

(No Model.)

W. J. BROWN, Jr.

MACHINE FOR INSERTING AND CLINCHING METALLIC STAPLES.

No. 369,916.

Patented Sept. 13, 1887.

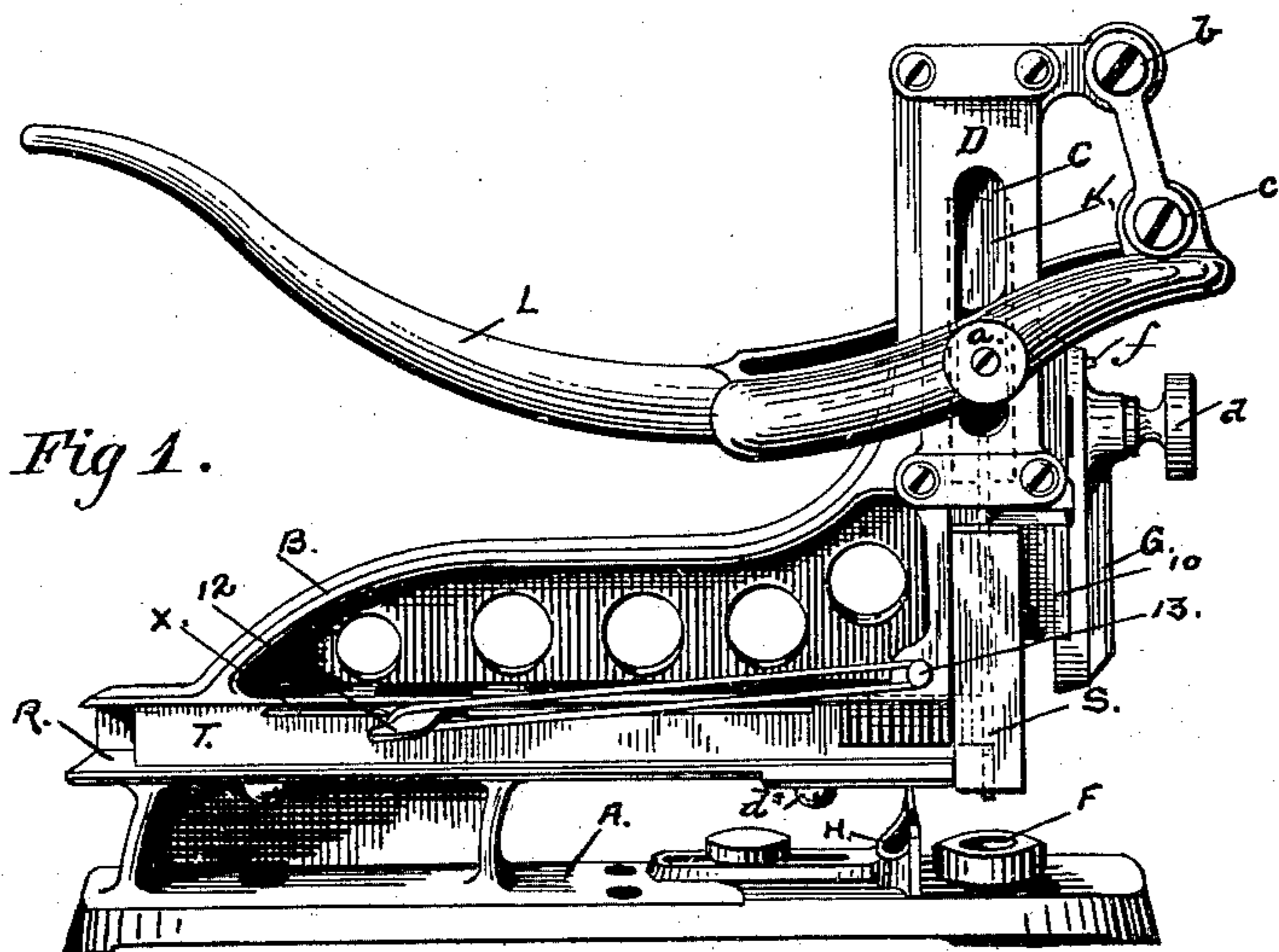


Fig 1.

