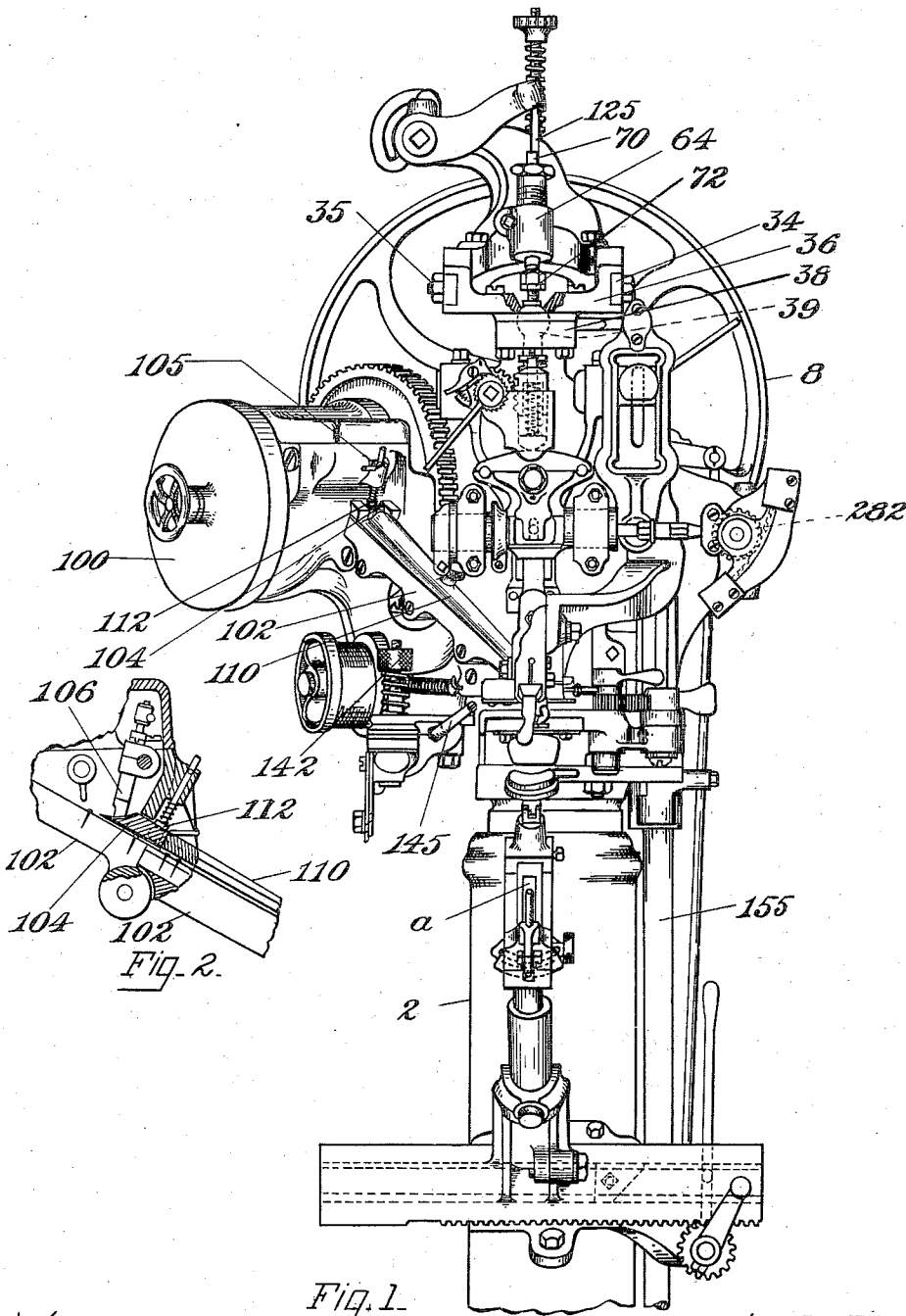


FIG. 1.

WITNESSES.

Bertha M. Kautschman.
 Elizabeth C. Coupe

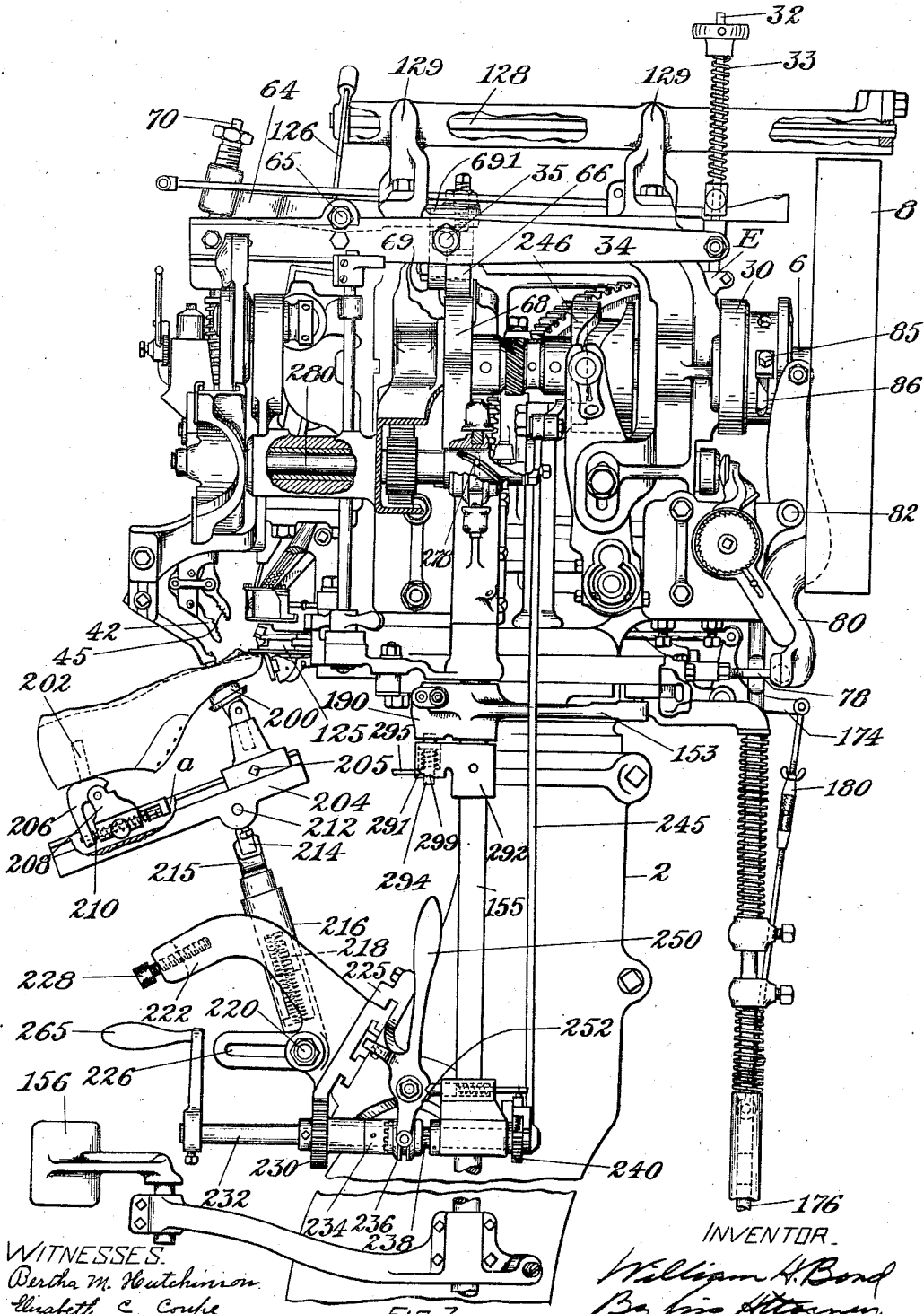
INVENTOR.

William A. Bond
 By his Attorney
 Nelson H. Merdun

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6 SHEETS-SHEET 2.



WITNESSES.
Bertha M. Hutchinson.
Elizabeth C. Coupe

FIG. 3.

