L. R. Blake,

Lasting Mach.

No. 86,353. Patented Feb. 2. 1869.

Fig: 1.

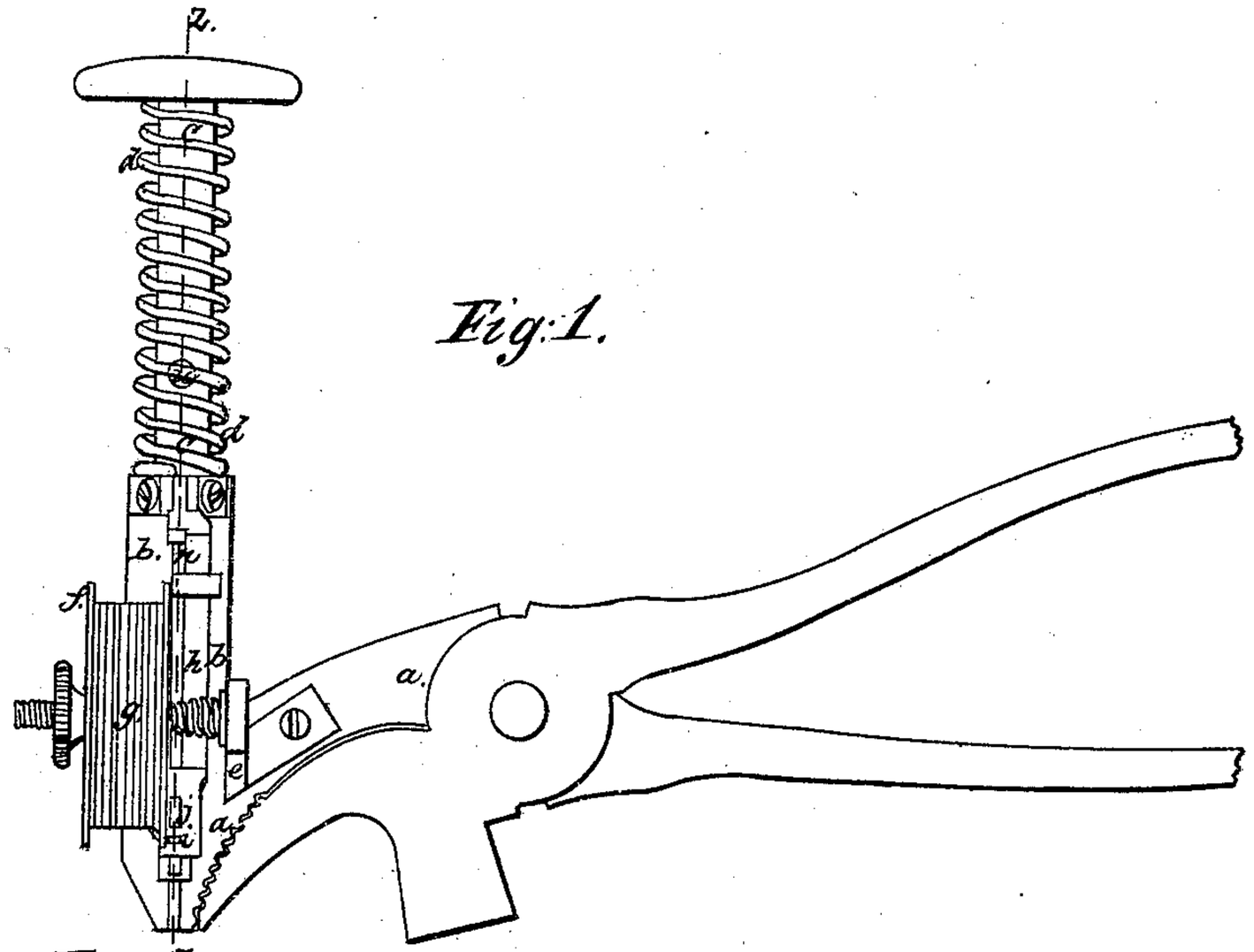


Fig: 2.

