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 [21] Appl. No. **809,098**
 [22] Filed **Mar. 21, 1969**
 [45] Patented **June 8, 1971**

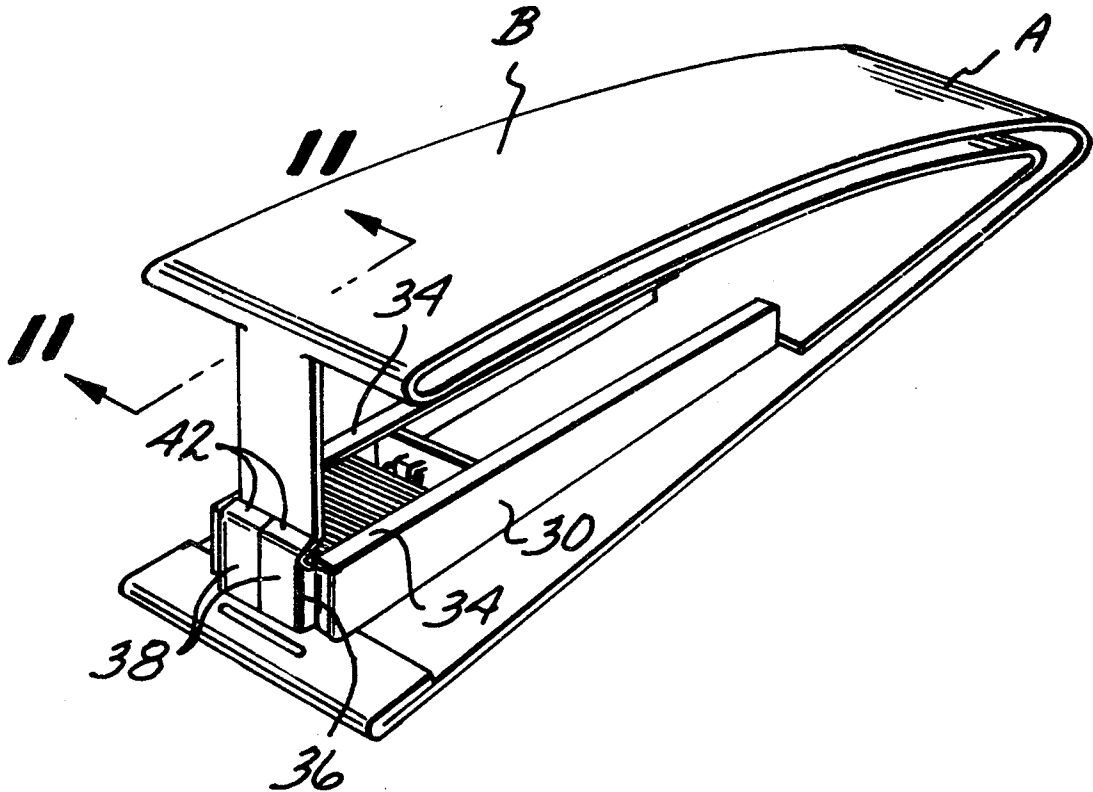
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 Primary Examiner—Granville Y. Custer, Jr.
 Attorney—William C. Babcock

[54] **STAPLER**
9 Claims, 18 Drawing Figs.

[52] U.S. Cl..... 227/120
 [51] Int. Cl..... B25o 5/02
 [50] Field of Search..... 227/120,
 129, 134, 139, 156; 206/56 DF

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ABSTRACT: A stapler of the type in which a sequence of generally U-shaped staples that are lightly bonded together are ejected one-by-one as the handle of the stapler is moved downwardly, with said staples at all times being urged forwardly in a magazine forming a part of the stapler by a spring-loaded follower. The present stapler is characterized by a body that includes a staple magazine, handle, base, and anvil, all of which are formed from an elongate blank of resilient, but deformable material after said blank has been subjected to a sequence of bending operations. Due to the structural simplicity thereof, and the low cost of the material from which it is formed, the stapler of the present invention may be retailed complete with a full stock of staples, and may be discarded when the original supply of staples contained therein is depleted.



