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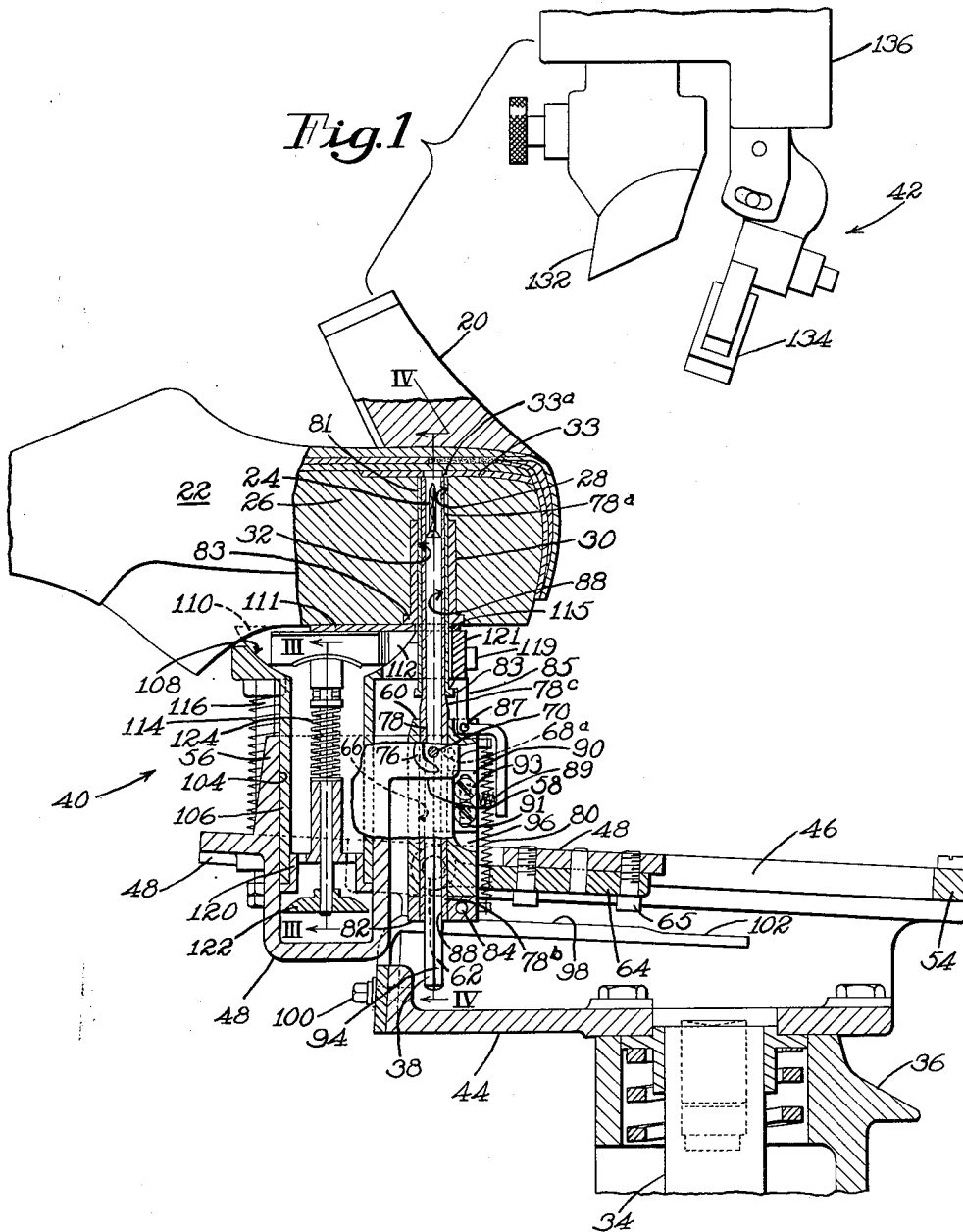
C. E. ROGERS, JR

3,101,480

HEEL ATTACHING MACHINES

Filed Oct. 2, 1961

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Inventor
Chester E. Rogers Jr.
By his Attorney
Douglas R. Buchanan

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C. E. ROGERS, JR

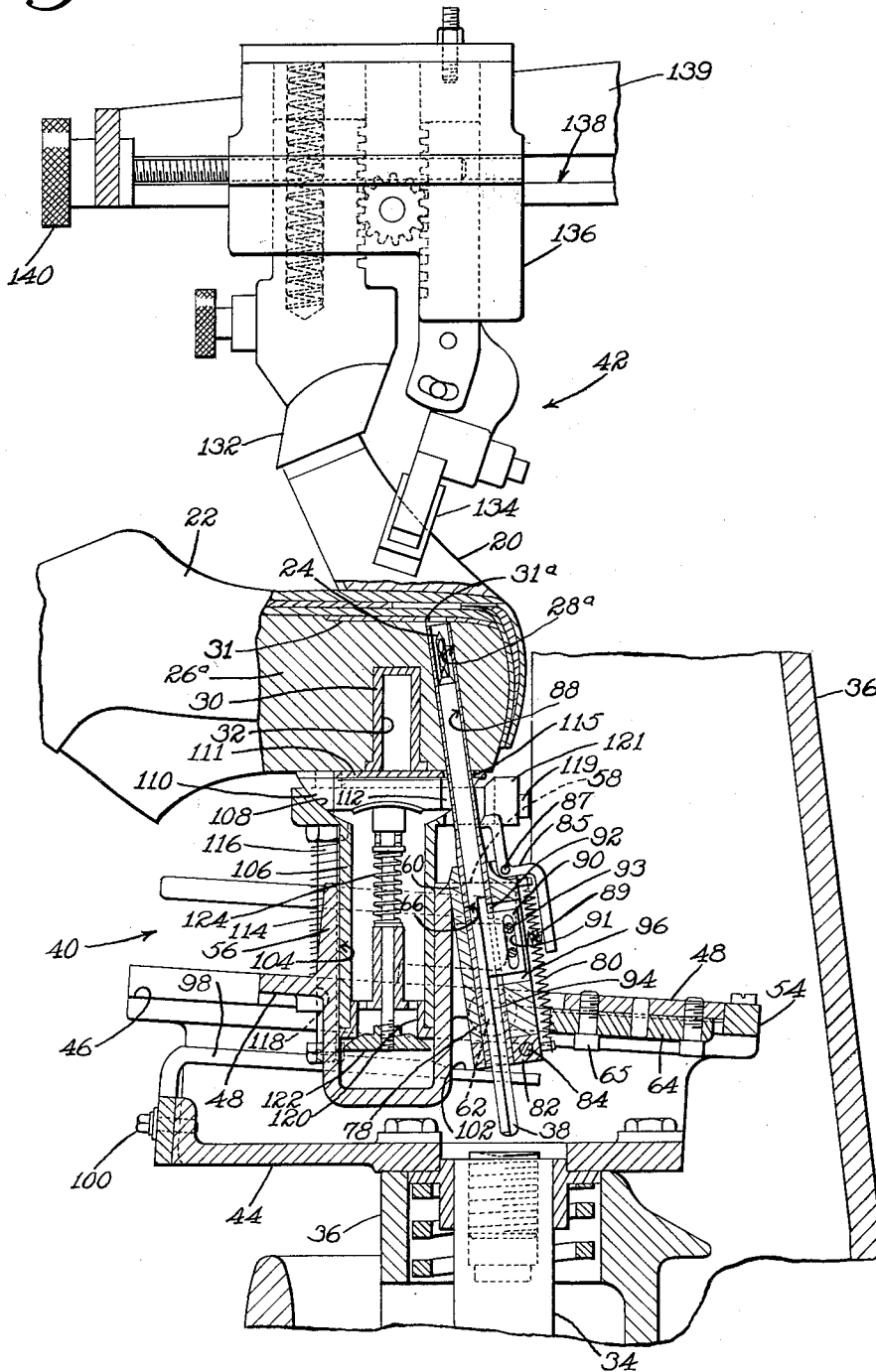
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HEEL ATTACHING MACHINES

