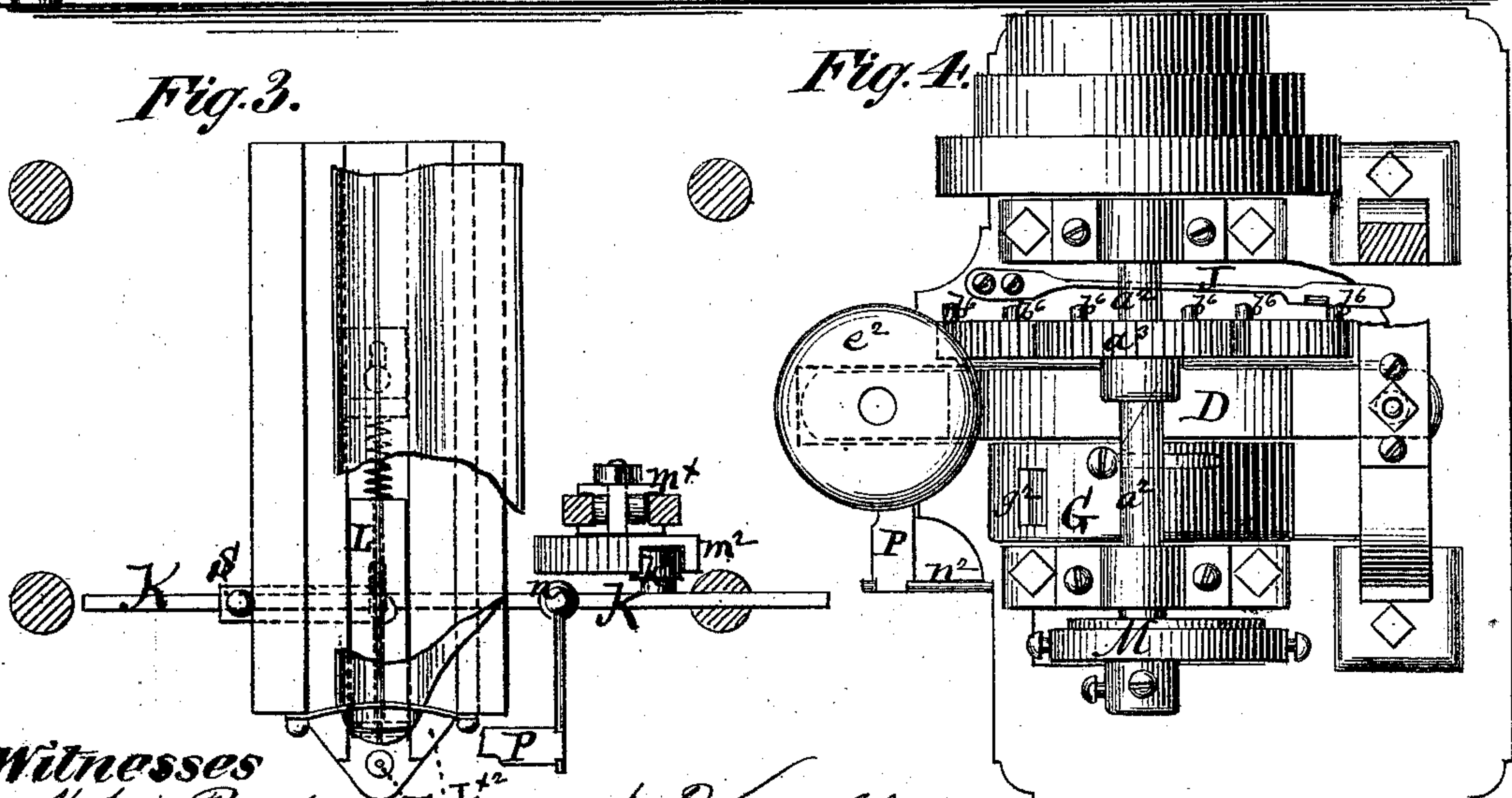
