May 14, 1968 A. SEIDERMAN 3,382,766

COMBINATION MANUAL AND AUTOMATIC BOLT ACTION FOR FIREARMS

Filed Sept. 30, 1966 2 Sheets-Sheet 1

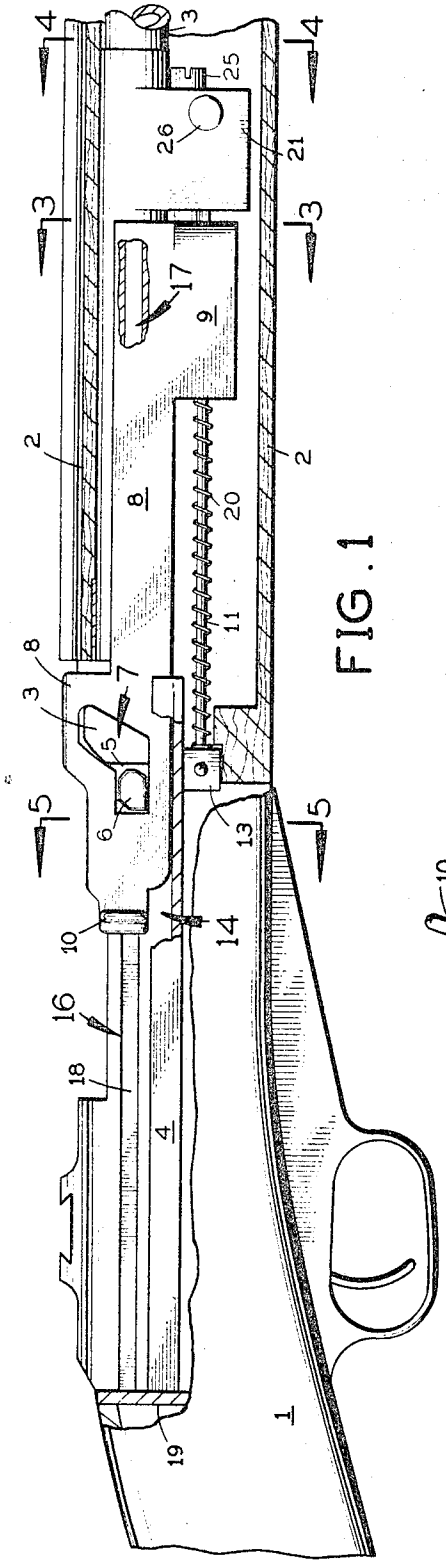


FIG. 1

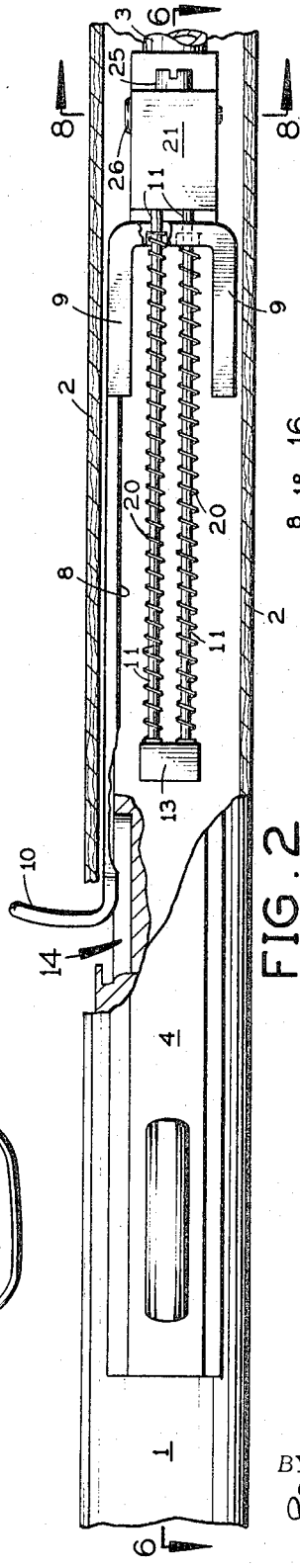


FIG. 2

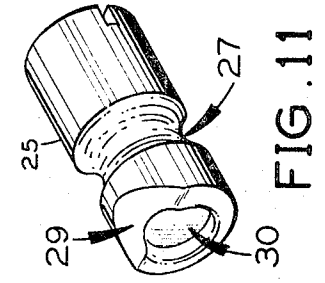


FIG. 11

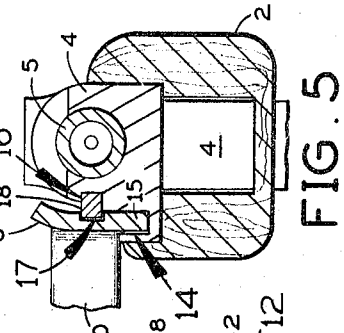


FIG. 5

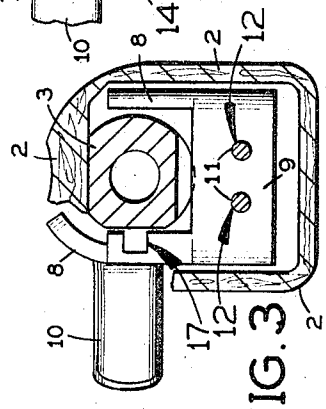


FIG. 3

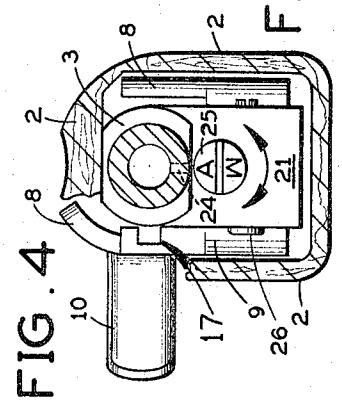


FIG. 4

INVENTOR.
ABE SEIDERMAN
BY
Lloyd & Anderson

May 14, 1968 A. SEIDERMAN 3,382,766

