Nov. 22, 1949 H. RUSKIN 2,489,050

STAPLING MACHINE

Filed Aug. 4, 1945 4 Sheets-Sheet 1

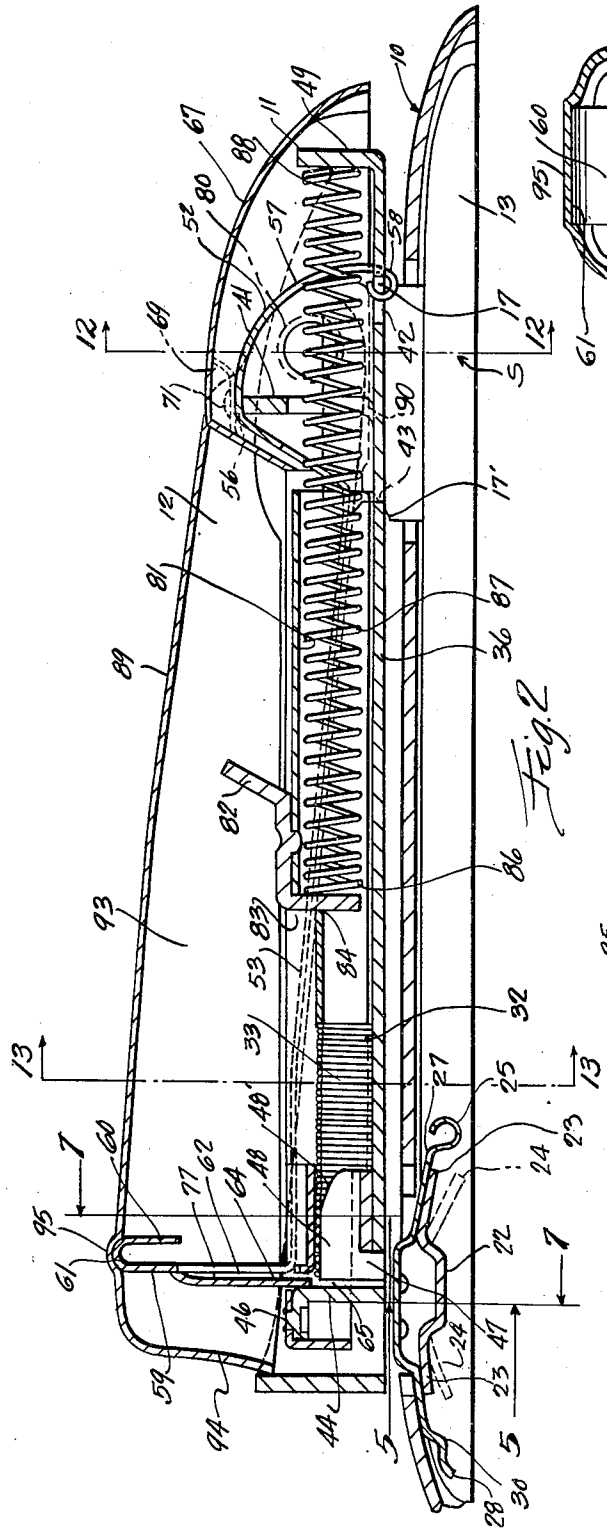


Fig. 2

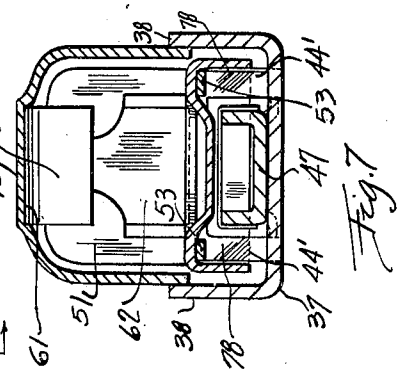


Fig. 7

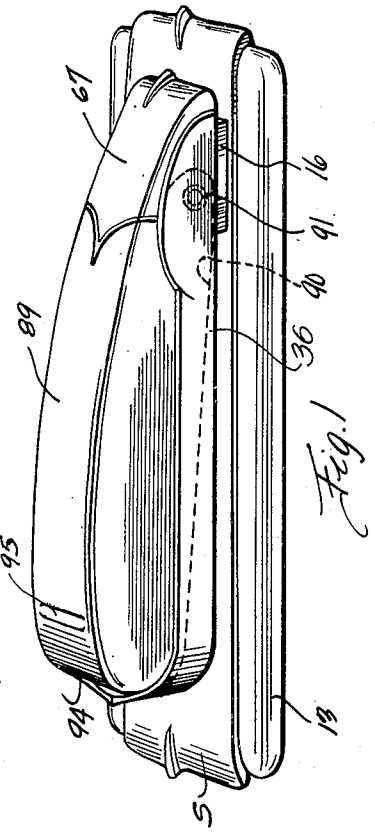


Fig. 1

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Nov. 22, 1949 H. RUSKIN 2,489,050