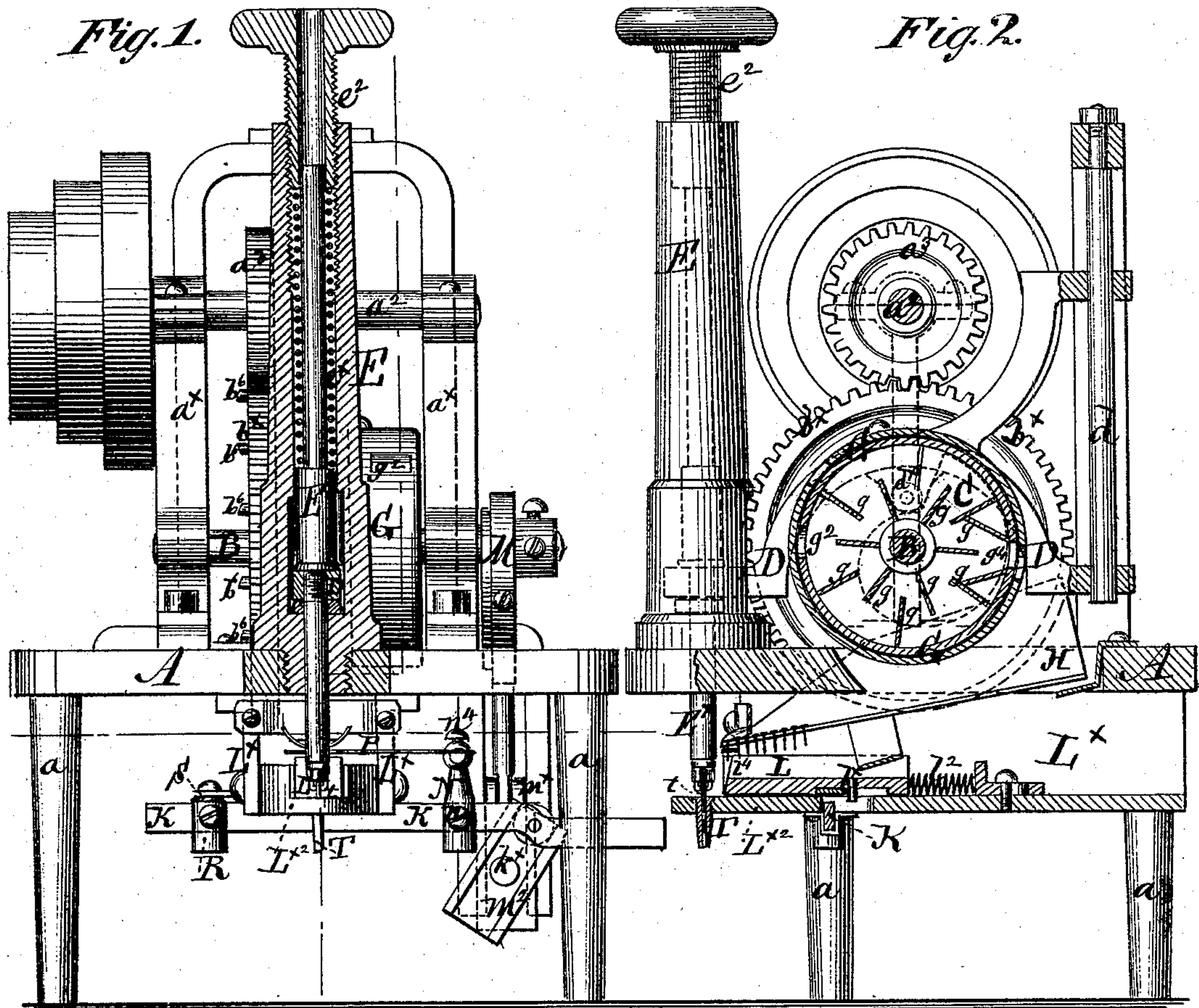


