J. W. TIERNEY.

APPARATUS FOR HAMMERING THE HEELS OF BOOTS AND SHOES.

APPLICATION FILED JAN. 13, 1911.

1,013,971.

Patented Jan. 9, 1912.

4 SHEETS—SHEET 1.

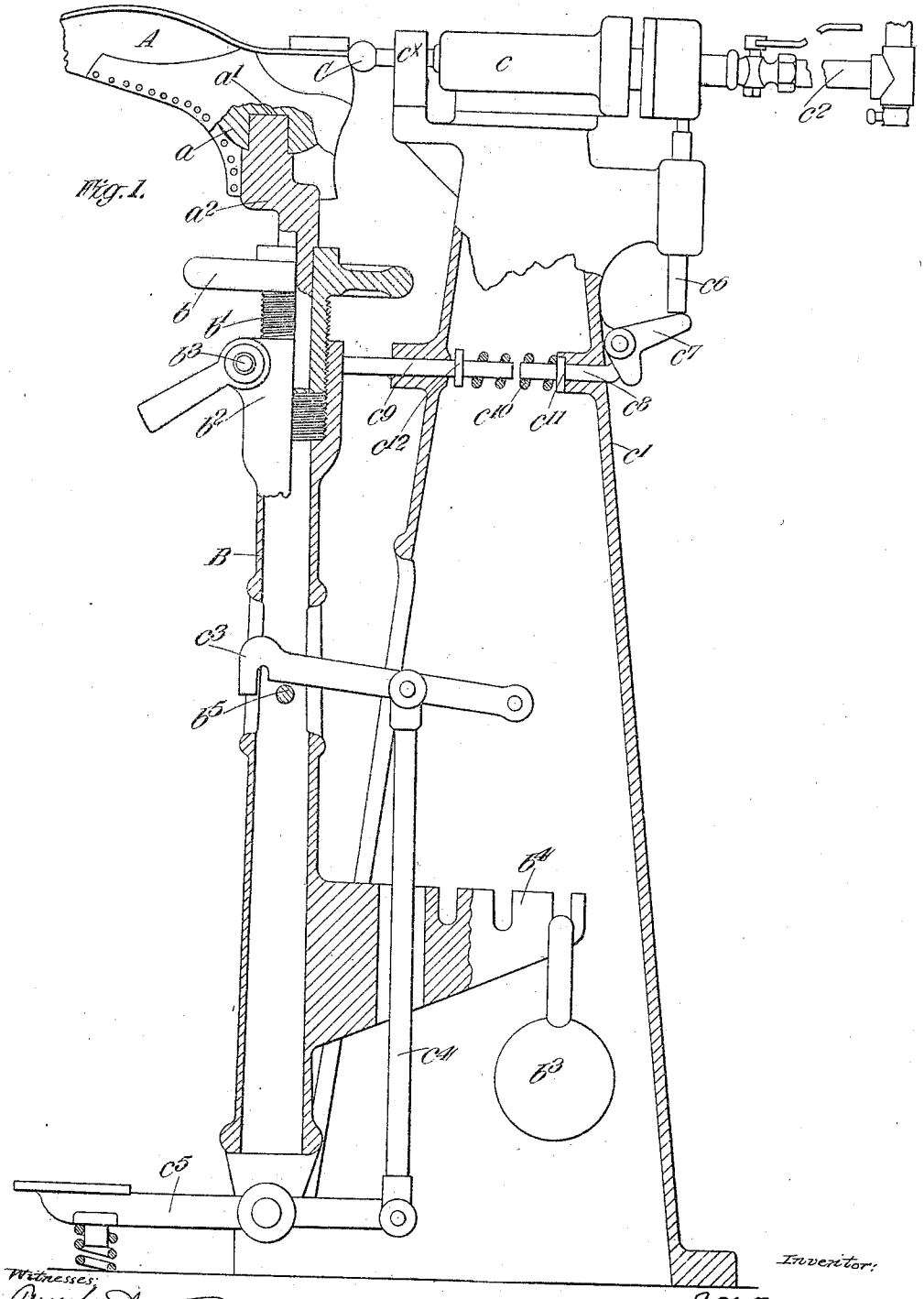

Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

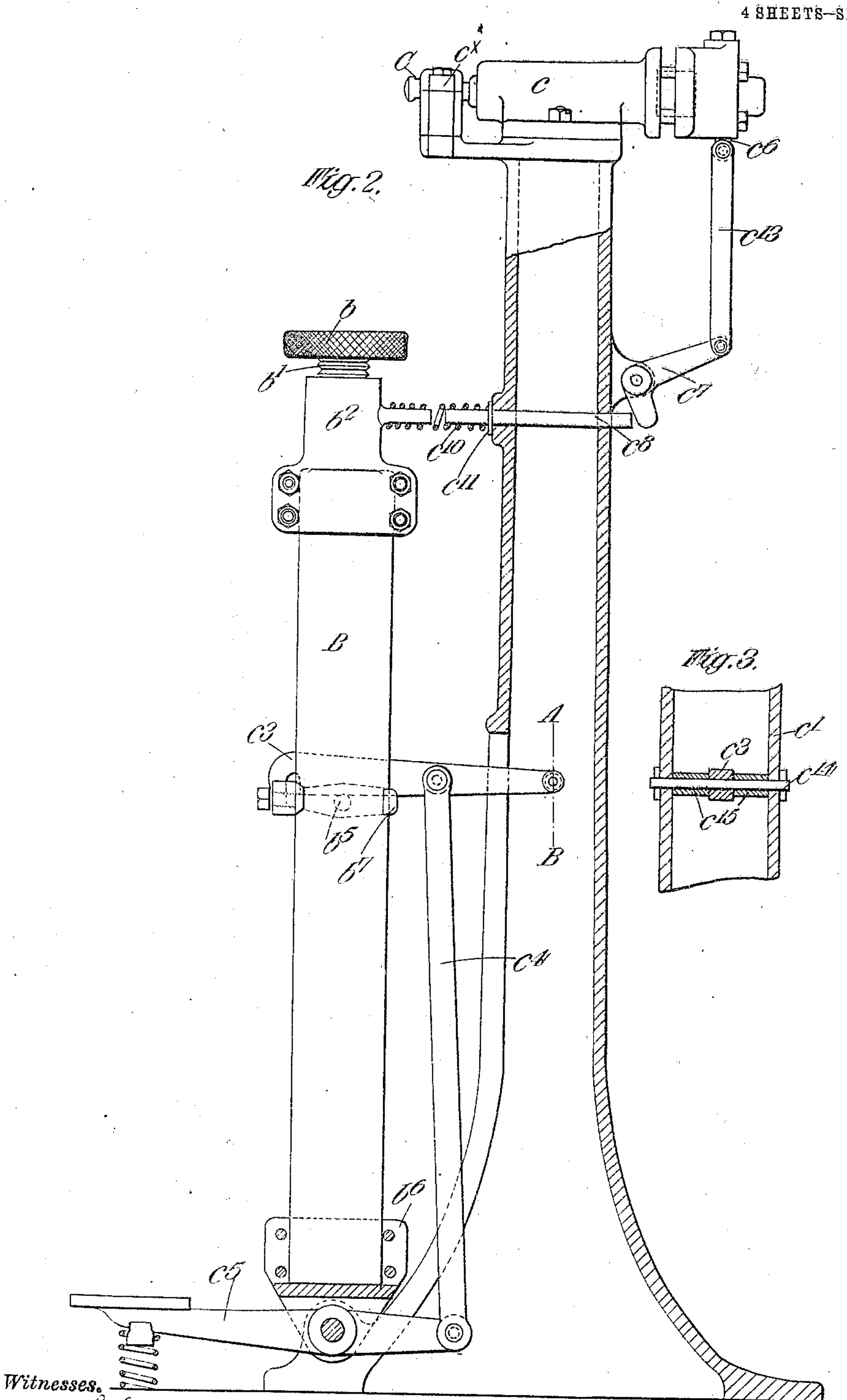

Fig. 3.