COMBINATION MANUAL AND AUTOMATIC BOLT ACTION FOR FIREARMS

Filed Sept. 30, 1966 2 Sheets-Sheet 2

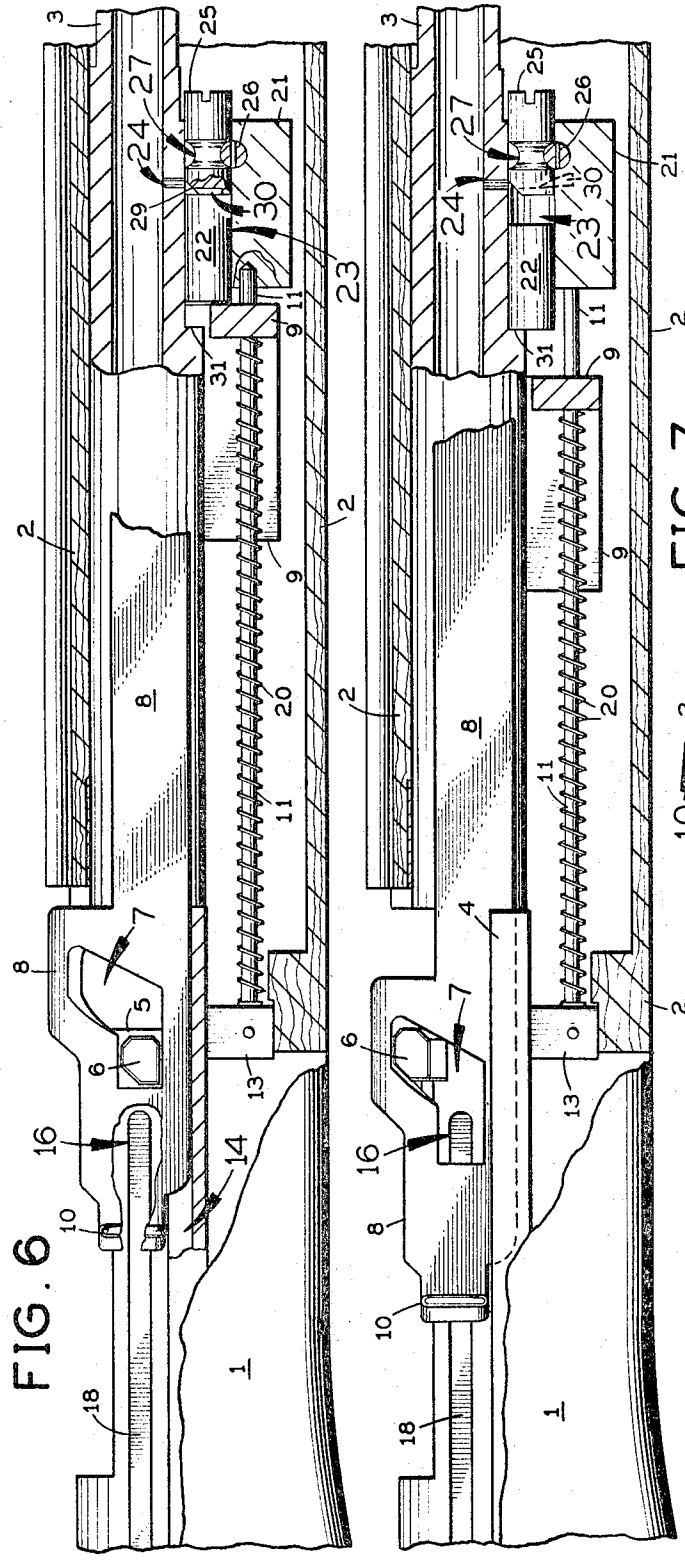


FIG. 6

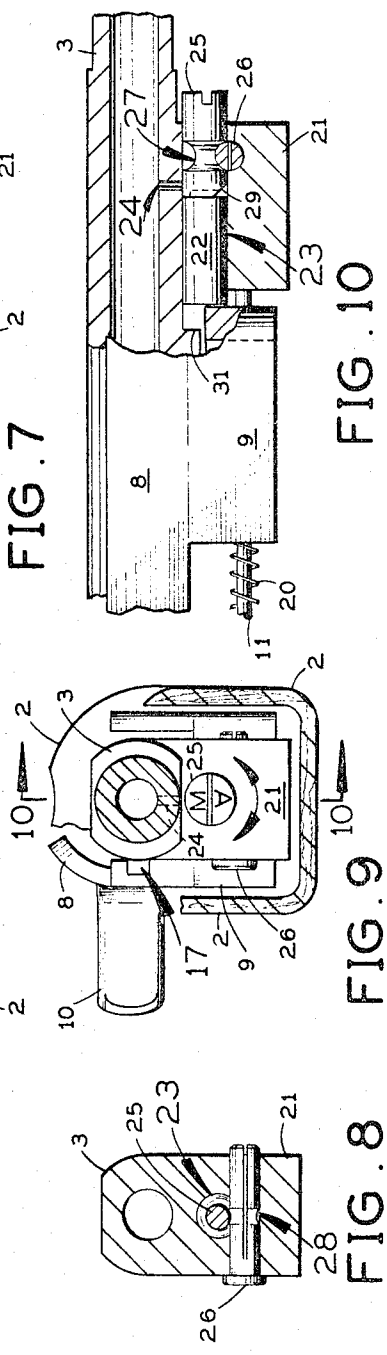


FIG. 7

FIG. 10

FIG. 9

FIG. 8

INVENTOR.
ABE SEIDERMAN
BY Lloyd J. Anderson

United States Patent Office 3,382,766
Patented May 14, 1968

3,382,766

COMBINATION MANUAL AND AUTOMATIC BOLT ACTION FOR FIREARMS

Abe Seiderman, Coral Gables, Fla., assignor to Universal Firearms Corp., Hialeah, Fla., a corporation of Florida

Filed Sept. 30, 1966, Ser. No. 583,266
3 Claims. (Cl. 89—193)

ABSTRACT OF THE DISCLOSURE

A semiautomatic firearm having a gas port in the barrel to urge a spring biased piston and bolt out of firing position is provided with a cylinder body. The cylinder body has an oblique face located near the port leading from the barrel. The oblique face leads into a cavity coaxial with the barrel. The cylinder body can be rotated to close the gas port so that the firearm can be single fire operated.

