(No Model.) 2 Sheets—Sheet 1.

# A. NEWTON.

## Nailing Machine.

No. 243,601. Patented June 28, 1881.

Fig. 2.

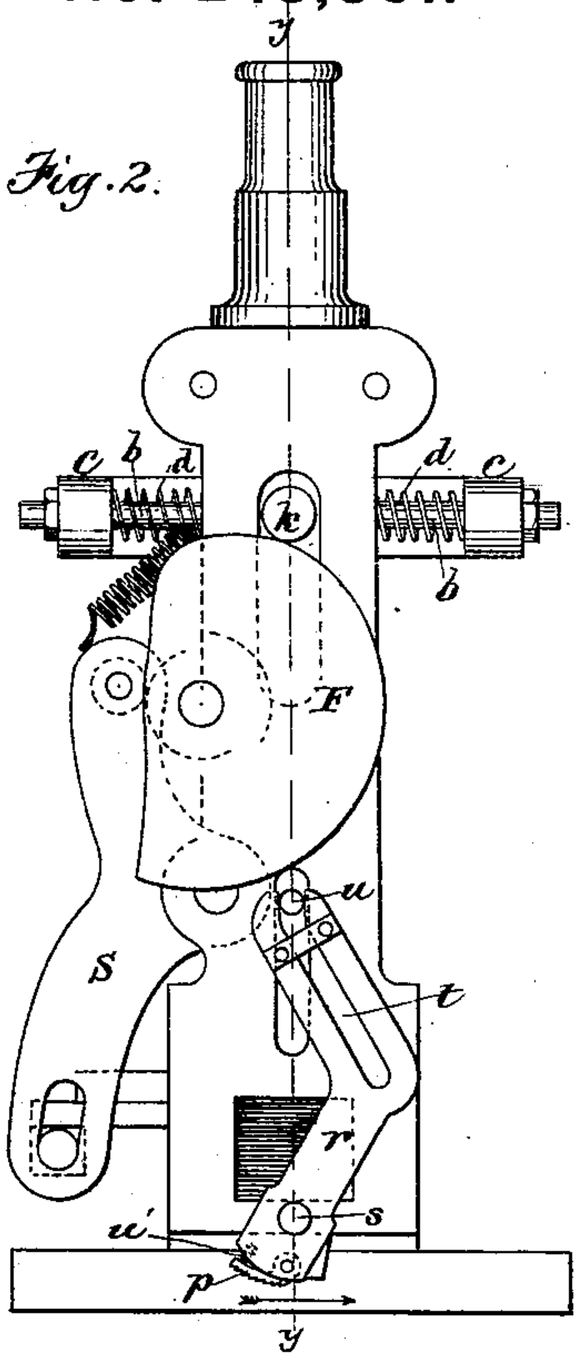



Fig. 1.