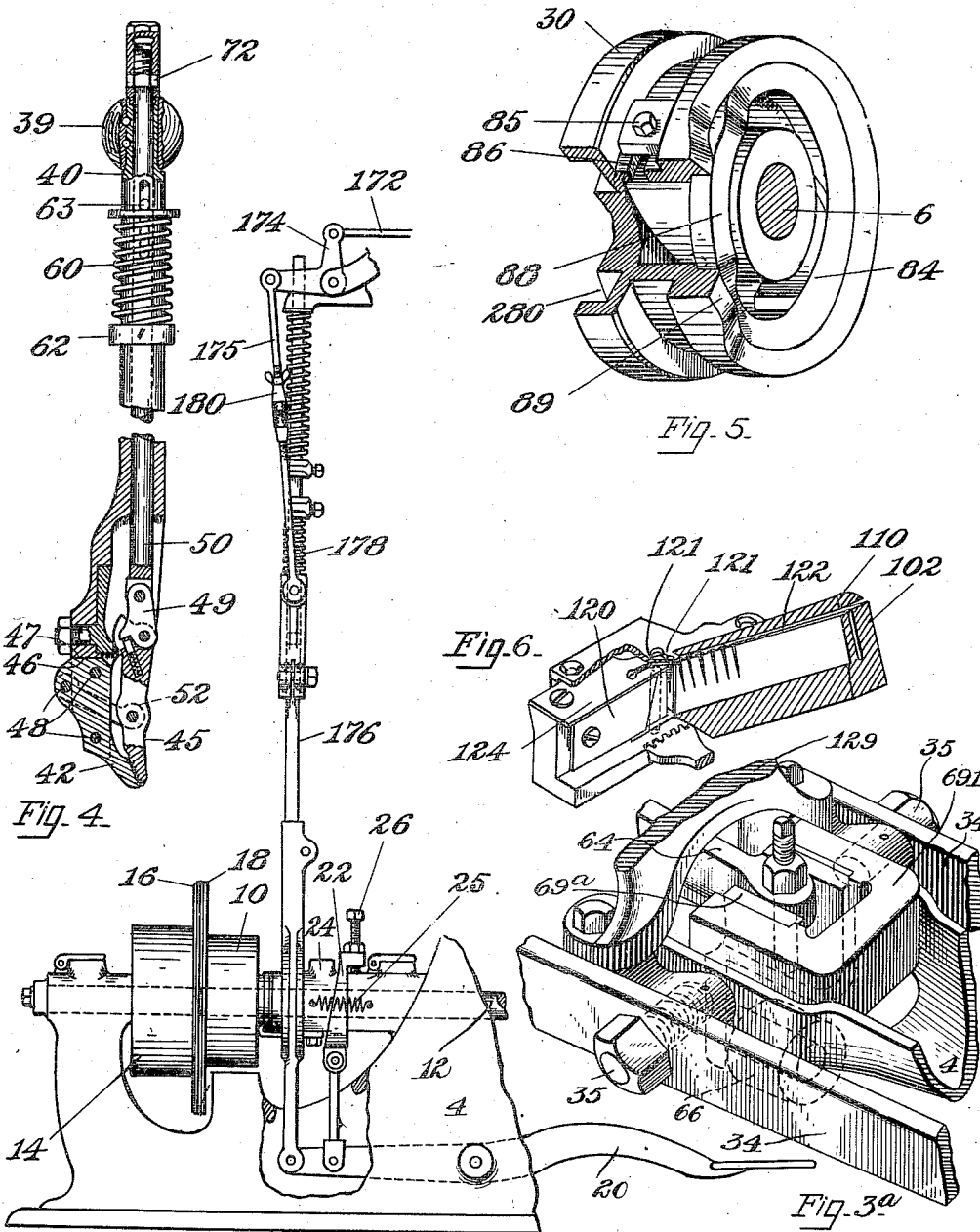
INVENTOR.
William A. Bond
By his Attorney,
Nelson D. Howard

W. A. BOND.
 LASTING MACHINE.
 APPLICATION FILED FEB. 26, 1907.

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Patented Oct. 17, 1911.

6 SHEETS—SHEET 3.



WITNESSES.
 Bertha M. Hutchinson.
 Elizabeth C. Coyle

Fig. 7

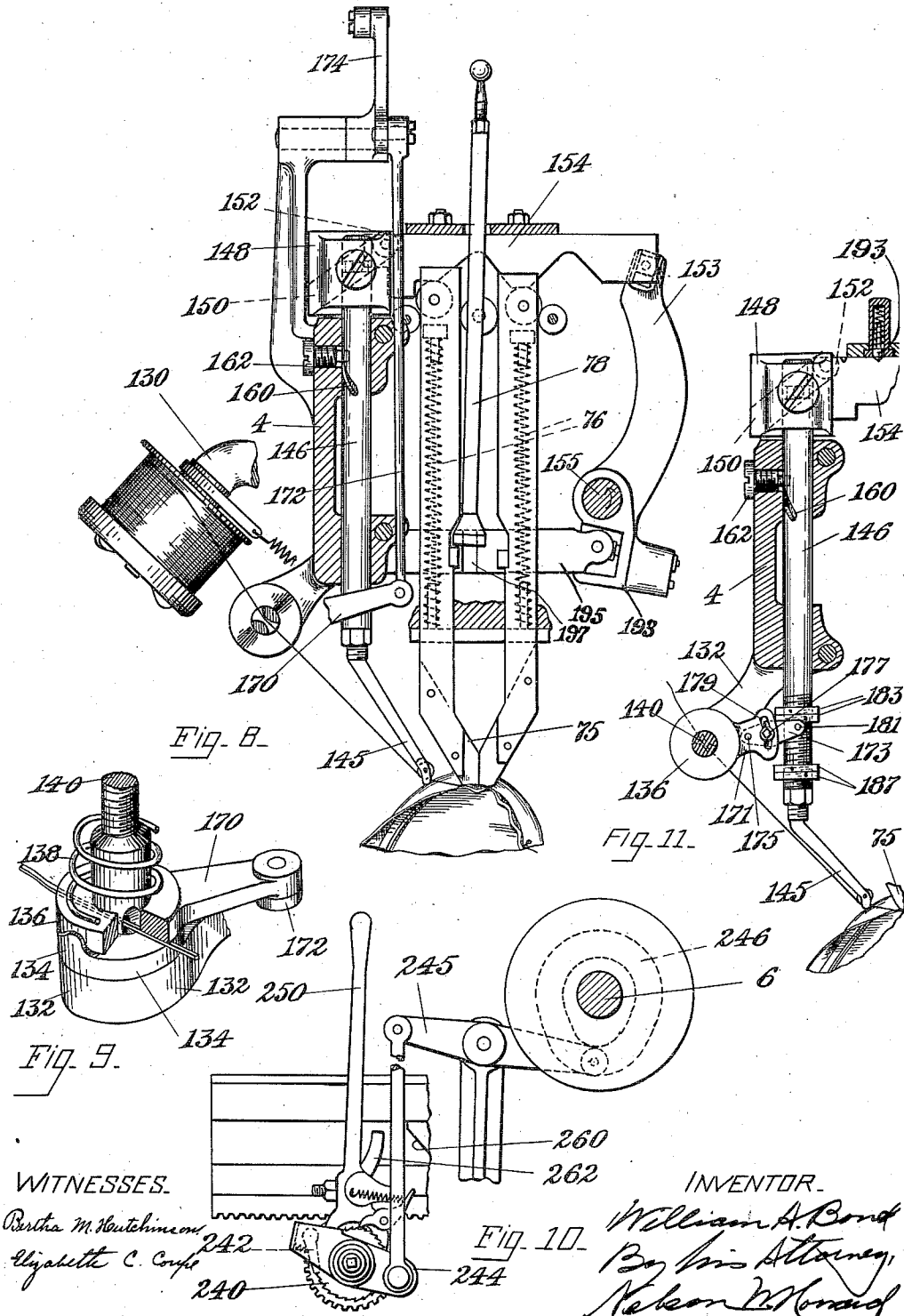
INVENTOR.
 William A. Bond
 By his Attorney,
 Nelson & Howard

W. A. BOND.
 LASTING MACHINE.
 APPLICATION FILED FEB. 25, 1907.

1,005,929.

