

Aug. 3, 1965

V. D. ROOSA

3,198,412

MAGAZINE AND SAFETY TRIP FOR FASTENING DEVICE

Filed July 8, 1963

4 Sheets-Sheet 1

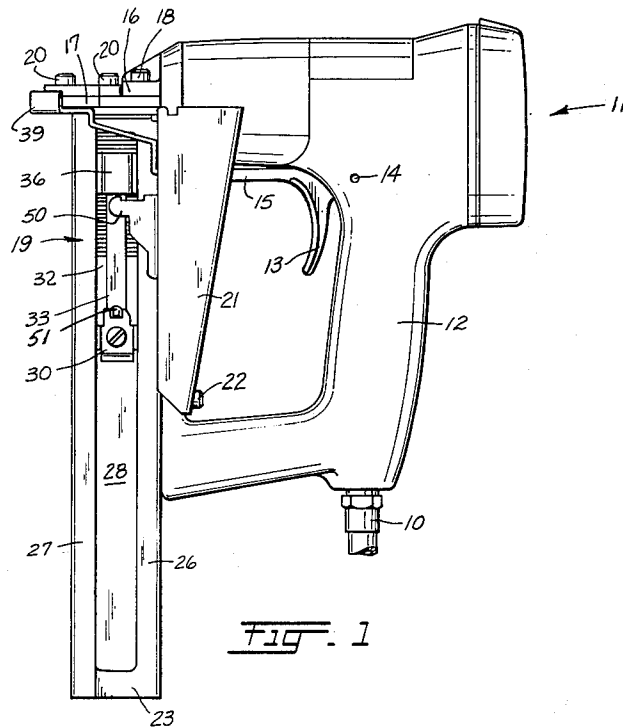


FIG. 1

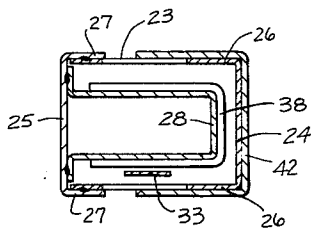


FIG. 4

INVENTOR.
VERNON D. ROOSA
BY *J. Walter Rude*
ATTORNEY

Aug. 3, 1965

V. D. ROOSA

3,198,412

MAGAZINE AND SAFETY TRIP FOR FASTENING DEVICE

