S. W. BALDWIN.

Manufacture of Boot and Shoe Heels.

No. 167,728. Patented Sept. 14, 1875.

Fig. 1.

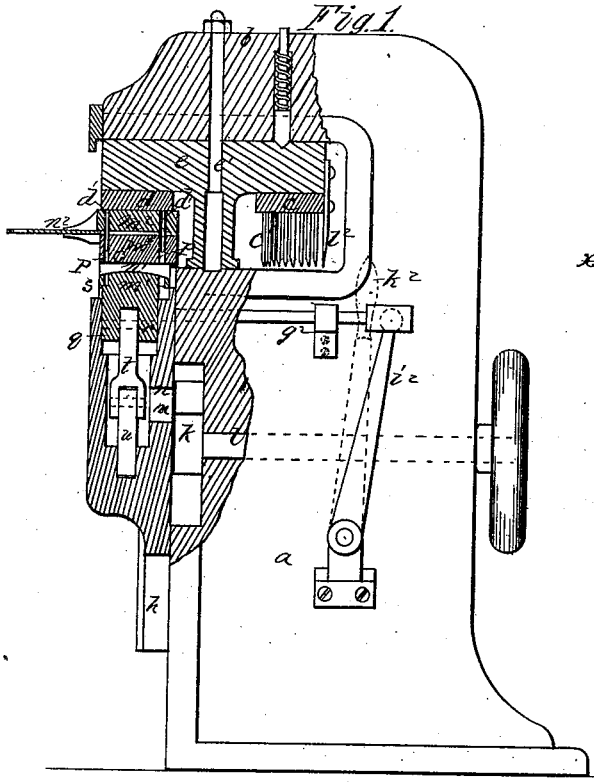


Fig. 2.

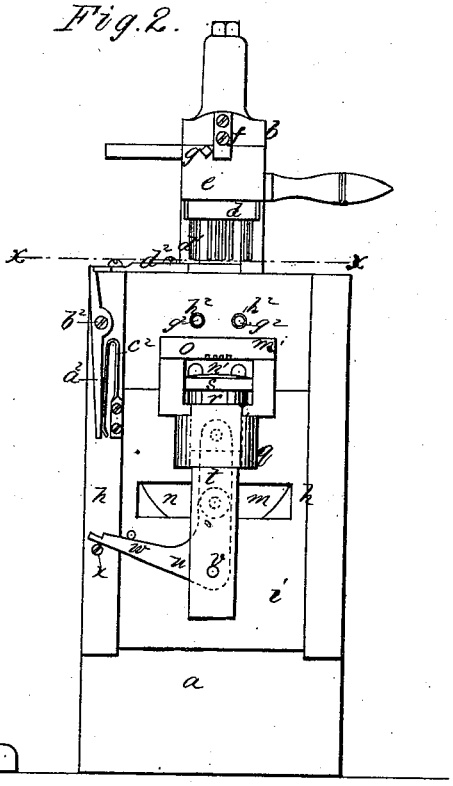


Fig. 3.

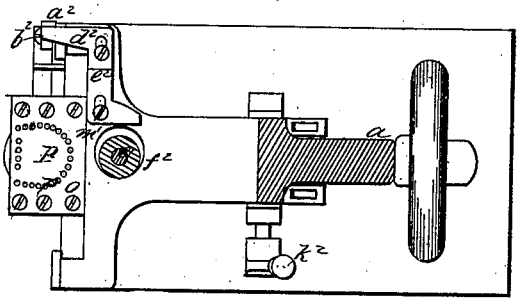


Fig. 4.

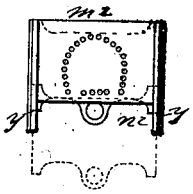
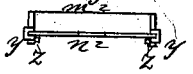


Fig. 5.



Witnesses.

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By his Attys
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UNITED STATES PATENT OFFICE.

STEPHEN W. BALDWIN, OF YONKERS, NEW YORK.

IMPROVEMENT IN THE MANUFACTURE OF BOOT AND SHOE HEELS.

Specification forming part of Letters Patent No. **167,728**, dated September 14, 1875; application filed August 8, 1871.

To all whom it may concern:

Be it known that I, STEPHEN W. BALDWIN, of Yonkers, in the county of Westchester and State of New York, have invented certain Improvements in the Manufacture of Boot and Shoe Heels; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to certain improvements in the manufacture of heels or heel-blanks for boots and shoes, the improvements having particular reference to the manner of punching the holes in an assemblage of heel-forming lifts, and of driving into such holes the nails which are to permanently unite said lifts together, and ultimately to the boot or shoe.

