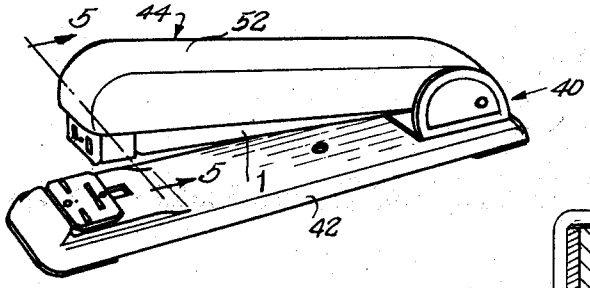
Feb. 5, 1963 W. JOPP 3,076,195

STAPLER

Filed Dec. 7, 1960

FIG. 1



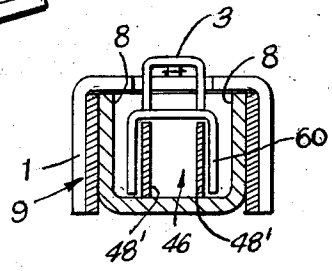


FIG. 5

FIG. 2

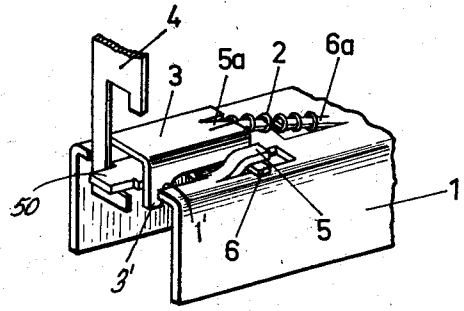


FIG. 3

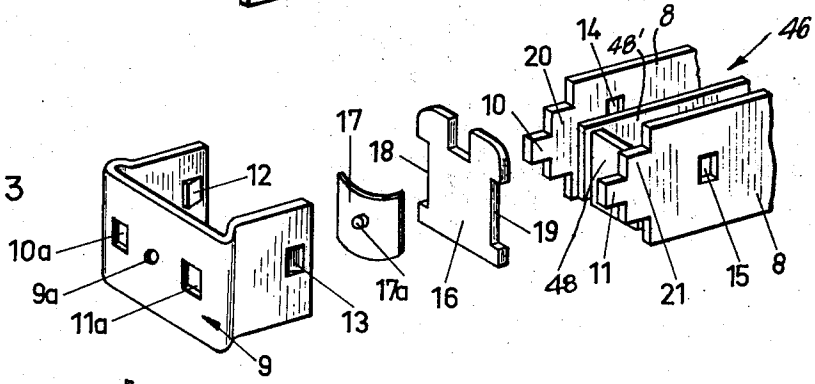
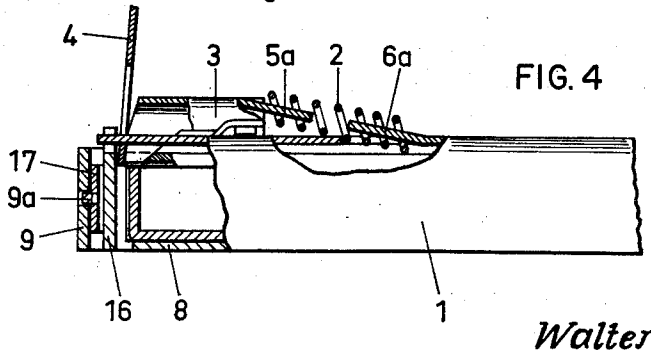


FIG. 4



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United States Patent Office 3,076,195 Patented Feb. 5, 1963

3,076,195

STAPLER

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Filed Dec. 7, 1960, Ser. No. 74,331
7 Claims. (Cl. 1—3)

This invention relates in general to stapling devices and in particular to a new and useful stapler which includes a simply constructed staple feed channel member and cover bar arrangement defining a feed line and discharge for the staples, and including a guide element which is carried by the cover bar and biased against a staple driving element to maintain the remaining staples on the staple feed channel during the discharge of a staple.

The invention is an improvement over prior art devices, particularly in the simple construction of the feed channel to support the staples for feeding therealong, and to the channel-shaped cover bar adapted to overlie the feed channel and confine the staples therebetween.