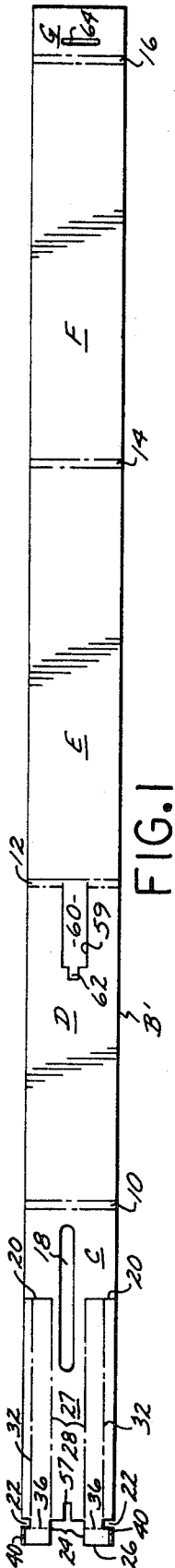


FIG. 1

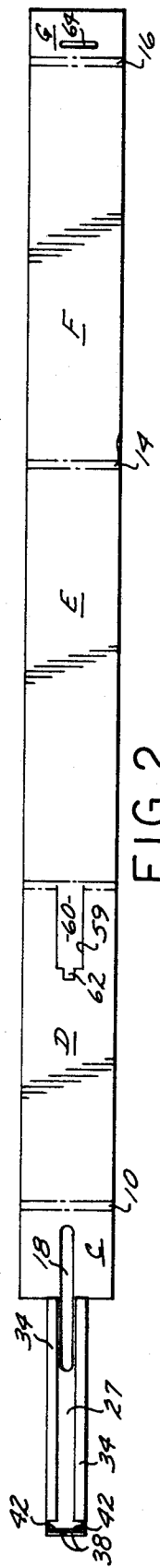


FIG. 2

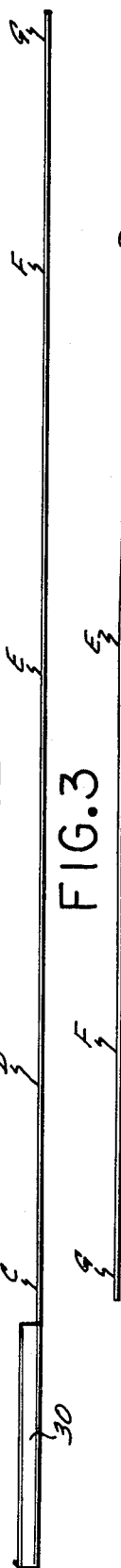


FIG. 3

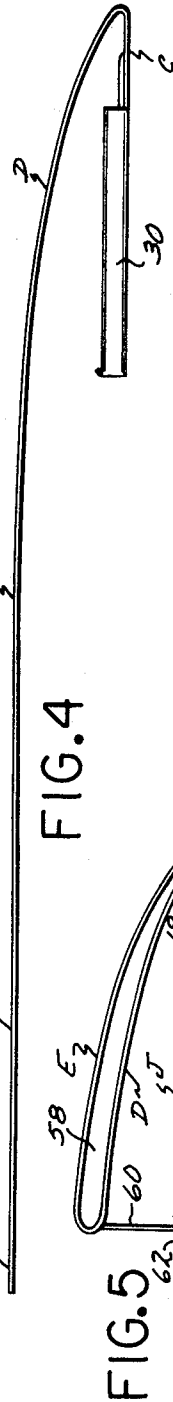


FIG. 4

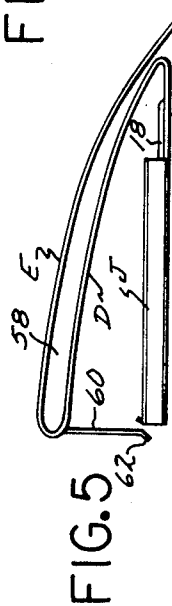


FIG. 5

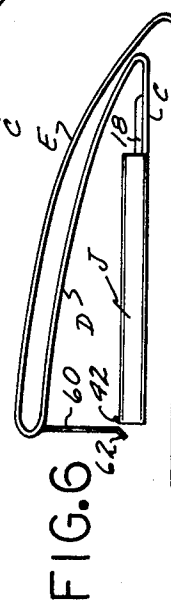


FIG. 6

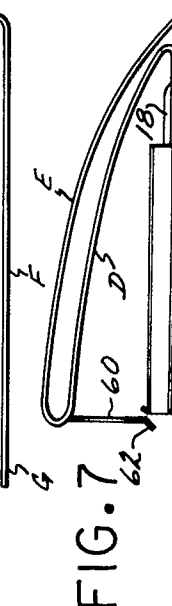


FIG. 7

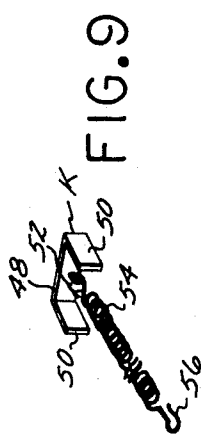


FIG. 8



FIG. 9

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FIG. 10

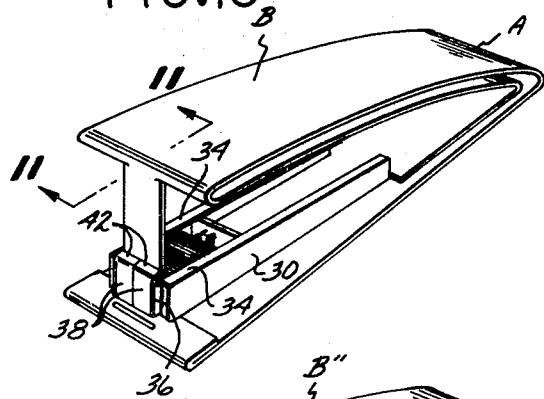


FIG. 11

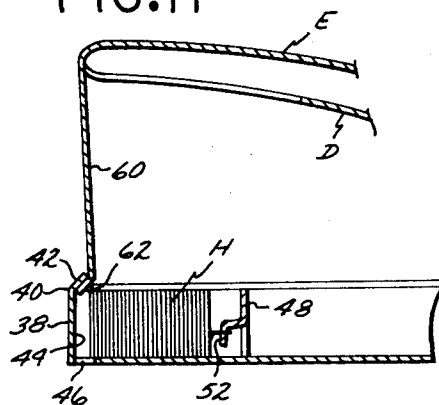


FIG. 12

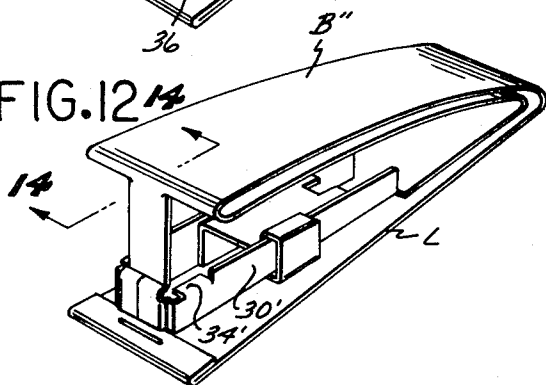


FIG. 13

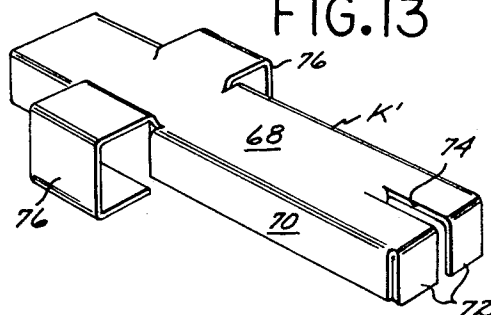


FIG. 14

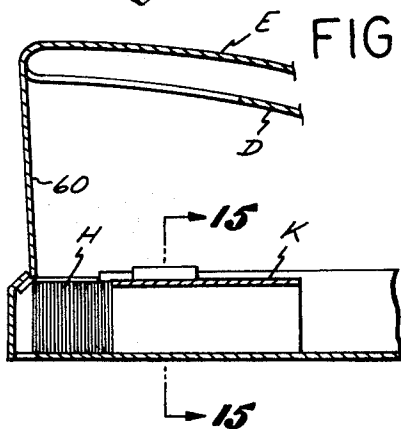


FIG. 15

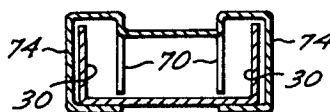


FIG. 16

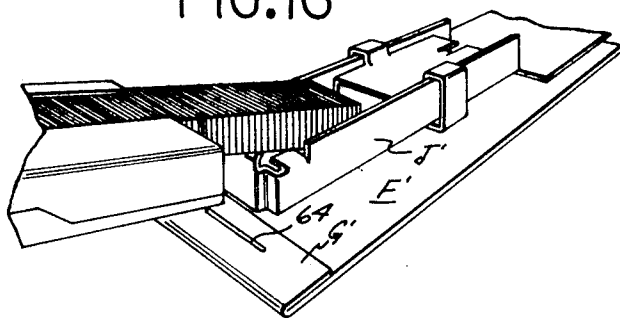


FIG. 18

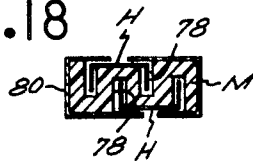
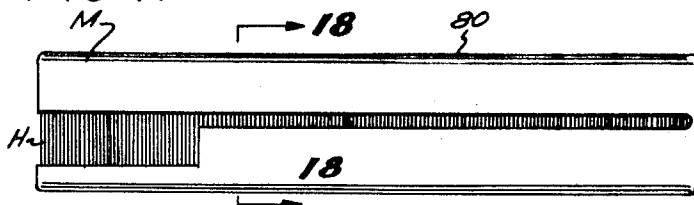


FIG. 17



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STAPLER

DESCRIPTION OF THE PRIOR ART

1. Field of the Invention

