Aug. 6, 1957 R. W. JENNY 2,801,417

MAGAZINE CLOSURE FOR STAPLING IMPLEMENTS

Original Filed March 25, 1955 2 Sheets-Sheet 1

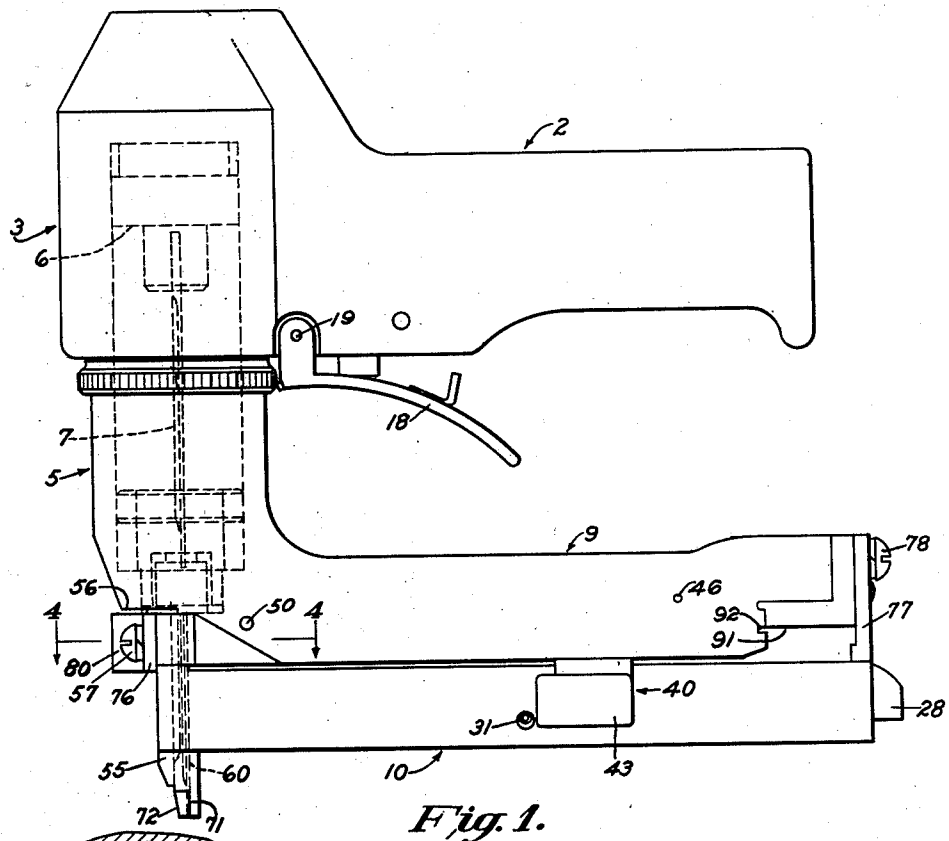


Fig. 1.

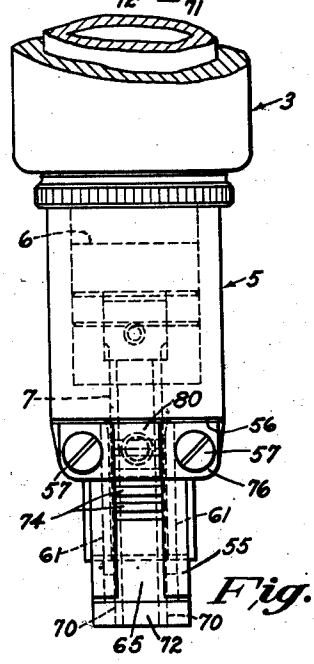


Fig. 3.

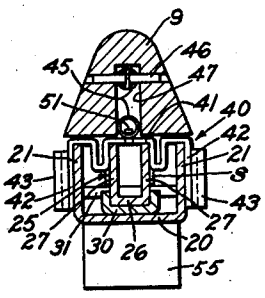


Fig. 5.

