March 30, 1948. A. H. MAYNARD 2,438,713

FASTENER-APPLYING IMPLEMENT

Filed Feb. 26, 1946 2 Sheets-Sheet 1

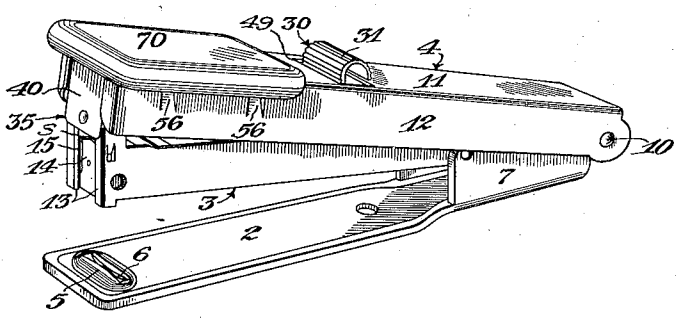


Fig. 1.

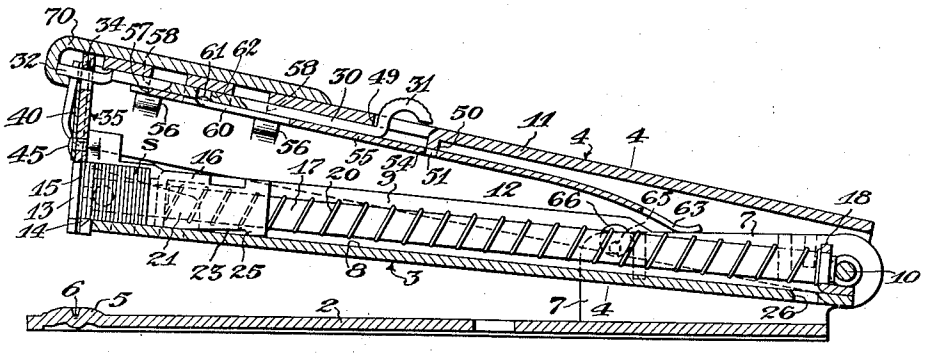


Fig. 2.

Inventor:
Arthur H. Maynard
By Pruning, Lowe & White
Attorneys.

March 30, 1948. A. H. MAYNARD 2,438,713

FASTENER-APPLYING IMPLEMENT

Filed Feb. 26, 1946 2 Sheets-Sheet 2

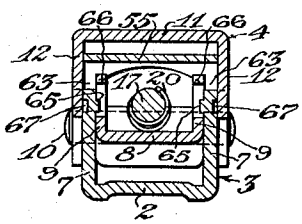


Fig. 4.

Fig. 3.

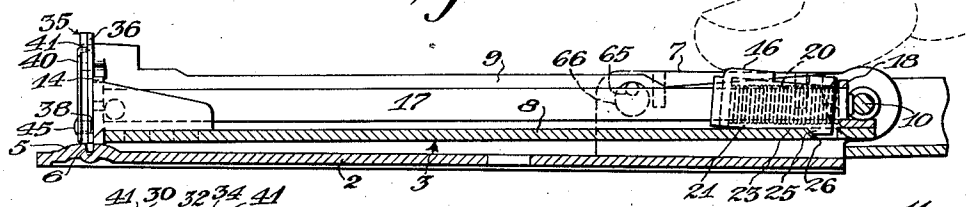


Fig. 7.

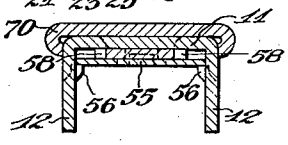


Fig. 6.

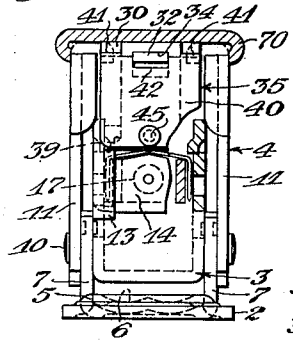


Fig. 5.