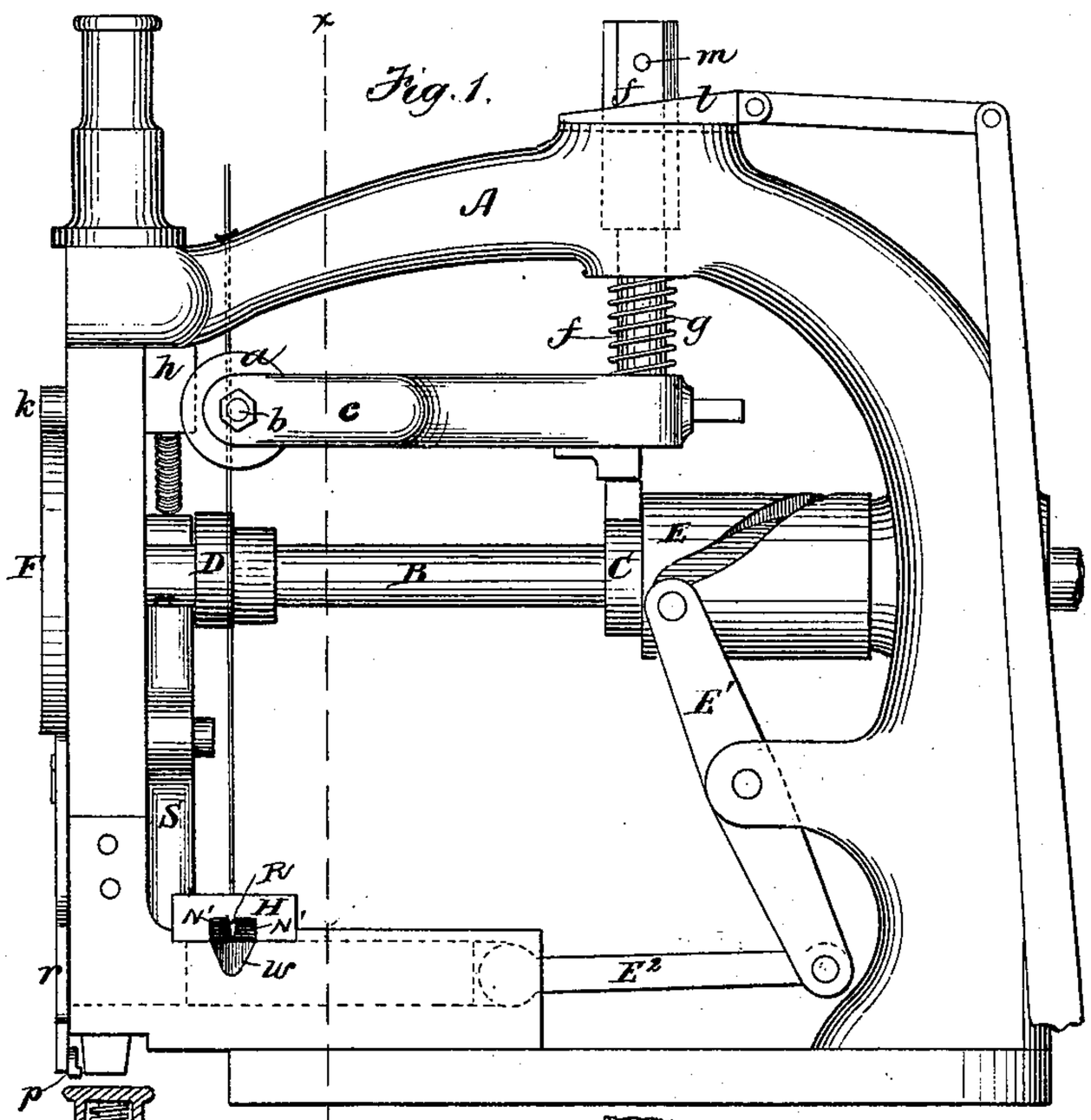



Fig. 4.

