

Oct. 31, 1939.

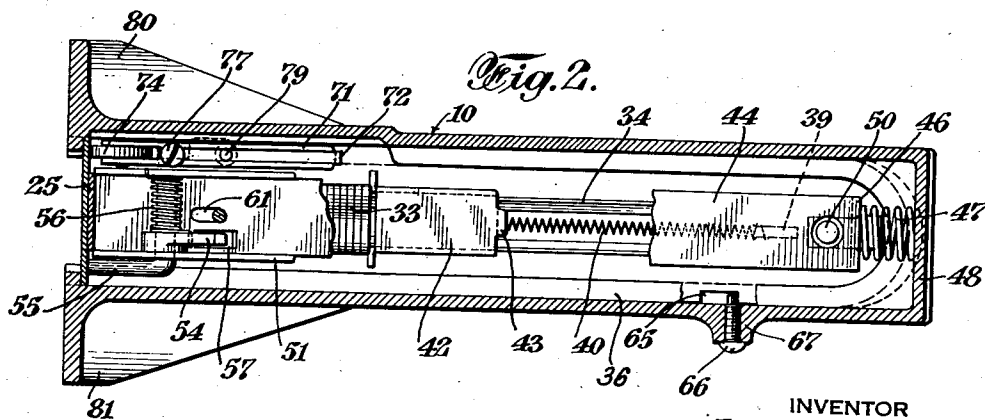
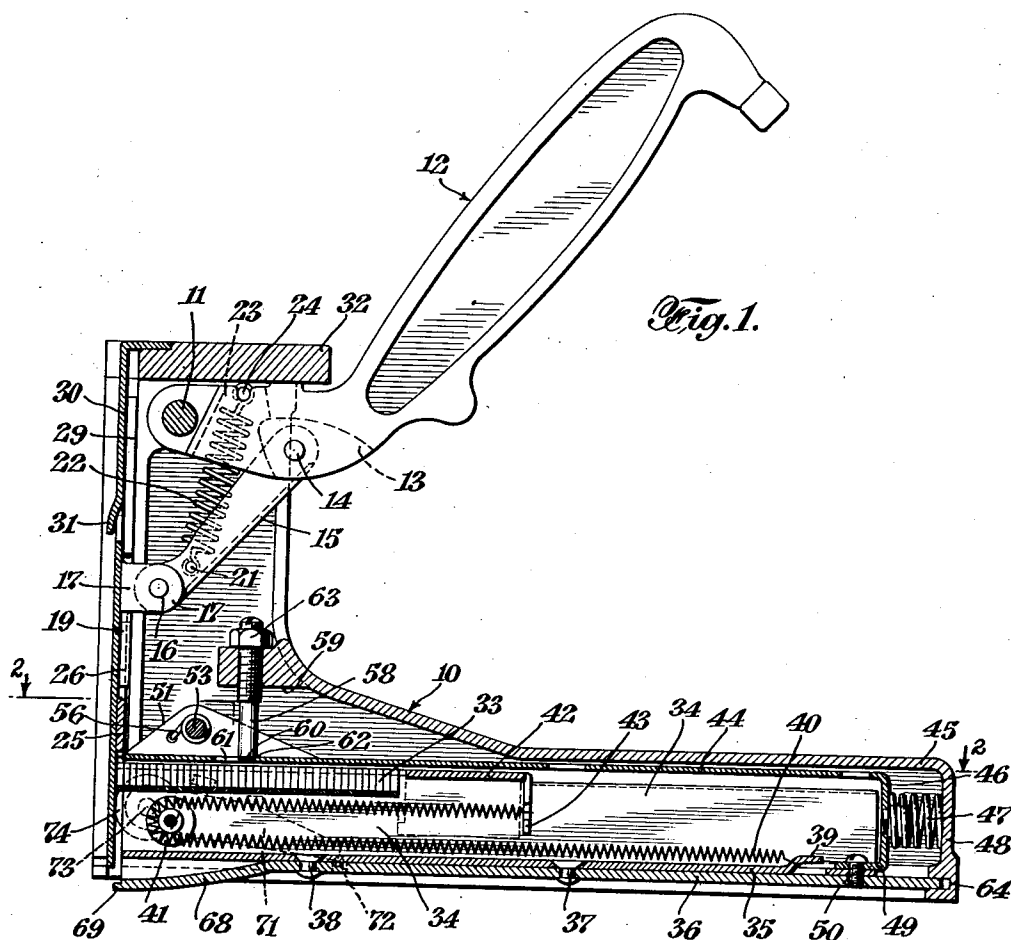
L. BROWNSTEIN

2,178,354

STAPLING MACHINE

Filed Feb. 17, 1936

3 Sheets-Sheet 1



INVENTOR
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Oct. 31, 1939.

