

May 9, 1944.

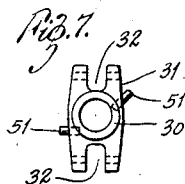
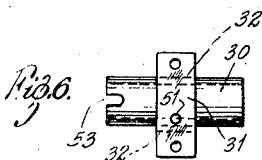
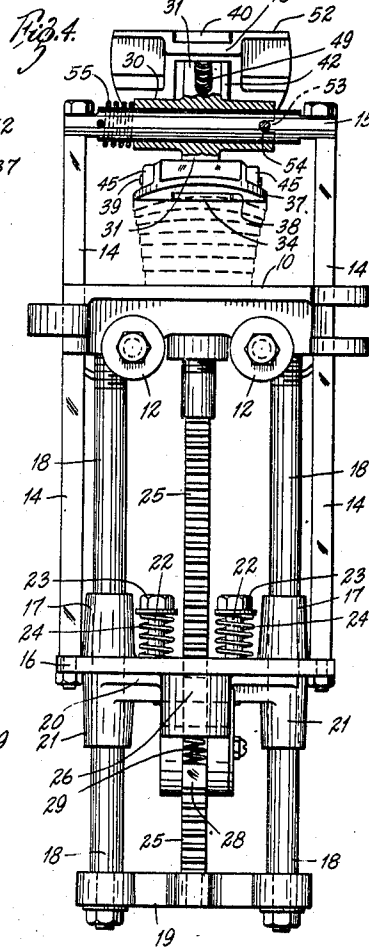
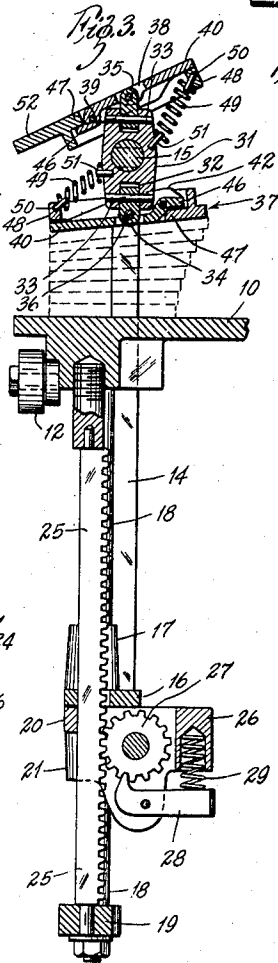
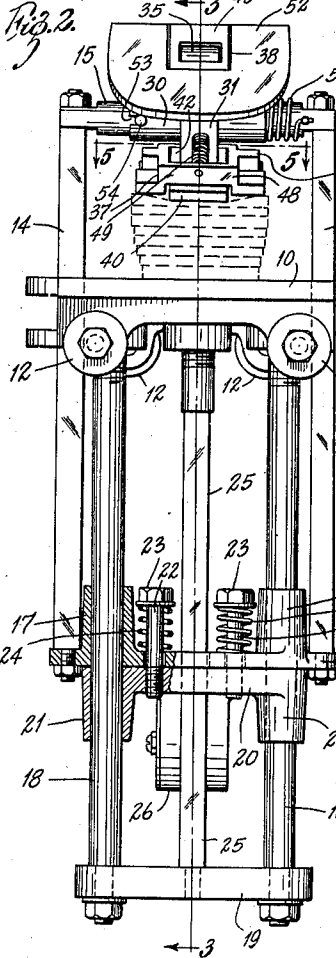
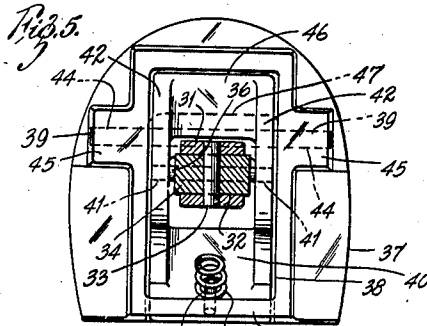
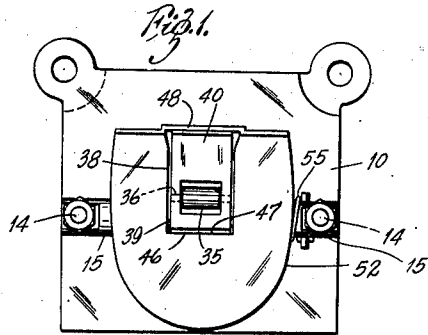
J. A. McMAHON ET AL

