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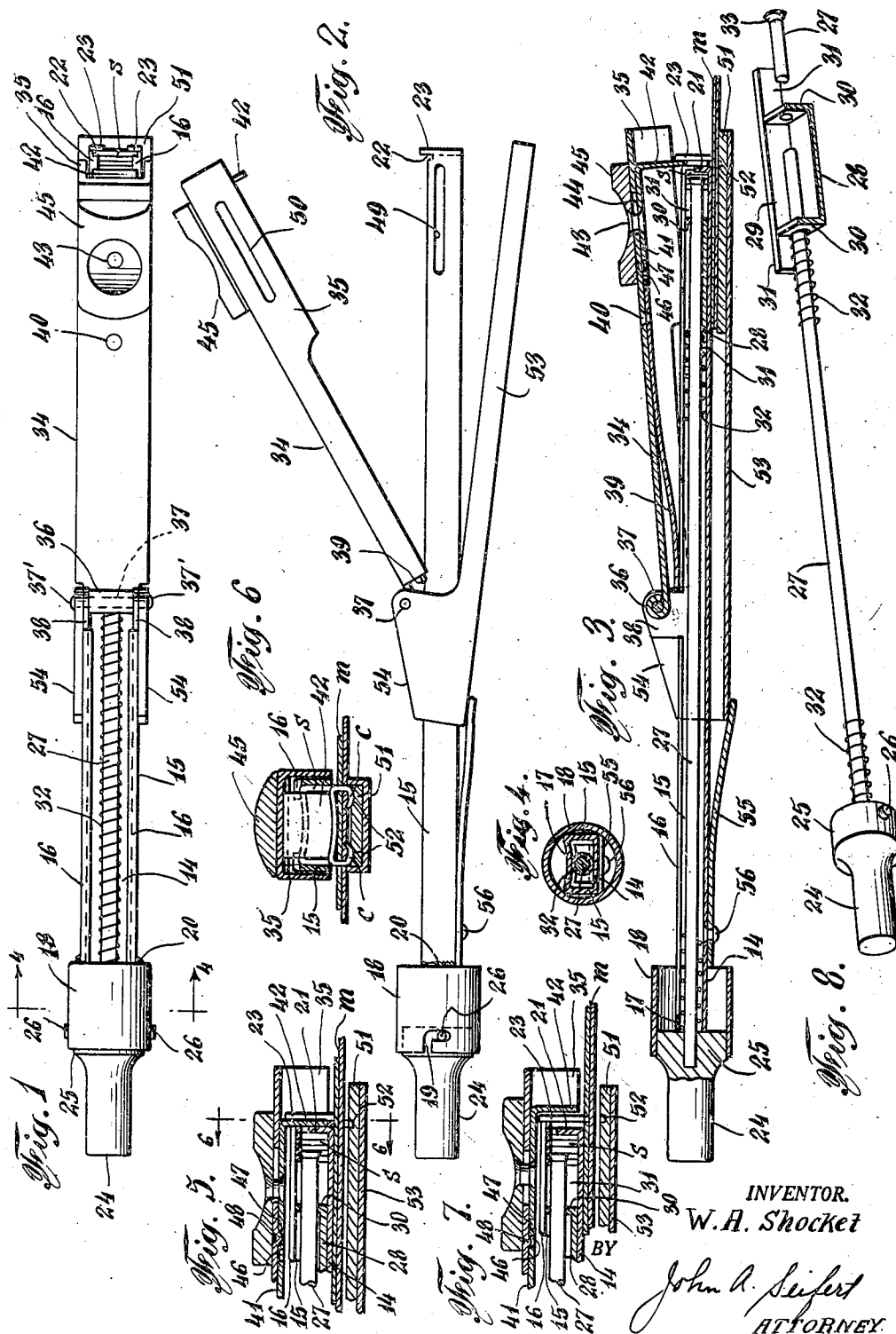
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STAPLING DEVICE