STAPLING MACHINE

Filed Aug. 4, 1945 4 Sheets-Sheet 2

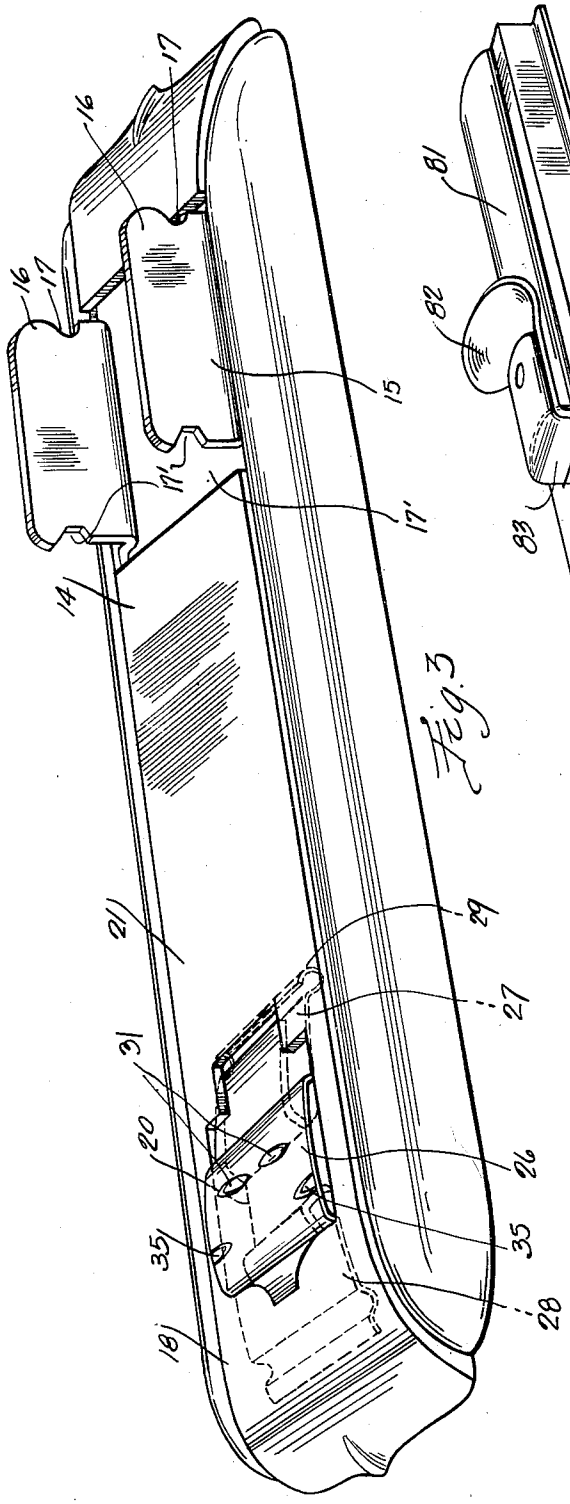


Fig. 3

Fig. 4

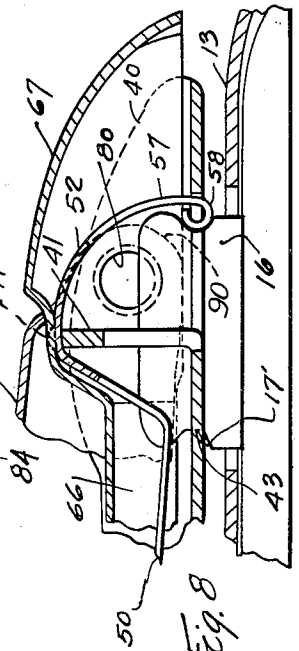


Fig. 8

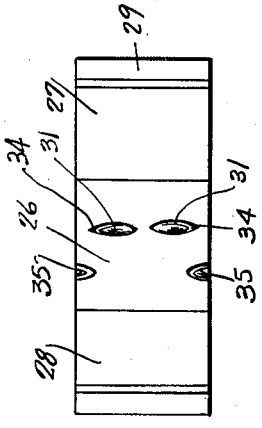


Fig. 6

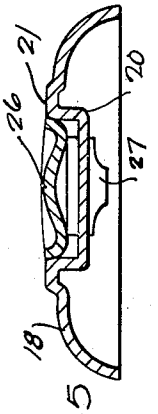


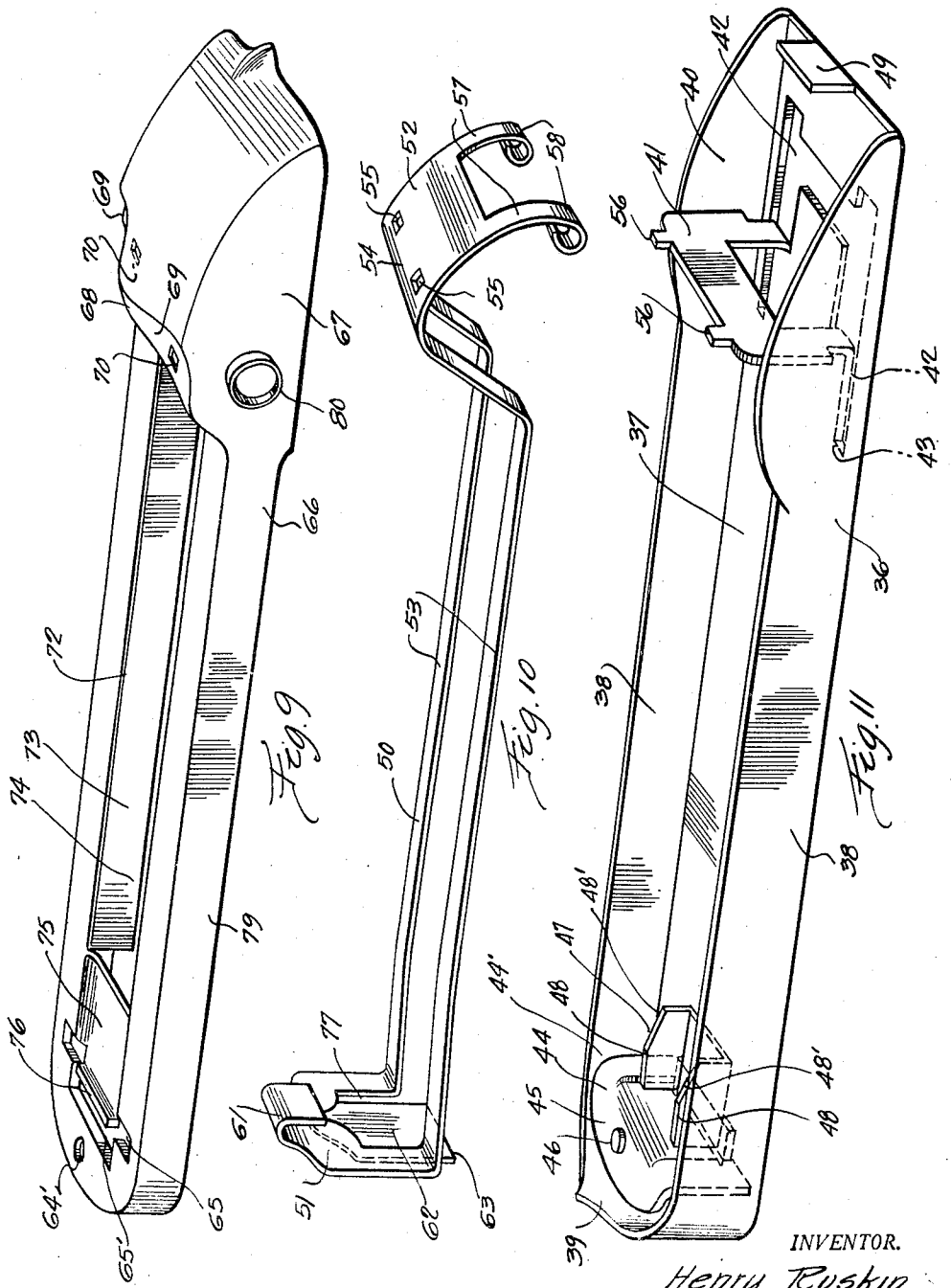
Fig. 5

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STAPLING MACHINE

Filed Aug. 4, 1945 4 Sheets-Sheet 3



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STAPLING MACHINE

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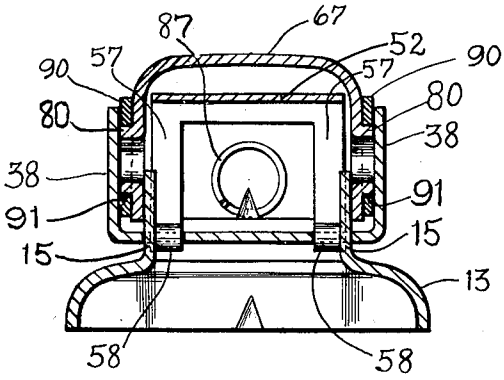


Fig. 12.

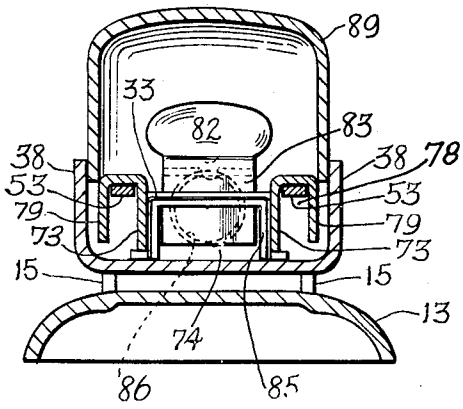


Fig. 13.

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UNITED STATES PATENT OFFICE

2,489,050

STAPLING MACHINE

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Application August 4, 1945, Serial No. 608,899

11 Claims. (Cl. 1—3)

1

This invention relates to a stapler machine. More particularly the invention relates to a stapler machine especially useful for passing staples through paper tags or other materials and for substantially clinching the staples so as to provide a connection between a plurality of sheets of paper tags or other materials.

Among the salient objects of the invention is to provide a stapler machine of the character hereinafter described, which will be highly efficient in use and economical in manufacture; one in which there are separate fulcrums for the driver and the striker therefor; one in which there is provided a hollow head which permits the paper to be self-forming with respect to the head so that the full benefit of the drive of the staple against the paper will result during the stapling operation; a stapler device in which there is an open staple magazine, thus providing easy loading of the staples with the staples each being guided into driving position by contact with the legs thereof; a stapler machine which will minimize the possibility of jamming of the staples either in the magazine or in the driver head; a stapler machine in which the driver at all times has a substantial portion confined in the driver slot, thus preventing the driver from becoming distorted or otherwise bent during the stapling operation.