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Fig. 2



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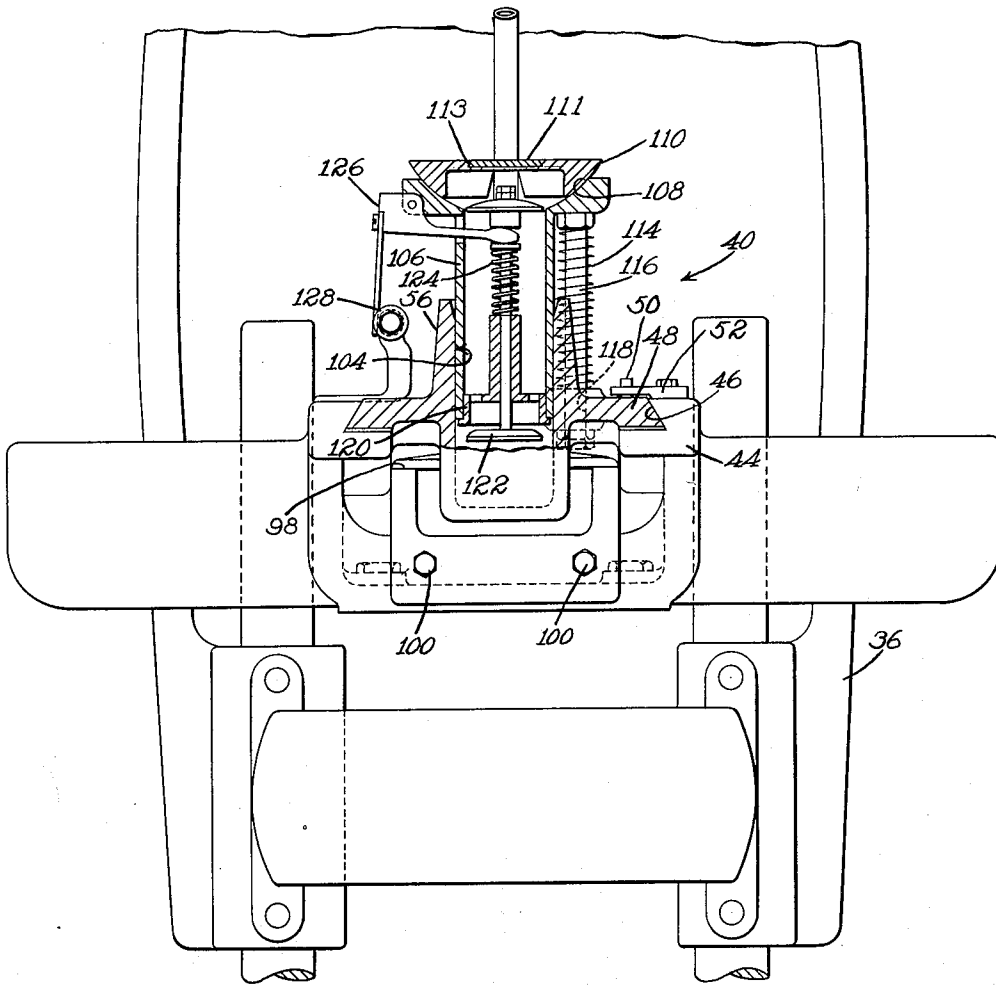
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Fig. 3