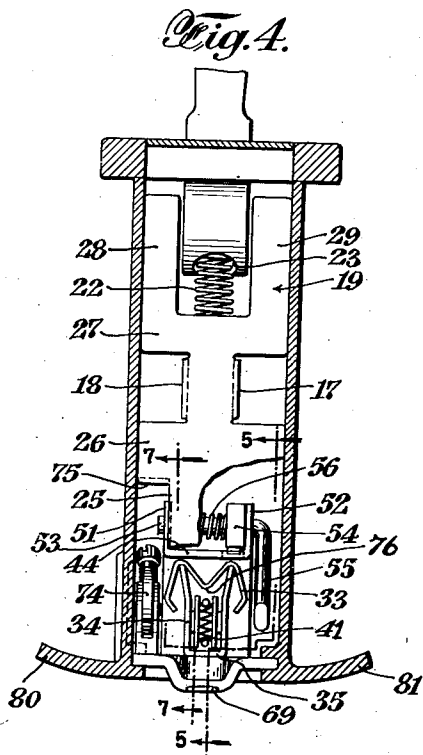
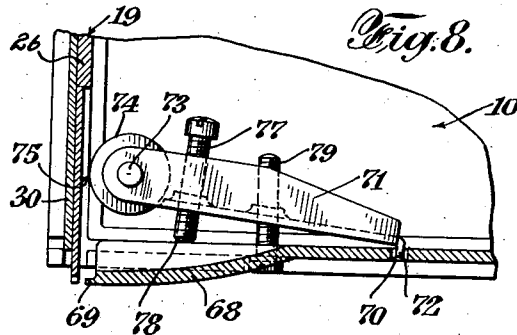
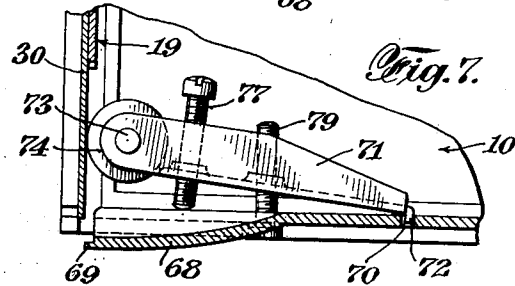
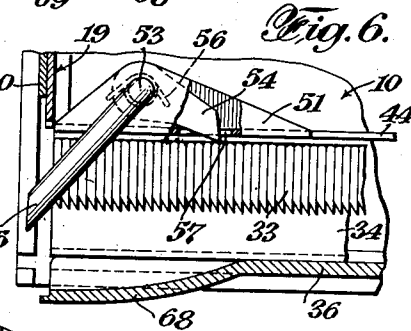
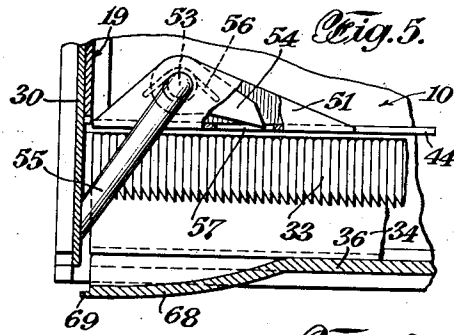
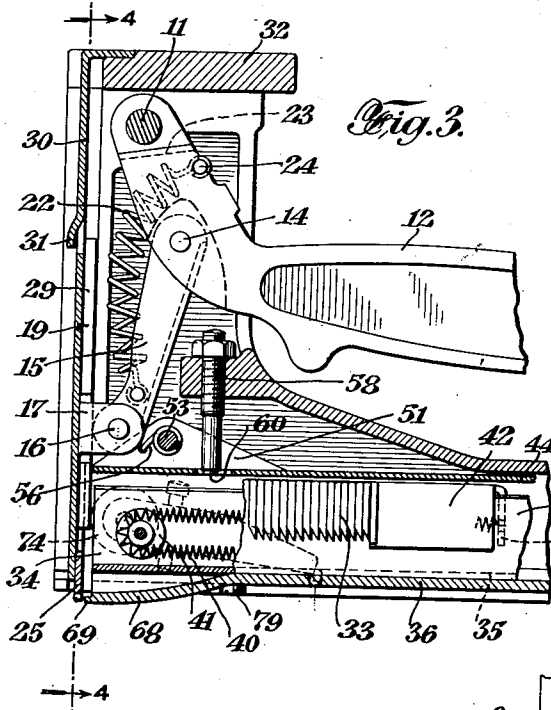
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2,178,354

STAPLING MACHINE

Filed Feb. 17, 1936

3 Sheets-Sheet 2



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L. BROWNSTEIN

2,178,354

STAPLING MACHINE

Filed Feb. 17, 1936

3 Sheets-Sheet 3

Fig. 9.

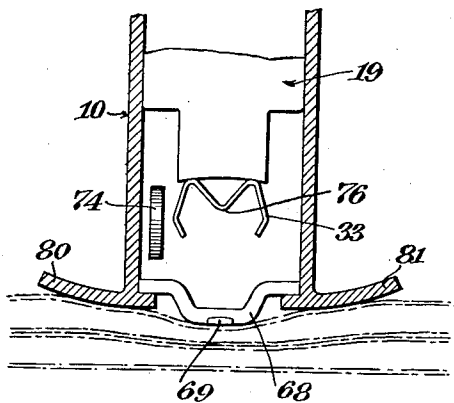


Fig. 10.

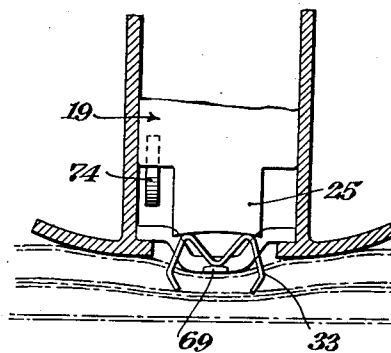


Fig. 11.