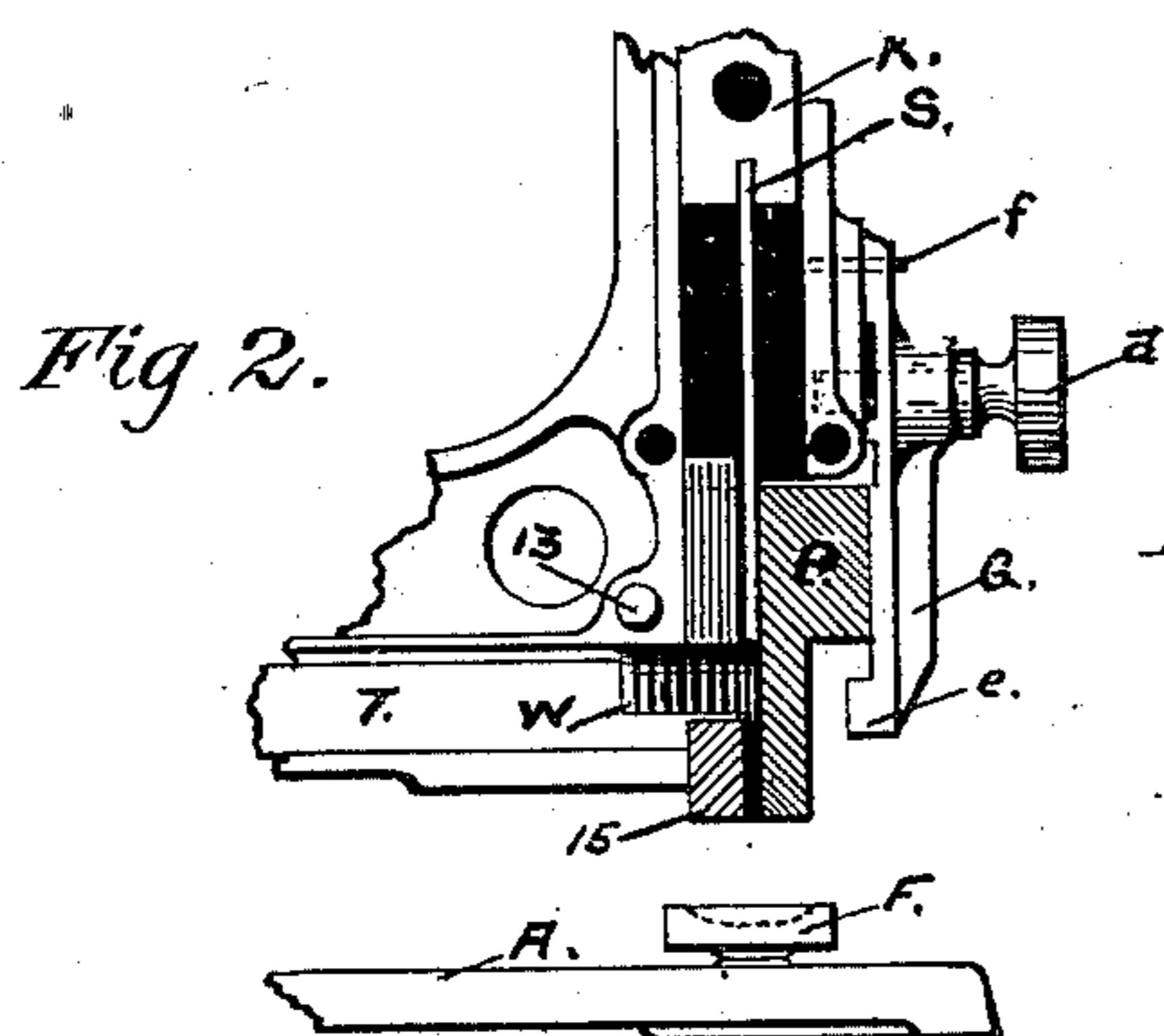


Fig 2.

