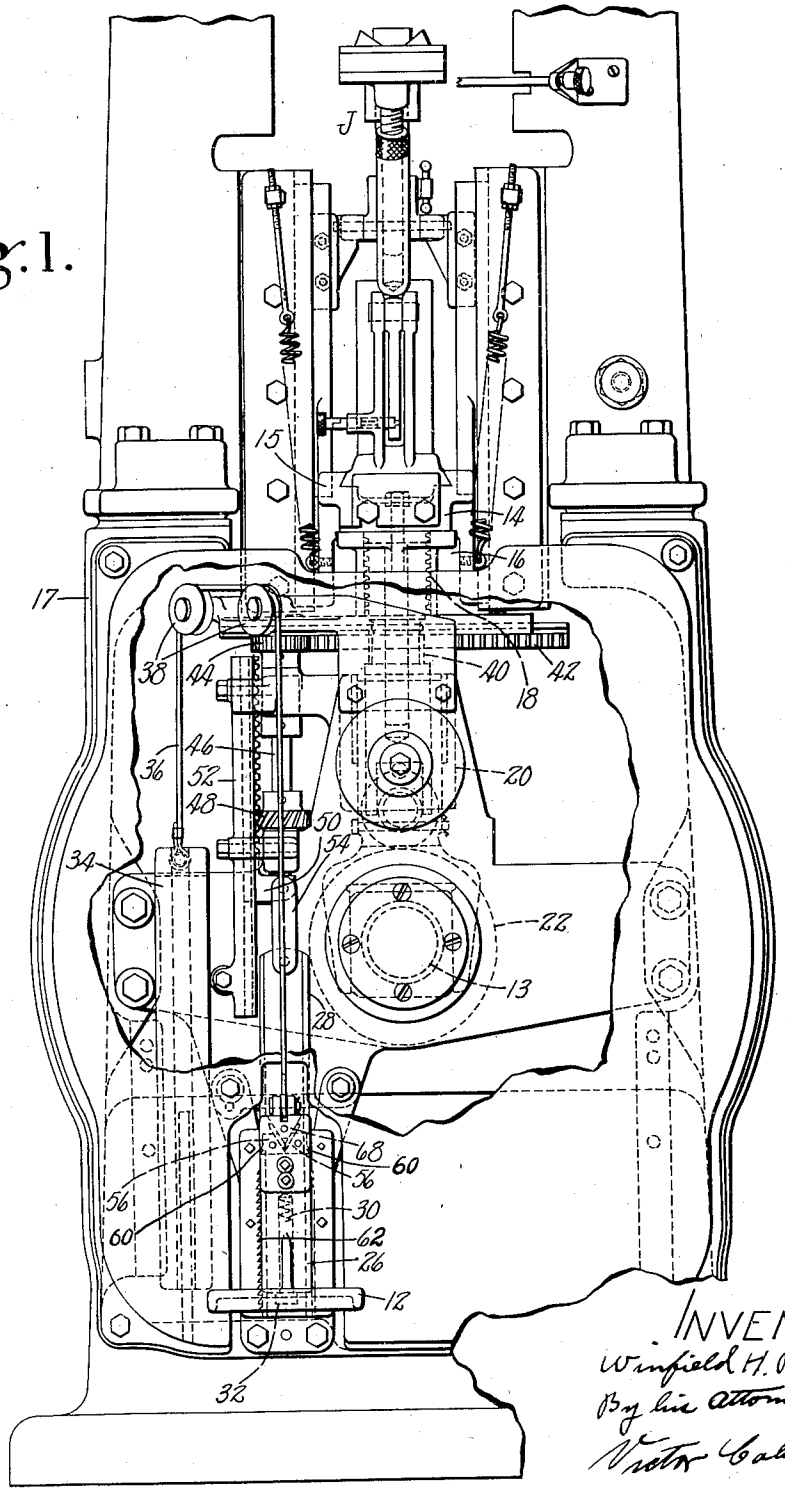
Aug. 18, 1942. W. H. PARKHURST 2,293,624

FASTENING-INSERTING MACHINE

Filed Dec. 30, 1940 6 Sheets-Sheet 1

Fig. 1.



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FASTENING-INSERTING MACHINE

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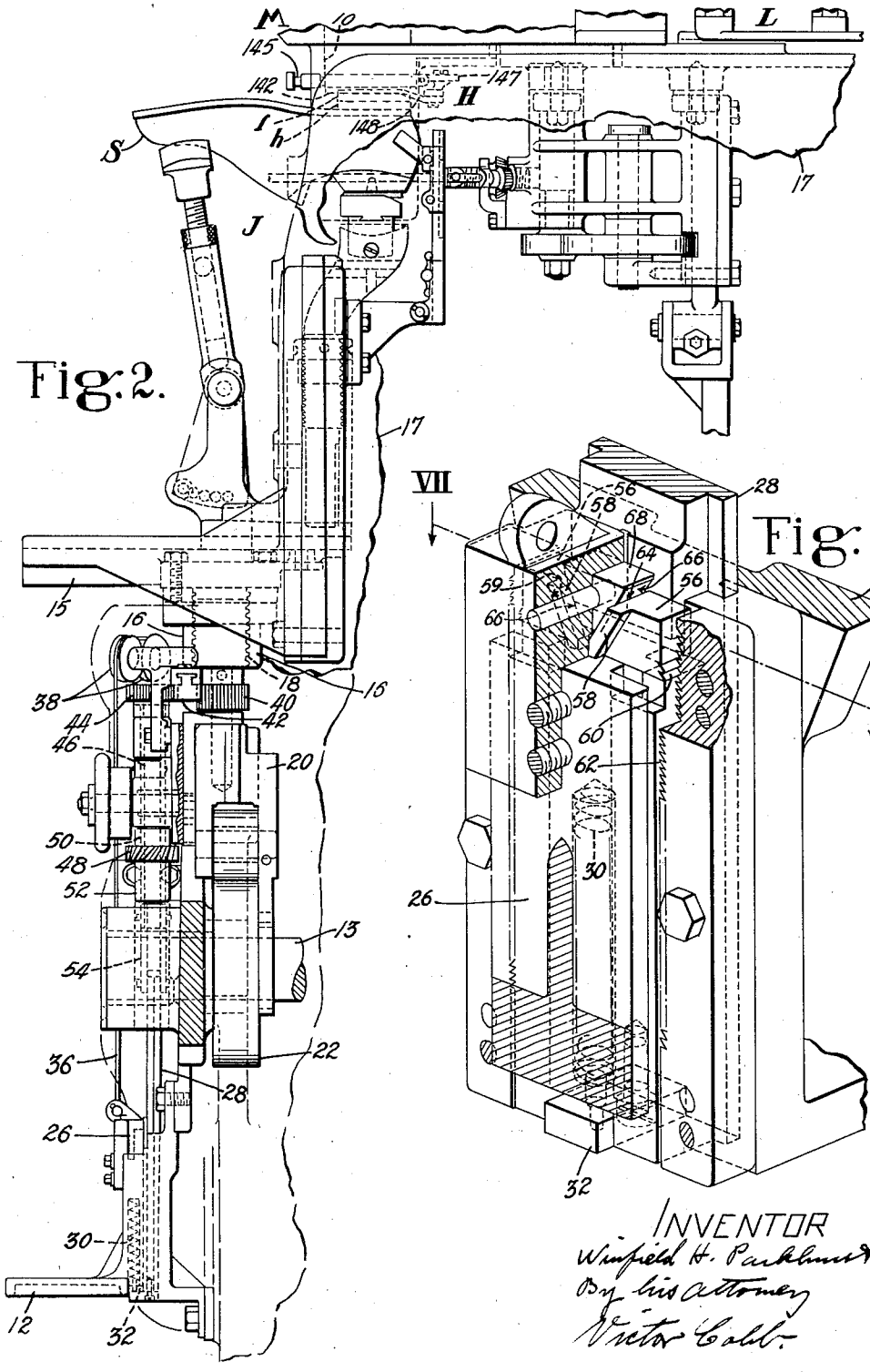


Fig. 2.

