H. P. FAIRFIELD.

NAILING MACHINE FOR BOOTS AND SHOES.

No. 189,851. Patented April 24, 1877.

Fig. 1.

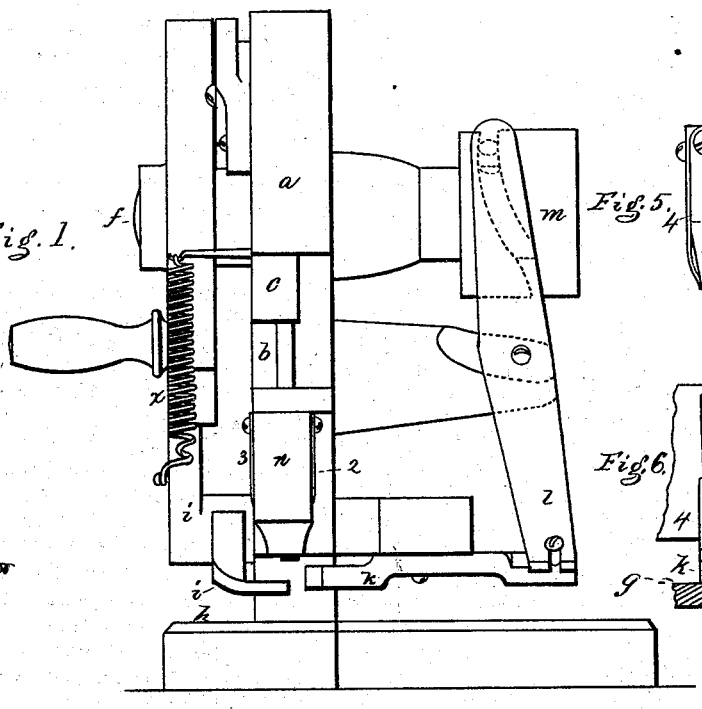


Fig. 5.

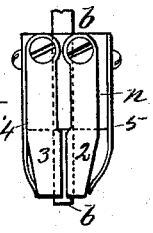


Fig. 3.

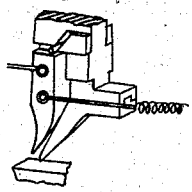


Fig. 6.

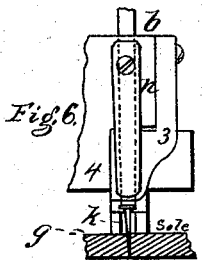


Fig. 4.

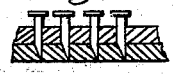
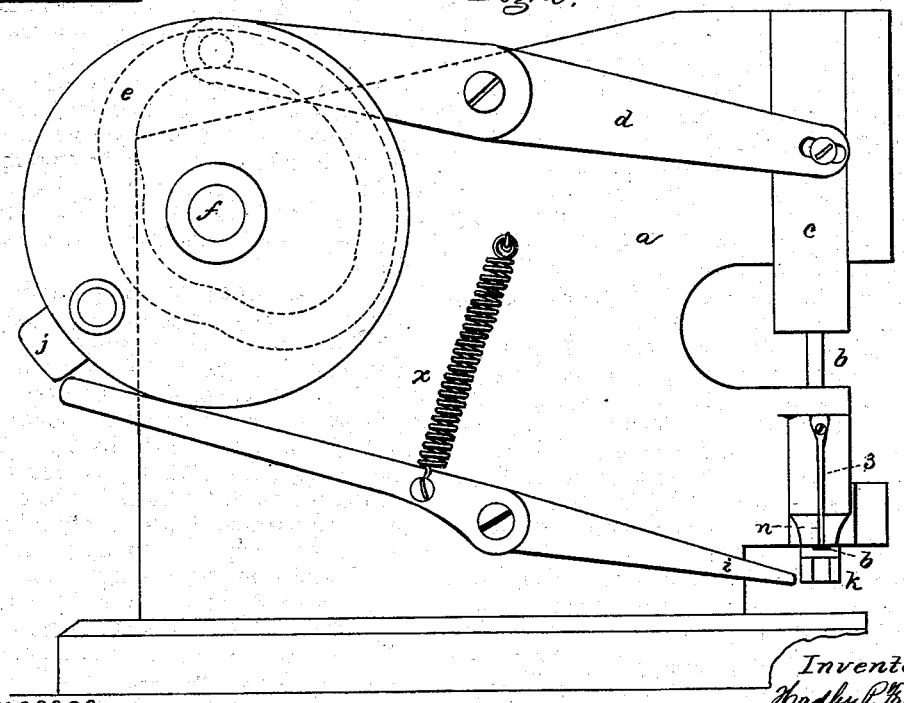


