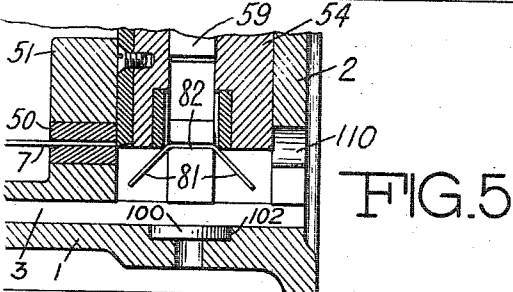
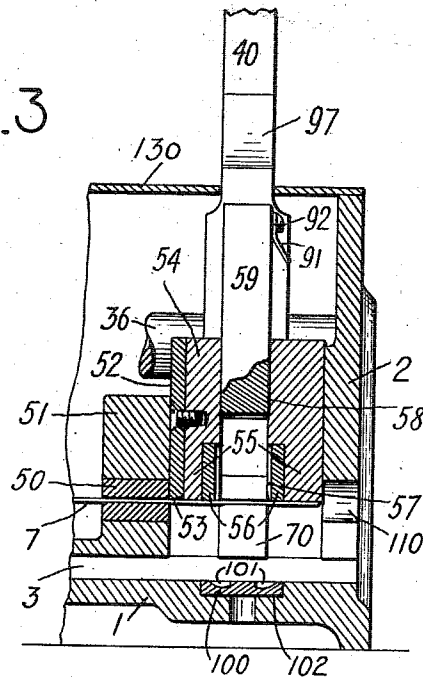
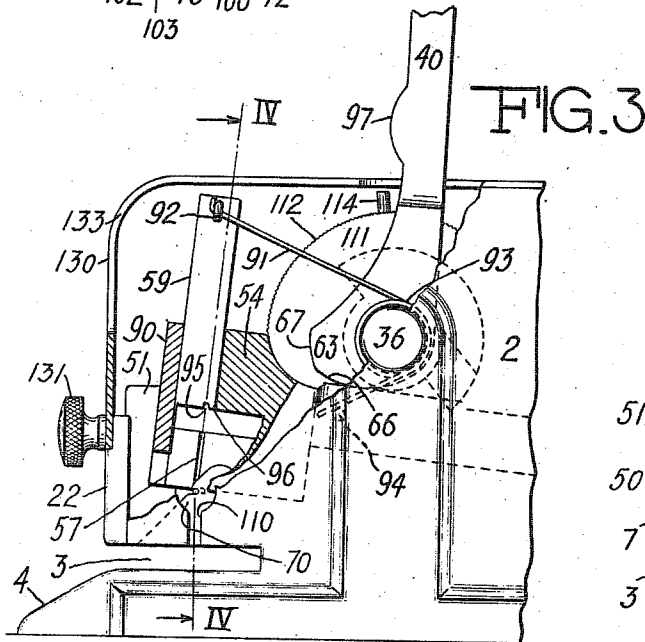
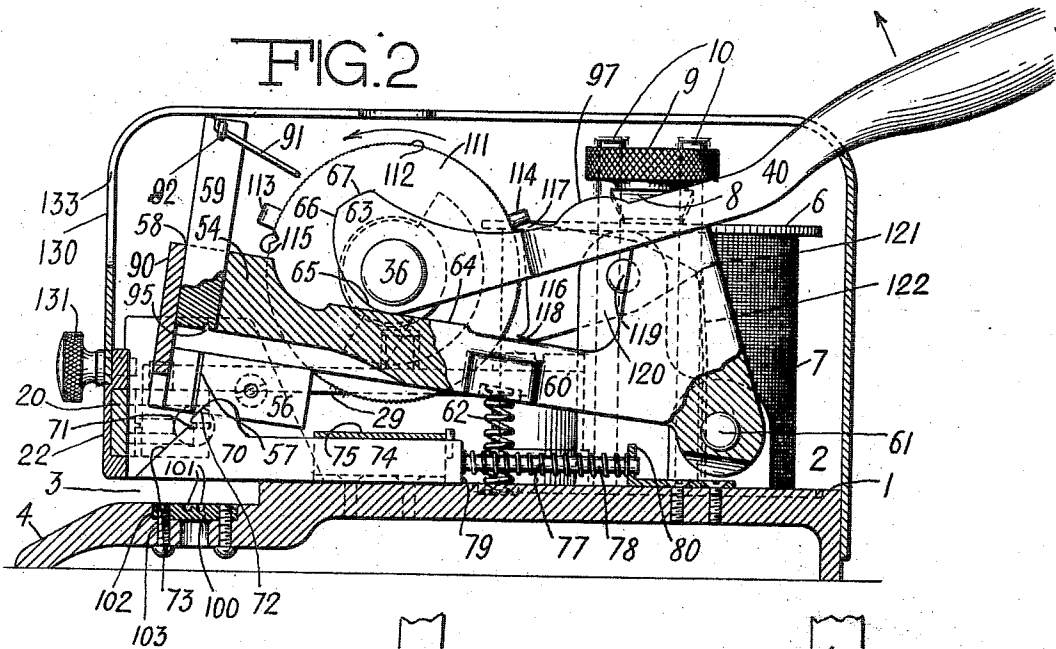


M. R. HUTCHISON.
STAPLE FORMING AND SETTING MACHINE.
APPLICATION FILED FEB. 19, 1916.

1,296,960.

Patented Mar. 11, 1919.