The construction includes means for supporting a staple guide element so that the front end thereof extends through openings in the cover bar and contacts the top portions of staples which are positioned on the feed channel. The arrangement includes means defining a discharge opening through which a driver is reciprocatable and means for biasing the guide element against the driver to prevent displacement of the remaining staples when one is being discharged.

A further feature of the invention is the removable end wall assembly for the staple feed channel which includes a snap-on front piece which carries a spring element for biasing an equalizing plate into a spaced location from the end of the staple feed channel. This plate may be displaced slightly when the driving element is pushed downwardly at an angle to the contact face thereof to effect accurate discharge feeding of a staple.

Accordingly, it is an object of this invention to provide an improved stapler construction.

A further object of this invention is to provide a stapler construction including a channel-shaped cover bar member which extends over a staple feed channel and is provided with a displaceable guide portion which is biased against a driver and contacts the upper portions of staples on the feed channel to prevent dislodgment thereof during operation of the driver to displace a staple from the feed channel.

Accordingly, another object of the invention is to provide a stapler including walls defining a staple feed channel closed at at least one end and including a wall connectable thereto disposed at a spaced location from the closed end and which is secured in position by a securing clip member having crimps to fit into complementary recesses on the channel and carrying a spring element for biasing the wall into a spaced position from the closed end of the channel to define a staple discharge opening therewith.

A further object of the invention is to provide a stapler which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

In the drawings:

FIG. 1 is a perspective view of a stapler constructed in accordance with the invention;

FIG. 2 is a fragmentary perspective view of the cover bar, guide element and driver;

FIG. 3 is an exploded perspective view of the staple feed channel;

FIG. 4 is a fragmentary partial elevation and partial sectional view of the assembled cover bar and staple feed channel; and

FIG. 5 is a section taken on line 5—5 of FIG. 1.

Referring to the drawings in particular, the invention embodied therein includes a stapler generally designated **40** which includes the usual base portion **42** and a cover assembly generally designated **44** which is pivotally mounted thereon at one end thereof. The cover assembly **44** includes a staple feed channel generally designated **46** (FIG. 3). The staple feed channel **46** includes outer spaced side walls **8, 8**. An end wall **48** connects the ends of sidewall pieces **48', 48'** spaced inwardly from side walls **8, 8** and which form vertical edges for guiding the staples during discharge. A staple **60** is indicated supported on walls **48', 48'** as shown in FIG. 5.

In accordance with one feature of the invention, a front end closure is provided for the staple feed channel **46** which includes an equalizing plate **16** having vertically elongated side notches **18** and **19** which permit it to be inserted over stepped shoulder portions **20** and **21** formed at the ends of the plates **8, 8**. The equalizing plate **16** is held in position by clip means such as a substantially U-shaped slip-on cap generally designated **9** which includes side walls having indentations **12** and **13** formed thereon which extend to the interior face and which cooperate with recesses **14** and **15** formed on the exterior of walls **8, 8** to permit the slip-on cap **9** to be latched into position. The ends of the walls **8, 8** also include projections **10** and **11** which fit into openings **10*a*** and **11*a*** formed on the slip-on cap **9**. In addition, a spring plate member **17** is interposed between the equalizing plate and includes a projection **17*a*** which fits into an opening **9*a*** formed in the end wall of the slip-on cap **9**. In the assembled position, the plate **16** is biased toward the abutting end of the walls **8, 8** by member **17** and forms together with the walls **48', 48'** a discharge opening for staples.

In accordance with the invention, staples are advanced along the staple feed channel **46** under the usual spring biasing means (not shown). The cover assembly includes a cover bar **1** of substantially U-shaped section which fits over the feed channel **46** and confines the staples therebetween. It includes a central top wall tongue or projection **50** which forms a guide for a staple pusher or driver **4** which is carried on a driving member **52** which is pivoted at one end on the base portion **42**. The driver **4** has a central slot permitting it to reciprocate relative to the cover bar **1** over projection **50**.

The invention includes a guide member **3** of channel shape having elongated legs **3'** at the forward end which project through an opening **1'** formed in the top wall face of the cover bar **1**. The cover bar **1** is advantageously cut in a rectangular area on each side of the guide element **3** to form anchor legs or tongues **5** on each side of the guide element which overlie lateral projections **6** formed at the rear end of the guide element **3**. The guide element **3** may thus pivot somewhat and move backwardly and forwardly axially in respect to the cover bar **1**.