Fig. 3.

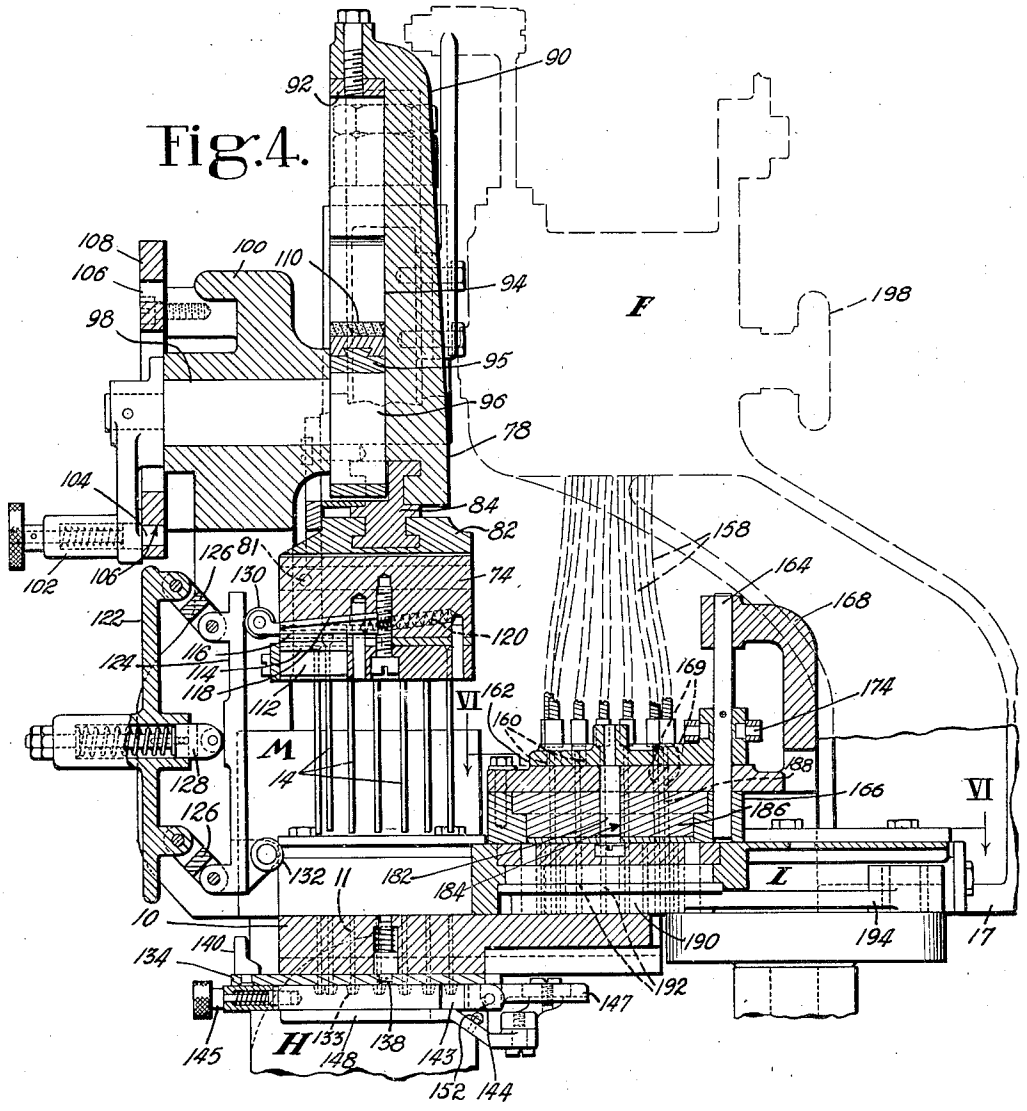
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FASTENING-INSERTING MACHINE

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Fig. 4.



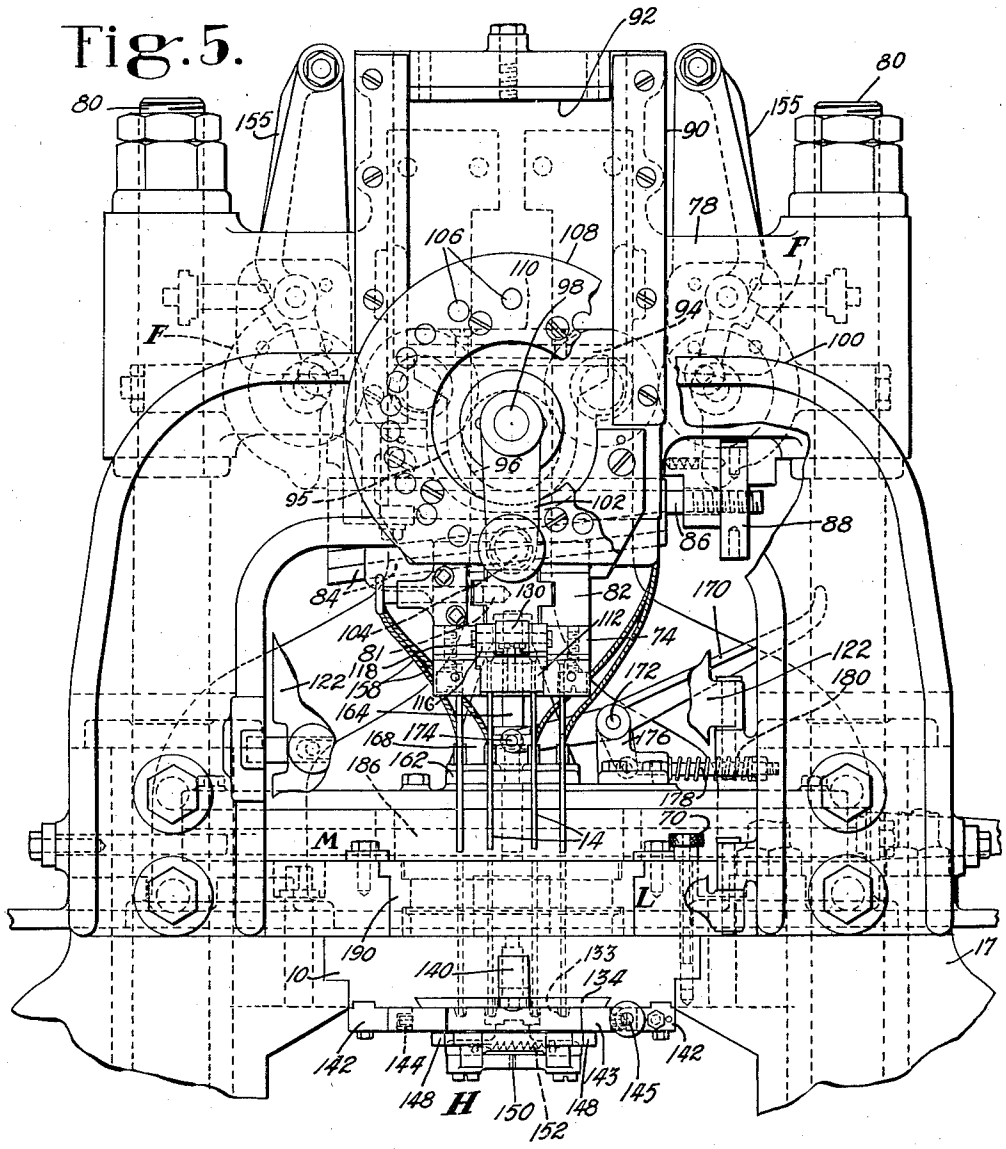
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FASTENING-INSERTING MACHINE

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Fig. 5.