5 SHEETS—SHEET 2.



INVENTOR.
Miller Reese Hutchison
BY *Clifford T. Gunn*
ATTORNEY

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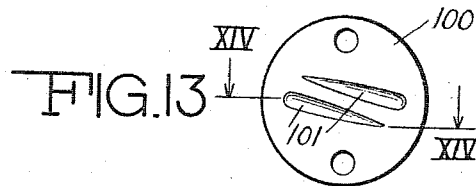
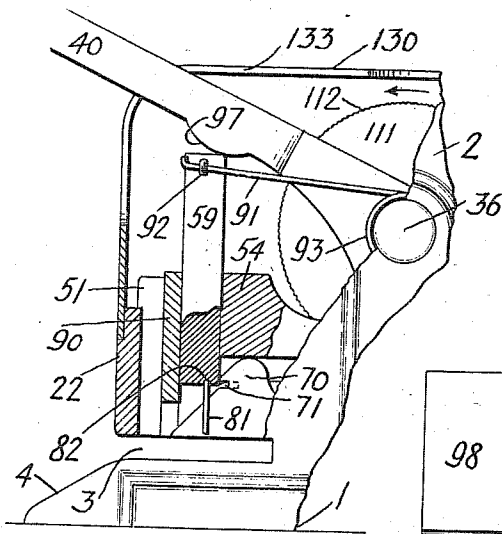
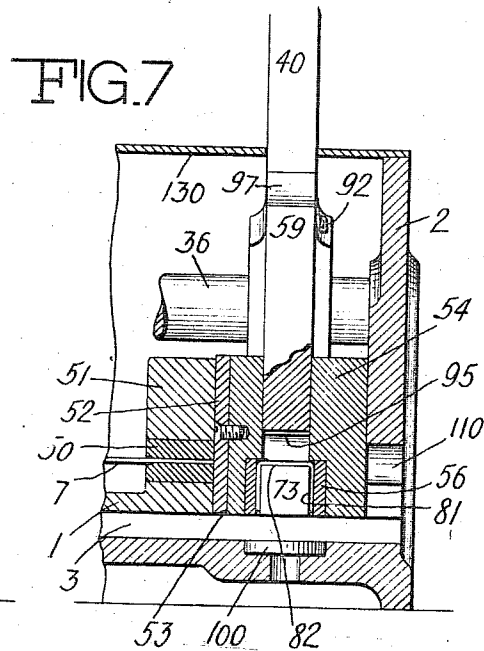
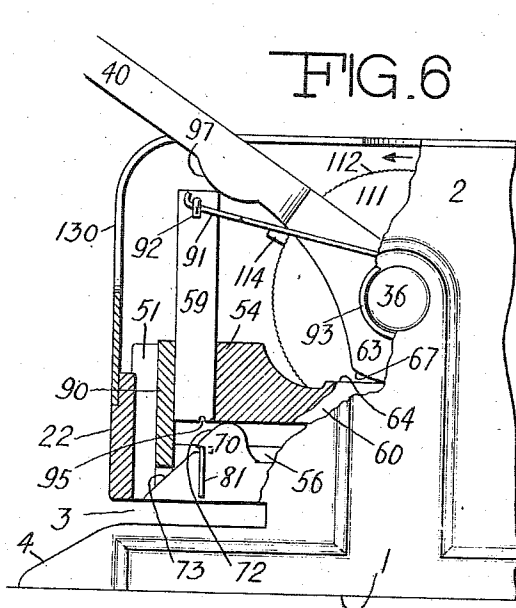


FIG. 15

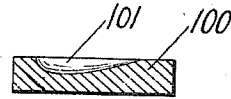
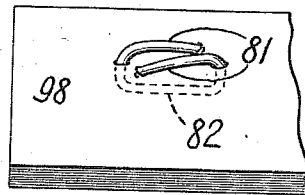


FIG. 14

FIG. 8

INVENTOR.
Miller Reese Hutchison.
BY *[Signature]*
ATTORNEYS.

1,296,960.

Patented Mar. 11, 1919.
5 SHEETS—SHEET 4.