Filed July 8, 1963

4 Sheets-Sheet 2

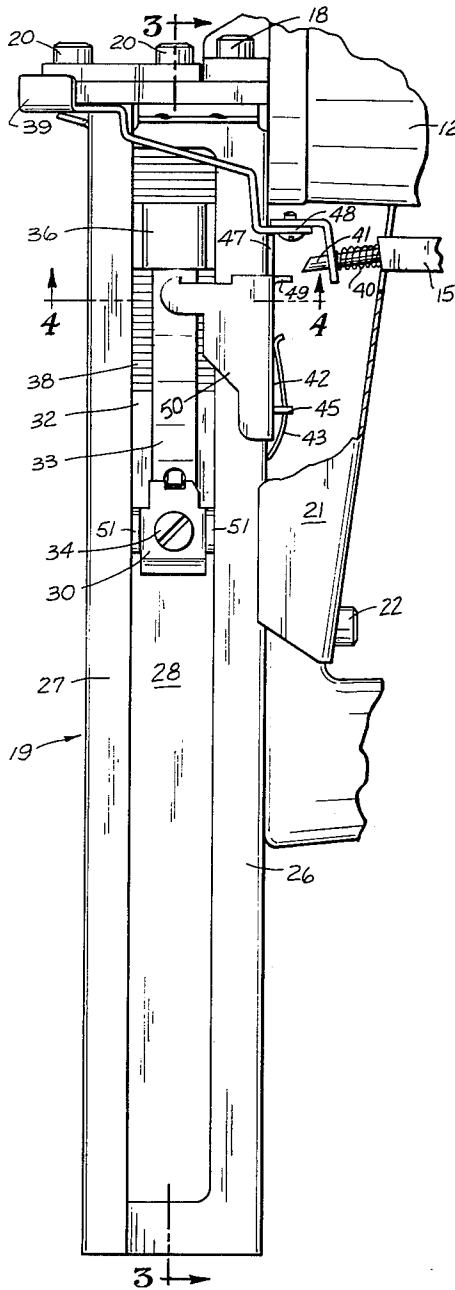


Fig. 2

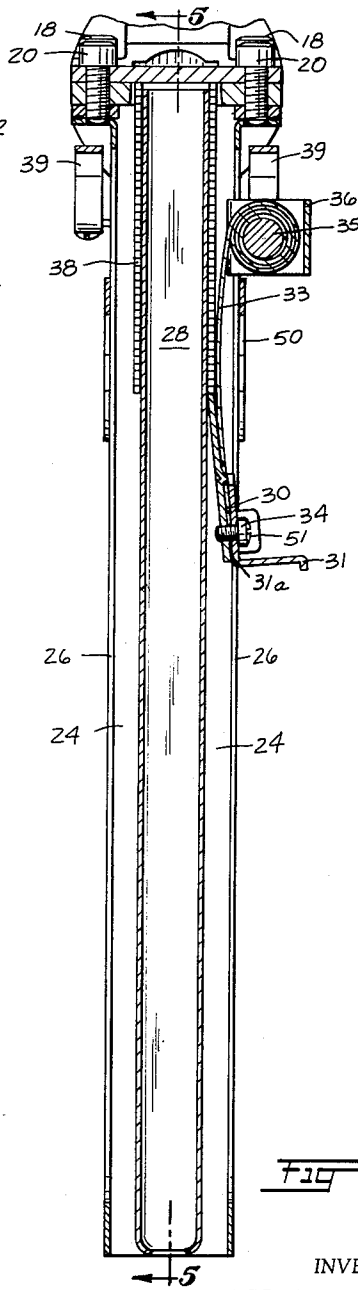


Fig. 3

INVENTOR.
VERNON D. ROOSA

BY

J. Walter Bode

ATTORNEY

Aug. 3, 1965

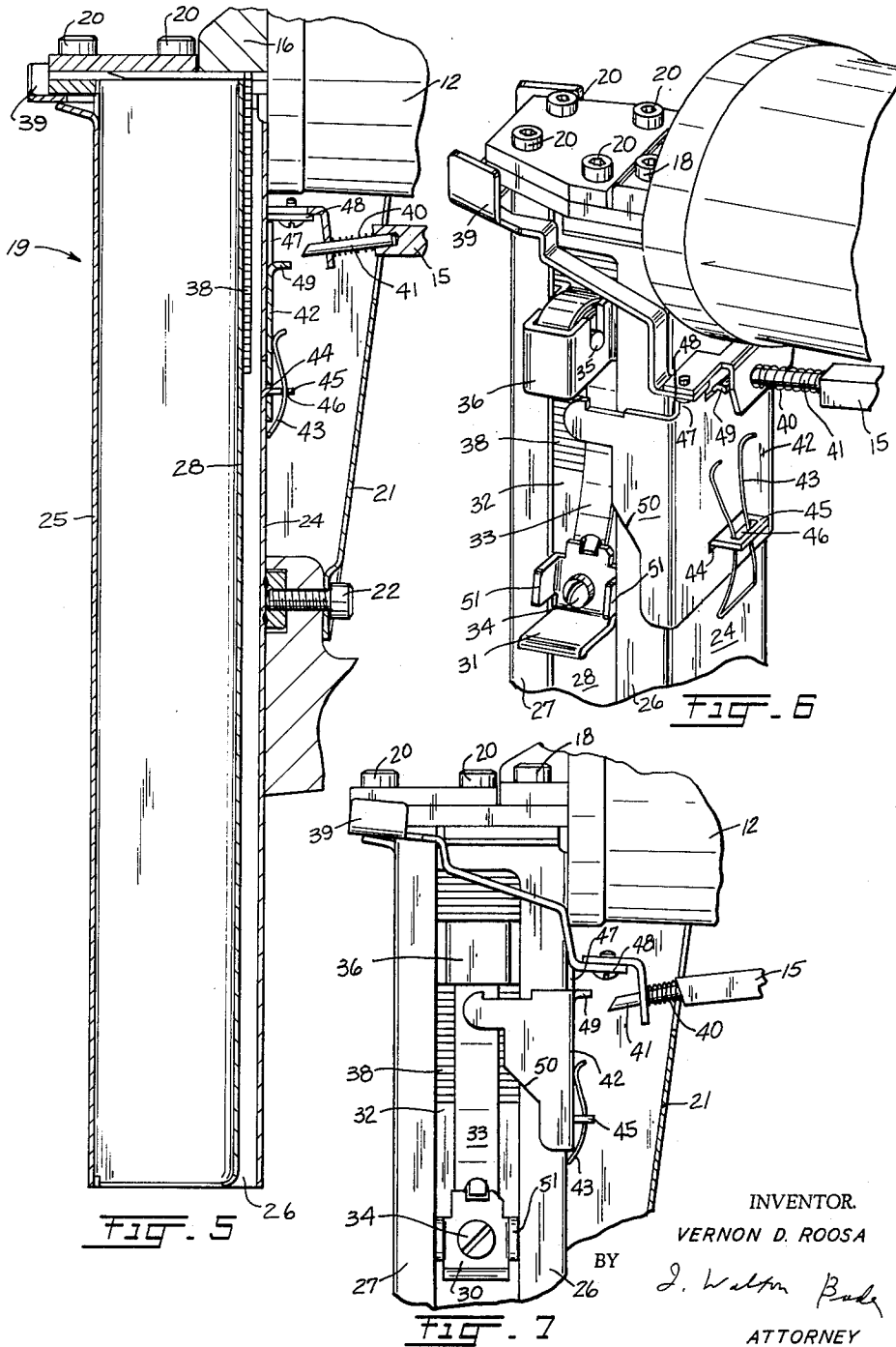
V. D. ROOSA

3,198,412

MAGAZINE AND SAFETY TRIP FOR FASTENING DEVICE

Filed July 8, 1963

