

Nov. 30, 1954

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STAPLING MACHINE

2,695,407

Filed Nov. 17, 1948

2 Sheets-Sheet 1

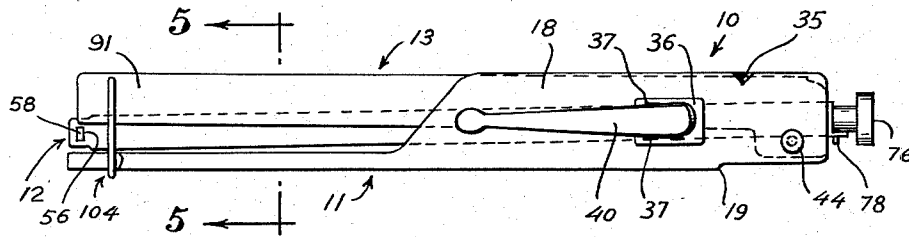


FIG. 1

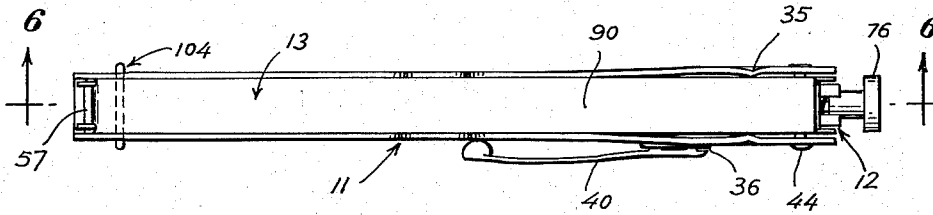


FIG. 2

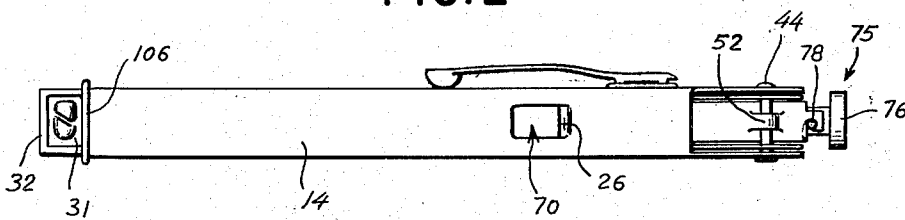


FIG. 3

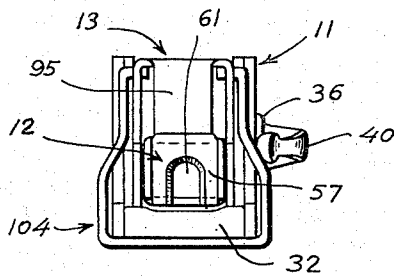


FIG. 4

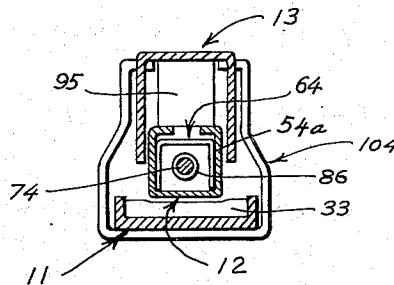


FIG. 5

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2 Sheets-Sheet 2

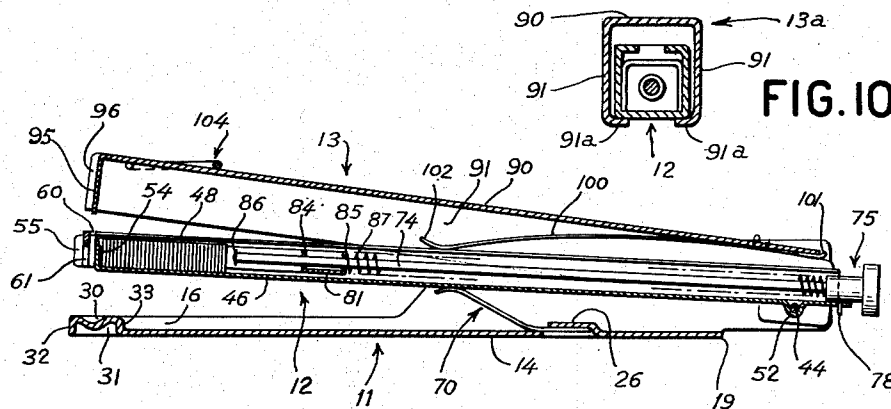


FIG. 6

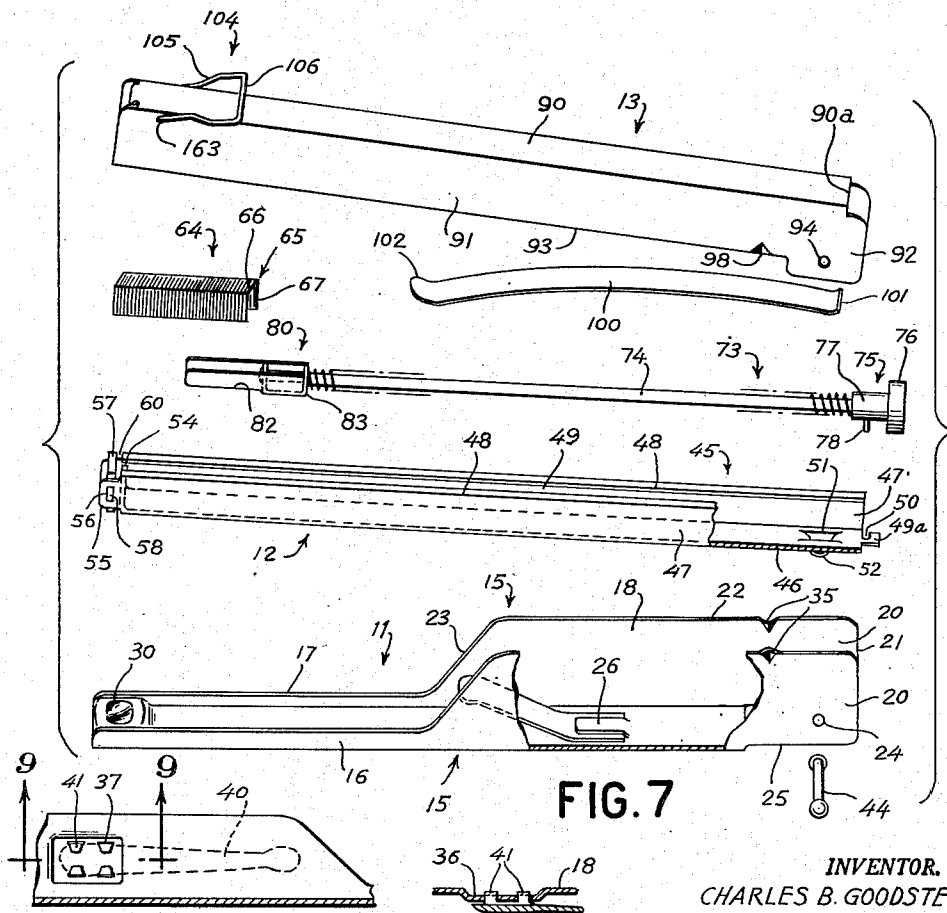


FIG. 7

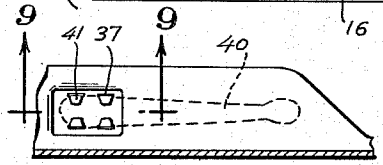


FIG. 8

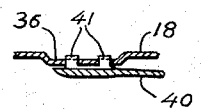


FIG. 9

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1

2,695,407

**STAPLING MACHINE**

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4 Claims. (Cl. 1—3)

This invention relates to stapling machines. It is particularly directed to a stapling machine which may be conveniently carried in the pocket.

An object of this invention is to provide a pocket stapler of the character described comprising a base provided at one end with an anvil, and provided with upstanding side walls, a staple magazine pivoted to the opposite end of said base on a pivot passing through said parallel side walls, and a lever pivoted to said base and staple magazine on said pivot and having a top wall and downwardly extending parallel side walls between which the staple magazine is received, and contacting the inner surfaces of the side walls of the base.

Another object of this invention is to provide in a stapling machine of the character described, a lever in which there is provided a downwardly extending tongue integrally formed with the top wall of the lever and serving as a plunger for driving staples from the staple magazine.