Among the several other objects of the invention is a stapler machine in which the mechanism is substantially concealed, one in which there is employed an anvil which has a predetermined degree of yieldability and in which there is provided a bridge structure serving as a support for the magazine cover and an anchor for the spring driver.

A still further and equally important object of the invention is the provision of a stapler machine in which there is provided a stapler magazine capable of holding a substantial number of staples in position for movement to the point of engagement with the driver, and in which the staples are guided to such point by engagement of the legs of the staples only with the guiding sides of the magazine cover.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of a stapler machine embodying the invention;

2

Fig. 2 is a longitudinal vertical sectional detail view of the same;

Fig. 3 is a perspective view of the base assembly of the stapler machine embodying the invention;

Fig. 4 is a perspective view of the staple follower;

Fig. 5 is a sectional detail view taken substantially on line 5—5 of Fig. 2;

Fig. 6 is a top plan view of the anvil embodied in the invention;

Fig. 7 is a sectional detail view taken substantially on line 7—7 of Fig. 2;

Fig. 8 is a fragmentary sectional detail view illustrating the mounting of the cover and driver spring with respect to the base of the stapler machine;

Fig. 9 is a perspective view of the magazine cover;

Fig. 10 is a perspective view of the driver;

Fig. 11 is a perspective view of the staple magazine;

Fig. 12 is a sectional detail view taken substantially on line 12—12 of Fig. 2;

Fig. 13 is a sectional detail view taken substantially on line 13—13 of Fig. 2.

The drawings illustrate the preferred form of construction by which the several objects of my invention are accomplished. In this drawing, 10 indicates the base of the stapler machine S, 11 the magazine assembly, and 12 the cover and/or striker.

I shall first explain the base assembly 10. This base assembly comprises a base plate 13, a perspective of which is illustrated in Fig. 3. At one end of the base plate 13 there is struck from the top walls 14 oppositely disposed lugs providing flat ears 15 having formed in opposite vertical edge portions 16, notches or cut-out portions 17. In the opposite end portions 18 of the base 13, there is an indented portion 20 which provides a support for the adjustable, yieldable anvil in a manner now to be explained. This portion 20 is stepped below the top surface 21 of the base plate 13 in the stamping operation thereof, and this indented portion provides a medial strip 22 from which extend in opposite directions with respect to each other, lugs or fingers 23. These lugs or fingers 23, after the stepping operation of the portion 20, are normally disposed in the position shown in dotted lines as at 24, prior to the assembly of the anvil 25, a plan view of which, as shown in Fig. 6, includes an anvil plate 26 from which extend, in opposite directions, extensions 27 and 28. The extension 27 has its edge portion rolled as at 29 to provide a suitable finger

grip for the purposes presently to be explained. The extension 28 provides a bead 30 which serves as a latch when the anvil is moved to the right as viewed in Fig. 2. The anvil plate 26 is provided with corresponding indents or indentations 31 into engagement with which the legs 32 of one of the staples 33 are adapted to be driven. These indentures 31 are tapered toward each other in the direction of their length so that the legs of the staple engaging at the points 34 of these indentures will be bent toward each other, thereby clinching the staple to the material through which it has been driven. On this anvil plate 26 there is also provided in addition to the indentures or indents 31, a second pair of indentures or indents 35 tapered in opposite directions outwardly from each other whereby the legs of the staple will be bent away from each other so as to effect pinning the staple to the material through which it has been driven, as distinguished from clinching the staple thereto.

In assembling this anvil with respect to the base plate 13, it is mounted upon the portion 22 with the extensions or fingers 24 in the position shown in dotted lines. The fingers 24 in the dotted line positioin, as shown in Fig. 2, permit the anvil to be projected in the position shown in Fig. 2, after which these fingers are pressed to the position shown in full lines, where they will form a suitable support and guide for the anvil.