2,348,351

CLAMPING DEVICE FOR HEEL-BUILDING MACHINES

Filed June 15, 1942

4 Sheets-Sheet 1



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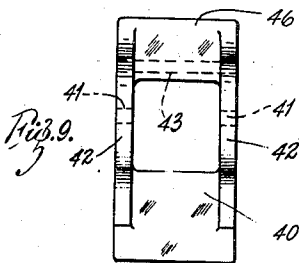
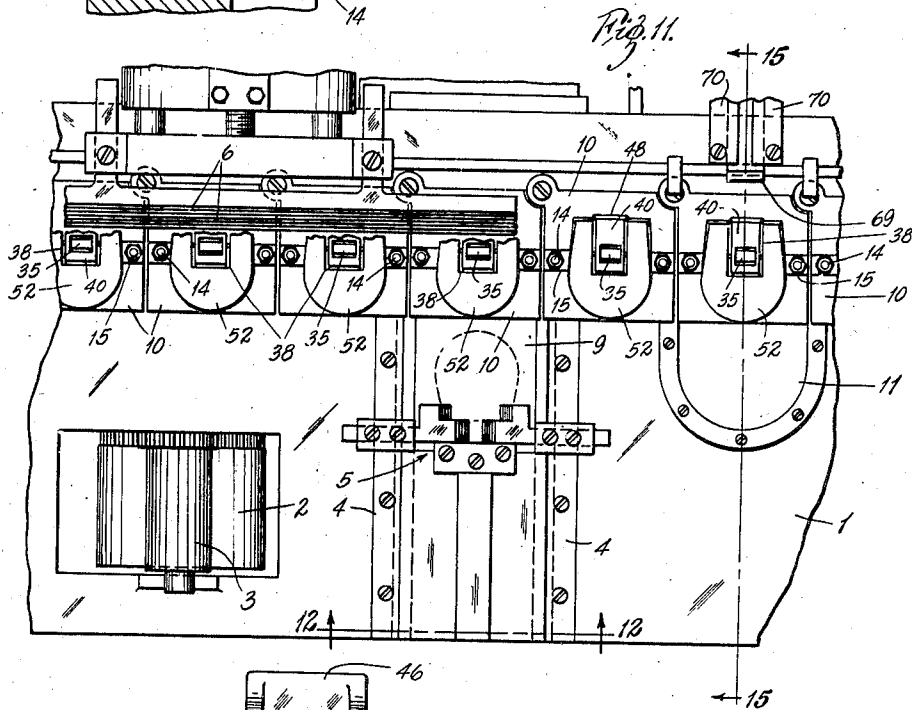
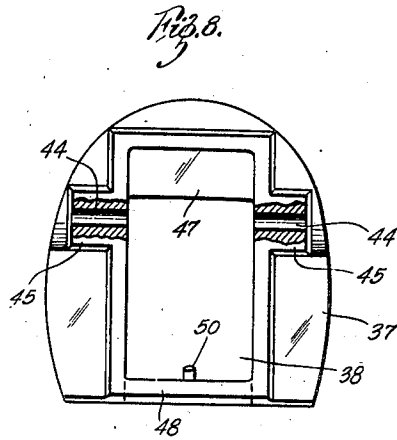
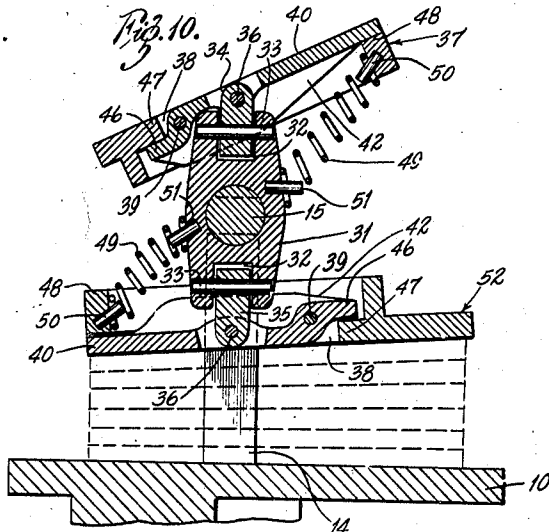
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CLAMPING DEVICE FOR HEEL-BUILDING MACHINES