A feature of the construction is that the guide element includes a central anchor lug **5*a*** formed as a central extension in alignment with a similarly formed anchor lug **6*a*** formed on the upper face of the cover bar **1**. The anchor lugs **5*a*** and **6*a*** carry a compression spring **2** which biases the guide element **3** to cause its U-shaped for-

ward face to bear against the driver 4. A bottom portion 3' overlies the tops of the staples which are positioned on the staple feed channel 46 and prevents displacement of the staples beyond an amount exceeding the small pivotal movement of the guide element 3 in the lugs 5. The bottom portion 3' abuts the tops of the staples and holds them downwardly on the walls 48', 48' against upward or lateral movement when the driver 4 is moved to displace the foremost staple into a sheet which is to be stapled.

Since the driver 4 is movable with the cover assembly 44, it is angled against the plate 16 so as to displace the plate slightly in an axial direction and permit the forcing of a staple downwardly and through the discharge formed between the plate 16 and the end of the feed channel 46. The guide element 3, which is biased against the driver 4, insures that the staples immediately adjacent the one being discharged are maintained in proper alignment and not displaced, so that there is no possibility of jamming of the device during operation. The guide element prevents any tilting of the staples and this is particularly important when only a few staples remain in the stapler.

Thus, the invention provides a very inexpensive stapler formed of inexpensively manufactured parts which may be stamped out and then easily assembled. The guide element functions to insure that the staples are maintained in alignment during the discharge of a single staple by the driver member. The guide element is inexpensively formed and easily assembled with the use of a minimum of operating parts.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A stapler for generally U-shaped staples comprising a base, walls pivoted on one end of said base and defining a staple feed channel adapted to support a plurality of staples thereon for feeding therealong, a channel-shaped cover bar pivoted on said base at the same location as said feed channel and extending over said staple feed channel and the staples thereon, equalizer plate means spaced from the free end of said staple feed channel and defining with said feed channel a discharge opening for the staples, a driver member pivoted on said base at the same location as said cover bar, a driver carried by said driver member and movable upon movement of said driver member relatively to said base through said discharge opening to drive a staple therethrough, said cover bar having a top wall with an opening adjacent the discharge opening, a guide element slidable on said cover bar and extending through the top wall opening of said cover bar to contact staples therebeneath and prevent displacement thereof upwardly and along said feed channel, and means to bias said cover bar away from said driver member whereby said driver member may be pushed manually toward said base and relatively to said cover bar to drive a staple through said discharge opening by contact with said driver while said guide element prevents displacement of the adjacent staples.

2. A stapler according to claim 1, including means to bias said equalizing plate means against said feed channel.

3. A stapler according to claim 1, wherein said feed channel includes end walls having stepped projections thereon, said equalizing plate having side notches adapted to fit over said projections and be positioned against the ends of said feed channel, and slip on cap means to hold said equalizing plate in position.

4. A stapler according to claim 3, wherein said slip on cap means includes a resilient element biased against said equalizing plate to urge said plate towards said feed channel.

5. A stapler according to claim 1, wherein said guide element includes a laterally extending tab, said cover bar including an upwardly extending lug, said tab being slidable backwardly and forwardly under said lug.

6. A stapler according to claim 5, wherein said lug is formed as a cutaway portion of said cover bar extending angularly upwardly and thence substantially parallel to the top face of said cover bar.

7. A stapler according to claim 1, wherein said guide element includes a central rearwardly projecting portion, said cover bar having a projecting portion in alignment with said rearwardly projecting portion of said guide element, and wherein said means to bias said guide element against said driver includes a coil spring extending over said projecting portions of said guide element and said cover bar.

References Cited in the file of this patent

UNITED STATES PATENTS

2,083,227	Drypolcher	June 8, 1937
2,117,741	Polzer	May 17, 1938
2,117,743	Polzer	May 17, 1938
2,420,830	Maynard	May 20, 1947
2,920,324	Kufel	Jan. 12, 1960

FOREIGN PATENTS

519,606	Great Britain	Apr. 1, 1940