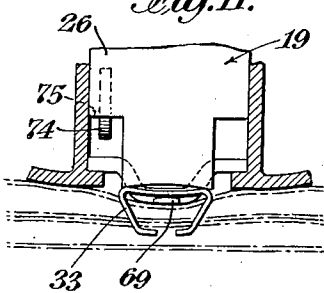


Fig. 12.

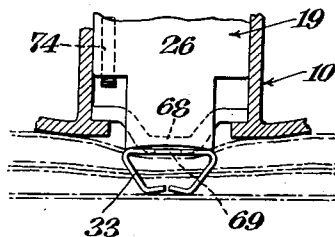


Fig. 13.

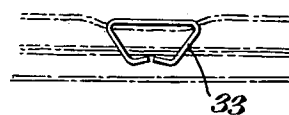


Fig. 14.

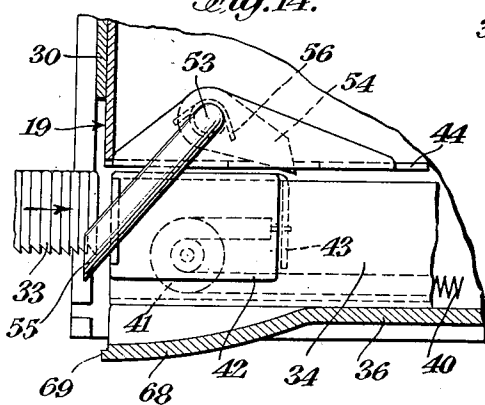
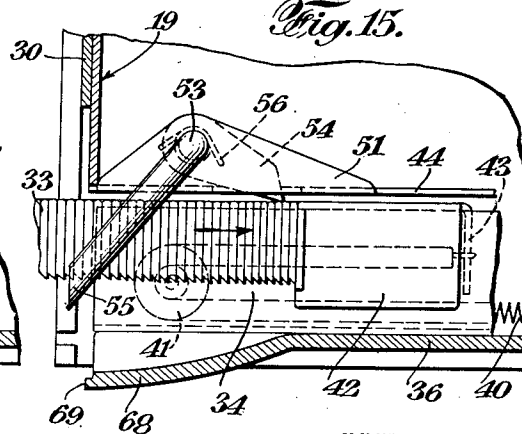


Fig. 15.



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UNITED STATES PATENT OFFICE

2,178,354

STAPLING MACHINE

Louis Brownstein, Brooklyn, N. Y., assignor of one-third to Charles B. Goodstein, one-third to Emanuel R. Posnack, and one-third to Wendell L. Sorenson, Brooklyn, N. Y.

Application February 17, 1936, Serial No. 64,307

24 Claims. (Cl. 1-49)

This invention relates to stapling machines for the sealing of containers made of corrugated board or other materials, and is intended primarily to constitute a further development of the invention of Emanuel R. Posnack described and disclosed in Letters Patent No. 1,945,377 issued January 30, 1934, whereby adjacent flaps of a carton are secured together by a drive effected from one side of the material without the use of any underlying blade or anvil, my invention being particularly, though not exclusively, adapted to employ the staples disclosed and claimed in Letters Patent No. 2,008,086 granted on July 16, 1935, upon the application of Wendell L. Sorenson.

In the said Posnack invention, the driving plunger is actuated by a spring-release or trip mechanism for severing and driving a staple from a strip of staples fed into the machine through the rear portion thereof. It is within the contemplation of my invention to improve upon this construction by simplifying the driving mechanism to effect a plunger stroke by direct manual or mechanical pressure, and also to provide a method of feeding staples into the machine through the front portion thereof. And it is also within the contemplation of this invention to enable the front feeding operation to be effectuated in a quick and easy manner, whereby the strip of staples will be retained within the machine and held against being projected forwardly until the machine is placed into condition for use.

It is still another object of my invention to enable a machine of this character to operatively receive therein a variety of sizes of staples either without any adjustments whatsoever, or with only a relatively simple adjustment if at all necessary.

It is also within the contemplation of this invention to improve upon the anvil mechanism in the said Posnack invention by eliminating the rotary anvil actuator and substituting therefor a simpler device readily adjustable for the timing of the anvil retraction.

Another object of my invention is to enable a machine of this class to be constructed at a low cost by providing not only inexpensive and readily fabricated elements, but also a special arrangement of parts for enabling certain combinative elements to be independently assembled outside of the frame of the machine, to be thereafter conveniently inserted to produce a completely assembled unit.

And another object is to produce a more convenient and effective stitch by causing the driven staple head to be imbedded and virtually counter-sunk into the material being stapled.

Still another object of this invention is to enable certain elements thereof, such as the feeding and driving mechanisms, to be operatively

and efficiently employed in various kinds of stapling machines including those which employ an anvil underlying the material being stapled as distinguished from those having anvils overlying the material, as exemplified by the aforesaid Posnack invention.

Other objects, features and advantages will appear from the drawings and the description hereinafter given.

Referring to the drawings:

Figure 1 is a vertical cross section of the machine showing the parts in their normal inoperative position.

