

(No Model.)

2 Sheets—Sheet 1.

J. A. KEYES & H. F. LEE.
STAPLING IMPLEMENT.

No. 563,970.

Patented July 14, 1896.

Fig. 1.

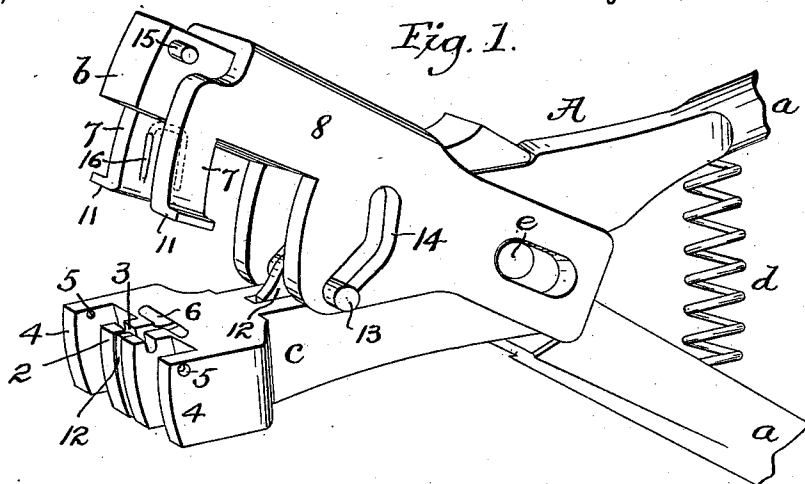


Fig. 2.

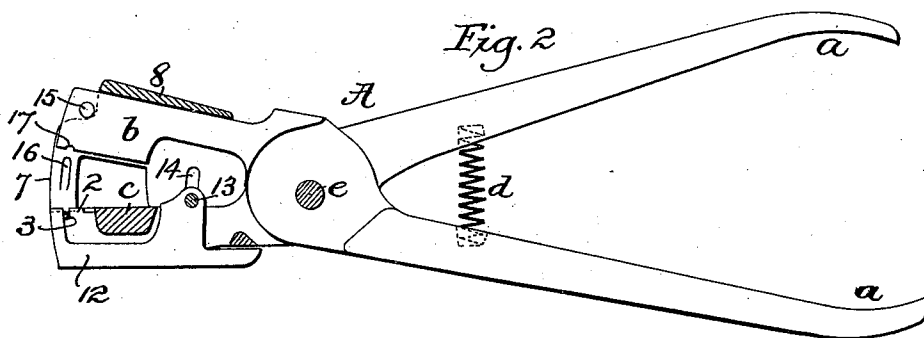


Fig. 3.

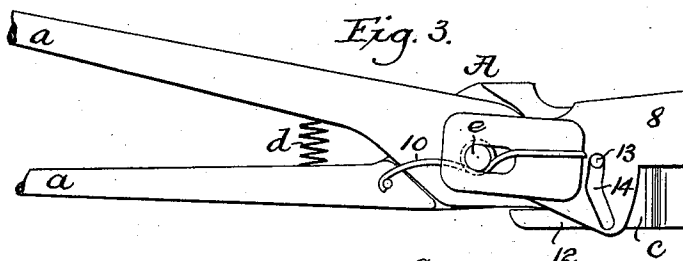


Fig. 5.

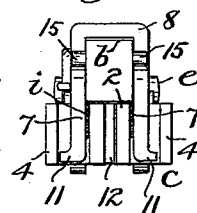
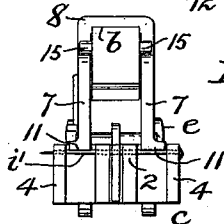


Fig. 4.



