July 26, 1955 E. H. BRADFIELD 2,713,859

SLIDABLE MAGAZINE FOR FLUID PRESSURE GUN

Filed Feb. 9, 1953 2 Sheets-Sheet 1

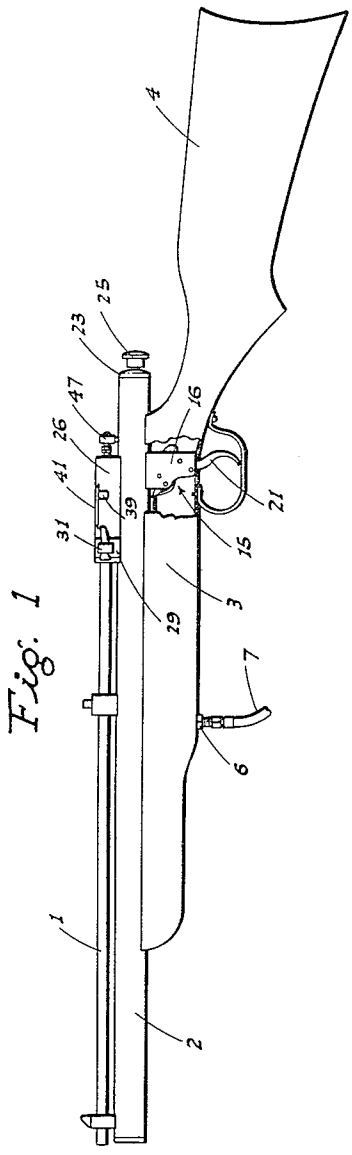


Fig. 1

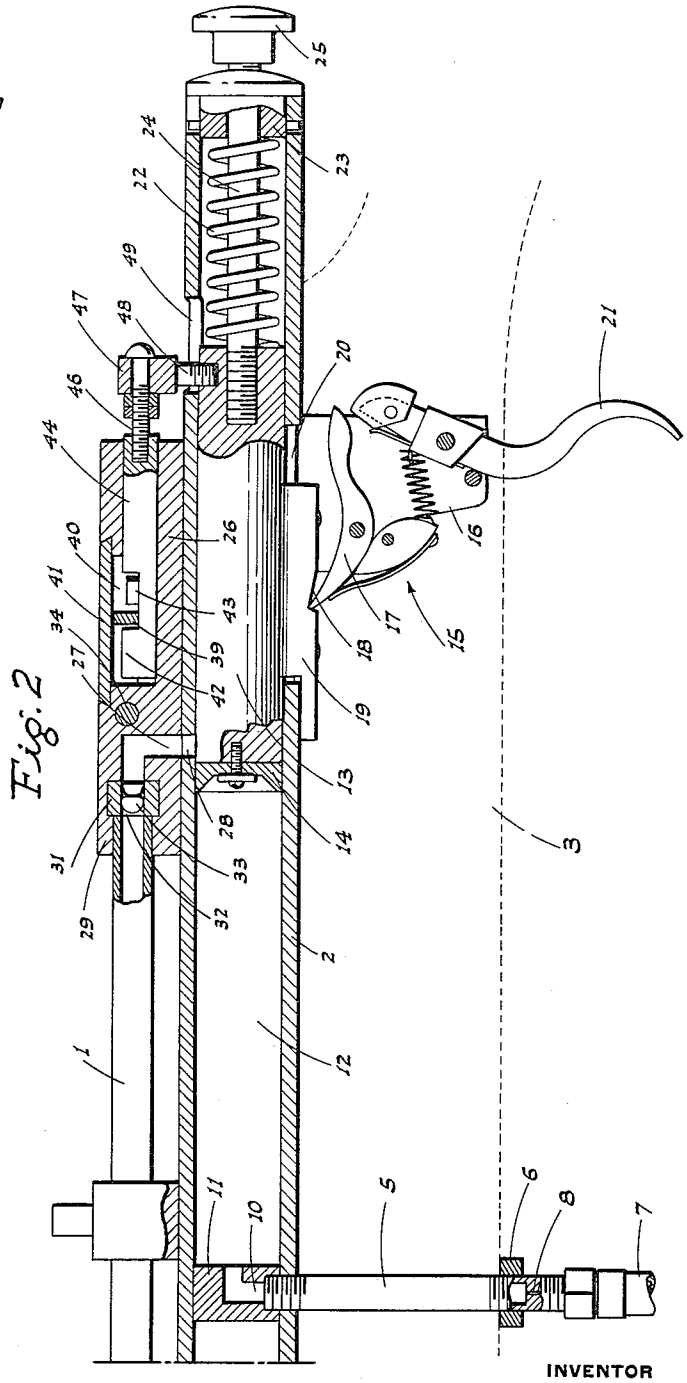


Fig. 2

INVENTOR

Elmer H. Bradfield

BY Webster & Webster

ATTORNEYS

July 26, 1955 E. H. BRADFIELD 2,713,859

SLIDABLE MAGAZINE FOR FLUID PRESSURE GUN