Witnesses.
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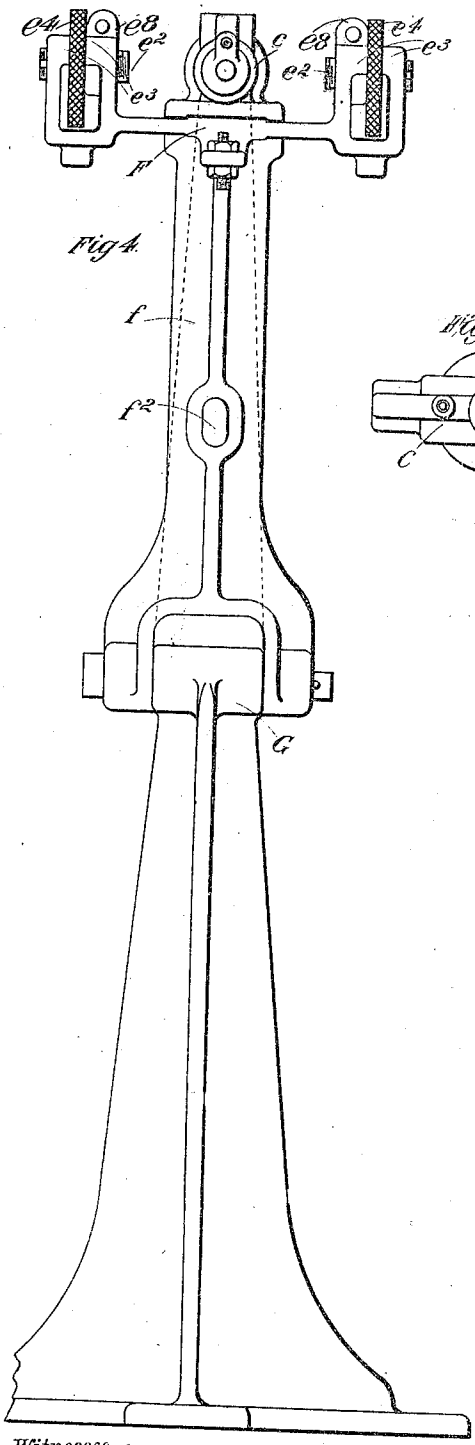

Fig 4.

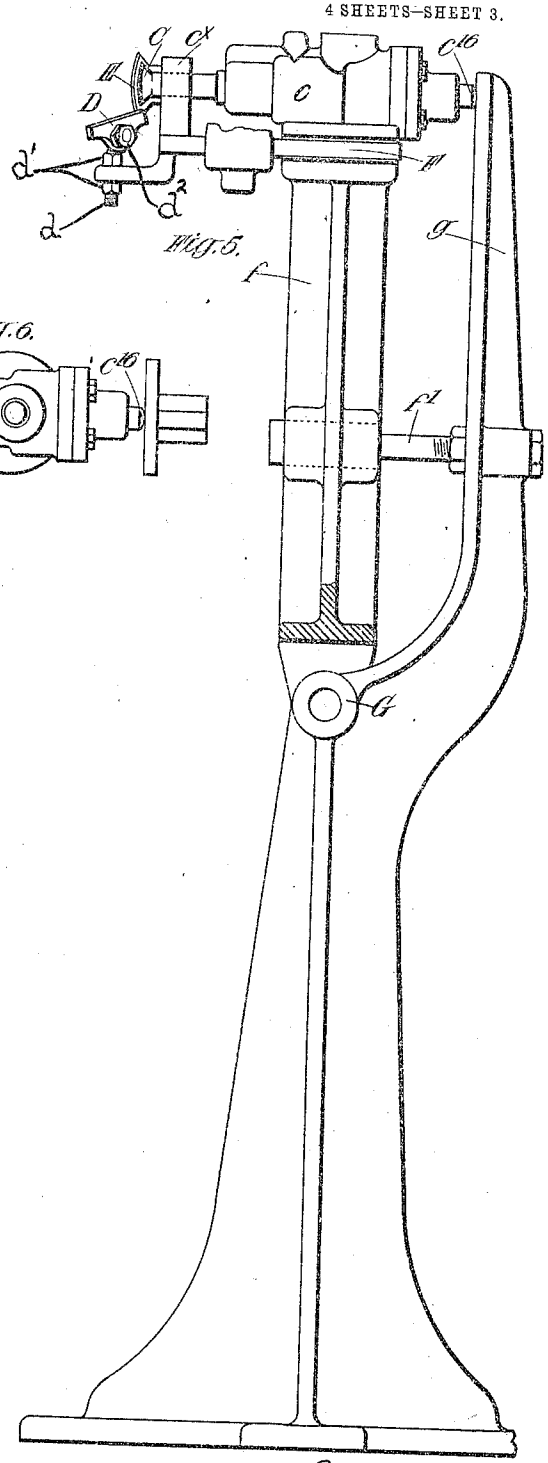

Fig 5.

