

May 10, 1949.

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2,469,985

FEED MECHANISM FOR STAPLING MACHINES

Original Filed April 30, 1945

FIG. 1

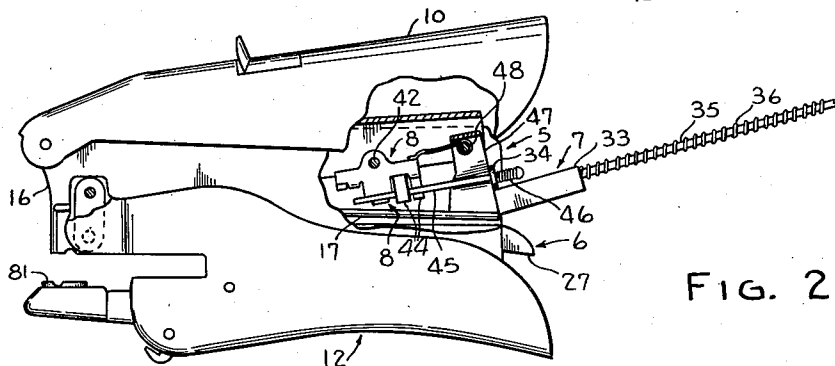
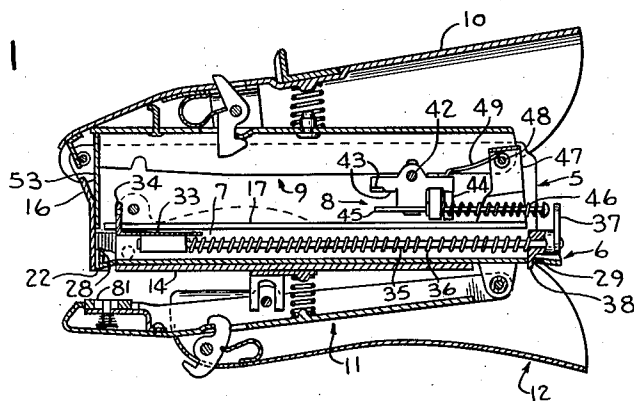
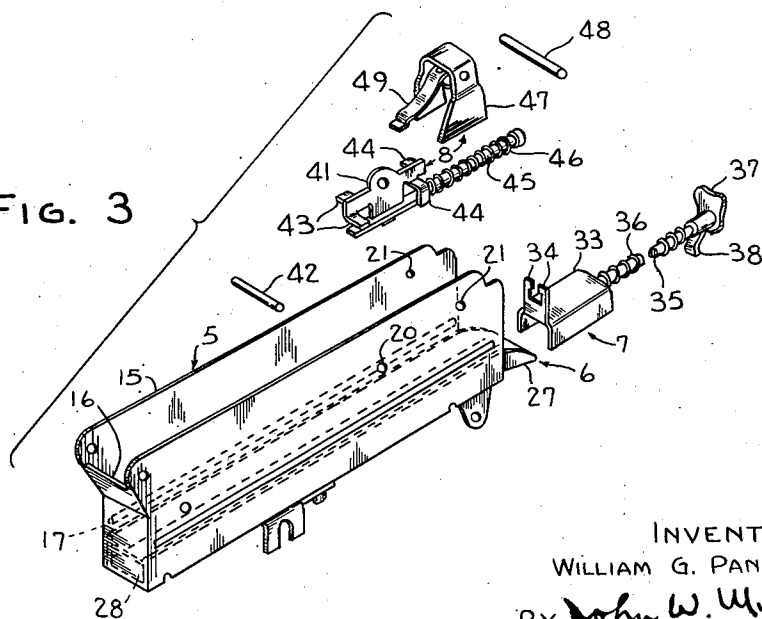


FIG. 2

FIG. 3



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2,469,985

FEED MECHANISM FOR STAPLING
MACHINES

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Original application April 30, 1945, Serial No.
591,009. Divided and this application April 2,
1947, Serial No. 738,782

5 Claims. (Cl. 1-49)

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This invention relates to improvements in stapling devices and particularly to staplers of the "pliers" type.

This application is a division of the co-pending application of William G. Pankonin, Serial No. 591,009, filed April 30, 1945, for "Feed mechanism for stapling machines."

An object of the invention is to provide a stapler in which the staple-feeding mechanism is movable into position for ready loading of the magazine but remains attached to the stapler during such loading operation.

The foregoing object is obtained by providing a retainer with which the staple follower engages as it is withdrawn from the magazine which holds the follower while allowing it to be swung out of the path to the mouth of the magazine.