This invention relates in general to automatic firearms and more particularly to a combination automatic or manual load and firing mechanism.

Reference is had to applicant's co-pending application, Ser. No. 548,960, filed May 10, 1966.

Prior auto-load firearm mechanisms usually employ a gas operated piston retained by screw threads which were often subject to failure and included other unreliable complications expensive to manufacture and the prior auto-load mechanisms are not equipped for a simple adjustment to change from auto to complete manual operation.

The present invention overcomes the above objections and disadvantages by the provision of a gas cylinder block having a bore parallel the bore of the barrel securely welded to the barrel before or following the drilling of the gas port through the barrel into the bore thereof with a port in the block coaxial with the port in the barrel.

Another object of the invention is the provision of a piston slidably retained in the cylinder of the block and positioned to abut an integral offset portion of the barrel when the firearm is fired.

A further object of the invention is the provision of a cylinder head adjustably retained in the outer portion of said cylinder and having a planar chamfer on the inner end thereof for providing a passage for gas from the barrel port to impinge against the outer end of the piston when the cylinder head is in automatic position and to close the barrel port and prevent the gas from flowing therethrough when the head is rotated 180 degrees for conditioning the firearm for manual operation.

Another object of the invention is the provision of an effective combination guide and retainer for the slide member which is slidably retained to reciprocate and lock the bolt of the firearm.

These and other objects and advantages in one embodiment of the invention are shown and described in the following specification and drawings, in which:

FIG. 1 is a fragmentary right side elevation of the firearm.

FIG. 2 is a fragmentary bottom plan view of the firearm shown in FIG. 1.

FIG. 3 is a cross sectional end elevation taken through section line 3—3, FIG. 1.

FIG. 4 is an end elevation taken through section line 4—4, FIG. 1, with a control element in automatic position.

FIG. 5 is a fragmentary cross sectional side elevation taken through section line 5—5, FIG. 1.

FIG. 6 is a fragmentary cross sectional view taken generally through section line 6—6, FIG. 2.

FIG. 7 is the same as FIG. 6 in changed position.

FIG. 8 is a cross sectional view taken through section line 8—8, FIG. 2.

FIG. 9 is the same as FIG. 4 with a control element in manual position.

FIG. 10 is a fragmentary cross sectional view taken through section line 10—10, FIG. 9.

FIG. 11 is a perspective view of the control element shown in FIG. 9.

Referring to FIGS. 1 and 2, the improvements to be set forth are related to a firearm like that set forth in applicant's aforesaid application, Ser. No. 548,960, with a stock 1 and a hand grip 2 retaining a barrel 3 and a bolt retaining housing or frame 4, which is the part of the firearm frame into which barrel 3 is secured.

The bolt assembly 5, not shown in detail, has an integral lock projection or lug 6 normal thereto and is engaged in the irregular camming aperture 7 in bolt operating member or slide 8, as shown. A U-shaped ballast weight 9 is secured to the forward end of the slide, better shown in FIG. 2, for the purpose to be hereinafter described. A manual operating handle 10 is integral with and projects from the slide in a convenient position.

The slide 8 is adapted for reciprocation through a predetermined distance on rods 11—11 parallel with the axis of the barrel 3 through bearing holes 12—12 therein. The inner ends of the rod are retained in suitable holes in block 13 secured to the frame 4.

The rear portion of the frame 4 has a straight rectangular groove or channel 14 opening upward therein and parallel with the axis of the barrel for guiding the lower edge portion 15 of the slide, as shown in FIGS. 2 and 5.

The frame 4 also has a lateral rectangular groove or channel 16 cut in one side thereof, as shown, and a mating channel 17 cut in the inner wall of the slide for retaining a fixed rectangular key 18, best shown in FIGS. 1 and 5, which key is inserted from the rear of the frame when the slide is engaged in channel 14 and retained therein by a removable stop 19, which part is related to the stock assembly, not shown.

Thus it is apparent that the slide is slidably retained on the frame for reciprocation parallel the axis of the barrel and held in both vertical and horizontal positions by the grooves or channels 14, 16 and 17 and the key 18. A pair of compression springs 20—20 are retained around rods 11—11 for normally urging the slide in its forward or firing position and it is apparent that the slide may be manually retracted to its load position by the use of the handle 10 against the restraining action of the springs 11—11.