A stapler in which both the body thereof and the stapler follower may be formed from sheet metal blanks by a series of bending operations.

2. Description of the Prior Art

Devices for sequentially ejecting wire staples of a generally U-shaped configuration have been used for many years. However, such prior staplers are formed from an excessive number of parts that are not only expensive to produce, but time consuming to assemble into the completed unit. Due to the number of parts and assembly cost thereof, staplers available heretofore must be retailed at a substantial price, thus making them out of reach for many potential customers, particularly students.

The present invention provides a stapler that has but three parts, two of which may be formed from inexpensive sheet metal blanks by a sequence of bending operations. Assembly of the present stapler is inexpensive as well as of most simple design, whereby the device may be retailed at a sufficiently low price as to permit discard of the stapler when the stock of staples contained therein at the time of purchase is depleted.

SUMMARY OF THE INVENTION

A stapler in which the staple follower and the body thereof includes a staple magazine, handle, base and anvil that may be formed from two sheet metal blanks by a series of bending operations.

A major object of the present invention is to provide a first form of stapler of such simplicity and low cost that it may be retailed, complete with staples, at a sufficiently low price as to permit the first form of stapler to be discarded when the stock of staples therein is depleted.

Another object of the invention is to supply a second form of stapler that is of far simpler construction than previously available devices of this nature, and one that may be refilled with staples after the initial supply contained therein is depleted.

Yet another object of the invention is to furnish first and second forms of staplers, the staple follower and body of each of which is formed from sheet metal blanks by a sequence of bending operations, with the assembly cost of both forms being at a minimum due to the relatively few component parts comprising same.

