

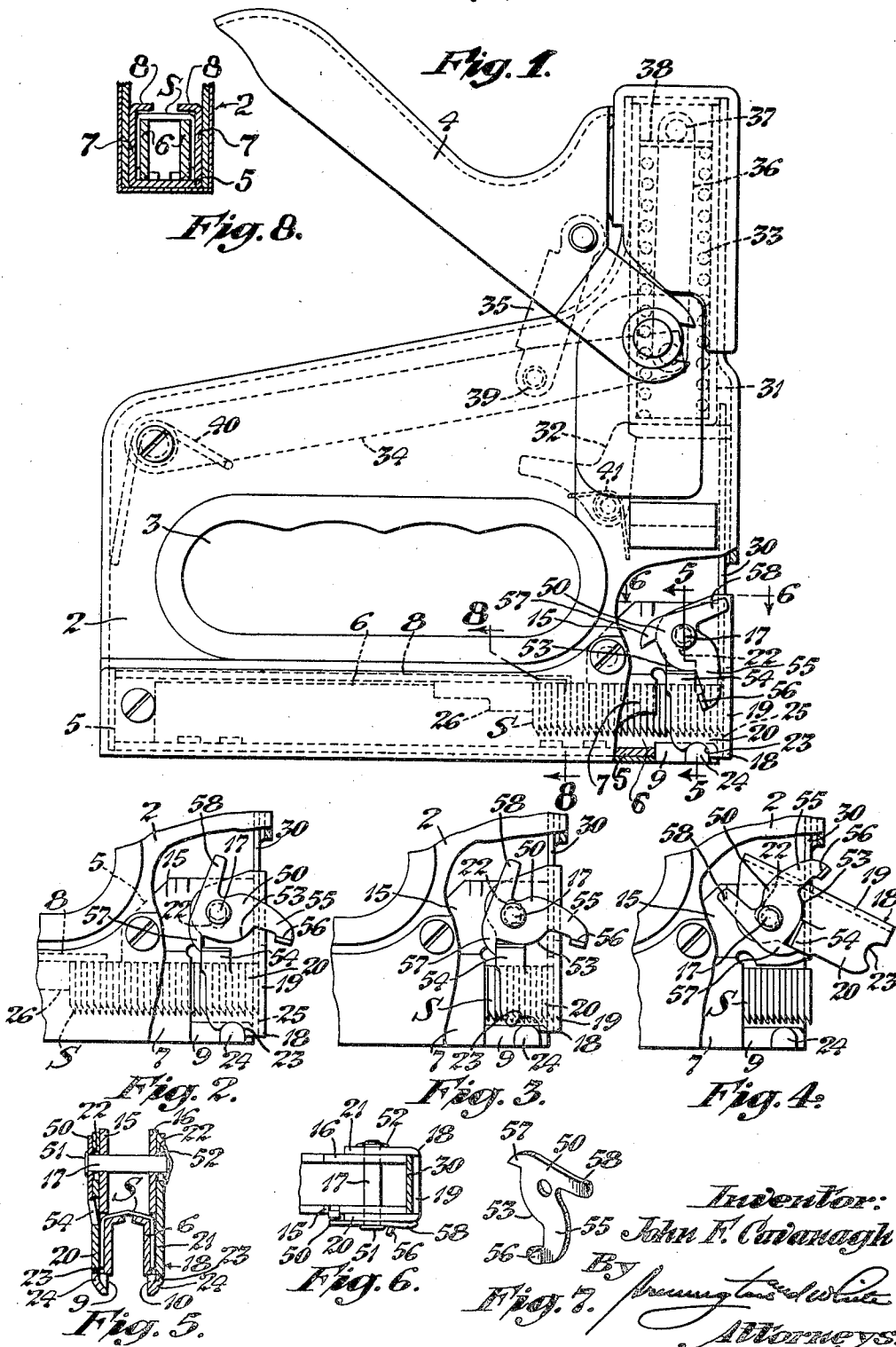
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FASTENER-APPLYING IMPLEMENT

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FASTENER-APPLYING IMPLEMENT

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The present invention relates to improvements in stapling or wire-stitching implements and more particularly to wire-stitching devices of the type having a pivoted gate for opening and closing the end of the staple magazine.

