

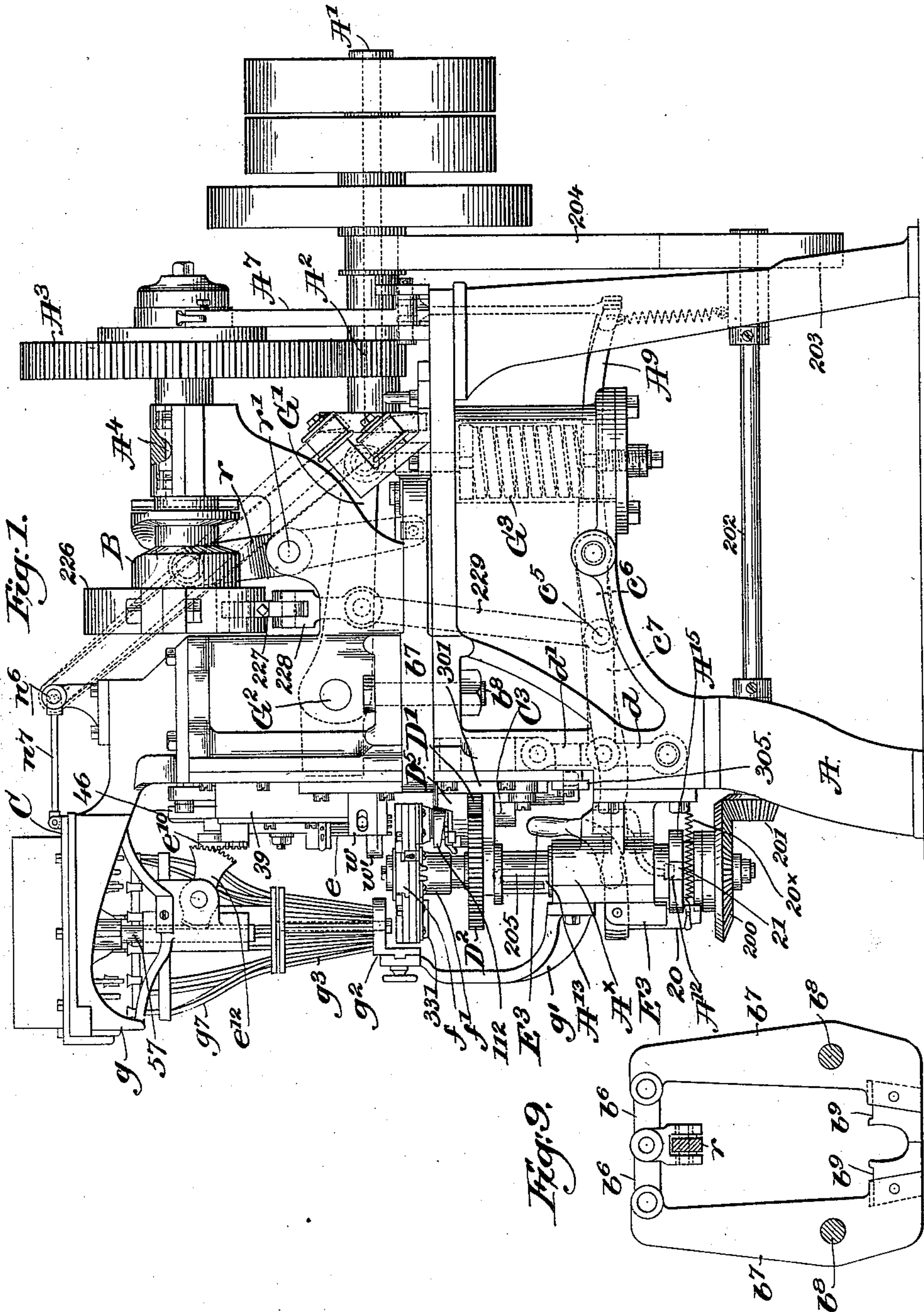
(No Model.)