A. KNOWLTON & S. SHEPHERD.
Nailing-Machines for Boots and Shoes.

No. 152,847.

Patented July 7, 1874.



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by their Attorneys
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Fig. 5.

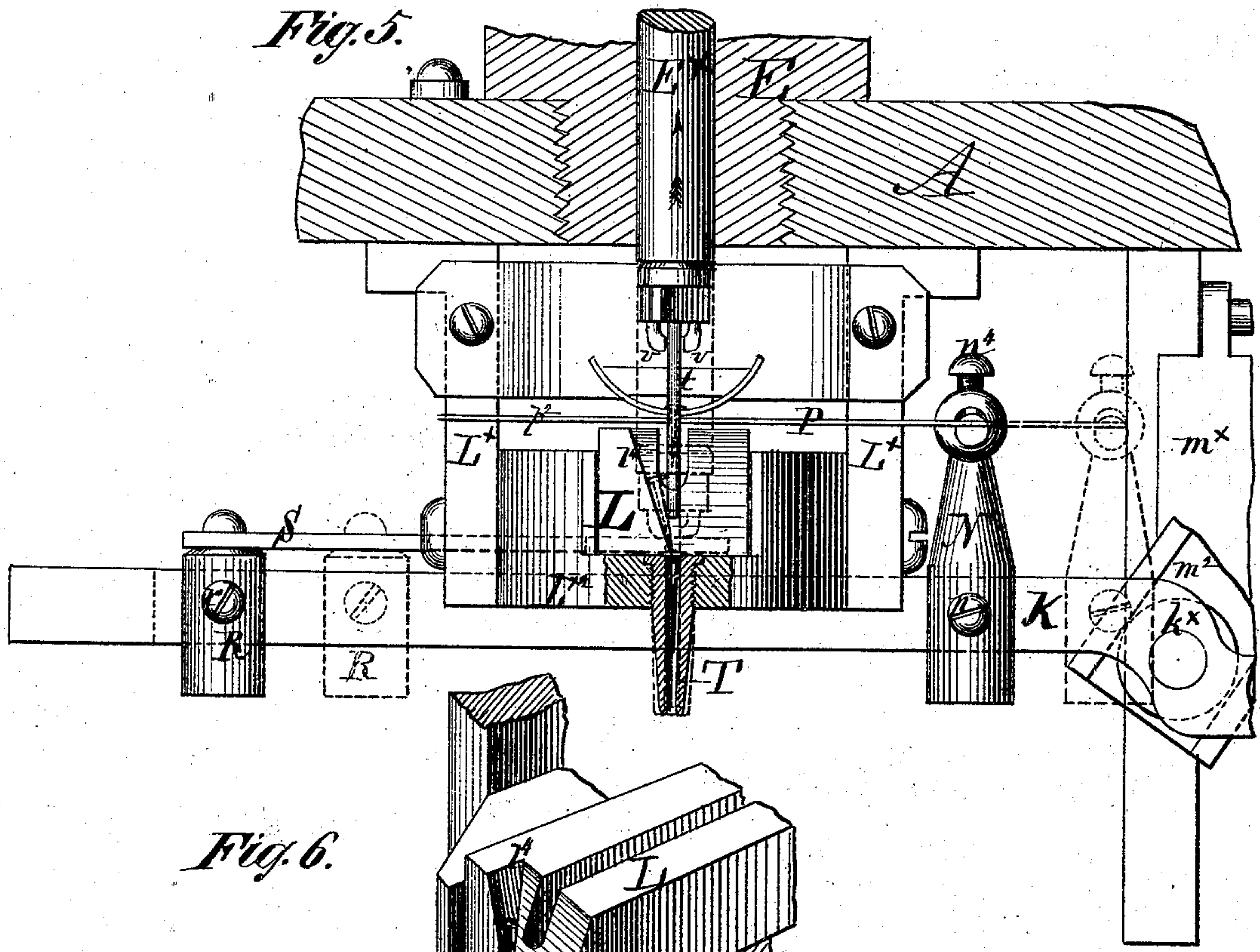


Fig. 6.