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

HADLEY P. FAIRFIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN NAILING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **189,851**, dated April 24, 1877; application filed December 28, 1876.

To all whom it may concern:

Be it known that I, HADLEY P. FAIRFIELD, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Nailing-Machine for Boots and Shoes, of which the following is a specification:

This invention relates to nailing-machines for use in the manufacture of boots and shoes, and has more especial reference to mechanism adapted to partially drive headed tacks or nails into a piece of sole-leather for an outer sole, such tacks or nails being subsequently driven through it, so that the heads meet the sole after it is applied to a lasted shoe, the tacks then entering the upper and inner sole, in accordance with an invention made by Lyman R. Blake, filed in the United States Patent Office May 5, 1876, to which reference may be had.

In this form of this invention the lower end of the nail-tube is arranged with such relation to the surface of the stock and its support that the end of the tube does not bear upon or touch the stock when the nail is driven from the tube by the driver, and the driver, that operates to only partially drive the tack or nail into the sole, also terminates its downward thrust at a point above the surface of the stock. The lower end of the tube and the driver, at the termination of its driving-thrust, remain above the surface of the stock a distance equal to the distance it is desired the heads of the partially-driven tacks or nails to occupy above the surface of the stock or sole.

In ordinary nailing-machines, the lower end of the nail-tube rests upon the stock when the nail is driven, and the driver drives the head of the nail substantially flush with the surface of the outer sole, it being held in place upon a lasted shoe during the whole time that the nail is being driven.

By preventing the lower end of the tube or the driver at its descent from touching the surface of the sole or stock the heads of the tacks or nails left projecting above the stock may be easily moved laterally with the stock under the action of a feeding device without slotting the tube or permitting the sole-support to yield, as has been done by Lyman R. Blake.

In another application made by me and filed concurrently with this I have employed, in connection with a tube that does not rest upon the stock, (and therefore called a "shortened" tube,) an auxiliary tack or nail guide, composed of jaws placed in an intermediary position between the lower end of the nail-tube and the surface of the stock.

In connection with the shortened tube shown in and forming part of this present invention, I prefer, in most instances, to use headed tacks with clinching-points, and when such tacks are employed it is best to use a tack-centering device or mechanism to guide the tacks in a straight line to the surface of, and present their points into, small holes in the sole, made by an awl or perforating-instrument for their reception.

If nails of wire or having corrugated or threaded shanks, or with heads somewhat elongated and cylindrical, are used, the centering device is not necessary, but may be employed.

Figure 1 represents, in front view, sufficient of a nailing-machine to illustrate how the present invention may be embodied in a machine. Fig. 2 is a side view thereof; Fig. 3, a modified form of presser and feed; Fig. 4, a piece of sole with partially-driven tacks. Figs. 5 and 6 represent modifications, to be hereafter described.

The frame *a*, of any usual or suitable shape, supports the nail-tube, driver, feed, awl, (if one is used,) and nail selecting or presenting mechanism. As herein shown, the tack or nail driver *b* is attached to the lower end of a driver-bar, *c*, connected with a lever, *d*, operated by a cam, *e*, on the shaft *f*. The shoe sole or stock *g* to be set or studded with partially-driven tacks or nails is placed upon a supporting-surface, *h*, preferably made adjustable as to its height, to adapt the machine to soles, single or double, of different thicknesses, and for tacks or nails of different lengths.