The bolt in the firearm described is not shown in detail but the lug 6 for operating same is integral therewith and is shown in its locked firing position in FIG. 6. When the slide 8 is moved rearward, as shown in FIG. 7, the oblique portion of the camming aperture 7 will first move the lug 6 about the axis of the bolt into its unlocked position whereby further rearward movement of the slide will withdraw the bolt away from the firing chamber and extract and eject the fired casing by the action of well known means. When the slide 8 is moved in reverse action a cartridge fed by a magazine, not shown, is inserted in the firing chamber and locked therein by the counter-rotation of the lug 6, as shown in FIG. 6.

FIGS. 1 and 2 show a cylinder body or block 21 which is welded integral with the barrel 3 for the auto-loading operation of the bolt to be hereinafter described.

Referring to FIGS. 6 and 7, a cylindrical piston 22 is slidably fitted in a bore 23 through cylinder block 21 parallel the bore 3, as shown. A round port 24 of predetermined diameter provides a gas passage from the bore in the barrel into the cylinder bore. A cylindrical head

member **25** of the same diameter as the piston is journalled for snug frictional rotation in bore **23** and retained for manual rotation in the bore by a split pin **26**, better shown in FIG. 8, which pin engages a peripheral groove **27** in the cylinder head **25**. A smaller peripheral groove **28**, shown in FIG. 8, retains the pin in its working position and permits the removal of the pin by the contraction thereof which in turn permits the removal of the cylinder head **25**.

FIG. 11 is an enlarged perspective view of the cylinder head which shows the front end thereof, which is provided with an oblique surface **29** and a shallow coaxial cavity **30** in the end thereof. The gas operated automatic elements are shown in firing position in FIG. 6 in which piston **22** is in its retracted position and the cylinder head **25** is rotated, as shown, corresponding with the position shown in FIG. 4. When a cartridge is fired in the chamber of the barrel and the bullet passes the port **24**, then the relatively high gas pressure will flow through the port **24** and across the oblique surface **29** and into the cavity **30** and impinge against the rear end of the piston which will motivate and forcefully drive the piston rearward against the outer surface of weight **9** with sufficient force to move the slide to its extreme rear load position against the restraining action of springs **20** and the spent casing. The rearward movement of the piston is arrested by the transverse stop surface **31** in the barrel member, as shown in FIG. 7. The return auto-load movement of the slide member and bolt is provided by the energy stored in the springs **20—20**, better shown in FIG. 2, which will return the elements to the firing position shown in FIG. 6.

It is to be noted that the inertia of the ballast weight **9** added to the slide **8** is for receiving and temporarily storing the energy imparted by the piston to provide a controlled uniform reciprocation of the slide for both the load and extract movements of the bolt.

When manual non-automatic operation is desired, the cylindrical head **25** is rotated by a screw driver or coin from the position shown in FIG. 4. 180 degrees to the position shown in FIG. 9 with the oblique surface in downward position, as shown, which rotation moves the opposite side of the head **25** to close the port **24** and prevents the gas from operating the piston, as shown in FIG. 10.

It is necessary to load the firearm by manually moving the handle **10** from a firing position to its extreme load position and permit the energy stored in the springs **20—20** to move the cartridge into the firing chamber by releasing or assisting the forward movement of the handle **20**.

It is now apparent that the firearm mechanism described provides for a bolt operating slide of low cost and high reliability and the firearm may be quickly converted with automatic to manual load without a change of any elements.

It is understood that certain modifications in the construction, utilizing the features above described, are intended to come within the scope of the appended claims.