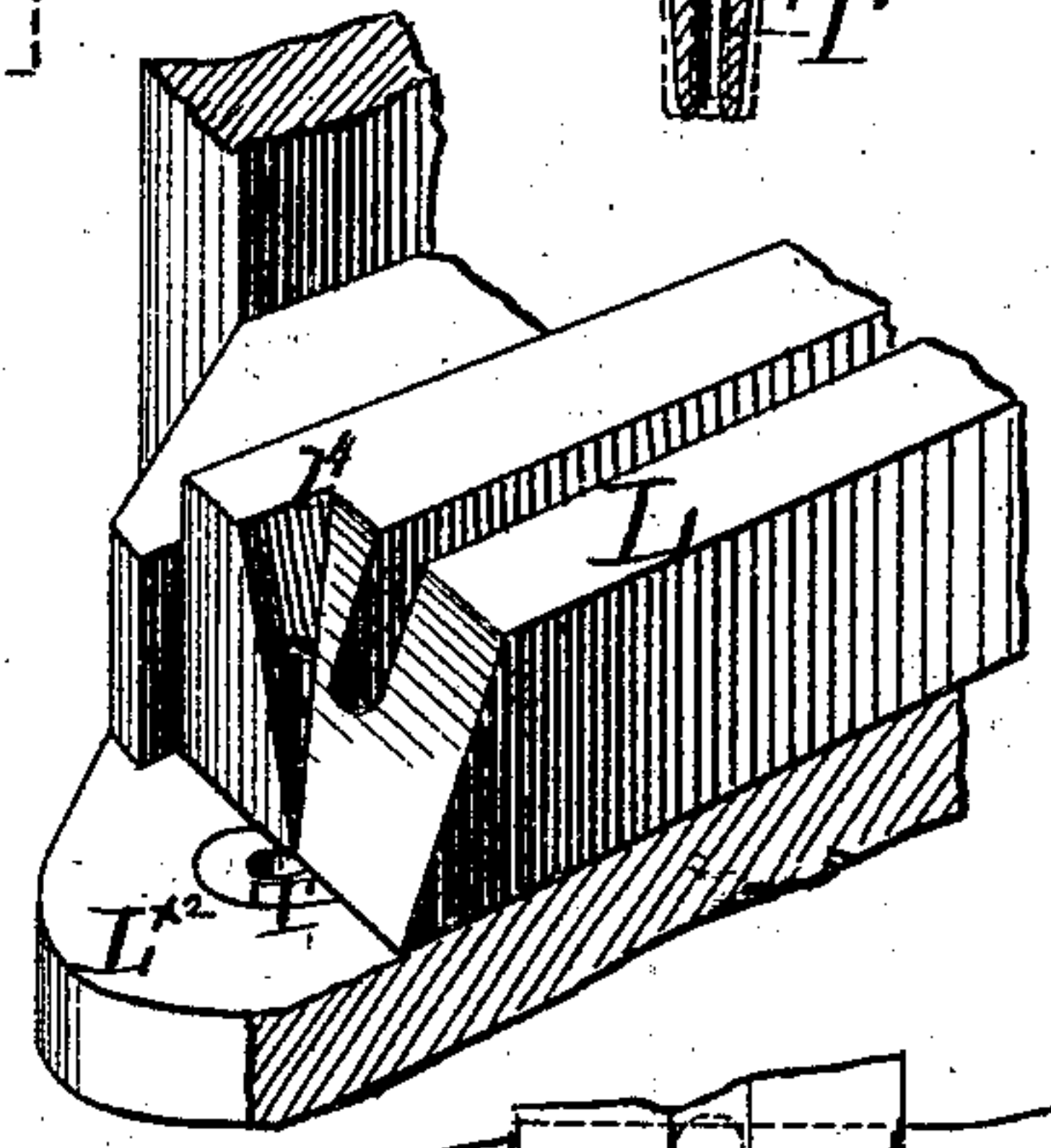


Fig. 7.