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4 Sheets-Sheet 2



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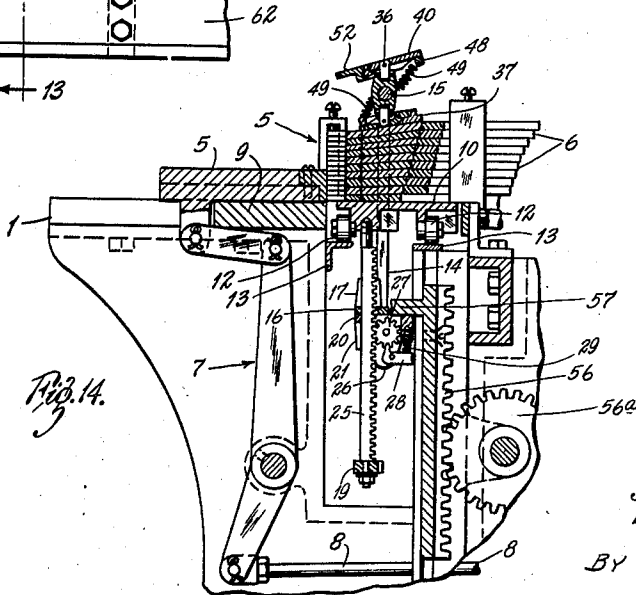
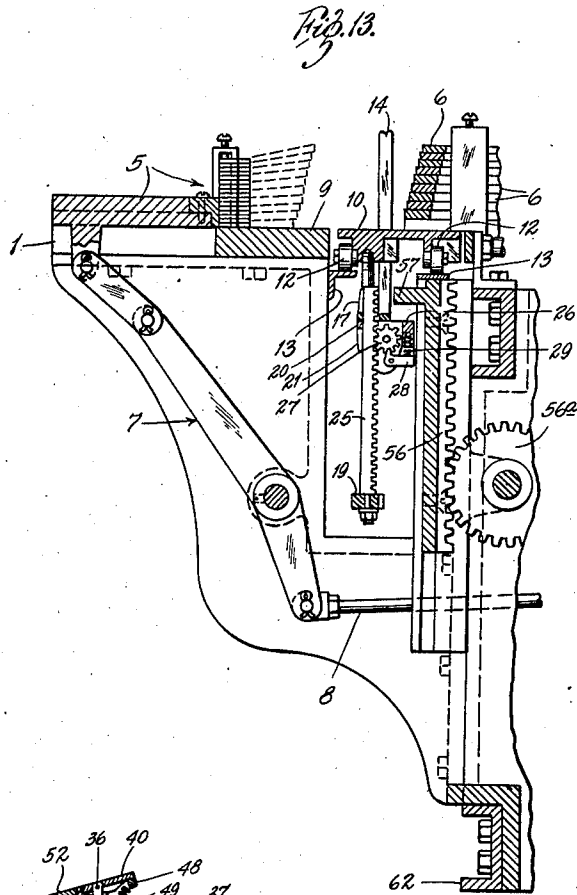
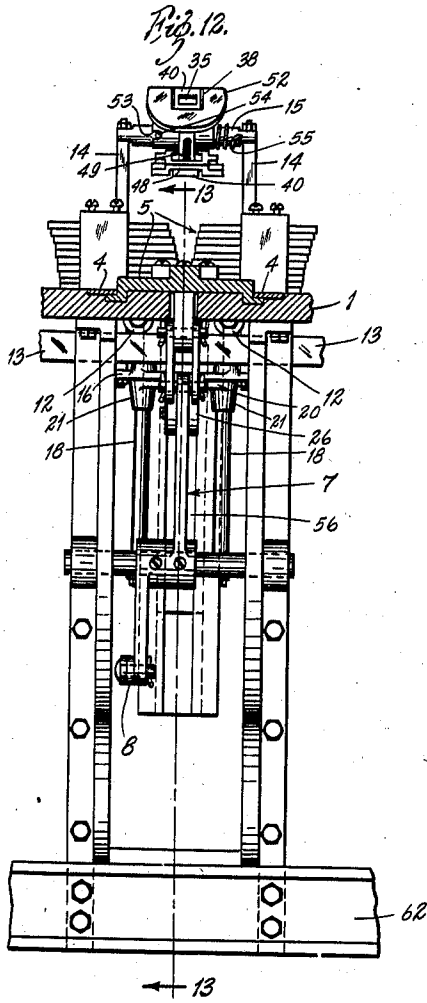
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CLAMPING DEVICE FOR HEEL-BUILDING MACHINES