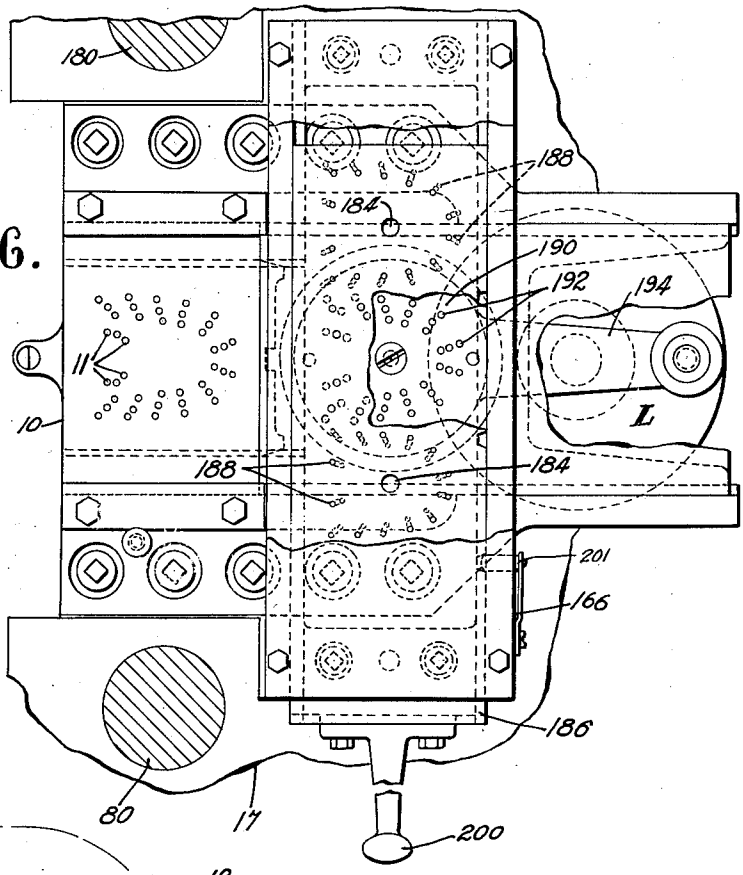
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FASTENING-INSERTING MACHINE

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Fig. 6.



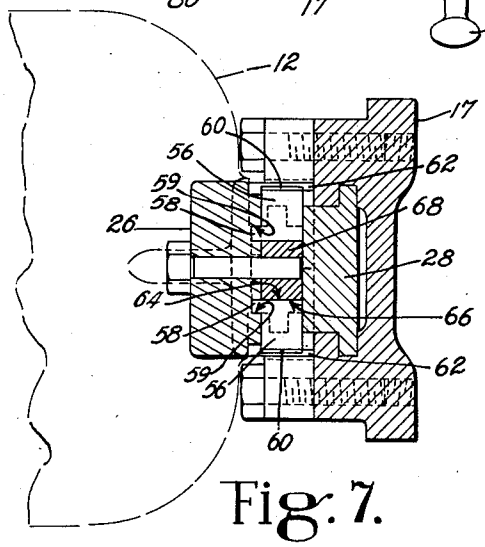


Fig. 7.

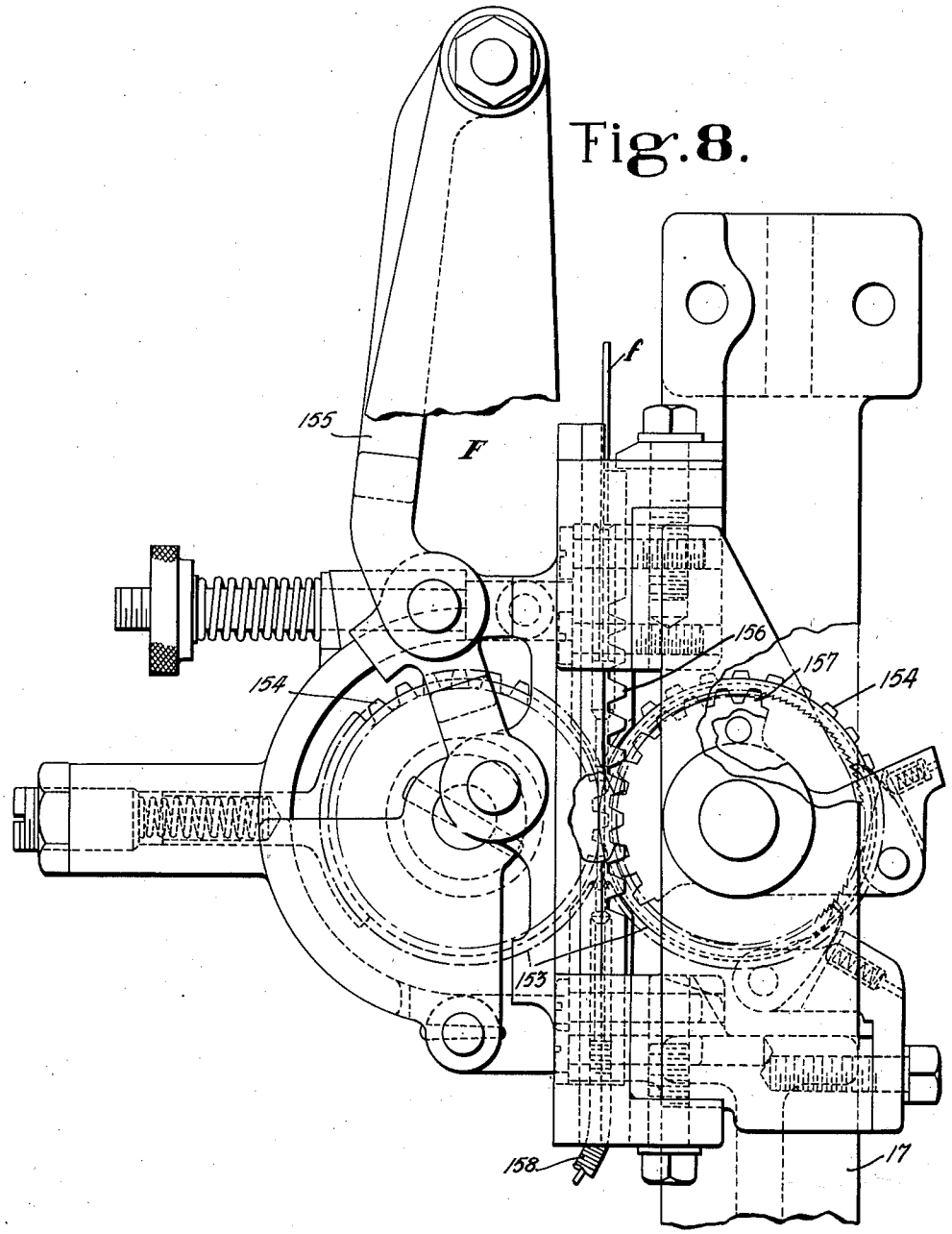
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FASTENING-INSERTING MACHINE

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Fig. 8.