Filed Feb. 9, 1953 2 Sheets-Sheet 2

Fig. 3

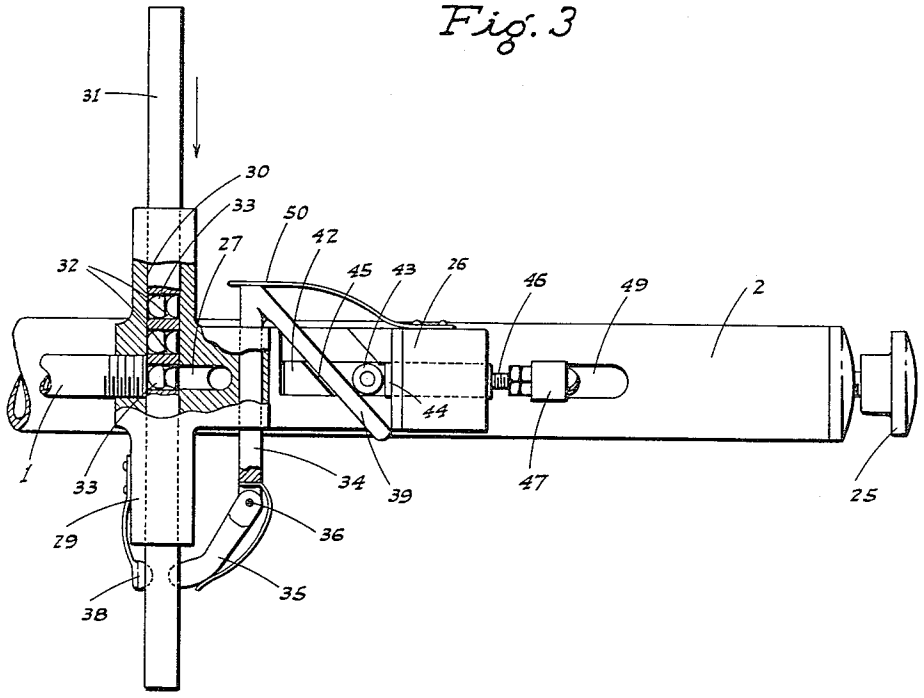
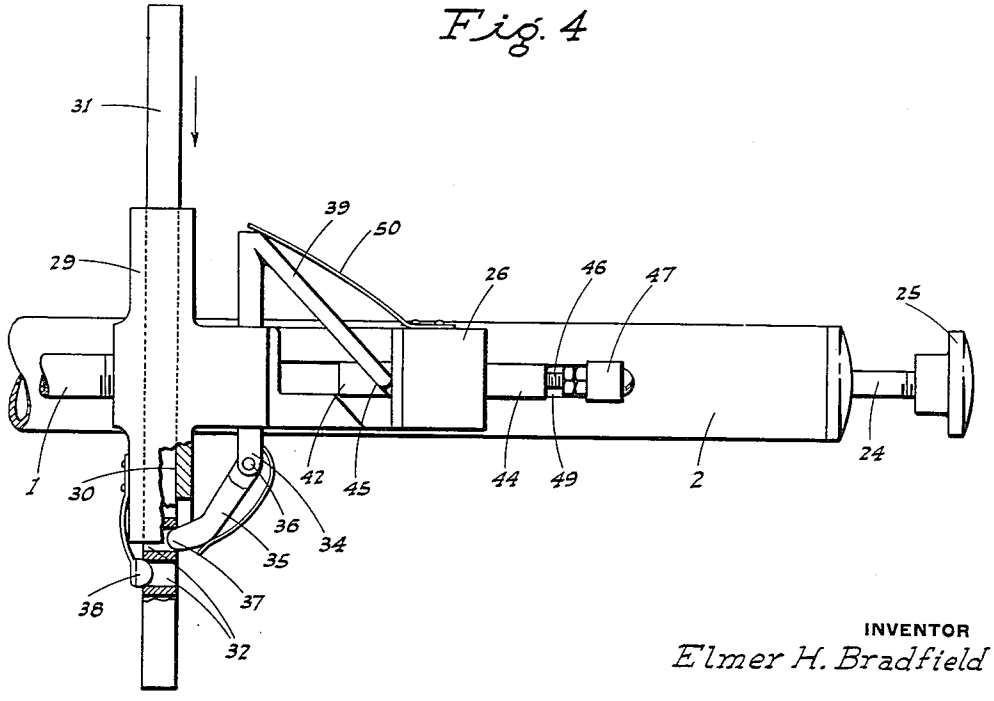


Fig. 4



INVENTOR
Elmer H. Bradfield

BY
ATTORNEYS

United States Patent Office 2,713,859 Patented July 26, 1955

2,713,859

SLIDABLE MAGAZINE FOR FLUID PRESSURE GUN

Elmer H. Bradfield, Stockton, Calif.