4 Sheets-Sheet 3



Aug. 3, 1965

V. D. ROOSA

3,198,412

MAGAZINE AND SAFETY TRIP FOR FASTENING DEVICE

Filed July 8, 1963

4 Sheets-Sheet 4

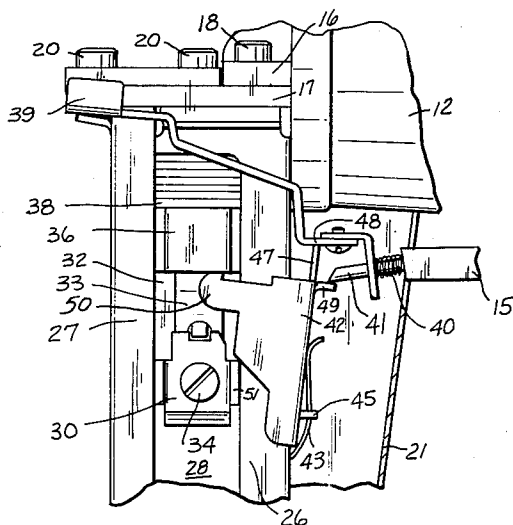


FIG. 8

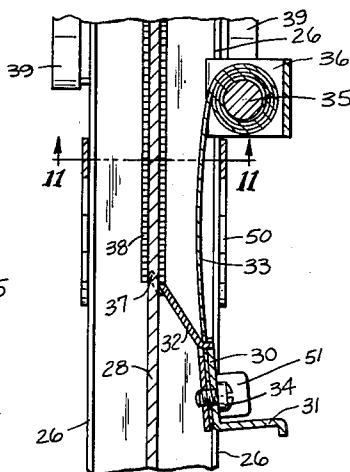


FIG. 10

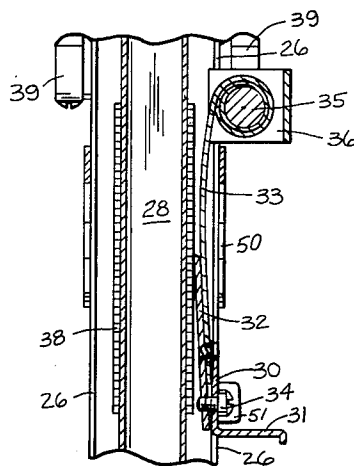


FIG. 9

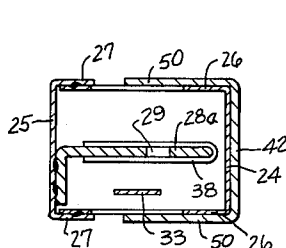


FIG. 11

INVENTOR.