Figure 2 is a sectional plan of Figure 1 taken along line 2-2.

Figure 3 is a fragmentary vertical cross section of the machine showing the position of the parts upon the completion of the down stroke of the plunger.

Figure 4 is a vertical transverse section of Figure 3 taken along line 4-4, a portion of the plunger being broken away to show the parts therebehind.

Figure 5 is a fragmentary vertical cross section of Figure 4 taken along line 5-5, showing the staple-retaining pawl in its non-engaging position.

Figure 6 is a view similar to Figure 5 showing the staple-retaining pawl in its engaging or operative position, with the front plate of the machine raised.

Figure 7 is a vertical section of Figure 4 taken along line 7-7, showing the anvil and anvil actuator in their inoperative positions.

Figure 8 is a view similar to Figure 7 showing the anvil and anvil actuator in their retracted positions.

Figures 9, 10, 11 and 12 are semi-diagrammatic fragmentary front views of a form of my invention illustrating the relative positions of plunger, staple, anvil and material being stapled during a complete stroke or clenching cycle.

Figure 13 shows the final position and shape of the fully clenched staple after completion of the stroke illustrated in Figures 9 to 12 inclusive.

Figure 14 is a fragmentary vertical section of Figure 4 taken along line 5-5 showing the position of the parts preparatory to the loading of the device with a strip of staples, and

Figure 15 is a view similar to Figure 14 showing the strip of staples partially inserted during a loading operation.

In the drawings the frame 10 contains at the forward part thereof the shaft 11 upon which is pivotally mounted the forward extremity of the driving lever 12, the underside of which contains a slotted portion 13 the lateral walls of which support the pin 14 extending transversely across the slot. Pivotaly mounted upon pin 14 is the driving arm 15, preferably though not necessarily

of channel-like structure, the forward end of said arm being rotatably mounted upon the pin 16 which is suitably secured to the ears or walls 17 and 18 (see Figure 4) associated with the driving plunger 19. The preferred construction is to have the said ears 17 and 18 integral with the plunger and bent back at right angles thereto. Extending transversely across the forward part of the driving arm 15 and suitably supported by the channel walls thereof is the pin 21 to which is anchored the lower portion of spring 22, which extends upwardly through the aperture 23 in the lever, the upper portion of the spring being suitably anchored to the pin 24 extending transversely across said aperture and suitably secured to the forward portion of the lever 12.

The plunger 19 (see Figure 4), in the preferred form thereof, contains the reduced driving portion 25, the full width portions 26 and 27, and the upwardly extending portions 28 and 29, the lateral edges of certain of said portions being in slidable engagement with suitable slots in the frame of the machine. It should be noted that the said portions 28 and 29 are each of relatively narrow width so as to form a space therebetween to reduce the weight and stock of the plunger and provide room for any parts that may be required to protrude therethrough due to dimensional design. The front plate 30 is positioned within the front slotted portions of the frame and is adapted for vertical slidable movement therein to either cover or expose the plunger and associated parts. The said plate contains a protruding element 31 adapted for manual manipulation to enable the plate to be raised or lowered; and the upper portion of the plate is preferably bent over at right angles to rest upon the depressed portion of the knob or top portion 32 of the machine which is suitably attached to the framework thereof.

The strip of staples 33 is carried by the staple rail 34 which is substantially U-shaped in cross-section and having the upper lateral walls thereof preferably flared outwardly for supporting the uppermost portions of the staples. Said staple rail extends longitudinally within the machine, the base 35 of the rail being suitably affixed to the base plate 36 by means of the screws 37 and 38. The said base 35 contains an upwardly and rearwardly extending portion or tongue 39, preferably formed integral therefrom, to which the spring 40 is anchored, said spring extending forwardly therefrom, around the roller 41 mounted from the front lateral walls of the rail, and back again longitudinally through the push member 42 to be anchored to the downwardly extending wall 43 thereof, said push member being slidably mounted over the rail 34 and adapted for yieldable engagement against the rear portion of the staple strip 33 under the influence of said spring 40.

The machine is provided with a hold-down plate 44 which extends substantially along the entire length of the machine within the housing 45, the rear portion thereof being preferably bent downwardly and then forwardly to form a U-shaped extremity the vertical wall 46 thereof being in constant engagement with the spring 47 interposed between said wall and the rear wall 48 of the housing, the lower forwardly bent wall 49 being suitably attached preferably by the screw 50 to the base plate 36 of the machine. The action of the spring 47 is to normally urge the hold-down plate 44, base plate 36, staple carrier 34, and attached parts in a forwardly direction.

The forward part of said hold-down plate contains the two upwardly disposed extensions or

ears 51 and 52 which support the transverse shaft 53 to which are affixed the pawl 54 and the forwardly extending arm 55, the said shaft having suitably associated therewith or preferably mounted thereover and anchored to the hold-down plate the spring 56 rotatably actuating the said shaft 53 to normally urge the arm 55 forwardly and the lower terminal edge of the pawl 54 downwardly for operative engagement with the staple strip, as will be more specifically herein-after described. It will be noted that the hold-down plate 44 contains the aperture 57 therein to permit the entrance therethrough of the operating terminal of said pawl.

