(No Model.)

J. A. KEYES.

STAPLING MACHINE.

No. 572,346. Patented Dec. 1, 1896.

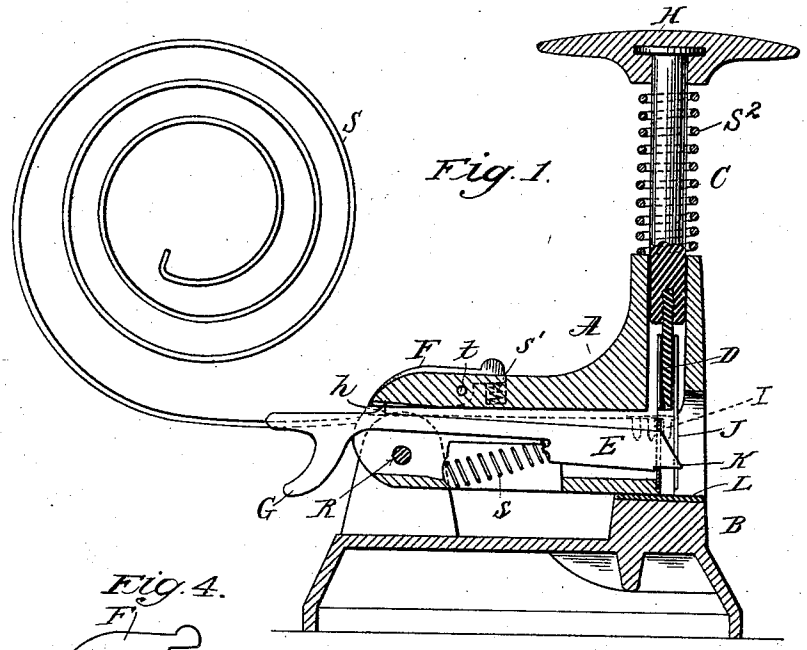


Fig. 1.

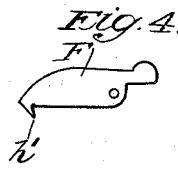


Fig. 4.

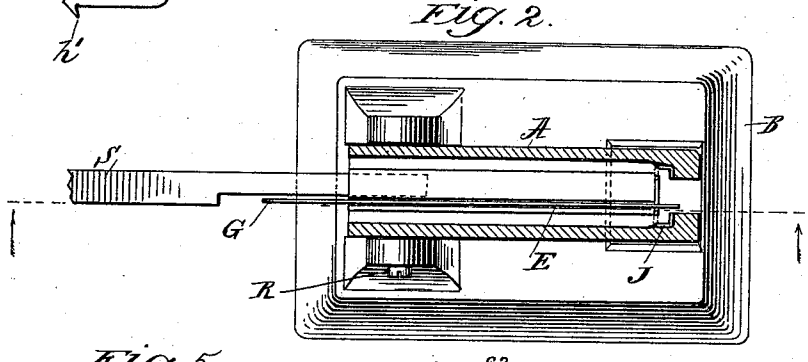


Fig. 2.

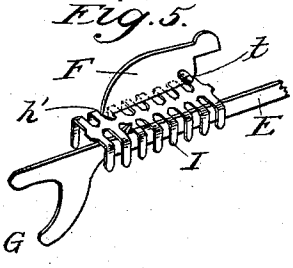


Fig. 5.

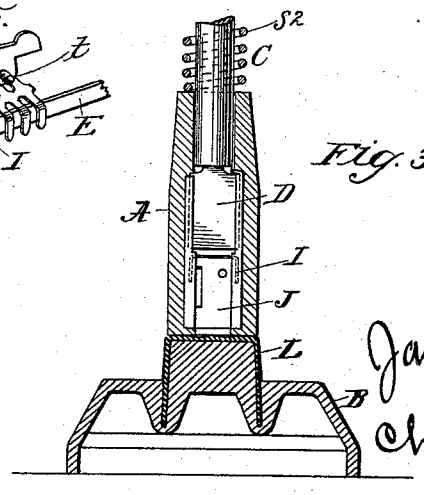


Fig. 3

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UNITED STATES PATENT OFFICE.

JAMES A. KEYES, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE GREENFIELD AUTOMATIC FASTENER COMPANY, OF SAME PLACE.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 572,346, dated December 1, 1896.

Application filed September 7, 1895. Serial No. 561,776. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. KEYES, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made a new and useful Improvement in Stapling-Machines, of which the following is a specification.

My invention is directed to improvements in stapling-machines which sever and drive a staple from a strip of completed united staples through the agency of a single plunger which severs one staple at a time, forces it forward into the material it is designed to hold, and ultimately clenches it on the under side thereof; and its objects are, first, to provide a sure and efficient means of automatically feeding the staple-strip forward each time after a staple has been clenched and driven; second, to provide means whereby the strip of staples may be removed from the machine whenever it is desired so to do.

In order that my invention may be fully understood by those skilled in the art to which it appertains, reference is had to the accompanying drawings, in which—

Figure 1 represents a part longitudinal sectional and part side elevational view taken through the body of the machine on the dotted line shown in Fig. 2 and as seen looking at that figure in the direction of the arrows from the bottom toward the top of the drawing. Fig. 2 is a part horizontal sectional part plan view of the machine; and Fig. 3 is a transverse sectional view thereof, taken through the body of the machine at right angles to the plane upon which Fig. 1 is taken. Fig. 4 is a detail elevational view of the retaining-pawl which holds the staple-strip while it is being fed forward. Fig. 5 is a detail perspective view of a part of a strip of completed staples and also illustrating the operation of the feeding mechanism thereon.