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4 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,348,351

CLAMPING DEVICE FOR HEEL-BUILDING MACHINES

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8 Claims. (Cl. 12—50)

The general object of this invention is to provide a novel clamping device for use on the type of heel-building machine forming the subject-matter of our prior application, Serial No. 421,108, filed December 1, 1941. Said machine embodies an endless series of clamp carriers movable around the machine in stages, each clamp carrier having a clamping plate mounted thereon which is designed to be depressed to clamp the heel-blank after it has been built up and moved into position on the clamp carrier.

All of these clamping plates, as illustrated in the drawings of said application, were of the same size, such size being great enough to enable the plate to properly clamp the largest size of heel-blank that would be built. However, in actual use, it was found that this large clamping plate did not act satisfactorily with heels of a small size. For example, in the case of a heel-blank for a man's shoe, which is usually straight-sided, flat, and made of lifts of large size, the center of pressure of the clamping plate will approximately coincide with the center of the heel-blank. On the other hand, in the case of a heel-blank for a woman's shoe, which is practically always of decked formation and made up of lifts relatively small in size, or area, the center of the heel-blank will be carried beyond the center of pressure of the clamping plate when moved onto the clamp carrier by the heel-former, with the result that the pressure will not be applied equally over the upper surface of the heel-blank.

Again, the clamping plate illustrated in our prior application, and likewise employed in the present invention, is composed of two clamping members, the clamping surfaces of which are normally flush with each other, but the smaller clamping member, which is pivotally mounted within the main clamping plate, being designed to move on its pivot below the clamping surface of the main clamping plate under clamping pressure, to engage the bottom of the cavity formed by gouging out the upper, or base, lift, or by applying a rand thereto, so that pressure may be applied uniformly to all parts of the upper surface of such a gouged or randed heel-blank. In this case also, it was found that the smaller clamping member of the large clamping plate did not function properly, or accurately, in clamping a heel-blank the base lift of which was of relatively small size.

To overcome these objections, we have devised a clamping device consisting of a clamping plate of the largest size that will be required and one of the smallest size necessary, which clamping plates

are operatively connected one above the other, and either of which may be positioned for use by merely reversing the position of the plates by turning the device over, and locking it in its reversed position.

Our invention is also concerned with novel features of construction involved in the provision of a clamp carrier for use on a machine constructed in accordance with the invention of our prior application referred to, but having reversible clamping plates of different size mounted thereon.

In the accompanying drawings—

Fig. 1 is a plan view of one of our clamping devices mounted on a carrier;

Fig. 2 is a view in front elevation, and partly in section, of one of the clamp carriers, showing the smaller clamping plate of our clamping device in clamping position on a heel-blank, the latter being indicated by dotted lines;

Fig. 3 is a vertical section, taken on the line 3—3 of Fig. 2;

Fig. 4 is a view in rear elevation, and partly in section, of the clamp carrier shown in Fig. 2;

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 2, but on an enlarged scale, being, in effect, a plan view of the smaller of the clamping plates;

Fig. 6 is a detail view, in side elevation, of a slidable and rotatable locking sleeve which, as shown in other views, has the two clamping plates mounted on opposite sides thereof;

Fig. 7 is an end view of the same;