VERNON D. ROOSA

BY

J. Walter Bode

ATTORNEY

1

2

3,198,412 MAGAZINE AND SAFETY TRIP FOR FASTENING DEVICE

Vernon D. Roosa, West Hartford, Conn., assignor, by
mesne assignments, to Inventions Management Corpo-
ration, Raleigh, N.C., a corporation of North Carolina
Filed July 8, 1963, Ser. No. 293,928
10 Claims. (Cl. 227—8)

This invention relates to a magazine for a fastening device and to a safety trip mechanism utilized in connection therewith. While both inventions have independent application they nevertheless cooperate most advantageously when employed together. The construction of the instant invention offers many advantages over the structure shown in the prior art which will be summarized seriatim.

The fasteners utilized within the magazine of the instant invention are very easily loaded therewithin. These fasteners are first placed within the magazine and the follower is then pulled rearwardly over the previously loaded fasteners. The construction of the follower is such that it passed over the fasteners and, when released subsequent to passing over the rearmost fastener it will abut the rearmost fastener and apply a compressor force to the entire series of fasteners. This method of loading is considerably simpler than those previously employed.

The magazine of the instant invention also optionally includes means to permit the follower to be easily guided in the magazine.

The magazine is further so constructed that various lengths of fasteners may be placed within the same magazine.

The rail within the magazine may be simply modified so as to permit reception of fasteners of different crown sizes therewithin.

The safety trip mechanism, utilized in connection with the magazine of this invention will not permit the trigger of the fastening device, to which the magazine is attached, to fire unless the device is placed against the work into which it is desired to drive a fastener.

Optionally, also, means are further provided in connection with the safety mechanism of this invention to prevent the fastening device from firing even if it is abutting the work if the magazine is either empty or almost empty. In fastening devices of the type referred to in this invention, if the device is fired without the driver blade abutting a fastener, very serious damage can occur to the working parts of the fastening device.

While the scope of the instant invention will be set forth in the appended claims, the invention may be briefly described as comprising two distinct elements which, while they are independently inventive, also cooperate with one another to produce a combined result which is more than the sum of each element alone.

The magazine portion of the instant invention comprises a housing which is adapted to support a number of fastener elements in laterally aligned relationship with one another. A follower is slidably and pivotally movable within the housing, spring means are operatively connected with the follower, and the follower is designed to overpass a plurality of fastener elements contained within the magazine upon loading thereof and thence is designed to abut the rearmost fastener element within the magazine.

The safety mechanism involved in the instant invention comprises movable device actuating means, work contacting means operatively connected with the device actuating means, and blocking means interposable against the work contacting means when the work contacting means are in operative position so as to prevent operation of the device actuating means in said position. Optionally

the blocking means are pivotally movable and contain a projection thereupon adapted to abut the follower when the follower is in forward position. As a result, when the optional structure is utilized, the safety device will not permit the fastening device to fire if the magazine is empty or partially empty as will be subsequently explained.

The invention will now be specifically described by reference to the accompanying drawings which are made a part of this specification.

FIG. 1 is a side elevational view, on a reduced scale, of a fastening device embodying the inventions of this application showing the magazine thereof partially loaded with fasteners.

FIG. 2 is a fragmentary side view of a magazine and a safety device made in accordance with this invention. The cover which is disposed about the lower portion of the downwardly depending stem portion of the trigger of the fastening device is partially broken away so as to show some of the internal structure.

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2.

FIG. 4 is a sectional view taken along lines 4—4 of FIG. 2.

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 3.

FIG. 6 is a fragmentary perspective view of the front portion of a fastening device which embodies the inventions set forth in this application. The cover which is normally disposed about the lower portion of the downwardly depending stem portion of the trigger of this invention is broken away so as to show some of the internal structure. In this figure the follower is shown in position against the rear of a plurality of fasteners within the magazine.

FIG. 7 is a fragmentary side elevational view, partly in section, of the front portion of a fastening device which embodies the inventions of this application with the safety device thereupon inoperative because the device is pressed against the work and the blocking plate is in its normal position because fasteners are contained within the magazine.

FIG. 8 is a view similar to that of FIG. 7 but showing the device inoperative despite the fact that it is pressed against the work because staples are no longer contained within the magazine of this invention.

FIG. 9 is a fragmentary sectional view substantially similar to that of FIG. 3 (as to the portion shown) but showing the position of the follower while overpassing the plurality of fastener elements during the loading of the magazine of this invention.

FIG. 10 is a fragmentary sectional view similar in part to that of FIG. 3 but wherein a rail for supporting a narrower crown staple is utilized within the magazine. This figure also shows the position of the follower behind the rearmost member of the series of fasteners.