Filed June 21, 1946

2 Sheets-Sheet 1



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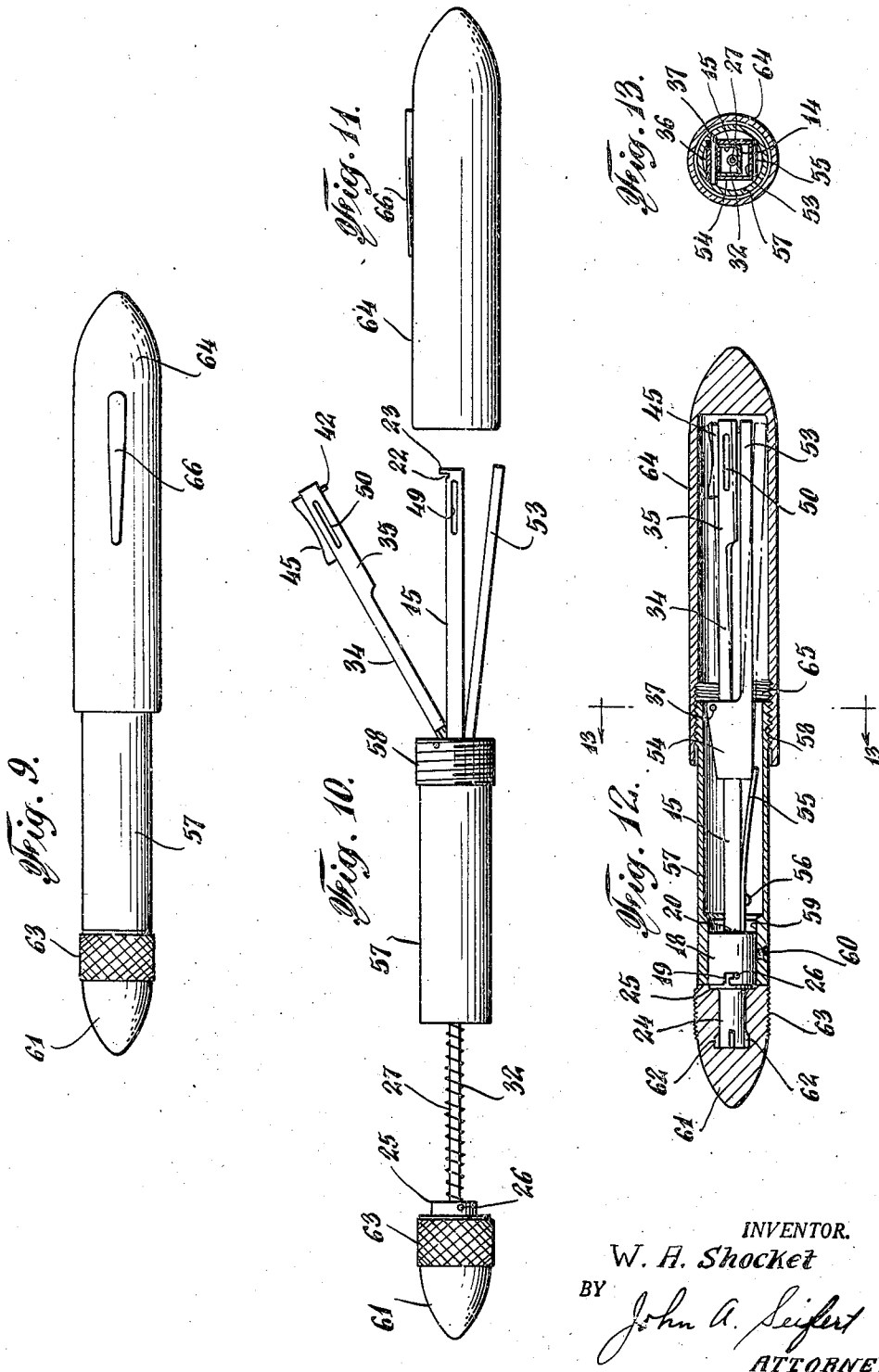
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STAPLING DEVICE

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This invention relates to stapling devices adapted to be held and operated in one hand to fasten sheets of material together by driving U-shaped staples or fasteners into the sheets and clinching the ends of the leg portions of the staples projecting from the sheets, and consisting of a magazine and arms carrying a driver and an anvil and pivoted on the magazine to have movements toward and away from the top and bottom of the magazine, respectively.