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2,293,624

UNITED STATES PATENT OFFICE

2,293,624

FASTENING-INSERTING MACHINE

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Application December 30, 1940, Serial No. 372,307

46 Claims. (Cl. 1—32)

This invention relates to machines for securing work-parts by the insertion of fastenings, and is herein disclosed as embodied in a machine for attaching heel-parts to shoes in a manner similar to the apparatus of Letters Patent of the United States No. 2,207,742, La Chapelle, July 16, 1940, which employs fastenings severed from strings of fiber, or the like.

It is an object of my invention to improve the operation of such machines as that of the patent, and to render them more convenient for the operator. In the attainment of this object, the following features are involved. The pressure which the operator may apply to the work in holding it for the insertion of the fastenings is limited to a predetermined amount. This is of particular utility in connection with such readily compressible parts as rubber lifts or heels. The adjustment of the extent of movement of the fastening-inserting drivers is facilitated. In heel-attaching, this is useful in changing from rubber-work to leather-work. In the use of fiber fastenings, the parts to be secured are pricked by the drivers before the inserting stroke, and, as in the preceding feature, this is made easy for the operator. The form of the work may render it desirable to prick less deeply for the fastenings over some areas, than other others. This I effect automatically under the control of mechanism for transferring fasteners to the inserting mechanism. There is provided a heel- or other work-holder arranged for ready interchangeability to present articles of different size for the inserting operation, and which allows for the substitution of work-engaging portions of the fastening-inserting mechanism. For changes in the inserting design, adapting means is placed between the feeding mechanism and transferring mechanism, so, with minimum effort, the operator may direct the strings of material from a constant arrangement of passages at the feeding mechanism, to differently arranged groups of passages in which the fastenings are transferred to the inserting mechanism. As the work is pricked to different extents, when its thickness changes, the length of the fastening material fed is correspondingly varied, and, to give the fastenings better holding power as they are compressed in driving, I advance an excess of fastening-length over the depth of pricking, this excess being proportionate to the variation in length.

In the accompanying drawings,

Fig. 1 shows the lower portion of a particular embodiment of my improved machine in broken front elevation;

Fig. 2 is a broken side elevation thereof;

Fig. 3, a broken perspective view of the locking mechanism for the jack;

Fig. 4, an enlarged central vertical section taken through the upper portion of the machine;

Fig. 5, a full front elevation thereof;

Fig. 6, a full horizontal section on the line VI—VI of Fig. 4;

Fig. 7, a horizontal section on the line VII—VII of Fig. 3; and

Fig. 8, an enlarged detail, in side elevation, of the fiber-feeding mechanism.

In its general characteristics, the present machine resembles that of the above-mentioned patent. There is, however, but a single work-pricking and fastening-inserting mechanism M, with its fiber-shearing and -loading mechanism L. The features common to the two machines will be but briefly described. The work, as a shoe S to be heeled (Fig. 2), is supported upon a jack J beneath a die and abutment 10 of the mechanism M, with which die is associated a holder H retaining against the underside of the die a top-lift *l*, which may be of rubber, and, below this, a heel-base *h*. The heel-seat of the shoe is brought into preliminary engagement with the heel-base in the holder by actuation of a treadle 12, and receives final work-clamping pressure under the influence of a rotatable power-shaft 13. Reciprocatory drivers 14 of the inserting mechanism M act, through fastening-receiving passages 11 in the die, to first prick through the heel-parts and into the heel-seat of the shoe, and, upon a second movement, to insert fastenings in the pricked openings. These fastenings preferably consist of lengths cut from strings of fiber *f* (Fig. 8), advanced from feeding mechanism F to the loading mechanism L. The feeding mechanism is operated, under the influence of the pricking stroke of the drivers 14, to advance the correct lengths of the fiber strings into the passages in the loading mechanism. Said loading mechanism then acts to shear off discrete fastenings and transfer these above the die-passages, presenting them to receive the inserting stroke of the drivers.

Considering the work-support or jack J, this may be as before, but an improved mechanism is provided for elevating it and the work into engagement with the die 10, together with means whereby the pressure applied through the treadle 12 may be limited. By this means is avoided distortion of rubber lifts, if excessive force is applied by the operator. Referring to Figs. 1, 2, 3 and 7 of the drawings, a bracket 15, upon which

the jack J is slidable horizontally, has at its underside a block 16 guided for vertical movement in the frame 17 of the machine, and is provided with a vertical threaded bore receiving a screw 18 rotatable upon a second block 20, also movable vertically upon the frame. A cam 22 upon the driving shaft 13, through the just indicated connections, applies final clamping pressure to the jacked work against the die. Engagement of the work with the die has previously been effected to give preliminary pressure through the following connections to the treadle 12. This treadle projects from the lower extremity of a slide 26, guided in vertical ways in a transmitting slide 28 movable in similar ways in the frame (Figs. 3 and 7). In the slide 26 is a vertical bore, in which is a compression-spring 30 resting at its lower extremity upon a forward projection 32 from the slide 28. Between the bottom of the slide 26 and the projection 32, there is a space so said slide may move down, compressing the spring. A weight 34 (Fig. 1), joined to the slide 28 by a cable 36 running over guide-rolls 38, 38 upon the frame, holds the treadle normally raised. Fast upon the screw 18 is a pinion 40, with which meshes a rack 42, guided for horizontal reciprocation upon the frame. Also meshing with the rack is a pinion 44, secured to a vertical shaft 46 journaled in the frame. The shaft 46 has fast upon it a spiral pinion 48, which meshes with a spiral rack 50 movable in a vertical guide 52 attached to the frame. The rack is joined by a link 54 to the slide 28. A horizontal extension from the rack, to which the link is connected, may engage the lower extremity of the shaft 46 to furnish a stop for the upward movement of the slide 26 and the treadle. Guided for movement transversely of the machine in horizontal ways in the slide 28 are opposite blocks 56, 56, the outer sides of which have at their inner extremities downwardly and inwardly inclined ribs 58, movable in correspondingly inclined grooves 59 in the adjacent inner wall of the slide 26. At the outer extremities of the blocks are vertical series of locking teeth 60, which, when brought into engagement with opposed vertical series of teeth 62 upon the frame 17, secure the slide 28 against downward movement. With downwardly and inwardly inclined surfaces 64 at the inner ends of the blocks, contact complementally inclined surfaces 66 upon a wedge 68 attached to the slide 26.