One of the objects of the present invention is to provide an implement of the type indicated with means for positively locking the gate in closed position on the magazine.

Another object is to provide an implement of the type indicated with detents for latching the gate in closed position on the magazine and a manually-operable member for positively locking the detents in latched engagement.

Another object is to provide an implement of the type indicated with a cam-member manually operable into engagement with a shoulder on the gate for positively locking the latter against movement to prevent release of the latching detents.

Another object is to provide a cam-member of the type indicated with a friction detent engageable with the side of the gate to resist movement of the cam-member to gate-releasing position.

Still another object is to provide gate-locking means which are of simple and compact construction to adapt them for economical manufacture and which may be easily and quickly manipulated to lock or release the gate.

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

Fig. 1 is a side view of a fastener-applying implement incorporating the novel features of the present invention and showing the gate-locking member operated to positively lock the gate in closed position on the magazine;

Fig. 2 is a side view of the forward end of the magazine with the casing shown as partly broken away to illustrate the gate-locking member in gate-releasing position;

Fig. 3 is a view similar to Fig. 2 showing the gate raised to release the latching detents on the gate and magazine;

Fig. 4 is a view similar to Fig. 2 showing the gate rocked to open the forward end of the magazine;

Fig. 5 is a transverse sectional view on line 5—5 of Fig. 1 showing the mounting for the gate to adapt it for rocking and vertical sliding movement comprising a pin extending through the magazine and the gate-locking member;

Fig. 6 is a sectional plan view on line 6—6 of

Fig. 1 showing the friction detent on the gate-locking member in engagement with the side of the gate to resist its rocking movement on the pivot-pin;

Fig. 7 is a detailed perspective view of the gate-locking member; and

Fig. 8 is a transverse sectional view on line 8—8 of Fig. 1 showing the magazine mounted in the base of the casing and illustrating the spaced rails constituting the core on which the fasteners are supported.

Certain fastener-applying implements are provided with a gate normally closing the end of the magazine and rockable away therefrom to open the latter to receive a supply of fasteners. In one form of construction the gate is mounted on the magazine for pivotal and vertical sliding movement and is releasably latched in closed position by the engagement of detent slots or notches in its bottom edge with detent-lugs on the magazine. A spring acting against the top of the gate is adapted to depress the latter to engage the notches in the gate with the detent-lugs on the magazine and the gate may be opened by lifting it vertically against the action of the spring to disengage the detents and then rocking the gate on its pivot. Such implements operate quite satisfactorily in most instances but on certain kinds of work the gate may become unlatched during operation. For instance, when a plier type of tacker is used for attaching articles to a rough surface the operator may hold the implement inclined with respect to the work and drag the bottom edge of the gate against the rough surface of the work. Such use of the implement sometimes causes the gate to move vertically against the action of the spring to thereby disengage the latching detents.

The present invention relates generally to the provision of a manually-operable means for positively locking the gate in closed position on the magazine. The gate and magazine are provided with the usual latching detents and the gate is formed with a shoulder engageable by the manually-operable locking means to prevent vertical sliding movement of the gate necessary to disengage the locking detents. Although the locking means may take other forms it preferably comprises a plate rockably mounted on the extended end of the pivot-pin for the gate and having a cam-face disposed eccentric to the axis of the pivot-pin and adapted to engage or release the shoulder on the magazine when rocked from one to the other of two positions. The locking member is preferably provided with a fin-

ger-piece to facilitate its manual operation and a friction detent engageable with the side of the gate to resist rocking movement tending to release the gate.

Referring to the drawing, the invention is shown as applied to an implement of the type illustrated and described in United States Letters Patent to John F. Cavanagh, No. 2,137,642, issued November 22, 1938. It will be understood, however, that the invention may be applied to other types of fastener-applying implements having pivoted gates. Suffice it to state herein that the implement comprises a hollow casing 2 adapted to rest against the work and mounting fastener-applying mechanism therein. The casing 2 has an opening 3 to provide for the insertion of the fingers therethrough and a handle 4 pivotally mounted on the casing for operating the fastener-applying mechanism whereby to adapt the implement to be held and operated in one hand.