Patented Oct. 17, 1911.

5 SHEETS—SHEET 4.



WITNESSES.
 Bertha M. Hutchinson
 Elizabeth C. Cook

INVENTOR.
 William A. Bond
 By his Attorney,
 Nelson W. Howard

W. A. BOND.
 LASTING MACHINE.
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5 SHEETS—SHEET 5.

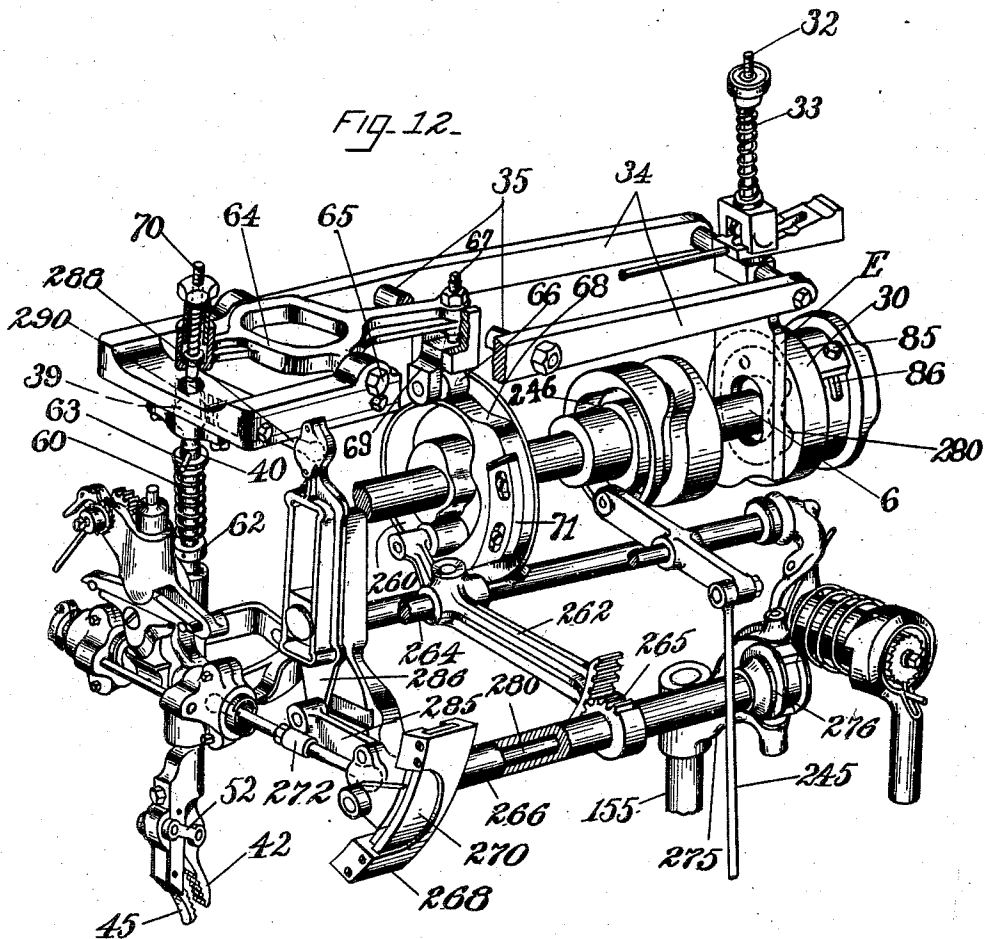
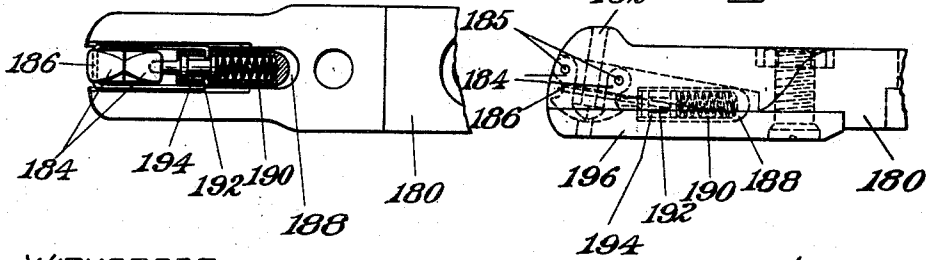


FIG. 13.

FIG. 14.



WITNESSES.

Bertha M. Hutchinson.
 Elizabeth C. Coupe

INVENTOR.

William A. Bond
 By his Attorney
 Nelson W. Stoddard

UNITED STATES PATENT OFFICE.

WILLIAM A. BOND, OF LYNNFIELD, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

1,005,929.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed February 25, 1907. Serial No. 359,081.

To all whom it may concern:

Be it known that I, WILLIAM A. BOND, a citizen of the United States, residing at Lynnfield, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Lasting-Machines, 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 lasting machines, and particularly to machines of the type shown in Letters Patent of the United States No. 584,744, dated June 15, 1897, and has for one object to improve the construction and arrangement of the machine in various respects.

Another object of the invention is to provide means by which the operator may be relieved partially or entirely from the labor of holding the shoe against the thrust of the lasting devices and the impact of the tack driver.

With these objects in view one feature of the invention consists in a novel construction of grippers by which a firmer gripping action is obtained and greater durability secured than in grippers as heretofore constructed. To this end, as herein shown, a fixed gripper jaw is arranged in its carrier with an extended upper end face in engagement with a lower end face of the carrier, whereby rocking of said gripper jaw about its connection with the carrier is avoided when pressure is applied to its gripping face for holding and pulling stock. For further increasing the rigidity of the connection between the gripper jaw and its carrier the jaw is preferably pinned or otherwise secured to the carrier at a plurality of points so that the jaw cannot pivot or turn in the carrier. In order to obtain a firmer gripping of the stock by the two gripping jaws and prevent any tendency of the movable gripper jaw to turn laterally said movable jaw is connected to the fixed jaw by parallel links arranged at opposite sides of the jaws.

In the type of machine in which the present invention is herein shown as embodied the grippers are first closed and then automatically uplifted to pull the upper. It is, of course, necessary to hold the grip-

pers closed while they are uplifted. The grippers closing means is, therefore, arranged to have a movement for closing the grippers and then to partake of the movement of the uplifting mechanism. The grippers closing means comprises a lever, which, for the purpose of causing the grippers to be maintained in their closed position while being uplifted, is mounted to move with one arm of a lever, herein called the "updraw lever", which forms one element of the mechanism for uplifting the grippers. Preferably the closing lever is actuated by a cam so located that movement of the closing lever with the updraw lever will not cause the grip on the stock to be relaxed. In accordance with a feature of the present invention the closing lever is arranged in alinement with its actuating cam and the grippers so that it applies force directly to the grippers. To facilitate this arrangement the updraw lever is bifurcated to allow the closing lever to be mounted centrally therein and, as shown, the updraw lever comprises parallel side bars fulcrumed upon trunnions carried by the machine frame.

As before mentioned, the machine comprises other lasting instrumentalities in addition to the grippers. These include a reciprocating presser which is actuated to press the upper pulled by the grippers over the last bottom and to hold it after the grippers release it and until it is fastened by the securing means. For this purpose the presser should advance into holding engagement with the upper before the grippers release it and continue to hold the upper until the securing means has been applied. To meet different conditions it is desirable to vary the timing of the presser with relation to the movements of the other operating parts of the machine, and a feature of this invention consists in providing means by which the presser may be advanced and retracted earlier or later in the cycle of the machine's operation. To this end an adjustable cam is provided which may be differently positioned to vary the time at which the presser is moved, but preferably without changing the position to which it is advanced. In the illustrated embodiment of this invention another feature is also included in that provision is

made for varying the length of time that the presser will be held in engagement with the work. It is desirable to retain the presser in its advanced position for a longer portion of the cycle of operation of the machine when lasting men's shoes than is found to be advantageous when lasting women's shoes, which are usually made of upper material that is lighter and more easily lasted than that used in men's shoes. In accordance with this feature of the invention the cam block comprises a main section having a cam face of the minimum length required and a movable section which can be shifted to lengthen the cam face. As shown, the movable section can be positioned either to cause the presser to be advanced sooner or to keep it longer in holding engagement with the upper.