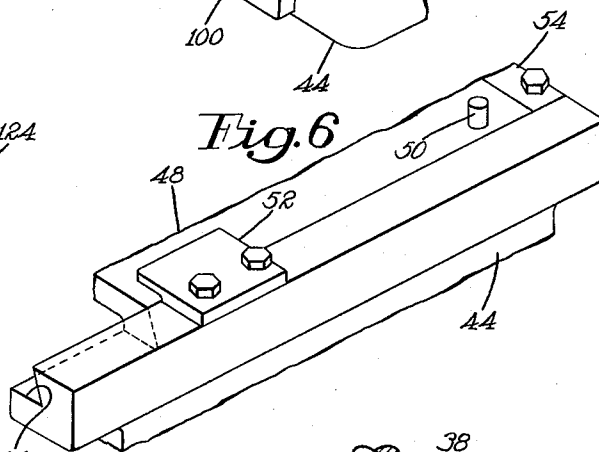
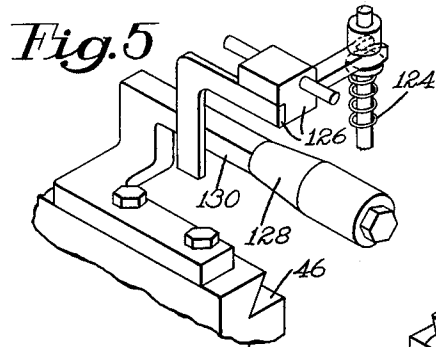
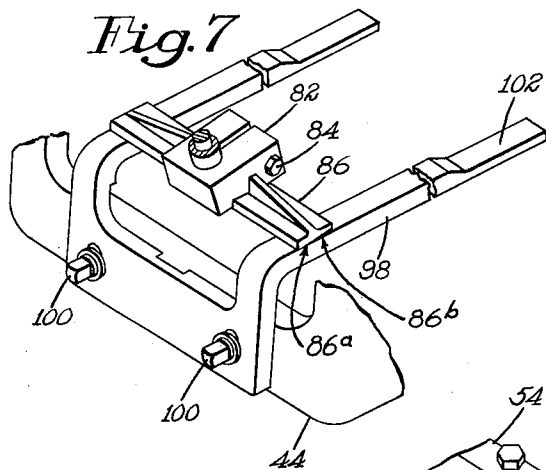
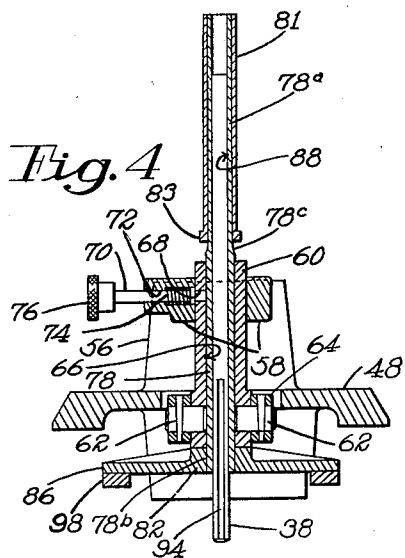
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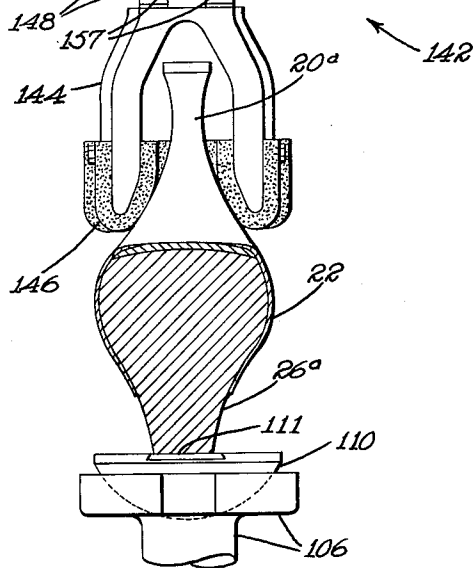
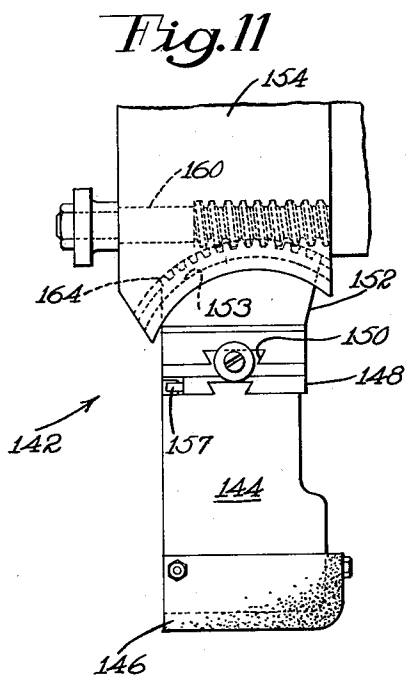
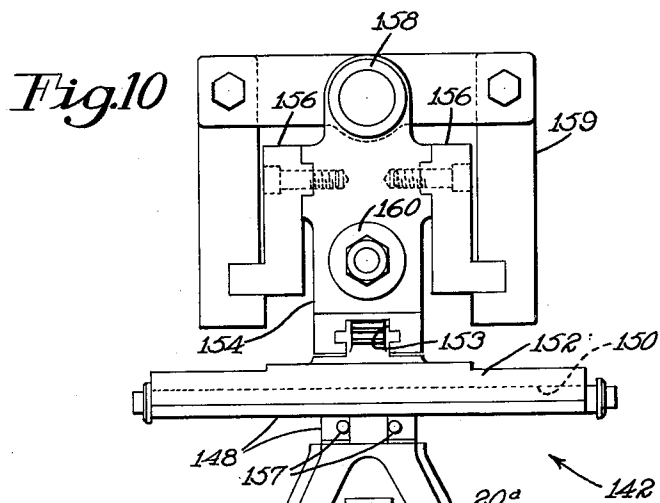
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3,101,480

HEEL ATTACHING MACHINES

Chester E. Rogers, Jr., Beverly, Mass., assignor to United Shoe Machinery Corporation, Boston, Mass., a corporation of New Jersey

Filed Oct. 2, 1961, Ser. No. 142,170
19 Claims. (Cl. 1—335)

This invention relates to work supports for use in heel attaching machines and more specifically to an improved jack of the type disclosed in United States Letters Patent No. 2,428,047, granted September 30, 1947, on an application filed in the name of John F. Standish.

In the manufacture of shoes it is customary to attach a heel to a shoe by the use of a single drive screw or nail, which is driven into the heel seat of the shoe and the heel through a passage extending generally heightwise of the back cone of a last bearing the shoe, as disclosed for example in Patent No. 2,428,047. The drive screw serves to hold the heel on the shoe while various finishing operations are being performed and until the last upon which the shoe is mounted has been "pulled," the heel then being "permanently" attached to the shoe during the usual nailing operation in which a plurality of nails are simultaneously driven through the heel seat of the shoe and into the heel. The drive screw which is referred to as a "temporary" attaching screw remains in the work and assists the nails in retaining the heel on the shoe permanently.

As explained in Patent No. 2,428,047 the screw is commonly driven by a driver through a passage of a hollow spindle occupying a bore or passage which is positioned just rearwardly of the usual last pin receiving thimble of the last and extends heightwise through the back cone of the last downwardly and forwardly at an angle of about 8° to the general plane of the rim of the heel plate of the last which rim is parallel to the crown of said back cone. The forming of the above mentioned bore in the last, which bore constitutes a passage for receiving the spindle, weakens the last as well as increases its cost. Accordingly it has also become common practice to extend the hole of the usual last pin receiving thimble of the last so that it progresses heightwise through the back cone of said last and thus accommodates a spindle in which reciprocates the driver for the temporary attaching screw. The thimble hole of the last and the above-mentioned passage which is an extension of this hole are disposed at substantially right angles to the general plane of the rim of the heel plate of the last.

It is an object of the present invention to modify the machine shown in Patent 2,428,047 so that it will accommodate a last which is provided with the above-mentioned inclined separate spindle receiving passage as well as accommodate a last having a spindle receiving passage which is a continuation with the thimble hole of the last.

With the above object in view the illustrative heel attaching machine is provided with a jack into cooperation with which a last bearing a shoe is moved and comprising two last supporting members which are moved by the last and one of which has the general form of a hollow spindle for example provided with a passage, a driver movable in the passage of said one member, means for retaining one of the members against movement relative to the other during movement of the other, means for freeing the retained member for movement and for restraining during this time the other member against movement and in accordance with a feature of the present invention, means for securing said one last supporting member which has the form of the spindle into either of two different angular operating positions with relation to the other supporting member.