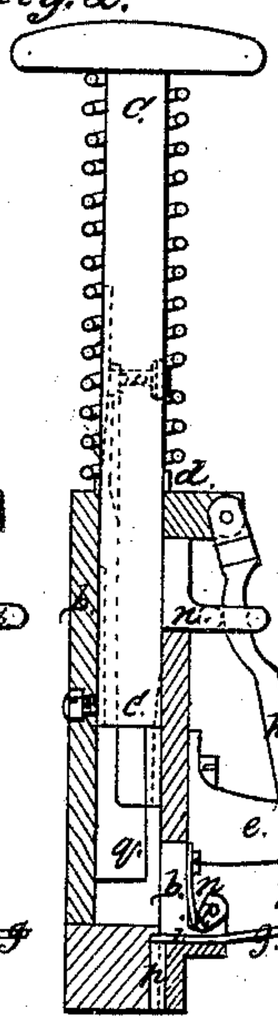


Fig: 3.

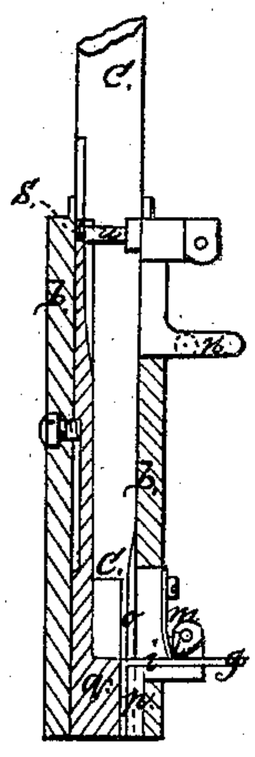


Fig: 8.

Fig: 9.

Fig: 4.

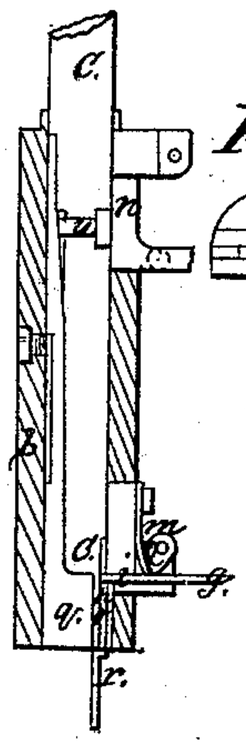
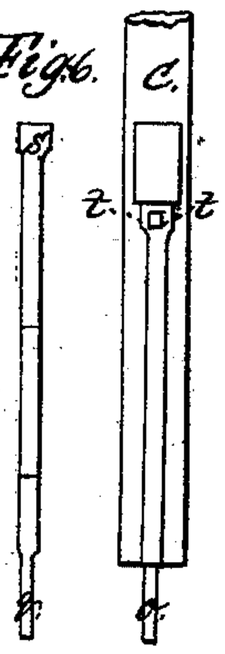


Fig: 5.

Fig: 7.

Fig: 6.



Witnesses.

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LYMAN REED BLAKE, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 86,353, *dated February* 2, 1869.

IMPROVED PINCERS, NAIL-MAKER, AND DRIVER FOR LASTING BOOTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, LYMAN REED BLAKE, of Boston, in the county of Suffolk, and State of Massachusetts, have invented a Combination of Pincers, and Nail-Maker, and Driver, adapted for Lasting Boots and Shoes, and for other uses; 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 practise it.

This invention is designed principally for employment where a flexible material, like leather, cloth, &c., is to be drawn over or upon a solid body, to which the flexible material is first to be temporarily and afterward permanently secured; the more immediate object of my invention being to facilitate the lasting of the uppers of boots and shoes to their inner soles, though in the form shown, or in some modification thereof, applicable for upholstery and similar work.

My invention may also be employed as a hand-nailer, for nailing soles to boots and shoes, especially where the soles are thin and light.

In my invention; I combine, with a pair of pincers, made to seize and hold flexible material, so that said material may be stretched and drawn by force applied to the pincers, a mechanism, that, at the will of the operator, and consequent upon blows given by him, works to feed, from a supply of flattened wire, lengths sufficient for the nails, which are headed and pointed, and are driven through the flexible material in proximity to the place where the nippers, or pincers, have hold of it.