In lasting the toe portions of welt and turn shoes it is customary to anchor a wire to a tack at one side of the toe and superimpose the wire upon the successively overworked portions of upper as the lasting proceeds to the other side of the toe, where the wire is anchored to another tack. A wire thus placed binds the upper material against the lip or shoulder of the innersole or sole and holds it until it is permanently secured in place by the usual sewing operation.

In accordance with another feature of this invention I have provided a novel construction and arrangement of mechanism for supplying and presenting wire for this purpose in which the wire is guided in an approximately straight course from the reel or spool through a tension device to a wire support, which is located adjacent to the lasting devices and holds or presents the wire in position to be superimposed upon the successively overworked portions of upper. Preferably the wire is guided centrally through the tension device so that an approximately uniform tension on the wire is maintained with any given adjustment of the tension device. This arrangement is of especial advantage when "flat" wire, or wire having one or more plane faces, is used for the reason that the wire while passing in an approximately straight course is not liable to twist in the tension device and present thereto sections of different thickness which would cause a non-uniform tensional resistance to be applied to the wire.

In order to obtain slack for fastening the wire to an anchor tack and commence the lasting it is necessary to pull the wire through the tension device; but while the lasting is in progress it is desirable that the tension device should hold the wire with sufficient force to prevent the wire being drawn easily from the reel. To obtain this variable resistance to the movement of the wire manually controlled means is employed

for adjusting the tension device. As herein shown, the tension device comprises clamping plates yieldingly pressed together and provided with cooperating cam surfaces and one of the plates is connected to a manually operated part of the machine for movement to cause its cam surface to ride upon the cam surface of the cooperating plate and thereby separate the plates more or less according to the extent of movement effected. For convenience the movable clamping plate may be connected with the foot treadle by which the machine is started and stopped, the arrangement being such that a hard tension will be applied to the wire when the machine is running and a lighter tension when the machine is stopped. A feature of this invention consists in providing means by which the tension under which the wire is held when the machine is stopped may be readily varied. As herein shown, means is provided for effecting an adjustment of the movable clamping plate with relation to the foot treadle or other means by which it is actuated.

As has been suggested, the wire is only employed while lasting the toe of the shoe, while tacks are employed for securing the upper at other portions of the shoe. The wire supporter before mentioned occupies an operative position substantially in the plane of the shoe bottom and close to the lasting devices. While the shank, and sometimes other portions of the upper which are secured by tacks, is being lasted the wire supporter in this position would be liable to interfere with the proper presentation of the shoe. It is therefore desirable to move the supporter into a retracted position when it is not in use.

A further feature of this invention consists in novel means for moving the wire supporter toward and from its operative position. In the embodiment of the invention herein shown, the wire supporter is mounted eccentrically on a sliding carrier shaft which is arranged to be automatically rotated as it is moved lengthwise, whereby the supporter is simultaneously retracted and turned upwardly away from the plane of the shoe bottom to place it where it will not interfere with the operations of lasting the shank and other portions of the shoe. As herein shown, connected means is employed for moving the wire supporter toward and from its operative position and changing the tension applied by the tension device to the wire.

It is sometimes desirable to employ the mechanism for actuating the grippers laterally without also using the several parts of the wire presenting mechanism including the presser. As herein shown, the means for controlling the grippers-actuating mechanism is detachably connected with the

means through which the presser is rendered operative or inoperative and the means through which the wire supporter and the tension device are adjusted. By reason of this detachable connection the controlling means may, when desired, be employed to set the grippers-actuating mechanism without disturbing the presser and wire presenting mechanism.

The machine herein shown as embodying the several features of this invention is equipped with a starting and stopping mechanism which includes a clutch and a clutch-operating treadle lever, as has been mentioned, and a spring is arranged to raise the lever when the machine is to be stopped. In practice the spring frequently gives to the lever a longer throw than is required so that an operator has to raise his foot unnecessarily high to reengage the lever. To obviate this difficulty an adjustable stop is provided for limiting that movement of the lever which is effected by the spring in the direction to stop the machine.

Another feature of this invention consists in a shoe supporting jack mounted for sliding movement transversely of the machine and preferably connected with mechanism for actuating said jack to effect and control the advance of the shoe for presenting successive portions thereof to the action of the lasting devices. This mechanism may also determine and control the position of the shoe during the operation of the lasting devices on it and relieve the operator from the labor of supporting the shoe against the action of the lasting devices.

These and other features of the invention, including certain combinations of parts and details of construction, will be explained more fully in the following description, and in connection with the accompanying drawings, and pointed out in the claims.

The machine which is shown as embodying the invention contains other novel features which will be described in connection with the complete machine but which are claimed in other applications about to be filed by me.

In said drawings, which represent a preferred embodiment of the invention, Figure 1 is a front elevation of a machine embodying the present invention in a preferred form. Fig. 2 is a detail of the tack-supplying mechanism. Fig. 3 is a side elevation of the machine shown in Fig. 1. Fig. 3^a is a perspective detail view of the mounting of the block carrying the cam roll of the pincer closing lever. Fig. 4 is a side elevation, partly in longitudinal section, of the grippers. Fig. 5 is a perspective view, partly in section, of a cam which will be described. Fig. 6 is a perspective view, partly in section, of the lower portion of

the raceway and of the tack-separating mechanism. Fig. 7 is a view of a portion of the machine, showing the starting and stopping mechanism and parts connected therewith. Fig. 8 is a plan view of the pressers and the wire-supplying mechanism. Fig. 9 is a perspective view of the tension device. Fig. 10 is a detail of the shoe-feeding mechanism. Fig. 11 is a plan view of a modified arrangement for actuating the tension device. Fig. 12 is a perspective view of portions of the machine concerned in the actuation of the grippers. Fig. 13 is a plan view, partly in section, of the tack block. Fig. 14 is a side elevation of the tack block.

The frame of the machine comprises a post or standard 2 and a head 4, in the latter of which is supported a shaft 6, which carries a pulley 8 driven by a belt from a loose pulley 10 on a shaft 12, which is mounted in the base of the machine. The shaft 12 also supports a driven pulley 14. The pulleys 10 and 14 are provided with friction disks 16 and 18 and the pulley 10 is actuated to bring its disk 18 into contact with the disk 16 by means of a treadle 20, which is connected to a wedge 22. The wedge engages a sliding sleeve 24 that bears against the hub of pulley 10. A spring 25 connects the sleeve 24 with the frame and acts through a hook standing in a groove in the hub of the pulley 10 for separating the friction disks when pressure on the treadle is relieved. The wedge is provided with a stop screw 26 adapted to engage the frame and limit the upward movement of the treadle so that it shall not be raised into a position higher than is convenient for the operator to reach.

The shaft 6 carries a cam block 30 having in its front face a cam groove 280, which acts through a connecting plate E, a rod 32, and a spring 33 for lifting and depressing the rear end of a lever 34. The lever comprises side bars spaced some distance apart and fulcrumed upon trunnions 35, 35, carried by the head of the machine. Said bars at the front end of the lever 34 are connected by a cross bar 36 which, with a block 38, forms a socket for a ball 39 on the upper end of the bar or shank 40 of the rigid member 42 of the grippers, which are best shown in Fig. 4. The cooperating movable gripper jaw 45 is operatively connected with the fixed member so that the grippers are depressed into gripping position and then uplifted to pull the stock by means of the lever 34, which is herein called the "up-draw lever."