In the illustrative jack the hollow spindle has an outside diameter of the proper size to receive slidingly the

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wall of the passage which is formed in the above-mentioned last and is positioned rearward of the thimble hole and is inclined downwardly and forwardly at about 8° to the plane of the rim of the heel plate of the last. As above explained, in the other type of last above mentioned the passage which is formed in the back cone of the last and is a continuation of the thimble hole of said last has a diameter somewhat greater than that of the above mentioned inclined passage.

In order to accommodate lasts of the two types above mentioned without requiring that the spindle and a mounting therefor shall be changed in changing over from one type of last to another, the illustrative machine in accordance with another feature of the invention is provided with a sleeve which has a cylindrical periphery and is adapted to be mounted slidingly on the hollow spindle for reception in a cylindrical passage which extends through the back cone of the last and has a diameter somewhat greater than the diameter of the spindle, cooperating means on the spindle and the sleeve for locating the sleeve in its operating position lengthwise of the spindle with an end of the sleeve in register with the end of the spindle and means for securing the sleeve in its operating position to the spindle.

The present invention consists in the foregoing features and in novel features hereinafter described in connection with the accompanying drawings which illustrate one embodiment of the same selected for purposes of illustration, said invention being fully disclosed in the following description and claims.

In the drawings,

FIG. 1 is a central vertical longitudinal section through a jack of the illustrative machine in a work receiving or loading position, a last, which bears a shoe and has a spindle receiving passage continuous with a thimble hole of the last, being shown upon a mount of the jack and as depressing said mount until a heel plate of the last engages the upper end of a jack spindle which at this time is fixed against depression;

FIG. 2 is a view similar to FIG. 1 but showing the jack in an operating or heel attaching position and as having mounted on it a last provided with a separate spindle receiving passage which is arranged rearward of the thimble hole of the last;

FIG. 3 is a front view of a portion of the jack partly in section on the line III—III of FIG. 1;

FIG. 4 is a section on the line IV—IV of FIG. 1;

FIG. 5 is a perspective view of control means for a valve governing the operation of the mount;

FIG. 6 is a perspective view of means for limiting travel of the jack;

FIG. 7 shows in perspective means for controlling movement of the spindle of the jack;

FIG. 8 is an enlarged section of a portion of the spindle and a sleeve mounted on the spindle;

FIG. 9 is a perspective view of a bed piece of the mount of the illustrative machine;

FIG. 10 is a front view of a modified holddown clamp for accommodating high style heels which are to be attached to shoes; and

FIG. 11 is a side elevation of a portion of the hold-down clamp shown in FIG. 10.

The illustrative machine is described with reference to the attachment of a heel 20 (FIGS. 1 and 2) to a shoe 22 by the use of a drive screw or nail 24 which is driven through the heel seat of the shoe and into the heel. As explained in Patent No. 2,428,047, it is common practice to attach the heel 20 "temporarily" to the shoe by the use of a drive screw 24, said heel being subsequently attached "permanently" to the shoe, after a last 26 (FIG. 1) or 26a (FIG. 2) upon which the shoe is mounted, has been "pulled," by the use of nails (not shown) which

are driven through the heel seat of the shoe and into the heel.

The illustrative machine is adapted for use with lasts 26, 26a provided respectively with spindle receiving passages 28 (FIG. 1) 28a (FIG. 2), the passage 28a being arranged rearward of the usual thimble hole 30 of the last and having an axis thereof disposed at an angle of approximately 8° to a line (not shown) normal to the general plane of the rim of a heel plate 31 (FIG. 2) of the last 26a, and the passage 28 being continuous with a hole 32 (FIG. 1) of the thimble 30 and having its axis arranged at right angles to the plane of the rim of a heel plate 33 of the last 26 and coincident with the axis of the thimble hole.

The illustrative machine is substantially identical with the machine disclosed in Patent No. 2,428,047 and comprises a plunger 34 reciprocable under power in a main frame 36 of the machine to raise a driver 38, which forms part of a jack 40 and has a magnetized upper end, whereby to insert the drive screw or nail 24 through the heel seat of the shoe 22 and into the heel 20 which is forced under power by a hold-down device or clamp 42 against the heel seat of the shoe. It will be noted that the heel plate 31 of the last 26a has a shoulder 31a (FIG. 2) which overlies the end of the passage 28a in the last 26a and that the plate 33 of the last 26 has a shoulder 33a (FIG. 1) overlying the end of the passage 28 in the last 26, said shoulders 31a, 33a being hereinafter described as shoulders formed in and extending transversely of said passages 28a, 28.

Attached to the top of a column of the main frame 36 is a frame cap 44 provided with ways 46 inclined downwardly and rearwardly and slidable along said ways is a carrier or base 48 of the jack 40. The work receiving position (FIG. 1) of the carrier 48 of the jack 40 is determined by the contact of a stud 50 (FIGS. 3 and 6) secured to the carrier with a stop plate 52 screwed to the frame cap 44, rearward movement of the carrier being limited by its engagement with a cross bar 54 adjustably secured to the main frame 36.

An upstanding housing portion 56 of the carrier or base 48 has projecting rearwardly from it a pair of spaced flanges 58 forming abutments for a guide block 60 (FIGS. 1, 2 and 4) which is journaled on a pair of bearing pins 62 pinned to a bracket 64 secured by bolts 65 to the carrier 48 and which has extending longitudinally and heightwise through it a cylindrical bore or guideway 66. The guide block 60 has a pair of recesses 68 (FIG. 4), 68a (FIG. 1) adapted fittingly to receive an end of a plunger 70 which is slidingly mounted in a guideway 72 (FIG. 4) of one of the flanges 58 of the carrier 48 and is constantly urged to the right (FIG. 4) by a spring 74. The angular setting of the guide block 60 upon the carrier 48 about the common axis of the bearing pins 62 may be quickly effected by the engagement of the plunger 70 with one or the other of the recesses 68, 68a. A hand knob 76 is secured to the plunger 70 for use in manually retracting it from the recess 68 or 68a. When the plunger 70 engages in the recess 68 the axis of the cylindrical guideway 66 of the block 60 is arranged vertically and when the plunger engages in the recess 68a the axis of the guideway is inclined at an angle of about 8° to the vertical.