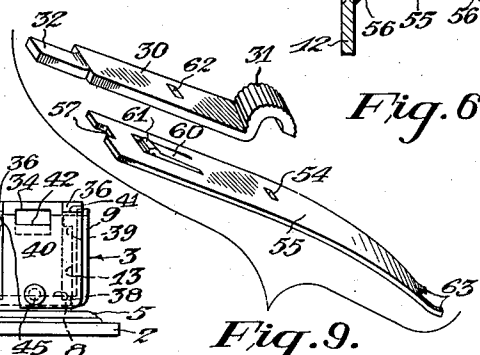


Fig. 9.

Fig. 8.

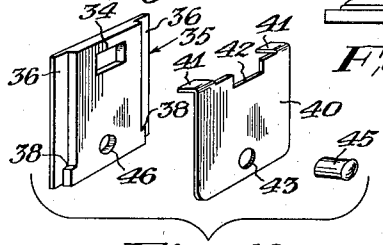


Fig. 10.

Inventor:
Arthur H. Maynard
By Pennington and Hutchinson
Attorneys.

Patented Mar. 30, 1948 2,438,713

UNITED STATES PATENT OFFICE

2,438,713

FASTENER-APPLYING IMPLEMENT

Arthur H. Maynard, Warwick, R. I., assignor to Boston Wire Stitcher Company, Warwick, R. I., a corporation of Maine

Application February 26, 1946, Serial No. 650,190

14 Claims. (Cl. 1—3)

1

This invention relates to improvements in fastener-applying implements for attaching papers and other sheets, fastening labels and tags to articles of commerce and for use generally for stapling and stitching together various objects.

One object of the invention is to provide an implement of the type indicated which is more convenient to load with a supply of fasteners and easier to operate for the purposes specified.

Another object is to provide an implement having a top-loading magazine for the fasteners with an operating lever forming a closure for the magazine and improved means for manually opening and closing the magazine.

Another object is to provide an implement of the type indicated having means to prevent the driving of a fastener or staple accidentally to cause injury to the hands when the operating lever is carried down onto the magazine to close the top of the latter.

Another object is to provide an implement of the type indicated having fastener-applying means in the form of a staple-driver which may be released from the operating lever when the latter is withdrawn from the magazine for supplying staples thereto.

Another object is to provide an implement of the type indicated having manually-operable means for releasing the lever from the magazine-arm to open the magazine for loading it with a supply of fasteners or staples and concurrently releasing the staple-driver from the lever.

Another object is to provide an implement of the type indicated with the staple-driver releasable from the operating lever to adapt it to remain in the throat at the end of the magazine to prevent staples from entering said throat and being ejected therefrom when the operating lever is closed down onto the magazine after loading the latter.

Another object is to provide an implement of the type indicated which may be manufactured at economical cost while rendering it more durable for long periods of use.

Further objects of the improvement are set forth in the following specification which describes a preferred form of construction of the device, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a general view in perspective of the present improved fastener-applying implement;

Fig. 2 is an enlarged longitudinal sectional view of the same;

Fig. 3 is a similar longitudinal sectional view of the implement showing the combined operating lever and cover raised above the magazine-arm;

2

Fig. 4 is a transverse sectional view of the fore part of the magazine-arm and operating lever on line 4—4 of Fig. 2;

Fig. 5 is a part-sectional front view of the device with the parts shown in the same position as in Fig. 2;

Fig. 6 is a transverse sectional view of the operating lever on line 6—6 of Fig. 3;

Fig. 7 is a longitudinal sectional view showing the magazine-arm depressed with the operating lever or cover turned back and illustrating the method of depressing the staple-pusher to retain it in retracted position for loading the magazine with staples;

Fig. 8 is a front view of the magazine-arm and staple-driver, shown in the same position as in Fig. 7, with the front plate on the driver partly broken away;

Fig. 9 is a composite perspective view of the slidable latch and bowed spring which cooperates therewith; and

Fig. 10 is a composite perspective view of the parts of the staple-driver.

Referring to the accompanying drawings, the present improved fastener-applying implement is similar in certain respects to that shown and described in my prior application for United States Letters Patent, Serial No. 610,961, filed August 17, 1945, but embodying several improvements therein as will be later set forth. In general, the improved device comprises a relatively flat base 2, a hollow magazine-arm 3 for containing a supply of fasteners such as wire staples of inverted U-shape and an operating lever 4 which also constitutes a cover for the magazine in the arm.