3 Sheets—Sheet 1.

C. W. GLIDDEN & C. C. SMALL.  
HEEL COMPRESSING AND LOADING MACHINE.

No. 543,804.

Patented July 30, 1895.



Witnesses.

Edward F. Allen.

Thomas J. Gummund.

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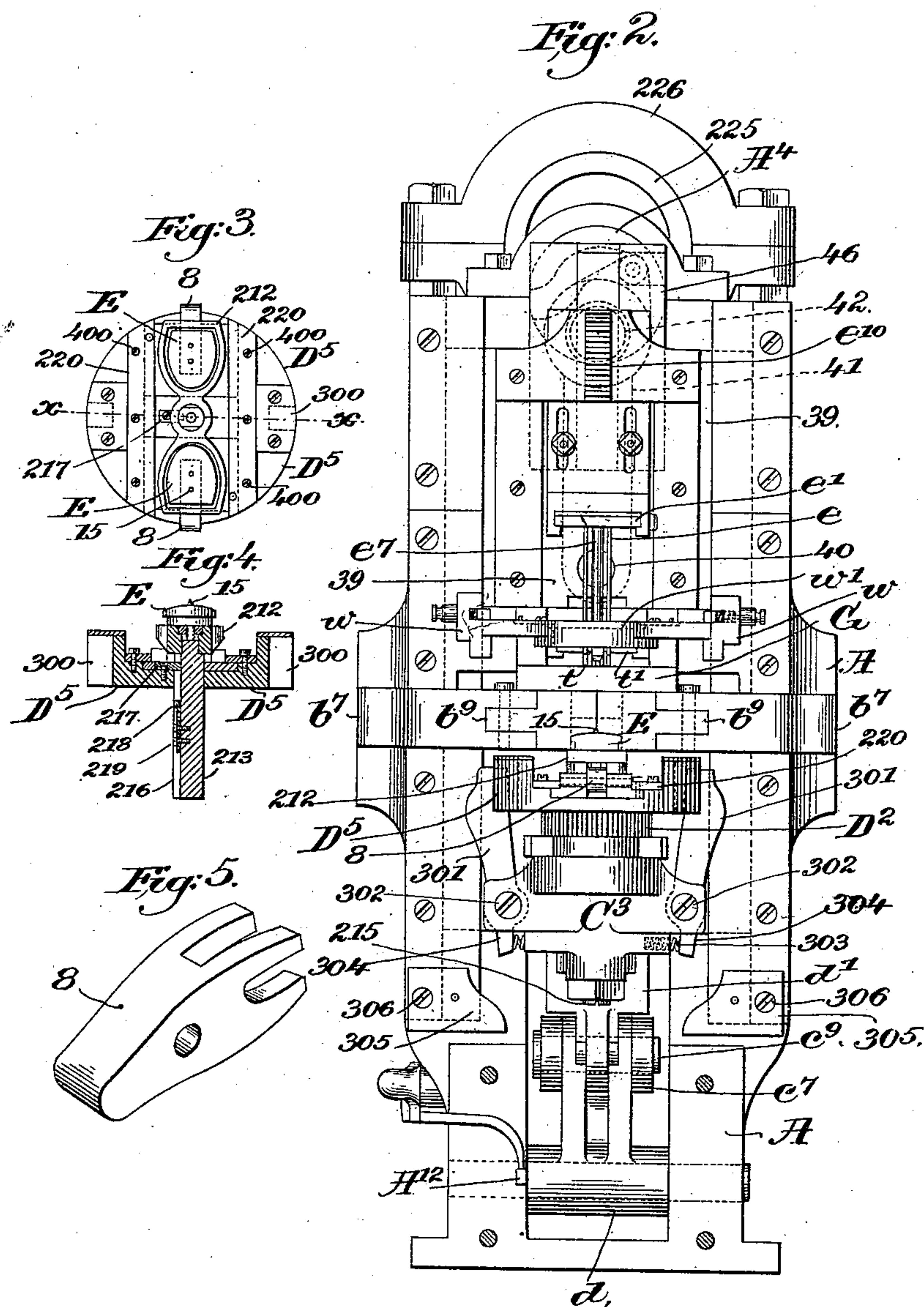
(No Model.)