Fig. 8 is a plan view, partly in section, of the clamping plate shown in Fig. 5, the inner clamping member, or pressure plate, being removed;

Fig. 9 is a plan view of the smaller clamping member, or pressure plate, shown in Fig. 5;

Fig. 10 is a sectional view on an enlarged scale, similar to the upper portion of Fig. 3, but showing the larger of the two clamping plates in clamping position on a heel-blank of larger size and less height than that shown in Fig. 3;

Fig. 11 is a broken plan view, on an enlarged scale, of the central front portion of the machine illustrated in our prior application referred to, with our novel clamping device mounted on the clamp carriers shown;

Fig. 12 is a sectional elevation, taken on the line 12—12 of Fig. 11, showing the heel-forming mechanism and a clamp carrier with its clamping mechanism immediately behind the same;

Fig. 13 is a longitudinal sectional view taken on the line 13—13 of Fig. 12, with the clamping mechanism broken away, illustrating parts of the

mechanisms for operating the heel-former and clamping device, respectively;

Fig. 14 is a view similar to Fig. 13, with the clamping device lowered by the clamp-operating mechanism, and the smaller of the two clamping plates in clamping position on the top of a high decked heel for ladies' shoes;

Fig. 15 is a cross-sectional view, taken on the line 15—15 of Fig. 11, illustrating the clamp carrier of Fig. 14 in position at the discharge point, or chute, of the machine, and a portion of the operating mechanisms for effecting the release of the clamped heel-blank on the carrier and its discharge into the chute, respectively; and

Fig. 16 is a similar view, showing the position of the above mechanisms after the heel-blank has been unclamped and discharged.

Referring now to the drawings, the machine of our prior application comprises a supporting table 1, Fig. 11, on which are mounted rotatable pasting rollers 2, 3 between which the lifts to be assembled into the heel-blanks are passed to be supplied with paste in the conventional manner. Slidably mounted in guides 4 on table 1 is a heel-former, indicated generally by the numeral 5, which, as shown by Figs. 13 and 14, is adapted to be reciprocated toward and from positioning back bars 6 by means of lever mechanism 7 operated by a connecting rod 8, which in turn is reciprocated from the machine. Mounted on the table 1 is a rectangular base plate 9 on which the heel-blanks are built up and over which they are moved by the heel-former onto a clamp carrier and under the clamping device. The numerals 10 indicate a series of pivotally-connected clamp carriers forming an endless carrier designed to be moved in stages around the machine, each carrier travelling from a position opposite the heel-former 5 to a position opposite a discharge chute 11, and being arrested in such positions, respectively, after each stage of operation of the machine. The clamp carriers 10 are rectangular in shape, and form the base of the clamp proper, their outer sides, or those toward the operator, being guided to move in a straight path by, and closely adjacent to, the outer side of the base plate 9. Each clamp carrier is provided on its under side with two sets of wheels 12 (Figs. 2, 3 and 4) which run on tracks 13 (Figs. 13 and 14) mounted on the frame of the machine and extending entirely around the same. The parts of the machine above referred to, and the means for operating the same from the machine, need no extended description, as they form no part, of themselves, of the present invention. We will now describe one of the clamp carriers in connection with our novel clamping device mounted thereon.

Slidably mounted in the sides of each of the clamp carriers 10 are two parallel bars 14 (Figs. 3 and 4) which are connected at their upper ends by a circular cross-rod 15 and at their lower ends by a plate 16 provided at its opposite ends and upper side with vertically-disposed sleeves 17, the bars thus connected affording a slidable clamping frame. Secured at their upper ends in, and projecting well below the under side of each carrier 10, are two parallel circular rods 18, which are connected at their lower ends by a cross-bar 19. The sleeves 17 are slidably mounted on the rods 18 to stabilize and guide the clamping frame in its up and down movements. The numeral 20 indicates a plate having integral sleeves 21 projecting downward from its under side, which sleeves are in line with the sleeves 17

and are also slidably mounted on the rods 18. Loosely mounted in apertures in the plate 16 are two bolts 22, the lower ends of which are screwed into the plate 20. Encircling each of these bolts, and retained between the head 23 thereof and the plate 16, is a coil spring 24, the purpose of which will be later explained. Secured at its upper end on the under side of the clamp carrier 10, and at its lower end centrally of the cross-bar 19 is a rack-bar 25. Formed integral with the inner side of plate 20 and extending downward therefrom is a casting 26 having a flat upper side and housing a ratchet wheel 27, which is in mesh with the teeth of the rack-bar 25, and a pawl 28 normally held in engagement with the teeth of said ratchet wheel by a coil spring 29. The clamping device is best shown in Figs. 2, 3, 4 and 10, and will now be described.