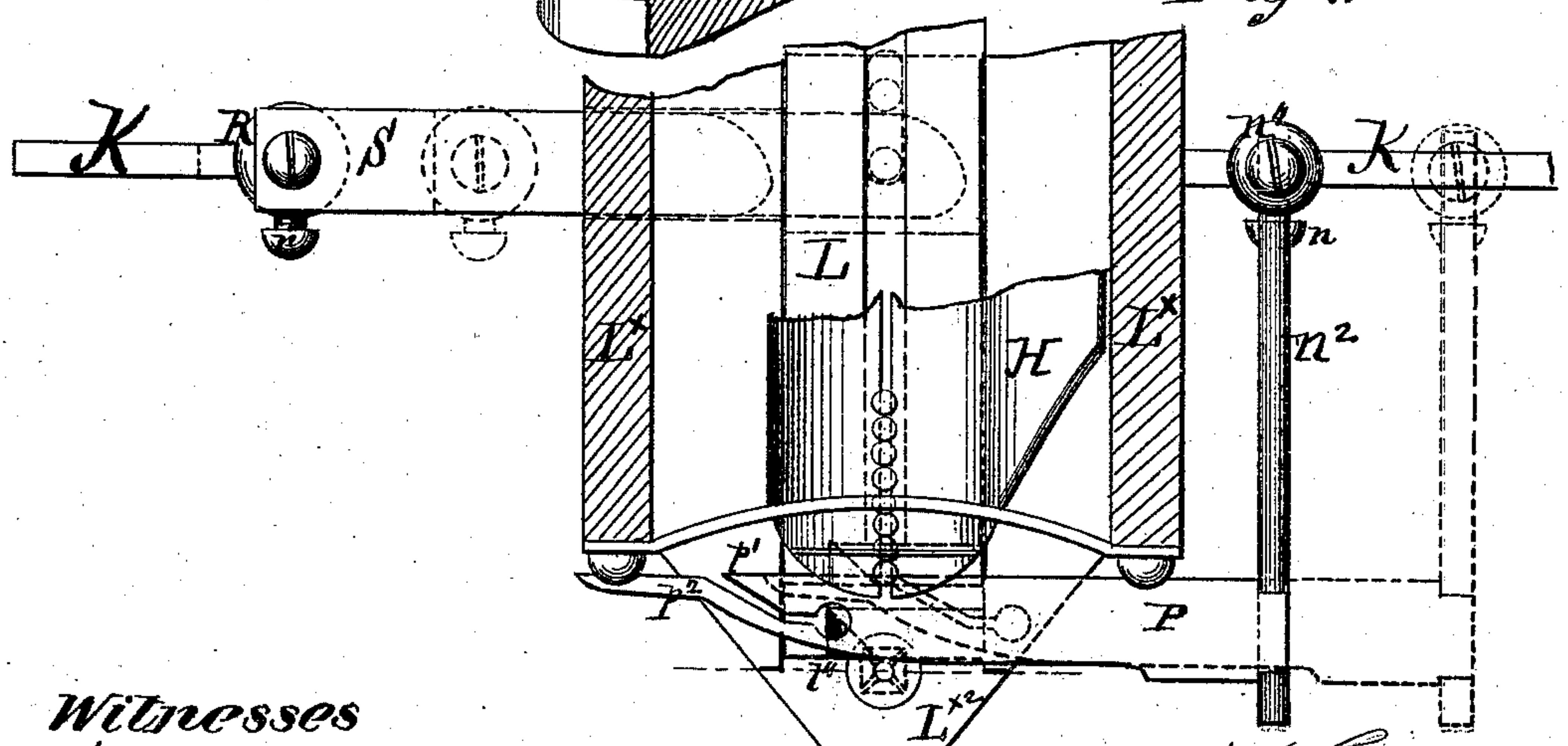
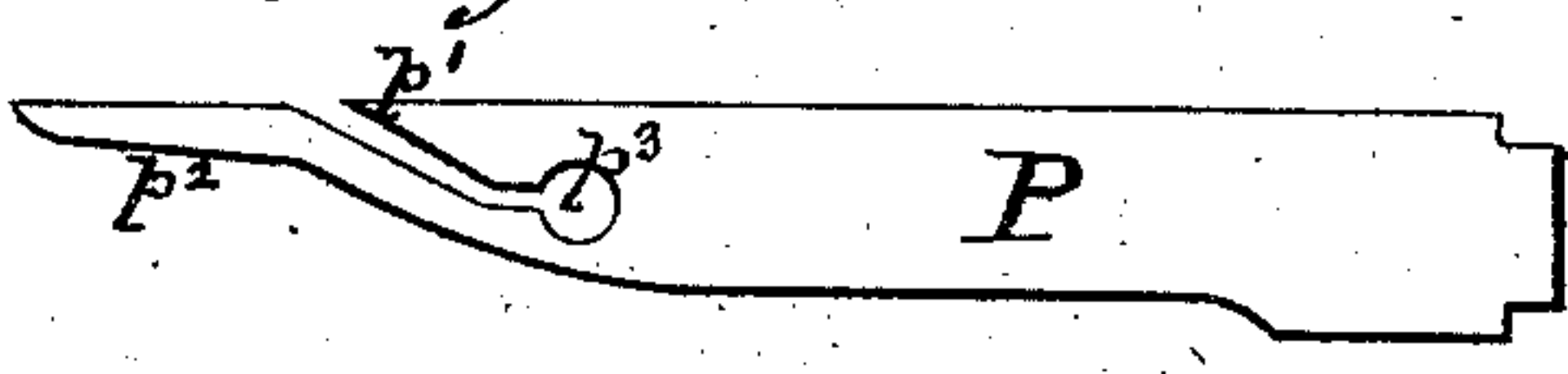


