

(No Model.)

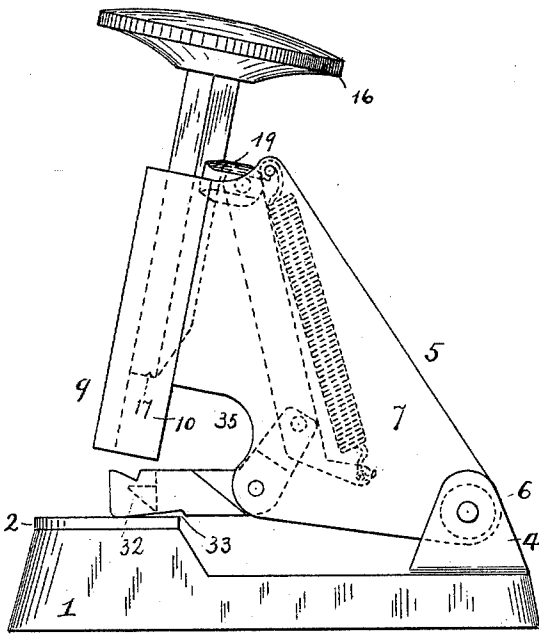
2 Sheets—Sheet 1.

# L. S. BURRIDGE. STAPLING MACHINE.

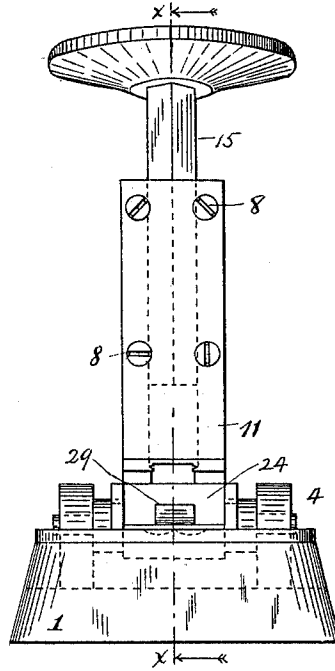
No. 600,510.

Patented Mar. 15, 1898.

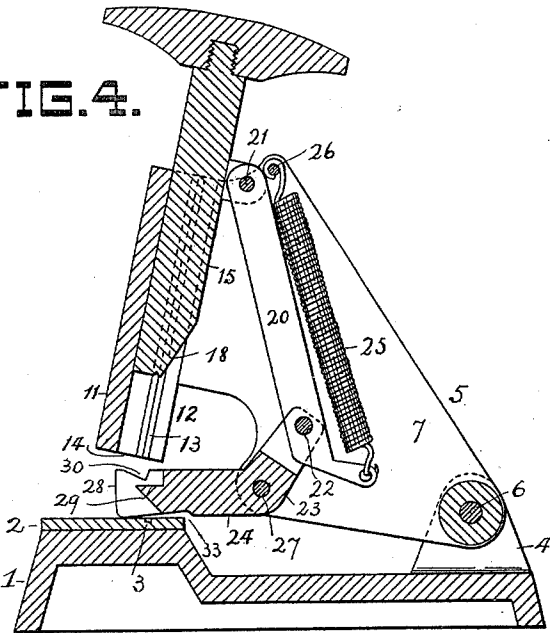
### FIG. 1.



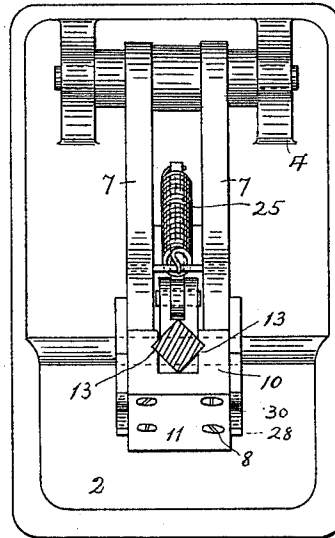
### FIG. 2.



### FIG. 4.



### FIG. 3.



**WITNESSES**

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FIG. 5.