Yet another object of this invention is to provide in a stapling machine of the character described, a staple magazine having a bottom wall, the upstanding parallel side walls, and aligned top flanges extending inwardly from the upper ends of said side walls and forming a longitudinal chamber in which the staple strip may slide, and said bottom wall being formed with an upwardly extending integral tongue and forming back of the staple drive slot, said side walls extending forwardly of the bottom wall, and a guide member received between and attached to said extending side wall portions and disposed parallel to the tongue and forming the front of the staple drive slot, and said member being formed with a notch at its lower edge to receive an instrument for dislodging any staples that might get stuck in the drive slot, the arrangement being such, furthermore, that the downwardly extending drive tongue on the lever will pass into the drive slot when the lever is pressed toward the base for driving a staple down against the anvil on the base.

Yet another object of this invention is to provide a stapling machine of the character described in which the bottom wall of the base is formed with an upwardly pressed tongue and a strip spring having one end received between said tongue and the base and the free end of the spring contacting the underside of the staple magazine, and a second strip spring being interposed between the staple magazine and the lever, and said second spring being curved longitudinally and being formed with an upturned lip at its rear end engaging the rear end edge of the top wall of the lever, and the forward end of the strip spring slidably contacting the top flanges of the staple magazine.

Still a further object of this invention in a stapling machine of the character described, means to restrain swinging movement of the lever, away from the base beyond a pre-determined angle, and also to restrain pivotal movement of the staple magazine away from the lever beyond a pre-determined angle.

Still a further object of this invention is to provide a staple magazine of the character described in which the bottom wall of the staple magazine is formed with a downwardly pressed strap and the pivot pin passing through the strap and between the strap and the bottom wall of the staple magazine for pivotally attaching said magazine to said pivot pin.

Yet another object of this invention is to provide a stapling machine of the character described in which the rear end of the bottom wall of the base is cut away to a

2

sufficient extent to permit swinging movement of the staple magazine and lever, together, through an angle of substantially 180 degrees relative to the base, when it is desired to use the device as a tacker.

5 Yet a further object of this invention is to provide a stapling machine of the character described comprising a loop hinged to the forward end of the lever, and being adapted to be swung into a position encircling the staple magazine and base to positively keep the lever from swinging outwardly away from the base beyond a pre-determined extent, and whereby said loop may be disengaged from the base and swung against the top of the lever when the stapler is being used, the length of the loop being such that it may engage the base without necessity for pressing the plunger on the lever into the drive slot, so that a staple need not be driven against the anvil each time the loop is engaged with the base. If a staple had to be driven when engaging the loop with the base, the staple would be wasted.

10 Still a further object of this invention is to provide a device of the character described in which one of the side walls of the base has attached thereto a spring clip so that the device may be readily carried in the pocket and clipped to the pocket.

15 Still a further object of this invention is to provide a strong, rugged, and durable staple magazine which shall be light in weight, small in size so that it may be clipped in a pocket, which shall be attractive in appearance, easy to manipulate, relatively inexpensive to manufacture, which shall be sure and positive in operation, and which shall yet be practical and efficient to a high degree in use.

20 Other objects of this invention will in part be obvious and in part hereinafter pointed out.

25 The invention accordingly consists in the features of construction, combinations of elements, arrangement of parts and method steps which will be exemplified in the constructions hereinafter described, and of which the scope of invention will be indicated in the following claims.

30 In the accompanying drawings in which is shown various illustrative embodiments of this invention:

35 Fig. 1 is a side elevational view of a stapling device embodying the invention showing the base engaging loop in engagement with the underside of the base, and illustrating the out-of-use condition of the stapling device;

40 Fig. 2 is a top plan view of the structure shown in Fig. 1;

45 Fig. 3 is a bottom plan view thereof;

50 Fig. 4 is a front end view thereof;

55 Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 1;

60 Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 2;

65 Fig. 7 is a perspective view of the various parts of the stapling device;

70 Fig. 8 is a partial cross-sectional view of the inside of the base of the stapling device and illustrating the attachment of the spring clip to a side wall of the base;

75 Fig. 9 is a cross-sectional view taken on line 9—9 of Fig. 8; and

80 Fig. 10 is a transverse cross-sectional view through the stapling magazine and lever, and illustrating a modified construction.