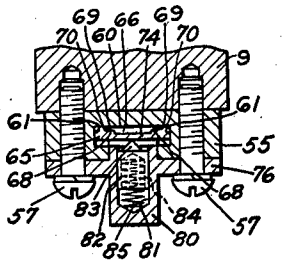


Fig. 4.

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MAGAZINE CLOSURE FOR STAPLING IMPLEMENTS

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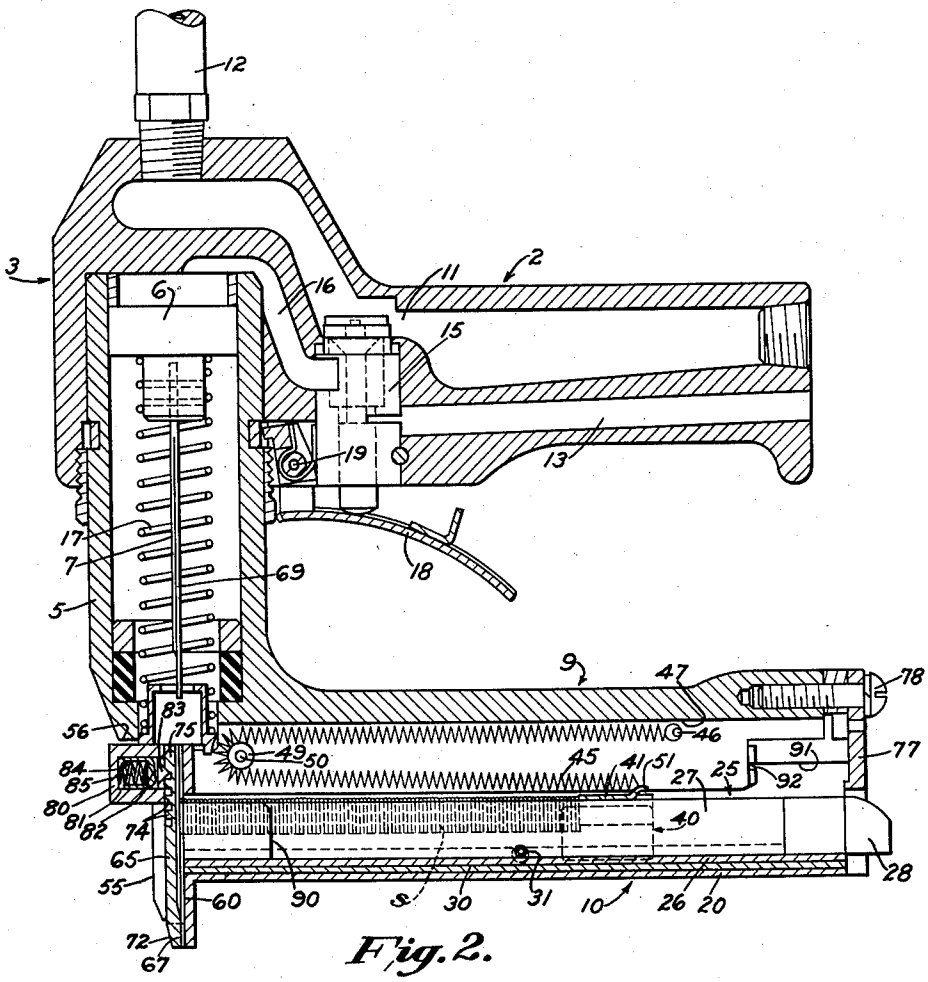


Fig. 2.

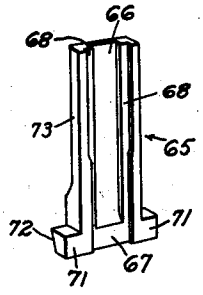


Fig. 6.

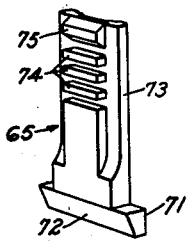


Fig. 7.