Referring now to the drawings in detail, B represents the base of the machine, and A the frame or support of the operative parts thereof, said frame or support being hinged to the base by a screw-rod R, extending through lugs or ears, as clearly shown in Figs. 1 and 2.

D represents a steel or equivalent cutting and driving plunger, having vertical movement in a guideway J, said guideway being held in position in the mold when the part A is cast, and L represents an anvil, also of steel, held in position in a mold when the base B is cast around it. The upper end of the plunger D is screw-threaded into a plunger-rod C, which in turn is provided with an operating-handle H, of similar material to that of which the parts A and B are composed, said head being cast thereon in a manner well understood by those skilled in the art of casting.

S^2 represents a spiral returning-spring for the rod C.

S represents a spiral support for sustaining the strip of staples, the inner end of said support being cast into the frame or support A in alinement with a slot therein, which slot gives direction to and supports the strip of staples as the latter is fed forward.

E represents a feeding-bar provided with a feeding-pawl *h*, and a releasing lock or extension G for releasing the pawl *h* when desired.

s represents a spiral spring, one end of which rests against a bearing at the lower side of the frame or support A and the other, when the spring is under compression, against a lug or extension on the under side of the feeding-bar E. This feeding-bar E, when in position, is located in a vertical slot which extends throughout the entire length of the frame or support A, and is provided with an inclined face K, which inclined face normally lies in the path of one edge of the cutting-plunger D.

F is a retaining-pawl having a hooked end *h'*. It is pivotally supported at *t* in a vertically-disposed slot in the frame or support A at a point to one side of the feeding-bar E, so that its hooked part *h'* will assume the position shown in Fig. 5 with relation to the strip of staples I, as the latter is being fed forward.

s' is an actuating-spring for the pawl F.

The operation of my improved stapling apparatus is as follows: A strip of staples I of the desired length is first placed upon the

spiral support S, with the legs of the staples extending on opposite sides of said support. It is then forced forward into the position shown in Fig. 1 until the inner end staple rests against the walls of the guideway J, as will be understood upon examination of Fig. 2. In this position the feeding-bar E and its operating detent or hook h, together with the retaining-pawl F and its operating detent or hook h', assume the position shown in Figs. 1 and 5, under the influence of the springs s and s'. The hinged support or frame A is now turned about its pivot-rod R and the material to be acted upon placed upon the anvil L, after which the frame or support is returned to the position shown in Fig. 1. The operator now strikes the handle H a severe blow with the palm of the hand, thereby causing the cutting-plunger D to be forced forward, at the same time severing and driving the inner staple through the material until its points come into contact with the anvil L and are ultimately clenched on the under surface of said material. When the plunger D descends, as already described, it comes into contact with the inclined face K of the feeding-bar E, thereby forcing it backward a sufficient distance against the stress of the spring s to permit the detent or hook h to grasp the next succeeding staple in the rear after the manner shown in Fig. 5. At the same time the retaining-pawl F and its detent or hook h' assume the position shown in that figure, thereby firmly holding the strip against withdrawal. As the plunger D is returned to its upper position under the influence of the spiral spring S^2 around the rod C the spring S causes the feeding-bar E to advance, thereby feeding the staple-strip forward one staple. It is now in position to sever and drive an additional staple.

If it is desired at any time to remove the strip of staples, it is only necessary for the operator to bear down upon the lug or thumb-piece G and simultaneously upon the inner end of the retaining-pawl F, so as to release the detents or hooks h and h', when the strip may be removed at pleasure.

I am aware that a stapling-machine has heretofore been devised which severs and drives one staple at a time from a completed strip of staples.

I am also aware that a staple-strip-retaining device of spiral form has heretofore been devised and that it is old to feed such a strip of staples forward by mechanism actuated by tilting a pivoted supporting-frame about its pivot or support, and I make no claim broad enough to include such a structure. The most generic claim made by me in this particular is directed to a stapling-machine provided with feeding mechanism which is controlled in its operation by the plunger which severs and drives the staples.

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

1. A stapling-machine provided with a single plunger adapted to sever and drive a single staple from a completed strip of staples at each operation, in combination with a guideway for guiding said staples to the plunger; feeding mechanism consisting of a sliding bar having an inclined face located in the downward path of the plunger; a pawl adapted to fall successively behind the individual staples of the strip when the sliding bar is forced backward by the downward movement of the plunger and a spring which normally holds said bar in its forward position, substantially as described.

2. A stapling-machine provided with a completed strip of staples, spring-actuated feeding mechanism for feeding said staples forward as desired, in combination with a plunger adapted to sever and drive one staple at a time, said feeding mechanism consisting of a sliding bar having an inclined face located in the path of the plunger, and a detent or hook adapted to fall between the backs of the staples as it is forced backward on the downward movement of the plunger, substantially as described.

In testimony whereof I have hereunto subscribed my name this 5th day of September, 1895.

JAMES A. KEYES.

Witnesses:
C. J. KINTNER,
J. H. LAMPHEAR.