Referring now in detail to the drawing, 10 designates the staple machine embodying the invention. The same comprises generally a base 11, a staple magazine 12, and a lever 13. The base 11 comprises a bottom wall 14 from which extend upwardly parallel side walls 15. The side walls 15 have front portions 16 rising only a short distance above the bottom wall, and these portions have top edges 17 parallel to the bottom wall. The side wall 15, further, comprises portions 18 rearwardly of portions 16 and extending to a greater height. The portions 18 extend rearwardly beyond the rear edge 19 of the bottom wall 14, as at 20. Portions 20 have vertical rear edges 21. Between the edges 17 and the top edges 22 of portions 18 are rearwardly and upwardly inclined edges 23. The side walls 18 are formed with aligned through openings 24 close to the rear edges, and also close to the lower rear edges 25 of the rearwardly extending portions 20 of the side walls. The bottom wall 14 is

formed with an upwardly pressed forwardly extending tongue 26 which is formed of the metal from the bottom wall, the bottom wall being die cut and stamped to form said tongue. The tongue 26 is, thus, parallel to and somewhat spaced above the bottom wall 14 and projects forwardly. The tongue 26 is located forwardly of the rear edge 19 of the bottom wall 14. The bottom wall 14 is formed adjacent the forward end with an upwardly pressed integral anvil 30. The anvil, for the purpose of illustration, is shown herein of the type which is used for overlapping staple legs. If desired, any other anvil may be substituted. The anvil 30 forms a recess 31 at the underside of the anvil bounded at its outer end by a downwardly extending lip 32 by the side wall 16, and at the rear by a shoulder 33.

For the purpose hereinafter appearing, the upper edges 22 of side walls 18 are formed with inwardly indented portions 35. One of the side walls 18 (Figs. 8 and 9) is, furthermore, provided with an outwardly pressed substantially rectangular portion 36 formed with two parallel pairs of aligned slots 37. The rectangular portion 36 is preferably located midway between the top and bottom of the side wall 18 of which it is formed, and the rear end of said rectangular portion is disposed just forwardly of the rear edge 19 of the bottom wall. Attached to said side wall 18 is a spring pocket clip 40 formed at its rear end with integral prongs 41 passing through the slots 37 and then inwardly toward each other for firmly attaching the spring clip to the base of the stapling device. The free end of the spring clip extends forwardly, as shown in Fig. 1 of the drawing.

Extending through the aligned openings 24 is a pivot pin 44, the ends of which are riveted over against the side walls 18.

The staple magazine 12 is pivotally mounted on the pivot pin 44, as will appear hereinafter. Said staple magazine 12 comprises a generally channel-shaped member 45 having a bottom wall 46 from which extends upwardly parallel side walls 47. Extending inwardly from the side walls 47 are aligned horizontal longitudinal top flanges 48, a slot 49 being formed between the inner edges of said flanges. The bottom wall 46 has a portion 49a extending rearwardly of the rear edges of side walls 47, said extension being formed with a bayonet-type notch 50, for the purpose hereinafter appearing.

The bottom wall 46 of the staple magazine is formed with a pair of parallel longitudinal slits 51 and the portion of the bottom wall between said slits is downwardly pressed to form a substantially semi-circular strap 52. The strap 52 is located adjacent the rear end of the staple magazine. The pivot pin 44 passes through the strap 52, that is, between said strap and the underside of the bottom wall 46, thereby pivotally connecting the staple magazine to the base.

Extending upwardly from the front end of the bottom wall 46 is a tongue 54, the upper edge of which is spaced below the top flanges 48. Furthermore, there are slots 54a between the sides of the tongue 54 and the inner surfaces of side walls 47, for the purpose hereinafter appearing. The side walls 47 have extensions 55 at their forward ends extending beyond the upwardly extending tongue 54. Said extensions 55 are formed with aligned vertical slots 56 spaced forwardly of the tongue 54 and parallel thereto. Received between the extensions 55 is a vertical front plate or member 57 having ears 58 received within the slots 56 and riveted to said extensions 55. Between the tongue 54 and the plate 57 is formed a drive slot 60. The front plate 57 is formed at its lower end with a central notch 61, the inner edge of which is bevelled, as shown. The upper end of the notch may be round, as shown in Fig. 4 of the drawing. Within the staple magazine is the staple strip 64 comprising a plurality of staples adhered together. Each staple 65 in the staple strip 64 has a top crown 66 and downwardly projecting legs 67. The staple strip is, preferably, of such dimension as to smoothly slide within the staple magazine with the legs 67 adjacent the inner surface of the side walls 47, and the crown 66 just below the flanges 48, and the lower ends of the legs 67 riding on the top surface of the bottom wall 46. The staples will straddle the tongue 54 and the forwardmost staple will be pressed, in the manner hereinafter appearing, into the drive slot 60 from where it may be driven downwardly against the anvil 30 by the lever 13 in the manner hereinafter to be described. In the event that a staple becomes jammed in

the drive slot, any instrument may be inserted within the notch 61 to dislodge the stuck staple. It will be noted that the legs 67 of the staple will be pressed down against the anvil 30, and will be bent inwardly into overlapping relationship.