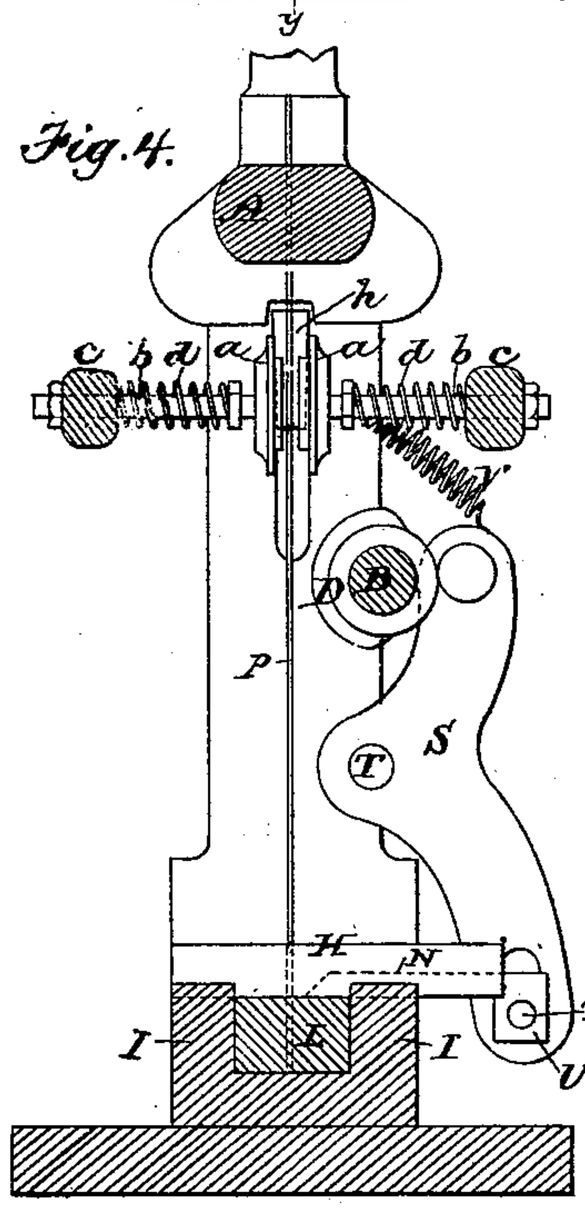
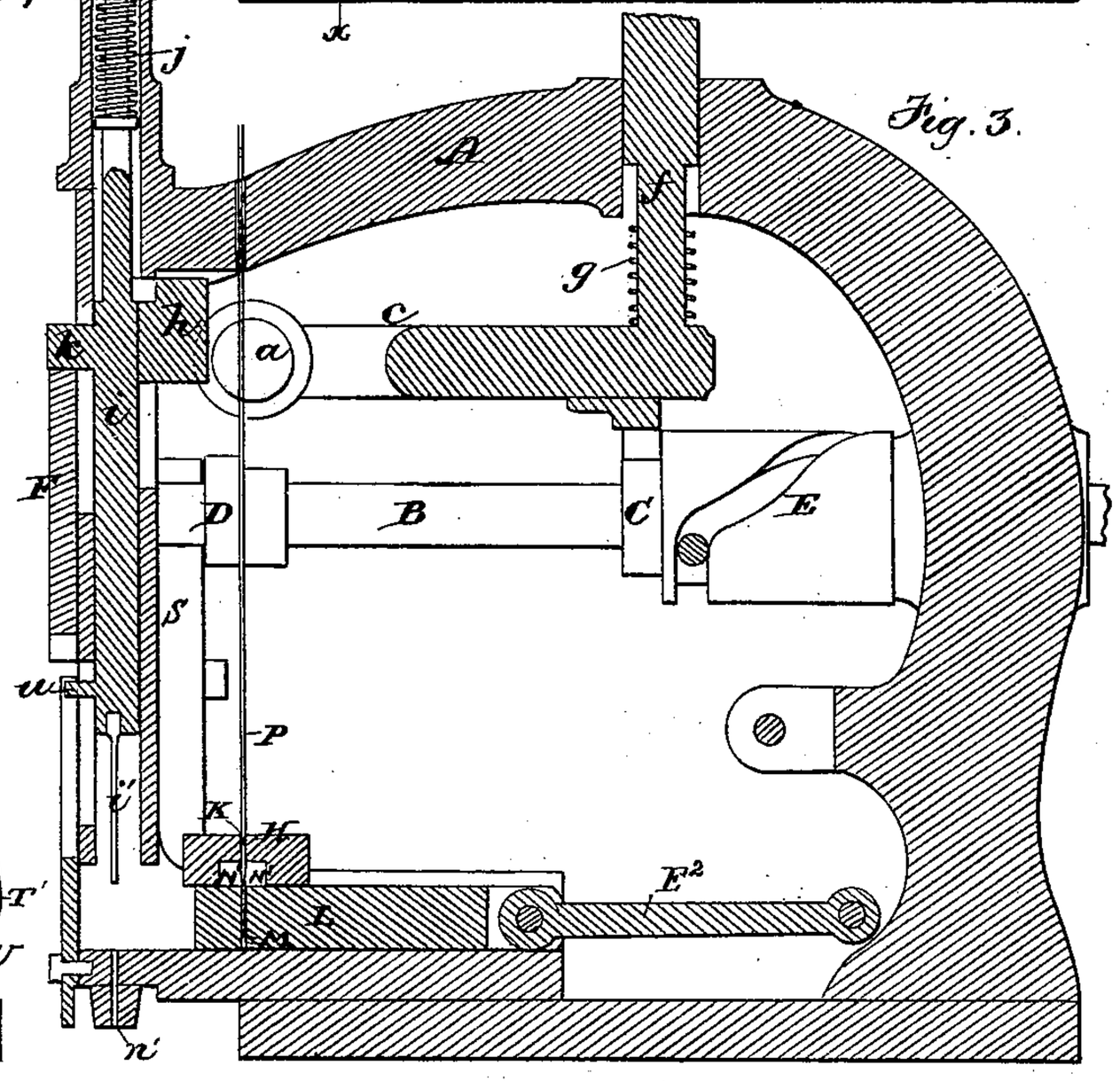



Fig. 3.




Witnesses:
H. G. Hadlin.
W. Elmo.

Inventor:
Arthur Newton
by Wright Brown
Attys.

(No Model.) 2 Sheets—Sheet 2.

# A. NEWTON.

## Nailing Machine.

No. 243,601. Patented June 28, 1881.