A still further object of the invention is to provide first and second forms of a stapler, which while simple in construction and operation and correspondingly inexpensive to produce, provide staplers that are completely satisfactory in practical use.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of an elongate blank used in the formation of the body of the first form of stapler;

FIG. 2 is a top plan view of the blank shown in FIG. 1 after a first longitudinal section thereof has been subjected to a bending operation to partially define a staple magazine;

FIG. 3 is a side elevational view of the blank shown in FIG. 2;

FIGS. 4-8 inclusive show successive side elevational views of the blank illustrated in FIGS. 2 and 3 as it is subjected to successive bending operations to transform the same into a complete stapler body including a staple magazine, handle, base, and anvil;

FIG. 9 is a perspective view of the staple follower used in the first form of the device;

FIG. 10 is a perspective view of the complete first form of stapler;

FIG. 11 is an enlarged fragmentary longitudinal cross-sectional view of the first form of stapler, taken on the line 11-11 of FIG. 10;

FIG. 12 is a perspective view of a second form of the stapler;

FIG. 13 is a perspective view of the stapler follower used in the second form of the device;

FIG. 14 is an enlarged fragmentary longitudinal cross-sectional view of the second form of stapler, taken the line 14-14 of FIG. 12;

FIG. 15 is a transverse cross-sectional view of the second form of stapler, taken on the line 15-15 of FIG. 14;

FIG. 16 is a perspective view of the second form of stapler being filled with a sequence of staples;

FIG. 17 is a side elevational view of a container for storing staples and dispensing the same into the second form of the device; and

FIG. 18 is a transverse cross-sectional view of the container taken on the line 18-18 of FIG. 17.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The body portion B of the first form A of the stapler shown in FIG. 10 is fabricated from an elongate, generally rectangular blank B', as illustrated in FIG. 1. The blank B' is formed from a metal or metal alloy possessing some resiliency, but which may be permanently deformed when stressed beyond its elastic limit, such as light sheet steel.

The blank B' is subdivided by longitudinally spaced, transverse first, second, third, and fourth bending zones 10, 12, 14 and 16, respectively, into first, second, third, fourth, and fifth sections C, D, E, F, and G, respectively, as shown in FIGS. 1 and 2.

By the application of pressure thereto, a longitudinally extending, centrally disposed rib 18 is formed in the first section C. Two transversely aligned, laterally spaced slits 20 are formed in the rear portion of first section C, as best seen in FIG. 1. Two transversely aligned, laterally spaced notches 22 are formed in the forward portion of first section C, and a rectangular recess 24 extends rearwardly in this section from the center of the first end 26 thereof.

The side edges of recess 24 and the inner extremities of slits 20 are in longitudinal central portion 27 of first section C. The longitudinal sides of the central portion 27 are indicated by bending lines 28 in FIG. 1. When first portions of section C outwardly from bending lines 28 and forwardly from slits 20 are bent upwardly to be disposed in a direction normal to central portion 27, they define the side walls 30 shown in FIG. 10. The upper longitudinal parts of sidewalls 30 are bent along lines 32 to define two parallel, laterally spaced flanges 34, the purpose of which will later be explained.

Second portions are provided in first section C forwardly of notches 22, which are bent inwardly toward one another along bending lines 36 to define a split end wall 38, as best seen in FIG. 10. The upper portions of the split end wall 38 are bent rearwardly along bending lines 40 to define stops 42, as illustrated in FIG. 11.

The rear faces 44 of the split end wall 38 are forwardly spaced from the forward edge of the central portion 27 and cooperate therewith to define a narrow transverse opening 46. The opening 46 is slightly wider than the thickness of one of the inverted U-shaped wire staples H to permit but a single staple at a time to be forcibly ejected therethrough, as will be explained in detail hereinafter.

The staples H are lightly bonded together in a longitudinal sequence, as shown in FIG. 11. The central portion 27, sidewalls 30, flanges 34, and split end wall 38 cooperatively define an elongate magazine J in which the staples H are contained. The lateral spacing between the free edges of the flanges 34 is less than the width of the staples H, and as a result, the staples will not be inadvertently displaced from the magazine J when the first form of stapler is held in an inverted position.