The base 2 may be constructed of sheet-metal and provided with clinching means 5 at its forward end in the form of a protuberance struck up from the metal and indented with grooves 6 for receiving the legs of the staple to bend them against the under side of the work. At the rearward end of the base 2 is a standard comprising a pair of parallel stanchions 7 folded upwardly from the sides of the base to provide a mounting for the pivoted magazine-arm 3. The metal plate or base 2 may be mounted in an ornamental support or sub-base constructed of plastic or the like, as disclosed in the pending application referred to above, but not herein shown; or the implement may be used without such a support for its base.

The magazine-arm 3 may be constructed of sheet-metal in channel-shape with a bottom 8, and upstanding side walls 9, the rearward end of

the arm being positioned between the stanchions 7 and pivoted on a transverse pin 10 extending through ears at the ends thereof.

The operating lever 4 which forms a cover for the magazine in the arm 3 may also be constructed from sheet-metal in inverted channel-shape with a top 11 and sides 12 folded downwardly therefrom. The sides 12 of the lever 4 are adapted to straddle the sides of the arm 3 with their rearward ends pivoted on the pin 10 which hingedly connects the arm to the stanchions 7 on the base 2.

The forward end of the arm 3 is provided with inwardly-folded portions 13 which cooperate with a shear-plate 14 spaced rearwardly therefrom to form a throat 15 through which the staples are driven into the work. The staples *s* are fed forwardly in the magazine-arm and across the shear-plate 14 into the throat 15 by means of a staple-pusher 16. The staples *s* may be assembled in a stick or refill and inserted in the magazine of the arm 3 with their legs resting on the bottom 8 thereof. Extending rearwardly from the shear-plate 14 between the sides 9 of the arm 3 is a rod 17 fastened at its opposite end in an angle-shaped support 18 which is held in place by the transverse pivot-pin 10. A helical spring 20 surrounds the rod 17 between the pusher 16 and the support 18 for sliding the pusher forwardly to advance the staples in the magazine. The staple-pusher 16 is of inverted U-shape with parallel sides 21 which abut the sides 9 of the arm 3 and rest on its bottom 8. At the rearward end of the sides 21 of the pusher 16 their bottom edges are recessed or cut away at 23 at a relatively long angle with a sharper bevel at the end to provide detent-projections 25 which may be pressed down into a bevel-edged opening 26 in the bottom of the arm 3 in the manner shown in Fig. 7 to retain the pusher in its retracted position.

The operating lever 4 is held in connection with the magazine-arm 3, while being movable within prescribed limits relatively thereto, by means of a manually-slidable latch 30 which engages with the staple-driver 35. The latch 30, shown in perspective view in Fig. 9, is in the form of a relatively narrow flat bar having an upturned arcuate portion at its rearward end which is knurled or fluted on its surface to provide a finger-grip 31. At its forward end the latch 30 has a projection offset below its upper face and narrowed at the sides to form a lug or prong 32 adapted to slide through a rectangular opening 34 adjacent the top of the staple-driver 35, see Fig. 2.

As shown in Fig. 10, the staple-driver 35 comprises a hardened metal blade formed with offset shouldered flanges or fins 36 at its sides which are slidable in grooves at the sides of the throat 15 in the arm 3. Adjacent its lower edge the thicker portion of the driver-blade 35 is formed with laterally-extending portions which provide detent-shoulders 38 adapted to engage with a pair of lugs 39, see Fig. 8, bent inwardly from the sides of the arm 3 near its top to limit the upward movement of the driver and prevent its removal from the magazine-arm. Overlying the forward face of the driver 35 is a flat sheet-metal plate 40 having lugs or ears 41 folded rearwardly at right-angles thereto to adapt them to project across the shoulders at the sides of the thicker portion of the driver 35 with their ends abutting the flanges or fins 36. The ears 41 are adapted to act as stops engageable with the top of the lugs 39 as shown in Fig. 8 to prevent the

driver from dropping out through the throat 15 in the arm 3. The staple-driver 35 may be assembled in the throat 15 by springing the upper portion of the plate 40 outwardly to adapt the ears 41 to be passed by the lugs 39 on the upper sides of the arm 3; and the same procedure may be adopted for removing the driver from the implement should repair or replacement thereof be required. The upper portion of the plate 40 is cut away at 42 to register with the opening 34 in the staple-driver 35 and adjacent its lower edge it is perforated with a circular opening 43 for receiving a rivet 45 inserted through a corresponding hole 46 at the bottom of the driver-blade 35 and headed over to secure the two parts in connection. By this form of construction the staple-driver 35 is provided with grooves at its sides for straddling the inwardly-folded portions 13 at the front of the arm 3 which form parallel ways for slidably mounting the driver.