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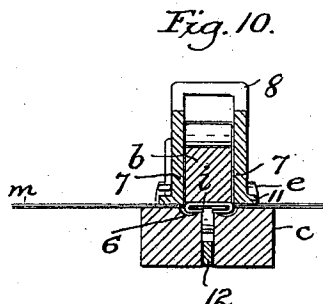
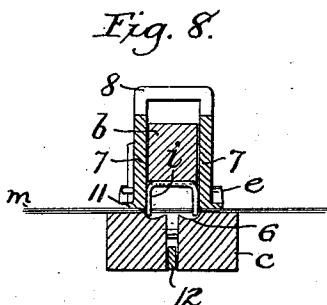
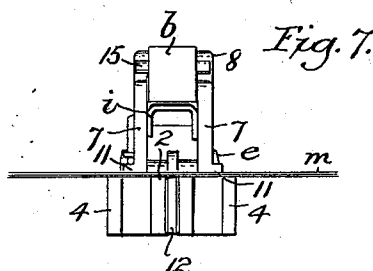
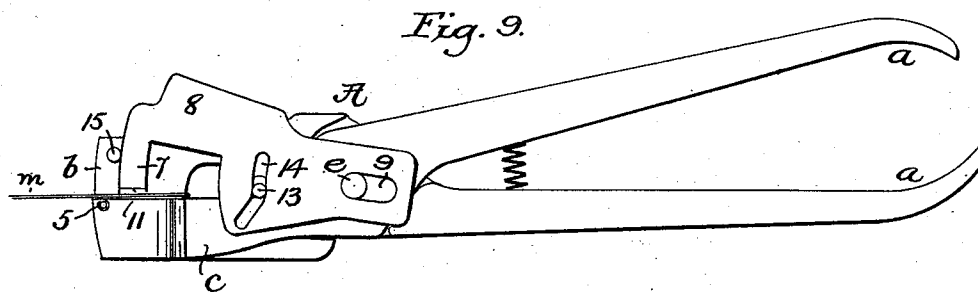
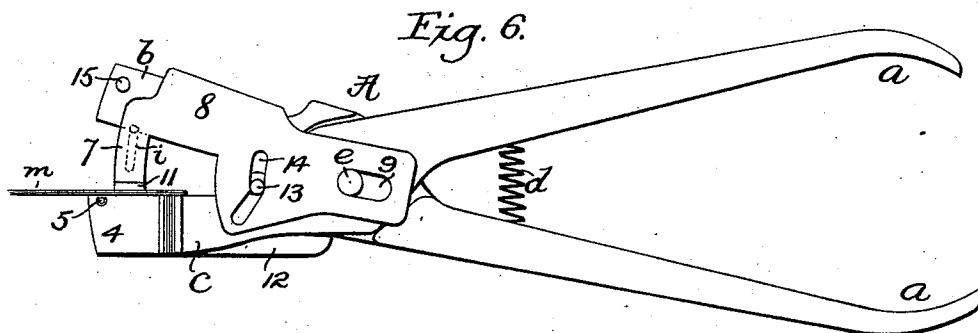
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UNITED STATES PATENT OFFICE.

JAMES A. KEYES AND HERMAN F. LEE, OF NEW YORK, N. Y.

STAPLING IMPLEMENT.

SPECIFICATION forming part of Letters Patent No. 563,970, dated July 14, 1896.

Application filed June 25, 1894. Serial No. 515,643. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. KEYES and HERMAN F. LEE, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Stapling Implements, of which the following is a specification.

This invention relates generally to stapling devices, that is to say, to a device or implement by which a staple may be formed preparatory to being employed for stapling purposes and by which the staple is forced through the material to be stapled and its legs clenched against the under side of the material.

The present improvements have for their object to provide a simple compact hand implement adapted among other things to serve the twofold function of forming the staple and of forcing such staple through the material and clenching its legs; and with these and other ends in view the invention consists in the novel implement and in the construction and arrangements of parts hereinafter fully set forth.