With or without the pincers, however, the mechanism which feeds the wire from a coil or reel, and cuts it off into short pieces, and heads and drives it, may be employed to advantage for many uses, carrying the apparatus as a hand-apparatus in one hand, and presenting it where it is necessary to drive a fastening, giving, with the other hand a blow, which cuts off and drives the detached piece of wire.

For use as a hand-nailer, the pincers-part of the combination, which is used as a handle to grasp and convey the apparatus, may be modified to serve as a mere handle, or, if desired, the cylinder *b*, mentioned beyond, may be enlarged and otherwise fashioned to serve as the object which is grasped, dispensing with any special handle-projection from the cylinder.

The drawings represent, in several views, an embodiment of my invention—

Figure 1 being a side elevation of a pair of shoemakers' common "lasting-pincers," with the addition thereunto of my nailing-mechanism.

Figure 2 is a section taken in the plane of the line *z z*, seen in fig. 1.

Figures 3 and 4 are sections similar to fig. 2, but showing only portions of the mechanism seen in fig. 2, and exhibiting such portions in the different positions which they are made to assume in operating to form and drive nails.

Figure 5 is an end view of the devices which operate on the end of the wire, to form nails therefrom, and to drive them.

Figure 6 is an elevation of the piece which operates to turn and bend the end of the wire from the direction in which it is fed from its reel, to the direction and position which the said end has previous to its being severed from the wire.

In the pincers there is nothing peculiar, except that the upper jaw, *a*, is made with or has attached to it a hollow cylinder, *b*, which terminates in a narrow slot or mortise, made parallel with the end of the upper pincers-jaw *a*.

In the cylinder *b* is fitted a plunger, *c*, which can be thrust downward therein, by compression of the helical spring *d*, which is coiled around the plunger, and bears upon the top of cylinder *b*, and under the knob in which the upper end of the plunger terminates.

The upper jaw *a* of the pincers is provided with an arm, *e*, on which is pivoted a reel, *f*, on which flattened wire, *g*, is to be wound, any suitable tension-device being provided for acting on the reel or the wire, as, in sewing-machines, tension-devices are provided for acting on the spool or thread.

The radius-arm *h* is pivoted to the upper end of the cylinder *b*, and is slotted through its free end, so that wire *g* may be passed through the slot *i*, seen in fig. 1, where it is subjected to the action of a friction-pawl, *j*, which is kept in contact with the wire by spring *k*, so that when the arm *h* is swung toward cylinder *b*, the wire is uncoiled from reel *f*, which rotates in giving off the wire, and is fed forward into a slot in the tube *b*, which is at right angles with the mortise seen in fig. 5, there being arranged on tube *b*, at the entrance of the slot into which the wire *g* is fed, a detaining-pawl, *l*, which is acted on by spring *m*, said pawl *l* acting to prevent the wire from being withdrawn, as the arm *h* swings outward from tube *b*, to take a new hold of the wire, previous to feeding toward the tube another length suited for the formation of a nail.

The vibrations of arm *h*, by which the feeding of the wire is effected, are caused by the action, on the curved part of the arm, of the studs which are connected with the plunger by the piece *n*, the arm *h* passing between said studs, so that as they are reciprocated up and down with the plunger *c*, the arm *h* is made to vibrate toward and from tube *b*, thereby intermittently feeding, at the proper times, suitable lengths of wire, to be cut off and formed into nails, to be driven through the flexible material griped in the jaws of the pincers.

The plunger *c* carries, at its lower end, a piece, *o*, which has its edge, which is in line with the perimeter of the plunger *c*, grooved into a V-form, for the entire

length projecting beyond the plunger. This piece *o* serves the functions of one blade of a cutter, or shears, by which short pieces are severed from the wire, and of a punch, or driver, by which the formed nails are driven.

In the mortise at the end of the tube *b*, is set a piece, *p*, which serves as an anvil or stationary part of a pair of cutters, of which the piece *o* is the other and moving member. The edge of this stationary cutter presented toward the piece *o*, is formed as a salient angle, corresponding to the re-entering angle made in *o*.