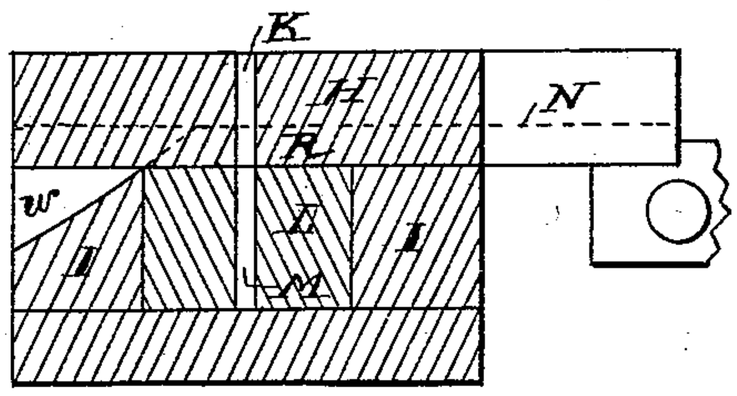



Fig. 7.

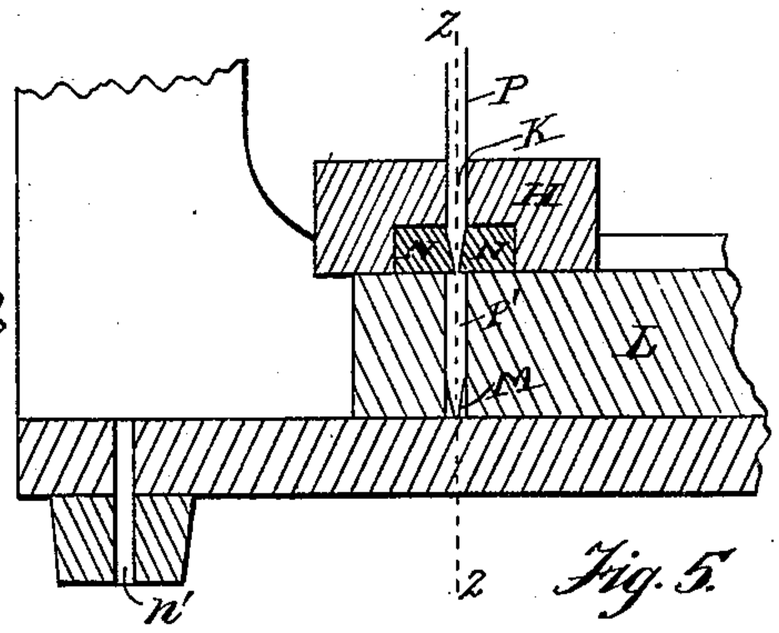



Fig. 5.

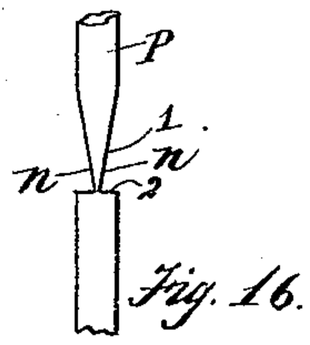



Fig. 16.

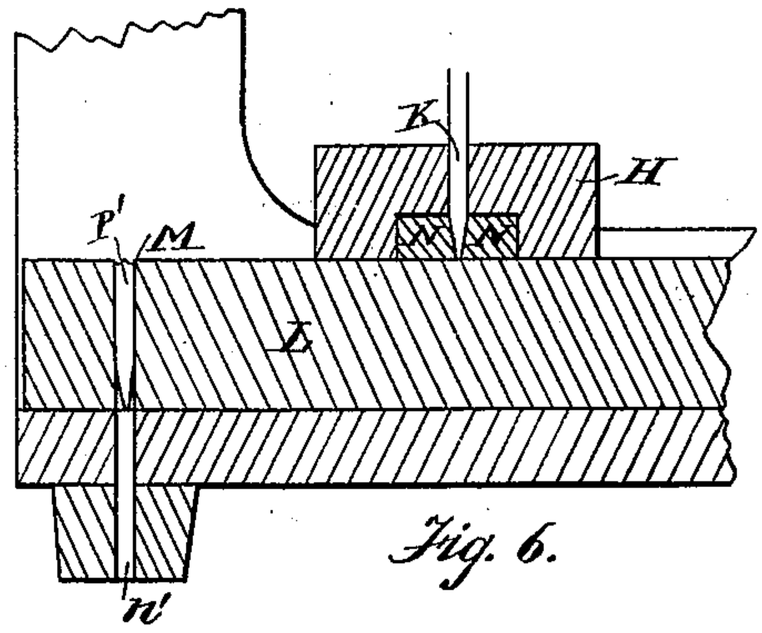



Fig. 6.