It will be noted, furthermore, that the pivot pin 44 is located rearwardly of the rear edge 19 and, thus, above the cut out form at the rear end of the bottom wall of the base.

Interposed between the bottom wall 14 of the base 11 and the staple magazine 12 is a bowed strip spring 70. One end of the spring is interposed between the tongue 26 and the bottom wall 14 for anchoring said end of the strip. The spring has a free portion which is inclined upwardly and forwardly and contacts the underside of the bottom wall 46 of the staple magazine. The spring thus tends to rotate the staple magazine in a clockwise direction relative to the base about the pivot 44, looking at Fig. 6 of the drawing.

Means is provided to push the staple strip 64 forwardly within the staple magazine. To this end, there is provided a pusher 73. Said pusher 73 comprises a straight rod 74 of round stock. Fixed to the rear end of the rod 74 is a knob 75 provided at its rear end with a hand wheel 76 of greater diameter than the shank 77 of the knob. Extending from said shank 77 is a radial pin 78 adapted to engage within the bayonet slot 50. Slidably mounted on the forward end of the rod 74 is a slider 80 made of a single piece of sheet metal and comprising a bottom wall 81 from which extends parallel side walls 82 projecting forwardly of the bottom wall. Extending upwardly from the front and rear ends of the bottom wall 81 are front and rear integral walls 84 and 86 formed with aligned openings through which the rod 74 slidably extends. The front end of the rod is upset, as at 86 so as to limit forward movement of the slider on the rod. Received on the rod 74 and interposed between the rear wall 85 of the slider 80 and the front end of the knob 75 is a coil compression spring 87. The forward ends of the side walls 82 constitute tongues which engage the side portions of the rear end of the staple strip 64 for pushing the staple strip forwardly so that a staple is always presented within the drive slot. The pusher 73 may be removed by turning the knob 75 to disengage pin 78 from the slot 50. Upon removing the pusher 73 from the rear end of the staple magazine, a new staple strip may be inserted through said rear end and then the pusher may be reinserted and the pin 78 again engaged within the bayonet notch 50.

It will be noted that the staple magazine 12 is located between the side walls 18 of the base and is spaced from said side walls. The magazine is substantially co-extensive with the base.

The lever 13 is also pivoted to pivot pin 44, as will hereinafter appear. Said lever has a top wall 90 from which extend downwardly parallel side walls 91. The side walls 91 of the lever straddle the staple magazine 12 and form guides therefor. Said side walls 91 are received within the side walls 18 of the base. Thus, the side walls 18 of the base straddle and frictionally engage the outer surfaces of the side walls 91 of the lever, and said side walls of the lever in turn straddle and frictionally engage the outer surfaces of the side walls 47 of the staple magazine.

The portions 92 of the side walls 91 are formed with aligned through openings 94 through which the pivot pin 44 passes. The pivot pin 94 is disposed just below the lower edges 93 and substantially in alignment with the rear edge 90a of the top wall 90 of the lever 13.

Extending downwardly from the forward end of the top wall 90 of the lever is an integral tongue 95 which constitutes a plunger or driver for the staples. The side edges of the plunger 95 are spaced inwardly of the inner surfaces of the side walls 91 of the lever and said plunger is adapted to enter the drive slot 60 and drive a staple against the anvil 30 when the lever 13 is pressed toward the base 11. The lower end of the plunger 95 is substantially in alignment with the lower edges of the side walls 91. The side walls 91 extend somewhat forwardly of the plunger 95, as at 96. It will be noted that the indented portions 35 of the side walls 18 engage the top of the lever to frictionally restrain the lever from being swung in a clockwise direction away from the base 11. Likewise, the side walls 91 of the lever are indented inwardly, as at 98 at their lower edges 93 just forwardly of the

portions 92 to frictionally engage the underside of the staple magazine to restrain movement of the staple magazine away from the lever 13 in a counter-clockwise direction, looking at Fig. 6 of the drawing.