Slidable in the guideway 66 of the block 60 is a hollow spindle 78 in which the driver 38 is mounted for reciprocation. The spindle 78 comprises upper and lower cylindrical portions 78a, 78b of relatively small and large diameter and a beveled portion 78c joining said upper and lower cylindrical portions. The spindle 78 is adapted to fit slidingly in the passage 28a of the last 26a and is constantly urged upward yieldingly by a tension spring 80 upper and lower ends of which are attached to studs secured respectively to the block 60 and to a foot 82 which is clamped upon the lower end portion of the

spindle by a screw 84 and has transverse flanges 86 (FIGS. 4 and 7) provided with angularly disposed planar lower faces 86a, 86b. Upward movement of the spindle 78 in the block 60 is limited by the engagement of the upper face of the foot 82 with a lower face of the block. Adjustment of the foot 82 on the spindle 78 permits the upper extremity of the spindle to be located at the proper height to support the shoe on the last in a definite relation to the driver 38.

The passage 28 forming the extension of the thimble hole 32 of the last 26 commonly has a slightly greater diameter than that of the passage 28a of the last 26a. In operating upon a shoe mounted upon the last 26, the diameter of the passage 28 of which is greater than that of the conventional passage 28a, a sleeve 81 (FIGS. 1, 4 and 8) is mounted on the upper cylindrical portion 78a of the spindle 78 and has a flanged lower end 83. When the flanged lower end 83 of the sleeve 81 engages the upper end of the bevel portion 78c of the spindle 78 the upper end of the sleeve is flush with the upper end of the spindle, the outside diameter of the sleeve being such that it fits slidingly in the passage 28 of the last 26 and also in the hole 32 of the thimble 30 of the last.

In order to insure that the sleeve 81 shall be held in its proper position on the spindle 78 there is provided a lever 85 which is journaled on a pin 87 secured to the block 60 and has its upper end overlying the flanged lower end 83 of the sleeve. A spring 89 opposite ends of which are housed in recesses of the block 60 and in the lever 85 constantly biases the upper end of the lever to its operating position shown in FIG. 1 over the flanged lower end 83 of the sleeve 81.

The driver, during a constant stroke thereof, sinks the head of the drive screw 24 to the proper depth into the insole of the shoe 26. Downward displacement of the driver 38 in a passage 88 of the spindle is limited by a key 90 (FIG. 2) extending through a slot 92 in the wall of the spindle and lying in a keyway 94 extending longitudinally along the lower portion of the driver. The key 90 lies in a recess 96 which is formed in the guide block 60 and has formed in it a vertical slot 91 through which pass screws 93 which are threaded into the guide block and have heads normally forcing the key against the bottom of the recess 96 to secure said key in an initially adjusted position to the guide block 60. The screws 93 may be initially loosened preparatory to securing the key 90 in a desired heightwise position upon the guide block 60. Initial adjustment of the key 90 is effected to vary the starting position of the driver 38 for the accommodation of drive screws or nails of different lengths.

When the jack 40 is in its forward or work receiving or loading position the spindle 78 is fixed against depression by contact of one or the other of the lower planar faces 86a, 86b of the flanges 86 of the foot plate 82 with tracks 98 which are inclined downwardly and rearwardly at the same angle as are the ways 46 and are adjustably secured to the frame cap 44 by screws 100. After a predetermined amount of rearward movement of the carrier 48 toward its operating or heel attaching position, the foot 82 of the spindle 78 moves above lower portions 102 of the tracks 98, thus allowing slight depression of the spindle, the last 26 or 26a at this time receiving the support of another member as will be hereinafter described.

Formed in the upstanding housing portion 56 of the carrier or jack base 48 is a vertical cylinder 104 in which operates a tubular piston 106 having at its upper end an enlargement provided with a spherical depression 108 shaped to receive a complementary lower surface of a bed piece or mount 110 having a planar upper face adapted to support the last by contact with the crown or upper surface of the back cone of the last. The bed piece 110, the cylinder 104 and the piston 106 may be considered part of the carrier 48 of the jack 40. Depression of the hold-down clamp 42 initially causes the bed piece 110 to tilt to the proper angular position and then after clamping

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pressure is applied to the bed piece, because of its spherical shape, to be held against displacement on the piston 106.

The bed piece 110 has a radial slot 112 through which the spindle 78 passes. The piston 106 and the bed piece 110 are normally urged upwardly by a pair of expansion springs 114 surrounding rods 116 which are secured to the upper end of the piston 106 and pass through bores 113 in the carrier 48. Upward movement of the piston 106 acted upon by the springs 114 is limited by contact of nuts threaded onto the rods 116 with the under side of the carrier 48.

In order to insure that the portion of the crown of the back cone of the last 26 or 26a overlying the slot 112 of the bed piece shall be effectively supported there is provided a slide plate 111 (FIGS. 1, 2 and 9) which is movable along a forwardly and rearwardly undercut guideway 113 in the planar upper face of the bed piece and which has formed in it a hole 115 through which the spindle 78 passes freely. In accommodating the last 26a the bed piece 110 may be initially oriented slightly on the tubular piston 106, the upper face of the bed piece during such orientation being inclined slightly downwardly and rearwardly from the horizontal.

It has been found that when the shoe to which the heel has been attached is removed from the machine disclosed in Patent No. 2,428,047 there is a tendency on the part of the operator to tilt the toe end of the shoe and accordingly the front end of the bed piece 110 downwardly with the result that when the work has been removed from the machine the bed piece is normally dipped forwardly and sometimes sidewardly. When this occurs more time is required in presenting the next shoe to be operated upon to the machine than where the upper face of the bed piece 110 is horizontal. Accordingly the bed piece 110 is provided at its forward lateral portions with flanges 117 which are normally in engagement with the flanged upper face of the tubular piston 106, the upper face of the bed piece at this time being horizontal. It will thus be apparent that the presence of the flanges 117 will allow the bed piece 110 to tilt slightly backward from its horizontal position to accommodate slight variations in the angles of the last passages 28a and/or irregularities in the crowns of the back cones of worn lasts. The presence of the flanges 117 insures against the operator tipping the forward end of the bed piece downward as above described when the work is removed from the jack 40.

It has been found that the thimble hole 32 and the passage 28 are consistently accurate, the common axis of the hole and the passage at all times being disposed at right angles to the planar crown of the back cone of the last. Accordingly in operating upon shoes mounted upon lasts 26 it is not necessary to provide an initially tiltable bed piece and accordingly said bed piece may be rigidly secured in its horizontal position to the tubular piston 106 or may be formed integral with said piston. In the illustrative construction it will be noted that when the spindle 78 is in its vertical position shown in FIG. 1 for accommodating "thimble hole work," the vertical axis of the thimble is arranged at a substantial distance rearward of the vertical axis of the tubular piston 106 and accordingly downward pressure imparted to the slide plate 111 and to the upper face of the bed piece 110 has a tendency to tilt the rear end of the bed piece downwardly against its locking action in the tubular piston 106. With the foregoing in view the rear end of the flanged upper portion of the tubular piston 106 has secured to it by screws 119 a block 121, the construction being such that when the machine is adjusted for thimble hole work the slide plate 111 rests upon the upper surface of the block, the flanges 117 of the bed piece 110 at this time resting on the upper face of the tubular piston 106. Accordingly when operating upon thimble hole work the bed piece 110 is fixed against tilting on the tubular piston 106.