Fig 6.

Witnesses

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4 SHEETS—SHEET 4.

Fig. 7.

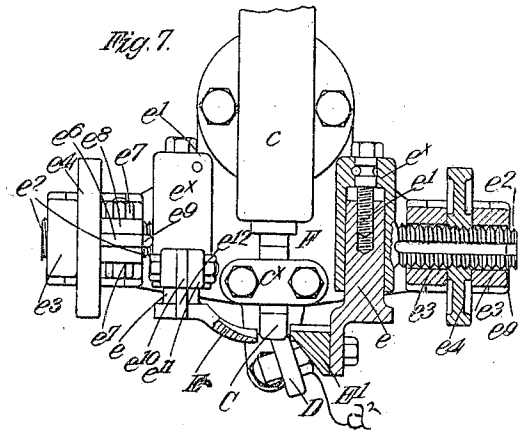

Fig. 8

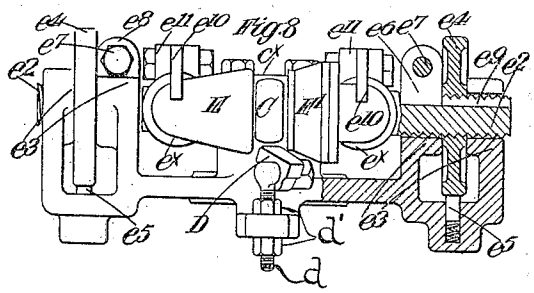

Fig. 9.

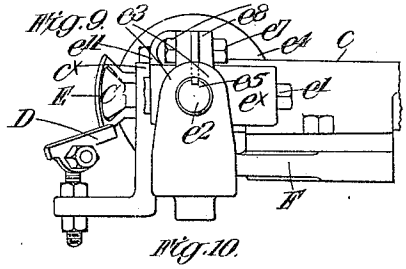

Fig. 10.

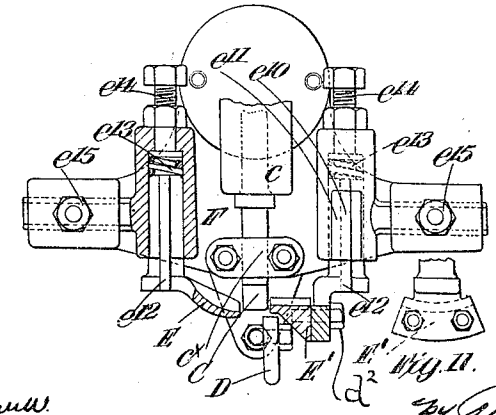

Fig. 11.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN WILBUR TIERNEY, OF UPPER NORWOOD, ENGLAND.

APPARATUS FOR HAMMERING THE HEELS OF BOOTS AND SHOES.

1,013,971. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed January 13, 1911. Serial No. 602,461.

To all whom it may concern:

Be it known that I, JOHN WILBUR TIERNEY, a citizen of the United States of America, residing at Ashtree, Beulah Hill, Upper Norwood, in the county of London, England, have invented certain new and useful Improvements in Apparatus for Hammering the Heels of Boots and Shoes, of which the following is a specification.

This invention relates to apparatus for hammering the edges of the lifts and top pieces of the heels of boots and shoes, and partly to that type of apparatus in which the boot or shoe is carried by a support that is capable of being moved toward or away from a power driven hammer arranged to deliver blows in rapid succession upon the part of the heel to be hammered.

According to this invention I employ a pneumatic or other power hammer of the rectilinear reciprocating type and mount the hammering tool in a fixed guide or socket in such a manner as to be acted upon by the piston of the hammer. This action is preferably arranged to take place automatically when the boot or shoe is pressed against the hammering tool or against guides supported in front of such tool, and to be automatically discontinued when the said pressure is removed. For this purpose the hammer may be mounted upon a fixed head and the boot or shoe upon a support connected with the hammer and adapted to be moved toward and away therefrom, or the hammer together with the aforesaid guides may be mounted upon a movable head capable of being moved toward and away from a fixed point for putting the hammer into and out of operation. This can also be performed by means of a treadle placed within suitable reach of the operator.