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MAGAZINE CLOSURE FOR STAPLING IMPLEMENTS

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Original application March 25, 1955, Serial No. 496,641. Divided and this application March 29, 1956, Serial No. 574,807

4 Claims. (Cl. 1—49)

This application is a division from my pending application, Serial No. 496,641, filed March 25, 1955.

The present invention relates to improvements in stapling implements and more particularly to the magazine for containing a supply of staples and a novel construction of closure for the forward open end of the magazine forming a throat or raceway through which the staples may be driven.

A particular object of the invention is to provide an implement of the type indicated having a removable insert at the front of the throat which is slidable to open the throat or raceway through which the staples are driven for clearing it of jammed staples caused by misalinement or distortion of their shape.

Another object is to provide an improved closure for the open end of the magazine which may be slid into place to form the front wall of the throat and automatically locked in place by resiliently-operated latching means.

Another object is to provide a slidable closure for the open front of the magazine which is readily releasable by the locking means so that it may be withdrawn from the magazine without removing screws or other manually-operable fastening means.

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

Fig. 1 is a general view in side elevation of the complete implement shown with its parts in normal relationship;

Fig. 2 is a sectional view of the implement taken on its longitudinal axis and illustrating the operating mechanism within its hollow frame;

Fig. 3 is a front elevational view showing the arrangement of the closure-means for the magazine;

Fig. 4 is a transverse sectional view on line 4—4 of Fig. 1;

Fig. 5 is a transverse sectional view of the magazine illustrating the staple core for slidably supporting the staples therein and the pusher for feeding the staples forwardly to deliver them into the throat through which they are driven;

Fig. 6 is a perspective view of the magazine-closure viewed in a direction looking toward its rearward wall which abuts the open end of the magazine; and

Fig. 7 is a perspective view of the magazine-closure viewed in a direction loking toward its forward face.

The present improvements are herein shown and described as applied to use with a fluid pressure-operated stapler such as disclosed in my pending application referred to hereinabove; but it is to be understood that the invention may be applied to other types of machines, either power-driven or hand-operated.

Referring to the drawings, as herein shown the stapling implement may consist in a hollow handle member 2 (Fig. 2) having a cylindrical head 3 at its forward

end that is mounted on or made a part of a vertical cylinder 5 in which is a reciprocable piston 6 for actuating a blade-like staple-driver 7. The cylinder 5 is formed with, or has attached thereto, a rearwardly-extending member or arm 9 overlying and supporting a hollow magazine 10 for containing a supply of staples *s*.

The handle member 2 contains a chamber 11 for compressed air or hydraulic fluid supplied thereto from a suitable source through a tube or hose 12 connected to the top of the head 3. A manually-operable valve 15 communicates with the pressure chamber 11 to admit air through a duct 16 into the upper end of the cylinder 5 for operating the piston 6 to actuate the staple-driver 7 for driving a staple into the work. A trigger 18 pivoted at 19 on the under side of the handle 2 provides for manually opening the valve 15. A passage 13 leading from the valve 15 through the handle 2 is open to the atmosphere at its end for exhausting the air during the return stroke of the piston 6. A helical spring 17 seated at the bottom of the cylinder 5 has its upper end engaging the piston 6 to carry it upwardly in a return stroke after each staple-driving operation.

The magazine 10 comprises a trough-shaped casing having a bottom wall 20 with parallel side walls 21 (Fig. 5) extending upwardly therefrom with a slight space at the top beneath the horizontal member or arm 9. Within the interior of the magazine 10 is a longitudinally-extending U-shaped staple-core 25 formed with a bottom wall 26 and parallel side walls 27 projecting upwardly to a height equal to that of the side walls 21 of the magazine. In the rearward end of the core 25 is an insert 28 (Fig. 2) welded or otherwise fastened to its side walls 27 and projecting beyond the end of the magazine with its top of arcuate shape at its end to provide a rest for guiding the end of a staple-strip thereinto. The staple-core 25 is seated in a channel-shaped sheet-metal strip 30 welded or otherwise fastened to the bottom wall 20 of the magazine 10. A cross-pin 31 inserted through holes in the side walls 21 of the magazine 10 and through holes in the side walls 27 of the core 25 fastens the core in place.