As will be observed by reference to Fig. 2 of the drawings, the forward lug or prong 32 of the latch 30 engages through the opening 34 in the driver-blade 35 with a slight clearance, the latch being slidable beneath the top wall 11 of the operating lever 4 with its rearward finger-piece 31 projecting upwardly through an elongated slot 49 therein. At the rearward side of the slot 49 a lug or projection 50 is bent downwardly and recessed along its sides to provide a narrower projection 51, see Fig. 3, which engages through an opening 54 in a bow-shaped spring 55. The relatively flat forward portion of the spring 55 underlies the latch 30 and forms a bearing therefor, being supported thereunder by means of pairs of lugs 56 pierced from the sides 12 of the lever 4 and bent inwardly therefrom as shown in Figs. 2, 3 and 6. The spring 55 is thus fixedly supported beneath the top wall 11 of the lever 4 with a space therebetween in which the latch 30 is adapted to slide. The latch 30 is guided at its forward end to prevent lateral displacement thereof by pairs of lugs 58 projecting downwardly from the top wall of the lever 4 and straddling its sides, see Fig. 6. The lugs 58 also serve as abutments engaging the top of the spring 55 to space it from the top wall of the lever 4. A rectangular notch 57 is formed in the forward edge of the spring 55 for receiving the lug or prong 32 on the latch 30 when the latter is in its retracted position as represented in Fig. 3. Rearwardly of the notch 57 the metal of the spring 55 is sheared to provide a longitudinally-extending spring-tongue 60, see Fig. 9, having its forward end crimped or curled over to form an upstanding detent-protuberance 61 which is adapted to engage in a transverse slot or opening 62 in the latch 30 when the latter is slid forwardly to engage its lug 32 with the driver-blade 35 as shown in Fig. 2. When the latch 30 is withdrawn from engagement with the staple-driver 35 the rounded upper surface of the detent-protuberance 61 will ride across the edge of the slot 62 in the latch to depress the spring-tongue 60 and release it from the latch. The rearward curved portion of the spring 55 is bifurcated at its end to form a pair of legs 63 adapted to bear against the upper edges of the stanchions 7 on the base 2 to normally maintain the operating lever 4 and the arm 3, connected thereto, raised above the base. The arm 3 is thus normally held in the position illustrated in Fig. 2 to provide for inserting the work beneath the staple-driving means. The upward movement of the magazine-arm 3 with respect to the

base 2 is limited through the means of a pair of cylindrical projections or teats 65 projecting inwardly from the sides of the stanchions 7, see Fig. 4, through enlarged circular openings 66 in the side walls 9 of the arm. The projections or teats 65 may be formed by indenting the metal at 67 on the outer sides of the stanchions 7 to force the projections 65 outwardly on the inner faces thereof. As will be noted by reference to Fig. 2, the side walls 9 of the arm 3 are cut away at the top rearwardly thereof to provide a clearance for the curved legs 63 of the spring 55 whereby to provide that the lever 4 and arm 3 may be held in the relative positions shown in Fig. 2 when the driver-blade 35 is at the upper limit of its throw and the magazine-arm is raised above the base 2. The lever 4 is provided at its forward end with a hand-rest 70 which may be constructed of sheet-metal welded or otherwise fastened thereto and formed with an overhanging marginal rounded rim overlying the sides and front of the lever.