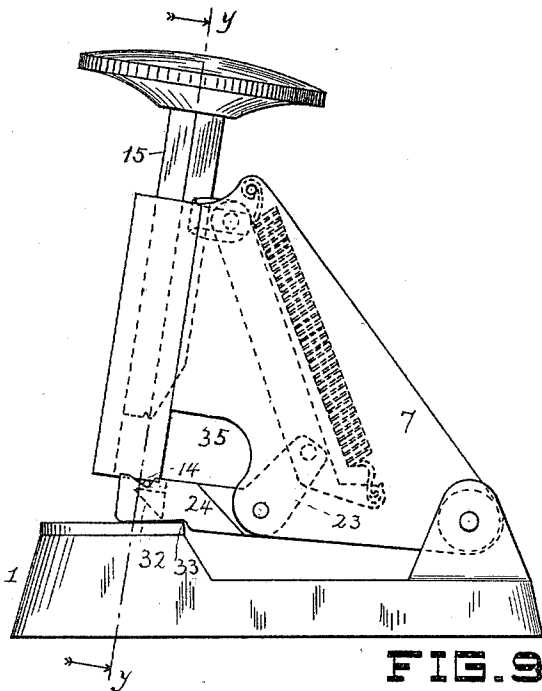


FIG. 6.

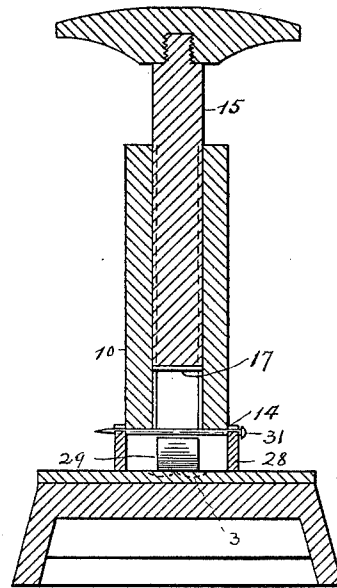


FIG. 9.

FIG. 7.

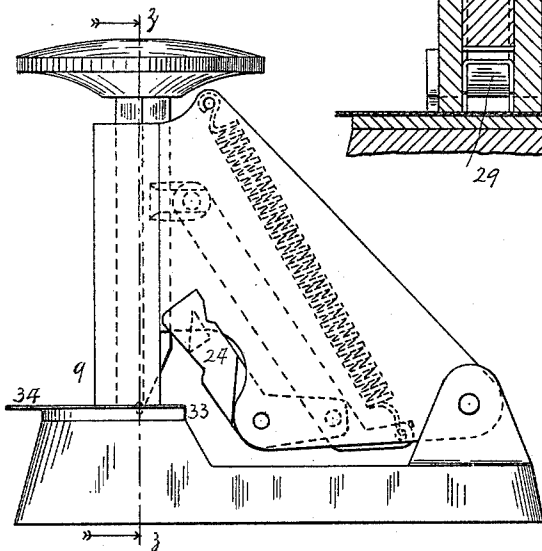
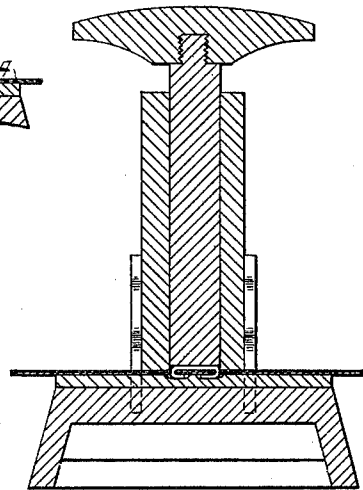


FIG. 8.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 600,510, dated March 15, 1898.

Application filed September 25, 1897. Serial No. 652,960. (No model.)

*To all whom it may concern:*

Be it known that I, LEE S. BURRIDGE, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Stapling-Machines, of which the following is a specification.

My invention relates more particularly to that description of hand stapling-machines in which the staple is formed from a straight pin or piece of wire and then driven through the material to be fastened and clenched on the under side thereof; and my invention has for its main object to provide a simple, cheap, and effective machine or implement of this kind.