When the operator depresses the treadle 12, the slide 26 is lowered, and, without compression of the spring 30, causes the depression of the slide 28, the teeth 60 upon the blocks 56 being at this time held away from the frame-teeth 62 by the ribs 58 and grooves 59. As the slide 28 descends, it draws down, through the link 54, the rack 50. This, through the pinion 48, shaft 46 and pinion 44, shifts the rack 42, rotating the pinion 40 to turn the jack-screw 18. Said screw, acting upon the bracket 15, raises it with the jack J to bring the work against the die 10. Upon establishment of this contact and continued downward movement of the treadle, the spring 30 is compressed, the slide 26 moving relatively to the slide 28. The surfaces 66 of the wedge 68, pressing against the surfaces 64 of the blocks 56, urge these outwardly, causing the block-teeth 60 to engage the frame-teeth 62, and locking the slide 28 to the frame. Consequently, further depression of the treadle has no effect upon said slide and the connected jack, the compression of the work being limited by the degree of compressibility of the spring 30. But when the treadle is released and elevated by the weight 34, the grooves 59 and ribs 58 upon the slide 26 and blocks 56, respectively, cam these blocks inwardly to effect positive withdrawal of their teeth from the frame-teeth. Because of this locking of the treadle, there is limited the preliminary pressure which the operator may apply to the work, and which, when added to the final pressure created by the cam 22, might be excessive.

The die 10 is interchangeably latched at 70 in the frame, and may have its fastening-receiving passages 11 arranged in a multiple of the inserting designs which are to be employed. The drivers 14, which co-operate with the passages in the die, are mounted upon a plate 74 carried upon a top-girt 78 (Fig. 5). This top-girt is secured to the upper extremities of side-rods 80, 80, guided for vertical reciprocation in the frame and operated from the driving shaft 13. This may be, in the manner of the previously mentioned patent, through a work-pricking stroke and a shorter fastening-inserting stroke. To vary the extent of downward travel of the drivers to adapt the machine to operate upon different types of work, as the attachment of rubber lifts and leather heels, the vertical position of the driver-plate 74 is made adjustable. It is directly mounted in ways in a carrier-plate 82 and is separably latched in place at 81. The carrier-plate is guided for vertical movement in the top-girt and has extended transversely at its upper side inclined ways, along which a wedge 84 is movable (Fig. 4). At its upper side, the wedge may be shifted along horizontal ways in the top-girt. This is effected by a screw 86 threaded into the wedge and being held against longitudinal movement by the extension of a hand-wheel 88, fastened upon it, into a recess at the underside of the top-girt. By rotating the hand-wheel and thus moving the wedge, the carrier-plate, driver-plate and drivers may be raised or lowered, and the plane in which the inserting travel of the drivers terminates similarly altered.

To vary conveniently the depth of the pricking stroke of the drivers 14, the top-girt 78 has a vertical extension 90, across the upper portion of which is secured a contact-plate 92. At the opposite sides of the extension are vertical ways, in which a slide 94 is guided. Movable transversely in ways at the bottom of the slide is an eccentric-strap or block 95. Fitting within an opening in this block is an eccentric 96, fast upon the inner end of a spindle 98 rotatable in a bridge 100 between the opposite sides of the frame, said bridge being located in front of the side-rods. Secured to the outer end of the spindle, is a hand-crank 102 carrying a locking pin 104, which may enter any one of a circular series of openings 106 formed in a disk 108 attached to the front of the bridge. Upon the slide 94, in vertical alinement with the contact-plate 92, a cushion or bumper 110, of yieldable material, is carried. As the drivers make their downward pricking stroke, the plate moves into engagement with the cushion, stopping the descent of the top-girt and, therefore, of the drivers. The point at which this occurs will depend upon the vertical position of the cushion. This is determined by the angular adjustment of the eccentric 96, controlled by the disk-opening 106 in which the plunger 104 has been placed by the operator. The range of adjustment may be increased by substituting contact-plates of different thickness. There may be associated with the openings in the disks, designations showing the

depth of pricking which will result from the positioning of the eccentric by the use of a particular opening.

Some of the drivers 14, as those inserting the fastenings nearest the breast of a heel, operate over areas of the heel-seat which are considerably curved outwardly. For this reason, it is desirable that the depth of insertion, and therefore the pricking stroke, shall be less than that of the companion drivers. When, however, the inserting stroke of the drivers is made, they should all advance to the same plane to correspondingly locate the outer ends of the fastenings. Referring particularly to Fig. 4 of the drawings, the two breast-drivers are carried by a secondary plate 112, guided for vertical movement at the front of the primary plate 74. At its upper side, the plate 112 has a T-projection 114, guided in complemental ways in an adjusting wedge 116 provided with opposite projections 118, 118 movable in upwardly and rearwardly inclined ways in the plate 74. An expansion-spring 120 urges the wedge outwardly, to so occupy the space between the plates 74 and 112 as to hold down the latter.

Upon the inner side of a door 122, hinged upon the frame and normally closed as a guard for the inserting mechanism M, a vertical plate 124 is pivotally supported upon arms 126, 126, it being urged inwardly by a spring-actuated plunger 128 slidable horizontally in the door. With the door closed, the plunger forces the plate against a roll 130, rotatable upon the forward end of the wedge 116, this being carried rearwardly and upwardly in its inclined ways against the force of the spring 120, elevating the plate 112. As a result of this, the breast-drivers are raised to prick the work less deeply over the outwardly curved portion of the heel-seat. Rotatable upon the lower edge of the plate 124 is a roll 132, which lies in the path of the loading or fastening-delivering mechanism L, when this advances to make its delivery to the die 10. During the pricking stroke of the drivers 14, the loading mechanism is retracted, as appears in Fig. 4, and does not engage the roll 132, so the plate is held in its advanced position by the plunger 128 and the wedge 116 is forced back, as above described. During the inserting stroke of the drivers, the loading mechanism is forward over the die, at this time acting upon the roll 132 to carry back the plate 124 against the force of the plunger 128. The plate is thus withdrawn from the wedge-roll 130, and the spring 120 forces the wedge forward, lowering the plate 112 and the breast-drivers. This corresponds in vertical relation to the other drivers, so the depth of insertion of the outer ends of all the fastenings is the same. Because of the vertical extension of the roll-engaging surface of the plate 124, it exerts its controlling influence upon the wedge 116, regardless of the vertical travel of the wedge-carrying driver-plate 74.

It may be desired to attach with this machine either heel-lifts of leather, or the like, or yieldable lifts of rubber. In the first instance, the die 10, at its underside, should present a smooth surface to the work. In the second, it is preferable to have upon the die frusto-conical projections 133 about the lower openings of the passages 11, these either seating in the usual depressions in the tread-surface of the lift, or, in absence of these, entering and compressing the yieldable material. I satisfy these conditions by the application to the die of interchangeable contact-plates, one of which is shown at 134 in Figs. 4 and 5 of the drawings. The one illustrated has the projections 133, and at its opposite side-edges is received by dovetail grooves in the die. It is locked in operating position by a spring-plunger 138 movable in the die, and, when this plunger is raised from a depression in the plate, may readily be withdrawn through a finger-piece 140 and replaced by another plate. This may be one with a smooth surface for leather-work, and such smooth plates, or those with the projections, have openings corresponding to a particular one of the inserting designs which are in multiple in the die.