The lower end of the piston 106 has secured to it a valve seat 120 in an axial extension of which a stem of

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a valve 122 is movable. An expansion spring 124 tends to close the valve 122 and thus the passage through the piston 106. When this occurs the piston is locked against depression by oil in the cylinder 104.

When the jack 40 is in its work receiving position shown in FIG. 1 the valve 122 is held open by a multipart bell crank lever 126 (FIGS. 3 and 5) fulcrumed on the enlargement of the piston 106, a bifurcated arm of this lever extending between an enlargement and a flange on a stem of the valve 122. The bell crank lever 126 has a depending arm which during travel of the carrier 48 of the jack 40 along its ways 46 moves along the periphery of a cam 128 rotatably mounted on a bracket 130 secured to the frame cap 44. When the jack 40 is in its work receiving or loading position the depending arm of the bell crank lever 126 engages the high portion of the cam 128 causing the valve 122 to be lowered from its seat.

The nuts on the lower ends of the rods 116 are so positioned that they permit the springs 114 so to elevate the piston 106 and the bed piece 110 that when the heel plate 33, 31 of the last 26, 26a respectively having the lowest cone, contacts the end of the spindle 78, the engagement of the crown of the last with the bed piece 110 lowers the unlocked piston slightly. When the jack 40 is shifted rearwardly to its heel attaching position the depending arm of the bell crank lever 126 rides off the cam roll 128 and lies out of contact with an opposed portion 130 (FIG. 5) which supports the roll and accordingly the valve 122 is closed by the spring 124 and the piston 106 and the bed piece 110 are locked against movement in preparation for the heel attaching operation.

The holddown clamp 42 is similar to that disclosed in United States Letters Patent No. 1,545,575, granted July 14, 1925, on an application filed in the name of John F. Standish and comprises a tread abutment 132 and a back fork 134 operatively connected for equal and opposite movements and mounted on a carrier slide 136, which is initially adjustable along ways 138 (FIG. 2) extending forwardly and rearwardly of an operating head 139 of the machine, by the use of a screw 140. Modified holddown clamps such as illustrated in United States Letters Patent No. 2,151,054, granted March 21, 1939, on an application filed in the name of John F. Standish and in United States Letters Patent No. 2,178,615, granted November 7, 1939, in the names of John F. Standish et al., may also be used advantageously. The holddown clamp 42 and the plunger 34 are operated in timed relation during the cycle of the machine as disclosed in detail in said Patent No. 1,545,575.

Preparatory to operating upon the work the tread abutment 132 and the back fork 134 of the holddown clamp 42 are initially adjusted with relation to the carrier slide 136 to accommodate the particular style of heel on hand and the holddown clamp as an entirety is moved forward or rearward to its proper position by the use of the screw 140 so that the tread abutment 132 and the back fork 134 will effectively engage the tread end and the rear face of the heel when said clamp is depressed vertically in response to operator controlled movement of a treadle (not shown).

When attaching heels 20 to shoes 22 which are mounted on lasts 26, 26a the guide block 60 is in its upright and inclined positions respectively as shown in FIGS. 1 and 2 upon the carrier or base 48 of the jack 40. Initially the carrier 48 is forward in the ways 46, the stud 50 (FIG. 6) being in engagement with the stop plate 52 and the transverse flanges 86 of the foot 82 of the tubular spindle 78 resting on the tracks 98 and accordingly the spindle being locked against depression.

The operator drops a drive screw or nail 24, head down, into the passage 88 of the spindle 78, places over the spindle or over the sleeve 81 on the spindle, the passage 28a or 28 of the last 26a or 26 bearing the shoe 22 and places the heel 20 on the heel seat of the shoe. Since the depending arm of the bell crank lever 126 is in engage-

ment with the cam 128 the valve 122 is open, the piston 106 and the bed piece 110 being raised to their maximum extent by the springs 114. The last 26 or 26a on the bed piece 110 is depressed by the operator against the action of the springs 114 until stopped by contact of the shoulder 33a or 31a of the last plates 33 or 31 with the end of the locked spindle 78 and the sleeve 31 or with the end of the locked spindle 78. When this occurs the distance of the insole of the shoe from the end of the driver 38, which has a constant throw, has thus been determined and the height of the back cone of the last has been measured.

The operator now slides the jack 40 rearward until the carrier or base 48 of the jack engages the cross bar 54 thus locating the work in the proper operating position. Before the transverse flanges 86 of the spindle foot 82 leave the tracks 98 the depending arm of the bell crank lever 126 passes off the cam 128 and accordingly the valve 122 is closed by the spring 124 thereby trapping oil beneath the piston 106 and locking said piston against depression. The passing of the flange 86 of the spindle foot 82 from the tracks 98 to positions over lowered portions 102 of these tracks frees the spindle 78, and the bed piece 110 now provides a rigid support for the work except for any initial angular accommodation as allowed by the universal locking movement of the bed piece 110 in the depression 108.

The power operation of the machine is now started by depression of the treadle (not shown), the holddown clamp 42 descending to clamp the work against the bed piece 110 and the driver 38 thereafter rising under the influence of the plunger 34 to insert the drive screw 24 through the heel seat and into the heel. At this time the spindle 78 is held up only by the spring 80 and is therefore not subject to clamping pressure. During the completion of the operating cycle the drive 38 descends to a starting position by gravity as the plunger 34 is moved to its lowered retracted position, the holddown clamp 42 is raised to free the work and the operator draws forward the jack 40 and removes the shoe and its attached heel from the machine.

In the attachment of high style Louis heels 20a (FIG. 10) to shoes it is customary to replace the holddown clamp 42 by a clamp 142. The clamp 142 includes a presser member 144 which is U-shaped in horizontal cross section and comprises a pad 146 which is made of leather or similar material and is wrapped about and secured to the lower U-shaped edge of the presser member and is adapted to engage the rear and side faces of the heel 20a to force it against the heel seat of the shoe 22.

The presser member 144 is secured interchangeably by the use of screws 157 to a holder plate 148 which has an upper dovetail portion adapted to fit slidably in a dovetail guideway 150 formed in a carrier block 152 provided with an upstanding arcuate portion initially adjustable in an arcuate guideway 153 formed in a header 154 secured to a carrier slide 156 corresponding to the carrier slide 136.