In the base of the casing 2 is a channel-shaped magazine 5 for holding a supply of fasteners, herein illustrated in the form of U-shaped staples S. Extending longitudinally of the magazine 5 are a pair of rails attached to the bottom wall thereof and constituting a core 6, see Figs. 5 and 8, on which the staples S are supported in straddled relationship, the vertical side plates 7 of the magazine being spaced from the rails and having inwardly-directed flanges 8 which overlie the top of the staples S. The rails constituting the core 6 project forwardly beyond the side plates 7 of the magazine 5 and into an opening at the bottom of the casing 2. Depending from and integral with the forwardly-projecting ends of the rails of the core 6 are laterally offset flanges 9 and 10, see Figs. 1 and 5, having rearward shoulders engageable with the forward edge of the bottom wall of the casing 2 with their lower edges aligning with the bottom of the casing. Projecting upwardly and forwardly from the side plates 7 of the magazine 5 are stanchions 15 and 16 which overlie the top of the forward end of the core 6 as shown in Fig. 5. Extending through suitable apertures in the stanchions 15 and 16 is a pivot-pin 17 with its ends projecting therefrom for mounting a U-shaped gate 18. The gate 18 has a front wall 19 and rearwardly and upwardly-extending side walls 20 and 21 which embrace the front and sides of the forwardly-projecting ends of the rails of the magazine-core 6 and the sides of the stanchions 15 and 16.

The side walls 20 and 21 of the gate 18 have vertically-extending elongate slots 22 through which the pivot-pin 17 projects. At the lower edges of the side walls 20 and 21 of the gate 18 are recesses or notches 23 which are engageable with detent lugs 24 struck outwardly from the flanges 9 and 10 on the forwardly-projecting ends of the rails of the core 6. The pivot-pin 17 thus provides for rocking movement of the gate from the closed position illustrated in Fig. 2 to the open position illustrated in Fig. 4, the elongate slots 22 permitting vertical sliding movement of the gate to disengage the notches 23 from the lugs 24. With the gate 18 in closed position on the magazine and the notches 23 in engagement with the lugs 24 the front wall 19 of the gate is spaced from the forward end of the core 6 a distance equal to the thickness of a staple S to provide a throat 25 therebetween through which the staples are driven. The staples S are advanced along the magazine-

core 6 by a spring-pressed pusher 26 to position the foremost staple in the throat 25.

The staple-applying mechanism comprises a driver 30 attached to the end of a plunger 31 mounted for reciprocation in a guideway at the forward side of the casing 2. The plunger 31 is normally latched in raised position as illustrated in Fig. 1 by a pivoted latch-member 32 and is adapted to be operated by a compression spring 33 when released by the latch. The spring 33 is compressed by rocking movement of the handle 4 which is connected to a lever 34 by a link 35. The lever 34 is pivoted to the casing 2 at its rearward ends and its forward end is connected to the lower ends of the links 36 at the opposite sides of the spring 33, the upper ends of the links being connected to a cross-pin 37 overlying a movable compression plate 38. The spring 33 is positioned between the compression plate 38 and the plunger 31 so that rocking movement of the handle 4 in counterclockwise direction, as viewed in Fig. 1, acts through the link 35, lever 34 and links 36 to depress the plate 38 and compress the spring 33. At the end of the rocking movement of the handle-lever 4 an abutment or pin 39 engages the tail of the latch-member 32 and rocks it in counterclockwise direction to release the plunger 31 which is then actuated by the compression spring 33 to slide the driver 30 through the throat 25. Upon release of the handle 4 a hair-pin-spring 40, acting between the casing 2 and lever 34, see Fig. 1, is operable to return the parts to initial position and a similar spring 41 returns the latch 32 into engagement with the plunger 31. As thus far described the implement is substantially identical with that illustrated and described in the Cavanagh patent referred to above.