In the accompanying drawings, which illustrate a practical embodiment of the invention in its preferred form, Figure 1 is an enlarged perspective view of the improved implement, the handles or grasping pieces being only partially shown. Fig. 2 is a sectional elevation of the same, showing the implement at its natural size. Fig. 3 is a side elevation looking at the side opposite that shown in Fig. 1. Fig. 4 is an end elevation, the implement about to cut and form a staple. Fig. 5 is a like view with the staple formed. Fig. 6 is a side elevation showing the clamping of the material preparatory to forcing the staple therethrough. Fig. 7 is an end view of the same. Fig. 8 is a like view, the staple having been forced through the material, showing the ends of its legs in the act of being bent to clench the material. Fig. 9 is a side elevation of the implement, the stapling operation having been completed; and Fig. 10 is an end view of the same.

The improved implement is adapted in its most complete form to support a short straight length of wire, cut the same to the proper length, and bend or shape it into the form of a staple of U shape, to serve as a

support and clamp for the material to be stapled preparatory to and while it is being stapled, force the formed staple through the material, and complete the stapling operation by bending or clenching its legs down against the surface of the material.

To adapt the improvements for hand use and to be manipulated readily with one hand, the devices are formed by and mounted on a pair of tongs A, of any usual construction, pivoted at *e*, having the handles or grasping pieces *a* and the opposed and cooperating jaws *b c*, a spring *d* serving to normally hold the jaws yieldingly apart, as indicated in Fig. 1.

The lower jaw *c* provides a staple-forming anvil 2, situated in a central position, and this anvil is preferably formed across its top surface with a groove or shallow recess 3, serving as a seat for the wire both before and while being bent into staple form. On either side of the anvil 2 and arranged at a suitable distance from its vertical sides extend flanges 4, one or both of which may have a perforation 5 to receive and support the end or ends of the wire during the cutting operation, while its central portion rests in the anvil-recess 3. On the inner side of the anvil 2 and flanges 4, and level therewith, the top surface of the jaw serves as a support for the material to be stapled, and adjacent the anvil the jaw has formed in its surface the leg bending or clenching recess 6.

The upper jaw *b* carries a pair of fingers 7, which in the present instance and preferably, although not necessarily, form a fourfold function: first to cooperate with the flanges 4 of the lower jaw to cut off the wire to the proper length; second, to cooperate with the anvil 2 to form the wire into a staple; third, to carry the staple and support it during the stapling operation; and, fourth, to cooperate with the lower jaw and form one part of a clamp to grasp the material while being stapled. These fingers 7 are formed integral with a carrier 8, mounted to move with the jaw *b* and also to yield or have movement irrespective thereof. The carrier 8 is of U form arranged to straddle the jaw *b* and is slotted at 9 to embrace the pivot *e*, a suitable spring 10, acting against a projection on the carrier, being provided to yieldingly hold the

carrier against the jaw, and it may be to hold the carrier with its fingers in its rearmost position with respect to the end of the jaw and in position so that the fingers, if the tongs
5 now be rocked together or so that the jaws approach one another, will meet the surface of the jaw *c*, which in such case will act with said jaw in forming a clamp for the material to be stapled.

10 The jaw *b* proper is interposed between the fingers 7 of the carrier 8 and coöperates with the jaw *c* and its recess 6 in forming a means of driving the staple through the material and of clenching its legs upon the material.

15 The carrier, with the fingers 7, is arranged at a certain time to slide bodily outward with respect to the jaw *b*, so that the fingers 7 aline with the anvil 2 and in rocking the tongs to bring the jaws together will straddle said anvil and pass between the anvil and the flanges 4. As the fingers in moving the jaws
20 together pass upon opposite sides of the anvil 2 their ends meet the outer portions of the piece of wire which is supported by said anvil and by a continued movement bends said wire over the anvil into **U** or staple shape, the crown of the staple resting on the anvil or in its recess 3 and its legs extending upon opposite sides of the anvil between its walls and
25 that of the fingers 7. The ends of the fingers 7 are formed with a wide face 11 to more or less nearly fit the space between the anvil and the flanges 4, and the outer edge of one or both of the widened faces coöperates with the contiguous face of the flange or flanges 4 to sever the piece of wire to the proper length.