My invention consists in the various features of construction and combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

The machine embodying my present improvements comprises a suitable base having formed therein a clenching-recess or equivalent device. At the rear end of the base is pivoted a head or frame which at its front side carries a combined cutter and bender in which slides a plunger constructed at its lower end to form the driver for forcing the staples through the material. The said plunger or driver reciprocates in V-shaped grooves formed in the cutter and bender, which grooves also receive the formed staple, as will hereinafter appear, and to the said driver or plunger is connected, by means of a link, a vibratory device which is independently pivoted or fulcrumed at the lower portion of the head or frame back of the plane of the bender, which vibratory or lever-like device is forked at its forward end to provide a rest or support for the pin or wire and to also provide means to cooperate with the cutter or bender to enable the pin or wire to be properly cut or severed to size, and the said vibratory device is also formed or provided with an anvil about which the severed pin or wire is bent into staple form by the said combined cutter and bender, the said anvil then swinging out of the way to permit the descending driver to come down onto the crown of the staple and force it through the work, after which a spring

returns the moving parts to their normal positions, all as will now be more specifically set forth in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a stapling-machine embodying my improvements, the parts being shown in their normal positions of disuse. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view taken below the knob, but showing the plunger or driver in section. Fig. 4 is a vertical section taken at the line *xx* of Fig. 2. Fig. 5 is a view similar to Fig. 1, but showing a pin in position to be cut and the cutter as just about to operate on said pin. Fig. 6 is a vertical section taken at the line *yy* of Fig. 5. Fig. 7 is a side elevation showing the parts in still other positions and representing the staple as having been formed, driven, and clenched on the paper. Fig. 8 is a vertical section taken at the line *zz* of Fig. 7, and Fig. 9 is a detail sectional view showing the staple within the grooves in the bender just before the anvil parts company with it and the driver engages with said staple.

In the various views the same part will be found designated by the same numeral of reference.

1 designates the base of the machine, which is raised at the front side and which raised portion may be provided with a separate face-plate 2, formed with curved clenching-recesses 3 of the usual form to turn the legs of the driven staple up against the under side of the work. At the rear end of the base are cast two lugs 4, between which is pivoted the head 5 by a pin 6. The said head carries all of the movable parts of the mechanism and consists of two parallel side plates 7 7, to the front edges of which is secured by screws 8 the combined cutter and bender 9. This device comprises two parallel side pieces 10 10, which are joined together only by a front piece or member 11, thus leaving a space or opening (indicated at 12) at the rear side of the device. In each side piece 10 is formed a longitudinal groove or channel 13, which extends for the entire length of the device. The lower end of each side piece 10 is made square, so as to form a cutting edge 14. The front and side pieces form together three sides of a hollow

square, and within this space is arranged the plunger or driver 15, which is preferably formed diamond shape in cross-section, and so arranged as that two of its angular edges work in the V-shaped grooves 13 in the bender. The upper end of the plunger or driver is provided with a knob 16 and its lower end is preferably formed with a transverse groove 17 in line with the two opposing longitudinal grooves 13 in the bender. The lower portion of the driver is beveled or chamfered at 18, so as to avoid any interference with the vibrating anvil. At the upper end or portion of the driver is a lug 19, which is slotted to receive the upper end of a link 20, which is pivoted to said lug by the pin 21. The lower portion of the said link is pivoted at 22 to an upwardly-extending slotted arm 23 on the vibratory anvil-frame 24. The lower extremity of the link is extended laterally to receive one end of a coiled returning-spring 25, whose upper end is attached to a pin 26, supported by the upper portions of the separated side plates 7 of the head 5. The link, the arm, and the spring are all arranged in the slot or opening formed by the plates 7 7.

The frame or device 24 is pivoted at 27 at the lower portion of the head 5 and between its pivot 6 and the bender. The said frame is bifurcated or is formed with or carries on each side at its forward portion an arm or support 28, and also midway between said arms or supports an anvil 29. The arms or supports 28 are placed apart a distance about equal to the width of the bender, and the upper edge of each of said arms is formed with a notch 30 to receive one end of a pin or wire 31 to be formed into a staple. The inner edges of the said arm cooperate with the outer edges of the bender to form the cutting mechanism for removing the head and point of the pin or for cutting the wire to size before the bending of the blank into the staple form.

The top of the anvil is located slightly below the plane of the bottom of the notches 30 in the arms 28, and the front side of said anvil may be beveled at 32 to fully escape the driver when the latter is descending to drive the formed staple through the work. The width of said anvil is slightly less than the distance between the inner walls of the side plates 10 10 of the bender, so that the said anvil may pass up between said plates and then out through the open back of the bender. The lower or foot end of each side plate 10 of the bender is of a thickness slightly less than the distance between the inner side of the arm 28 and the adjacent side of the anvil, and hence may pass down between these two devices in the forming operation of the staple following the cutting above referred to.