3 Sheets—Sheet 2.

C. W. GLIDDEN & C. C. SMALL.  
HEEL COMPRESSING AND LOADING MACHINE.

No. 543,804.

Patented July 30, 1895.



Witnesses,

Edward H. Allen.

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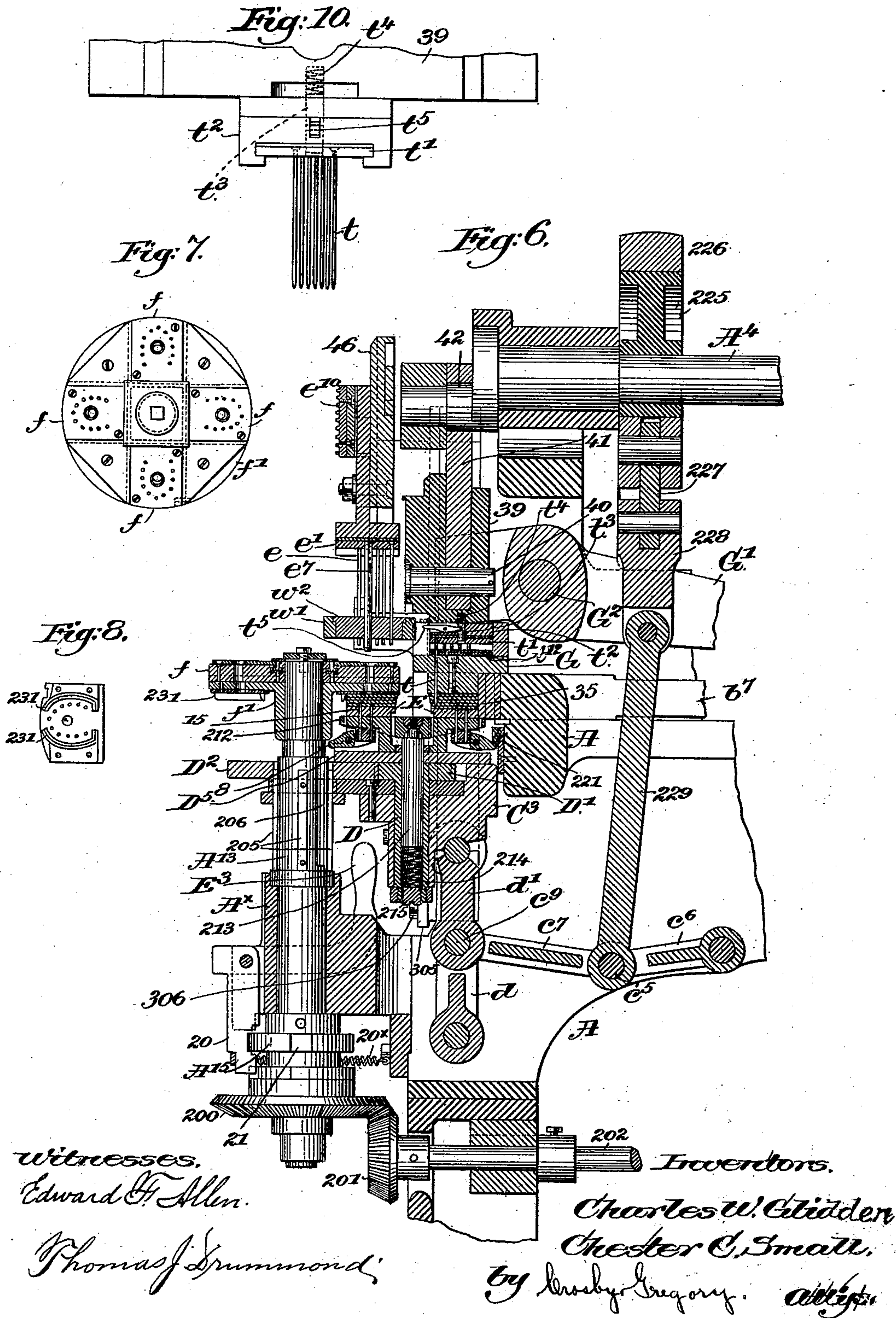
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3 Sheets—Sheet 3.