FIG. 11 is a sectional view taken along lines 11—11 of FIG. 10.

The invention will now be more clearly described by reference to the accompanying drawings which represent the best mode known to the inventor of taking advantage of his inventions.

The fastening device 11 in general, in connection with which the inventions of this application are employed, is preferably of the fluid actuated type. It comprises a housing 12 into which an air inlet 10 is provided. A trigger 13 is pivotally supported upon housing 12 by means of pin 14. Trigger 13 bears a downwardly depending stem portion 15.

Housing 12 is formed with a nose 16 which in turn bears a support 17 which is secured to nose 16 by screws 18. Magazine 19 is secured to support 17 by screws 20.

3

A cover plate 21 is disposed above magazine 19 and is held in position by screw 22.

Housing 12 contains therewithin a driver blade, valving, and a piston which are controlled by trigger 13 and cause the device to drive a fastener into work at the appropriate time. The structure last recited forms no part of the instant invention and therefore is not specifically described or shown.

Magazine 19 is formed with a housing 23 having a roof portion 24 and a base 25. Upper overhanging portion 26 downwardly depends from roof 24 and lower overhanging portion 27, spaced from portion 26, upwardly extends from base 25.

Rail 28 is substantially centrally disposed within housing 23 and is adapted to support fastening devices thereupon. Rail 28a shown in FIG. 11 is provided with a recess 29. Follower 30 is formed with an operating handle 31 and an actuating portion 32. Clock coil spring 33, which is normally disposed in almost completely coiled relationship, is secured to follower 30 by screw 34 at one end thereof. The opposite end of spring 33 is secured to rail 35 which is rotatably disposed within housing 36 which in turn is secured to overhanging portions 26 and 27 of magazine 19 at the forward end thereof. Thus when spring 33 is uncoiled by the movement of follower 30 rearwardly it will produce a forward and pivotal pull on follower 30 since spring 33 desires to return to its normal coiled relationship.

Actuating portion of follower 32 matches rail 28. Thus in the rail construction shown in FIG. 4 the construction of actuating portion 32 of follower 30 is of the form shown in FIGS. 3 and 9.

On the other hand if the rail construction shown in FIG. 11 is used then actuating portion 32 of follower 30 bears an additional prong 37 which is disposed within recess 29 so that the follower is more effectively guided within the magazine. Follower 30, in all of the variant structures shown is also selectively pivotally movable within overhanging portions 26 and 27. Follower 30 is elongated and is formed with a front actuating portion 32, a rear portion 31a, and an adjacent handle 32. Screw 34 holds spring 33 to follower 30. Rear portion 31a of follower 30 is the portion of follower 30 which is pivotally disposed within portions 26 and 27 of magazine 19.

When actuating portion 32 of follower 30 abuts the rear of a plurality of aligned fastener elements 38 the tendency of stretched spring 33 to coil pulls actuating portion 32 toward rail 28 or rail 28a and rear portion 31a away from rail 28 or 28a and against overhanging portions 26 and 27. On the other hand if follower 30 is pulled back and the fastener elements 38 intervene its path then the pivotal movement of follower 30 causes actuating portion 32 to overpass the plurality of fastener elements since the pull back pressure counters the normal coiling force of spring 33.

A work contacting member 39 normally projects from nose 16 and is maintained in downward projecting position against upward sliding movement by coil spring 40. Spring 40 is disposed upon reduced end portion 41 of stem portion 15 of trigger 13. Member 39 is restrained against pivotal movement by blocking member 42 when this member is in blocking position. Otherwise member 42 is pivotally moved by trigger 13 when it does not serve to block firing of the device.

Blocking member 42 is normally maintained in downward position against roof 24 of magazine 19 by spring 43. Blocking member 42 is provided with a recess 44 through which a projection 45 on roof 24 of magazine 19 is disposed. Projection 45 in turn is provided with a recess 46 through which spring 43 contacts the top of blocking member 42 and roof 24.

Blocking member 42 bears a pair of spaced prong portions 47 which normally abut transverse bar 48 of work contacting member 39. Blocking member 42 also

4

bears upwardly extending portion 49 and lateral projection 50.

Follower 30 also bears projection 51 which can contact projection 50 and cause blocking member 42 to move upwardly.

With the foregoing specific description the operation of this invention can now be explained.