Rotatably and slidably mounted on the cross-rod 15 is a clamping-plate holder, comprising a sleeve 30 from opposite sides of the center of which project integral arms 31, each of which is provided in its outer end with a transverse rectangular groove 32. Pivotally mounted on a cross-pin 33 in each of these grooves is a bearing-block, 34, 35, respectively. Pivotally mounted on a cross-pin 36 in the upper end of bearing-block 34 is the smaller of the two clamping plates of our device, which is indicated by the numeral 37. This plate is provided with a central rectangular recess 38 (Fig. 8) in which is pivotally mounted at one end on a cross-pin 39 a compensating pressure-plate 40 (Figs. 5 and 9). The cross-pin 36 has its opposite ends terminating in openings 41 in flanges 42 at the sides of plate 40, but the cross-pin 39 passes through a hole 43 extending transversely through the plate and its ends seat in aligning apertures 44 extending through the side walls of recess 38 and through bosses 45 on said side walls, as shown more clearly in Fig. 5. The rear end of the pressure plate 40, or that located near the rounded end of clamping plate 37, is provided with a downwardly and rearwardly extending projection 46, which engages under a web 47 extending across the rear end portion of the recess 38. The front end of plate 40 rests on a depressed ledge 48 at the front end of said recess, the bearing surface of plate 40 normally lying flush with the bearing surface of clamping plate 37, as clearly shown by the upper portion of Fig. 10. A coil spring 49, retained between a pin 50 on the front wall of recess 38, and a pin 51 on the arm 31 supporting the clamping plate, normally holds the two plates in the relation described, and both clamping plates in the inclined position shown. As the smaller clamping plate 37, shown at the upper portion of Fig. 10 mounted on bearing block 34, is exactly the same in construction and operation as the larger clamping plate 52 mounted on bearing block 35, and shown in clamping position in said figure, a description of one will equally well apply to the other, and the same reference numerals have accordingly been used to indicate corresponding parts of the two clamping plates.

It will now be seen that as the two cross-pins 33 and 36 extend at right angles to each other, each clamping plate has a limited universal mounting on the holder on the clamping frame, and can readily adjust itself to the surface of the heel-blank to be clamped. It will also be seen that when a depression is present at the breast portion of the base lift of the heel-blank, occasioned either by gouging said lift, or by applying a rand thereto, pressure of plate 37 on the heel-

blank will cause plate 40 to pivot on pin 39 until its forward end portion rests on the bottom of the depression, thus causing the pressure of the clamping plate to be applied uniformly over the entire surface of the base lift. Stated otherwise, as the clamping force exerted in the downward movement of the clamping frame is applied directly to the pressure plate 40 through pin 36, it will be obvious that this will cause said plate to turn on its pivot 39 until it comes in contact with the surface of the lift within the depression, after which both plates 37 and 40 will exert pressure on the heel-blank. Referring to Figs. 2 and 4, it will be seen that the sleeve 30 is provided at one end on opposite sides with grooves 53 which engage the ends of a pin 54 passing through and secured in the cross-rod 15, and is normally held in such engagement by a coil spring 55 exerting pressure on the opposite end of said sleeve and mounted on said cross-rods. If, as shown in Figs. 3 and 15, the smaller clamping plate is being used on heels for ladies' shoes, and it is desired to employ the machine for clamping heels for men's shoes, as shown by Fig. 10, the sleeve 30 is simply pushed to the right, in Fig. 3, against the resistance of spring 55, until the grooves 53 have been moved out of engagement with pin 54, and then given a half turn, which will reverse the position of the clamping plates from that shown in Figs. 3 and 15 to that shown in Fig. 10, in which the larger clamping plate will be at the bottom of the device, and will be held in that position by the grooves 53 being forced into engagement with pin 54 by spring 55.