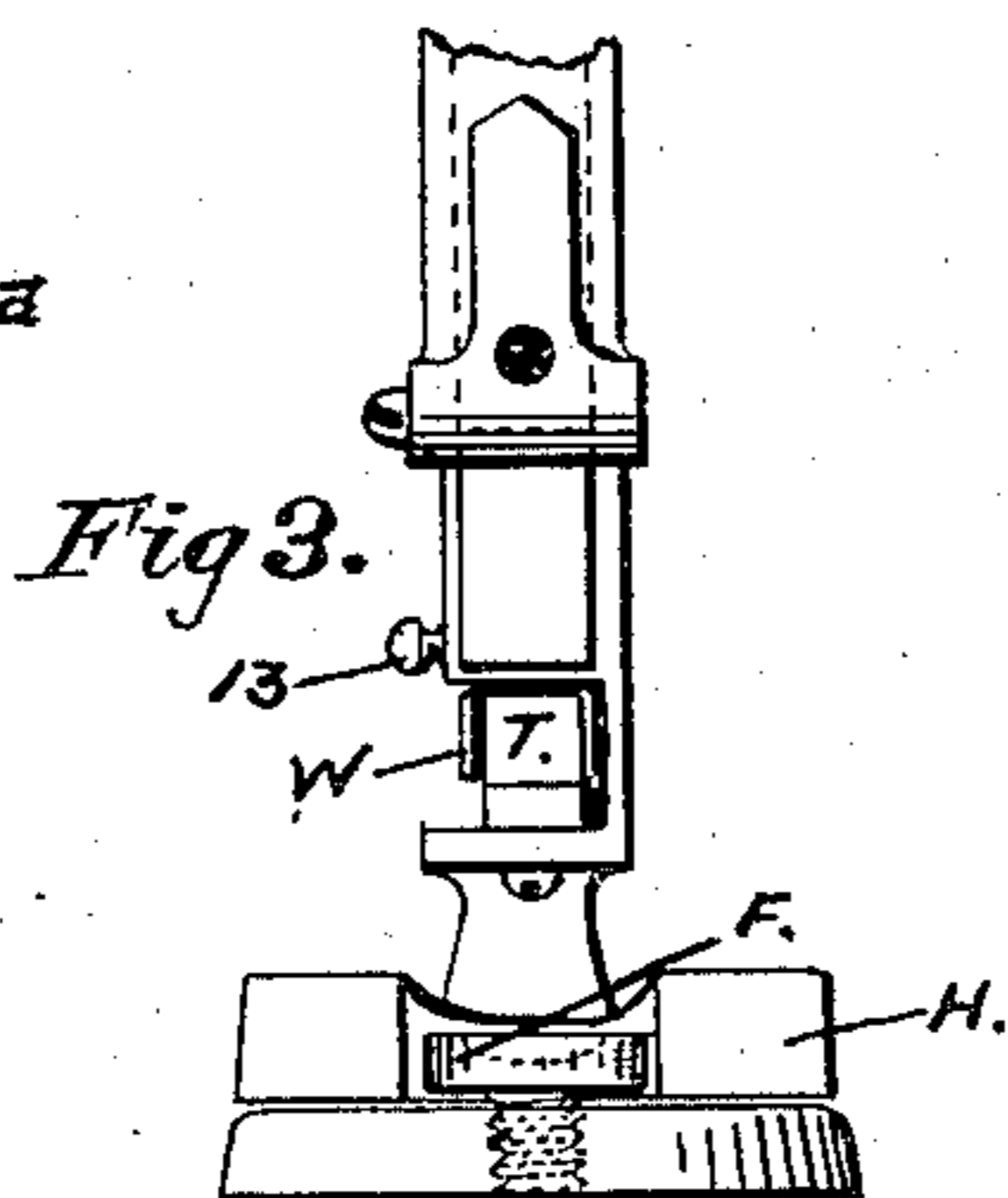


Fig 3.