A hold-down screw 58, preferably in threaded engagement with a lug 59 forming an integral part of the frame, extends downwardly within the machine, the terminal portion 60 extending through the aperture 61 of the hold-down plate 44, the shoulder 62 of the screw being in engagement with the upper surface of said hold-down plate. The upper portion of the said screw is in threaded engagement with the lock nut 63.

The aforesaid base plate 36 is slidably movable within the slotted portion 64 at the bottom of the housing 45, said plate containing a recess 65 therein (see Figure 2) into which extends the terminal portion of the shank of screw 66 in threaded engagement with the boss 67 forming an integral part of the base of the housing. The front part of said base plate 36 contains a depressed portion 68 extending forwardly and constituting the body of the retractable anvil of the machine, the extreme forward portion containing the anvil lip 69 (see Figures 4 and 7) adapted in its forward position to underlie the reduced portion 25 of the plunger 19. The said base plate contains an aperture 70 therein (see Figures 7 and 8), preferably rearwardly of the anvil portion thereof, the anvil actuator 71, preferably of channel-shaped structure, having the rear extremity 72 thereof extending into said aperture and in operative engagement with the walls thereof. The front of said anvil actuator 71 contains the transversely disposed shaft 73 upon which is mounted the roller 74 the forward portion of which normally underlies the shoulder 75 of the plunger 19, as shown in Figures 4 and 7. Extending vertically through and in threaded engagement with the base of the anvil actuator is the adjusting screw 77, the lower extremity 78 thereof being in abutment with the base of the machine. Extending upwardly through the base plate 36 is another screw 79 also in threaded engagement with the anvil actuator 71, the head portion of the screw being exposed to view and preferably readily accessible.

In the operation of this device, a downward movement of the lever 12 will cause the applied pressure to be transmitted through the driving arm 15 to the plunger 19 to cause a driving stroke thereof during which the lowermost edge of the plunger will disengage the foremost staple on the staple strip 33 and drive it downwardly towards the material being stapled. During the course of the operative stroke, the lowermost portion of the V-shaped indenture 76 (see Figures 4 and 9) of the staple will come into engagement with the lip 69 of the anvil (see Figure 10), and at a predetermined point the shoulder 75 will engage the roller 74 (see Figures 8 and 12) to force the anvil actuator 71 rearwardly, resulting in a corresponding rearward movement or retraction of the entire base plate and anvil against the action of spring 47, thereby permitting the continued movement of the plunger to complete the driving operation

by forcing the top of the staple flush against the material (see Figure 12). It should be noted that inasmuch as the V-shaped indenture contacts with the non-yieldable lip 69, the upper portion of the staple becomes flattened against the material (see Figure 11) to cause a clenching of the prongs thereof within the work, substantially in accordance with the description and drawings in the aforementioned patents of Posnack and Sorenson. Upon a release of the lever 12 after completion of the driving operation, the spring 22 will cause a return of said lever to its normal inoperative position, and the base plate 36 with anvil 68 will be projected forwardly under the influence of spring 48 to its initial position at the beginning of the cycle.

The retraction of the anvil and base by the action of the anvil actuator causes a corresponding retraction of the attached rail 34 and the hold-down plate 44, thereby removing any possible obstruction to the easy downward movement of the plunger, the apertures 57 and 61 in the hold-down plate permitting such movement without interference with the screw 58 or pawl 54. The entire base plate 36 is limited in its forward movement by the engagement of the shank of screw 66 with the rear wall of the slot 65.

In feeding the staples into the machine, the front plate 30 is raised and the staple strip inserted upon the staple rail 34, the rearmost staple being brought into engagement with the foremost portion of the push member 42 which is positioned at the front of the machine due to the pull of the spring 40 (see Figure 14). By pushing the entire strip rearwardly against the action of said spring 40, the terminal portion of the pawl 54 will slidably engage the staples during the aforesaid operation of inserting the strip, due to the action of spring 56 (see Figure 15). Upon a release of the manually applied pushing pressure, the operating edge of the pawl 54 will enter the nearest adjacent space between the tops of two contiguous staples, and will hold the strip against forward movement, thereby yieldably retaining it in place (see Figure 6). During this entire operation, while the front plate 30 is in its raised position, the arm 55 will be protruding through the front of the machine as shown in Figure 6. As soon, however, as the front plate 30 is lowered, the arm 55 will be pushed back rearwardly thereby to rotate the shaft 53 in a counterclockwise direction, thereby raising the pawl 54 out of engagement with the staple strip (see Figure 5). In this manner the push member 42 is left free to urge the staple strip forwardly for operative coaction with the plunger.

This machine constituting my invention is adapted, in accordance with one of the objects thereof, to operatively employ a number of different sizes of staples, the only requirement being that the distance across the indenture of the various sizes be substantially the same. In other words, when this requirement is met staples of different lengths of legs, different angles of the indenture and different cross-sections can be employed. It is desirable, however, that proper provision be made for adjusting the machine for staples of different cross-sections. If, for example, the hold-down plate 44 is placed at too great a distance above the staple strip, the most forwardly positioned staples may have a tendency to tilt over forwardly at an angle, especially while the first staple is being severed. It is for this reason that it is advisable that the hold-down plate 44 be positioned at such a distance above the sta-

ple strip as to provide sufficient clearance for movement and yet close enough to the staple strip to hold the forward portions thereof in their vertical positions. The adjusting screw 58 is therefore manipulated to either slightly lower said hold-down plate in accordance with requirements, or to permit it to raise itself to a higher level in accordance with its normal tendency due to its resiliency. In this connection it should be noted that the hold-down plate is mounted nearly at the rear of the housing, and hence the entire upper portion of the plate can be moved up or down slightly due to the resiliency of the material out of which it is made. In this manner, staples of various cross-sections can be accommodated for efficient operative use within the machine without any other adjustment except that of a simple turn of a screw, if such an adjustment should at all be necessary.