In order that the said invention may be clearly understood and readily carried into effect I will describe the same more fully with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation part of which is shown in section of a heel hammering machine constructed in accordance with this invention. Fig. 2 is a similar view showing a slightly modified arrangement, and Fig. 3 is a section taken on line A—B of Fig. 2. Fig. 4 is a front elevation of a modified construction of machine. Fig. 5 is a side elevation of Fig. 4. Fig. 6 is a plan of the hammer. Fig. 7 is a plan partly shown in section of the machine head drawn to a larger scale. Fig. 8 is a front elevation partly shown in section of Fig. 7. Fig. 9 is a side elevation of Fig. 8 with the right hand adjusting nut removed for the sake of clearness. Fig. 10 is a plan partly shown in section of a modified construction of a machine head. Fig. 11 is a detached view of the right hand guide shown in Fig. 10.

In the example shown in Figs. 1 to 3 the hammering tool C is acted upon by the piston of a pneumatic hammer that is situated in the cylinder c in the ordinary way, such hammering tool being mounted in a fixed guide or socket c^x. The cylinder c is supported upon a pedestal or column c' and is supplied with air through a pipe c^2. The boot or shoe A is supported upon a last a that is rotatably mounted upon a holding device a'. This holding device is rotatably mounted in a table b and is advantageously cranked at a^2 somewhat in the manner indicated in order to permit of the necessary movements being imparted to the boot heel to enable the hammering operation to be satisfactorily effected. The table b is formed on its under side with a threaded boss b' which engages with a threaded socket b^2 formed in the top of the pillar B. This arrangement enables the position of the boot to be adjusted in a vertical direction in relation to the hammering tool C by rotating the table b in one direction or the other, a clamping screw b^3 securing the table in position after adjustment. The pillar B is pivoted at its lower end to the column c' and when the machine is in its operative condition such pillar is drawn toward the hammering tool C through the intervention of a weight b^3 suspended from an arm b^4 that projects from the pillar B. The latter is retained in its outward position in relation to the hammering tool C when the machine is in its inoperative condition by a catch c^3 pivoted to the column c' and adapted to engage with a pin b^5 on the pillar B when the latter has been moved to a predetermined extent away from the hammering tool. The catch c^3 is connected by a rod c^4 to a spring controlled treadle lever c^5 which disengages the catch c^3 from the pin b^5 when the treadle is depressed.

In order to cause the hammer to be automatically put into or out of operation by moving the heel of the boot or shoe into or

out of engagement with the hammering tool, the hammer is provided with a suitable valve adapted normally to assume a closed condition. This valve is provided with an actuating stem c^6 which rests upon one arm of a bell crank lever c^7 pivoted to the column c'. The other arm of this lever rests against the end of a rod c^8 that is slidably mounted in the column c' in line with another slidably mounted rod c^9 that is separated from the rod c^8 by a spring c^{10} interposed between collars c^{11} and c^{12} on the rods c^8 and c^9 respectively. When the treadle c^5 is depressed the weight b^3 actuates the pillar B to bring the heel of the boot or shoe into contact with the hammering tool C, the pillar B previously coming into contact with the rod c^9 and imparting endwise movement to the rod c^8 through the spring c^{10} with the result that the aforesaid valve is opened and the hammer put into operation. The spring c^{10} is made short enough not to operate the rod c^8 until the rod c^9 is moved forward by the pillar B almost into contact with the rod c^8, the valve stem c^6 and crank lever c^7 returning the rod c^8 when the forward pressure of the spring c^{10} is relieved. The boot or shoe is now turned around by hand upon the table b and is moved sidewise when necessary to bring all the parts of the edges of the lifts and top piece of the heel to be hammered into contact with the hammering tool. This sidewise movement is permitted in the example now under consideration by the cranked portion of the holding device a^2. When the hammering operation is completed the pillar B is withdrawn from the hammering tool until the catch c^3 engages with the pin b^5 and retains the pillar in its outward position, the air valve previously having closed by reason of the disengagement of the pillar with the rod c^9.