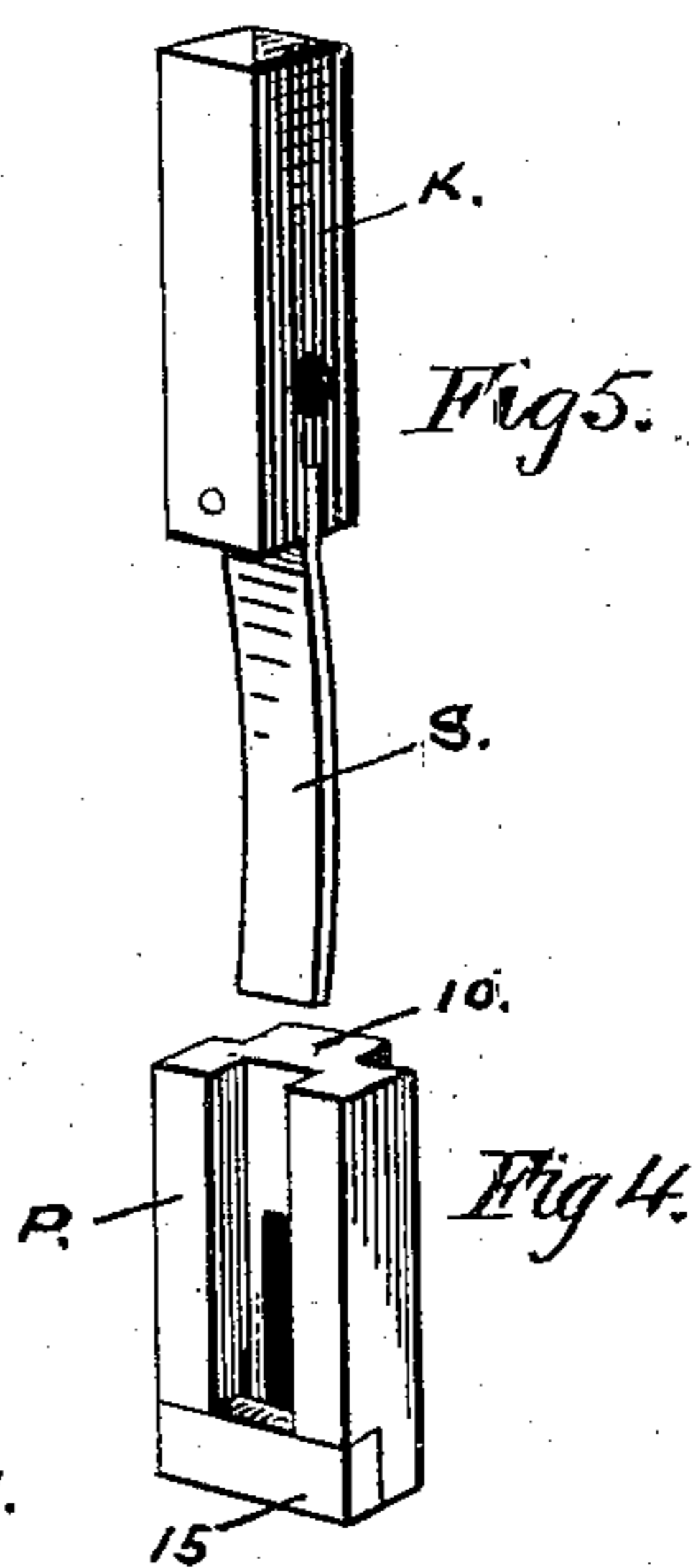


Fig 4.

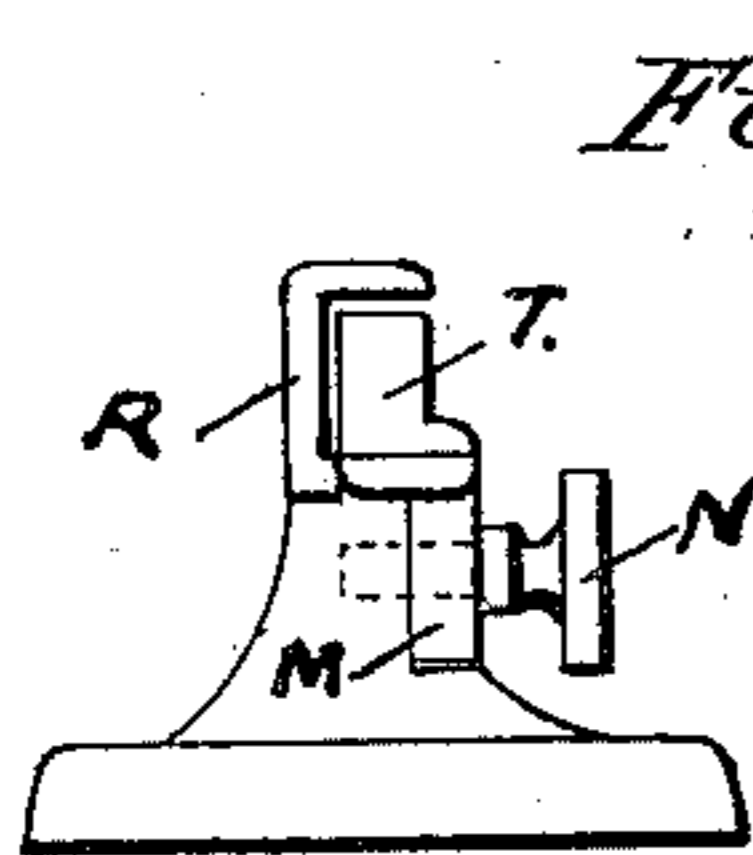


Fig 6.