My invention consists in a machine having a gang of nail-hole punches, and a heel or heel-lift holding and compressing mechanism, so constructed and arranged, with respect to the punches, that in the relative movement between the punches and the heel compressing and holding devices the punches pass through the top plate of the holder, and through a series of holes in said plate corresponding to the punches, into the heel held between said top plate and a clamping and compressing plate. The invention further consists in combining, with the heel holding and compressing mechanism, a gang of nail-drivers, which force the nails through the nail-hole plate into the heel beneath, and clamp them against said plate. The invention further consists in combining, with a heel or heel-lift holding and compressing mechanism, a gang of nail-hole punches, and a gang of nail-drivers, so arranged that each may be brought into position relatively to the heel-holding mechanism and a nail-holder plate forming part of said mechanism that the nail-holes may be first made, and the nails next driven, without removing the heel or heel-blank from the heel-holding device. The invention further consists in certain details of construction, arrangement, and operation of the mechanism.

The drawing represents a machine embodying the invention.

Figure 1 shows the machine partly in sectional elevation and partly in side elevation. Fig. 2 is a front elevation of it. Fig. 3 is a sectional plan on the line *x x*. Fig. 4 is a top view of the nail-holder block. Fig. 5 is a front view thereof.

a denotes the frame, having an overhanging head, *b*, to the under side of which is fastened the punch-block *c*, or driver-block *d*, or, preferably, both blocks *c* and *d*, the two blocks being fastened to a swiveling-plate, *e*, on a semi-rotative shaft, e^1. This plate being turned in one direction brings the punch-block *c* to the front, and into position over the heel-holding mechanism, a suitable stop, *f*, and gage *g*, or other devices bringing the punches accurately into position; and, being turned in the other direction, similarly brings the drivers to the front, and into position to enter the holes, or drive the nails into the holes, made by the punches. At the front part of the frame *a* are vertical ways or guides *h*, between which reciprocates a slide, *i*, vertical reciprocating motions being imparted to the slide from a crank, *k*, on the end of a driving-shaft, *l*, the crank-pin carrying a slide, *m*, traversing in a horizontal slot, *n*, in the slide. At the top of the reciprocating slide *i* is the heel, or heel-lift, or heel-blank holder m^1, having a recess or pocket, n^1, in which the assemblage of heel-lifts is placed, and a top plate, *o*, this plate being perforated with a series of nail-holes, *p*, corresponding in number and position to the number and position of the nails to be driven into the heel. From the bottom of the heel-holder a tube, *q*, extends, this tube carrying a vertical plunger, *r*, at the top of which, and within the pocket n^1, is a clamp-plate or follower, *s*. The foot of the plunger is jointed to the upper end of a toggle-arm, *t*, whose lower end is jointed to the upper arm of a toggle-lever, *u*, pivoted at *v*, the outer arm *w* of the lever extending out over a stationary pin, *x*, as seen at Fig. 2.

When the heel-holder slide is descending the toggle-arms are out of vertical line, and the clamp-plate is at the bottom of the pocket n^1. The heel-lifts are then introduced into the pocket between the clamp-plate *s* and the nail-hole plate *o*. As the slide is reaching its lowest position the arm *w* strikes the pin *x*, throw-

ing the toggle-arms into vertical line, and clamping the heel or heel-lifts between the clamp-plate and nail-hole plate, the toggle-arms by reason of their vertical position, or their position in line, locking the clamp-plate in position relatively to the nail-hole plate. As the slide next rises, (the punches c^1 being in position,) the punch-points pass through the nail-hole plate, and enter the heel or heel-blank, punching the nail-holes therein to the depth required. As the shaft continues to rotate the slide, with the punched and still clamped heel-blank, descends, and, as soon as the nail-hole plate is below the punch-points, the plate e is swung around, bringing the driver-block d and drivers d^1 into position over the nail-hole plate, and the nail-block m^2 (its nail-holes charged with nails, which rest upon the bottom slide n^2) is then slid upon the nail-hole plate, said block having guide-lips y, that guide it laterally upon the nail-hole plate, and suitable stops z, that arrest it at the proper place, so that when positioned the nail-holes in the block will exactly match with the nail-holes in the nail-hole plate below. The slide n^2 is then drawn out, releasing the nails, which will drop through the block into the nail-hole plate, their points resting upon the heel-blank clamped against the under surface of the plate. The nail-block is then removed, and, as the drivers next descend, they will pass into the corresponding holes in the nail-hole plate, and, striking upon the nails, will drive them into the heel.