In the modified arrangement illustrated in Figs. 2 and 3 a flat spring blade is substituted for the tubular pillar comprising the movably mounted member B shown in Fig. 1, with a view to facilitating the sidewise movement of the boot heel in relation to the hammering tool C. The spring blade is conveniently secured at its lower end to a bracket b^6 pivoted to the base of the column c and carries at its upper end the threaded socket b^2 for supporting the adjustable table b. In this example the catch c^3 is pivoted on a pin c^{14} extending through the pillar c' and provided with distance pieces c^{15} as shown in Fig. 3, to retain such catch in a central position in relation to the pillar. A further modification consists in supporting the pin b^5 upon a clamp b^7 which can be fixed in any required position upon the spring blade for causing the latter to occupy a position closer to or farther away from the hammering tool C, when the catch c^3 is in engagement with the pin b^5. A single rod c^8 is employed for actuating the bell crank lever c^7 and the latter is connected to the valve rod c^6 through the intervention of a link c^{13}, the spring c^{10} being interposed between the threaded socket b^2 and a collar c^{11} on the rod c^8.

The hammering tool C may be driven by any suitable pressure fluid, or by electrical or mechanical means, the end of the hammering tool may be spherical as shown in Fig. 1, or convex as shown in Fig. 2 or be otherwise shaped to suit any particular requirements. If desired a spring may be substituted for the weight shown in Fig. 1, and a cam, eccentric, or toggle arrangement worked by a hand lever or treadle for retaining the pillar B in its outward position may be substituted for the catch c^3. Means may also be provided for varying the angular position of the table b in relation to the axis of the pillar B in addition to the means for effecting its vertical adjustment. For example the table b may be hinged to the screwed shank b' and be secured in any adjusted position by a suitable clamping device.

In the example shown in Figs. 4 to 9 the boot heel is supported upon an adjustable rest D that is situated between and below two guides E, E′ situated on opposite sides of the hammer and adapted respectively to engage with the lower edge of the heel and the portion of the boot upper that comes immediately above the heel. The rest D is mounted on the threaded rod d and secured in vertical adjustment by the nuts d'. The nut d^2 serves to hold it in angular adjustment on the end of the rod d. The hammer c, the rest D and the guides E, E′ are mounted upon a head F that is fixed to an upright arm f Figs. 4 and 5, pivoted at its lower end to a frame or pillar G and having its outward movement from the pillar controlled by a suitable stop, such for example as a bolt f' passing through a slot f^2 in the pivoted arm f and secured in an upwardly extending portion g of the aforesaid frame or pillar G. The hammering tool C is as already mentioned slidably mounted in a guide c^x carried by the head, and the hammer is provided with a spring controlled plunger c^{16} adapted to be depressed by contact with the upwardly extending portion g of the frame or pillar G when the head is advanced thereto. This plunger may constitute the stem of a valve which controls the supply of air to or from the hammer. The aforesaid guides E E′ project from spindles e which are slidably mounted in brackets e^x and are conveniently provided with an adjusting screw e' by means of which they can be caused to occupy a position that is more or less in advance of the hammering tool according to requirements. These guides are also capable of adjustment

in a direction toward and away from each other to accommodate heels of different thickness. In the example shown such adjustment is effected by providing the said brackets e^x with screwed spindles e^2 supported in bearings e^3 carried by the head F and arranged to receive an axial movement through the intervention of nuts e^4 mounted between the bearings upon screwed portions of such spindles. These nuts are prevented from being rotated through the vibration of the machine by means of spring controlled plungers e^5 which bear against roughened or otherwise suitably formed peripheral portions of the nuts. Angular or rotary motion of the spindles e^2 is prevented by keys e^6 clamped by bolts e^7 between lugs e^8 on the bearings e^3 and engaging with slots e^9 formed in the said spindles. The guides E E′ are in like manner prevented from rotary or angular motion by keys e^{10} clamped between lugs e^{11} on the brackets e^x and engaging with slots e^{12} in the guide spindles e. In the modification described, slight pressure of the boot heel against the aforesaid guides depresses the plunger e^{16} against the upwardly extending portion g of the frame or pillar G with the result that the hammer is set in motion and continues to operate upon the heel until the said pressure is removed.