FIG. 9

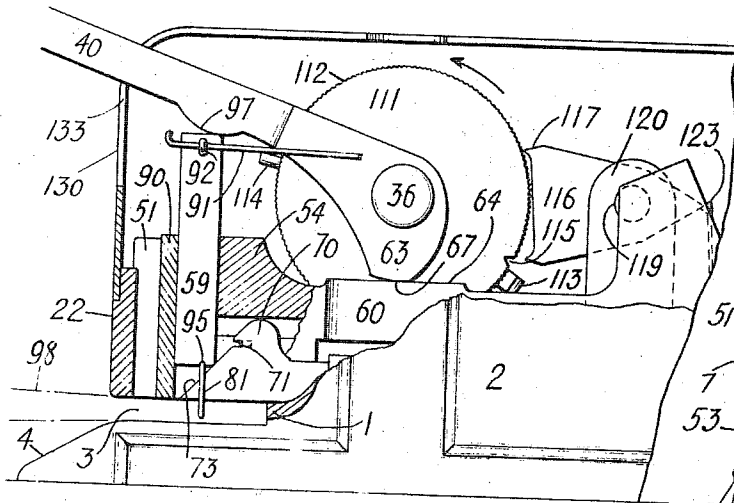


FIG. 10

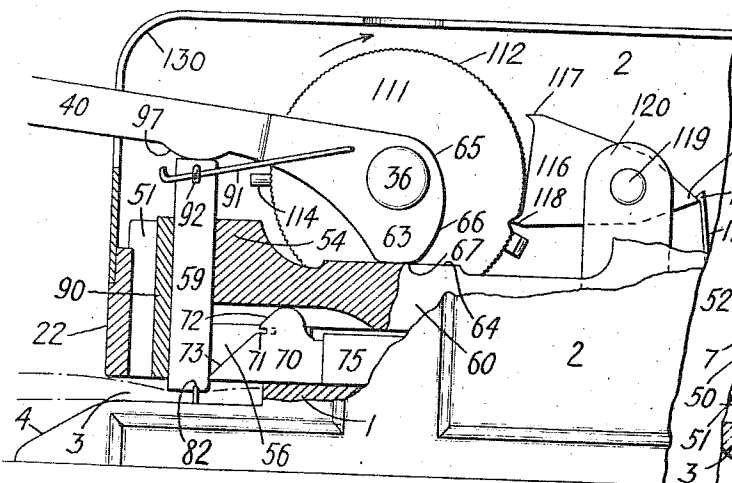
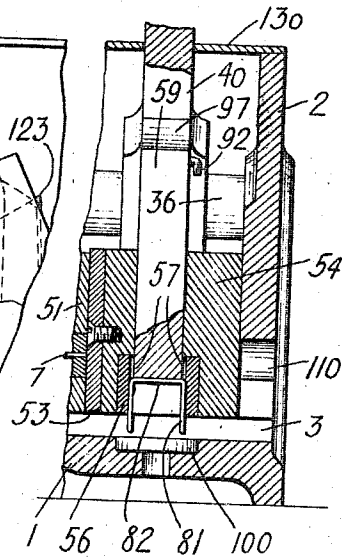


FIG. 11

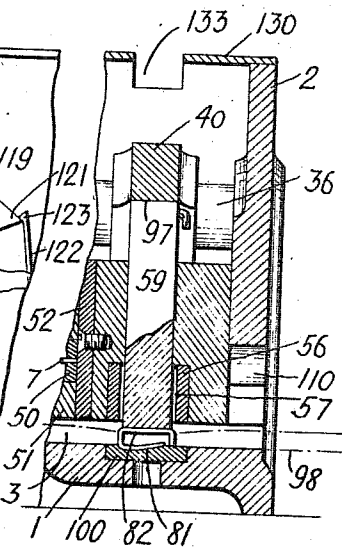


FIG. 12

INVENTOR.
Miller Reese Hutchison,
BY *Clifford E. Dunn*
ATTORNEY

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5 SHEETS—SHEET 5.