A staple-pusher 40 (Figs. 1 and 5) formed from sheet-metal has a top wall 41 adapted to be slidably mounted on the core 25 with U-shaped portions projecting downwardly at the sides in overlying contact with the walls 27 of the core. The pusher 40 is also provided with outer depending legs 42 overlying the outer side walls 21 of the magazine 10 in contact therewith. The legs 42 are provided with concave finger-tabs 43 welded or otherwise fastened thereto which serve for manually sliding the pusher 40 rearwardly on the core 25. The pusher 40 is advanced longitudinally in the magazine 10 by means of a helical wire spring 45 (Fig. 2) anchored at one end to a pin 46 (Fig. 5) bridging a central longitudinal slot 47 in the horizontal arm 9 and held fast in holes in the sides thereof. At the forward end of the slot 47 in the arm 9 is a roller or pulley 49 journaled on a pin 50 held fast in holes in the sides of the arm. The spring 45 extends forwardly and then down around the pulley 49 to reach rearwardly with its end fastened to a lug 51 bent up from the top wall of the pusher 40.

A nosepiece 55 is constructed integral with or fixedly attached to the forward part of the magazine 10 with its upper portion fitting closely within a recess 56 at the bottom of the cylinder 5; being fastened in place by the screws 57 threaded into the laterally-flaring end of the horizontal arm 9 (Figs. 2 and 4). The nosepiece 55 is of U-shape in cross-section with its inner face 60 extending throughout the full length thereof and forming the rearward wall of the staple-throat through which the staples are driven. At the sides of the face 60 the projecting portions of the nosepiece 55 are undercut or slotted

to provide grooved guideways **61** (Fig. 4) for receiving the marginal portions **73** of the detachable closure-plate **65** (Figs. 4, 6 and 7) to mount it for forming the forward wall of the staple-throat. The closure-plate **65** is slotted vertically to provide a recessed face **66** which is opposed to the face **60** of the nosepiece **55** with the lower portion of said face recessed to a lesser extent to form a forward face **67** at the bottom of the staple-throat. At the sides of the face **66** are narrow ribs **68** formed by shouldered portions which cooperate with the forward face **60** (Fig. 4) on the nosepiece **55** to form grooved guideways **70** for receiving the thin flanges **69** (Fig. 4) on the sides of the staple-driver **7**. The bottom of the closure-plate **65** is extended laterally at each side in abutments **71** (Figs. 6 and 7) which, together with its opposite beveled portion **72**, form a foot for the lower end of the nosepiece **55**. The closure-plate **65** is reduced in thickness along its sides to provide thinner flange-like portions **73** (Fig. 7) engageable with the guideways **61** on the sides of the nosepiece **55** to adapt the plate to slide upwardly therein for closing the front of the staple-throat. The upper part of the closure-plate **65** is slotted laterally to provide a series of cross-members or teeth **74**, the final end tooth **75** being beveled on its sides for a purpose later explained.

The closure-plate **65** is held in place in the nosepiece **55** by latching means mounted on a clamp **76** (Figs. 2 and 4) fastened at the front thereof. The upper end of the nosepiece fits within the recess **56** in the forward end of the arm **9**. The screws **57** fasten the clamp **76** and nosepiece **55** to the end of the arm **9**, thus serving to support the forward end of the magazine from the arm. For this purpose the strap-like clamp **76** extends laterally across the front of the nosepiece **55** (Figs. 1 and 3) with the shanks of the screws **57** projecting through holes at its ends. The threaded ends of the screws **57** engage in tapped holes in the end of the recess **56** at the forward end of the horizontal member or arm **9**. The rearward end of the magazine **10** is supported from the arm **9** by a lug **77** projecting upwardly from the magazine and secured to the end of the arm by a screw **78**.