The shank 40 is slotted from front to back at its lower end and provided at the upper edge of the slot with an extended face 46. The fixed gripper jaw has a body portion shaped to fit in the slot in the shank and has an extended upper end face 47

adapted to fit against the end face 46 of the shank. This extended engagement between the upper end face of the gripper jaw and the face 46 of the shank is designed to minimize the tendency of the gripper jaw to turn with relation to the shank when pressure is exerted against its gripping face for holding and pulling the stock. For further insuring against the tendency of the gripper jaw to turn in its shank said parts are connected at a plurality of points by rivets or clamping bolts 48. This construction forms a very rigid connection between the gripper jaw and its shank and one which is not liable to become loose under the rapidly recurring strains to which the grippers are subjected in the operation of the machine. The cooperating movable gripper jaw 45 is flexibly connected by a link 49 to its shank 50 and is connected to the rigid gripper jaw by parallel links 52 arranged at opposite sides of the gripper jaws, whereby they are spaced a considerable distance apart and prevent any swiveling of the movable jaw about a vertical axis.

The grippers are normally held open by a spring 60 which, resting upon a collar 62 secured to the shank 40, presses upwardly against a pin 63 extending outwardly from the shank 50. The grippers are closed by depressing the shank 50 against the action of the spring 60 and this movement is effected by a lever 64 arranged in the central vertical plane of the machine between the side bars of the updraw lever 34. The closing lever 64 is fulcrumed at 65 on pivot studs carried by the updraw lever and extending transversely of said lever. The rear end of the closing lever carries an adjustable contact screw 67 which rests upon a block 69 that slides up and down in a vertical guide 691 which is located within the updraw lever and is formed in the portion of the frame in which the updraw lever is fulcrumed and from which rises the front one of the brackets 129 for the tack driver spring, later described. The block 69 bears a roll 66 which rests upon an edge cam 68 carried by the shaft 6. This arrangement by which the block 69 has only a right line movement perpendicular to the axis of the cam allows the roll 66 to bear squarely upon the edge cam 68 at all times and avoids rapid wear of the cam, which would occur if the roll were carried directly on the closing lever and tilted with it. The cam 68 has an adjustable section 71 by which the time may be extended or diminished during which the grippers will be held closed. The location of the gripper closing cam 68 adjacent to the fulcrum about which the levers 34 and 64 move together enables the closing lever to move with the updraw lever about said fulcrum without being affected by the cam. By arranging the closing lever in

alignment with its actuating cam the grippers force is transmitted directly from the lever without any tendency for the lever to twist or turn in its supports.

The closing lever is provided at its front end with a spring-pressed plunger 70 which rests upon a cap on the upper end of the shank 50 of the grippers and through which force is transmitted from the lever for closing the grippers. The provision of this yielding element in the closing mechanism allows the grippers to engage and hold with approximately the same force stock varying in thickness. In practice it is desirable that the movement of the closing lever be sufficient to cause the spring surrounding the plunger 70 to be compressed during each closing movement. The gripper shank 50 is provided with an adjustable stop 72 for engaging a stop on the shank 40 of the rigid gripper and limiting the downward movement of the shank 50. By this arrangement the movable gripper jaw may be prevented from contacting with the rigid gripper jaw so that wear of their gripping faces, which are usually toothed or corrugated, may be prevented. This is desirable because the machine is sometimes run without interposing stock between the gripper jaws and if said jaws were allowed to close against each other they would become worn and mutilated. The engagement of the gripper jaws when no stock is interposed also causes some noise which it is desirable to avoid.

The machine is provided with pressers and with means for reciprocating one of said pressers to force the pulled upper inwardly over the bottom of the last into position to be secured. The pressers also assist in holding the upper in overworked position during the interval between the opening of the grippers and the application of the fastening means. The actuating mechanism for the pressers comprises springs 76 which impel them rearwardly and a plunger 78 connected to a lever 80 fulcrumed at 82 at the rear of the machine and engaging at its upper end with a cam face on the rear side of the cam block 30. Said cam block comprises a movable section 84, which is circularly adjustable on the main portion, as shown in Fig. 5. The movable section of the cam block is formed as a ring or sleeve mounted in an annular recess in the rear end of the main section and carries a screw 85 which, in the adjustment of the movable section, travels in a slot 86 in the main section and may be set to secure the two sections in desired relative positions. The movable section of the cam block is provided on its rear side with a cam surface 88 for actuating the lever 80 to advance the presser. By adjusting the movable section of the cam block the time in the cycle of the machine's operation at which the presser

will be advanced and retracted may be varied with relation to the timing of the other moving parts of the machine, as, for example, the grippers closing and uplifting means and the means for reciprocating the tack block 125. It is best that the presser be advanced into holding engagement with the upper before the grippers release the upper and as it is desirable, because of varying conditions which exist in different factories or in the manufacture of different shoes, to vary the time at which the grippers release the upper it is important to vary also the time at which the presser advances. The presser should always remain in holding engagement with the upper until the securing means has been applied for holding the upper in overworked position. The time at which the presser may advantageously release the upper varies under different conditions,—for example, in the use of different securing means. To enable this variation in the timing of the presser to be effected, the main section of the cam block has a cam surface 89 of the same height as the cam surface 88 on the movable section. These two sections may be placed in register when the presser is to be held in its advanced position for a minimum length of time, and the movable section may be shifted either forwardly or backwardly to cause the presser to advance earlier or to remain later in engagement with the upper.

A rotary hopper 100 and an inclined raceway 102 form parts of a mechanism for supplying tacks to be driven for securing the upper in overworked position. A portion of the raceway extends into the hopper and tacks are supplied in large numbers to this inclosed portion of the raceway. Those which fall upon the raceway in such position that they become suspended by their heads upon the supporting faces of the raceway slide by gravity to and along the outer portion of the raceway to the tack-separating mechanism. At the point where the raceway passes through the wall of the hopper it is covered by a block 104, which has in its lower face a groove for the heads of the tacks and permits only those tacks which are properly arranged in alinement to pass thereunder. At the inner side of this block an oscillating tack clearer 106 is arranged to sweep upwardly along the raceway for pushing back misplaced tacks and then, as it retreats, letting the tacks slide freely under the block. The clearer is mounted movably in its holder and pressed yieldingly toward the raceway. The front face of the block 104 is concave, as shown in Fig. 2, and forms a guide for the clearer as it moves toward and from the raceway. The block fits snugly between the upper side of the raceway and the lower side of the raceway hole in the hopper and is normally held

from sliding out of place by the removable cover 110 which fits over the outer portion of the raceway. It frequently happens, however, in the use of the machine that it is necessary to remove this cover in order to give access to the raceway, and when this is done the block 104 is liable to be forced out of position by the clearer. To insure against this occurrence a device 112 is provided for holding the block 104 against displacement. This holding device is shown as a spring-pressed plunger mounted in a fixed portion of the hopper and having an operating handle engaging a cam face 105 which is formed to retain the holder in an elevated position when the holder is lifted and turned by the operating handle. The holder is arranged to bear yieldingly upon the upper face of the block near its outer end and thereby serves another purpose in resisting the tendency of the clearers in their intermittent movement to rock the block and cause it to wear the relatively soft cast iron of the hopper which would allow the block to become loose and unsatisfactory in use.

The main portion of the raceway is inclined, as shown, to cause tacks suspended by their heads on its upper surface to slide down by gravity. At the delivery end of the raceway is arranged tack-separating mechanism comprising a reciprocating blade 120 for separating the lowermost tack in the raceway from those above it. The upper faces 121 of the portion of the raceway upon which said lowermost tack is supported by its head are arranged at an angle to the head-supporting surfaces 122 of the main portion of the raceway so that the stem of the tack to be separated will hang at an angle or diverge from the stem of the next tack above it and, therefore, provide a wider space for the passage of the separating blade than would be provided by tack stems hanging parallel to each other. Preferably the faces 121 will extend horizontally, as shown in Fig. 6. After the separator blade passes between the tacks the separated tack is forced by the slotted plate 124 into a position where it may fall into the reciprocating tack carrier 125 from which it is inserted into the stock by a driver 126 actuated by a torsion-spring 128 held in brackets 129 that rise from the portion of the frame in which the updraw lever 34 is fulcrumed.

The machine is provided on its left-hand side with a bracket 130 on which is held a reel for wire. The wire extends from the reel through a tension device comprising a bracket 132, having a fixed friction disk 134, cooperating with a movable friction disk 136, see Figs. 8 and 9. The friction disks are pressed together by a spring 138 surrounding a post 140, the tension of the spring being controlled by a nut 142. From the tension device the wire passes over a

wire supporter 145 having its operative end normally positioned adjacent to the pressers and in approximately the plane occupied by the bottom of a shoe being lasted.