Referring now particularly to Figs. 13 and 14, there is provided on the machine a rack-bar 56 which is movable in the operation of the machine first in a downward and then in an upward direction by means of a gear 56^a in mesh with the teeth of said rack-bar. The latter is provided at its upper end with a projection 57, and when the rack-bar 56 is moved downward, the projection 57 will engage the top of casting 26 and move the clamping frame downward to cause one or the other of the clamping plates 37, 52, according to the setting, to bear down on the heel-blank which has been moved by the heel-former from the position shown by dotted lines in Fig. 13 to that shown by full lines in Fig. 14. As will be seen from an inspection of Figs. 2 and 3, when the projection 57 engages casting 26 the bolts 22 secured in plate 20 will be drawn down, placing the springs 24 under tension, and they in turn exert pressure on plate 16 to move the clamping frame downward, so that the pressure applied to the heel-blank is a yielding one. In the downward movement of the clamping frame above described, the teeth of the ratchet wheel 27 ride over the pawl 28, as more clearly shown by the enlarged view, Fig. 3, and at the termination of this downward movement, or when the clamping plate has been lowered to its clamping position, as shown, upward movement of the clamping frame is prevented by reason of the fact that the ratchet wheel 27 will be locked from rotation in the reverse direction to that described by the pawl 28. The clamp carrier with a clamped heel-blank thereon is then moved in stages around the machine till it reaches a position opposite the discharge chute 11, Figs. 11 and 15. At this part of the machine, there are positioned on the frame two rack-bars, 58, 59, respectively, working in guide-ways 60, 61, mounted on a frame member 62, and adapted to be raised and low-

ered by means of a lever mechanism L, connected to the rack-bar 58 in the operation of the machine. The respective rack-bars are engaged by the teeth of two gears, 63, 64, respectively, which are rigidly connected by a cross-shaft 65 rotatably mounted in bearings 66 on the slideways. It follows that when the rack-bar 58 is raised by lever L, the gear 63 will be rotated, thereby rotating gear 64 and raising rack-bar 59. Secured on rack-bar 59 is a combined pawl-releasing and clamp-raising device, comprising a horizontal lifting member 67 having at one end a vertically-disposed contact member 68. With the parts in the position shown in Fig. 15, when the rack-bar 59 is raised, the member 68 will engage the under side of the spring-pressed end of pawl 28 and release the engagement of the pawl with the teeth of ratchet wheel 27; thereafter, lifting member 67 will engage the under side of casting 26 and raise the clamping frame, releasing the clamping plate from engagement with the heel-blank. This position of the parts is shown in Fig. 16, the clamping device being broken off. The position of the clamping frame and its clamping device in this view would be the same as that illustrated by Fig. 12, except, of course, that in the latter view the clamp carrier has been moved to a position opposite the heel-former.

The next operation consists in discharging from the machine the finished heel-blank released from its clamp, as described above. To this end, we provide an ejector 69, slidably mounted in guides 70 on the top of the machine, and operated at the completion of each stage of movement of the machine by a connecting rod 71 to move the heel-blank off of the clamp carrier and into the chute 11, as will be readily apparent by comparing Fig. 15 with Fig. 16.

In order to make clear the use of our clamping device as applied to the machine embodied in our prior application referred to, we have described in a very general way the operation of the parts of the machine with which our novel clamping device is associated, without illustrating or describing the actuating mechanism for these parts, as the same forms no part of the present invention, and is not necessary to an understanding thereof.

While the drawings of this application have been made from an actual commercial machine, and represent the best embodiment of our invention now known to us, we do not wish to be limited to the details of construction of the clamping device as illustrated and described in this application, except as may be required by certain of the appended claims designedly limited to such details of construction.