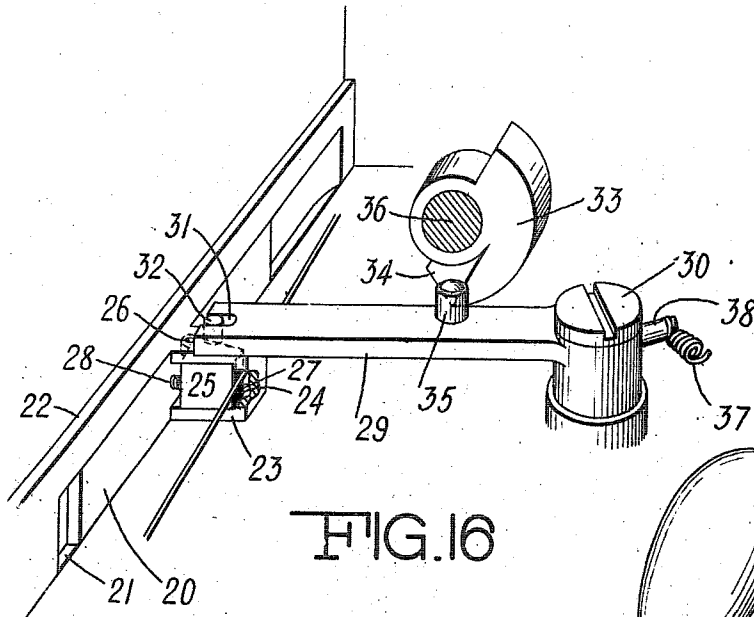


FIG. 16

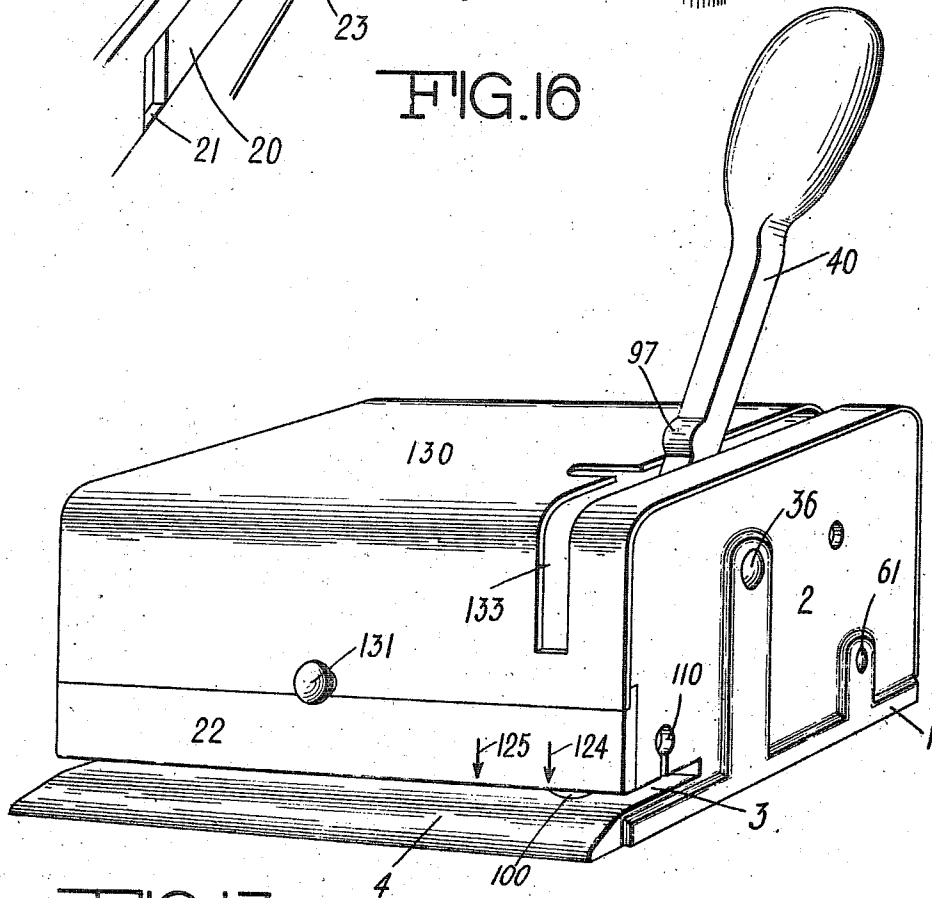


FIG. 17

INVENTOR.
Miller Reese Hutchison,
BY *Clifford E. Dun*
ATTORNEY

UNITED STATES PATENT OFFICE.

MILLER REESE HUTCHISON, OF WEST ORANGE, NEW JERSEY.

STAPLE FORMING AND SETTING MACHINE.

1,296,960.

Specification of Letters Patent.

Patented Mar. 11, 1919.

Application filed February 19, 1916. Serial No. 79,241.

To all whom it may concern:

Be it known that I, MILLER REESE HUTCHISON, a citizen of the United States, residing in West Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Staple Forming and Setting Machines, of which the following is a specification.

This invention relates to machines for forming and setting staples such as are used for fastening together sheets of paper, or for other similar purposes, and it is designed primarily to provide a simple mechanism which will take the wire or material for forming the staple from a spool, or other source of supply, cut the same off in proper length, form the same into a staple and drive and clench the staple. As will be apparent, however, some of the features of improvement hereinafter set forth may be employed with advantage in machines which do not perform all of the operations indicated.

The objects of the invention are in general to provide a machine of the character described, of very simple and strong construction, which shall perform the necessary operations with precision, which shall possess great durability, which shall be capable of handling the wire without liability of the latter becoming deranged in the machine so as to interfere with its proper operation and which shall be easy to operate and to replenish with staple-forming material.

A more specific object of my invention is the provision of a staple-forming and setting machine which shall be of such small dimensions and simplicity of operation that it is adapted for general office use and which can be constructed at so low a price as to make it generally available for such purpose.

In the accompanying drawings which form a part of this specification and which illustrate one preferred embodiment of my invention in the form of a compact hand-operated paper fastening machine, Figure 1 is a plan view of the machine with the cover removed. Fig. 2 is a transverse vertical section through the machine taken on line II—II of Fig. 1. Fig. 3 is a fragmentary end view of the machine, a part of the end plate of the frame being broken away and portions of the machine being shown in section, illustrating the parts after a partial movement of the operating

handle has taken place, and the wire for forming a staple is about to be cut off. Fig. 4 is a front vertical sectional view of the parts shown in Fig. 3 taken on line IV—IV of Fig. 3. Fig. 5 is a view similar to Fig. 4 showing the staple partly formed. Fig. 6 is a view similar to Fig. 3 showing the staple formed and the staple-setting plunger about to begin its movement. Fig. 7 is a front sectional view similar to Fig. 4 showing the parts in the position illustrated in Fig. 6. Fig. 8 is a view similar to Fig. 6 showing the parts at a slightly advanced stage in the cycle of operation, the setting plunger having begun its action of forcing back the staple-forming horn and having just engaged the staple. Fig. 9 is a view similar to Figs. 3, 6 and 8 showing a further advance in the cycle of operation, the plunger having forced the staple partly through the papers. Fig. 10 is a front sectional view showing the position of the parts indicated in Fig. 9. Fig. 11 is a view similar to Fig. 9 showing the final position of the parts and the staple clenched to the paper. Fig. 12 is a front sectional view showing the parts in the position shown in Fig. 11. Fig. 13 is a plan view of the clenching anvil. Fig. 14 is a sectional view through the same on line XIV—XIV of Fig. 13. Fig. 15 is a perspective view of the underside of the paper, or other material, showing the ends of the staple clenched thereto. Fig. 16 is a perspective view of the wire-feeding mechanism. Fig. 17 is a perspective view of the apparatus with the cover in place showing the guide marks for assisting in properly locating the articles to be stapled in correct position. Fig. 18 is a vertical sectional view through the wire-holding spool mounted on its support.

Supporting base.—Referring to the drawings in detail the numeral 1 designates a base provided with end walls 2 and having a suitable slot or pocket 3 formed in its front edge to receive the papers to be fastened. The base is preferably provided with a forwardly-projecting inclined lip 4 to assist in guiding the papers into the pocket. The base, end walls and pocket may conveniently be formed as an integral casting although this is not essential.