5 The reel-supporting bracket, the tension device, and the wire supporter are arranged so that the wire may extend in an approximately straight line from the reel to the supporter. This is especially desirable when

10 flat wire or wire of other irregular form is being used which would be liable to twist in the tension device and cause unequal tension to be applied at different times if the wire were deflected from a straight course by the

15 tension device. The post 140 is shown as provided with a transverse guide opening through which the wire passes and by which the wire is held centrally between the tension disks.

20 The wire supporter 145 is mounted in a carrier 146, being bent or deflected laterally from the carrier so that its wire-guiding end is eccentric to the carrier. The carrier is mounted for movement in the machine

25 frame and provided near its rear end with a block 148 having an inclined groove 150, as indicated in dotted lines in Fig. 8. The groove 150 receives a stud 152 on a sliding bar 154 connected with one arm 153 of a

30 rockshaft 155, the other arm of which is formed as a knee lever 156, see Fig. 3. The carrier 146 is provided with a spiral groove 160 in which stands a stud 162. With this arrangement the wire guide may be moved

35 toward and from its operative position by the knee lever 156 and in retreating from its operative position it will not only be moved backwardly, but will be turned to carry its wire-guiding end upwardly out of

40 the plane in which is located the bottom of the shoe being lasted. With this arrangement the wire supporter is caused to assume the inoperative position shown in Fig. 1 where it is not liable to interfere

45 with the proper presentation of any part of a shoe to the lasting devices.

The friction disks 134, 136 of the tension device are provided with cam surfaces, as shown in Fig. 9, which are so formed that

50 when they are in register, as shown therein, the disks may be pressed by the spring 138 as close together as the wire will permit and the wire will, therefore, be held with the full force of the tension spring. The

55 disk 136 has a radially extending arm 170 by which it may be turned to cause its cam face to ride up on the cam face of the disk 134 and diminish the tension on the wire. This is desirable at times in order to enable

60 the wire to be drawn more easily through the tension device. The arm 170 is connected by a rod 172 with a bell crank lever 174 and the bell crank is connected by rods 175 and 176, see Fig. 7, with the foot treadle 20

65 so that by depressing the treadle the friction

disk 136 may be turned. A spring 178 acting on the rod 176 moves the treadle and the connected parts in the reverse direction. As the treadle 20 is also employed for starting the machine the parts of the tension device are so arranged that when the treadle is depressed the friction plate 136 is moved to put its cam face in register with the cam face on the disk 134 and the wire is clamped. When the treadle is released the spring 178

70 reversely moves the parts and diminishes the tension on the wire. The extent to which the disk 136 is moved for this purpose and therefore the degree of tension under which the wire is held when the treadle is released may be determined by the adjustment of a turn buckle 180, shown as movably connecting two parts of the rod 175.

Another arrangement for varying the tension with which the wire is held is illustrated in Fig. 11 wherein the rotatable tension disk 136 is provided with an arm 171, which, by means of an adjustable finger 173 and stops 183 and 187, is arranged to be actuated by the carrier 146 upon which the wire supporter is mounted. This carrier, it will be remembered, is moved lengthwise by manipulation of the knee lever 156. This construction enables the tension on the wire to be varied independently of the starting and stopping of the machine. As herein shown the knee lever and its connected rockshaft 155 may be employed for connecting and disconnecting the presser 75 from its actuating mechanism. To this end the shaft has an arm 193, to which is connected a slide 195, having a guideway 197, in which the plunger 78 reciprocates and by which the head of the plunger is held in position to engage a cooperating shoulder on the presser 75, as shown in Fig. 8, when the presser is to be actuated. When the presser is not to be actuated the knee lever will be moved to turn the shaft 155 in the direction to shift the slide 195 to the right

85 in Fig. 8 and the slide will withdraw the head of the plunger from position to engage and actuate the presser. The same movement which disconnects the plunger 78 from the presser will retract the carrier 146 to

90 move the wire supporter into its inoperative position and will, in accordance with the construction shown in Fig. 11, manipulate the tension device to relax the tension on the wire. The extent to which the tension on the wire will be relaxed may be varied by adjusting the finger 173 upon the arm 171, this adjustment being effected by the pin-and-slot connection 177, 179.

The cam block which has the cam surface 68 heretofore mentioned has also a cam groove 260 through which a lever 262 is actuated. This lever is fulcrumed on a rod 264 and on its front end are formed teeth that engage a pinion 265 on a sleeve shaft

125 130

266, having on its end a segment block 268 which is rocked with each revolution of the cam. A slide 270 is mounted in the inner face of the segment block and is connected by a link 272 with the grippers as shown in Fig. 12, and more fully explained in the prior patent before mentioned. The rockshaft 155 has at its upper end an arm 275 that engages a loose sliding collar 276 on the sleeve shaft. The collar has a stud 278 that extends through a spiral slot in the sleeve shaft 266 and into a shaft 280, see Fig. 3, so that when the collar is moved lengthwise of the shafts by the rockshaft 155 the inner shaft 280 will be turned. This inner shaft has on its front end a pinion 282 best shown in Fig. 1, by which the slide 270 is adjusted toward and from the center about which the sleeve shaft is oscillated by the lever 262. When the slide is eccentric to said sleeve shaft motion will be transmitted from the segment block 268 through the link 272 to move the grippers laterally to plait the upper. When however the slide is adjusted by the rockshaft 155 and the described connections into alignment with the axis of the sleeve shaft no motion will be transmitted from the segment block to the grippers. The rockshaft 155 thus constitutes controlling means for rendering operative or inoperative the mechanism for moving the grippers laterally. A second link 285 connects the slide 270 with a lever 286 which is joined by a link 288 with a rack bar 290 that engages teeth on the head 39 of the gripper shank 40, see Fig. 4. By this connection the grippers are turned as well as moved laterally when the described actuating mechanism is operatively connected with them. To enable the rockshaft to be employed for controlling the grippers actuating mechanism without adjusting the presser actuating plunger 78, the wire supporter 145, or the tension device if the construction shown in Fig. 11 be employed, the arms 153 and 193 may be detachably connected to the rockshaft as shown in Fig. 3. The connection comprises a collar 292 pinned to the rockshaft and carrying a spring pressed plunger 294 that can enter a seat in the lower side of the hub on which the arms 153 and 193 are formed. The plunger is provided with a handle 295 that rests on an incline 291 up which it may be forced to withdraw the plunger and disconnect the rockshaft from said arms and the parts connected with the arms. A seat 299 in the collar 292 receives the handle and retains the plunger in its retracted position. A spring plunger 193, see Fig. 11, may be employed to hold the several parts connected with the rockshaft in their adjusted position, and when the arms 153 and 193 are disconnected from the rockshaft the plunger will hold the parts controlled by said

arms in whatever position they may be adjusted, as, for example, in the operative positions shown in Figs. 8 and 11.

The means for supporting the shoe against the thrust of the lasting and tack-driving devices comprises a jack having a toe rest 200 and a heel pin 202. The toe rest is mounted in a carriage which is adjustable longitudinally of the shoe upon a plate 204 and held in adjusted position by a binding screw 205. The heel pin is mounted on a lever 206, which is pivoted on the carriage 208, also adjustable longitudinally of the shoe upon the plate 204. The lever 206 is pressed in the direction to rock the shoe downwardly against the toe rest by means of a spring 210. The plate 204 is pivotally connected at 212 to a block 214, having a segment-shaped lower face guided in a post 215. The post and jack are yieldingly sustained in a spindle 216 by a spring 218 and the spindle is pivotally connected at 220 to a slide 222. The slide 222 is arranged for movement transversely of the machine in a bracket 225 secured to the standard 2. The slide 222 is slotted at 226 to permit the point of support for the post to be adjusted toward and from the machine and said slide is provided with an adjustable stop 228 to limit the tipping movement of the jack away from the machine. With this construction it will be evident that the shoe is mechanically upheld to the action of the lasting and tack-driving devices, thus relieving the operator from the labor involved in holding the shoe in proper position to receive to the best advantage the action of the lasting devices.