A staple follower K is shown in FIG. 9, which includes a web 48 having two laterally spaced legs 50 projecting forwardly therefrom. The dimensions of follower K are such as to permit it to be slidably movable in magazine J. Two laterally spaced slits (not shown) extend upwardly in web 48, with that portion

of the web between the slits being so formed as to define a hook 52. Hook 52 is connected to the rear end of a tensioned helical spring 54 that extends longitudinally through magazine J. The forward end of a hook 56 attached to the forward end of spring 54 engages a second notch 57 (FIG. 1) formed in the forward part of central portion 27. The spring-loaded follower K at all times urges the sequence of staples H forwardly in the magazine J to dispose the foremost staple over the opening 46. Assembly of the staples H, follower K, and spring 54 in the magazine J is preferably carried out prior to completion of the bending of the balance of the blank B'.

A generally U-shaped slit 59 is formed in the second section D (FIG. 1), with the material within the confines of the slit being bent downwardly relative to the rest of the section, as may best be seen in FIGS. 5-8 to define a pressure exerting member 60. The lower extremity of the member 60 has a centrally disposed extension that is bent outwardly to provide a tab 62 situated under the stop 42, as illustrated in FIG. 11. A The lower edges of the member 60 on each side of tab 62 can forcefully contact the upper portion of a staple H to drive the latter when the handle 58 is manually moved downwardly. A transversely positioned cavity 64 is formed in the fifth section G that is slightly wider than the width of one staple H, also for reasons which will later be explained herein.

After the blank B' has been bent in the manner described, the blank is subjected to further bending operations during which the sections D and E are bent one above the other at the bending zones 10 and 12 to provide a handle 58 from which the pressure exerting member 60 depends, as shown in FIG. 5. The blank B' is subsequently bent at the third bending zone 14 to position the fourth and fifth sections F and G under the magazine J to provide a base as shown in FIG. 7. The fifth section G is then bent rearwardly to overlie the forward portion of the section F, and in this position serves as an anvil, with the cavity 64 facing upwardly. The cavity 64 and the opening 46 are in substantial vertical alignment, and when the handle 58 is moved downwardly relative to the base, the pressure exerting member 60 forces the foremost staple H from the magazine J through the opening 46 to permit the ends of the staple to be bent towards one another when they forcefully contact the cavity 64.

In use, the operation of the first form A of the invention is the same as that of a present-day conventional stapler and need not be described herein. Due to the structural simplicity of the form A and the low production cost thereof, the stapler is particularly well adapted to be retailed at such a low price as to permit discard thereof after the stock of staples H initially contained therein has been depleted.

The body B'' of the second form L of the invention illustrated in FIG. 12 is identical to that of the first form A thereof, except that the flanges 34' thereof extend rearwardly only a relatively short distance along the sidewalls 30', and situated below the upper edges thereof. Except for the body B'', those elements of form L common to the first form A of the invention are identified in the drawings by the same numerals employed in describing the first form, but to which a prime has been added.

A second form of stapler follower K' is shown in FIG. 13 that is used in the second form L of the invention. The follower K' can be fabricated from a flat sheet of metallic material that has been so slit that portions thereof may be forced into a configuration including an elongate top 68, two longitudinally extending sidewalls 70, two downwardly extending rear walls 72 which are separated by a slit 74, and two channel-shaped guides 76 which extend outwardly from the top.

The forward extremity of the second follower K' is open. The lateral spacing of side walls 70 is such that the second follower extends around the sequence of staples H' in the second form of the device, with the guides 76 slidably engaging the side walls 30' and lower surface of the central portion 27' (FIG. 12). The second follower K' is urged forwardly by a spring (not shown) of the same structure as spring 54. The spring (not shown), like spring 54, is provided with hooks (not

shown) at each end thereof, one of which engages the forward extremity of the slit 74, and the other, the second notch 57'.