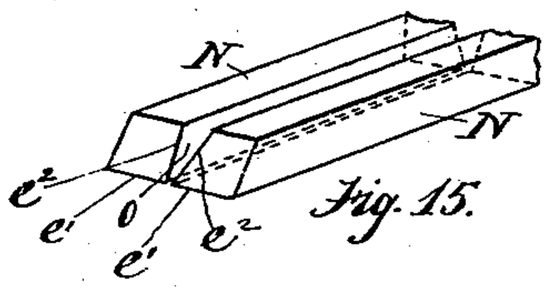



Fig. 15.

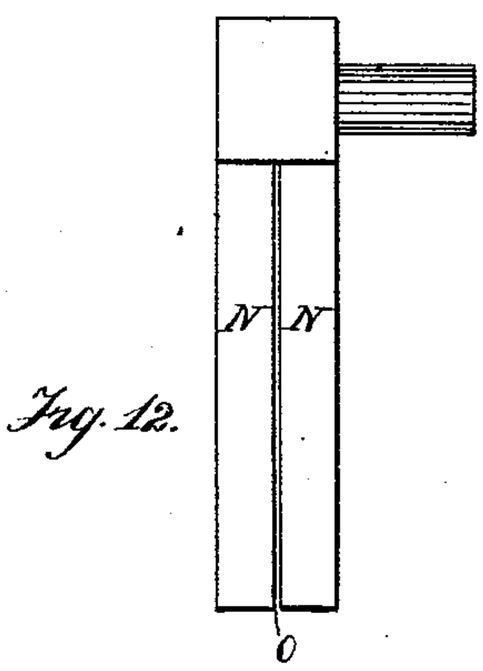



Fig. 12.


Fig. 11.

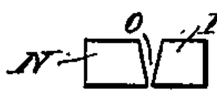



Fig. 13.

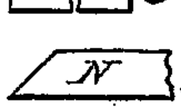



Fig. 14.

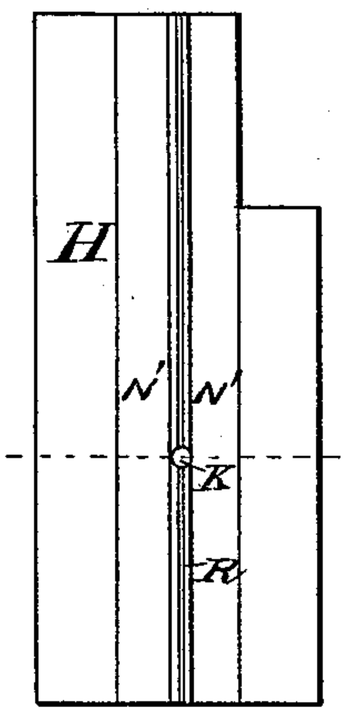



Fig. 8.

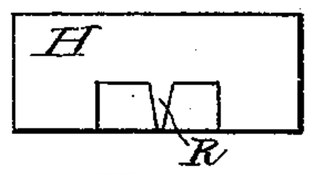



Fig. 9.

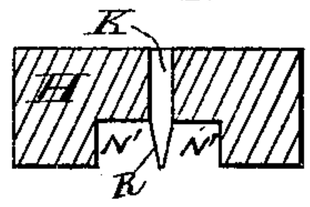



Fig. 10.

Witnesses:
H. G. Wadlin.
W. Elmo.

Inventor:
Arthur Newton
by Wright Brown Atty

# UNITED STATES PATENT OFFICE.

ARTHUR NEWTON, OF BOSTON, MASSACHUSETTS.

## NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 243,601, dated June 28, 1881.

Application filed January 19, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR NEWTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Boot and Shoe Sole Nailing Machines, of which the following is a specification.

This invention relates to machines for cutting corrugated or other wire into nails for attaching soles to boots and shoes, and driving said nails as fast as they are formed.

The invention has for its object, first, to provide an improved means for converting such wire into nails, whereby the cutters used in forming the chisel-points on the nails are prevented from bending or distorting said points.