In accordance with the present invention a manually-operable locking member 50 is provided for positively locking the gate 18 against vertical movement to prevent disengagement of the latching detents 23 and 24. While the locking member 50 may take other forms, as herein illustrated it comprises a plate-like element pivotally mounted on the extended end of the pivot-pin 17, see Fig. 5. The pivot pin 17 has a head 51 at one end which overlies the side of the locking member 50 around the aperture through which the pin extends and the opposite reduced end of the pin extends through a hole in a spring washer 52. The reduced end of the pivot-pin 17 is riveted over the side of the washer and the latter bears against the side 21 of the gate 18 to yieldingly hold the head 51 of the pin against the side of the locking member 50.

The locking member 50 has a portion of its edge arranged eccentrically with respect to the axis of the pivot-pin 17 to provide a cam-face 53 adapted to engage a shoulder 54 projecting laterally from the side 20 of the gate 18. The arrangement of the eccentric cam-face 53 of the locking member 50 is such as to permit the gate 18 to be raised vertically to the position illustrated in Fig. 3 when the locking member is rocked to one position and to depress the gate to the position illustrated in Fig. 1 by engagement with the shoulder 54 whereby to firmly engage the notches 23 with the detent-lugs 24 when the member is rocked to another position. Thus when the locking member 50 is rocked to the position illustrated in Fig. 1 the gate 18 is held positively against vertical sliding movement to prevent disengagement of the notches 23 from the detent-lugs 24 whereby to lock the gate in

closed position on the magazine. The locking member 50 is provided with a radial extension 55 and a tail-piece 57 at opposite ends of the cam-edge portion 53 which are engageable with the sides of the shoulder 54 on the gate 18 to limit the rocking movement of the member. The extension 55 has a laterally-extending finger-grip 56 to facilitate manual rocking movement of the member. A detent finger 58 projecting from the locking member 50 has its end curved or bent laterally to adapt it to engage the side of the gate 18 when the locking member is rocked to the position illustrated in Fig. 1. The frictional engagement of the end of the detent finger 58 with the side of the gate 18 is thus adapted to resist rocking movement of the locking member 50 whereby to prevent accidental release of the gate. A preferred form of construction of the invention having been described in detail its mode of operation is explained as follows:

With the locking member 50 in the position illustrated in Fig. 1 the engagement of its cam-face 53 with the shoulder 54 on the gate 18 will positively hold the latter depressed and prevent vertical sliding movement thereof necessary to unlatch the notches 23 of the gate from the detent-lugs 24 on the magazine core 6. The implement may be operated to apply the fasteners by depressing the handle-lever 4 which, operating through the link 35, lever 34, links 36 and compression plate 38, will compress the spring 33 until the latch 32 is released from the plunger 31 by the engagement of the pin 29 therewith. Upon release of the latch 32 the spring 33 will operate the plunger 31 and driver 30 carried thereby to slide the latter downwardly in the throat 25. A staple S positioned in the throat 25 will thus be driven into the work. Upon release of the handle 4 the spring 40 will operate to rock the lever 34 in counterclockwise direction to return the parts to their initial position, the spring 41 will return the latch 32 into engagement with the plunger 31 and the spring-pressed pusher 26 will advance the foremost staple S into the throat 25. The operator may continue to operate the implement in this manner until the supply of staples S in the magazine 5 is exhausted.

To reload the implement with a supply of staples S the operator first unlocks the gate 18 by pressing against the laterally-offset finger-piece 56 on the locking member 50 to rock the latter from the position illustrated in Fig. 1 to that illustrated in Fig. 2, this rocking movement of the member being limited by the engagement of its tail-piece 57 with the side of the shoulder 54 on the gate 18. The gate 18 will then be free for vertical sliding movement to permit it to be raised to the position illustrated in Fig. 3 whereof to release the notches 23 from engagement with the detent lugs 24. The gate 18 may then be rocked to the position illustrated in Fig. 4 to open the forward end of the magazine to receive a supply of staples S. The staples S, preferably in the form of a self-sustained stick or refill, are then inserted into the magazine 5 in straddled relationship on the core 6 and the end of the magazine closed by rocking the gate 18 back to the position illustrated in Fig. 3. The gate 18 is locked in closed position on the magazine by rocking the locking member 50 manually from the position illustrated in Fig. 3 to that illustrated in Fig. 1. During such rocking movement of the member 50 its eccentric camface 53 will