With the underside of the plate 134 is associated the heel- and top-lift-holder H. To the die 10, at each side of the plate, is secured a retaining strip 142 supporting a horseshoe-shaped heel-ring 143, which will receive between its arms a rubber lift, somewhat compressed, and hold this against the under face of the die. This heel-ring is hinged to the strips 142 in recesses 144, and is normally latched up in horizontal position by a spring-plunger 145 mounted upon the forward extremity of one of the support-strips, and engaging the ring. Said ring has a rearward extension 147, upon which are movable about vertical pivots opposite forwardly extending arms 148, 148 for grasping between them a heel-base. The arms are geared at 150 to move together, and are drawn toward each other by a tension-spring 152 connecting them. The holder H is used in the customary manner by inserting a rubber lift in the ring and a base between the arms, it retaining one above the other for the driving of the fastenings through them into the heel-seat of the jacked shoe. When the plate 134 with the projections 133 is to be removed from or applied to the die, the latch 145 is freed, and the ring 143 turned down in its pivot-recesses 144, so both the ring 146 and the arms 148 are separated from the plate. This leaves clear a space beneath the die, through which the projections 133 may move without interference during manipulation of the plate 134. To permit the ring, with its supported arms, to be changed for elements adapted to engage heel-parts of different sizes, the pivot-recesses 144 for the ring are downwardly and forwardly inclined, being open at their lower portions (Fig. 4). Consequently, when the ring is raised and latched, it is retained in position, but, when lowered, may be separated from the die for substitution.

The strings *f* of fiber, which furnish the fastenings, are taken from unillustrated reels, which, to be convenient of access and for manipulation when the fastening-inserting design is changed, are supported upon the upper portion of the frame, as are also the feeding mechanisms F, F (Fig. 5). These feeding mechanisms and their actuation may be, except as to a detail which will be hereinafter considered, as in the previously mentioned patent, the fiber being advanced to the loader mechanism L step-by-step to an extent determined by the pricking stroke of the drivers 14. This feed is produced by a pair of rolls 153, 153 (Fig. 8), geared together at 154, and one of which is oscillated through a link 155 connected to the top-girt 78 and to a reciprocatory rack 156 meshing with a gear 157 on one of the roll-shafts. From the rolls, the fiber passes through flexible tubes 158 (Fig. 4), the lower extremities of which are inserted in vertical passages 160 in a foot-plate

162. This foot-plate is attached to a vertical rod 164, movable in a guide member 166 and in an overhanging bracket 168 mounted upon the frame, a horizontal extension of the bracket having passages 169 continuing those in the foot-plate. Said foot-plate may be raised and lowered through a hand-lever 170 (Fig. 5), fulcrumed at 172 upon the frame and pivotally joined to the foot-plate at 174. To an arm 176 of the lever, a rod 178 is attached, this being urged to the right by an expansion-spring 180 to hold the foot-plate normally lowered. Depending from the foot-plate and guided in the extension of the bracket 168 is a latch-pin 182, which may enter any one of a series of openings 184 (Fig. 6) in an adapter-bar 186, which is guided in the member 166. The bar is provided along its length with a plurality of spaced groups of passages 188, arranged in accordance with the inserting designs which are to be employed and which are herein shown as three in number. These groups of passages are inclined vertically to different degrees, but at their upper extremities are identical in their relation, being arranged to register with the passages 169 and 160. Included in the loading mechanism L is a multiple fiber-shearing and -transferring block 190, containing groups of passages 192 for all the inserting designs. The inclination of the bar-passages 188 is such that one of each of its groups may be brought into registration with one of the multiple designs in the block 190. This block, as in the hereinbefore cited patent, is oscillated and reciprocated by slide-and-crank mechanism 194 to shear off fastenings advanced by the mechanisms F, F, through the passages 158, 160 and 169 into the block-passages 192 and convey these fastenings into registration with the die-passages 11, to be inserted in the work by the descent of the drivers 14. When the inserting design is to be altered, the strings of fiber are withdrawn from the passages in the bar 186, by turning a hand-wheel 198 (Fig. 4) upon one of the roll-shafts of each of the feeders F. Then, the lever 170 is depressed and the foot-plate 162 lifted. This frees the bar 186 from the latch-pin 182, so said bar may be shifted longitudinally by a hand-hold 200 upon one of its extremities. When the chosen group of openings is in registration with the unvarying passages 169 and 160, as determined by a spring-click 201 carried by the member 166 and engaging one of three depressions in the bar, the release of the latch into the corresponding openings 184 again secures the bar. The inclination of its chosen group of passages correctly leads into one of the groups of multiple passages 192 in the loader-block.

The operator may wish, as the feed of the fiber *f* is varied under the control of the pricking stroke of the drivers 14, to proportionately increase the excess of the length of the fastenings, which is to be compressed as the drivers complete the insertion. This, I accomplish by making the pitch-diameter of the gear 157 less than the diameters of the rolls 153. Since, for any reciprocation of the rack 156 through a distance depending upon length of the pricking stroke of the drivers, the peripheries of the rolls 152, turned by the smaller gear 157, will oscillate through an arc greater in length than said pricking stroke, there will always be an excess of material fed to be compacted by the drivers. Further, as the depth of pricking increases, there will be a corresponding lengthening of this excess. The fiber employed in this machine owes some of its holding power in the work to the fact that it is made by twisting a strip helically. This is as in Letters Patent of the United States, No. 1,729,169, La Chapelle, September 24, 1929. When the fastenings formed from it are inserted, the driving pressure tends to untwist the helix, adding to its diameter. Therefore, with an increase in fastening-length, I obtain a proportionately greater force of retention, not only exerted by the pricking-controlled portion but also by the excess-length.

Let it be assumed that the apparatus is to be employed for the attachment to a shoe S of a leather base *h* and a rubber lift *l*, by fastenings severed from strings *f* of fiber. The operator makes certain that there is mounted beneath the die 10 a plate 134, having lift-entering projections 133 with their passages arranged in the correct inserting design, the drivers 14 being similarly arranged upon their plates 74 and 112. The adapting bar 186 is positioned to bring the correct group of its passages 188 into registration with the foot-plate-passages 160 and the loader-block-passages 192, the foot-plate-projection 182 latching the bar in place. The depth of the pricking stroke of the driver is determined by adjustment of the eccentric 96 and the extent of the inserting stroke by that of the wedge 84. The shoe is placed upon the jack J, and depression of the treadle 12 raises the heel-seat into contact with the cup of the base *h* with a pressure limited by the yield of the spring 30. Upon starting the power-operation of the apparatus, the rotation of the cam 22 applies final pressure to the work, and the drivers are reciprocated to prick said work. Then, the loader-block 190 advances to shear fastenings from the strings *f*, which have been delivered from the feeders F through the adapting bar, and transfers them above the die 10. These fastenings exceed in length the depth of pricking to permit their expansion in the work. Finally, the drivers are again reciprocated to carry the fastenings out of the loader-block and insert them in the pricked openings for the attachment of the heel-parts to the shoe. For these two strokes, the breast-drivers are raised by the wedge 118 during pricking to act less deeply than their companions, and are then returned with their ends in a common inserting plane, and for both are definitely fixed in position. With the return of the jack J to its normal position, the cycle of operation is completed, and the heeled shoe may be removed from the jack.

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

1. The combination with a work-supporting member, of an abutment member, the members being relatively movable to apply pressure to the work, a device for actuation by the operator to effect such relative movement, and means made effective during the movement of the device for locking one of the members against movement and thereby preventing increase of pressure by the operator.