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HEEL COMPRESSING AND LOADING MACHINE.

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# UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, AND CHESTER C. SMALL, OF NEWTON,  
ASSIGNORS TO JAMES W. BROOKS, TRUSTEE, OF PETERSHAM, MAS-  
SACHUSETTS.

## HEEL COMPRESSING AND LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 543,804, dated July 30, 1895.

Application filed October 18, 1894. Serial No. 526,286. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES W. GLIDDEN, of Lynn, county of Essex, and CHESTER C. SMALL, of Newton, county of Middlesex, State of Massachusetts, have invented an Improve-  
ment in Heel Compressing and Loading Ma-  
chines, of which the following description, in  
connection with the accompanying drawings,  
is a specification, like letters on the drawings  
representing like parts.

This invention has for its object to improve  
and simplify the class of machines represented  
in United States Patent No. 502,667, dated  
August 1, 1893. The machine described in  
said patent was intended to always make a  
concavity in the heel-seat end of the heel-  
blank and yet leave the tread-lift flat; but it  
was found, owing to the particular timing of  
the parts, that at times the tread-lift would  
also be bent so as not to be flat, this difficulty  
arising from the fact that the heel-blank was  
partially lifted into the space between the  
side-compressing dies, and after said dies  
were fully closed the blank was further lifted  
in the dies and the lifts were curved by the  
friction of their edges against the dies. To  
overcome this trouble, the machine herein to  
be described has been so devised and timed  
that the tread-lift end of the blank is lifted  
fully into its position between the side-com-  
pressing dies before the said dies are fully  
closed, and consequently, during the vertical  
compression of the blank after the side dies are  
fully closed, the edge of the tread-lift is not  
made to travel vertically with relation to the  
side-compressing dies. The machine de-  
scribed in said patent had two nail-boxes, one  
being in position to be automatically filled  
while the other was in position for the drivers  
to act and drive nails therefrom into the heel-  
blank, and the motion of the nail-boxes was  
directly from filling into driving position, and  
it sometimes happened that the nail-box failed  
to receive a nail in each nail-hole, and the  
blank next to be loaded failed to receive the  
required number of nails. To overcome this  
trouble the nail-box carrier has been provided  
with a greater number of nail-boxes and the  
movement of the same has been so timed with  
relation to the filling and driving mechanisms

that the filled nail-boxes are permitted to  
come to rest between their filling and dis-  
charging positions, to thus enable the opera-  
tor to inspect a filled nail-box and detect the  
absence of a nail therefrom and supply the  
deficiency before the nail-box arrives into its  
discharging position.

The machine to be herein described has  
been further improved by new means for  
actuating the impaling pins or awls, which  
serve to retain the heel-blanks on the heel-  
seat dies, and the drivers have had combined  
with them driver-guides in the form of a plate  
surrounding the positioning-pin, and the nail-  
box carrier has been provided at its under  
side with a registering-guide by which to in-  
sure the correct position of the heel-blank  
under the nail-box from which the blank is  
to receive nails, and the heel-seat dies have  
had combined with them a heel-blank holder  
and the latter has been made vertically mov-  
able with relation to the heel-seat dies, said  
holder greatly facilitating putting the heel-  
blank into position on the heel-seat die in  
place of a finished blank.