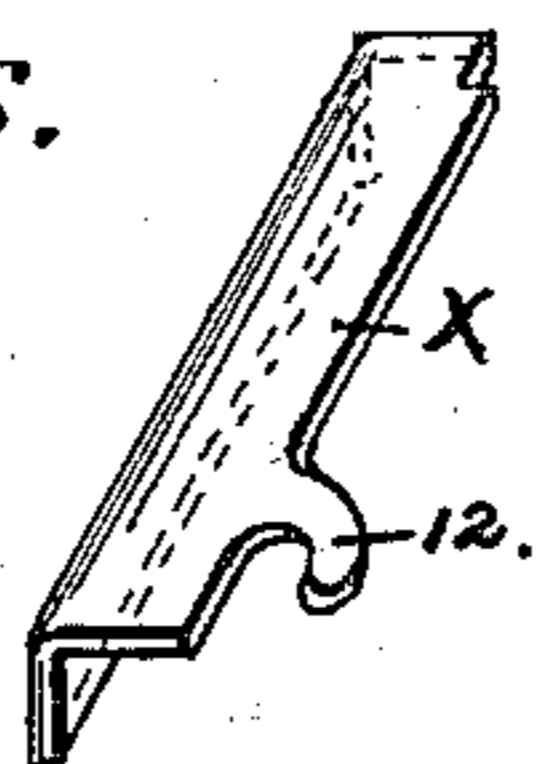
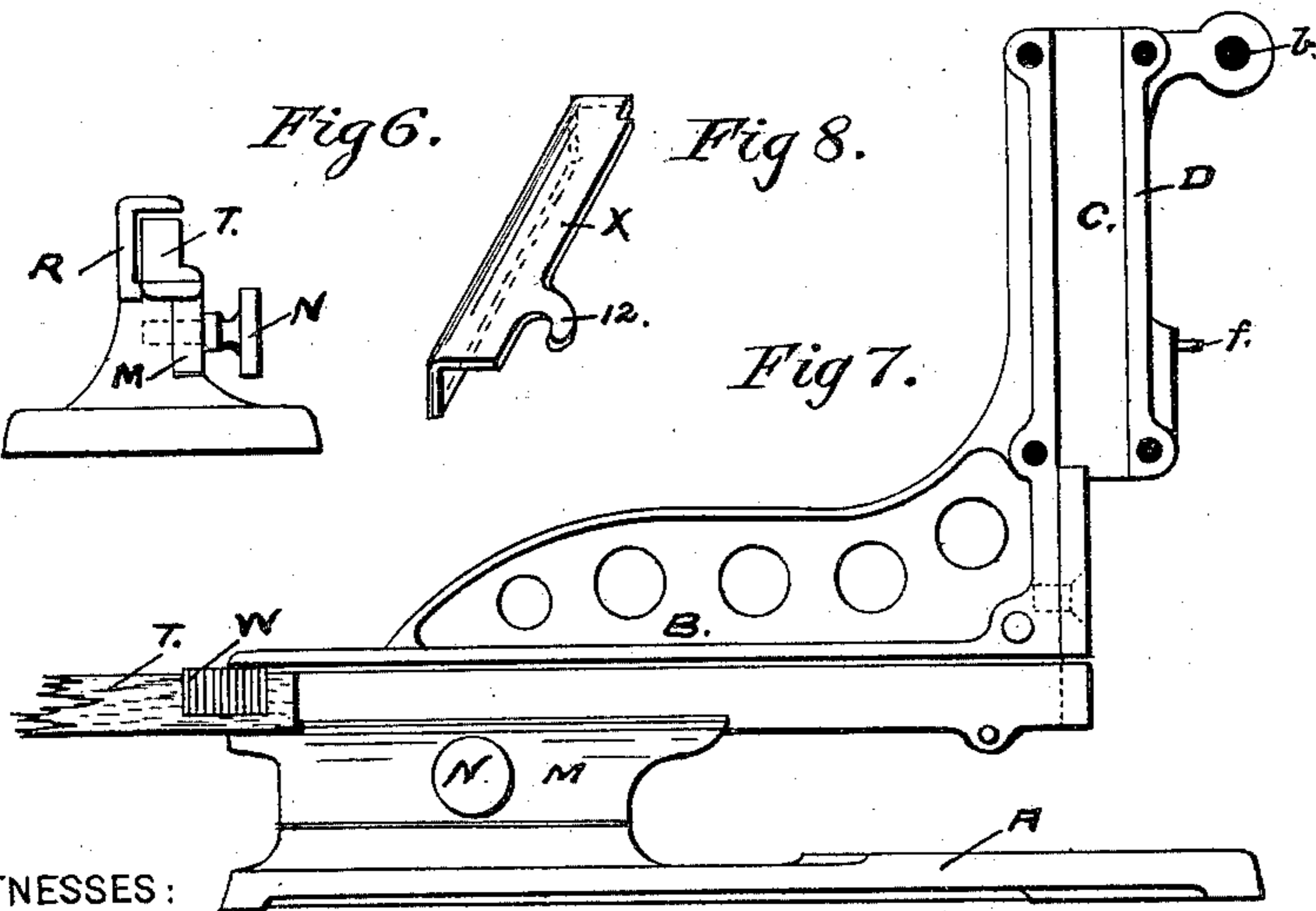