In the operation of the contrivance the head 5 is thrown back on its pivot 6 to the desired extent, thus carrying the vibratory frame 24 up from the face-plate 2, when the papers to be stapled may then be placed on the bed. The

head is then swung forward and down until the arms 28 come to a rest or bearing upon the top of the papers, at which time the lower end of the bender stands above the said arms in about the position shown at Fig. 1. The pin or blank to be formed into a staple may then be placed in the notches 30, after which by a single blow upon the head 16 of the plunger a blank of the proper size is produced, then bent into inverted-U-shaped form, and then driven through the papers and clenched or set on the under side thereof. These several operations are carried on by the particular devices here involved in the manner now to be described in detail.

The knob 16 being in front of the pivot 6 of the head 5 when struck causes said head to swing down and the cutter and bender thereon to approach the pin or wire, while at the same time the holder or support for said pin or wire resting at its free end on the paper is rocked slightly as its pivot 27 descends with said head until the cutting edges of the bender strike the supported portions of the pin or wire and cut off such ends, so as to produce a blank of a length equal to the distance between the inner sides of the arms or supports 28, which blank at its middle portion is at once forced upon the top of the anvil 29. The bender continuing to descend then carries down the unsupported ends of the blank and the staple is formed about said anvil, the lower end of the bender coming down finally to a bearing on the paper, as represented at Fig. 8. While the bender is thus descending after the cutting operation, the anvil is at the same time swinging up toward the back of the bender, but the legs of the formed staple remain in the grooves 13 in the bender. The said grooves register with the notches 30 when the bender comes down to the cutting position, so that when the bending occurs (which operation takes place instantly after the cutting operation) the legs of the staple are formed at once and pass into the grooves 13 in the bender. The anvil is tilted upwardly at this time—that is, between the time the wire is cut and the foot of the bender strikes the paper. By reason of the fact that the pivot 27 of the anvil-frame is caused to descend below the plane of the top of the face-plate 2 the said frame is caused to rock or tilt on the said face-plate or upon the paper thereon at about the locality marked 33. At about the time the bender-foot comes to a bearing on the paper the anvil-frame is rocked or tilted to such an angular position that the bottoms of the notches 30 are brought up and back to nearly the line of the back edges of the bender side plates, and the anvil itself has swung upwardly and rearwardly to such an extent that the forward edge of its top has retreated to a position slightly past the vertical grooves 13 in the bender, at which time the lower end of the driver stands a short distance above the hori-

zontal plane of the forward edge of the anvil. Now as the driver continues to descend under the force of the blow it immediately encounters the staple which has been left in the grooves 13 by the anvil and forces it downwardly through and out of said grooves and through the papers, the crown of the staple fitting in the transverse groove in the driver and the legs of the staple are turned inwardly and upwardly by the clenching-recesses 3 in the face-plate, as shown at Fig. 8, the paper being represented by the numeral 34.

Fig. 9 shows the formed staple in the grooves 13, the bender down upon the work to hold it firmly in position, and the relative positions of the anvil and driver at about the time the driver starts to descend to drive the staple. During this driving action the link descends with the driver and, operating on the arm 23 of the anvil-frame, causes said frame to vibrate upon its pivot 27 and the anvil to swing back out of the way of the driver and out through the back opening in the bender to the position shown at Fig. 7, the side plates 77 of the head being cut away or recessed, as at 35, to permit the swinging back of the anvil-frame to the position shown at said figure. During the descent of the driver and link the spring 25 is expanded, and hence operates when the pressure is removed to restore all of the parts to their normal positions. While the said spring is expanded, it acts with a downward pull or force on the head 5, and hence serves to keep the bender down firmly on the pile of papers.

Various changes may be made without departing from the several features of my invention as expressed in the following claims.

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

1. In a stapling-machine, the combination with a bender and a driver, of a swinging head or frame and a swinging anvil pivoted on said head or frame and having an upward movement toward and away from the descending bender.

2. In a stapling-machine, the combination with a bender and a driver, of a swinging head or frame, and an anvil pivotally connected to said head or frame and having an upward movement toward and past said bender during the time of its descent.

3. In a stapling-machine, the combination of a swinging head or frame, a combined cutter and anvil pivotally connected thereto, and a cutter and bender and a driver carried by said head or frame.

4. In a stapling-machine, the combination of a pivoted head or frame, a cutter and bender secured to the front side of the same, a driver supported in said head or frame and adapted to reciprocate through said cutter and bender, and a vibratory frame pivoted to said head and carrying a combined cutter and anvil.