Application February 9, 1953, Serial No. 335,735

2 Claims. (Cl. 124—45)

An object of the invention is to provide a gun with a novel clip or magazine for the pellets; such magazine being arranged, upon predetermined step-by-step movement, to successively dispose the pellets in proper position for firing through the barrel.

A further object of the invention is to provide a gun, as above, which includes novel mechanism arranged to cause such step-by-step movement of the magazine in response to recurring actuation of the trigger controlled, pressure release mechanism, so that the gun automatically reloads after each firing thereof.

It is also an object of the invention to provide a gun which is designed for ease and economy of manufacture, compactness, durability, and positive action, both in the firing and magazine actuating mechanisms.

Still another object of the invention is to provide a practical and reliable fluid-pressure operated pellet gun, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the gun.

Fig. 2 is an enlarged fragmentary sectional elevation of the gun showing the working parts thereof.

Fig. 3 is an enlarged fragmentary plan view of the gun showing particularly the magazine actuating mechanism; the latter being shown in its normal or starting position.

Fig. 4 is a similar view, but shows said mechanism as actuated to advance the magazine one step.

Referring now more particularly to the characters of reference on the drawings, the gun comprises an elongated barrel 1 fixed on top of an elongated cylinder 2; the barrel 1 terminating at its rear end short of the corresponding end of the cylinder 2. The cylinder 2 is secured on top of the forepiece 3 which extends forwardly from the gun stock 4; such securing of the cylinder 2 being accomplished by means which includes a small-diameter pipe 5 which extends from the cylinder 2 downwardly through the forepiece 3, with a nut 6 threaded on such pipe and abutting the under side of the forepiece 3.

In addition to serving as a securing element, the pipe 5 is coupled at its lower end to a fluid pressure supply hose 7, which leads to a source of relatively high air or gas pressure.

Such pressure delivers from the hose 7 through a restricted orifice 8 in the pipe 9, and thence delivers from such pipe through a passage 10 in a plug 11 secured in the cylinder 2; such passage 10 delivering rearwardly from the plug 11 into a pressure storage chamber 12 in the cylinder 2. The plug 11 forms the front end of the pressure storage chamber 12, while its rear end is closed by a piston 13 having a sealing cup 14 thereon; the piston 13 being adapted to retract in the cylinder 2 from the advanced position shown in Fig. 2.

Such retraction of the piston 13 is normally prevented

by a trigger mechanism, indicated generally at 15, whose parts are pivotally mounted between side plates 16 depending from the cylinder 2 into a suitable pocket in the forepiece 3. The trigger mechanism 15 includes a spring-returned sear 17, whose forward end normally engages upwardly against a rearwardly facing notch 18 in a slide 19 fixed on the under side of the piston 13, which such slide being adapted to run in a slot 20 in the bottom of the cylinder 2. The trigger mechanism includes, in addition to the spring-returned sear 17, a spring-returned trigger 21; the arrangement being such that upon a rearward pull on the trigger 21, the sear 17 is caused to swing downwardly at the front, whereupon the slide 19 and piston 13 may surge rearwardly under the influence of fluid pressure in the chamber 12; such rearward surging or sliding of the piston 13 being resisted to some extent by a compression spring 22 in the cylinder 2 between the rear end of the piston 13 and a rear end plug 23 in cylinder 2. The spring 22 is maintained in place by an axial rod 24 fixed to the piston 13 and extending in slidable relation through the plug 23; there being a finger knob 25 on the outer end of rod 24.

At its rear end the barrel 1 projects into a longitudinal mounting block 26 affixed to the top of the cylinder 2; there being a passage 27 in the mounting block 26, with one end opening in alinement with the rear end of the barrel 1, and opening at the other end to a port 28 in the cylinder 2 close to the the forward end of the piston 13 but normally closed by the latter.

The mounting block 26 is formed, adjacent its front end, with a cross head 29 which has a transverse, rectangular bore 30 extending therethrough from end to end; such bore intersecting the alined passage 27 and the bore of barrel 1 at adjacent ends thereof.

A rectangular magazine bar 31 is slidable through the bore 30, and such magazine bar 31 has a multiplicity of horizontal pellet receiving openings 32 therethrough from front to rear; such openings being equally spaced, and the same being adapted to receive pellets 33 for forward projection from such bar.

With the magazine bar 31 in position, with one of the openings 32 alined between the forward end of passage 27 and the rear end of the bore of barrel 1, the related pellet 33 is ready for firing.