Wire-storing and tensional means.—Mounted in the base is a stud 5, which forms a bearing for a spool 6 upon which is wound

a supply of wire or strip 7, which is used for forming the fasteners or staples. Such a spool may contain enough wire to form a great many thousand staples so that the machine has to be recharged only at long intervals. Suitable means are preferably employed for preventing too rapid unwinding of the wire from the spool and producing the proper tension on the wire, these means, in the form of apparatus illustrated, comprising the leaf spring 8 which is slipped over the upper end of the stud 5 and held in frictional engagement with the top of the spool by suitable means such as the nut 9. The spring 8 is prevented from rotating with the spool by having its end held between the ribs 10 formed on the end wall of the base. In order to make sure that the spool will be properly placed in the machine with the wire leading from the side thereof adjacent to the wire-guiding means, the spool and its support are preferably so formed that it is impossible to place the spool incorrectly. This may be accomplished in any suitable manner, for example as shown in Fig. 18, by forming the upper part of the stud 5 as a portion of reduced diameter 5^a, the opening 6^a in the lower part of the spool being large enough to pass over the large diameter of the stud, while the opening 6^b in the upper end of the spool is of sufficient size only to go over the reduced upper end of the stud. For convenience the upper end of the spool preferably bears a suitable legend such as "This side up."

Wire-straightening means.—The wire 7, after leaving the spool, passes through a guide 11 which, as illustrated, is in the form of a small tubular member and then through a straightening device 12 which, as shown, comprises a pair of grooved pins or disks 13 and a cooperating flanged guide 14, these members 13 and 14 serving to strain the wire beyond its elastic limit so as to take the "kink" out of the wire and cause it to travel in a straight line to the staple-forming mechanism without springing out of alinement, owing to its previous coiled condition. In order to separate the members 13 and 14 to permit a new wire to be inserted between them and to provide for adjustment, the guide 14 is preferably eccentrically mounted upon a pivot screw 15 and is provided with an operating finger 16 by which it may be rotated about its pivot. The pivot screw may be tightened sufficiently to hold the guide 14 frictionally in whatever position it may be placed. Any other suitable straightening means may be employed for the purpose stated.

Wire-feeding mechanism.—After coming from the straightening device the wire is engaged by feeding mechanism which at each operation of the machine draws enough wire from the spool to form a staple and

feeds the same to the staple-forming mechanism. This feeding device may be of any suitable construction and location to accomplish the desired purpose, but as illustrated (see particularly Figs. 1 and 16) it comprises a slide 20 mounted to reciprocate in a groove 21 formed in the inner face of a front plate 22 secured at its ends to the end walls of the base. The slide 20 carries a yoke-shaped stationary gripping jaw 23 provided with teeth 24 on its inner end surface and a movable jaw 25 pivoted at 26 to the side members of the fixed jaw and having teeth 27 which cooperate with the teeth of the fixed jaw to grip the wire. A spring 28 holds the jaw 25 against the wire. The movable jaw face 27 being offset with relation to the pivots 26, it will be seen that as the slide 20 and jaws move toward the wire straightening device they will slip freely along the wire, but when moved in the opposite direction the jaws will firmly grip the wire and carry it with them. Any suitable means may be employed for reciprocating the wire-gripping mechanism, these means being shown as comprising the lever 29 mounted on the pivot 30 and having a slot 31 in its outer end adapted to receive the pin 32 projecting from the fixed jaw 23. The lever is forced in a direction to feed the wire forward by means of a cam 33 having an inclined cam face 34, which engages with a roller 35 mounted on the lever, the cam being mounted on a shaft 36 which in the form of my invention illustrated constitutes the main operating shaft of the machine. When released by the cam the lever is returned to initial position by a spring 37 attached to an arm 38 projecting from the hub of the lever. The shaft 36 is supported in any suitable manner, one end being shown as journaled in an upright 39 rising from the base of the machine, while the other end is journaled in the end wall. The shaft is adapted to be partially rotated or oscillated by means of a handle or hand-lever 40 secured thereto.

Cutting-off and stapling-forming mechanism.—The wire is fed by the feeding mechanism through a hard metal die 50 mounted in a lug 51 projecting upwardly from the base (see Fig. 4). This die forms a stationary member of a cutting mechanism the movable member of which comprises a hard metal shear 52 having a cutting edge 53 and which is secured in a recess in the side of the staple-forming head 54. By this construction, which is very strong and simple, the movement of the staple-forming head first cuts off the wire and then forms it into a staple, as will be described; but while this is a preferred mechanism, it will be understood that the cutting mechanism may if desired be of any other suitable form than that shown, and may be entirely separate

from the staple-forming mechanism. The staple-forming head 54 is bifurcated at its lower end so as to provide the two side portions 55 and is preferably provided with the hardened cheek pieces or forming dies 56 which have vertical grooves 57 formed therein. The head is also provided with a guideway 58 in which slides the driving or setting plunger 59 which will be further described hereinafter. The forming head is mounted so as to have an up and down movement for cutting off the wire and forming the staple, the preferred method of mounting being that illustrated in the drawings in which the head forms the end of an arm 60 which is pivoted at 61 to the base. The arm and head are preferably held in raised position by springs 62 (see Fig. 2). The head and arm 60 are adapted to be forced down by a cam 63 mounted on the main shaft 36 and preferably constituting the inner end of the operating lever 40. This cam engages a bearing surface 64 on the arm and is shaped to provide a dwell or portion of substantially constant radius 65 which permits a certain amount of movement of the operating handle to take place before the head begins its downward movement. The dwell 65 is followed by an active surface 66 which forces down the arm and head during a further period of movement of the operating handle after which a second dwell 67 is reached upon the cam (see Fig. 9) which serves to hold the head down while the final movement of the operating handle drives and clenches the staple as will be described later.