The device is prepared for loading by placing a plurality of fastener elements in laterally aligned relationship upon rail 28 of magazine 19. (Staples are shown in the drawings of this invention but other types of fastener elements in laterally aligned relationship such as nails, corrugated fasteners, etc. could be substituted by minor variations in the magazine). Staples 38 in laterally aligned cohered relationship are slid along rail 28 until the front portion of the series of staple elements abut the rear of follower 30. Follower 30 is then pulled rearwardly and actuating portion 32 overpasses the plurality of staples as shown in FIG. 9 of the drawings. As follower 30 is pulled rearwardly until actuating portion 32 clears the last staple element the pivotal movement of follower 30 causes it to abut one side of rail 28 and, when follower 30 is released, it assumes the position shown in FIGS. 3 and 10 applying pressure against the series of fastener elements in conventional manner.

The device may now be fired in the usual manner to drive staples into work. However unless work contacting member 39 is moved upwardly prongs 47 of blocking member 42 bear against transverse bar 48 secured to work contacting member 39. In the normal safety position trigger 13 is blocked and therefore the device cannot fire unless it is firmly pressed against the work.

Assuming now that the operator of this invention continues to fire staples into work a time will come when follower 30 will bear against projection 50 of blocking member 42 as shown in FIG. 8. When this occurs upwardly extending portion 49 of blocking member 42 will now intervene the lower portion of reduced end portion 41 of trigger 13 and will prevent the device from firing even though work contacting member 39 is against the work. This additional safety feature is optionally provided so that the device cannot be fired with an empty magazine since such firing will cause serious damage to the parts of the device. In order to be absolutely certain that such empty firing cannot occur the device can be so constructed so that blocking member 42 will move pivotally upwardly before the magazine of the device is completely empty.

The foregoing specific description indicates how the objects of this invention have been achieved.

I claim:

1. A magazine comprising a housing having a lateral overhanging portion thereupon, a rail centrally disposed within said housing adapted to support a plurality of U-shaped staple elements in laterally aligned relationship with one another, said rail provided with a longitudinal slot therewithin, a follower slidably movable along said rail and pivotally movable within said housing, said follower supported within said overhanging portion and having a prong normally disposed within said slot, a clock spring having one end connected to said housing and an opposite end connected to said follower, said follower being pivotally movable to overpass said plurality of staple elements upon loading of said magazine and thence abutting the rearmost staple element.

2. A magazine comprising a housing having upper and lower spaced overhanging portions thereupon, a rail centrally disposed within said housing adapted to support a plurality of U-shaped staple elements in laterally aligned relationship with one another, said rail provided with a longitudinal slot therewithin, a follower slidably movable along said rail and pivotally movable within said housing, said follower having upper and lower support portions disposed respectively within the corresponding overhanging portions of said housing, said follower also having a

prong normally disposed within said slot; a clock spring having one end connected to said housing and an opposite end connected to said follower, said follower being pivotally movable to overpass said plurality of staple elements upon loading of said magazine and thence abutting the rearmost staple element.

3. In a trigger operated fastening device the improvement which comprises a magazine including a housing having upper and lower spaced overhanging portions thereupon, a rail centrally disposed within said housing adapted to support a plurality of U-shaped staple elements in laterally aligned relationship with one another, said rail provided with a longitudinal slot therewithin, a follower slidably movable along said rail and pivotally movable within said housing, said follower having upper and lower support portions disposed within the corresponding overhanging portions of said housing, said follower also having a prong normally disposed within said slot and an offset front portion; a clock spring having one end connected to said housing and an opposite end connected to said follower, said follower being pivotally movable to overpass said plurality of staple elements upon loading of said magazine and the front portion of said follower abutting the rearmost staple element after said elements are overpassed.

4. A safety mechanism for a fluid operated fastening device having a magazine adapted to carry a plurality of laterally aligned fastener elements, said mechanism comprising a pivotally movable trigger having a downwardly depending stem portion, a projecting slidably and upwardly movable work contacting member slidably connected to the stem portion of said trigger and having a transverse bar thereupon, spring means upon said stem portion of said trigger abutting said work contacting member, and a pivotally movable blocking plate carried by said magazine abutable at one end thereof with said transverse bar when said work contacting means are in projecting position.