2. The combination with a work-supporting member, of an abutment member, the members being relatively movable, a device for actuation by the operator to effect such relative movement and to apply preliminary pressure to the work, mechanism through which final pressure is applied to the work, and means made effective during the movement of the device for locking one of the members against movement and thereby

preventing increase of pressure by the operator during the application of final pressure.

3. The combination with a work-supporting member, of an abutment member, the members being relatively movable to apply pressure to the work, a device for actuation by the operator to effect such relative movement, and means made effective during the movement of the device and after the application of a predetermined pressure for locking one of the members against movement and thereby preventing increase of pressure by the operator.

4. The combination with a work-supporting member, of an abutment member, the members being relatively movable to apply pressure to the work, a device for actuation by the operator to effect such relative movement, an element through which the effect of the device is transmitted, means for locking said element against movement, and means acting in the relative movement between the device and transmitting element for operating the locking means.

5. The combination with a work-supporting member, of an abutment member, the members being relatively movable to apply pressure to the work, a device for actuation by the operator to effect such relative movement, an element through which the effect of the device is transmitted, means for locking said element against movement, a spring connecting the device and transmitting element, and means acting upon yield of the spring for operating the locking means.

6. In a fastening-inserting machine, fastening-inserting mechanism, a jack movable toward and from the inserting mechanism, a slide movable by the operator, a slide connected to the jack, a spring through which movement of the operator-slide is transmitted to the jack-slide, a locking member movable upon the jack-slide for engagement with a relatively fixed element, and means for actuating the locking member upon yield of the spring.

7. In a fastening-inserting machine, fastening-inserting mechanism, a jack movable toward and from the inserting mechanism, a slide movable by the operator, a slide connected to the jack, a spring through which movement of the operator-slide is transmitted to the jack-slide, and a locking member movable upon the jack-slide for engagement with a relatively fixed element, the locking member and operator-slide having complemental inclined surfaces which contact upon yield of the spring.

8. In a fastening-inserting machine, a frame, fastening-inserting mechanism carried thereby, a jack movable upon the frame toward and from the inserting mechanism, a slide movable by the operator, a slide connected to the jack, a spring through which movement of the operator-slide is transmitted to the jack-slide, locking members oppositely movable upon the jack-slide into engagement with the frame, said locking members being provided with oppositely inclined opposed surfaces, and a wedge projecting from the operator-slide between said surfaces.

9. In a fastening-inserting machine, fastening-inserting mechanism, a jack movable toward and from the inserting mechanism, a treadle, a reciprocatory rack, means for connecting the treadle and rack, a shaft, a pinion upon the shaft meshing with the rack, a second reciprocatory rack, means for imparting movement of the second rack to the jack, and a pinion upon the shaft meshing with said second rack.

10. In a fastening-inserting machine, fastening-inserting mechanism, a jack movable toward and from the inserting mechanism, a slide movable by the operator, a transmitting slide, a spring interposed between the slides, a rack connected to the transmitting slide, a second rack connected to the jack, a shaft, and gears upon the shaft meshing with both racks.

11. In a fastening-inserting machine, fastening-inserting mechanism, a jack movable toward and from the inserting mechanism, a slide movable by the operator, a transmitting slide, a spring interposed between the slides, a locking member movable upon the transmitting slide for engagement with a relatively fixed element upon yield of the spring, a rack connected to the transmitting slide, a second rack connected to the jack, a shaft, and gears upon the shaft meshing with both racks.

12. In a fastening-inserting machine, an inserting die provided with fastening-receiving passages, rods reciprocating at opposite sides of the die, a top-girt joining the side-rods and provided with horizontal ways, a wedge movable in the ways, a carrier-plate guided for vertical movement in the top-girt and having ways in which the wedge is received at its underside, a driver-plate separably secured to the carrier-plate, and drivers depending from the driver-plate and operating in the die-passages.

13. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a stop for the carrier, and means for supporting the stop in different vertical positions to arrest the travel of the carrier.

14. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a stop for the carrier, and an adjusting member movable by the operator to differently position the stop.

15. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a stop for the carrier, a rotatable adjusting member for the stop, and means for fixing the adjusting member in different angular positions.

16. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a stop for the carrier, means for supporting the stop in different vertical positions to arrest the travel of the carrier, and means arranged to support the drivers in different vertical positions upon the carrier.

17. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a stop for the carrier. means for supporting the stop in different vertical positions to arrest the travel of the carrier, and a member movable upon the carrier and arranged to support the drivers in different vertical positions thereon.

18. In a fastening-inserting machine, inserting mechanism comprising a reciprocatory carrier, fastening-drivers mounted thereon, a movable stop guided by the carrier, and an adjusting member for the stop mounted upon a member fixed relatively to the carrier and variable in position by the operator.

19. In a a fastening-inserting machine, reciprocatory side-rods, a top-girt joining the side-rods and having a contact-portion, a slide guided in the top-girt, means for supporting the slide in different positions for engagement by the con-

tact-portion of the top-girt, and fastening-drivers carried upon the top-girt.

20. In a fastening-inserting machine, reciprocatory side-rods, a top-girt joining the side-rods and having a contact-portion, a slide guided in the top-girt, an eccentric by which the slide is supported, means arranged to fix the eccentric in different angular positions, and fastening-drivers carried upon the top-girt.

21. In a fastening-inserting machine, reciprocatory side-rods, a top-girt joining the side-rods and having a contact-portion, a slide guided in the top-girt, means for supporting the slide in different positions for engagement by the contact-portion of the top-girt, a wedge movable upon the top-girt, a plate carried by the wedge, and drivers depending from the plate.

22. In a fastening-inserting machine, a reciprocatory carrier, fastening-drivers mounted thereon, a portion of the drivers being held against movement upon the carrier while others are movable thereon in the direction of fastening-insertion, and a member movable upon the carrier to fix in position the last-mentioned driver or drivers.

23. In a fastening-inserting machine, a reciprocatory primary carrier, fastening-drivers mounted thereon, a secondary carrier movable upon the primary carrier, drivers mounted upon the secondary carrier, and an adjusting member movable to different positions between the primary carrier and the secondary carrier.

24. In a fastening-inserting machine, a reciprocatory primary carrier, fastening-drivers mounted thereon, a secondary carrier movable upon the primary carrier, drivers mounted upon the secondary carrier, and a wedge interposed between the primary and secondary carriers and by which said secondary carrier is supported.

25. In a fastening-inserting machine, a reciprocatory carrier, fastening-drivers mounted thereon, a portion only of the drivers being movable upon the carrier, an inserting-die with which the drivers co-operate, a member movable to deliver fastenings to the die, and an adjusting member movable upon the carrier under the control of the delivering member to vary the position of the drivers upon the carrier in the direction of fastening-insertion.

26. In a fastening-inserting machine, a reciprocatory carrier, fastening-drivers mounted thereon, a portion only of the drivers being movable upon the carrier, an inserting-die with which the drivers co-operate, a member movable to deliver fastenings to the die, an adjusting member movable upon the carrier to vary the position of the drivers upon the carrier in the direction of fastening-insertion, and a member set by the delivering member to control the adjusting member.