It is an object of the invention to adapt a stapling device of this character to be mounted in a carrying case resembling a fountain pen.

It is another object of the invention to provide a driver adjustable on its carrying arm to permit adjustment of said driver into and out of staple driving position and prevent the driving of staples when the stapling device is adjusted to be enclosed by a cap member of the carrying case.

It is another object of the invention to provide the magazine of the stapling device with inspection openings to permit the operator to see when the supply of staples needs to be replenished.

It is a further object of the invention to provide one end of the magazine with an annular portion adapted to releasably support pusher mechanism and adapt said magazine to be mounted in the carrying case.

Other objects and advantages of the invention will hereinafter appear.

In the drawings accompanying and forming a part of this application, Figure 1 is a plan view of the device forming the embodiment of the invention.

Figure 2 is a side elevational view looking at the bottom of Figure 1.

Figure 3 is a longitudinal sectional view showing sheets of material clamped between the magazine and anvil and the driver in position to drive a staple from a throat of the magazine.

Figure 4 is a cross sectional view taken on the line 4—4 of Figure 1 looking in the direction of the arrows to show the shape of the staple replenishing end of the magazine.

Figure 5 is a sectional view, on an enlarged scale, of the stapling end of the device to show the driver driving a staple into sheets of material and the anvil clinching said staple.

Figure 6 is a cross sectional view taken on the line 6—6 of Figure 5 looking in the direction of the arrows to show the clinching of a driven staple.

Figure 7 is a view similar to Figure 5 showing the driver adjusted to a position in front of the

throat of the magazine to permit positioning of the driver and anvil in juxtaposed relation to the magazine without driving and clinching a staple.

Figure 8 is a perspective view of pusher mechanism with a staple engaging portion thereof in section and an adjacent portion of a supporting rod broken away to show the construction thereof.

Figure 9 is a view of a case for carrying the stapling device shown in Figures 1 and 2 in assembled condition to be placed in a pocket of the user.

Figure 10 is a view of a body of the carrying case with a cap member of said case disconnected and showing the stapling end of the stapling device projecting from said body and the pusher mechanism partly removed from the stapling device and the body of the case.

Figure 11 is a view of a cap member of the carrying case.

Figure 12 is a longitudinal sectional view of the case shown in Figure 9 and showing the stapling device mounted therein.

Figure 13 is a cross sectional view taken on the line 13—13 of Figure 9 looking in the direction of the arrows.

The stapling device forming the embodiment of the invention illustrated in the accompanying drawings comprises a magazine of channel shape in cross section having a bottom wall 14 and side walls 15 arranged with inwardly flanged longitudinal edges 16 joined at one end of the magazine by a transverse portion 17 curved in a direction toward the bottom wall 14. The downwardly curved portion 17 conforms to the contour of the leg connecting portion of the staples to facilitate the engagement of a clip or gang of detachably connected staples 3, as shown in Figures 4 and 6. The inwardly extending flanges 16 engage the juncture between the connecting and leg portions of the staples and retain the ends of the leg portions of the staples against the bottom wall 14 of the magazine. The end of the magazine having the transverse portion 17 is provided with an annular member 18 having diametrically opposed bayonet slots 19 opening to one end and attached at the opposite end to the side walls 15 of the magazine by suitable means, such as solder or a weld, as indicated at 20 in Figures 1, 2 and 12, with diametrically opposed wall portions spaced from the bottom wall 14 and flanges 16 of the magazine, as shown in Figure 3. The opposite end of the magazine is arranged with a throat through which the lead-