The carrier slide 156 may be initially adjusted forwardly and rearwardly in a vertically movable operating head 159 by the use of a screw 158 which is rotatably mounted in said operating head and is threaded into the header 154. Angular adjustment of the presser member 144 with relation to the header 154 is effected by rotating a worm 160 which is rotatably mounted in the header 154 and meshes with a rack 164 at the upper end of the carrier block 152.

When the clamp 142 is lowered over the heel 20a manually positioned upon the heel seat of the shoe 22 it is pressed against the side and rear faces of the heel to force the heel against the heel seat of the shoe. As the presser member 144 is lowered it shifts laterally or lengthwise of the dovetail guideway 150 of the carrier block 152 to accommodate the left and right work.

Having thus described my invention, what I claim as

new and desire to secure by Letters Patent of the United States is:

1. In a heel attaching machine, a jack into cooperation with which a last bearing a shoe is moved and comprising two last supporting members which are moved by the last and one of which has a passage, a driver movable in the passage of said one member, means for retaining one of the members against movement relative to the other during movement of the other, means for freeing the retained member for movement and for retaining during this time the other member against movement, and means for securing the last supporting member which has a passage in either of two different angular operating positions with relation to the other supporting member.

2. In a heel attaching machine, a frame having ways, a jack base slidable in said ways between work receiving and operating positions, a last bed piece movable on said base, a guide block pivotally mounted on the base, means for securing said block in either of two different angularly arranged positions on the base, a last spindle movable in the guide block, and means adapted to control movements of the spindle and the bed piece with relation to the base in accordance with the position of the jack base in the ways.

3. In a heel attaching machine, a jack comprising a base movable between last receiving and operating positions, a guide block, means for securing the guide block initially in either of two different angularly arranged operating positions on said base, a last supporting spindle movable in said block, means for locking the spindle against movement in the block when the base is in its last receiving position, a mount adapted to support a last and movable upon the base in its last receiving position, means for locking the mount to the base in response to movement of the base to its operating position, and means for releasing the spindle from its locking means upon movement of the base toward its operating position.

4. In a heel attaching machine, a jack comprising a portion adapted to be engaged by the crown of the back cone of a last, a guide block which is mounted for pivotal adjustment on said jack and has a bore, means for securing said guide block in any one of a plurality of predetermined angularly adjusted positions on the jack, a hollow spindle which is mounted for movement in said bore and is adapted to be engaged by a shoulder in a passage extending heightwise through the back cone of the last, means for clamping a heel against a heel seat of a shoe on the last mounted upon the jack, a driver slidable in said hollow spindle, and means for causing said driver to drive a screw through the heel seat portion of the shoe and into the heel.

5. In a heel attaching machine, a mount having a face adapted to be engaged by the crown of a back cone of a last bearing a shoe, a spindle projecting from said face of the mount and adapted to be received in a passage extending through the back cone of the last, means for securing the spindle in either of two different operating positions in which an axis thereof is disposed at different angles to said face whereby to accommodate last passages which extend at different angles to the crowns of the lasts, and a driver movable in the spindle for driving a fastener through the heel seat of the shoe and into the heel.

6. In a heel attaching machine, a jack comprising a base movable between work receiving and operating positions, a mount which is movable in said base and is adapted to be engaged by the crown of the back cone of a last, means responsive to movement of the base to and from its work receiving position respectively for yieldingly supporting the mount on said base and for securing the mount against movement to the base, a block having a bore, means for securing the bore initially to the base in either of two angularly disposed positions, a hollow spindle which is mounted in the bore of the block and is adapted to be received in a passage extending heightwise through the back cone of the last and which is engaged

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by a last shoulder extending into said bore, means responsive to movement of the base to and from its work receiving position respectively for securing the spindle to the block and for yielding supporting the spindle for movement in said block, means for retaining a heel against the heel seat of a shoe mounted on the last and the last against the mount and the spindle, and a driver slidable in the spindle and adapted to drive a screw through the heel seat of the shoe and into the heel.

7. In a heel attaching machine, a jack comprising a base and two supporting members adapted to be engaged respectively by the crown of the back cone of a last and a shoulder in a bore extending heightwise through said back cone, said base and accordingly said supporting members being movable together generally lengthwise of the last between loading and operating positions, said supporting members being movable independently of each other on said base and generally heightwise of the last, means for restraining, when said base is in its loading position, the shoulder engaging member against movement on said base and for allowing movement of said crown engaging member on said base, means responsive to movement of the base from its loading position to its operating position for freeing the shoulder engaging member for movement relatively to the base and for restraining the crown engaging member against movement on the base and means for securing said shoulder engaging member in any one of a plurality of operating positions.

8. In a heel attaching machine, a jack comprising a base movable between a last receiving position and a heel attaching position, a mount which is slidable on said base and is adapted to be engaged by the crown of a back cone of a last, means for causing the mount to slide yieldingly on said base in response to pressure of the last when said base is in its last receiving position, a guide block having a bore, means for securing the block in either of two different operating positions to the base, a hollow spindle which fits in the bore of the guide block and is adapted to be engaged by a shoulder in a passage extending heightwise through the back cone of the last means for locking the spindle for movement in the bore of the block when the base of the jack is in its last receiving position, means for releasing the spindle from the block for yielding movement in the bore under the action of the shoulder of the last in response to movement of said base to its heel attaching position, and means for locking the mount to the base in response to movement of the base to its heel attaching position.

9. In a heel attaching machine, a jack comprising a mount which has a substantially planar face adapted to be engaged by the crown of the back cone of a last, said mount having a slot terminating at said face, a hollow spindle extending through said slot in the mount and beyond said face of the mount and adapted slidably to receive a passage which extends heightwise through the back cone of the last and which has extending into it a shoulder adapted to be engaged by an end of the spindle, and means for securing the spindle in different operating positions with relation to said face of the mount to accommodate lasts having passages axes of which are disposed at different angles to the crown of the last.

10. In a heel attaching machine, a jack comprising a movable mount and a movable spindle adapted to be engaged respectively by the back cone of a last and a transverse shoulder in a passage which extends heightwise through said cone and slidably receives the spindle, means for effecting movement of the jack between last receiving and heel attaching positions, means for causing, when the jack is in its last receiving position, the mount to be movable under pressure exerted against it and the spindle to be held stationary whereby to measure the cone of the last heightwise, means for causing, when the jack is in its heel attaching position, the spindle to be movable under pressure of said shoulder and the mount to be held stationary, and means for securing the spindle in angular

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relation to the mount in accordance with the position of the passage in the last.