Suitable markings may appear on the anvil plate 26 to indicate the indentures to be used.

To this base plate is secured the magazine assembly 11, which will now be explained. This magazine assembly 11 includes a magazine 36, a perspective view of which is shown in Fig. 11. This magazine 36 includes a bottom wall 37 and opposite side walls 38 merging together at the front end as at 39. The side walls 38 are enlarged at the rear end of the magazine as at 40, and between these enlarged portions of the side walls there is struck from the bottom wall 37 a bridge 41. On opposite sides of this bridge 41 and formed in the bottom wall 37, are elongated slots 42 through which pass the lugs 15 in a manner such that the opposite corresponding notches 17' will latchingly receive the edge portions 43 of that portion of the bottom wall 37 defining the corresponding end portions of the slots 42.

A mounting bracket is indicated at 44, and this mounting bracket is positioned at the forward end portion of the magazine 36 and secured to the bottom and side walls thereof in any approved manner, such as welding or the like. This mounting bracket 44 has a horizontal portion 45 provided with an upstanding stud 46 for reasons hereinafter explained. As a part of the assembly of this mounting bracket 44 is a staple track 47 comprising oppositely disposed, parallelly extending spaced walls 48 over which the staples are moved from the staple storage of the magazine in a manner hereinafter set forth. These walls 48 are beveled as at 48' to facilitate the movement of the staples thereover into the position shown in Fig. 2.

In Fig. 2, this staple track 47 is spaced from the mounting bracket 44 a distance equivalent to the diameter of a staple. The vertical walls 44' of this mounting bracket serve and cooperate with the staple track to properly guide a staple for penetration through the material to be stapled.

This magazine at its opposite end portion provides an upstanding plate 49 to serve as an abutment for a spring to be presently described.

Associated with this magazine 36 is a staple driver 50. This staple driver 50 is preferably formed of spring material and comprises a driver head 51 and a mounting heel 52. This head 51 and mounting heel 52 are integrally connected together by the elongated strips 53 arranged in parallel spaced relation with respect to each other.

The heel 52 comprises an arcuated portion 54, and formed in this arcuated portion 54 are spaced openings 55, preferably substantially square in plan view, for the reception of the trunnions 56 formed as an integral part of the bridge 41.

The arcuated portion 54 terminates into parallel spaced resilient fingers 57 rolled at their end portions as at 58 for engagement in the corresponding notches 17 (Fig. 2) of the lugs 15, whereby to effectuate a connection between the staple driver 50 and the magazine 36.

The driver head 51 (Figs. 2 and 10) comprises a vertically extending wall 59, an extension 60 of which is turned back upon itself to provide a bearing 61 for reasons hereinafter set forth. The medial portion of this striker head is stepped forwardly as at 62 to provide a staple driver blade 63 which, as shown in Fig. 2, has its lower end portion 64 normally disposed through the driver slots 65 of the magazine cover 66, a perspective of which cover is shown in Fig. 9. Adjacent this slot 65 is a perforation 64' through which projects the stud 46 for permanently connecting the cover 66 to the magazine 36. The significance of this arrangement will be found in the fact that the staple driver blade is stabilized for its striking movement upon the staple between the guiding wall 44' of the mounting bracket and the track 47.

The magazine cover 66 comprises an end portion 67 which corresponds in shape to the enlarged portions 40 of the side walls 38 of the magazine 36. The top portion 68 of this end portion 67, is provided with opposite indentations 69, and the bottom walls of these indentations are perforated as at 70 for the projection of the lugs 56, which lugs 56, after projection through these perforations, are swaged to provide attaching caps 71.

Thus, through these swaged end portions 71 of the lugs 56, the spring and the magazine cover are secured to the magazine 36. It will be seen that in this simple arrangement the resilient extensions 57 of the staple driver 50 serve as a resilient latch connection between the magazine 36 and the base plate 13 in cooperation with the notches 17' in their latched engagement with the end portions 43 of the notches 42. It will be particularly noted that this provides a very effective and simple method of connecting these several parts together which materially reduces the cost of manufacture.