Fig 8.

Fig 7.



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MACHINE FOR INSERTING AND CLINCHING METALLIC STAPLES.

SPECIFICATION forming part of Letters Patent No. 369,916, dated September 13, 1887.

Application filed October 13, 1885. Serial No. 179,788. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. BROWN, Jr., a citizen of the United States, residing in the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machines for Inserting and Clinching Metallic Staples in Books, Papers, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to mechanism for inserting and clinching metallic staples in books, papers, &c.; and it consists, primarily, of the combination, with a frame containing in itself and constituting a magazine for supplying staples arranged in train on a bar or mandrel inserted in said magazine, of staple-feeding mechanism, with staple presenting and driving mechanism, constructed, combined, and arranged as hereinafter fully described, in order that staples may be one by one successively supplied, presented, and driven by a continuous operation; second, of the automatic staple-feeding mechanism; third, of the staple presenting and inserting mechanism, whereby the staples contained in the magazine are each successively received and brought to the surface of the material to be operated upon and driven through the same; and, lastly, of the combination, with the frame of the machine, of the staple presenting and inserting mechanism, and an underlying vertically-adjustable clinching-anvil, whereby the machine can be adjusted to varying thicknesses of material to be wire-stitched.

In the accompanying drawings, in which similar letters of reference denote like parts in the several views, Figure 1 is a side elevation of the machine, showing in dotted lines the location of the plunger within the recessed arm of the frame and of the driver within the guide-block. Fig. 2 is a vertical section of part of the machine, showing the forward end of the staple-magazine with a few staples on the bar or mandrel contained therein, the guide-block and the bracket for supporting the same, the driver and part of the plunger, the vertically-recessed arm of the frame in which the plunger is reciprocated, and the clinching-anvil. Fig. 3 is a front view of these parts. Fig. 4 is a perspective

view of the guide-block from the inside; Fig. 5, an elevation of the plunger and staple-driver; Fig. 6, an end view from the rear; and Fig. 7, a side elevation of the frame, showing how the bar or mandrel holding the staples in train may be secured in place in the magazine if made removable, (the said bar in Fig. 1 being shown as screwed permanently to the base of the magazine, the staples being slipped onto it from the rear end;) and Fig. 8 is a side view of the pusher-rod for propelling the staples forward on the bar in the magazine to the mouth of the reciprocating guide-block.