For holding the section of wire after being cut off and to cooperate with the forming head in forming the staple, a staple-forming block or horn 70 is provided. This block has an open sided slot 71 in its front face through which the wire is fed before being cut off, as shown particularly in Fig. 4, and in which the wire is held after being cut off and during the forming operation. The front face of this block is provided with inclined or cam surfaces 72 and 73 for a purpose which will be hereinafter explained, the upper of these surfaces preferably overhanging the lower slightly as shown. This forming block or horn is suitably mounted for reciprocating movement preferably directly upon the base 1, it being shown as having a shank 74 which slides in a guide 75 mounted upon the base, and it being normally held in projected position by a spring 77 mounted on a stem 78 and compressed between the shoulder 79 formed by the end of the shank 74 and a fixed abutment 80 secured to the base. (See Fig. 2.) The bifurcation in the lower end of the forming head is of just sufficient width to receive the horn 70 and to form the staple by bending the end portions 81 of the sec-

tion of wire over the horn so as to form the legs of the staple as shown in Figs. 5, 6 and 7, these legs being received in the grooves 57 in the cheek pieces 56, while the center or body portion 82 of the staple is held in the slot 71 of the horn.

The operation of the cutting off and forming mechanism will now be apparent. It will be seen that as the arm and forming head are forced downward by the active surface 66 of the cam 63 the section of wire held in the groove 71 in the horn will first be cut off by the cutting edge 53, whereupon the engagement of the corners of the jaws or cheek pieces 56 will immediately bend down the staple legs 81 as shown in Fig. 5, the forming head continuing its movement until the staple is completely shaped with its legs parallel, and held firmly in position in the grooves in the cheek pieces, as shown in Fig. 7. The dwell 67 on the cam is now reached so that the forming head is maintained in its downward position during the further operation of the handle which brings into action the staple-driving and clenching devices now to be described.

Staple-driving and clenching mechanism.—The driving of the staple formed and held as described is accomplished by the driving plunger 59 above-mentioned, which is slidably mounted in the recess 58 in the forming head and held in such recess by the front plate 90. This plunger moves with the forming head during the operations of cutting off and forming as above described, it being held in its uppermost position, as shown in Figs. 2 and 3, by any suitable means such as the spring 91 engaging a lug 92 on the plunger, the spring being coiled about the main shaft as shown at 93, (see Fig. 11) and its other end engaging a fixed pin 94. The plunger which is preferably formed of hardened steel is provided at its lower end with a groove 95 which is adapted at the proper time to receive the body portion 82 of the staple, and it preferably has its inside lower corner rounded, as indicated at 96, for engagement with the inclined surfaces 72 and 73 of the horn. Suitable means are provided for forcing down the plunger, this function being accomplished in the construction illustrated by the direct engagement of a projection 97 formed upon the handle 40 with the upper end of the plunger, as shown in Figs. 6, 8 and 9. The first downward movement of the plunger with reference to the forming head causes the rounded corner 96 to engage the surface 72 on the horn, and owing to the inclination of such surface to force the latter backward as shown in Fig. 8 so as to withdraw the slot therein from engagement with the body of the staple, the latter being meanwhile firmly held by the legs which are retained between the grooves in the cheek pieces of the form-

ing head and sides of the horn. The body portion of the staple is now engaged by the groove in the lower end of the plunger and the staple is forced down by the continued movement of the plunger and its legs driven into the paper or other material into which the staple is to be set, which is inserted in the slot 3 in the base as indicated by the broken lines 98 shown in Figs. 9, 11 and 12. As the forcing down of the staple progresses the horn is further retracted by the engagement of the corner of the plunger with the inclined surface 73 of the horn, as shown in Fig. 9. Thus it will be seen that the legs of the staple are firmly held between the cheek pieces and the horn during the actual driving operation. The legs of the staple when driven completely through the paper engage the clenching anvil 100 as shown in detail in Figs. 13 and 14, which is provided with the grooves 101, which serve to turn over and guide the lower ends of the staple so as to clench the same over underneath the paper as illustrated in Figs. 12 and 15. The clenching anvil preferably comprises a separate hard metal die set in a recess 102 in the base and held therein in any suitable manner as by the screws 103, shown in Fig. 2. As shown in Figs. 13 and 14 the grooves 101 are preferably deeper at the ends first engaged by the respective legs of the staple, so as to bend the same over, not too sharply, and to cause the ends to be directed upward at a reëntrant angle. The ends of the staple legs will thus be forced back into close contact with the paper or caused to actually enter thereinto, as shown in Figs. 12 and 15, thus burying the sharp ends of the staple and making a smooth finish which will not catch upon other papers or cause scratch. A pair of clenching grooves 101 arranged diagonally with respect to the axis of the body of the staple are preferably provided, although this is not essential if the staple legs are so formed as to not overlap. With the construction shown, however, it will be seen that the staple legs may be made long, but will pass by each other, thus giving a very firm grip. As much pressure as is desirable may be applied to the operating handle and transmitted from the latter through the plunger to the staple so as to cause the same to grip, and, if necessary, tightly compress the paper.

In order to facilitate the starting of a new piece of wire through the apparatus a slot 110 is preferably formed in the end wall beyond the forming head so as to permit the wire to be pushed beyond the latter and pulled from the outside, thereby securing a perfectly straight length of wire through the machine. By then manipulating the device so as to cut off this extra long piece of wire the apparatus will be placed in condition for regular operation. Unless this is

done there may be difficulty in causing the wire to start feeding properly as there will be a tendency for the wire to buckle up between the feed jaws and the dies unless it is perfectly straight.