Figure 1 in side elevation represents a heel  
compressing and loading machine embodying  
the improvements to be claimed. Fig. 2 is a  
front elevation thereof with the nail-assorting  
mechanism and the spindle A<sup>13</sup> and the nail-  
box carrier and nail-boxes omitted; Fig. 3, a  
detail in plan view of the heel-seat carrier and  
heel-blank holder; Fig. 4, a section on the line  
x, Fig. 3; Fig. 5, a detail showing the lever 8  
detached and enlarged. Fig. 6 is a partial  
vertical longitudinal section of the machine  
shown in Fig. 1, but enlarged, the nail-assort-  
ing mechanism being omitted. Fig. 7 is a top  
or plan view of the nail-box carrier and nail-  
box; Fig. 8, a detail showing the heel-blank  
registering-guide attached to the lower side  
of the heel-box carrier. Fig. 9 is a detail  
showing the edge-compressing dies and their  
actuating-levers. Fig. 10 is a detail showing  
the awl-plate, awl, and awl-carrier.

The framework A, the main shaft A', hav-  
ing the pinion A<sup>2</sup>, engaging the gear A<sup>3</sup>, loose  
on the cam shaft A<sup>4</sup>, and adapted through a  
releasing-lever A<sup>7</sup> to be made fast to said  
shaft when desired, the cam B, the lever r,



pivoted at  $r'$  on the frame-work and connected through links  $b^6$  with the levers  $b^7$ , carrying the edge-compressing dies  $b^9$  and  $b^9$ , said levers being pivoted at  $b^8$ , the spring  $G^3$ , the guide  $A^x$ , to receive and guide the spindle upon which is mounted the nail-box carrier, to be described, the bracket  $g'$ , the foot  $g^2$ , to which is connected the lower ends of the portion  $g^3$  of the system of nail-tubes, they being in suitable communication with the main part  $g^7$  of said tubes, the arm  $g$ , the sliding tables  $C C'$ , suitably mounted thereon, the link  $n^7$ , connected with a suitable cam-shaft  $n^6$ , mounted in suitable bearings and adapted to be rotated by a suitable belt, the nail-boxes  $f$ , the nail-box carrier  $f'$ , the spindle  $A^{13}$ , to which it is attached, the nail-box actuator  $e^7$ , the driver-plate  $e'$ , the drivers  $e$ , the driver-bar 46, having a rack  $e^{10}$  in engagement with the segment  $e^{12}$  to engage the rod 51 to raise and lower the lifter-frame  $g$ , the crank-pin 42, the link 41, joined by pin 40 to the awl-carrying slide 39, the templet or pressure plate  $G$ , the yielding abutment  $G'$ , pivoted at  $G^2$ , the vertically-movable frame  $C^3$ , adapted to be lifted by or through a toggle-joint  $d d'$ , the lever  $A^9$ , provided with a locking device  $A^{12}$ , are and may be all substantially as indicated by like letters in United States Patent No. 504,667, referred to, with slight alterations in the clutch parts at the lower end of the spindle  $A^{13}$  to adapt them to imparting to the nail-box carrier a step-by-step movement for about ninety degrees instead of one hundred and eighty degrees.

The novel mechanism and devices which have been added to the machine referred to will now be briefly described.

The carrier  $f'$ , carrying the usual nail-boxes  $f$ , is fast to the vertical spindle  $A^{13}$ , mounted in bearings  $A^x$ , and herein said spindle has at its lower end a continuously-rotating loose bevel-gear 200, the latter at suitable times engaging a co-operating clutch device, fixed with relation to the spindle  $A^{13}$  and employed to rotate the said spindle, which derives its motion from a beveled gear 201, fast on a shaft 202, provided with a suitable pulley 203, surrounded by a suitable belt 204 extended about a suitable pulley on the main shaft  $A'$ .

The spindle  $A^{13}$  has fast to it a locking-plate  $A^{15}$ , having a notch 21 for each nail-box, and at its lower end and co-operating with the continuously-rotating gear 200 is a suitable clutch mechanism, which may be substantially such as provided for in said patent, it being under the control of a suitable trip  $E^3$  having a suitable dog 20, a spring  $20^x$  moving the dog in one direction.

The trip  $E^3$  and the dog referred to are for substantially the same purpose as the trip and dog designated by like characters in said patent, so need not be herein further described.