The frame of the machine is a cast-metal structure, containing in itself on the arm B an open magazine, R, having a straight-sided internal top and inner side, in which is placed a square or straight sided bar or mandrel, T, capable of receiving and supporting a number of wire staples arranged in train thereon. This mandrel may be permanently screwed in the magazine, and the staples pushed thereon from the rear, as shown in Fig. 1; or it may be removable (for the purpose of receiving staples) and secured in the magazine by thumb-screws, as seen in Figs. 6 and 7. The mandrel or staple-bar is slightly smaller than the interior of the magazine, in order that when placed therein there shall be a space between it and the interior upper and inner side of the magazine slightly more than the thickness of the staple, so as to present a space between it and the internal top and side surfaces of the magazine of the size and form of the crown and leg of the staple, and serve as a guide therefor in its passage to the staple-channel of the inserting mechanism. By this device all unnecessary parts are dispensed with, as the staple needs only a top guide for its crown and a side guide for its inner leg to guide it along the mandrel with certainty to its destination in the staple-channel. The staples are automatically pushed forward on the rod or mandrel by means of a sliding pusher-rod, Fig. 8, inserted in the magazine from its rear end and fitting around the top and inner side of the mandrel, and bearing against the last staple in the train, and capable of being moved forward until the last staple is pushed into the staple-channel of the guide-block. It is so operated by means of a pull-spring or elastic band fastened to the curved end 12 of the rod and to a finger, 13,

on the top of the magazine. The frame has also an arm, D, at the front of the machine, which is recessed vertically to form a socket, C, for the reception of the reciprocating plunger K, and also an extension-piece, *b*, to which is secured a link, *c*, which latter is joined at its other end with a lever, L, the lever being pivoted on the lower end of the plunger, at *a*, by a set-screw. Secured to the plunger at its lower end is a flat metal spring-bar, S, which serves as a staple-driver.

At the base of the frame A, immediately beneath and in a line with the driver S, is supported a clinching-anvil, F, which is a simple metal block having a recessed circular cavity on its face or in the form of a slot, the staple-legs being bent over by coming in contact with the inclined surfaces of the slot or circular cavity when driven down by pressure on the crown, as hereinafter mentioned. This anvil F is mounted on a screw working into a vertical thread in the base-plate A of the frame, so as to be adjustable as to height and to enable it (as it receives and supports the papers to be wire-stitched) to bring the upper surface of such papers to a point where it will be reached by the guide-block, which drops downward in the descent of the actuating mechanism and carries the staple received in it from the magazine to the upper surface of such papers.

A gage-plate, H, with a slotted arm held in place on the base A by a thumb-screw, *d*, serves as a convenient guide or gage for regulating uniformity in the line of staple-stitching on the edge of the books or papers to be operated upon.

The staple-driving mechanism is actuated by the said plunger K, reciprocated vertically in the socket or recess of the arm D by means of the lever L, connected with it, as above described. This plunger is merely a square or cylindrical bar fitting accurately in the said recessed arm.

The staple presenting and inserting mechanism consists of a guide-block, P, and the said driver S, both of which are reciprocated vertically—the former by frictional contact only with the driver, and the driver by being secured to the lower end of the plunger. This guide-block P (shown in perspective from the interior in Fig. 4) is a vertically-recessed block of metal with a vertical slot to form a staple channel or groove as wide as the staple, and leading from the base of the recess downward to the under face of the guide-block, and with a projecting arm, 10, on the outer side, the slot and channeled recess being of a size and form to permit the passage downward through both of the driver S and of the staples received into such recess from the magazine. It will be noticed that the guide-block is not recessed to its extreme base, (otherwise the staple-groove could not be cut therein,) or if recessed its entire length a guard-plate, 15, slightly thinner than the depth of the recess

is secured thereto to form such staple-groove. In adjusting the guide-block in the frame its inner side bears against the side of the frame, and at its highest point of reciprocation the top of the slot or groove at the base of the recess is in a line just below the ends of the staple-legs, the end of the mandrel being cut to the depth of the guard-plate 15 and resting thereon, (see Fig. 2,) thus forming a continuation of the staple-groove; and the width of the mandrel being narrower than the slot in the guide-block by the thickness of the two legs of the staple forms a guide for each leg of the staple to guide it with certainty and precision to the vertical channeled staple-groove. The block is held in position and partly guided in its vertical reciprocation by a securing-clamp, G, hung on a pin, *f*, in the frame, and fastened in position by a thumb-screw, *a*, instead of being screwed permanently to the frame, in order thereby to permit of the ready insertion and removal of the guide-block P, this clamp having an inwardly-projecting end, *e*, at its base and an internal flat side, against which the projecting arm 10 of the guide-block constantly bears.