By pulling rearwardly on the trigger 21, with resultant escape of the sear 17 from notch 18, the pressure stored in chamber 12 immediately slides the piston 13 rearwardly against spring 22, uncovering port 28 so that relatively great pressure enters passage 27 and fires the pellet 33 through the barrel 1.

By reason of the restricted orifice 8, fluid pressure for the next firing of the gun is delayed in recharging the chamber 12 to permit the spring 22 to return the piston 13 to its starting position, where it is locked against retraction by the spring-returned sear 17.

While it is possible to manually advance the magazine bar 31 step by step through the bore 30 of cross head 29 for successive firing operation of the gun, the present invention contemplates the embodiment of the following automatic mechanism to cause one-step advance of the magazine bar 31 with each firing of the gun.

A transverse slide bar 34 extends through the mounting block 26, rearwardly of the cross head 29, and parallel to the magazine bar 31; such slide bar 34 having a spring pressed pawl 35 pivoted to one outer end, as at 36. From the pivot 36 the spring pressed pawl 35 extends at a forward and outward diagonal, and is formed with a nose 37 adapted to frictionally but removably engage successively in the pellet receiving openings 32 of magazine bar 31.

From a starting position, as in Fig. 3, each sliding motion of the bar 34 to the left causes a one-step advance—

as in Fig. 4—of the magazine bar **31**; this by reason of the engagement of the nose **37** in one of the openings **32** as said bar **34** so slides. When bar **34** slides in the opposite direction, the nose **37** merely ratchets out of the engaged opening **32** and retracts from the next magazine advancing operation. The magazine bar **31** is normally held in each position by a spring-pressed detent **38** which engages in one of the openings **32** from the front.

With each reciprocation of the piston **13**, upon firing of the gun, the slide bar **34** is likewise reciprocated once to advance the magazine bar **31** one step, and this is accomplished by a diagonal arm **39** fixed to the end of the bar **34** opposite the pawl **35**; such diagonal arm extending inwardly and rearwardly through a transverse slot **40** in the mounting block **26**, which slot is normally covered by a removable slide plate **41**. Within the slot **40** the diagonal arm **39** runs between a forwardly disposed cam block **42** and a rearwardly disposed roller **43**, both formed on top and at the front end of a plunger **44** which is slidable longitudinally in the mounting block **26**. The cam block **42** has a rearward diagonal face **45** which matches the diagonal arm **39**.

The plunger **44** is adjustably connected at its rear end by a longitudinal screw **46** to the head **47** of a pin **48** which is secured to, and projects upwardly from, the piston **13** through a longitudinal slot **49**.

Upon reciprocation of the piston **13** such motion will, by reason of the above described connections, be translated by the cam block **42**, roller **43**, and diagonal arm **39**, to transverse reciprocation of the slide bar **34**. Thus, with each firing of the gun and the attendant reciprocation of the piston **13**, the slide bar **34** and pawl **35** are actuated to advance the magazine bar **31** one step; i. e. to bring the next following opening **32** in position for firing of the related pellet **33**.

At the end opposite the pawl **35** the slide bar **34** works against a leaf spring **50** in order to maintain said bar **34**, as well as the diagonal arm **39**, at all times in proper working position.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as

do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. In an air actuated gun having a barrel, a mounting block from which the barrel projects, and a pressure-advanced trigger-released and spring-returned piston mounted in connection with the block, a magazine bar slidable transversely through the block and having a row of evenly spaced horizontal pellet receiving openings extending therethrough to successively aline with the barrel, advance of the piston by pressure thereagainst admitting air to the block immediately behind the bar in alinement with the barrel, a laterally movable slide bar mounted on the block rearwardly of the magazine bar, a spring-pressed pawl on one end of the slide bar arranged to engage a pellet-opening on the rear side of the magazine bar, means between the piston and the slide bar to shift the same laterally a distance equal to the spacing between the pellet openings upon retractive movement of the piston, and a releasable holding detent mounted on the block on the forward side of the magazine bar in position to engage a pellet opening from which a pellet has been discharged.

2. A structure as in claim 1, in which said bar shifting means comprises a rigid arm extending diagonally and rearwardly from the other end of the slide bar, a longitudinally extending plunger mounted in the block and disposed under the arm, cam elements on the plunger engaging the diagonal arm to cause lateral shifting of said arm and the slide bar upon reciprocation of the plunger, and a longitudinally adjustable exposed connection between the plunger at its rear end and the piston adjacent its rear end.

References Cited in the file of this patent

UNITED STATES PATENTS

437,365	Perrna	Sept. 30, 1890
2,147,003	Kozurik	Feb. 14, 1939
2,273,678	Webby	Feb. 17, 1942
2,566,181	Fitch	Aug. 28, 1951
2,673,557	Sherman et al.	Mar. 30, 1954

FOREIGN PATENTS

542,727	Great Britain	Jan. 26, 1942