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBION KNOWLTON AND SAMUEL SHEPHERD, OF BOSTON, MASS., ASSIGNORS
TO THEMSELVES AND RICHARD P. HARRINGTON, OF SAME PLACE.

IMPROVEMENT IN NAILING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. **152,847**, dated July 7, 1874: application filed
April 11, 1874.

To all whom it may concern:

Be it known that we, ALBION KNOWLTON and SAMUEL SHEPHERD, both of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Machine for Nailing Soles on Boots and Shoes, of which the following is a specification:

Our invention relates to certain improvements whereby the operation of nailing soles on boots and shoes is greatly facilitated; and consists in the peculiar construction, arrangement, and operation of parts, as hereinafter particularly described and set forth.

In the accompanying drawing, Figure 1 is a vertical section of a machine embodying our improvements. Fig. 2 is a side view, partly in section, at right angles with Fig. 1. Fig. 3 is a partial horizontal section. Fig. 4 is a top view. Fig. 5 is a vertical section on an enlarged scale. Fig. 6 is a perspective view, hereinafter particularly referred to. Fig. 7 is a horizontal section, hereinafter particularly referred to. Fig. 8 is a top view of the "picker-out," or nail-carrier.

The base or platform which supports the machine consists of a plate, A, provided with legs *a*. From the plate A extend upward two standards, *a*^x, in which the main driving-shaft *a*² is journaled, said shaft having a series of driving-pulleys on its end. The shaft *a*² carries a gear-wheel, *a*³, which meshes into another gear-wheel, *b*^x, on a shaft, *b*, and thus drives said shaft. Adjoining the gear-wheel *b*^x on the shaft B is a snail-cam, C, which engages with a yoke, D, the rear end of which slides on a vertical rod, *d*, near the rear side of the plate A, and the front end works in a slot in a vertical hollow column or standard, E, extending upward from the front edge of the plate A, and engages with the lower end of a plunger, E^x, working in said hollow standard, and surrounded by a spiral spring, *e*^x. The lower end of the spring rests upon a shoulder on the plunger, and its upper end bears against a screw-cap, *e*², which may be screwed in or out in order to regulate the tension of the spring. As the shaft B revolves, the cam C raises the yoke D, and causes it to lift the plunger E^x until the shoulder of the cam has