The invention also has for its object to provide certain improvements in a machine embodying mechanism for carrying out my improved method of pointing, said improvements relating to mechanism for feeding the wire, mechanism for presenting the completed nails to the driver, and mechanism for feeding the boot or shoe sole while it is being nailed.

To these ends my invention consists in the improvements hereinafter described and claimed.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a machine embodying my invention. Fig. 2 represents an end elevation of the same. Fig. 3 represents a longitudinal vertical section on line *y y*, Fig. 2. Fig. 4 represents a transverse vertical section on line *x x*, Fig. 1. Fig. 5 represents an enlarged longitudinal section of the mechanism for pointing and severing the nails, showing the position of the parts while the point is being formed. Fig. 6 represents a similar section, showing the nail severed from the wire and presented to the driver. Fig. 7 represents a section on line *z z*, Fig. 5. Figs. 8 and 9 represent, respectively, bottom and end views of the fixed block in which the wire is held while being pointed. Fig. 10 represents a section on line *z' z'*, Fig. 8. Figs. 11, 12, 13, and 14 represent, respectively, top, bottom, end, and side views of the cutters used in pointing the nails, and Fig. 15 represents a perspective view of the same. Fig. 16 represents a side view of the wire after the notches are formed thereon.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents a frame of suitable construction for supporting the mechanism hereinafter described.

B represents the driving-shaft journaled in the frame, and provided with cams C, D, E, and F, for operating the wire-feeding mechanism, the nail-pointing mechanism, the nail severing and presenting mechanism, and the driver-bar.

The nail forming or pointing mechanism is composed of a fixed block, H, rigidly attached to fixed supports I I on the frame A, and provided with a wire-guide orifice, K, a movable block, L, adapted to slide between the supports I I, and provided with a guide-orifice, M, adapted to coincide with the orifice K, and a pair of cutters or chisels, N N, rigidly connected and adapted to reciprocate in guides N' N' formed in the under side of the block H. The cutters N N are separted by a wedge-shaped space, O, and their inner sides form acute angles with their bottom surfaces. The ends of the cutters are beveled to form cutting-edges $e'$ $e'$ on the bottom surfaces and cutting-edges $e^2$ $e^2$ on the proximate sides of the cutters, as shown in Fig. 15. The bottom surfaces of the cutters are in close contact with the surface of the block L. The form and arrangement of the cutters are such that when they are reciprocated they will have a planing action on and thus remove portions of the metal from the opposite sides of a wire, P, inserted in the guide-orifices K M, and thereby form notches *n n*, each notch being composed of a beveled surface, 1, subsequently forming one of the sides of a chisel-point, and a surface, 2, substantially at right angles with the length of the wire, and subsequently forming a portion of the head or outer end of a nail. The notches do not quite sever the wire, but leave a thin neck between the notches, which neck can be easily broken, as hereinafter described. The notches *n n* are formed at a distance from the end of the wire equal to the length of one nail, and the block L is of sufficient depth to contain the portion of the wire below the notches *n n*. It will be seen, therefore, that when the block L is in position to cause its orifice M to coincide with the orifice K of the

block H, as shown in Fig. 5, and the wire P is inserted in both of said orifices, the wire is supported laterally both above and below the point where the notches *n n* are formed by the cutters, and as said cutters do not sever the wire it follows that they cannot bend or disturb the same in forming the notches. The metal being removed from the wire by a planing action of the cutters, there is no displacement by the cutters of the metal not removed in forming the notches; hence the points of the nails are not made wider than the diameter of the wire. It will also be seen that by moving the block L, after the notches *n n* are formed, the thin neck between said notches will be severed thereby, severing the portion of the wire contained in said block, and at the same time completing the chisel-point on the end of the wire in the fixed block H, as shown in Fig. 6, the surface formed by the breakage of the thin neck constituting the apex of the chisel-point. The severed portion P′ of the wire now constitutes a completed nail, its head or outer end being completed by the severing of the neck, and its chisel-point having been previously formed by an operation similar to that above described.

This improved method of forming nails from continuous wire differs from methods heretofore employed in forming the beveled sides of the chisel-point by cutters moving parallel with each other and having a planing action. Heretofore the wire has been indented at a distance from its end to form the point of each nail by cutters moving toward each other, said cutters displacing the metal so as to make the points wider than the diameter of the wire. It is obvious that by my improved method a more perfect point is formed, the point being of the same width as the diameter of the wire.