We claim:

1. A clamping device for heel-building machines comprising a clamp carrier affording a clamping base, a clamping frame slidably mounted on said carrier, a holder rotatably mounted on the upper end of said clamping frame, two clamping plates of different size mounted on opposite sides of said holder and interchangeable in position for clamping purposes by turning said holder, means for locking said holder in either position of said clamping plates, means for lowering and raising said clamping frame, and coil springs interposed, respectively, between said holder and corresponding ends of said clamping plates.
2. A clamping device for heel-building machines comprising a clamp carrier affording a

clamping base, a clamping frame slidably mounted on said carrier and having a cross-rod at its upper end, a holder comprising a sleeve rotatably mounted on said cross-rod and having arms projecting from opposite sides thereof, a bearing block pivotally mounted for transverse movement in the outer end of each of said arms, two clamping plates of different size, each comprising a main clamping plate and a supplemental pressure-plate pivotally mounted at one end within the same and pivotally mounted intermediate its ends on the outer end of one of said bearing blocks on a pivot extending at right angles to the pivot of said bearing block on said arm, said clamping plates being interchangeable in position for clamping purposes by turning said holder, means for locking said holder in either position of the clamping plates, and means for lowering and raising said clamping frame.

3. A clamping device for heel-building machines comprising a clamp carrier affording a clamping base, a clamping frame slidably mounted for vertical movement on said carrier, a clamping plate mounted on the upper end of said clamping frame, a depressible contact device also slidably mounted on said carrier and having spring-retaining members extending upward through the bottom of said clamping frame, springs interposed between the upper ends of said retaining members and the bottom of said frame, and means operated by the machine for engaging said contact device and lowering said clamping frame to cause said clamping plate to engage a heel-blank on said base with yielding pressure exerted by said springs.

4. A device for use in clamping heel-blanks comprising a clamp carrier affording a clamping base, a clamping frame slidably mounted for vertical movement on said carrier, a holder rotatably mounted at the upper end of said clamping frame, two clamping plates of different size mounted on opposite sides of said holder in a manner to have universal movement relative thereto and interchangeable in position for clamping purposes by turning said holder, means for locking said holder in either position of said clamping plates, and means for lowering said clamping frame to cause a positioned clamping plate to engage a heel-blank on said base.

5. In a heel-building machine, in combination with a reciprocable heel-former, a clamping device comprising a clamp carrier affording a clamping base, a clamping frame slidably mounted on said carrier, a holder rotatably mounted at the upper end of said clamping frame, two clamping plates of different size,

having the shape of a heel-lift, mounted on opposite sides of said holder in reversed position relative to each other and interchangeable in position for clamping purposes by turning said holder, means for locking said holder in either position of said clamping plates, the arrangement being such that when either clamping plate is in clamping position its breast side will be directed toward the heel-former, means for advancing said heel-former to move a freshly-built heel-blank onto said base, means for lowering said clamping frame to cause a positioned clamping plate to clamp the heel-blank, and means for locking the clamping frame in its lowered position.

6. In a heel-building machine having an endless series of clamp carriers movable in stages from a loading station to a discharge station and each of said carriers affording a clamping base, a clamping device for each carrier comprising a clamping frame slidably mounted for vertical movement on the carrier, a holder rotatably mounted at the upper end of said clamping frame, two clamping plates of different size mounted on opposite sides of said holder and interchangeable in position for clamping purposes by turning said holder, means for locking said holder in either position of said clamping plates, actuated means at the loading station for lowering said clamping frame to cause a positioned clamping plate to clamp a heel-blank on said base, means for locking the clamping frame in its lowered position to maintain the clamp on the heel-blank till it arrives at the discharge station, and a plurality of means located at the discharge station and actuated by the machine for unlocking and raising said clamping frame and for ejecting the unclamped heel-blank.

7. A clamping device according to claim 1 in which the coil springs normally maintain the clamping plates in a forwardly and downwardly inclined position.

8. In a clamping device, a base and a holder movable relative to the base to effect a clamping action therewith, a plurality of clamping plates on the holder, and each being adapted to face the base when in clamping position relative thereto, said plates being pivotally mounted on the holder to engage a surface to be clamped that is out of parallel to the base, and means mounting the holder for rotary displacement to bring the selected one of said plates into clamping relation with the base.

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