Non-return ratchet.—As a precaution against improper manipulation of the device and incomplete operation thereof, which might cause a partially formed staple to jam in the machine, it is preferable to provide a ratchet mechanism which will prevent the reversal of direction of movement of the operating parts except after the completion of a stroke in either direction. A suitable mechanism for this purpose is shown which comprises a ratchet wheel 111 fixed to the shaft 36 and having a large number of small teeth 112 and also carrying two pins or stops 113 and 114. The ratchet wheel also has formed in it adjacent to the stop 113 a notch 115. Coöperating with this ratchet is a double-acting pawl 116 having two prongs 117 and 118 and which is pivoted at 119 to lugs 120 rising from the base. The pawl also has a rearwardly-projecting tail 121 which is adapted to coöperate with a spring 122. The latter is preferably formed with a wedge-shaped lug 123 at its end which is adapted to act upon either the upper or the lower surface of the tail and to cause either one or the other of the pawl prongs to engage with the ratchet depending upon whether the tail of the pawl is engaging the upper surface of the lug as shown in Figs. 2 and 9, or the lower surface thereof as shown in Fig. 11. The operation of this ratchet it will be seen is as follows: Starting with the handle in the position shown in Fig. 2 it will be seen that the ratchet will permit free motion of the shaft in the direction of the arrow, but that the pawl will immediately stop any motion in the opposite direction. When the stroke forward has been completed, however, it will be seen that the pin 113 will engage the lower prong of the ratchet which it is shown about to do in Fig. 9. This engagement will swing the ratchet about its pivot to an extent sufficient to snap the tail of the pawl across the wedge-shaped projection of the spring, the notch 115 in the ratchet providing the necessary clearance for the lower prong of the pawl to permit this. The handle is now free to be moved back to its original position, but it cannot be moved only part-way back and then moved forward again, as the pawl which now occupies the relation shown in Fig. 11 will prevent this. When the handle has been moved back however the pin 114 will engage the upper prong of the pawl as shown in Fig. 2 and restore the pawl to its original position.

Cover and spacing marks.—The machine is preferably provided with a suitable removable cover such as is shown at 130, which

fits down upon the base and end walls and front plate 22 so as to completely inclose the mechanism, it being shown as secured to the front plate 22 by the screw 131 (see Figs. 1 and 17). The cover is provided with a slot 133 through which the operating handle projects. Obviously any suitable form of cover or casing may be employed. In order to facilitate the proper location of the staples at equal distances from the sides of a bundle of papers, or pamphlet, or the like, which is to be stapled at more than one place, indicating arrows 124 and 125 are preferably placed on the front of the machine as shown in Fig. 17. The mark or arrow 124 is placed over the center of the clenching die while the mark 125 will be placed at a distance from the arrow 124 equal to the distance of the latter from the righthand end of the machine. In setting the staples the papers are inserted in the slot 3 with the right-hand edge of the papers flush with the right-hand end of the machine and the first staple set, whereupon the papers are slid along until the left-hand edge of the papers is under the arrow 125 when the next staple will be set.

Operation.—The operation of the machine it will now be seen is as follows: The wire having been led from the spool through the guide, straightener, feed device, die and forming members (as shown in Fig. 1) the papers or other article to be stapled are slipped into the slot 3. The operating handle 40 is then pulled forward, the first effect of this motion being to rotate the cam face 34 out of engagement with the roller 35 so as to permit the feed lever 29 and its slide to return under the influence of the spring 37 to the position shown in dotted lines in Fig. 1, where the gripping device is ready to grip a second length of wire. The continued forward movement of the handle 40 causes the lift 66 of the cam 63 to force down the forming head thereby cutting off the length of wire for the first staple and forming it as already described. Further forward movement of the handle causes the projection 97 to engage the end of the driving plunger and force the latter down, which drives the staple and simultaneously presses back the horn and ultimately by forcing the legs of the staple into engagement with the grooves in the anvil, clenches the legs of the staple and causes the reëntrant points of the latter to press into the underside of the paper, as has already been set forth. Throughout the driving of the staple and until the legs are substantially buried in the paper, it will be seen that the staple is firmly supported between the horn and the grooved cheek pieces of the forming head. When the staple has been driven and clenched the handle is moved back to original posi-

tion, either by hand or by means of a spring or otherwise. This movement permits the driving plunger to be restored to its initial position with relation to the forming head by the action of the spring 91, while the forming head is lifted to its initial position by the spring 62. The horn is also restored to its position by the spring 77. All of these movements take place while the handle is moving from its forward position to a substantially upright position, as shown in Fig. 3, and during this time the feed lever has occupied its left-hand position as shown in dotted lines in Fig. 1. The further backward movement of the handle causes the cam face 34 to engage the roller 35 and thereby feed the wire through the die 50 and into the position shown in Figs. 1 and 4, when the device is ready for another operation. Thus it will be seen that the first part of the forward stroke of the handle restores the feed device to a position to feed a second length of wire, while the last part of the forward stroke cuts off, forms and clenches the staple, while on the back stroke the first part of the stroke restores the forming and driving mechanism to initial position, while the last part of the back stroke feeds a new length of wire, so as to place the machine in condition for a second operation. The entire operation of the device thus requires merely a forward and backward movement of the handle which may be and preferably is less than 180° in extent, and all the operating parts are driven from a simple rock shaft having the necessary cams and ratchets mounted thereon. In fact in the preferred construction shown the actual operations of cutting off the wire, staple forming and driving are performed by parts driven directly by portions of the operating handle itself. The utmost simplicity of parts and the maximum efficiency of operation are thus insured.