Means is also provided which may be employed at the will of the operator for feeding the shoe supported on the jack in a direction transversely of the machine. The slide 222 is provided on its lower face with rack teeth engaged by a pinion 230 on a shaft 232 loosely mounted in the bracket 225. The shaft 232 carries a clutch member 234 adapted to be engaged by a sliding clutch member 236 fast on a shaft 238. The latter shaft also carries a ratchet wheel 240, as shown in Fig. 10, the ratchet being engaged by a pawl 242 on a pawl carrier 244, which is actuated by a link and lever connection 245 with a cam track 246 in a cam disk mounted on the main shaft 6. The mechanism thus arranged moves the jack and the shoe thereon from left to right, which is the direction in which it is customary to progress with the lasting of a shoe. A clutch-operating lever 250 is provided for disconnecting the clutch members 234 and 236 and a spring-pressed plunger 252 serves to hold the lever in either of its two required positions. The lever extends into position to be conveniently engaged by the operator and if the lasting is begun on one

side of the shoe and progresses toward the toe it is usually desirable to stop the feeding of the shoe while rounding the toe, as it is only necessary at this time to turn the shoe without advancing it materially. The feeding of the shoe can be stopped by operating the lever 250 when the toe is reached and the feeding resumed by reversing the lever when the toe has been rounded. The slide 222 is provided with an inclined face 260 adapted to be engaged by an arm of the lever 250 and actuate said lever to disconnect the clutch members and stop the feeding of the shoe when the slide reaches the end of its possible movement. When the clutch members are disconnected the slide may be moved freely in either direction and a crank 265 is shown as provided to turn the shaft 232 for this purpose.

The tack block heretofore referred to and designated as a whole by the reference character 125 in Fig. 3 is mounted on a forwardly and backwardly moving slide actuated by a lever and cam connection with the driving shaft 6, substantially as in said prior patent. The tack block is advanced over the shoe bottom into position for a tack therein to be driven for securing the upper after the upper has been pulled by the grippers. The tack block may be constructed as shown in detail in Figs. 13 and 14, wherein the carrier 180 has a tack and driver passage 182 in which a tack may be supported by the fingers 184, pivoted at 187 in the fore part of a longitudinal groove 188 in the carrier. The fingers are arranged one in advance of the other, as shown, to allow the tack block to be made narrow. This is particularly desirable in machines used for lasting the heel seats of turn shoes, for in this work it is necessary that the tack block advance under the upturned heel end of the sole and drive tacks as close as possible to the angle between the sole and upper. The fingers 184 are yieldingly held pressed together to support the tack, but allow the driver to force the tack therebetween by means which includes a loop 186 seated in a groove in the front finger and extending rearwardly with its side arms embracing the sides of the fingers. The rear ends of the side arms are intumed to form hooks that extend through the walls of a spring case and terminate between two collars on a plunger 192. The plunger is engaged by a spring 190 seated in the case and the front end of the plunger rests in a recess in the back side of the rear finger 184. With this arrangement the one spring 190 acting in one direction through the loop 186 and in the reverse direction through the plunger 192 holds the two fingers yieldingly toward each other with equal force. The ends of the loop stand in the space 194 between the casing and the reduced portion

192 of the plunger and by limiting the forward movement of the plunger center the two tack fingers with relation to the driver passage 182.

In the use of the machine the shoe is presented either upon the jack or in the hands of the workman in position for the upper to be engaged by the grippers, which pull it over the bottom of the last, after which the pressers in their operation force it into position to be secured and the reciprocating tack block advances into position for a tack to be driven. The heel and sides of the shoe are usually fastened by tacks and when the toe of the shoe is reached the foot treadle is usually released and the machine stopped. The wire is then pulled through the tension device, the clamping disks of which will at that time have been separated sufficiently to allow the wire to be pulled through easily. The end of the wire is anchored to the last driven tack and when the machine is restarted the lasting proceeds around the toe of the shoe. The wire which is held taut by the tension device is pulled from the reel as the lasting progresses, and is superimposed in position to hold the overworked upper. When the lasting has been completed around the toe of the shoe the machine is again stopped and the wire anchored to a tack driven on that side of the shoe. If the shoe-feeding means is employed it will advance the shoe step-by-step as the lasting proceeds along the side and when the toe is reached the feeding means may be stopped by manipulating the lever 250, until the other side of the shoe is reached, when the feeding means will be again started. While lasting the heel of the shoe it is the custom of many operators to hold the shoe so that the grippers do not engage the shoe and the upper is wiped into lasted position by the tack block. The stops on the shanks of the gripper bars prevent the grippers being closed to wear the gripping faces on the jaws at such times when no stock is interposed between said faces.

Certain features of the invention, not herein claimed, form the subject-matter of divisional applications Ser. Nos. 431,010 and 431,011, filed May 5, 1908 and Ser. No. 472,910, filed Jan. 18, 1909.

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

1. In a lasting machine, the combination with grippers, of actuating mechanism therefor, comprising an updraw lever and means for operating it, and a closing lever arranged for independent movement about an axis separate from and parallel to the axis of the updraw lever and for further movement with the updraw lever and cam means adjacent the axis of the updraw lever for actuating the closing lever.

2. In a lasting machine the combination with grippers, of actuating mechanism therefor comprising an updraw lever and means for operating it, a closing lever pivoted upon the updraw lever and arranged for independent gripper closing movement in approximately the same plane as the updraw lever and also for movement with and by the updraw lever to cause the jaws to hold the upper during the updraw movement, and means for actuating said closing lever in timed relation to the updraw lever.

3. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising an updraw lever and means for operating it, a closing lever mounted on the updraw lever to partake of its movement and arranged for independent movement about an axis parallel with the axis of the updraw lever and means for actuating said closing lever in timed relation to the updraw lever.

4. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising an updraw lever and means for operating it, a closing lever mounted on the updraw lever to partake of its movement and arranged for independent movement in approximately the same plane as the updraw lever and means for actuating said closing lever in timed relation to the updraw lever.

5. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising a bifurcated updraw lever and means for operating it, a closing lever pivoted to the updraw lever between its sides and arranged to partake of the movements of the front arm of the updraw lever, and means for actuating the closing lever independently of the updraw lever and in timed relation thereto.

6. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising a bifurcated updraw lever and means for operating it, and a gripper closing mechanism including devices arranged between the bifurcations of said updraw lever and in substantially the central plane of the machine.

7. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising a bifurcated updraw lever and means for operating it, gripper closing means including a lever pivoted to the updraw lever between its bifurcations, and means for actuating the closing lever independently of the updraw lever.

8. In a lasting machine, the combination with grippers, of actuating mechanism therefor including an updraw lever arranged centrally of the machine, and gripper closing means including parts arranged centrally of the machine and extending from the fulcrum of said lever forwardly to the grippers, said lever being formed and ar-

ranged to permit the closing means to be positioned in a vertical plane between two lateral sides of the lever.

9. In a lasting machine, the combination with grippers, of actuating mechanism therefor including an updraw lever arranged centrally of the machine, and gripper closing means including connections leading from the front end of the updraw lever toward the fulcrum thereof and located centrally of the machine within the lateral sides of said lever.

10. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising a bifurcated updraw lever and means for operating it, a closing lever pivoted to the updraw lever between its sides, a sliding block carried by the updraw lever to engage the closing lever, and a cam for actuating the sliding block.

11. In a lasting machine, the combination with grippers, of actuating mechanism therefor comprising a bifurcated updraw lever and means for operating it, a closing lever pivoted to the updraw lever between its sides, a cam, and a block slidingly mounted in the updraw lever adjacent to its fulcrum and constructed and arranged to transmit movement from the cam to the closing lever.

12. In a machine of the class described, the combination with grippers and mechanism for automatically actuating the grippers, of a presser, and means for automatically actuating the presser to force the upper over the last, said machine having provision for varying the timing of the grippers and the presser.