engage the laterally-offset shoulder 54 thereon and depress the gate 18 to the position illustrated in Fig. 1 to engage the notches 23 in the gate with the detent lugs on the magazine-core 6. After the locking member 50 has been rocked to the position illustrated in Fig. 1 the eccentric edge 53 will act to positively lock the gate 18 against vertical movement to prevent disengagement of the latching detents. It will also be observed that the rocking movement of the locking member 50 to the position illustrated in Fig. 1 acts to engage the friction detent finger 58 with the side wall 20 of the gate 18 to frictionally hold it in its locking position to prevent accidental or unintentional release of the gate.

It will be observed from the foregoing specification that the present invention provides for positively locking the gate in closed position on the magazine to prevent unintentional opening of the latter during operation of the implement. It will also be observed that the locking means of the present invention are of simple and compact construction and adapted to act effectively to lock the gate in closed position while facilitating manual operation of the device to release the gate.

While a preferred form of construction of the invention is herein illustrated and described, it is to be understood that modifications may be made in the form and structure of the gate-locking means without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a fastener-applying implement, a magazine for holding a supply of fasteners, fastener-applying means for driving fasteners from the magazine, a gate mounted on the magazine for pivotal movement outwardly and upwardly away from the front of the magazine and for vertical sliding movement in a plane parallel to the direction in which the fasteners are driven, said gate being adapted to pivot to open the magazine to receive a supply of fasteners and close the magazine to adapt fasteners to be driven therefrom, cooperating notch-and-lug detents on the magazine and gate for releasably holding the latter against pivoting movement, and manually-operable means for holding the gate against vertical sliding movement whereby to positively lock the gate in closed position on the magazine.

2. In a fastener-applying implement, a magazine for holding a supply of fasteners, fastener-applying means for driving fasteners from the magazine, a gate mounted on the magazine for pivotal and vertical sliding movement, said gate being adapted to pivot to open the magazine to receive a supply of fasteners and close the magazine to adapt fasteners to be driven therefrom, cooperating detent means on the magazine and gate engageable upon vertical sliding movement of the gate, and a manually-operable cam for wedging engagement with the gate to positively hold the latter against vertical sliding movement to prevent disengagement of the detents.

3. In a fastener-applying implement, a magazine for holding a supply of fasteners, fastener-applying means for driving fasteners from the magazine, a gate mounted on the magazine for pivotal and vertical sliding movement, cooperating detents on the magazine and gate engageable upon vertical sliding movement of the latter, and a second pair of cooperating detents on the magazine and gate for holding the latter against vertical sliding movement, said last-named detents comprising a manually-operable eccentric cam

on one part engageable with a means on the other part whereby to positively lock the gate in closed position on the magazine.

4. In a fastener-applying implement, a magazine for holding a supply of fasteners, fastener-applying means for driving fasteners from the magazine, a gate mounted on the magazine for pivotal movement outwardly and upwardly away from the front of the magazine and for vertical sliding movement in a plane parallel to the direction in which the fasteners are driven, said gate being adapted to pivot to open the magazine to receive a supply of fasteners and close the magazine to adapt fasteners to be driven therefrom, cooperating notch-and-lug detent means on the magazine and gate engageable upon vertical sliding movement of the latter, and a movable member having a cam-face engageable with a portion of the gate for positively locking the latter against vertical sliding movement to prevent disengagement of the detent means.

5. In a fastener-applying implement, a magazine for holding a supply of fasteners, fastener-applying means for driving fasteners from the magazine, a gate mounted on the magazine for pivotal movement outwardly and upwardly away from the front of the magazine and vertical sliding movement in a plane parallel to the direction in which the fasteners are driven, said gate being adapted to pivot to open the magazine to receive a supply of fasteners and close the magazine to adapt fasteners to be driven therefrom, cooperating notch-and-lug detent means on the magazine and gate engageable upon vertical sliding movement of the latter, and an eccentric cam member engageable with the upper edge of the gate for positively locking the latter against vertical sliding movement to prevent disengagement of the cooperating detent means, said member having means frictionally engageable with the gate to resist movement of said member.

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