The second follower K' may be moved rearwardly (FIG. 16) to receive a sequence of staples H' in the magazine J'. Staples H' are conveniently stored for use in an elongate body M', as illustrated in FIGS. 17 and 18, in which body two offset oppositely disposed U-shaped passages 78 are formed that receive the staples H'. A metallic sheath 80 may be provided that extends around body M', as shown in FIGS. 17 and 18. The staples H' are dispensed from the body M' by disposing the body in the position illustrated in FIG. 16. A stock of these staples H' may then be ejected individually from the body M' into the magazine J'.

During the loading operation the pressure exerting member 60 is deformed rearwardly to disengage tab 62 from stop 42. The pressure exerting member may now be moved upwardly to permit staples H to be placed in the magazine J' as shown in FIG. 16.

I claim:

1. A stapler characterized by the body portion thereof which includes a base, handle, staple magazine, and staple ejector, all of which are fabricated from a single piece of metallic material.

2. A stapler as defined in claim 1 that includes a spring-loaded staple follower which is slidably movable relative to said magazine, which follower is characterized by being fabricated from a single piece of metallic material.

3. In a stapler of the type wherein a sequence of inverted U-shaped staples are disposed that are lightly bonded together and are at all times urged forwardly by a spring-loaded staple follower, which stapler includes a body fabricated from a single, elongate, generally rectangular strip of metallic material having some resiliency, but when subjected to bending operations is permanently deformed, which body is characterized by:

a. a first longitudinal section of said strip that is bent to define an elongate magazine in which said staples are contained, with said magazine having an opening formed therein through which said staples can be consecutively ejected;

b. second and third longitudinal sections of said strip that are bent to define a generally U-shaped handle which supports said magazine;

c. fourth and fifth sections of said strip that are bent to define a base and anvil, with said base being disposed under said magazine and handle, which anvil is located above said base and in alignment with said opening in said magazine; and

d. a slit defined part of said second section which is bent to define an elongate pressure exerting member that is in alignment with said magazine for sequentially ejecting said staples through said opening to permit the legs of each of said ejected staple to be bent inwardly towards one another upon contact with said anvil when said handle is moved downwardly relative to said base.

4. A stapler as defined in claim 3 wherein a pair of transversely spaced slits, a pair of transversely spaced notches, and a recess is formed in the first end of said first section, which recess is in alignment with the central portion of said first section, with first portions of said first sections on opposite sides of said central portion and between said notches and slits being bent to provide sidewalls that partially define said magazine, and with second portions of said first section forwardly of said notches being bent inwardly towards one another to provide a split end wall that forms a part of said magazine, which split end wall and forward end of said central portion cooperatively define said opening that is elongate in configuration, transversely positioned, and slightly wider than the thickness of one of said staples.

5. A stapler as defined in claim 4 wherein the upper parts of said end walls are bent rearwardly to define a stop and the lower end of said pressure exerting member is bent to define a forwardly extending tab that is disposed in said magazine

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under said stop, which tab when it contacts said stop serves to limit the upward movement of said handle relative to said magazine.

6. A stapler as defined in claim 4 wherein the upper longitudinal parts of said sidewalls are bent inwardly towards one another to define two parallel, laterally spaced flanges forming a part of said magazine and prevent inadvertent displacement of said staples therefrom should said stapler be placed in an inverted position.

7. A stapler as defined in claim 6 wherein said follower is disposed in said magazine and is slidably and longitudinally guided therein due to contact with said central portion, sidewalls, and flanges.

8. A stapler as defined in claim 4 wherein said follower further includes:

e. an elongate cuplike member slidably disposed between

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said sidewalls and extending around said sequence of staples, which member has a forward open end and a closed rear end, with said rear end being in engagement with the rearmost of said staples; and

f. two laterally spaced channel-shaped guides which extend outwardly from said cuplike member and slidably engage said sidewalls and the under surface of said central portion.

9. A stapler as defined in claim 8 which further includes:

g. an elongate tensioned spring connected to said rear end of said cup-shaped member and the forward part of said central portion to at all times urge said cup-shaped member forwardly to maintain one of said staples over said opening.

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