13. In a machine of the class described, the combination with grippers and mechanism for actuating the grippers to pull an upper about a last, of a presser, and means for actuating the presser to force the upper over the last, said actuating means having provision for adjustment to vary the movements of the presser.

14. In a machine of the class described, the combination with grippers and mechanism for actuating the grippers to pull an upper about a last, of a presser, and means for reciprocating the presser, said means having provision for adjustment to control the length of time that the presser shall remain in engagement with the upper.

15. In a machine of the class described, the combination with grippers and mechanism for actuating the grippers to pull the upper about a last, of a presser for forcing the upper over the last and means for advancing the presser in predetermined time relation with the grippers, said means being adjustable to extend or diminish the time that the presser shall be held in pressing engagement with the upper.

16. In a machine of the class described,

- the combination with grippers for pulling an upper over a last, and a presser for forcing the upper over the last bottom, of actuating mechanism for said grippers and presser including a relatively adjustable cam by which the timing of the grippers and presser may be varied.
17. In a machine for working an upper over a last, a presser, and means for automatically actuating the presser to force the upper over the last, said actuating means having provision for adjustment to vary the movements of the presser.
18. In a machine for working an upper over a last, a presser, and automatically operating means for reciprocating the presser, said means having provision for adjustment to control the length of time that the presser shall remain in engagement with the upper.
19. In a machine for working an upper over a last, a presser for forcing the upper over the last and means for automatically advancing the presser, said means being adjustable to cause the presser to engage the upper earlier or later in the cycle of the machine's operation.
20. In a machine for working an upper over a last, the combination with a presser, of means for actuating it intermittently to force the upper inwardly over the edge of the last, said actuating means having provision for adjustment to vary the length of time that the presser remains in holding engagement with the upper.
21. In a machine for working an upper over a last and securing the upper, the combination with a reel holder and a wire support, of a tension device comprising clamping disks, a post or spindle extending through said disks and provided with a transverse opening through which the wire is guided centrally between the disks, and means on the engaging faces of said disks for separating the disks to relieve the tension on the wire when they are rotated about the post relatively to each other.
22. In a machine for working an upper over a last and securing the upper, the combination with a reel holder and a wire support, of a tension device comprising clamping disks having cams on their engaging faces for separating the disks when one is rotated in its plane relatively to the other, resilient means normally pressing the disks toward each other, and a wire guide located approximately in alinement between the holder and support arranged to direct the wire in a substantially straight course from the reel to the support.
23. In a machine of the class described, the combination with devices for working an upper over a last, of means for supplying wire to secure the overworked upper, said means comprising a wire supporter, a holder upon which the supporter is eccentrically mounted, and means for rotating the holder to turn the supporter toward and from operative position.
24. In a machine of the class described, the combination with devices for working an upper over a last, of means for supplying wire to secure the overworked upper, said means comprising a wire supporter, a holder upon which the supporter is eccentrically mounted, means for moving the holder and supporter longitudinally, and means for automatically turning the holder to swing the supporter toward and from the overworking devices.
25. In a lasting machine, the combination with means, including a presser for working an upper into lasted position, a supporter mounted independently of the presser for guiding wire into position to be placed for binding the upper, and movable angularly and also toward and from an operative position in substantially the plane of the bottom of the shoe being lasted, and connected means for moving the presser and supporter toward and from operative positions.
26. In a machine of the class described, the combination with devices for working an upper over a last and mechanism for operating the same including starting and stopping means; of means for supplying wire to secure the overworked upper; a tension device; means, including a foot treadle, which also controls the starting and stopping means, and intermediate connections for applying and relieving the tension on the wire; a spring for actuating the treadle in the direction to relieve the tension and stop the machine; and a stop adjustable to limit the movement of the treadle effected by the spring and cause a tension which can be varied to be maintained on the wire while the machine is at rest.
27. In a machine of the class described, the combination with devices for working an upper over a last and mechanism for operating the same; of means for supplying wire to secure the overworked upper; a tension device; means, including a foot treadle, which also controls the starting and stopping means, and intermediate connections for applying and relieving the tension on the wire and for starting and stopping the machine; a spring for actuating the treadle in a direction to relieve the tension and to stop the machine; and a stop for limiting the movement of the treadle to a point where it may be conveniently reengaged by the operator and where a suitable amount of tension will be maintained on the wire when the machine is at rest.
28. A lasting machine, having in combination, lasting devices, actuating mechanism therefor, starting and stopping means,

wire tensioning means, a treadle connected to the said two means, a stop 26 to limit the movement of the treadle, and means 180 to adjust the tension independently of the
5 treadle stop.

29. In a machine of the class described, the combination with devices for working an upper over a last, and means for supplying wire to secure the overworked upper, of a
10 tension device for the wire, means for operating the tension device to apply and relieve tension on the wire, and means for effecting adjustment of the tension device with relation to its operating means.

15 30. In a machine of the class described, the combination with devices for working an upper over a last, and means for supplying wire to secure the overworked upper, of a device comprising a rotatable member for
20 applying tension to the wire, a spring-actuated operating member therefor, and means for adjusting the rotatable member with relation to the operating member for varying the normal angular position of said rotatable
25 tension member.

31. In a machine of the class described, the combination with devices for working an upper over a last, and means for supplying wire to secure the overworked upper, of
30 a tension device comprising a rotatable member for applying tension to the wire, a cam cooperating with said member to raise it from the wire when it is turned, an actuator operatively connected with said member for
35 turning it, and means for adjusting said member with relation to the actuator for varying its position on said cam.

32. In a machine of the class described, the combination with devices for working an
40 upper over a last, and means for supplying wire to secure the overworked upper, of a tension device comprising a rotatable member for applying tension to the wire, a cam cooperating with said member to raise it
45 from the wire when it is turned, a spring operatively connected with said member for turning it, and an adjustable stop for limiting the movement of said member effected by said spring.

50 33. In a lasting machine, the combination with grippers and actuating mechanism therefor, adapted to be rendered operative or inoperative, a presser adapted to be rendered operative or inoperative, a single con-
55 trolling means for said mechanism and presser, and a detachable connection between the controlling means and one of said parts.

34. In a lasting machine, the combination
60 with lasting devices, of a jack, a slide upon which the jack is mounted, means for automatically actuating said slide to feed the

jack with relation to the lasting devices, and means under control of the operator to render the feeding means operative or inoperative without interrupting the operation of
65 the lasting devices.

35. In a lasting machine, the combination with lasting devices, of a jack, a slide upon which the jack is mounted, means for auto-
70 matically actuating said slide to feed the jack with relation to the lasting devices in one direction, and manually controlled means for actuating the slide in either di-
rection.

36. In a lasting machine, the combination
75 with lasting devices, of a jack, a slide upon which the jack is mounted, means for automatically actuating said slide to feed the jack with relation to the lasting devices, and means for automatically disconnecting said
80 feeding means from its actuating mechanism.

37. In a lasting machine, the combination with lasting devices, of a jack, a slide upon which the jack is mounted, and means for
85 automatically actuating said slide to feed the jack with relation to the lasting devices, said machine having provision for permitting the feed to be suspended while the end of a shoe is being operated upon by the last-
90 ing devices and resumed when the side of the shoe is to be lasted.

38. In a lasting machine, an updraw lever pivoted intermediate its ends, means for ac-
95 tuating the same, a pincer closing lever partaking of the movement of the updraw lever to maintain the pincers closed during the up-drawing movement, a closing lever cam relatively to which the updraw lever rocks, a
100 cam roll, and connections between said cam roll and said closing lever constructed and arranged to allow the roll to bear squarely upon the edge of said cam in all positions of said levers.

39. A machine of the class described, hav-
105 ing, in combination, with grippers, the updraw lever 34, means for actuating the same, the closing lever 64, mounted to rock with said updraw lever, the cam 68 for operating the closing lever, the roll 66, guiding means
110 for maintaining the roll in even engagement with the face of the cam and the roll carrier 69 having sliding engagement with the closing lever.

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

WILLIAM A. BOND.

Witnesses:

CHARLES E. GRUSH,
ARTHUR L. RUSSELL.