The stock is held pressed down upon the support by a presser, *i*, at all times, except during the time the feed device moves the stock. The presser is held down by a suitable spring, *x*, and lifted by a cam, *j*. The feeding device is represented as a reciprocating bar, *k*, notched or shaped at its forward end to engage a tack or nail left projecting above the

surface of the stock, and by pressure against the tack or nail move it and the stock for the reception of another tack or nail. The feeding device is reciprocated by a lever, *l*, acted upon by a cam, *m*. If the nail is not driven the feed will not take place.

Instead of this presser and feed, any other presser and feed of usual construction may be used—for instance, as in Fig. 3, where is represented the feed and presser of the McKay machine—the feed in this modification engaging the stock.

The lower end of the nail-tube *n*, as represented in the drawing, does not extend to or rest upon the stock as the nail is driven. The driver terminates its down-thrust at a point above the surface of the stock, and with relation to the bottom of the tube, just sufficient to drive the head of the tack or nail from the nail-tube.

In this invention the support for the stock will be placed at a distance from the lower end of the nail-tube according to the thickness of stock or length of nail, so as to present the upper or outer face of the sole at a distance from the lower end of the nail tube substantially equal to the length of nail it is desired to leave undriven above the stock.

Tacks with large heads require that the nail-tube have a passage a little larger than the diameter of the head, and such tacks are liable to tip in their passage, and not be driven straight into the sole. To obviate this and guide the tacks in a straight line, or present their points properly to enter holes previously made in the sole by an awl or equivalent, I add to the nail-tube a centering device, composed, in this instance, of two spring-fingers, 2 3, (spring-held jaws might be used instead,) that, projecting into the nail-tube, act against the body and head of the tack and guide it straight through the tube. The centering device acts upon the body or head of the nail until after its point enters the sole, or the hole in the sole. Headed tacks with regular tack-points will not run straight through the leather; so a hole may be made for them by an awl, operated in any usual way. Nails of other constructions, or having central points, may be driven without previously making holes in the sole. In all cases the tacks or nails are driven into the sole with sufficient firmness to remain therein when the sole is being applied to the shoe.

The shape of the jaws or centering devices may be varied without departing from this invention. If desired, the jaws might be arranged to form a separable prolongation of the nail-tube, the driver descending through the tube and the prolongation thereof formed by the jaw.

This modification is shown in Figs. 5 and 6, front and end views. In such figures, the solid portion of the nail-tube is marked *n*, and the jaws 2 3 extend below, and form a continuation of, the tube. Springs 4 5 hold the jaws pressed toward each other.

I claim—

1. In combination, a work-support, a nail-tube, and a driver, the nail-tube being arranged with its lower end above the surface of the stock to permit the lateral movement of the partially-driven nail from under it, and the driver to descend far enough to remove the head of the nail out of the nail-tube and only partially drive the nail, thereby leaving its upper end projecting above the surface of the stock, substantially as described.

2. A shortened nail-tube and driver and a support for the stock, arranged with relation to each other as described, so that the end of the nail-tube and driver are elevated above the stock, as set forth, in combination with a presser, to hold the stock upon the support, substantially as described.

3. The combination, with a shortened nail-tube, a driver, and a work-support, of a nail-centering device, arranged in connection with the nail-tube, having its lower end placed at a distance above the surface of the stock, as described, and adapted to hold and direct the tack or nail while it is partially driven into the stock by the driver, the latter terminating its downward thrust at a distance above the surface of the stock, to prevent driving the head of the tack or nail down completely to the surface of the stock, substantially as described.

4. A shortened nail-tube and driver, constructed as described, and a work-support and centering device, in combination with a feeder, to move the stock and partially-driven tack or nail laterally from under the path of the driver, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HADLEY P. FAIRFIELD.

Witnesses:
GEO. W. GREGORY,
ELMER C. PERKINS.