The plunger *c* is on the side opposite to that which carries piece *o*, grooved and otherwise formed, as seen in Figure 7, for reception of the piece *q*, which may be termed the bender, since its function is to bend the wire, which is thrust into the mortise in the end of tube *b*, over the cutting-bed *p*, at right angles with the direction at which the wire is fed forward into the mortise.

In fig. 3 will be seen how, after the wire *g* has been thrust forward, about on a horizontal line, into the mortise left vacant for the purpose, as in fig. 2, said wire is bent to a right angle, ready for the cutter *o* to descend and sever the wire, as seen in fig. 4, making the nail *r*, seen as projecting beyond the instrument in fig. 4, and as enlarged in the detached perspective view, Figure 8.

When the plunger is fully up, the parts are in the position shown in figs. 1 and 2, and the effect of the first part of the downward movement of the plunger is to cause arm *h* to feed forward the end of the wire *g*.

The end, *s*, of the piece *q*, being then locked into the recess *t*, seen in fig. 7, piece *q* is carried down with the plunger even with the end of the pincers-jaw *a*, as seen in fig. 3, when pin *u*. in the plunger, entering the tube *b*, forces end *s* out of recess *t*, so that the plunger then moves on the bender *q*, and the cutter *o* comes down and operates, with the cutter-bed *p*, to sever the bent piece from the wire, and to drive the short piece, cut off from the wire, out from the apparatus, into whatever may be beneath.

The shank of the bender is made, between its ends, of such form, as, when in place in tube *b*, to keep the end *s* pressed toward the plunger, so that said end will catch in recess *t*, and will remain there till forced out by the longitudinal movement given pin *u*, consequent upon the entry of its bevelled head into tube *b*.

After the first cut made upon the end of the wire, each nail will be formed with a pointed end, and with a head upon one side only of the nail, the head being formed of two prongs, as seen in fig. 8.

By change in the form of the cutter *o* and cutter-bed *p*, the head of the nail might be a single triangle, and the point of the nail made by a single bevel, as seen in Figure 9, the point, of course, being at one edge instead of at the centre line of the nail, but the forms of the point and head shown in the drawing, fig. 8, are the preferable ones.

When, after driving a nail, the spring *d* throws up the plunger, the bevelled head of pin *u* emerges from tube *b*, and as recess *t* comes opposite head *s* of the bender, the parts couple, and the bender is lifted the remainder of the upward movement of the plunger.

It will at once be obvious, in lasting boots and shoes, and elsewhere, when it is desirable to strain a flexbile material over a solid body, and to unite such parts temporarily, how convenient this apparatus will be for driving fastening-nails before the strain obtained by the pincers is released.

In lasting boots and shoes with this apparatus, lasts faced with metal are used, so that if the points of the nails come through the inner sole, the points will be clinched.

In practice, it is found that the "swallow-tail" heads made by it are sufficient for holding the parts together for the temporary purposes of lasting, and until the parts are secured together by the finishing-fastening of nails, pegs, screws, or stitches.

When nailing objects together, for example, like soles to boots and shoes, and where it is not desired to strain one part upon another, as in lasting boots and shoes, and in some upholstery-work, it may be desirable to have a row or rows of nails driven at given distances from the edge of the object to be nailed, in which case, I attach to the cylinder *b*, a gauge, which may be made adjustable.

I claim the combination of the pincers with the nail-feeding and driving mechanism, substantially as described.

Also, for forming pointed and headed nails or brads from wire, and for driving the same, I claim the combination of the following instrumentalities, viz, a wire feeder, a bender, a cutter, and a driver, substantially as described.

Also, the combination of a handle with a mechanism which carries a coil of wire, or wire-like material, and intermittently draws short lengths from such coil, cuts them off and drives them by hand-given blows, substantially as described.

Also, a driver, which is arranged and operates, not merely as a driver, but as a cutter, or as one blade of a shears, in the act of cutting and driving nails or pegs, substantially as described.

LYMAN R. BLAKE.

Witnesses:

J. B. CROSBY,

C. WARREN BROWN.