The chief and substantially the only difference between the clutch mechanism at the lower end of the spindle  $A^{13}$ , shown in this in-

vention, and the clutch mechanism at the lower end of the nail-box spindle of the said patent lies in providing the locking-plate  $A^{15}$  with more notches 21, one for each nail-box.

The spindle  $A^{13}$  referred to has secured to it, in this instance, four like stops 205, which are struck by the levers 8, on which are pivoted the blocks carrying the impaling-pins 15, as the block  $C^3$  before referred to arrives in its lowest position, to thus withdraw the impaling-pins from the heel-blank; this done said block being then raised slightly to thus place the ends of the levers 8 just above the said stops, so as not to interfere with the rotation of the spindle  $A^{13}$ . The spindle  $A^{13}$  is surrounded by a gear  $D^2$ , which is loosely connected thereto by a spline 206, Fig. 6, so that said gear may be rotated by said spindle and may also be slid vertically on said spindle to thus keep in mesh with and rotate the gear  $D'$  of half its diameter, properly secured to the heel-seat die-carrier  $D^5$ , the shank  $D$  of the said carrier having its bearing in the movable block  $C^3$ .

The heel-seat dies  $E$  are convexed at their upper sides, as provided in the said patent, and are surrounded by heel-blank holders 212, (shown as arms,) having openings of a shape corresponding externally with the heel-blank openings, and being enough larger than the heel-seat dies to enable the said dies to be moved vertically within said holders. The holders 212 are suitably secured to a spindle 213, extended through the hollow shank  $D$  of the heel-seat die-carrier, said spindle resting on a suitable spring 214, (shown as sustained in an adjustable manner by a screw-plug 215,) said spindle 213 being shown as provided at one side with a vertical groove 216, (see Fig. 4,) in which enters a finger-like spline 217 suitably attached to the die-carrier  $D^5$ , the groove 216 having also fitted adjustably into it a stop 218, (shown as held in place by screws 219.)

The heel-seat dies  $E$  are independent blocks having flanged portions, and each one is put in proper position and there held by gibs 220, (shown best in Fig. 3,) as overlapping said flanged portions, the gibs being suitably secured to the heel-seat die-carrier by screws 400. The heel-seat dies are slotted, as provided for in said patent, for the reception of the levers 8, referred to, for actuating the impaling-pins 15.

The framework  $A$  of the machine has secured to it a stop device 221, (see Fig. 6,) against which acts that lever 8 which is in range with it as the block  $C^3$ , supporting the heel-seat die-carrier, is raised to put a heel-blank on the heel-seat die then under the open edge-compressing die into place between the said edge-compressing dies  $b^9$ , and against the lower end of the templet  $G$ , held down by the yielding abutment  $G'$ , said stop by turning said lever causing the impaling-pins to be thrust up into the heel-blank, where they remain until after a semirotation of the heel-seat die-carrier to put the compressed and



pricked heel-blank under the nail-block carrier and nail-block to have nails driven into it and thus complete the blank, said impaling-pins being withdrawn from the heel-blank, as stated, by contact with the stops 205. While the block C<sup>3</sup> is lowered, the toggle  $d d'$  being then broken, the heel-seat dies will occupy a position at a level a little below that occupied by the top of the heel-blank holder, so that a finished blank having been removed from below the nail-box carrier the operator may readily put a fresh heel-blank into the holder just left vacant, and then the heel-seat die-carrier will be rotated to put the heel-blank last supplied to it below the open edge-compressing dies  $b^9$ , and during this time the spindle A<sup>13</sup> will be rotated for about ninety degrees to thus bring under the drivers a nail-box  $f$ , which has been exposed for a sufficient length of time and left at rest, as stated, in order that the operator may see that the same is properly filled with nails. The blank having been brought into position under the open edge-compressing dies, the toggle  $d d'$  is straightened so as to lift the block C<sup>3</sup>, and during an early part of this lifting movement the heel-blank holder meets the lower end of the heel-breast guide 35, common to said patent, and is arrested, the spring 214 yielding as the block C<sup>3</sup> continues to rise to put the heel-seat die containing the heel-blank fully into position between the then open edge-compressing dies and put the tread end of said blank against the templet G, as provided for in said patent, it having holes for guiding the pricking-awls  $t$ , if used, and the lift at the tread end of the blank having been placed against said templet the edge-compressing dies are closed to compress the heel-blank in the direction of its width, and the heel-seat die-carrier is then moved vertically to finish the vertical compression of the heel, but during this last part of the vertical movement of the said die the templet G rests firmly against the tread-lift and prevents said lift from being curved, as stated.