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ing staple of the clip of staples supported in the magazine is driven or discharged from the magazine. Said throat is formed by severing inwardly the end portion of the bottom wall 14 from the side walls 15 and bending said severed portion in an upwardly direction, as shown at 21 in Figures 3, 5 and 7, and forming notches 22 in the side walls 15 adjacent the ends thereof and said end portions of the side walls extending outwardly from the notches 22 having the longitudinal edges straight and not arranged with the flanges 16 and bent inwardly toward each other and in spaced relation to the outer or front face of the upwardly bent bottom portion 21, as shown at 23.

The clip of staples are moved and maintained under compression by pusher mechanism comprising a finger gripping or manipulating member 24 having a circular enlarged head 25 slidably engaged in the annular member 18 of the magazine and arranged with pins 26 fixed in and extending from diametrically opposite portions of the head 25 to engage the bayonet slots 19 and releasably secure the manipulating member 24 in the annular member 18 by a rotary movement of the manipulating member. A rod 27 is fixed at one end in the head 25 and extends longitudinally of the magazine in spaced relation to the bottom wall 14 and side walls 15 and slidably supporting a staple engaging member of channel shape in cross section having opposite end portions of the bottom wall 28 severed from the side walls 29 and bent upwardly and arranged with aligned openings, as shown at 30 in Figure 8, to slidably engage the rod. End portions 31 of the side walls 28 extend from said bent end portions 30 and the forwardly extending end portions 31 engaging the rearmost staple of the staple clip under the yielding force of a spring 32 coiled around the rod 27 and compressed between the head 25 and the rear bent end portion 30. The staple engaging member is retained on the rod 27 by an abutment on the free end of the rod formed by peening said end, as shown at 33 in Figure 8. The forward extending end portions 31 engage the leg portions of the rearmost staple of the staple clip in the magazine and the forward end of the rod 27 extends in the space between the leg portions of the staples, as shown in Figures 3, 5 and 7.

The forward staple of the staple clip in the magazine is positioned in the throat 21-23 by the pusher mechanism 24-33 and is driven from said throat by a driver device comprising an arm 34 of channel shape in cross section with the channel side walls of increased height at one end of the arm, as shown at 35. The bottom wall of the channel is extended from the side walls at the opposite end of the arm and curled upon itself to form a knuckle 36 pivotally engaged on a pin 37 mounted at the opposite end portions in opposed ear portions 38 extending from and in the plane of the side walls 15 of the magazine. At said ear portions 38, the flanges 16 are omitted as the ear portions are integral with the side walls 15, as shown in Figures 1 and 3. The end portion of the arm having the side walls 35 is yieldingly urged from the top of the magazine 14-16 by a spring 39 fixed at one end to the under face of the bottom wall of the arm 34 by suitable means, such as a rivet 40, and the opposite end portion curved toward and engaging the flanges 16, as shown in Figure 3. The end of the arm 34 having the side walls 35 is arranged with an adjustable staple driver