The magazine cover has a central portion 72 provided by striking therefrom the opposite longitudinal guiding flanges 73, as seen in Figs. 7 and 9. These flanges 73, when struck from the top wall of the magazine cover 70, provide the channel 74 for the staples 33 and constitute the sole guide for guiding the staples from the channel to the staple guide 47, thus greatly facilitating not only the mounting of the maximum number of staples in the channel 74, but also greatly reducing the cost of manufacture of the magazine cover.

Forwardly of the channel 74, the top wall of the magazine cover is stepped down as at 75 to provide a guiding plate which extends over the staple track 47, as best shown in Fig. 2, and this guiding plate 75 is provided with an upstanding flange 76 which is positioned in the slot 77 pro-

vided by stamping the staple driver blade 63 from the driver head 51, as best shown in Fig. 2.

The parallel bar portions 53 of the staple driver 50 are disposed in the channels 78 provided by the side walls 79 of the magazine cover 66 and the flanges 73. The driver head projects upwardly through the driver slot 65, with the staple driver blade 63 manipulatable through an adjacent slot 65'. The enlarged portions 67 of the side walls 79 provide bearings 80 for pivotally mounting a striker member 89, hereinafter set forth.

Operable in the channel 74 is a staple follower 81, a perspective of which is shown in Fig. 4. This follower is substantially channel-shaped in cross section and is designed to be mounted in the channel 74 to the rear of the staple strip 33 for yieldably urging the staples forward into staple driving position. To facilitate manual retraction of this follower when assembling a strip of staples in the channel 74, a suitable finger-piece 82 is provided. This finger-piece 82 has a portion 83 which projects through a slot 84 formed in the top wall 85 of the follower and serves as an abutment for one end portion 86 of a spring 87 confined within the follower 81, as best shown in Fig. 2, the opposite end portion 88 of this spring engaging the abutment lug 49 (Fig. 2).

To complete the invention I provide a striker 89. This striker 89 provides rearwardly extending side wall portions 90 disposed on opposite sides of the end portion 67 of the magazine cover 66 and provided with perforations 91 (Fig. 1) to receive the bearings 80 (Figs. 8, 9 and 12). This striker comprises a top wall 89, opposite side walls 93, and a front wall 94, and operates within the magazine 36. The top wall 89, at one end thereof, is provided with an outwardly indented portion 95 which receives the bearing 61.

A device constructed in accordance with the foregoing description will result in a stapler machine the parts of which are related to each other in a manner such as affords expeditious and easy assembly and one which will be economical in manufacture.

In use, after the striker has been pivoted upwardly about the bearings 80 to expose the storage channel 74, the staple follower 81 is retracted against the action of the spring 87 and a strip of staples 33 is mounted in the channel 74. In this mounting of the strip of staples 33, it will be seen that it does not require particular attention during this mounting operation, as it is a very simple matter to merely mount the strip in the open channel 74. The construction of this channel 74 and the arrangement of the follower therein affords the mounting of a strip of staples of substantial length, of a length greater than may usually be employed in the stapler machines with which I am familiar. Upon this mounting of the strip of staples in the channel 74, the follower is released and by action of the spring will engage the end of the strip of staples to urge the staples into driving position. The striker 89 is now pivoted to the position shown in Fig. 2. The foremost staple will be disposed directly beneath the staple driver blade 63 in the space between the guiding wall 44' and the staple track 47. In such position, the staple driver blade at all times has its lower end portion stabilized in driving direction and is ready for operation upon the staple, which is brought about by striking the striker 89 to pivot the striker downwardly and at the same time move the staple blade through its driving