In practice the spring of the newly-formed staple *i* will be such that its legs will bear with sufficient pressure against the inner side of
40 the fingers 7 so that on the outward movement of the fingers away from coöperation with the anvil the staple will be carried by said fingers away from the anvil ready in position to be projected through the material
45 when the jaws or one jaw and the fingers are moved together.

As a means of governing the position of fingers 7 with respect to the anvil 2 there is provided a movable pawl 12, which, in the
50 present instance, is seated in a recess in the lower jaw *c* with its outer end arranged in position to meet the wire when in place on the anvil 2. The inner end of the pawl has a pin 13 projecting into a slot 14, formed in
55 duplicate in this embodiment, in the carrier 8. When a piece of wire *i'* is in place on the anvil 2, the movement of the jaws together brings the end of the pawl against the wire, in a measure clamping the same immovable
60 in the recess 3 preparatory to the staple-forming operation, and at the same time fixing the pin 13 in a rigid position, so that in the rocking of the tongs together the finger-carrier 8 will be moved outwardly by reason
65 of the slot or slots 14 to bring the fingers 7 in position to straddle and coöperate with the anvil 2 to form the staple. As the carrier is

thus automatically moved outwardly its end underlies a pin or projection 15 on the jaw *b*, so that the carrier is moved rigidly with the jaw and does not yield with respect thereto.
70 When the jaws *b c* are now further rocked together, the ends of the fingers 7 first bear against the length of wire *i'*, Fig. 4, and then by coaction with the flanges 4 cut the wire off
75 flush with the inner surfaces of the flanges, allowing the cut-off end or ends or pieces of the wire to drop from the perforation or perforations 5. A continued downward movement of the jaw *b* with the fingers 7 now
80 bends the wire over the anvil 2 into **U** or staple form *i*, as in Fig. 5, completing its formation. The tongs are then released and the spring *d* forces the jaws *b c* apart and returns the parts to the position shown in
85 Fig. 6, the spring 10, Fig. 3, sliding the carrier 8 with its fingers backwardly, so that the fingers rest over and in alinement with the flat top surface of the lower jaw *c*. The inner sides of the fingers 7 each have a shallow recess 16, in which the legs of the staple may
90 rest and allow the fingers to lie more closely to the sides of the anvil in forming the staple. The spring of the newly-formed staple *i* is sufficient to enable it to cling to the fingers
95 7, so that when they rise with the jaw *b* into position shown in Figs. 6 and 7 the staple will be carried with them. This action brings the staple above the jaw *c* ready to be forced into the material. The material *m* to be
100 stapled may now be placed on the jaw *c*, and the jaw with the carrier 8 rocked downward to bring the ends of the fingers 7 down upon the material, thus clamping it in place. A further movement of the jaw *b* will now bring
105 its under surface or notch 17 against the head of staple, moving the staple downward, its legs guided by the inner sides of the fingers 7, the downward force of the jaw *b* being sufficient to drive or force the legs of the staple
110 through the material, as in Fig. 8, with its ends entering the clenching or bending recess 6. A still further movement of the jaw *b* downward will complete the bending of the staple, as in Fig. 10, which shows the material *m* stapled. This downward movement
115 of the jaw *b* while the fingers 7 of the carrier are clamping the material has been had against the force of the spring 10; and the slot 14 is moving over the pin 13 of the pawl 12, idly moving the pawl rearward without effecting any result.

When the piece of wire or common pin *i'*, say, is first placed in position on the anvil 2, the upper end of the pawl 12 bears against the
125 wire, as in Fig. 2, and prevents the pawl from moving rearwardly, and this has the effect of holding the pin 13 in a fixed position with respect to the carrier 8, so that when the jaw *b*, with the carrier, is rocked downward the slot
130 14 (being properly shaped for the purpose) causes the carrier to be moved outwardly on the jaw *b* to bring a shoulder on the carrier beneath the projection 15 of the jaw *b*, which,

then meeting the carrier, causes the carrier to move rigidly with the jaw in the act of forming the staple. When the jaw and carrier return to their normal up positions again, the carrier moving backward rearwardly under the force of its spring 10, the fingers 7, with the newly-formed staple, is brought in position ready to staple the material on the succeeding rocking movement of the jaw *b*.