Having described my invention, I claim:

1. In a gas operated automatic firearm of the character described, a means forming a frame including a barrel secured therein having a bore therethrough and breech chamber coaxial with the axis of said barrel, a bolt means retained for reciprocating in said frame in coaxial alignment with the breech of said barrel for reciprocation to and from the firing and load position and for rotation through a predetermined angle for locking same when said bolt is moved into said firing position, a slide means retained for reciprocation only through a predetermined distance on said frame retained and guided for movement parallel said axis including a cam means engaged with said bolt for reciprocating and locking the latter when moved from said load to said firing position, spring means biased between said slide means and said frame for urging said slide means into said firing position, a cylinder body integral with said barrel positioned in predetermined distance from said chamber, said body having a cylindrical bore therethrough parallel with and in predetermined spaced relation to the bore in said barrel, a port of predetermined diameter through the wall of said cylinder body and said barrel forming a passage from the bore of said barrel into a predetermined position in said cylinder bore, a cylindrical piston slidably retained in said cylinder bore for reciprocation therein to and from a normal position with the outer end thereof in close proximity to said port to a motivated position a predetermined distance therefrom, a stop means integral with said barrel for engaging a first predetermined area of the inner end of said piston when the latter is moved to said motivated position, a cylindrical cylinder head secured in the outer end portion of said cylinder bore with the inner end thereof in close proximity to said port, said cylinder head having an oblique surface and said surface leading into a cavity in the inner end of said cylinder head, a forward end of said slide positioned for engagement by a second predetermined area of the inner end of said piston when the latter is moved from said normal to said motivated position for moving said slide and said bolt to said load position when pressurized gas from a fired cartridge in said chamber in said barrel flows through said port into said cylindrical bore and impinges against and motivates said piston and whereby said spring means will return said slide means and said bolt to its former fire position.

2. The construction recited in claim **1** including means for retaining the cylinder head in said cylindrical bore for frictional rotation about the axis thereof comprising a radial groove of uniform shape around the periphery of the cylinder head,

a transverse bore through said body normal to the axis of said cylinder head and intersecting said groove,

a pin means frictionally secured in said transverse bore for retaining said head in longitudinal position and permitting frictional rotation thereof for adjusting the firearm for either manual or automatic operation.

3. In a gas operated automatic firearm of the character described, a means forming a frame including a barrel secured therein having a bore therethrough and breech chamber coaxial with the axis of said barrel, a bolt means retained for reciprocation in said frame in coaxial alignment with the breech of said barrel for reciprocation to and from the firing and load position and for rotation through a predetermined angle for locking same when said bolt is moved into said firing position for moving and locking a cartridge in said chamber, a slide having a manual operating handle therein retained for reciprocation only through a predetermined distance on said frame retained and guided for movement parallel said axis including a cam means engaged with said bolt for reciprocating and locking the latter when moved from said load to said firing position, spring means biased between said slide and said frame for urging said slide into said firing position, a cylinder body on said barrel a predetermined distance from said chamber, said body having a cylinder bore therethrough, a port of pretermined diameter through the wall of said body and said barrel forming a passage from the bore of said barrel into a predetermined position along the axis of said cylinder bore, a cylindrical piston slidably positioned in said barrel for predetermined reciprocating movement therein from a normal position with the rear end thereof in close proximity to said port to a motivated position with the front end thereof against a stop means in said barrel, said slide adapted and constructed to be engaged by the rear end of said piston when the latter is moved from said normal to said motivated position for moving said bolt from said fire to said load position, a cylindrical cylinder head positioned in said

cylinder bore and retained therein for rotation only about the axis thereof, said head having an oblique surface on the inner edge thereof leading into a cavity in the inner end of said head, said inner end normally positioned adjacent said port for permitting high pressure gas in the bore of said barrel to enter said cylindrical bore and impinge against and motivate said piston for automatically operating said bolt for reloading when a cartridge in said chamber is fired, said head adapted to be rotated a predetermined angle to displace said oblique surface from said port and close same for preventing high pressure gas in said bore from entering said cylinder bore whereby said slide may be manually operated by said handle.

References Cited

UNITED STATES PATENTS

1,802,816	4/1931	Holek	89—193
853,715	5/1907	Mondragon	89—193 X
1,892,141	12/1932	Garand	89—185 X
2,308,257	1/1943	Williams	89—193
2,393,627	1/1946	Garand	89—193

BENJAMIN A. BORCHELT, *Primary Examiner.*

SAMUEL FEINBERG, *Examiner.*

S. C. BENTLEY, *Assistant Examiner.*