It will be noticed (see Fig. 2) that the guide-block is thus stopped in its descent by contact of its outwardly-projecting arm 10 with the inwardly-projecting end *e* of the bracket-clamp G, and in its ascent by the recessed arm D of the frame, and it has, therefore, a very limited vertical travel. The driver S is slightly curved outward and fits accurately in the recess and channeled staple-groove of the guide-block, and the latter is reciprocated solely by frictional contact with the driver moving up and down in it.

The operation of the machine is as follows: The pusher-rod X being withdrawn, the mandrel T, if stationary, is supplied with a train of staples pushed onto it from the rear from a stick of strung staples, or, if made removable, as shown in Fig. 7, may be removed and supplied with staples, the pusher-rod then being inserted in the magazine to embrace the mandrel and bear against the side of the crown and inner leg of the last staple in the train. The lever L is then depressed, so that the driver S covers the slot in the guide-block opposite the open inner end of the magazine, and the pull-spring is then adjusted. An upward movement of the lever carries with it the plunger and the driver S, the latter carrying up (by frictional contact with it) the guide-block to its highest point. Continued raising of the lever carries up the driver alone, thus uncovering the recess in the guide-block, into which a staple from the mandrel is thus shot by the pressure of the pull-spring, and lodges therein immediately over the vertical channeled staple-groove, which recessed space thus uncovered is of sufficient width only to admit the staple therein, which is thus retained there until the descent of the driver forces it down the groove or slot immediately beneath. By

this time the plunger has reached its highest point in the recess C of the arm D. Papers or books to be wire-stitched are then placed on the anvil F, the latter being raised or depressed 5 according to the thickness of the papers, and so adjusted with relation thereto that the space between the anvil and the guide-block at its lowest point of descent will about equal the thickness of the papers. The lever, being then 10 depressed, forces the driver downward, and its frictional contact with the slotted interior of the guide-block causes the latter to drop to the upper surface of the paper. By this time, in its continued descent, the end of the driver 15 S has reached the crown of the staple lodged in the recess of the guide-block over the staple-channel thereof, and a further downward movement of the driver drives the staple down the channel-groove and into and through the 20 paper beneath, where its legs, coming in contact with the inclined sides of the circular cavity in the underlying clinching-anvil, are bent up flat or clinched against the under side of the paper. The lever being again raised to 25 its full height, or until the driver has passed the open inner end of the magazine, a second staple is ejected into the recess of the guide-block, and the operation is repeated as before.

What I claim as my invention, and desire to 30 secure by Letters Patent, is—

1. The combination, in a frame, A, constructed with an extended vertically-recessed arm, D, and a magazine, R, of staple-feeding mechanism with staple presenting and driving 35 mechanism acting in unison with each other, in order that staples may be one by one successively supplied, presented, and driven by a continuous operation, said feeding mechanism consisting of the magazine R, mandrel T, 40 pusher-rod, and pull-spring, and said presenting and driving mechanism consisting of the vertically-reciprocating guide-block P, guiding-clamp G, and driver S, said parts being

constructed, combined, and arranged with relation to each other substantially as and for 45 the purpose set forth.

2. Automatic staple-feeding mechanism arranged to deliver staples singly and successively to the staple-channel of the presenting and inserting mechanism, consisting of a maga- 50 zine having a flat-faced top and inner side, a square-sided mandrel capable of receiving and supporting a train of staples and placed within said magazine, a pusher-rod, and a pull-spring, the said parts being constructed, arranged, and 55 operating substantially as described.

3. The combination, with the frame A, having a vertically-recessed arm, D, supporting actuating mechanism, of the vertically-reciprocating channeled recessed guide-block P 60 and the driver S, the said guide-block being reciprocated solely by frictional contact with said driver moving therein, and a clamp, G, whereby the reciprocation of the guide-block is limited and partially guided, said mechanism being constructed, combined, and operat- 65 ing substantially as set forth.

4. Staple inserting and clinching mechanism consisting of the frame A, having a recessed arm, D, and a base-plate supporting a 70 vertically-adjustable clinching-anvil, F, a channeled and recessed guide-block, P, guiding-clamp G, and a driver, S, moving vertically in said guide-block and serving as the sole means by internal frictional contact therewith of ver- 75 tically reciprocating the same, said parts being constructed and combined substantially as described.

In testimony whereof I have hereunto affixed my signature this 5th day of October, A. D. 1885.

WILLIAM J. BROWN, JR.

Witnesses:

FRANCIS S. BROWN,
H. T. FENTON.