10 So long as no pin or piece of wire *i'* is in place on the anvil so as to hold the pawl rigid the carrier will remain in its normal rearward position on the jaw *b*, and hence when the jaw is rocked the ends of the fingers will be brought onto the top surface of the jaw *c*; and when a piece of wire *i'* is in position the carrier by reason of the then rigid condition of the pawl will move forward so that the fingers will pass on opposite sides of the anvil to form the wire.

15 It should be understood that while we have shown the novel features of the device in connection with a hand implement it is obvious that some of its features may be utilized in larger structures adapted, say, for automatic action without material change.

What is claimed is—

1. The combination in a stapling device of an anvil adapted to support the wire to be bent, a pair of fingers coöperating with the anvil to bend the wire and a forward and rearwardly movable carrier for said fingers to carry the formed staple into stapling position, as set forth.

35 2. The combination in a stapling device of an anvil, a pair of bending-fingers for coöperation with the anvil, a pawl for contact with the wire to be bent and a connection between the pawl and the fingers to control the position of the fingers with respect to the anvil, as set forth.

45 3. In a stapling implement, the combination with the tongs, a staple-forming anvil and staple-clenching base formed by one jaw of the tongs, a pair of bending-fingers carried by the opposed jaw and means for moving the fingers along the jaw to and from staple-forming position, as set forth.

50 4. In a stapling implement, the combination, of a fixed anvil and a staple-clenching recess in rear of and in substantially the same horizontal plane as the anvil, of a pair of movable bending-fingers coöperating with the anvil to form the staple and to carry the formed staple rearwardly from the anvil into all alinement with the clenching-recess, as set forth.

5. The combination with the two opposing jaws, an anvil formed by one jaw and a staple-clenching recess formed in said jaw, a pair of bending-fingers carried by the other jaw and means for moving the fingers into and from coincidence with the anvil, as set forth.

6. The combination with the two opposed jaws, an anvil formed by one jaw and a staple-clenching recess formed in said jaw, a pair of bending-fingers carried by the other jaw, a pawl, and a connection between it and the fingers for determining the position of the latter, as set forth.

7. The combination with the two opposed jaws, an anvil and a staple-clenching recess carried by one jaw, a pair of fingers carried by the other jaw, a spring for holding the fingers in one position to coöperate with one jaw to clamp the material to be stapled and means for moving the fingers to coöperate with the anvil to form a staple, as set forth.

8. The combination with the two opposed jaws, an anvil formed by one jaw, a pair of bending-fingers carried by the other jaw, a projection on said latter jaw, a pawl for controlling the position of the fingers on the jaw and for moving them beneath the projection to connect the fingers rigidly with the jaw, as set forth.

9. The combination with the lower jaw having an anvil, of the upper jaw, a movable pair of bending-fingers supported by the upper jaw and having a cam-slot, and a controlling-pawl having a pin engaging said slot, as set forth.

10. The combination with the lower jaw having an anvil and a cutting-flange, of the upper jaw and a pair of fingers coöperating independently with the flange to sever the wire and with the anvil to bend the wire, as set forth.

11. The combination with the lower jaw, of the upper jaw, a pair of staple-carrying fingers, a carrier for the fingers supported on said upper jaw, and means for longitudinally moving the carrier and fingers, as set forth.

12. The combination of the lower jaw, the upper jaw, a carrier supported by the upper jaw and embracing the pivot of the jaws, and a pair of wire cutting and bending fingers on said carrier, as set forth.

In witness whereof we have hereunto signed our names in the presence of two witnesses.

JAMES A. KEYES.

HERMAN F. LEE.

Witnesses:

GEO. H. GRAHAM,
E. L. TODD.