The complete implement is operated in the manner as next explained. To fasten together sheets of paper or the like the work is laid across the top of the base 2 above the clinching means 5 and pressure applied to the hand-rest 70 at the forward end of the lever 4. Such pressure will cause the lever 4 and the connected arm 3 to swing downwardly as they pivot on the pin 10 until the forward end of the arm bears against the work resting on the base 2; the spring 55 yielding under this action with its legs 63 sliding rearwardly along the upper edges of the stanchions 7. As the forward end of the arm 3 contacts with the work the downward movement of the lever 4 is continued to slide the driver 35 down in the throat 15 to drive a staple *s* through the work and cause its legs to be clinched on the underside thereof in the grooves 6 of the clinching means 5. Pressure on the lever 4 may then be released, whereupon the spring 55 will act to raise the lever 4 to withdraw the staple-driver 35 upwardly through the throat 15 until its detent-shoulders 38 engage with the lugs 39 which project inwardly from the sides of the arm 3. Further upward movement of the staple-driver 35 in the throat 15 will thus be checked and the lever 4 will continue its upward motion to raise the arm 3 above the base 2 into the position illustrated in Fig. 2. The upward rise of the arm 3 and lever 4 is limited by the engagement of the cylindrical projections or teats 65 on the stanchions 7 with the edges of the circular openings 66 in the sides of the arm 3.

As long as a supply of staples remains in the magazine of the arm 3 the implement may be operated continuously to apply the staples to the work in the manner explained above; or if it is desired to tack labels or other articles to various objects the base 2 may be swung back out of cooperative relation with the arm 3 by causing the projections 65 to spring across the edges of the opening 66. After the supply of staples *s* in the magazine of the arm 3 has been exhausted by driving the last one in the series the machine is loaded with a fresh supply in the manner as next explained.

By pressing against the finger-grip 31 of the latch 30 the latch may be retracted rearwardly on the lever 4 to release its lug or prong 32 from the opening 34 in the staple-driver 35; the spring-tongue 60 yielding to release the detent-protuberance 61 from the slot 62 in the latch to permit its retraction. As the lever 4 thus is disconnected from the staple-driver 35 the arm 33 will be released to permit it to drop down onto the base 2 and the driver 35 will slide down through the throat 15 in the arm. The staple-pusher 16 may then be retracted by sliding it rearwardly in the arm 3 to compress the spring 20. As the staple-pusher 16 is withdrawn the finger of the hand may be pressed down against its top to cause its lugs or detent-projections 25 to engage in the opening 26 in the bottom of the arm 3 to retain it in its rearward position. A stick or refill of staples *s* may be placed in the magazine of the arm 3 straddling the rod 17 and the staple-pusher 16 thereafter released. The projections 25 on the pusher 16 will ride up across the beveled edge of the slot 26 to permit the pusher to be slid forward under the tension of the spring 20 to cause it to feed the whole series of staples *s* forwardly and advance the foremost one into engagement with the rearward face of the staple-driver 35.

After the magazine of the implement has been supplied with staples in the manner explained above, it is prepared for operation by swinging the lever 4 downwardly and latching it to the staple-driver 35. This may be accomplished as the arm 3 rests against the base 2 in the position illustrated in Fig. 3, the lever 4 being pressed downwardly to cause the spring 55 to yield until the lug 32 is in alinement with the opening 34 in the staple-driver 35. Then, by sliding the latch 30 forwardly its prong 32 will engage in the opening 34 in the driver 35, whereafter the spring 55 will act to return the lever 4 into its uppermost position as shown in Fig. 2. The upward movement of the lever 4 will cause the staple-driver 35 to be slid upwardly in the throat 15 at the front of the arm 3 and when its lower edge is clear of the top of the shear-plate 14 the pusher 16 will be slid forwardly under the tension of the spring 20 to feed the foremost staple *s* into the throat 15. The implement may then be operated in the manner as first explained to continuously apply staples to the work.

It is to be particularly noted that the present improved construction of the latching means for connecting the operating lever with the staple-driver and thereby with the arm 3 insures against premature driving of a staple, that is to say, since the staple-driver 35 remains down in the throat 15 of the arm 3 when the lever 4 is disconnected therefrom it will prevent the feeding of a staple into position beneath the driver. Consequently, the downward movement of the lever 4 for connecting it with the arm 3 cannot operate to drive a staple which would be wasted or, which is more important, there is no danger that the connection of the lever with the arm will cause a staple to be driven into the fingers if the latter are held under the arm 3 while pressing the lever 4 downwardly to connect it therewith. The present improvement therefore provides against premature driving of a staple as a safety factor to avoid injury to the hands and further makes for greater ease and convenience in loading the magazine and preparing the implement for operation.