It will be understood that the abutment G' yields only to extreme pressures.

To gain for the block C<sup>3</sup> and the heel-seat dies the proper length of stroke at just the proper time with relation to other parts of the machine, the present machine has had applied to its cam-shaft A<sup>4</sup> an eccentric 225, which is surrounded by an eccentric-strap 226, connected by a link 227 with a short slide 228, to which is jointed a link 229, which directly engages the center pin  $c^5$  of the toggle  $c^6 c^7$ , the link  $c^7$  being attached to the center pin  $c^9$  of the toggle  $d d'$ .

The awls  $t$  are connected to an awl-plate  $t'$ , having, preferably, dovetailed edges, (see Fig. 10,) which fit a block  $t^2$ , suitably secured between projections at the lower end of the awl-carrier 39, said block having a pin  $t^3$ , which is normally pressed downwardly by a suitable spring  $t^4$ , to thus cause the pin to enter a hole in said plate  $t'$  and keep the same in proper

position with relation to the awl-carrier to insure the correct entrance of the awl into the holes in the yielding templet G, and when it is desired to replace a plate  $t'$  by another one having fresh awls or awls differently set the said pin  $d^3$ , which constitutes a locking device, may be engaged by a lever or handle  $t^5$ , by which to move said pin against the spring.

The framework of the machine has suitable ears  $w$  (see Fig. 1) to sustain a support  $w'$ , in which is removably placed a driver-guide  $w^2$ , it steadying the drivers and insuring their more correct entrance in the usual holes in the nail-box.

The nail-box carrier  $f'$  has attached to its under side below each nail-box a heel-blank guide, (best shown in Figs. 6 to 8 as composed of two curved plates 231,) each of suitable shape to correspond with a part of the contour of the heel-blank, the inner edges of the plate being preferably beveled, these plates serving, in case the heel-blank should become loosened on or with relation to the heel-seat die, to properly center or position the said blank with relation to the nail-box.

The nail-box carriers in the patent referred to has two nail-boxes, and when one is being filled with nails the other is in position to have the nails driven from it; but herein the nail-box carrier is shown as provided with four nail-boxes, and, as stated, the said carrier is so rotated step by step as to enable each filled nail-box to be brought to rest between the position occupied by it when filled and when the nails are subsequently driven therefrom, and this invention is not, therefore, limited to the exact number of nail-boxes shown so long as there are more than two.

The heel-seat-die carrier D<sup>5</sup> has suitable locking-notches 300, (shown best in Fig. 4 and by dotted lines in Fig. 3,) which are entered by locking-dogs 301, (shown only in Fig. 2,) each dog being mounted on a suitable pivot 302 and acted upon by a spring 303, which normally serves to cause the dog to enter the notch. These locking-dogs lock the heel-seat-die carrier in position to be moved vertically and not be displaced during such vertical movements.

The heel-seat-die carrier is partially rotated when the block C<sup>3</sup> is in substantially its lowest position, and at that time the projections 304 of the locking-dogs strike the cams 305, attached to the framework by suitable screws 306.