path to drive the staple through the material and into engagement with the anvil for either of the two operations; namely, the pinning or the clinching. Upon removal of striking pressure on the striker 89, the striker will return to its normal position, as shown in Fig. 2, by the action of the return of the staple driver 50. Thus, it will be significant to note that the driver serves the two-fold purpose of driving the staple through the material and crimping or pinning the same and also that of returning the cover to its normal position. The spring fingers 57 of the driver also serve to releasably latch the various parts to the base plate 13.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A stapler device comprising a base, a stapler magazine carried by the base and between which material to be stapled is adapted to be positioned, a driver throat provided by the magazine and adapted to receive staples therefrom, a cover for said magazine, a staple driver having a longitudinal portion thereof arranged between the cover and the magazine, one end of said longitudinal portion providing connection between the base and the staple driver, said longitudinal portions of said staple driver being formed of spring material whereby to bias said driver member from driving position with respect to said staples received in the throat from the magazine, said staple driver having a driver head exterior of said magazine and provided with a staple driver blade movable through the throat, in combination with an anvil carried by the base and adapted to cooperate with the staple driver blade to clinch the leg portions of a staple with respect to said material.

2. A stapler device comprising a base member including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the magazine, a striker for said staple driver, and means for pivotally connecting said striker to said magazine cover.

3. A stapler device comprising a base member including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the magazine, a striker for said staple driver, and means for pivotally connecting said striker to said magazine cover, said driver being formed of spring material whereby to bias said striker to non-driving position with respect to said staples.

4. A stapler device comprising a base member

including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having an offset portion providing a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the magazine, a striker for said staple driver, and means for pivotally connecting said striker to said magazine cover.

5. A stapler device comprising a base member including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the magazine, a striker for said staple driver, means for pivotally connecting said striker to said magazine cover, said staple driver being formed of spring material whereby to bias said striker to non-driving position with respect to said staples, and a throat structure into which the lower portion of said staple drive finger projects and adapted to receive staples from said track.

6. A stapler device comprising a base member including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the magazine, a striker for said staple driver, and a bridge provided at one end of said magazine and providing a common connection between said magazine, staple driver and magazine cover.

7. A stapler device comprising a base member including an anvil, a magazine including a staple channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position over said anvil, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved along said track and over said anvil, a cover for the mazagine, a striker for said staple driver, and a bridge provided at one end of said magazine and providing a common connection between said magazine, staple driver and magazine cover, said staple driver being limited in its up and down movement by said cover and magazine, respectively.

8. In a stapler machine, the combination with a base, a staple magazine, a staple driver, and a striker for said staple driver, of means providing a connection between the staple driver, the magazine and the base, including a portion of said driver adapted to bias said staple driver from driving position with respect to a staple contained in said magazine, and other means providing a pivotal connection between the striker and the magazine, said staple driver serving to bias said striker in a direction from striking position with respect to said staple driver.

9. A device of the class described comprising a magazine including a staple channel and a staple receiving throat at the end of the channel, a track at one end of the channel and adapted to receive staples therefrom for movement to a position in said throat, a follower carried by the magazine for moving said staples to said position, a resilient staple driver having a staple driver blade disposed to engage a staple moved from said track to said throat, a cover for the magazine, a striker for said staple driver, and means for pivotally connecting said striker to said magazine cover.

10. A device of the class described comprising a magazine including a staple channel and a throat at one end of the channel, a track at one end of the channel and adapted to receive staples therefrom for movement into said throat, a follower carried by the magazine for moving said staples to said track, a resilient staple driver having an offset portion providing a staple driving blade adapted to drive a staple moved in said throat, a cover for the magazine, a striker for the cover, and means for pivotally connecting the striker to said magazine cover.

11. A device of the class described comprising a magazine including a staple channel and a throat at one end of the channel, a track at one end of the channel and adapted to receive staples therefrom for movement into said throat, a follower carried by the magazine for moving said staples to said throat, a resilient staple driver having a staple driver blade disposed to drive a staple moved into said throat, a cover for the magazine, a striker for said driver, and a bridge provided at one end of the magazine and providing a common connection between said magazine staple driver and magazine cover.

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