I form on the under side of the fixed block H a wedge-shaped rib, R, fitting closely in the space between the cutters N N, and intersected by the orifice K. The ends of said rib, on either side of the orifice K, support the wire laterally between the proximate surfaces of the blocks H L, and constitute a safeguard against the slightest bending of the wire under the influence of the cutters at the point where the notches *n n* are formed. The cutters N N, after forming the notches *n n*, remain in contact with the wire until the block L has been moved, the inner side of one of said cutters constituting an edge or shear to support the notched portion of the wire, and co-operate with the surface of the block L to sever the neck between the notches when the block L is moved. The cutters N N are reciprocated by means of the cam D on the driving-shaft B, and a lever, S, pivoted at T to the frame A, and at T′ to the stock U, to which said cutters are attached. A spring, V, holds the upper end of the lever S in contact with the cam D.

The mechanism for feeding the wire P to the pointing mechanism last described is composed of a pair of plates or feed-jaws, *a a*, located on rods *b b*, which are adapted to slide in bearings in a bifurcated yoke or frame, *c*. The jaws *a a* may be coated with rubber on their proximate surfaces, or may have steel plates with grooved or roughened surfaces, the latter being preferable, and the wire to be fed is interposed between said surfaces. Springs *d d* on the rods *b b* press the jaws *a a* against the wire and cause them to normally hold or grasp the same with sufficient tightness to enable them, when moved toward the block H, to feed the wire into said block. The frame *c* is provided with a vertical arm, *f*, adapted to slide in a socket in the frame A. The frame *c* is pressed, by a spring, *g*, against the cam C on the driving-shaft, and is therefore reciprocated vertically when the shaft rotates.

*h* represents a wedge located on the driver-bar *i*, which bar is also reciprocated vertically by means of the cam F, a stud, *k*, from said bar bearing on the cam, and a spring, *j*, adapted to force the driver-bar abruptly downward when the cam passes from under the stud *k*. The wedge *h* is so arranged and the driver-bar *i* is so timed in its movements that when the feed-jaws *a a* rise the wedge will also rise, and at the same time insert itself between and separate the jaws *a a*, so that during their upward movement they will not move the wire. When the jaws *a a* have completed their upward movement they descend before the driver-bar, so that the wedge remains behind, and the jaws are caused, by their springs *d d*, to grasp the wire and feed it downward into the blocks H and L. The length of movement given to the wire, and consequently the length of each nail, is determined by a sliding wedge, *l*, on the frame A, said wedge constituting an adjustable stop for an arm, *m*, on the slide *f*, and limiting the downward movement of the slide *f*, the frame *c*, and the feed-jaws *a a*. When the operator desires to change the length of the nails he moves the wedge *l* in one direction or the other, thereby permitting the slide *f* to descend more or less. The wedge *l* may be moved by the operator's foot through a treadle and suitable intermediate mechanism, so that the length of the nails may be varied while the machine is in operation.

*n′* represents a guide, through which the nails are driven by the driver *i′*, rigidly attached to the driver-bar *i*, into a boot or shoe held on a suitable jack (not shown) under said guide. The movement of the block L, whereby each nail is severed or broken from the wire, is effected by the cam E and intermediate mechanism, consisting of the pivoted lever E′ and the connecting-rod E². Said movement is sufficient to cause the orifice M of said block L to coincide with the guide *n′*, and thus present the nail to the driver *i′*.

For the purpose of feeding the sole as it is being nailed, I employ a feed-dog, *p*, pivoted to the lower end of a bent lever, *r*, and arranged to bear upon the sole when the same is held in position to receive the nails from the

guide-orifice $n'$. The lever $r$ is pivoted at $s$ to the frame A, and is provided with an inclined slot, $t$, into which projects a stud, $u$, on the driver-bar $i$. The feed-dog $p$ is provided with teeth on its bottom, so formed that when the dog is moved in the direction indicated by the arrow in Fig. 2 said teeth will have no effect on the sole, but will slip over the same, the dog being held against the sole with a yielding pressure by a spring, $w'$; but when the dog is moved in the opposite direction the teeth will engage with the surface of the sole and move the latter. The inoperative movement of the feed-dog is effected by the downward movement of the driver-bar $i$, and the operative movement by the upward movement of said bar; hence the feeding movement of the sole is effected after each nail has been driven. While the inoperative movement of the feed-dog is being effected the nail is entering the sole from the guide $n'$, and is not completely driven until said movement is completed; hence the partially-driven nail prevents the sole from being moved during the inoperative movement of the feed-dog. By operating the sole-feed directly from the driver-bar, as described, I obviate any liability of change in the relative movements of the feed-dog and the driver-bar, such as might occur if the feed-dog were operated directly from the driving-shaft.