While the present improved device is herein shown as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the structure and arrangement of the parts of the implement without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a device of the type indicated, an open-

top magazine for containing a supply of fasteners, said magazine formed with a throat through which the fasteners may be driven, a driver slidable in the throat in the magazine and normally releasable therefrom, means for limiting the extent of sliding movement of the driver to prevent its release from the throat in the magazine, a lever for reciprocating the driver, said lever constituted as a cover for closing the top of the magazine, and manually-operable means for releasably connecting said lever to said driver, said manually-operable means being releasable to adapt the lever to be lifted above the magazine to open the latter for loading it with fasteners.

2. In a device of the type indicated, an open-sided magazine for containing a supply of fasteners, said magazine formed with a throat through which the fasteners may be driven, a driver slidable in the throat in the magazine and normally releasable through an end of said throat, means for limiting the extent of sliding movement of the driver in the throat to prevent its release from the magazine, a lever for reciprocating the driver, manually-operable means for connecting the lever to the driver, said means being manually releasable to adapt the lever to be moved independently of the driver to open the magazine for loading it with fasteners, and resilient means for maintaining said lever raised above the magazine with the driver at the upper end of its stroke.

3. In a device of the type indicated, a top-loading magazine for containing a supply of fasteners, a lever constructed as a cover for the magazine and movable relatively thereto to drive the fasteners therefrom, a normally releasable fastener-driver reciprocable in a throat at the end of the magazine to drive the fasteners therefrom, means for limiting the extent of movement of the driver in the throat to prevent its release from the magazine, and manually-operable means for connecting the operating lever to reciprocate the driver and disconnecting it therefrom to permit raising the lever sufficiently to open the magazine for receiving a supply of fasteners.

4. In a fastener-applying implement, a top-loading magazine for containing a supply of fasteners, a lever constructed as a cover for the magazine and movable relatively thereto, a driver slidable in a throat at the end of the magazine for driving the fasteners therefrom, detent-means for limiting the sliding movement of the driver in either direction in the throat in the magazine, and manually-operable means for latching the operating lever to the driver and thereby connecting said lever in operative relationship to the magazine, said latching means being releasable to permit raising the lever to uncover the magazine for loading it with fasteners.

5. In a device of the type indicated, an arm constructed as a hollow open-sided magazine for containing a supply of fasteners, a lever of inverted channel shape pivoted to swing relatively to the magazine-arm and forming a cover for closing the open side of said magazine, a driver reciprocable in a throat at the end of the arm, means to limit the extent of sliding movement of the driver in each direction in the throat, and a manually operable latch for connecting the lever with the driver to reciprocate it in the throat to drive the fasteners therefrom, said latch being releasable to disconnect the lever from the driver to allow it to be moved to open the magazine for loading it with fasteners.

6. In a device of the type indicated, an arm of channel-shape forming a hollow magazine for containing a supply of staples, a lever of inverted channel-shape pivoted to the magazine-arm to adapt it to rock relatively thereto, a staple-driver reciprocable in a throat at the end of the arm, means to limit the extent of movement of the driver in the throat in the arm to prevent its removal therefrom, and a latch manually slidable on the lever for engaging the driver to connect it for reciprocation thereby.

7. In a device of the type indicated, a base, clinching means on said base, an arm pivoted above the base and formed with an open-sided magazine for containing a supply of staples, a lever pivoted to rock with respect to said arm and the base and constructed as a cover for closing the open side of the magazine in the arm, a staple-driver slidable in a throat at the end of the arm, means for limiting the extent of sliding movement of said staple-driver in either direction in the throat, means for releasably connecting the lever with the driver to effect reciprocation of the latter, said connecting means being manually operable to release the driver from the lever to adapt the latter to be moved to open the side of the magazine, and a spring acting between the lever and the base for maintaining said lever raised above the arm with the driver at the upper end of its stroke.

8. In a stapling implement, the combination of a base, a hollow channel-shaped magazine-arm pivoted at its rearward end to the base and provided at its forward end with a throat through which the staples may be driven, means to advance the staples in the arm to feed the foremost one into the throat, a driver reciprocable in the throat to drive the staples, a lever constituted as a cover for closing the top of the magazine in the arm, means for pivoting said lever to adapt it to rock with respect to the arm, means for releasably connecting said lever to the driver to reciprocate the latter, said connecting means being manually operable to release the lever from the driver to adapt the lever to be raised for opening the magazine, and a spring acting between the lever and the base to normally maintain the lever in raised relation to the arm and the arm raised above the base.