27. In a fastening-inserting machine, a reciprocatory primary carrier, fastening-drivers mounted thereon, a secondary carrier movable upon the primary carrier, drivers mounted upon the secondary carrier, an adjusting member movable upon the primary carrier and engaging the secondary carrier, an extended member along which the adjusting member travels in the movement of the primary carrier, and means for setting the extended member in different positions to control the adjusting member.

28. In a fastening-inserting machine, a reciprocatory carrier, fastening-drivers mounted thereon, a portion of the drivers being movable upon the carrier, an inserting-die with which the drivers co-operate, a member movable to deliver fastenings to the die, an adjusting member movable upon the carrier under the control of the delivering member to vary the position of the drivers upon the carrier, a member urged into engagement with the adjusting member to position the movable drivers, and means for withdrawing such engaging member from the adjusting member.

29. In a fastening-inserting machine, inserting mechanism comprising a carrier and drivers movable thereon, a movable closure guarding the inserting mechanism, and means carried by the closure for controlling the position of the drivers.

30. In a fastening-inserting machine, inserting mechanism comprising a carrier and drivers movable thereon, an adjusting member for the drivers movable upon the carrier, a door guarding the inserting mechanism, and a member movable upon the door for engagement with the adjusting member.

31. In a fastening-inserting machine, inserting mechanism comprising a carrier and drivers movable thereon, an adjusting member for the drivers movable upon the carrier, a door guarding the inserting mechanism, a member movable upon the door for engagement with the adjusting member, and a member movable to deliver fastenings to the inserting mechanism and contacting with the engaging member to set it in different positions.

32. In a fastening-inserting machine, a fastening-receiving die, a reciprocatory carrier, drivers fixed in the carrier and co-operating with the die, drivers movable upon the carrier and co-operating with the die, the carrier and drivers being movable through work-pricking and fastening-inserting strokes, a wedge interposed between the carrier and the movable drivers, a plate with which the wedge contacts in the reciprocation of the carrier, means for forcing the plate toward the wedge to elevate the drivers upon the carrier for the pricking stroke, and means for retracting the plate to release the wedge for lowering the drivers upon the carrier during the inserting stroke.

33. In a fastening-inserting machine, a fastening-receiving die, a reciprocatory carrier, drivers fixed in the carrier and co-operating with the die, drivers movable upon the carrier and co-operating with the die, the carrier and drivers being movable through work-pricking and fastening-inserting strokes, a wedge interposed between the carrier and the movable drivers, a plate with which the wedge contacts in the reciprocation of the carrier, means for forcing the plate toward the wedge to elevate the drivers upon the carrier for the pricking stroke, a loader-block delivering fastenings to the die, said loader-block acting upon the plate to free the wedge for lowering the drivers upon the carrier during the inserting stroke.

34. In a heel-attaching machine, inserting mechanism comprising a die provided with fastening-receiving passages, a lift-holding ring pivoted upon the die to be swung away therefrom, means for releasably retaining the ring in operating position, and heel-base-holding arms pivoted upon the ring.

35. In a heel-attaching machine, inserting mechanism comprising a die provided with fastening-receiving passages and spaced retaining strips secured to the die, a lift-holding ring pivoted upon the retaining strips, a latch movable upon one of the strips for engagement with the

ring, and heel-base-holding arms pivoted upon the ring.

36. In a heel-attaching machine, inserting mechanism comprising a die provided with fastening-receiving passages and spaced retaining strips secured to the die, there being in the strips recesses opening at their sides in an inclined direction from the adjacent surface of the die, a lift-holding ring provided with projections pivoted in the strip-recesses and separable through the inclined openings, and a latch normally securing the ring against the die.

37. In a heel-attaching machine, inserting mechanism comprising a die provided with fastening-receiving passages, means for mounting interchangeably upon the die a plate having passages registering with those in the die, and a heel-holder mounted upon the die outside the plate and being movable upon said plate to a position to free the plate for removal and replacement.

38. In a heel-attaching machine, inserting mechanism comprising a die provided with fastening-receiving passages, a plate separably mounted upon the die and having passages registering with those in the die and projections extending outwardly from the passages, a heel-holder pivoted upon the die outside the plate-projections, and means for releasably retaining the heel-holder in heel-presenting position upon the die.

39. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism having passages arranged in a plurality of inserting designs and delivering to the inserting mechanism, means for feeding fastening material through passages having openings arranged in a single design, and adapting means movable between the feeding passages and the transferring passages for directing the fastening material from the single design of said feeding passages to the plural designs of the transferring passages.

40. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism having passages arranged in a plurality of inserting designs and delivering to the inserting mechanism, means for feeding fastening material through passages having openings arranged in an unvarying design, and an adapting member movable between the feeding passages and the transferring passages and provided with a plurality of groups of passages, each group of passages opening at one extremity in the design of the feeding means and at the other extremity in one of the designs of the transferring mechanism.

41. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism having passages arranged in a plurality of inserting designs and delivering to the inserting mechanism, means for feeding fastening material through passages having openings arranged in an unvarying design, an adapting member movable between the feeding passages and the transferring passages and provided with a plurality of groups of passages, each group of passages opening at one extremity in the design of the feeding means and at the other extremity in one of the designs of the transferring mechanism, and means for latching the adapting member with any one of its groups of passages in registration with both the feeding passages and the transferring passages.

42. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism, fastening-feeding mechanism having delivering tubes terminating in a foot-plate, a loader-block movable between the foot-plate and inserting mechanism and having passages for a plurality of inserting-designs, and an adapting bar movable between the foot-plate and the loader-block and provided with a plurality of groups of passages, any one of which may be brought into registration with the delivering tubes at the foot-plate and with one of the designs of the loader-block.

43. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism, fastening-feeding mechanism having delivering tubes terminating in a movable foot-plate, a loader-block movable between the foot-plate and inserting mechanism and having passages for a plurality of inserting-designs, an adapting bar movable between the foot-plate and the loader-block and provided with a plurality of groups of passages, any one of which may be brought into registration with the delivering tubes at the foot-plate and with one of the designs of the loader-block, and means carried by the foot-plate for latching the bar in various positions.

44. In a fastening-inserting machine, fastening-inserting mechanism, fastening-transferring mechanism, fastening-feeding mechanism having delivering tubes terminating in a foot-plate provided with a projection, a loader-block movable between the foot-plate and inserting mechanism and having passages for a plurality of inserting-designs, and an adapting bar movable between the foot-plate and the loader-block and provided with a plurality of groups of passages, any one of which may be brought into registration with the delivering tubes at the foot-plate and with one of the designs of the loader-block, said bar having a series of openings, any one of which may receive the foot-plate-projection.

45. In a fastening-inserting machine, inserting mechanism comprising reciprocatory drivers, means for imparting to said drivers successive work-pricking and fastening-inserting strokes, means arranged to vary the depth of the pricking stroke, and means for feeding fastening material for insertion and causing the extent of feed to vary with the depth of pricking but with the length of material advanced exceeding such depth proportionately to changes in the depth.

46. In a fastening-inserting machine, inserting mechanism comprising reciprocatory drivers, means for imparting to said drivers successive work-pricking and fastening-inserting strokes, means arranged to vary the depth of the pricking stroke, a pair of rotatable rolls engaging the material to feed it for insertion, a rack reciprocated in accordance with the depth of the pricking stroke of the drivers, and a gear meshing with the rack and through which the rolls are rotated, the pitch-diameter of the gear being less than the diameter of the rolls.

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