Nails driven into a heel-blank and left for any length of time are apt to rust and be stuck thereby so firmly into the blank that they will not drive properly and freely when the heel-blank is to be attached to the sole of a shoe. To obviate this we have laid upon the plate or templet G a suitable absorbent of oil, such as felt or other textile material capable of holding oil and delivering it slowly to the awls, in order that the latter may be oiled in such a manner that when they are driven into the heel-blank to make holes



therein the walls of the leather at the sides of the holes will be oiled, and thereafter nails driven into the awl-holes will not rust and stick therein. This absorbent or oil-retainer is represented by the letter  $t^{13}$  in section in Fig. 6, and preferably we shall lay upon the top of the oil-retainer, of whatever form, a thin metal plate provided with holes coinciding with the awls and with the awl-holes in the templet.

It will be understood that the plate designated by the letter G will be provided with awl-holes, thus constituting a templet, provided awls are used to prick the heel-blanks; but if it is not desired to use awls, but to depend upon the drivers to drive the nails directly from the nail-boxes into a heel, then, in such case, the term "plate" might more accurately describe the plate marked G, and in some of the claims the word "plate" will be used to designate the plate G, its chief function being to contact with the tread-end of the heel and keep the lift at the tread-end flat during the heel-compressing operation, as described.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for compressing and loading heel blanks, a heel seat die carrier, a series of heel seat dies mounted thereon, a lever co-operating with each of said heel seat dies, impaling pins actuated by or through said levers, a stop to effect the movement of its lever to thrust the impaling pins into a heel as the heel seat die rises, and a plurality of independent stops to co-operate each with its own lever to withdraw the impaling pins from a heel blank as the heel seat die descends, substantially as described.

2. The heel seat dies, their carrier, the levers S and impaling pins actuated thereby, combined with stops 205, attached to the nail-box spindle  $A^{13}$ , to operate the said lever as the carrier is lowered, substantially as described.

3. In a heel compressing and loading machine, the combination with a nail box carrier, a series of nail boxes thereon, means to move said carrier, a driver bar, a series of drivers connected therewith, and a guide in continuous engagement with the drivers, to guide the lower ends thereof into the holes in a nail-box, substantially as described.

4. The combination with the driver bar, and its attached drivers, of a driver-guide having openings therein for the loose ends of the drivers, a support therefor, and a nail-box having nail holes in alignment with and of the same size as the holes in the driver guide, substantially as described.

5. A heel seat die carrier, and a connected heel seat die, combined with an independently supported heel blank holder surrounding said die, substantially as described.

6. A heel seat die, a carrier therefor, and an independently supported yielding heel blank holder to operate, substantially as described.

7. The combination with a heel seat die, and means to move it vertically, of a yielding independently supported heel blank holder surrounding said heel seat die and adapted to receive within it the heel about to be compressed, substantially as described.

8. A vertically movable heel seat die carrier, a heel seat die mounted thereon, and heel compressing mechanism, combined with an independently spring supported vertically movable heel blank holder adapted to receive within it a heel blank to be placed on the heel seat die preparatory to compressing the same, substantially as described.

9. The combination with a heel seat die, of a vertically movable independently supported heel blank holder co-operating with the edges of the heel blank laid on said die, substantially as described.

10. A revoluble vertically movable heel-seat die-carrier, and a heel seat die mounted thereon, means to move said carrier and heel seat die laterally, combined with a heel blank guide located at the edges of the heel seat die and moved laterally in unison with the heel seat die carrier, substantially as described.

11. In machine for compressing and loading heel blanks, a revoluble vertically moving heel-seat die-carrier, combined with the elongated locking devices 301, and means to actuate the same to release the said heel-seat die-carrier when the latter is to be rotated, substantially as described.

12. An awl carrying bar or plunger, an awl plate holder having an attached open guide  $t^2$ , a removable awl plate therein provided with a series of awls, combined with a locking pin to engage and retain the awl plate in the guide, and a lever to operate the same, the movement of the lever actuating the pin to withdraw it from and to release the awl plate when it is desired to remove the same from the guide for a change of awls, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES W. GLIDDEN.  
CHESTER C. SMALL.

Witnesses:

H. P. FAIRFIELD,  
WALTER SOFFORD.