9. In an implement of the type indicated, a base having stanchions at its rearward end and clinching means at its forward end, a hollow arm pivoted at its rearward end to the stanchions and forming a magazine for a supply of staples, a lever of inverted channel-shape pivoted at its rearward end to the base with its sides straddling the sides of the arm to form a closure for the magazine, a staple-driver slidable in a throat at the forward end of the magazine and formed with an opening adjacent its upper end, a latch slidable on the lever to engage its end through the opening in the staple-driver, and a spring fixedly attached to the lever and engaging the upper edges of the stanchions to normally maintain the lever raised above the arm and the arm elevated above the base.

10. In an implement of the type indicated, a base formed with a pair of stanchions at one end and clinching means at its opposite end, a hollow magazine-arm for containing a supply of staples, said arm provided with a throat at its forward end through which the staples may be driven, means for pivotally mounting the rearward end of the arm between the sides of the stanchions, a lever of inverted channel-shape

pivoted at its rearward end to the stanchions with its sides straddling the sides of the arm to form a closure therefor, a driver-blade slidable in the throat at the end of the magazine and formed with an opening adjacent its upper end, a latch slidable on the lever to engage it with the opening in the driver, detent-means for maintaining the latch in engagement with the driver, and a spring tensioned between the lever and the base for raising the lever above the arm and elevating the arm above the base.

11. In an implement of the type indicated, a base, a channel-shaped arm pivoted at its rearward end to said base and provided with a throat at its forward end, a driver-blade slidable in said throat in the arm, means for limiting the extent of sliding movement of said driver-blade to prevent its removal from the throat, a lever of inverted channel-shape pivoted to the base at its rearward end with its sides enclosing the arm, a latch slidable on the lever for engaging the driver-blade to connect the lever thereto and thereby to the arm, said latch formed with an opening, a spring within the sides of the lever operative to maintain the lever raised above the arm and the arm elevated above the base, said spring formed with a tongue having a detent protuberance at its end engageable in the opening in the latch to maintain the latter in engagement with the driver-blade.

12. In an implement of the type indicated, a hollow arm forming a magazine for staples, said arm having portions folded inwardly at its end and provided with a throat at the rear thereof, a driver-blade slidable in said throat, a plate fastened to the blade on its forward side and overlying the inwardly-folded portions of the arm for slidably mounting said blade, and a lever pivoted to the arm and connected to reciprocate the driver-blade in the throat.

13. In an implement of the type indicated, a hollow arm having a bottom and sides with portions of the sides extending inwardly at right-angles at its forward end, a shear-plate in the arm spaced rearwardly from the inwardly-extending portions of its sides to provide a throat through which staples may be driven, detent-lugs at the upper end of said throat, a driver-blade slidable in the throat and formed with detent-shoulders at its lower end engageable with the detent-lugs in the throat to prevent the driver-blade from sliding upwardly out of the throat, a plate secured against the forward face of the driver-blade adjacent its lower end and formed with ears projecting rearwardly to adapt them to engage the lugs at the upper end of the throat to prevent said blade from sliding down through the throat, a lever pivoted to the arm, and means for latching said lever to the driver-blade for reciprocating it thereby.

14. A staple-applying device comprising a hollow open-sided magazine for containing a supply of staples, an arm constructed as a cover for closing the open side of the magazine and adapted for movement relatively thereto, said magazine having a throat through which the staples may be driven, a driver inserted into the throat through an end thereof for reciprocation longitudinally therein, detent-means for limiting the reciprocatory movement of the driver in the throat in the magazine to prevent its release therefrom after being assembled therewith, and manually-operable means for connecting the lever with the driver for reciprocating the latter, said connecting means being releasable to permit the lever to be moved away from the magazine to open its side while the driver is retained within the throat in the magazine.

ARTHUR H. MAYNARD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,251,917	Crosby	Aug. 12, 1941
2,264,322	Maynard	Dec. 2, 1941
2,309,763	Goodstein	Feb. 2, 1943