Should it be necessary to vary the timing of the anvil, that is the time of retraction thereof with respect to the movement of the plunger, the screws 77 and 79 are manipulated to raise or lower the position of the roller, in obvious manner, thereby enabling the plunger to actuate the member 71 at predetermined points during its operative stroke. Such adjustment need normally be made during the original assembly of the machine.

The forward part of the base of the machine (see Figure 4) contains two upwardly curved flanges 80 and 81 flanking the anvil portion 68. When pressure is applied to the knob 32 simultaneously with the operation of the lever, the said anvil portion will compress the underlying material and slightly impress itself therein (see Figures 9 and 12), so that when a staple is operatively forced into the material, the top thereof will become imbedded therein to form a countersunk stitch such as is shown in Figure 13, producing a firm seal and presenting a smooth upper surface.

It should be observed that although the front feed hereinbefore described has been employed, in accordance with the drawings forming part of this specification, in conjunction with a particular type of machine having an anvil adapted to overlie the material, it is of course understood that the same feeding means can be employed in other stapling devices employing the conventional structure containing an anvil underlying the material.

It will also be observed that the design hereinabove described is very compact and economical of space. The feed spring 40 and the mountings therefor are contained within the lateral walls of the rail 34 (see Figures 2 and 4); the anvil actuator 71 is contained at one side of the staple rail (see Figure 2), and the staple-strip retaining means 54 is positioned on the other side, all of which combines to produce a very compact structure. The construction of the plunger should be particularly noted, in that it contains certain elements which serve a number of functions as hereinbefore explained, the entire plunger being adapted for fabrication from a stamping die.

The cost of manufacture of this device can be rendered relatively low in view of the feasibility of assembling certain parts in combinative units outside of the frame. The plunger 19, the lever 12, the driving arm 15 and the spring 22 can be assembled in one unit; and the base plate 36, the staple rail 34, the hold-down plate 44, the anvil actuating mechanism and the aforesaid

pawl retaining means can similarly be independently assembled. Thereafter both combinative units can be inserted into the machine to complete the assembling job.

- 5 Although the above-described machine is of the manually operated type, it is of course apparent that the mechanical features thereof can be employed as well in an electrically or foot operated unit; and it is further understood that the various
10 embodiments above described and shown in the drawings are illustrative of my invention and not employed by way of limitation, inasmuch as numerous changes and modifications may be made within the scope of the appended claims without departing from the spirit of this invention.
15

What I claim is:

1. In a stapling machine, a plunger, a pivotally mounted lever, a driving arm pivotally connected
20 to said plunger and lever for reciprocatingly actuating the plunger, a spring anchored to said lever and attached to said arm for yieldably resisting the driving movement of the latter, a retractable anvil adapted to overlie the material being stapled
25 and in its normal position underlying the plunger, and means coacting with said plunger and anvil for retracting the latter from said normal position at a predetermined point during the stroke of the plunger.
- 30 2. In a stapling machine, a reciprocating plunger, a driving lever the forward extremity of which is pivotally mounted at the front of the frame of the machine, said lever containing a hole extending through the front portion thereof and a slot
35 at the bottom thereof, a pin extending transversely across said slot and suitably supported by the lateral walls thereof, a driving arm one end of which extends into said slot and is pivotally mounted on said pin, the other end of the arm being
40 pivotally mounted on the plunger for operatively actuating it, a second pin attached to the lever and extending transversely across said hole therein, a spring attached to said driving arm and extending upwardly through said hole and anchored to said latter pin, a retractable anvil adapted
45 to overlie the material being stapled and in its normal position underlying the plunger, and means coacting with said plunger and anvil for retracting the latter from said normal position at
50 a predetermined point during the stroke of the plunger.
3. In a stapling machine, a reciprocating plunger containing a bottom driving portion of reduced width flanked by two outwardly extending shoulders
55 thereabove and having an intermediate portion the sides thereof being bent back and perforated with two axially aligned holes, a pin extending through said holes and suitably supported by the sides of the plunger, a driving arm pivotally
60 mounted on said pin, a driving lever pivotally mounted on the frame of the machine and having pivotally secured thereto said arm for operatively actuating the plunger, a retractable anvil adapted to overlie the material being stapled and in its
65 normal position underlying the plunger, and means operatively connected with said anvil and engageable by one of said shoulders of the plunger for retracting the anvil from said normal position at a predetermined point during the stroke
70 of the plunger.
4. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a retractable anvil adapted to overlie the material being stapled
75 and in its normal position underlying the plunger, and an anvil actuator movable longitudinally

within the machine and coactively connected to said anvil, the forward portion of said actuator being normally in the line of travel of the plunger and engageable thereby during its downward stroke to cause a rearward movement thereof and a consequent retraction of the anvil from its said normal position.