If it is desired to use the device as a tacker, both the lever 13 and the staple magazine 12 may be swung about the pivot 44 substantially through an angle of 180 degrees and the cut out at the rear end at the bottom wall of the base permits such swinging movement. However, it is preferable that the staple magazine and lever do not freely swing away from the base and the indentations 35 prevent such free movement. The spring 70 serves to raise both the staple magazine and the lever 13 above the base, so that paper may be interposed between the anvil 30 and the staple magazine for stapling.

Spring means is, furthermore, provided to swing the lever 13 in a clockwise direction relative to the staple magazine so as to move the plunger out of the drive slot whereby the next staple may move into said slot. To this end, there is interposed between the top of the staple magazine and the underside of the top wall 90, a bowed strip spring 100 having at its rear end an upwardly turned lip 101 engaging the rear edge 90a of the top wall 90. The forward end of the spring slidably contacts the top surfaces of the flanges 48. The front end of the spring 100 may be formed with an upwardly turned lip 102, as shown in Fig. 6 of the drawing.

Means is provided to keep the stapling device in inoperative position and to positively prevent the staple magazine and lever from swinging away from the base. To this end, the side walls 91 of the lever are formed adjacent their forward ends and adjacent the top wall 90, with a pair of aligned openings 103. Swiveled to the openings 103 is a loop 104. The loop 104 has ends journaled within the openings 103 and it has side portions 105 interconnected by a bottom portion 106. When the stapling machine is in use, the loop 104 is in a position shown in Fig. 6 swung back against the top wall of the lever. However, when the stapling machine is not in use, the loop 104 may be swung into a position shown in Fig. 1, with the portion 106 thereof engaging the underside of the base. It will be noted that the length of the loop is such that the loop may be in a position shown in Fig. 1 engaging the base, without necessity for the plunger to enter the drive slot 60. Thus, when it is desired not to use a stapler any more, and the loop 61 is swung into the base engaging position, a staple will not be driven against the anvil and wasted. If the loop were of such length that the plunger would have to be pressed into the drive slot to engage the loop with the base, a staple would be driven against the anvil, and there would be a staple wasted each time the loop is engaged to the base.

In Fig. 10, there is shown a modified construction. The construction in Fig. 10 is similar to the stapler shown in Figs. 1-9 with the exception that in Fig. 10 the side walls 91 of the lever 13a are formed with lugs 91a which engage beneath the staple magazine 12 to positively limit rotation of the lever away from the staple magazine. The lugs 91a would, of course, replace the indentations 98.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States:

1. A stapling machine comprising a base, a staple magazine and a lever interpivotated at their rear ends, said staple magazine being interposed between the base and the lever, said base being provided at its forward end with an anvil, said staple magazine being provided at its forward end with a drive slot, said lever being provided at its forward end with a plunger adapted to enter the drive slot for

driving a staple against said anvil, said base and lever constituting outside members located on opposite sides of the staple magazine and a loop pivoted to one of the outside members and adapted to engage the other outside member to limit swinging movement of said outside members away from each other, said loop being of such length as to permit engagement of said other outside member while said plunger is outside of said drive slot.

2. A stapling device comprising a base, a staple magazine pivoted to the rear end of the base, a lever pivoted at its rear end to the staple magazine, spring means interposed between the base and the staple magazine to urge movement of the staple magazine away from the base, spring means interposed between the staple magazine and lever and urging the lever away from the staple magazine, and releasable means to positively limit movement of the lever away from the base, and means comprising a detent on said base in frictional engagement with said lever to limit movement of said lever away from the base when said releasable means is released.

3. A stapling device comprising a base, a staple magazine pivoted to the rear end of the base, a lever pivoted at its rear end to the staple magazine, spring means interposed between the base and the staple magazine to urge movement of the staple magazine away from the base, spring means interposed between the staple magazine and lever and urging the lever away from the staple magazine, and releasable means to positively limit movement of the lever away from the base, and means comprising a detent on said base in frictional engagement with said lever to limit movement of said lever away from the base when said releasable means is released, and means comprising a detent on said lever in frictional engagement with said staple magazine to retard movement of said lever away from said staple magazine.

4. A stapler comprising a base, a staple magazine pivoted to said base, a lever pivoted to said magazine and base, means on the lever to drive staples from the magazine, an anvil on the base against which the staples may be driven, and a loop pivoted to the lever, said loop having an upper portion, and swingable in an arc, said upper portion resting on the top of the lever in one extreme position of the arc, and in engagement with the underside of the base in the other extreme position of said arc.

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