In order that the nail-heads may be left projecting, and the nail-points not protrude, (so that the heel will be ready to be fastened upon the boot or shoe, its lifts being nailed together, but the nails left to be driven home,) the heel-clamp is released before the drivers pass entirely through the nail-hole plate, and the drivers then push the nails down out of the nail-holes, and push the heel with them. For this purpose devices are arranged as follows: a^2 denotes a lever or tripper bar pivoted at b^2, and having its lower arm pressed outward by a spring, c^2. The upper arm of this lever lies against or in the path of movement of an arm, d^2, of a slide, e^2, the inner end of which is acted upon by an eccentric, f^2, on the shaft e^1. When the shaft is turned to bring the drivers into position, the eccentric pushes out the slide, which, operating on the tripper-bar, throws in its lower end, bringing said end into the path of upward movement of the outer end of the toggle-lever. As the heel-holder slide is rising and the nails are being driven in, and a little before the ascent is completed, the end of the toggle-lever strikes the tripper-bar, throwing the toggle-levers out of line, and the nail-hole plate then rising, and the clamp-plate remaining stationary, the nails are driven no farther, but the heel, with the nail-heads protruding, (the heads freed from the nail-plate holes,) is brought into position where it can be ejected. The mechanism is preferably so arranged that the nail-points come almost, but not quite, through the lower heel-lift, before the toggle-arm strikes the tripper, and the heel is therefore ready (when thus prepared) to be fastened to a boot or shoe. When the shaft e^1 is turned to bring the punches into position, the slide e^2 is freed from the eccentric, and the spring c^2 throws the tripper out of the path of movement of the toggle-lever.

The nailed heel may be ejected as follows: Back of the slide i, one or more horizontal slides, g^2, work through one or more holes, h^2, such slide or slides being pivoted to a lever, i^2, which may be automatically worked from the driving-shaft, or by a hand-lever, k^2. Just as the heads of the nails of the nailed heel-blank are released from the nail-hole plate, the slides are thrown forward and drive the nailed heel-blank out, the slides being thrown back before the nail-hole plate reaches them.

In connection with the punches, a breast-cutter, l^2, may be employed, this cutter being fastened to the end of the punch-block plate, and (as the clamped heel-lifts are being punched) cutting off the projecting edges extending beyond the face of the nail-hole plate, as will be readily understood. The heel-lifts are preferably tacked together before being placed in the machine, and when the tacked blank is punched it may be removed, to be nailed in a separate machine, but I prefer to apply the nails in the same machine that punches the holes. Several nail-blocks may be used with one machine, so that while one heel-blank is being punched, and then nailed, nails may be applied to a second block to be used in the machine in nailing the next heel-blank. Heels thus punched, or punched and nailed, are ready to be used in any suitable machine for nailing such heels to boots and shoes, and I prefer to use the punched and nail-fastened blank in connection with a heel-trimming machine, in which the heel is both trimmed to a proper contour and fastened to the boot or shoe sole.

In the machine, as represented in the drawing, the punches or drivers are stationary, and the heel-blank is moved against them, and although I have spoken of the punches and drivers acting, it will be understood that they act negatively, the result being the same whether the heel-blank be pressed up against them or they be pressed down into the heel-blank.

I claim—

1. In a machine for compacting a set of lifts for a boot or shoe heel independently of the boot or shoe, a nail-hole plate, against which the heel-blank is compacted and consolidated, and a gang of movable punches operating through the nail-hole plate to punch the nail-holes in the blank while under pressure, substantially as described.

2. In a machine for compacting a set of lifts for a boot or shoe heel independently of the boot or shoe, a nail-hole plate, against which the heel-blank is compacted and consolidated, and a gang of drivers for driving the nails, substantially as described.

3. In a machine for compacting, punching,

and inserting nails in a boot or shoe heel, a perforated plate, against which the heel is compacted and consolidated, and through which it is pricked and loaded, substantially as described.

4. In combination with the nail-hole plate, against which the heel-blank is clamped, and with the clamp-plate *s*, a gang of drivers, by which all the nails are driven and their heads left protruding from the heel-blank, substantially as described, for the purpose specified.

5. In combination with the heel-holding and nail-driving mechanism, the ejectors, substantially as described.

STEPHEN W. BALDWIN.

Witnesses:

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JOHN LANE.

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