5. In a stapling-machine, the combination

of a pivoted head or frame, a cutter and bender secured thereto at its front side, a driver adapted to reciprocate through said cutter and bender, and a cutter and anvil carrying frame pivoted to said head or frame and positively connected to said driver.

6. In a stapling-machine, the combination of a pivoted head or frame, a cutter and bender carried thereby, a reciprocatory driver, an anvil-carrying frame pivotally supported on said head or frame, and a link connecting said anvil-carrying frame with said reciprocatory driver.

7. In a stapling-machine, the combination of a pivoted head or frame, a cutter and bender carried thereby, a reciprocatory driver, an anvil-carrying frame pivoted to said head or frame between said bender and the pivot of the said head or frame, a link connecting said anvil-carrying frame with the said driver, and a returning-spring.

8. In a stapling-machine, the combination with a base, of a pivoted head or frame carrying a cutter and bender, and a driver, and a frame pivoted to said head or frame in advance of the pivot of the latter and formed or provided with blank-supporting means, cutting devices and an anvil and arranged to bear on said base.

9. In a stapling-machine, the combination with a base, of a pivoted head or frame carrying a cutter and bender and a driver, a device pivoted to said head or frame in advance of the pivot of the latter and comprising the blank-supporting side arms or members and the intermediate anvil and arranged to bear on said base.

10. In a stapling-machine, the combination of a pivoted head or support carrying a cutter and bender and a driver, a device pivoted to said head or bender and comprising the notched side arms, the intermediate anvil, and a rear arm, a link connecting said last-mentioned arm with the driver, and a spring.

11. In a stapling-machine, the combination of a base, a depressible head or frame, and a blank-supporting cutting and anvil frame pivoted to the lower part of said head or frame, so that its forward portion rests upon the said base or the papers thereupon and rocks or fulcrums upon said base or the papers thereupon during the descent of said head or frame.

12. In a stapling-machine, the combination of a base, a head or frame pivoted thereto, a cutter and bender and a driver carried by said head or frame, and a blank-supporting cutting and anvil frame pivoted to said head or frame and adapted to fulcrum upon the said base or upon the papers thereon; in substantially the manner set forth.

13. In a stapling-machine, the combination of a base, a head or frame pivoted thereon and carrying a cutter and bender and a driver, a blank-supporting cutting and anvil frame pivoted to said head or driver and adapted to fulcrum upon said base or upon the papers there-

on, a connecting-rod between said last-mentioned frame and said driver, and a spring connected to said rod and to the head or frame.

5 14. In a stapling-machine, the combination of a base, a head or frame pivoted thereto and carrying a cutter and bender which is open on its rear side, a driver adapted to reciprocate in said bender, and a blank-supporting cutting and anvil frame pivoted to said head  
10 or frame and connected to said driver.

15 15. In a stapling-machine, the combination of a base, a head or frame movably supported thereon and carrying a cutter and bender, and a driver, and a blank-supporting cutting and  
15 anvil frame, connected to said movable head or frame and having a fulcrum upon the base or upon the paper thereon when the said head or frame carrying the cutter and bender and driver is depressed.

20 16. In a stapling-machine, the combination of a base and a depressible head or frame carrying a cutter and bender and a driver, and also a blank-supporting cutting and anvil frame connected to said driver and which is  
25 first actuated by the said base or the paper thereupon and then by the said driver.

17. In a stapling-machine, the combination

of a head or frame, a bender, a driver, and an anvil connected to the driver and pivoted to vibrate upwardly as the driver descends. 30

18. In a stapling-machine, the combination of a head or frame, a cutter and bender, a driver and a blank-supporting cutting and anvil device connected to the driver and pivoted to vibrate upwardly as the driver descends. 35

19. In a stapling-machine, the combination of a base having the raised front portion, the pivoted side plates 7, 7, the cutter and bender secured to said plates, the driver, the bifurcated blank-supporting cutting and anvil  
40 frame pivotally attached to the said plates and having an arm extending therebetween, the link or rod connected at one end to said arm and at its upper end to the said driver, and a coiled spring between said plates connected  
45 at one end to the said plates and at its other end to the link or rod.

Signed at New York city, in the county of New York and State of New York, this 24th day of September, A. D. 1897.

LEE S. BURRIDGE.

Witnesses:

K. V. DONOVAN,

JACOB FELBEL.