The novel features, which are considered characteristic of the invention, are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, in which:

Fig. 1 is a sectional view taken on a vertical plane of a stapling device embodying the present invention;

Fig. 2 is a view in side elevation with a portion broken away to show the coaction of the parts when staples are to be loaded into the stapler; and

Fig. 3 is a perspective view of the various parts of the magazine, follower, and retainer in "exploded" relation.

Referring to the drawing by reference numerals, the stapler generally comprises a body portion 5 which, in cooperation with the staple-carrying portion 6, forms both a magazine and an ejection chute for the staples. The staples are fed through the body by a follower, generally designated 7. The follower when withdrawn is held in engaged relationship with the body portion 5 by a retainer, generally designated 8. The staples are driven through the material to be stapled by a driver blade 53 carried by a staple driver 9 connected with the body portion 5 for oscillation therein. The blade 53 coacts with an anvil 81 on an anvil carrier 11, pivoted on the body 5, to clinch the staples. An upper handle 10, pivoted to the body member 5, is operatively associated with the driver 9 to effect its oscillation. A lower handle 12, pivotally interconnected with both the body 5 and the anvil carrier 11,

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controls the cooperative action of the anvil 81. The parts are preferably made of sheet metal for economy in weight and in manufacturing cost although the parts may be otherwise constructed. It is, however, essential that the parts be so made that the entire stapler is of a size and weight to be conveniently operated in one hand.

In the following description, the left-hand ends of the various parts, as viewed in the drawing, are termed the front or forward ends, and vice versa, and the parts toward the top of the drawing are considered as the upper parts, and vice versa. The body member or portion 5 is substantially channel-shaped with a bottom wall 14, side walls 15, and a front wall 16, the front wall being formed at right angles to the bottom for a material portion of its height. The side walls are severally corrugated or pressed inwardly to form ribs or ridges 17 which serve as guides overlying the staples as they pass through the body.

The staple carrier or magazine member 6 is formed substantially as a channel of such size as to fit into the body 5 in spaced relation with the side walls 15 thereof to allow free movement of the usual U-shaped staples straddling the carrier with the legs of the staples extending into the spaces between the side walls of the body and the sides of the staple carrier. The sides 27 of the carrier are of such height that the staples may slide freely between the ribs 17 and the tops of the edges of such sides. The body 5 and the carrier 6 hence define a magazine for receiving a supply of staples and from which the staples are fed into a chute defined by the vertical portion of the front wall 16 of the body 5 and a front wall 28 of the carrier 6, it being understood that such two front walls are spaced from each other a sufficient distance only to allow free passage therethrough of one staple. The forward end of the carrier 6 is shaped to extend downwardly through the opening 22 in the body bottom 14 to bring such forward end of the carrier 6 substantially flush with the bottom of the body front wall 16. The rear ends of the carrier sides 27 are curved, as is usual, to aid in placing the staples on the carrier, and the rear bottom end of the carrier 6 is formed with a slot 29 (see Fig. 1) for the purpose of holding the follower 7 in operative position, as will be apparent from the following description.

The follower 7, which feeds the staples through the magazine and presses them into the ejection chute, comprises a head 33 which is substantially U-shaped and of a size substantially like that of the staples so as to move freely through the staple

magazine. The head is formed with lugs 34 defining a space of predetermined size and shape and extending upwardly from the magazine space for a purpose which will appear hereinafter. The follower head is so connected with a rod 35 that the head may move away or toward the forward end of the rod against or under the action of a compression spring 36 placed around the rod. One end of the spring bears against a handle 37 fixed on the rear end of the rod and having a projection 38 engageable in the slot 29 of the staple carrier 6. It will be understood that the follower head 33 bears on the staples in the magazine when the projection 38 engages in the slot 39, the spring 36 being compressed to different degrees dependent on the quantity of staples in the magazine, and that the parts are so proportioned as to allow filling of the magazine to a substantial degree while the staples are pressed forwardly with sufficient force to deliver the last of the staples into the ejection chute.

The follower retainer 8 comprises a guide 41 pivotally mounted on a pin 42 passing through the holes 20 in the stapler body 5 and is formed with arms 43 and 44 extending therefrom to fit in freely sliding relation into the body 5 and to keep the retainer guide 41 in a substantially central position on its pivot. A bar 45 is mounted on and extends both forwardly and rearwardly from the guide 41, the bar being somewhat smaller in size than, and of a sectional shape such that it may be engaged and held by, the follower head lugs 34 so that the follower head, during a portion of its rearward movement, is restrained by the action of a spring 46 about the bar and is held against disengagement from the bar by a suitable head on the end of the bar. The arms 44 are spaced sufficiently to permit the lug 34 to freely pass therebetween. A saddle 47 is set into the body 5 to rest on the ribs 17 therein and is fixed in position by a pin 48 passing through the body holes 21, the pin having a spring 49 mounted thereon under the saddle and bearing on the guide 41 to urge the retainer 8 in a clockwise direction about its pivot until the arms 44 abut against the top of ridges 17 when the bar 45 is substantially parallel with the longitudinal axis of the magazine.