passed a friction-roller, *d*^x, on the yoke D, when the spring *e*^x forces down the plunger with a sudden motion to the position shown in Figs. 1 and 2. Adjoining the cam C on the shaft B is a cylindrical box, G, for carrying the nails or tacks used in the machine, said box being provided with radial partitions *g*, for preventing the nails from becoming entangled with each other. This box is composed of two shells, fitting one over the other, and is provided with an opening, *g*², for supplying the nails, and another opening, *g*⁴, for feeding them out one at a time. Under the box G is a trough, H, for the reception of the nails from said box as they are dropped through the opening *g*⁴. The trough H has a slot in its bottom, through which the points of the nails drop, but are prevented from falling entirely through by the engagement of the heads of the nails with said slots, so that they hang with their points downward, as shown in Fig. 2. The trough is made of sheet metal, and is attached to the plate A by its front end, so that its rear portion is free to vibrate when struck by a projection on an elastic bar, J, with which studs *b*⁶ on the gear-wheel *b*^x engage as said wheel revolves, and press back said bar as each stud passes it, and as soon as each stud clears the bar it springs forward and strikes the trough, vibrating it so as to cause the nails to enter the slot with their points downward, as shown. The bottom of the trough is inclined downward, so that the nails in the slot will gradually slide toward the front of the machine as the trough is vibrated.

Immediately under the trough H is a block, L, which is arranged to slide transversely of the machine in a box, L^x, under the plate A. On the under side of this block is a pin, *l*^x, which projects downward through a slot in the bottom of the box, and thus limits the motion of the block. At the rear end of the block is a spring, *l*², which has a tendency to keep the block pressed toward the front of the machine. On one end of the shaft B, outside of the box G, is an eccentric, M, connected by a band and pitman with a block, *m*^x, which slides vertically in guides attached to the under side of the plate A. To the block *m*^x is attached a grooved block, *m*², arranged in

an inclined position, and capable of adjustment at different angles by means of the screw-bolt which secures it to the block m^x . The sides of the groove in the block m^2 form two inclined planes, running parallel with each other, and between them in the groove runs a friction-roller, k^x , journaled on the side of a bar, K, which runs across the machine at right angles with the line of travel of the block L, working in suitable guides to prevent lateral displacement. As the shaft B revolves, the eccentric M raises and lowers the block m^2 , which, by its engagement with the roller k^x , imparts a reciprocating motion to the bar K. On the bar K, near the roller k^x , is a standard, N, which may be adjusted at different heights by means of a set-screw, n . Through an eye in the upper portion of the standard passes a bar, n^2 , at right angles with the bar K, and capable of adjustment longitudinally by means of a set-screw, n^4 . Near the outer end of the bar n^2 is attached one end of a "picker-out," or nail-carrier, consisting of a plate or flat bar, P, the free end of which is bifurcated, or divided into two branches, p^1 p^2 , the space between which is slightly inclined inward with relation to the line of travel of the plate, so that the inner branch, p^1 , forms a sharp point, and the outer branch, p^2 , is elongated and extends beyond the point of the inner branch. The space between the branches of the fork is just wide enough to admit the body of the nail, so that the head will rest upon the two branches p^1 p^2 , and hold the nail with its point downward, while the inner end of said space is enlarged sufficiently to allow the head of the nail to pass through. The block L has on its upper side a groove, lying immediately under the slot in the bottom of the trough H, and the front end of said block is beveled or inclined backward, and also on one side of the outer end of the groove, so as to form a shoulder, l^4 , in the front end. On the bar K, near the end opposite to the roller and standard, is a block, R, which may be moved along on the bar, and secured in different positions by means of a set-screw, r . To the upper end of the block R is attached one end of a flat bar, S, the outer end of which is beveled or inclined, as shown in Figs. 3 and 7. This bar S passes through a slot in the side of the box L^x , and works under the block L, so that when the bar K moves in one direction, the beveled end of the bar S engages with the pin l^x , and moves the block L toward the rear edge of the machine; and when the bar K moves in the opposite direction, the bar S is disengaged from the pin l^x , and the spring l^2 forces the block L toward the front of the machine. The bottom of the box L^x is formed of a plate, L^{x2} , near the front end of which is inserted a die, T, the opening in the upper portion of which is smaller than the heads of the nails or tacks used in the machine. In the lower end of the plunger E is a punch, t , the diameter of which corre-