The clamp **76** is formed at its center with a projecting box-like casing **80** having a horizontal bore **81** for receiving a slidable plunger **82**. A pointed projection **83** on the forward end of the plunger **82** is adapted to engage in the slot between the adjacent teeth **74** and **75** on the face of the closure-plate **65**. The plunger **82** has an axial bore **84** containing a helical wire spring **85**, one end of which engages with the inner end of the bore **81** of the casing **80** for sliding the plunger to engage its pointed projection **83** between the teeth **74** and **75** on the closure-plate **65**. It will thus be observed that when the closure-plate **65** is slid upwardly in the guideways **61** on the nosepiece **55** its beveled tooth **75** will engage the pointed projection **83** on the end of the plunger **82** to retract the plunger against the tension of the spring **85**, whereafter the projection **83** will snap into the slot between the tooth **75** and the next adjacent tooth **74** as shown in Fig. 2 to releasably lock the closure-plate in place. The purpose of the remaining teeth in the series on the closure-plate **65** is to provide a slot for the insertion of a screw-driver or other tool whereby the closure-plate may be slid downwardly manually to release it from the spring-pressed plunger **82**. By this means the closure-plate may be readily removed from the nosepiece **55** when it is required to clean the staple-throat or dislodge jammed staples therefrom. Preferably, the slots or grooved guideways **61** at the sides of the nosepiece **55** are dimensioned to provide for free entrance and easy sliding of the closure-plate **65** therein but the runners at the lower end of the plate are of the required thickness to cause the plate to bind snugly against the face **60**.

In the forward end of the staple-core **24** is a hardened block-like insert **90** welded or otherwise secured to the interior walls of the core and conforming to the shape of the cross-bars or heads of staples used in the implement. The forward vertical face of the insert **90** forms a shearing edge at the top for severing the foremost staple *s* from the strip or refill-cartridge as the driver **7** descends to drive a staple through the throat for setting it in the work.

At the rearward end of the horizontal member or arm **9** is a rectangular opening **91** (Fig. 3) on its underside adapted to receive the upper portion of the staple-pusher **40** (Figs. 1 and 2) when it is drawn back to retain it therein for loading the magazine with staples. The forward end of the slotted opening **91** is beveled on the under side to adapt the staple-pusher **40** to be rocked and slid upwardly into the opening, a notch **92** in the forward end of the opening **91** being engaged by the horizontal edge-portion of the forward top wall **41** of the pusher **40** for latching it in place in raised relationship above the core **25** so that a strip of staples may be slid thereunder. After a stick of staples has been supported on the end of the core beneath the raised and latched pusher **40** it is slid forwardly therebeyond and the pusher may be released by retracting it slightly and rocking its forward end downwardly in under the beveled portion of the opening **91** in the member **9**. The spring **45** will then draw the pusher forwardly for engaging the staples to successively feed them into the throat in the nosepiece **55** at the front of the magazine **10**. The method of operation of the implement is as next explained.