The operation of the described machine as a whole is as follows: The blocks H L being in the position shown in Figs. 1, 3, and 5, the wire is fed into the orifices in said blocks and held firmly therein. The cutters N N then advance and form the notches $n$ $n$ on the wire, the cuttings removed by the cutters being ejected through an inclined spout, $w$, formed in one of the supports I. The block L is now moved forward, severing the nail, as previously described, and when its orifice M coincides with the guide $n'$, as shown in Fig. 6, the driver-bar $i$, which has been previously raised, descends, bringing down the driver $i'$, which drives the nail through the guide $n'$ into the sole below. After the nail is thus driven the block L is moved back until its orifice M coincides with the orifice K; and when said orifices coincide the feed-jaws $a$ $a$, which were raised while the block L was moving back, descend, and again feed the wire, as above described. The cutters N N move back before the wire is fed, so that they leave the orifice K unobstructed for the passage of the wire into the orifice M. The operation is thus repeated as long as desired.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sole-nailing machine, the above-described means for converting wire into chisel-pointed nails, said means consisting in a fixed block, H, having an orifice to contain the wire, a pair of chisels reciprocating in guides formed in the block H, adapted to remove metal from opposite sides of the wire, thereby partially forming the point of one nail and the head of the preceding nail, and a movable block, L, having a wire-receiving orifice adapted to coincide with the orifice in the fixed block and assist the latter in holding the wire and to be moved laterally after the action of the cutters to sever the wire, and thereby complete said head and point, as set forth.

2. The combination, with the fixed block H and the movable block L, having the wire-holding orifices, the cutters or chisels N N, having planing cutting-edges to form notches in the opposite sides of the wire held in said orifices, and adapted to remain stationary in contact with the wire when the block L is moved, thereby supporting the notched portion of the wire and co-operating with said block L in severing the neck of wire between the notches, as set forth.

3. The combination of the fixed block H, having the guide-orifice K, the reciprocating notching-cutters N N, the movable block L, having the orifice or holder M, the driver $i'$, the fixed guide-orifice $n'$, through which the nails are forced by the driver $i'$, and mechanism for reciprocating the movable block, whereby its orifice or holder is alternately caused to coincide with the orifice K to hold the wire while it is being notched, and with the orifice $n'$ to present the nails to the driver $i'$, as set forth.

4. As a means for holding and notching the opposite sides of wire in a sole-nailing machine, the combination of the fixed block H, having the wedge-shaped rib R and the guide-orifice K, terminating in said rib, the movable block L, having its upper surface in close proximity to the outer edge or apex of the rib, and provided with the guide-orifice M, adapted to coincide with the orifice K of the fixed block H at stated times, and the reciprocating cutters N N, separated by a wedge-shaped space closely fitting the rib R and adapted to form notches $n$ $n$ in the opposite sides of wire held in the orifices, as set forth.

5. The combination of the fixed block H, having the wire-guide M and cutter-guides N′ N′, the cutters N N, fitted closely in said guides, and the inclined channel $w$, formed in the supports on which the block H rests, for the escape of the cuttings removed by the cutters N N, as set forth.

6. The wire-feeding mechanism consisting of two opposing separable jaws, $a$ $a$, pressed against the wire interposed between them by springs and mounted on an intermittently-reciprocating yoke or frame, $c$, combined with a wedge, $h$, on the driver-bar reciprocating in the same direction as the yoke or frame, and so timed in its movements as to be interposed between the jaws $a$ $a$ and cause them to release the wire during their upward movements and allow said jaws to clamp the wire during their downward movements, as set forth.

7. The combination, with the reciprocating wire-feeding mechanism, constructed substan-

tially as described, of a movable wedge, *l*, for varying the length of movement of said feeding mechanism, as set forth.

8. In combination with reciprocating driver-bar *i*, a sole-feeding device consisting of the pivoted bent lever *r*, having a slot at one end receiving a stud projecting from the driver-bar, and at the other end a pivoted feed-dog, *p*, as set forth.

9. The combination of the pivoted lever *r*, the pivoted feed-dog *p*, and a spring, *u'*, to press said feed-dog against the sole, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of January, A. D. 1881.

ARTHUR NEWTON.

Witnesses:
C. F. BROWN,
W. CLIMO.