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comprising an angle shaped member having one side portion 41 of substantially the same width as the distance between the side walls 35 and the other side portion 42 of a width substantially equal to the width of the throat 21-23 or the distance between the side walls 15 of the magazine, whereby the portion 41 is slidable on the bottom wall of the arm 34 between the side walls 35 and the portion 42 is slidable in the throat 21-23. The driver member 41, 42 is slidably mounted on the bottom wall of the arm 34 by a pin shown in the form of a rivet 43 slidable in a slot 44 in the arm 34 and having one end fixed in the driver portion 41 and the opposite end fixed in a finger engaging or manipulating member 45 slidable on the outer face of the bottom wall of the arm 34, as shown in Figure 3. In the rearmost adjusted position of the driver member 41, 42, the portion 42 engages the forward staple in the throat 21-23 and drives said staple from the throat when the arm 34 is actuated toward the magazine against the force of the spring 39, as shown in Figure 5. In the foremost adjusted position of the driver member 41, 42, the portion 42 extends in front of the throat 21-23 and permits the arm 34 to be positioned in juxtaposed relation to the top of the magazine without driving a staple from the throat, as shown in Figure 7. To assure the proper positioning of the driver portion 41 and a detent or teat 48 releasable retaining means are provided comprising indentations or perforations 46 and 47 in the driver portions 41 and a detent or teat 48 projecting from the inner face of the bottom wall of the arm 34 to engage the indentation 47 when the driver member 41, 42 is adjusted to position the portion 42 to reciprocate in the throat 21-23, as shown in Figure 5; and to engage the indentation 46 when the driver member 41, 42 is adjusted to position the portion 42 in front of the throat 21-23, as shown in Figure 7.

To ascertain whether the supply of staples is getting low or becoming exhausted without lifting the driver arm 34, the side walls 15 of the magazine is arranged with windows or elongated openings 49 adjacent to the throat 21-23 and corresponding openings 50 are arranged in the side walls 35 of the arm 34 to register with the openings 49 when the arm 34 is positioned in juxtaposed relation to the magazine.

The staple in the throat is driven by the driver portion 42 into juxtaposed sheets of material, as indicated at *m* in Figures 3, 5, 6 and 7, and the leg portions of said staple projecting from said sheets are clinched over and into the lowermost sheet, as shown at *c* in Figure 6, by an anvil 51 having clincher grooves 52 and mounted on one end of and in the channel of an arm 53 of channel shape in cross section and having at the opposite end ear portions 54 extending from and in the plane of the side walls of the channel on the opposite sides of the magazine 14-16 and pivotally mounted on the ends of the pin 37 projecting from the ear portions 38 of the magazine 14-16 with an end portion of the arm 53 and ear portions 54 extending to the rear of the pin 37. The pin 37 is retained in the knuckle 36 and ear portions 38 and 54 by peening over the ends of the pin projecting from the ear portions 54, as shown at 37 in Figure 1. The anvil 51 is yieldingly urged from the bottom or discharge end of the throat 21-23 by a spring 55 fixed at one end to the under face of the bottom wall 14 of the magazine by suitable means, such as a rivet 56, and the opposite end of the spring

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engaging the end of the arm 53 extending to the rear of the pin 37.

Sheets of material *m* are stapled by inserting and clamping said sheets between the bottom wall 14 and the anvil 51 and then actuating the arm 34 toward the top of the magazine to engage the driver portion 42 into the throat 21—23 of the magazine. The actuation of the arms 39 and 53 toward the magazine 14—16 is accomplished by the thumb and forefinger of one hand of the user while the sheets are inserted between the anvil and magazine by the other hand.