5. A safety mechanism for a fluid actuated fastening device comprising a casing, a pivotally movable trigger having a downwardly depending stem portion carried by said casing, a magazine secured to said housing having a roof portion thereupon, a spring-loaded follower within said magazine; a projecting slidably and upwardly movable work contacting member slidably connected to the stem portion of said trigger and having a transverse bar thereupon, coil spring means upon said stem portion of said trigger abutting the adjacent portion of said work contacting member, a pivotally movable blocking plate forwardly disposed upon the roof of said magazine having a downwardly depending member adapted to abut said follower, said blocking plate also having a projection thereupon; a spring upon said blocking plate normally holding said plate in level position, said blocking plate abutable with said transverse bar when said work contacting means are in projecting position, said projection upon said blocking plate abutable with the stem portion of said trigger when said downwardly depending portion of said blocking plate abuts said follower and said blocking plate moves pivotally out of level position.

6. In a fastening device the improvement which comprises a casing, a pivotally movable trigger having a downwardly depending stem portion carried by said casing, a magazine including a housing having a roof portion and upper and lower spaced overhanging portions thereupon, a rail centrally disposed within said housing adapted to support a plurality of fastener elements in laterally aligned relationship with one another, said rail provided with a longitudinal slot therewithin, a follower slidably movable along said rail and pivotally movable within said housing, said follower having upper and lower support portions disposed within the corresponding overhanging portions of said housing, said follower also having a prong normally disposed within said slot, a front portion, a handle portion and a lateral contacting projection; a clock spring having

one end connected to said housing and an opposite end connected to said follower, said follower being pivotally movable to overpass said plurality of fastener elements upon loading of said magazine and to abut the rearmost fastener element after said elements are overpassed; a depending and upwardly movable work contacting member vertically slidable on the stem portion of said trigger and having a transverse bar thereupon, coil spring means upon said stem portion of said trigger normally holding said work contacting member in depending position, a blocking plate resiliently and pivotally disposed upon the roof of said magazine having a downwardly depending portion, said follower adapted to abut said depending portion when said magazine is empty, said blocking plate also having an upwardly projecting portion, said blocking plate abutting the said transverse bar when said work contacting member is in depending position, said blocking plate moving pivotally upwardly when said follower contacts said downwardly depending portion when said magazine is empty so as to prevent pivotal movement of said trigger.

7. In a fastening device having a magazine adapted to carry a plurality of aligned fasteners therewithin and a trigger adapted to actuate said fastening device, the improvement which comprises means carried by said magazine for intervening said trigger actuated when said magazine is empty so as to prevent firing of the device in this position.

8. In a fastening device having a magazine adapted to carry a plurality of aligned fasteners therewithin a follower slidably movable within said magazine and a trigger adapted to actuate said fastening device the improvement which comprises a blocking plate carried by said magazine and means connected to said follower adapted to pivotally move said blocking plate into blocking position when said magazine is empty to prevent actuating movement of said trigger in this position.

9. In a fastening device having a magazine adapted to carry a plurality of aligned fasteners therewithin, a follower within said magazine, and a trigger adapted to actuate said fastening device the improvement which comprises a blocking plate resiliently and pivotally disposed upon and carried by said magazine normally clear of said trigger and a prong member upon said follower, said prong member adapted to abut and move said blocking plate when said magazine is empty so as to cause said plate to intervene said trigger and prevent actuating movement of said trigger in this position.

10. In a fastening device having a magazine adapted to carry a plurality of aligned fasteners therewithin, a follower within said magazine, and a trigger adapted to actuate said fastening device, a safety mechanism which comprises a depending and upwardly movable member normally intervening said trigger in depending position but clear of said trigger when in upward position, a blocking plate resiliently and pivotally disposed upon and carried by said magazine adjacent said depending member, said blocking plate also being normally clear of said trigger, and a prong member upon said follower, said prong member adapted to abut and move said blocking plate when said magazine is empty so as to cause said plate to intervene said trigger and prevent actuating movement thereof in this position.

References Cited by the Examiner

UNITED STATES PATENTS

2,041,523	5/36	Bunnell	1-414
2,181,387	11/39	Webber	1-414
2,445,180	7/48	Maynard	1-412
2,637,029	5/53	Marano	1-414
3,056,137	10/62	Wandel et al.	1-3.1
3,056,965	10/62	Rogers	1-106
3,058,114	10/62	Haubold	1-3.1
3,112,489	12/63	Beckman et al.	1-106

75 GRANVILLE Y. CUSTER, JR., *Primary Examiner.*