5 5. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a retractable anvil adapted to overlie the material being stapled
10 and in its normal position underlying the plunger, and an anvil actuator movable longitudinally within the machine and coactively connected to said anvil, the forward portion of said actuator having rotatably mounted thereon a roller normally in the path of the plunger and operatively
15 engageable thereby during its downward stroke to cause a rearward movement of the actuator and a consequent retraction of the anvil from its said normal position.

20 6. In a stapling machine, a reciprocating plunger containing a bottom driving portion of reduced width flanked by two outwardly extending shoulders thereabove, means to reciprocally actuate the plunger, a retractable anvil adapted to overlie the
25 material being stapled and in its normal position underlying the plunger, and an anvil actuator movable longitudinally within the machine and coactively connected to said anvil, the forward portion of said actuator being normally in the line of travel of the plunger and operatively engageable
30 by one of said shoulders of the plunger during its downward stroke to cause a rearward movement of the actuator and a consequent retraction of the anvil from its said normal position.

35 7. In a stapling machine, a reciprocating plunger containing a bottom driving portion of reduced width flanked by two outwardly extending shoulders thereabove, means to reciprocally actuate the plunger, a retractable anvil adapted
40 to overlie the material being stapled and in its normal position underlying the plunger, and an anvil actuator movable longitudinally within the machine and coactively connected to said anvil, the forward portion of said actuator having rotatably mounted thereon a roller normally in the
45 path of the plunger and operatively engageable by one of said shoulders of the plunger during its downward stroke to cause a rearward movement of the actuator and a consequent retraction of the anvil from its said normal position.

50 8. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a retractable anvil adapted to overlie the material being stapled and in its normal position underlying the plunger, an anvil actuator movable longitudinally
55 within the machine and coactively connected to said anvil, the forward portion of said actuator being normally in the line of travel of the plunger and engageable thereby during its downward stroke to cause a rearward movement thereof and a consequent retraction of the anvil from its said normal position, and means coactively engageable
60 with said actuator to adjustably raise or lower the said forward portion thereof to vary the timing of the operative engagement of the plunger and the anvil actuator.

65 9. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a retractable anvil adapted to overlie the material being stapled
70 and in its normal position underlying the plunger, an anvil actuator comprising a longitudinally disposed member movable lengthwise within the machine the rear end of said member being coactively associated with said anvil, the forward
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2,178,354

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portion of said actuator being normally in the line of travel of the plunger and engageable thereby during its downward stroke to cause a rearward movement thereof and a consequent retraction of the anvil from its said normal position, and screw means extending substantially vertically through said member and in threaded engagement therewith for adjustably raising and lowering the said forward portion of the actuator to vary the timing of the operative engagement of the plunger and the anvil actuator.

10. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise along the lower portion of the machine and extending substantially along the entire length thereof and forming a bottom closure therefor, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate and anvil rearwardly to retract the said front portion of the anvil from its normal position.

11. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise along the lower portion of the machine and extending substantially along the entire length thereof and forming a bottom closure therefor, an anvil at the forward part of the base plate and integral therewith, said anvil extending downwardly below the level of said plate and containing a forwardly protruding lip normally underlying the plunger, and means coacting with said plunger for moving the base plate and anvil rearwardly to retract the said lip from its normal position.

12. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and an anvil actuator comprising a longitudinally disposed member movable lengthwise within the machine; the said base plate containing an aperture therein rearwardly of said anvil, the rear end of said member being operatively engageable with a wall of said aperture, the forward portion of said actuator being normally in the path of the plunger and operatively engageable thereby during its downward stroke to cause a rearward movement of the actuator and engagement of the latter with the wall of the aperture and a consequent retraction of the base plate and anvil from said normal position.

13. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate and anvil rearwardly to retract the said front portion of the anvil from its normal position; said base plate containing along a lateral edge thereof a notched portion, and an element attached to the frame of the machine and engageable with said notched portion to limit the longitudinal movement of the base plate and associated parts.

14. In a stapling machine, a reciprocating plunger, a retractible staple rail substantially U-shaped in cross-section and normally extending longitudinally within the machine to the plane of the plunger, means associated with the plunger

engageable with the rail for retracting it from its said normal position, a spring mounting positioned at the front of the rail and between the lateral walls thereof, a push member slidably mounted over said rail, and a spring extending lengthwise between the lateral walls of said rail, said spring having the lower rearmost end thereof suitably attached to the base of the rail and extending forwardly and around said mounting and then rearwardly, the upper rearmost portion of the spring being suitably attached to said push member to constantly urge it forwardly.

15. In a stapling machine, a reciprocating plunger, a retractible staple rail substantially U-shaped in cross-section and normally extending longitudinally within the machine to the plane of the plunger, means associated with the plunger and engageable with the rail for retracting it from its said normal position, the upper portions of the lateral walls of the rail being flared outwardly and adapted to support staples having angulated legs and V-shaped tops, a roller positioned at the front of the rail and rotatably mounted between the lateral walls thereof, a push member slidably mounted over said rail and containing at the rear thereof a depending wall, the base of the rail containing an upwardly extending element, and a spring extending lengthwise between the lateral walls of said rail, the spring having the lower rearmost end thereof anchored to said element and extending forwardly around said roller and then rearwardly, the upper rearmost portion of the spring being attached to said depending wall to constantly urge the push member forwardly.

16. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail substantially U-shaped in cross-section and extending longitudinally within the machine, the base of the rail being suitably attached to said base plate, a spring mounting positioned at the front of the rail and between the lateral walls thereof, a push member slidably mounted over said rail, and a spring extending lengthwise between the lateral walls of said rail, said spring having the lower rearmost end thereof suitably attached to the base of the rail and extending forwardly and around said mounting and then rearwardly, the upper rearmost portion of the spring being suitably attached to said push member to constantly urge it forwardly; an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate, rail and anvil rearwardly to retract the said front portion of the anvil from its normal position.

17. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail extending longitudinally within the machine and suitably attached to said base plate, a hold-down plate extending to the extreme forward part of the rail and positioned a predetermined distance thereabove, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate rearwardly to effect an operative retraction of the anvil.

18. In a stapling machine, a plunger, means to

reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail substantially U-shaped in cross-section and extending longitudinally within the machine, a hold-down plate extending longitudinally of the machine, the forward part thereof being positioned a predetermined distance above the rail, the rail and hold-down plate being suitably attached to said base plate, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate with its said attached parts rearwardly to effect an operative retraction of the anvil.

19. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail extending longitudinally within the machine and suitably attached to said base plate, a hold-down plate extending to the extreme forward part of the rail, adjusting means in operative engagement with the forward part of said hold-down plate for varying the distance thereof above the rail, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate rearwardly to effect an operative retraction of the anvil.

20. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail extending longitudinally within the machine and suitably attached to said base plate, a hold-down plate extending to the extreme forward part of the rail, a lug in the forward part of the frame of the machine, a screw in threaded engagement with said lug and in operative engagement with the forward part of said hold-down plate whereby upon a manipulation of the screw the latter plate will be raised or lowered a predetermined distance above the rail, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate rearwardly to effect an operative retraction of the anvil.

21. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate slidably movable lengthwise within the lower portion of the machine, a staple rail substantially U-shaped in cross-section and extending longitudinally within the machine, a hold-down plate extending longitudinally of the machine and containing a vertical portion at the rear thereof, the forward part of the plate being positioned a predetermined distance above the rail, the rail and hold-down plate being suitably attached to said base plate, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, means coacting with said plunger for moving the base plate with its said attached parts rearwardly to effect an operative retraction of the anvil, and spring means in engagement with said vertical portion of the hold-down plate yieldably holding said latter plate, said base plate and attached parts in their normal, unretracted positions.

22. In a stapling machine, a plunger, means to reciprocally actuate the plunger, a base plate suitably movable lengthwise within the lower por-

tion of the machine, a staple rail substantially U-shaped in cross-section and extending longitudinally within the machine, a hold-down plate extending longitudinally of the machine, the forward part being adjustably positioned over the rail, the rear portion of said hold-down plate extending down vertically and then forwardly, the forwardly extending portion being attached to the said base plate, an anvil at the forward part of said base plate and having the front portion thereof normally underlying the plunger, and means coacting with said plunger for moving the base plate and attached parts rearwardly to effect an operative retraction of the anvil, and a spring anchored to the rear of the machine frame and in constant engagement with the rear vertical wall of said hold-down plate yieldably holding said latter plate, said base plate and attached parts in their normal, unretracted positions.

23. In a stapling machine containing a front opening therein, a staple rail for slidably accommodating a strip of staples, staple pushing means engageable with the said strip for constantly urging it forward, a hold-down plate extending to the extreme forward part of the rail and adjustably positioned a predetermined distance thereabove, the forward part of said plate containing two spaced upwardly disposed extensions, a transverse shaft rotatably supported by said extensions, a pawl affixed to said shaft, the edge of the pawl being adapted in its operative position to engage said staple pushing means and said strip when they are operatively positioned below the pawl, a forwardly extending arm affixed to said shaft and adapted to project through the front opening of the machine, spring means urging said pawl into its said operative position and said arm into its said projected position, a front plate slidably movable within the frame of the machine and positioned forwardly of said rail, said plate being adapted upon a movement thereof towards the base of the machine to engage said protruding arm and actuate it rearwardly and cause a consequent retraction of the pawl from its said operative position against the action of said spring means.

24. In a stapling machine containing a front opening therein, a staple rail for slidably accommodating a strip of staples, staple pushing means engageable with said strip for constantly urging it forwardly, a pivotally mounted pawl engageable with said staple pushing means when the latter is positioned below the pawl, said pawl when in its operative position being engageable with said strip when it is positioned below the edge of the pawl to hold the strip against forward movement, an independent rotatably mounted arm operative associated with the pawl and in fixed relation thereto, said arm extending forwardly and being adapted to project through the said front opening of the machine, spring means urging said pawl into its said operative position and said arm into its said projected position, a front plate slidably movable within the frame of the machine and positioned forwardly of said rail, said plate being adapted upon a movement thereof towards the bottom of the machine to engage said protruding arm and actuate it rearwardly and cause a consequent retraction of the pawl from its said operative position against the action of said spring means.

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