In the example shown in Fig. 10, the guides E E′ are normally retained slightly in advance of the hammering tool C by springs e^{13} situated in the brackets e^x and capable of adjustment by set screws e^{14}, and the brackets e^x are secured in their adjusted positions by set screws e^{15}. Fig. 11 is a side elevation of the guide spindle e that carries the guide E′.

If desired the head F may be mounted upon a fixed frame or pillar, and the valve which controls the supply of air to the hammer may be connected with a treadle placed within convenient reach of the operator.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a machine for hammering boots and shoes the combination of a power hammer, a hammering tool adapted to transmit the blows of the hammer, a movable rest for the boot or shoe, and mechanism controlled by the said rest for starting and stopping the said hammer automatically.

2. In a machine for hammering boots and shoes, the combination of a power hammer, a hammering tool adapted to transmit the blows of the hammer, a rest for the boot or shoe adapted to turn around a fulcrum, and mechanism controlled by the turning of the said rest around the fulcrum for starting and stopping the said hammer automatically.

3. In a machine for hammering boots and shoes, the combination of a pneumatic hammer, a movable rest for the boot or shoe, and valve mechanism controlled by the movement of said rest for putting the pneumatic hammer into and out of operation.

4. In a machine for hammering boots and shoes, the combination of a pneumatic hammer, a rest for the boot or shoe adapted to turn around a fulcrum, and valve mechanism controlled by the turning of the said rest around the fulcrum for putting the pneumatic hammer into and out of operation.

5. In a machine for hammering the heels of boots and shoes, the combination of a power hammer, a fixed guide or socket in which such tool is slidably mounted, an adjustable rest for the boot or shoe, adjustable heel guides situated at opposite sides of the hammering tool, a movable head carrying the aforesaid hammer, rest and guides, and a stationary abutment arranged to coöperate with the hammer for putting the latter into and out of operation.

6. In a machine for hammering the heels of boots and shoes, the combination of a pneumatic hammer, a hammering tool acted upon by the piston of such hammer, a guide carrying such hammering tool, an adjustable rest for the boot or shoe, adjustable heel guides situated at opposite sides of the hammering tool, a movable head carrying the aforesaid hammer, rest and guides, a pivoted arm supporting the aforesaid head, a fixed abutment situated in proximity to the hammer, and a valve actuating member carried by the hammer and arranged to receive movement by contact with the fixed abutment.

7. In a machine for hammering the heels of boots and shoes, the combination of a pneumatic hammer, a hammering tool acted upon by the piston of such hammer, a guide carrying such hammering tool, a rest provided with means for adjusting it in a vertical and angular direction, a head carrying the hammer, guide and rest, brackets mounted in bearings projecting from the head at opposite sides of the hammer, means for adjusting the distance between the said brackets, heel guides carried by the brackets and means for adjusting the position of the said guides in relation to the hammering tool.

8. In a machine for hammering the heels of boots and shoes, the combination of a pneumatic hammer, a hammering tool acted upon by the piston of such hammer, a guide carrying the hammering tool, a rest provided with means for adjusting it in a vertical and angular direction, a movable head carrying the hammer, guide and rest, tubular brackets provided with screwed shanks, bearings projecting from the head to receive such shanks, nuts mounted upon the shanks between the bearings, retaining devices for holding the nuts in position, heel guides carried by the tubular brackets and means

for automatically putting the hammer into and out of operation.

9. In a machine for hammering the heels of boots and shoes, the combination of a pneumatic hammer, a hammering tool acted upon by the piston of such hammer, a guide carrying the hammering tool, a heel rest provided with means for adjusting it in a vertical and angular direction, a movable head carrying the hammer, guide and rest, tubular brackets provided with screwed shanks, bearings projecting from the head to receive such shanks, nuts mounted upon the shanks between the bearings, retaining devices for holding the nuts in position, heel guides projecting from spindles slidably mounted in the tubular brackets, adjusting screws for regulating the position of such guides and spindles, a pivoted arm carrying the aforesaid head, a fixed abutment situated in proximity to the hammer and a valve actuating member arranged to be operated by contact with the fixed abutment.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WILBUR TIERNEY.

Witnesses:
T. SELLY WARDLE,
G. APPLEYARD.