The stapling device as described is of such size as to be readily carried in the pocket of the user and to facilitate the carrying of said device in the pocket of the user, there is provided, as shown in Figures 9 to 13, inclusive, a carrying case comprising a tubular body or casing 57 having an exteriorly screw threaded enlarged portion 53 at one end and the wall at the opposite end of increased thickness extending inwardly to form a bore portion of reduced diameter, as shown at 59 in Figure 12, for the mounting therein of the annular member 18 of the magazine 14—16. The member 18 is retained in said reduced bore portion 59 by a set screw 60. The manipulating member 24 extends from the casing 57 and to enhance the appearance of the device, said member 24 is encased in a knob 61 of suitable material, such as plastic, which may be molded on the member 24 and secured thereto by lugs or ears 62 integral with and extending from the member 24, as shown in Figure 12. To facilitate the turning of the knob to engage the pins 26 with the bayonet slots 19 or to disengage the pins 26 from the bayonet slots 19, the knob 61 is arranged with knurling 63. The inner end of the knob abuts the outer end of the casing 57 when the pins 26 are engaged in the slots 19. The casing 57 is made of the same material and in the same or contrasting color as the knob 61. The casing 57 is of a length substantially equal to the distance between the outer end of the annular member 18 and the pivot pin 37, so that the end portions of the arms 34, 53 and the magazine carrying the driver 41, 42, the anvil 51 and throat 21—23, respectively, will extend from the screw threaded end 58 of the casing 57 to permit the stapling of the sheets *m* without interference. When the stapling device is not in use the stapling portions of said device extending from the screw threaded end 58 of the casing 57 are encased in a cap member 64 having internal screw threads 65 at the open end to releasably mount the cap member on the screw threaded portion 58 of the casing 57 and a pocket clip 66 mounted thereon adjacent to the closed end. The cap member 64 is also made of the same material and in the same or contrasting color as the casing 57 and knob 61. When the carrying case 57—66 is fully assembled, it resembles a fountain pen in appearance. When it is desired to encase the extending portions of the arms 34, 53 and magazine 14—16 with the cap member 64—66, the driver 41, 42 is adjusted to engage the detent 48 in the indentation 46 to position the driver portion 42 in front of the throat 21—23, and the arms 34 and 53 are juxtaposed to the magazine 14—16 to permit sliding of the cap member over said extending portions of the arms and magazine and engagement of the screw threaded portion 65 with the screw threaded portion 58. With the cap member 64 engaged on the casing 57, the arms 34 and 53 will assume the broken line positions shown in Figure

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12 under the influence of the springs 39 and 55, respectively.

Having thus described my invention, I claim:

1. In a stapling device, a magazine for staples having a throat at one end for the discharge of staples from the magazine, an arm pivotally mounted at one end on the magazine to have movement toward and away from the top of the magazine, a driver adjustably mounted on the opposite free end of the arm to reciprocate in the throat and drive staples therefrom in one adjusted position and to extend exteriorly of the throat in the other adjusted position, and a second arm pivotally mounted adjacent one end on the magazine to have movement toward and away from the bottom of the magazine and arranged with an anvil at the opposite end to be positioned relative to the discharge end of the throat and adapted to clinch the driven staples.

2. In a stapling device, a magazine having a throat portion for the discharge of staples from the magazine, an arm pivotally mounted on the magazine to have movement toward and away from the top of the magazine and having a slot therein, a driver comprising an angular member, a manipulating member and a pin fixed at the opposite ends in a side portion of the angular member and the manipulating member with an intermediate portion slidable in the slot of the arm and said side portion of the angular member and the manipulating member adjustable on opposite faces of the arm to adjust the other side portion of the angular member to reciprocate in the throat to drive staples therefrom in one position and to extend in front of said throat in the other position, and an anvil pivotally mounted on the magazine to have movement toward and away from the bottom of the magazine to be positioned relative to the discharge end of the throat for clinching the driven staples.

3. A stapling device as claimed in claim 2, wherein the juxtaposed surfaces of the arm and first side portion of the angular member of the driver are arranged with cooperating means to releasably retain the driver in the adjusted positions.

4. In a stapling device, a magazine having a throat for the discharge of staples therefrom, an arm pivotally mounted on the magazine to have movement toward and away from the top of the magazine, a driver adjustably mounted on the arm to have limited movement on the underface of the arm and having a manipulating portion slidable on the upperface of the arm to position the driver to reciprocate in the throat and drive staples therefrom and to extend in front of the throat, and an anvil pivotally mounted on the magazine to have movement toward and away from the bottom of the magazine to be positioned relative to the discharge end of the throat to clinch the driven staples.