It will be seen from Fig. 1 that the follower head 33 is disengaged from the retainer bar 45 when the follower head is pressed forwardly beyond the end of the bar as staples are fed through the machine, and that the retainer spring 49 tends to hold the retainer head and bar in a horizontal position. However, when the follower handle projection 38 is released from the carrier slot 29, and the follower head is being withdrawn from the stapler body 5, the lugs 34 on the follower head 33 engage with and slide along the retainer bar 45. When the follower is fully withdrawn from the stapler body, the spring 46 is compressed and the head 33 is clear of the magazine. The guide 41 then pivots to the position shown in Fig. 2, and the spring 36 passes the head 33 against the sloping edges of the saddle 47 to hold the follower in the out-of-the-way position to permit the staples to be loaded into the magazine. After the magazine has been filled, the operator exerts outward pressure on the handle 37 and swings the follower downwardly into alignment with the magazine permitting its entry therein. The retainer 8 functions not only to keep the follower always attached to the body 5 but also to hold the follower in loading position

and to guide the head 33 into the magazine opening after loading.

While constructions in which this invention may be embodied have been shown and described, it is to be understood that these constructions have been selected merely for the purpose of illustration or example and that various changes in size, shape, and arrangement of parts may be made without departing from the spirit of the invention or the scope of the subjoined claims.

What is claimed is:

1. In a stapling device, a body portion comprising a magazine having a loading opening and an ejection chute, a staple follower adapted to be received in said magazine including a head and means for urging said head forwardly in said magazine, said staple follower being movable to a loading position outside of said opening, a follower retainer pivotally mounted in said body portion, lugs on said head adapted to engage with said retainer as said follower is withdrawn from said magazine, and resilient means associated with said retainer to engage said head and hold said follower in said loading position out of the path to the opening of said magazine.

2. In a stapling device, a body portion comprising a magazine having a loading opening and an ejection chute, a staple follower adapted to be received in said magazine including a head and means for urging said head forwardly, said staple follower being movable to a loading position outside of said opening, a bar pivotally mounted in said body portion above the path of movement of said head, lugs on said head adapted to slidably engage said bar as said follower is being withdrawn, spring means carried by said bar and compressed by said lugs as said follower is removed from said opening of said magazine, and abutment means against which said head may be pressed by said spring means to hold said follower in said loading position out of the path to the opening of said magazine.

3. In a stapling device, a body portion comprising a magazine having a loading opening and an ejection chute, a saddle positioned in said body portion adjacent said opening to said magazine, a staple driver pivoted to said body portion, a common pivot pin for pivotally mounting said staple driver and retaining said saddle, a staple follower adapted to be received in said magazine including a head and means for urging said head forwardly in said magazine, said staple follower being movable to a loading position outside of said opening, a follower retainer pivotally mounted in said body portion, lugs on said head adapted to engage with said retainer, spring means mounted on said pin and biased by said saddle to normally hold said follower retainer in a position to be engaged by said lugs as said follower is being withdrawn, spring means associated with said follower retainer engaged and compressed by said lugs as said follower is removed from said opening of said magazine, said follower and said retainer being jointly swingable after said follower is withdrawn to said loading position, and sloping edges on said saddle cooperable with said head when in said loading position under influence of said spring means associated with said retainer to maintain said follower in said loading position out of the path to the opening of said magazine.

4. A housing having a loading opening, a staple magazine for preformed staples mounted in said housing, an ejection chute through which the staples are discharged, means for feeding the staples to said chute including a head slidably

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mounted upon a rod, said head and rod being removable from said magazine, and means having a resilient force acting in the direction of said ejection chute to engage said head and said rod upon removal thereof and hold said head and rod to said housing out of the path of entrance to said opening.

5. In a stapling device, a body portion comprising a magazine having a loading opening and an ejection chute, a staple follower adapted to be received in said magazine including a head and means for urging said head forwardly in said magazine, a bar pivotally mounted in said body portion above said magazine, spring means carried by said bar, lugs on said head adapted to slidably engage said bar and said spring as said follower is withdrawn toward said opening, said bar permitting said follower to be swung upwardly out of the path to said opening of said magazine after said follower has been withdrawn

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from said magazine, said bar and said spring guiding said follower into said opening of said magazine when said follower is swung downward into general alinement therewith.

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The following references are of record in the file of this patent:

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