To prepare the implement for operation after the magazine **10** has been loaded with staples *s* the handle-member **2** may be held in one hand to apply the implement to the work. It will be understood that the implement may be connected to a source of power, either pneumatic or hydraulic pressure, by attaching a hose thereto. As the implement is held conveniently in one hand the operator's forefinger is looped under the trigger **18** for rocking it upwardly to raise the valve-plunger and open the valve **15**. Pressure is admitted to the upper end of the bore in the cylinder **5** to act against the piston **6**. Pressure on the piston **6** forces the staple-driver **7** down through the throat in the nosepiece **55**, thereby causing it to shear the foremost staple *s* from the stick or strip in the magazine **10** and drive it into the work. Release of the trigger **18** causes the pressure in the air-chamber **11** to act against the head of the valve-plunger to close the intake port of the valve and open the exhaust port for releasing the air to exhaust through the passage **13** in the handle **2**. Upon relief of pressure on the piston **6** the spring **17** will raise it to the upper end of the bore in the cylinder **5**, thereby withdrawing the staple-driver **7** from the throat in the nosepiece **55**. As the staple-driver **7** is withdrawn in this manner the pusher **40** will slide the staple stick forwardly under the tension of the spring **45** to feed another staple into the throat in the nosepiece **55**. The parts of the staple-driving mechanism are thus returned to initial position to condition the implement for another operation. When the supply of staples in the magazine **10** has been exhausted the operator may grasp the finger-tabs **43** overlying the sides of the magazine to draw the staple-pusher **40** rearwardly and raise it into the opening **91** for latching it in inoperative relationship so that a fresh supply of staples may be inserted into the open rearward end of the magazine by resting the forward end of the stick on the rest or guide **28**.

It will be observed from the foregoing specification that the present invention provides an improved stapler or fastener-applying implement which may be operated by pneumatic or hydraulic pressure, or in other cases may be constructed with manually-operative mechanical means for actuating the staple-driver.

The construction of the detachable closure-plate **65** for the nosepiece at the end of the staple-magazine provides for most convenient opening of the throat in the nosepiece to remove jammed or misalined staples therefrom, while also adapting the closure to be readily replaced and automatically latched in position.

While the invention is herein shown and described as embodied in a preferred form of construction, it is to be understood that modifications may be made in the structure and arrangement of the parts of the device, and in the means for applying power thereto, without departing from the spirit and scope of the invention as expressed in the accompanying claims. Therefore, without limiting myself in this respect, I claim:

1. In a machine of the type specified comprising a frame, and a staple-driver reciprocable in said frame, the combination of a nosepiece on said frame below said staple-driver, said nosepiece having a face arranged in alinement with the staple-driver and grooved guideways at its sides, a closure-plate having runners at its sides slidable in said guideways to mount it in parallel spaced relation to the face of the nosepiece, and latching means engageable between said closure-plate and said nosepiece for locking the closure-plate in position to form a throat or raceway for said staple-driver.

2. In a machine of the type specified comprising a frame, and a staple-driver mounted for reciprocation on said frame, the combination of a nosepiece on said frame arranged below said staple-driver, said nosepiece formed with a face alined with said staple-driver and provided with grooved guideways at its sides, a closure-plate having runners at its sides slidable in said guideways to mount it in parallel spaced relation to the face of the nosepiece, a member fastened to the frame across the front of the nosepiece, a latch mounted in said member for movement to engage the closure-plate to lock it in position in the nosepiece, and resilient means for operating said latch.

3. In a machine of the type specified comprising a frame, and a staple-driver reciprocable on said frame, a nosepiece on said frame formed with a face alined with said staple-driver for engagement with the rearward face thereof, said nosepiece formed with slotted guideways at its sides, a closure-plate slidable in said guideways to mount it in opposite spaced relation to the face of said nosepiece for forming a throat in which said staple-driver may slide, a member fastened at the front of said nosepiece and formed with a bore therein, a plunger slidable in said bore for engagement with a detent slot in said closure-plate, and a spring in the bore for sliding said plunger to engage it with said slot and lock the closure-plate in said nosepiece.

4. In a machine of the type specified comprising a channel-shaped magazine for containing staples, a staple-driver reciprocable across the end of said magazine for driving staples therefrom, a nosepiece extending across said end of the magazine, a closure-plate slidably mounted at the front of said nosepiece in spaced relation thereto for forming a throat to receive staples fed from the magazine, said closure-plate formed with a laterally-extending slot, a member fastened to said nose-piece overlying said closure-plate and provided with a pocket therein, a latch mounted for movement in said pocket to engage the slot in the closure-plate for releasably holding it in position on the nose-piece, and resilient means for actuating said latch.

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