5. In a stapling device, a magazine for staples having a throat at one end for the discharge of staples from the magazine, an arm pivotally mounted at one end on an intermediate portion of the magazine to have movement toward and away from the top of the magazine, a driver mounted on the opposite end of the arm to reciprocate in the throat of the magazine and drive staples therefrom, a resilient member fixed at one end to the arm and the opposite end adapted to engage the magazine and yieldingly urge the driver from the throat of the magazine, a second arm pivotally mounted adjacent one end on the intermediate portion of the magazine to

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have movement toward and away from the bottom of the magazine and arranged with an anvil at the opposite end to be positioned relative to the discharge end of the throat and adapted to clinch the driven staples, and a second resilient member fixed at one end to the magazine and the opposite end engaging the end of the second arm adjacent to the pivotal mounting of said arm to yieldingly urge the anvil end of the second arm from the discharge end of the throat of the magazine.

6. In a stapling device, a magazine of channel shape in cross section having ear portions on the side walls of the channel intermediate the ends of the magazine and a throat at one end for the discharge of staples from the magazine, an arm pivotally mounted between the ear portions of the magazine to have movement toward and away from the top of the magazine, a driver mounted on the arm to reciprocate in the throat and drive the staples therefrom, a second arm having ear portions on opposite sides of the side walls of the channel of the magazine and pivotally mounted on the ear portions of said side walls with said second arm in opposed relation to the bottom of the magazine, and an anvil arranged on the second arm to be positioned relative to the discharge end of the throat to clinch the driver staples.

7. In a stapling device, a magazine of channel shape in cross section having a throat at one end for the discharge of staples from the magazine and an opening in the side walls of the channel adjacent to the throat to view the supply of staples in the magazine, an arm of channel shape in cross section pivotally mounted on the magazine to have movement toward and away from the top of the magazine and having an opening in the side walls of the channel thereof to be registered with the openings in the side walls of the magazine, a driver carried by the arm to reciprocate in the throat and drive staples therefrom, and an anvil pivotally mounted on the magazine to have movement toward and away from the bottom of the magazine and be positioned relative to the discharge end of the throat to clinch the driven staples.

8. In a stapling device, a tubular casing, a magazine for staples having a throat at one end for the discharge of staples from the magazine and mounted at the opposite end in the casing with the throat end extending from the casing, an arm pivotally mounted on the magazine to have movement toward and away from the top of the magazine and having a driver to reciprocate in the throat and drive staples therefrom, a second arm pivotally mounted on the magazine to have movement toward and away from the bottom of the magazine and having an anvil to be positioned relative to the discharge end of

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the throat to clinch the driven staples, and a cylindrical cap member adapted to be releasably engaged on the tubular casing in enclosing relation with the throat end of the magazine and the arms.

9. A stapling device as claimed in claim 8, wherein the arms are pivotally mounted on the portion of the magazine in substantial alignment with the end of the casing from which the magazine extends.

10. In a stapling device as claimed in claim 8, resilient members associated with each arm to yieldingly urge the arms from the magazine, and the engagement of the cap member on the casing retaining the arms relative to the magazine against the force of said resilient members.

11. In a stapling device as claimed in claim 8, a pusher mechanism releasably mounted in the end of the magazine mounted in the casing and having a manipulating portion to abut and close the end of the casing opposite the end from which the magazine extends.

12. In a stapling device, a tubular casing having one end of the bore of reduced diameter, a magazine for staples of channel shape in cross section having an annular portion at one end mounted in the reduced end of the bore of the casing and the opposite end of the magazine extending from the opposite end of the casing and arranged with a throat at said opposite end for the discharge of staples from the magazine, a driver pivotally mounted on the magazine to have movement toward and away from the top of the magazine to reciprocate in the throat and drive staples therefrom, an anvil pivotally mounted on the magazine to have movement toward and away from the bottom of the magazine to be positioned relative to the discharge end of the throat and clinch the driven staples, and a pusher mechanism releasably mounted in the annular portion of the magazine and having a manipulating portion to engage and close the reduced bore end of the casing.

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