It will be understood that numerous changes in the organization of the apparatus and in the details of construction of the various parts may be made without departing from my invention. For example the machine may be driven by power or by a treadle, or may be made in multiple form so as to set a plurality of spaced staples at the same time. Any suitable wire-straightening and feeding devices may be employed and in fact in some cases certain parts of the apparatus may be omitted or utilized with other mechanism. For example the driving and clenching devices could be so organized as to set previously formed staples. Therefore, while I have illustrated and described in detail one preferred embodiment of my invention I do not intend to limit myself thereto, but intend to cover my invention and the various

features thereof broadly and in whatever form they may be embodied.

Having thus described my invention what I claim as new herein and desire to secure by Letters Patent is:—

1. In apparatus of the class described, the combination with wire feeding means, staple forming means, and staple setting means, of a unitary operating mechanism therefor, including an operating lever, a pair of cams, a shaft carrying said cams one of which is integral with said lever and controls the said staple forming and staple setting means, and the other controlling the wire feeding means, whereby upon the operation of said lever the said means are actuated in a given sequence.

2. In apparatus of the class described, the combination of means for supporting a section of staple forming wire, a movable forming head for bending said wire into the form of a staple and for holding and guiding said staple during the said operation, a setting member carried by said forming head but movable relatively thereto, and means for moving said forming head to form a staple, moving said setting member to set the staple, and holding said forming head in its actuated position while the said member is actuated, said means including a cam, one portion of the surface of which actuates the forming head, and another portion of the surface of which holds the said head in actuated position as set forth, and a projection on said cam member adapted to operate the said setting member.

3. In apparatus of the character described, the combination of a pivoted arm, a staple-forming head carried thereby, a staple-setting member carried by said head, a shaft, a cam lever mounted thereon, the cam thereof being adapted to cause said arm to swing about its pivot so as to move said head and cause it to form a staple, and a projection extending from said lever for moving said staple-setting member relatively to said head to cause it to set said staple when formed.

4. In apparatus of the character described, the combination of wire-feeding means, staple-forming means and staple-setting means, a shaft, a cam on said shaft for operating said wire-feeding means, a lever mounted upon said shaft, a cam integral with said lever and provided with an inactive surface which first becomes effective to permit said first mentioned cam to function upon the movement of said lever, said inactive surface on said cam member being followed by an active surface for effecting the operation of said staple-forming means, and said active surface being followed by a second inactive surface for retaining said forming means in a given position during the operation of said staple-setting means.

5. In apparatus of the class described, the combination of means for supporting a section of staple forming wire, a forming head for bending said wire into the form of a staple and for holding and guiding said staple during the setting operation, a staple setting member carried by said forming head, but movable relatively thereto, and means for moving said forming head to form said staple, actuating said setting member to set the staple and holding said forming head in its actuated position while said setting member is actuated, said means including a cam, having an active surface for actuating the forming head to operative position, and an inactive surface for maintaining the head in operative position.

6. In apparatus of the character described, the combination of a movable staple-forming head, a staple-setting member carried by said head, but movable relatively thereto, and an actuating member having a cam portion for operating said head and a projecting portion for moving said staple-setting member relatively to said head.

7. In apparatus of the character described, the combination of a pivoted arm, a staple-forming head carried thereby, a staple-setting plunger slidably mounted on said head, and an operating member having a cam surface engaging said arm to swing the same about its pivot and cause said head to move to form a staple and also having a surface thereon adapted to engage said plunger and move the same relatively to said head to set the staple formed thereby.

8. In apparatus of the character described, a casing having an end wall, a stud mounted adjacent said wall and having a portion of reduced diameter, a wire containing spool having heads, each of which is provided with a central aperture, one of said apertures being less in diameter than the greatest diameter of said stud, a tensioning spring engaging one end of said spool, and means on said end wall engaging the end of said spring to prevent the latter from rotating with said spool.

9. In stapling mechanism, the combination of wire feeding and cutting mechanisms, staple forming and staple setting mechanisms, an operating lever for actuating said mechanisms by a continuous movement in one direction, and means for preventing return of the operating lever to initial position until it has been moved to its extreme actuated position.

10. In stapling mechanism, the combination of wire feeding and cutting mechanisms, staple forming and staple setting mechanisms, an operating lever for actuating said mechanisms by a continuous movement in one direction, and ratchet and pawl mechanisms controlled by said lever for pre-

venting return of the lever to initial position before it has been moved to its extreme actuated position.

5 11. In stapling mechanism, the combination of wire feeding and cutting mechanisms, staple forming and staple setting mechanisms, an operating lever for actuating said mechanisms by a continuous movement in one direction, a shaft on which said
10 lever is mounted, a ratchet carried by said shaft and a pawl controlled by said ratchet for preventing movement thereof in a predetermined direction and thereby return of
15 the operating lever to initial position before the lever has been moved to its extreme actuated position.

20 12. In stapling mechanism, the combination of wire feeding and cutting mechanisms, staple forming and staple setting mechanisms, an operating lever for actuating said mechanisms by a continuous move-

ment in one direction, a shaft on which said lever is mounted, a ratchet carried by said shaft, a pawl cooperating with said ratchet, and a spring controlled by said operating
25 lever for maintaining the pawl in position to prevent movement of the ratchet in a direction to return the operating lever to initial position before it has been moved to its extreme actuated position.

30 13. In stapling mechanism, the combination of wire feeding and cutting mechanisms, staple forming and staple setting mechanisms, an operating lever for actuating said mechanisms by a continuous movement in one direction, and means for preventing only a partial movement of said
35 lever in a direction to operate said mechanisms, and to prevent only a partial return of said lever toward initial position.

MILLER REESE HUTCHISON.