11. In a heel attaching machine, a jack comprising a mount having a planar face adapted to be engaged by the crown of the back cone of a last, a hollow spindle extending beyond said face of the mount and adapted slidably to be received in a passage which extends heightwise through the back cone of the last and into which extends a last shoulder, until an end of the spindle engages said shoulder, means for securing the spindle in different angular operating positions upon the mount whereby to accommodate lasts having passages which are disposed at different angles to the crown of the last, a sleeve which is adapted to be mounted on and removed from said spindle, means for positioning the sleeve on the spindle with an end of the sleeve substantially in register with an end of the spindle, and means for securing the sleeve positioned on the spindle to said spindle.

12. In a heel attaching machine, a jack comprising a cylindrical spindle adapted slidably to be received in a passage, which extends heightwise through a back cone of a last and into which a shoulder of the last extends, until an end of the spindle engages said shoulder, means for securing the spindle in any one of a plurality of operating positions, a sleeve adapted to fit slidably on said spindle, and means for securing the sleeve in a predetermined relation to the spindle with an end thereof substantially in register with an end of the spindle.

13. In a heel attaching machine, a jack comprising a spindle which has a cylindrical periphery and is adapted slidably to receive a cylindrical passage of one diameter and extending heightwise through a back cone of the last bearing a shoe, until an end of the spindle is engaged by a last shoulder extending into said passage, means for securing the spindle in any one of a plurality of operating positions, and a sleeve which has a cylindrical periphery and is adapted interchangeably to be mounted slidably on the spindle for reception in a cylindrical passage which extends through the back cone of said last and has a diameter greater than said one diameter, coaxial means on the spindle and the sleeve for locating the sleeve in its operating position lengthwise of the spindle with an end of the sleeve in register with said end of the spindle, and means for securing the sleeve in its operating position to the spindle.

14. In a heel attaching machine, a jack comprising a movable mount and a movable spindle adapted to be engaged respectively by the back cone of a last and a transverse shoulder in a passage which extends heightwise through said cone and slidably receives the spindle, means for effecting movement of the jack between last receiving and heel attaching positions, means for causing, when the jack is in its last receiving position, the mount to be movable under pressure exerted against it and the spindle to be held stationary whereby to measure the cone of the last heightwise, means for causing when the jack is in its heel attaching position the spindle to be movable under pressure of said shoulder and the mount to be held stationary, means for securing the spindle in any one of a plurality of operating positions, a sleeve adapted to be received slidably on the spindle to increase the diameter of said spindle, said sleeve and spindle having interengaging portions for positioning the sleeve on the spindle, and means for locking the positioned sleeve on said spindle.

15. In a heel attaching machine, a jack comprising a base movable between last receiving and operating positions, a guide block, means for securing the guide block initially in any one of a number of different angularly arranged operating positions on said base, a spindle movable in the block, means for locking the spindle against movement in the block when the base is in its last receiving position, a mount adapted to support a last and movable generally heightwise of the last upon the base when said base is in its last receiving position, means for locking the mount to the base in response to movement of the

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base to its operating position, means for releasing the spindle from its locking means upon movement of the base to its operating position, and a plate which is slidingly supported by said mount and is adapted to be engaged by the back cone of the last and which has a hole in which the spindle fits loosely, said plate being movable into different operative positions on the mount in response to initial adjustment of the guide block to its different angularly arranged positions on the base.

16. In a heel attaching machine, a jack comprising a base movable between last receiving and operating positions, a guide block, means for securing the guide block initially in any one of a number of different angularly arranged operating positions on the base, a spindle movable in the block, means for locking the spindle against movement in the block when the base is in its last receiving position, a mount which comprises a bed piece arranged for orientation on the mount and is adapted to support a last and which is movable heightwise of the last when the base is in its last receiving position, means for locking the mount to the base in response to movement of the base to its operating position, means for releasing the spindle from its locking means upon movement of the base toward its operating position, and a plate which is slidingly supported upon the bed piece and is adapted to be engaged by the back cone of the last and which has a hole in which the spindle fits loosely, said plate being movable into different operating positions on the bed piece in response to initial adjustment of the block to its different angularly arranged positions on the base.

17. In a heel attaching machine, a jack comprising a base movable between last receiving and operating positions, a guide block, means for securing the guide block initially in any one of a number of different angularly arranged operating positions on the base, a spindle movable in the block, means for locking the spindle against movement in the block when the base is in its last receiving position, a mount which comprises a bed piece arranged for orientation on the mount and is adapted to support a last and which is movable heightwise of the last when the base is in its last receiving position, means for locking the mount to the base in response to movement of the base to its operating position, means for releasing the spindle from its locking means upon movement of the base toward its operating position, a plate which is slidingly supported upon the bed piece and is adapted to be engaged by the back cone of the last and which has a hole in which the spindle fits loosely, said plate being movable into different operating positions on the bed piece in response to initial adjustment of the block to its different angularly arranged positions on the base, and means for locking the bed piece in a predetermined posi-

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tion against movement on the mount when the block is arranged in one of its angularly arranged operating positions.

18. In a heel attaching machine, a jack for supporting a last bearing a shoe and comprising two last supporting members which are moved by the last and one of which has a passage, a driver movable in the passage of said one member, means for restraining one of the members against movement during movement of the other, means for freeing the retained member for movement and for retaining during this time the other member against movement, means for securing the last supporting member which has a passage in any one of a plurality of operating positions, a powered head movable heightwise of the last supported by the jack, a clamp which is carried by the head, said clamp having a presser member adapted to engage opposite sides of a heel positioned upon a heel seat of the shoe on the jack and which is mounted for free shifting movement transversely of the shoe whereby to allow the presser member to shift laterally of the shoe as it applies pressure against the heel in order to accommodate itself to the heel irrespective of whether the heel is a right or a left.

19. In a heel attaching machine, a jack for supporting a last bearing a shoe and comprising two last supporting members which are moved by the last and one of which has a passage, a driver movable in the passage of said one member, means for restraining one of the members against movement during movement of the other, means for freeing the retained member for movement and for retaining during this time the other member against movement, means for securing the last supporting member which has a passage in any one of a plurality of operating positions, a powered head movable heightwise of the last supported by the jack, a clamp which is carried by the head, said clamp having a presser member adapted to engage opposite sides of a heel positioned upon a heel seat of the shoe on the jack and which is mounted for free shifting movement transversely of the shoe whereby to allow the presser member to shift laterally of the shoe as it applies pressure against the heel in order to accommodate itself to the heel irrespective of whether the heel is a right or a left, and means mounting said clamp on said head for movement longitudinally of said shoe.

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