sponds with that of the opening in the die T.

When the machine is in operation, the box G being supplied with nails, the operator holds the shoe under the die T, and, if desired, the shoe may be provided with a suitable rest for supporting it. As the shafts and gear-wheels revolve, the box G deposits the nails in the trough H, and they move gradually toward the front of the machine. As the bar K moves in one direction the picker-out or nail-carrier P takes a nail from the bottom of the trough H, and carries it along until it reaches the shoulder l^4 in the front end of the block L, when the nail drops through the enlarged portion p^3 of the space between the branches p^1 p^2 , and falls down the inclined sides of the shoulder l^4 , and enters the opening in the upper part of the die T at the moment that the plunger E^x is being raised by the action of the cam C on the yoke D. The opening in the die, being smaller than the head of the nail, holds the nail in the position shown in Fig. 5 until the cam C has revolved sufficiently far to allow its shoulder to clear the roller d^x , when the plunger E descends with a sudden motion, and the punch t strikes the head of the nail while it is in the position shown in Fig. 5, driving it through the die T, and into the sole of the shoe held by the operator under the lower end of the die. As the punch t descends and strikes the head of the nail, driving it through the die, it punches from the head a ring of metal, which remains on the die-plate until the plunger completes its downward motion, when said ring is cut and separated by cutters V (see Fig. 5) on the lower end of the plunger, so as not to interfere with the next operation of the punch.

The die T is provided with an elastic prolongation below the die-plate L^{x2} , consisting of elastic strips, with their edges placed together so as to form a guide for the nail as it is forced down by the punch, preventing it from dropping loosely, and insuring its descent in a vertical direction.

What we claim as new, and desire to secure by Letters Patent, is—

1. The box G, provided with the partitions g and openings g^2 g^4 , substantially as and for the purpose shown and described.

2. The combination of the slotted inclined trough H, the elastic shaking-bar J, and a series of revolving studs, b^6 , substantially as and for the purpose shown and described.

3. The picker-out P, constructed and operating substantially as shown and described.

4. The sliding block L, working in the box L^x , and formed with the inclined shoulder l^4 , substantially as shown and described.

5. In a machine for nailing the soles of boots and shoes, the method, substantially as described, of supporting the nail by its head upon the upper surface of the die until forced through the opening in the die by a punch or driver, as set forth.

6. The cutters V on the lower end of the

plunger, in combination with the die and punch, substantially as and for the purpose shown and described.

7. A guide-tube provided with an elastic prolongation extending below the die-plate, substantially as shown and described, for the purpose specified.

8. The combination of the slotted trough H, picker-out P, and sliding block L, having the inclined shoulder l^4 , substantially as shown and described.

9. The combination of the eccentric M, sliding block m^x , grooved block m^2 , friction-roller k^4 , and reciprocating bar K, substantially as and for the purpose shown and described.

10. The combination of the sliding block L, bars S and K, inclined grooved block m^2 , and eccentric M, substantially as and for the purpose shown and described.

11. The combination of the cam C, yoke D, plunger E^x , hollow standard E, and spring e^x , substantially as and for the purpose shown and described.

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