C. S. WHEATLEY.

AUTOMATIC RELOADING RIFLE.

APPLICATION FILED NOV. 8, 1915.

1,195,307.

Patented Aug. 22, 1916.

4 SHEETS—SHEET 1.

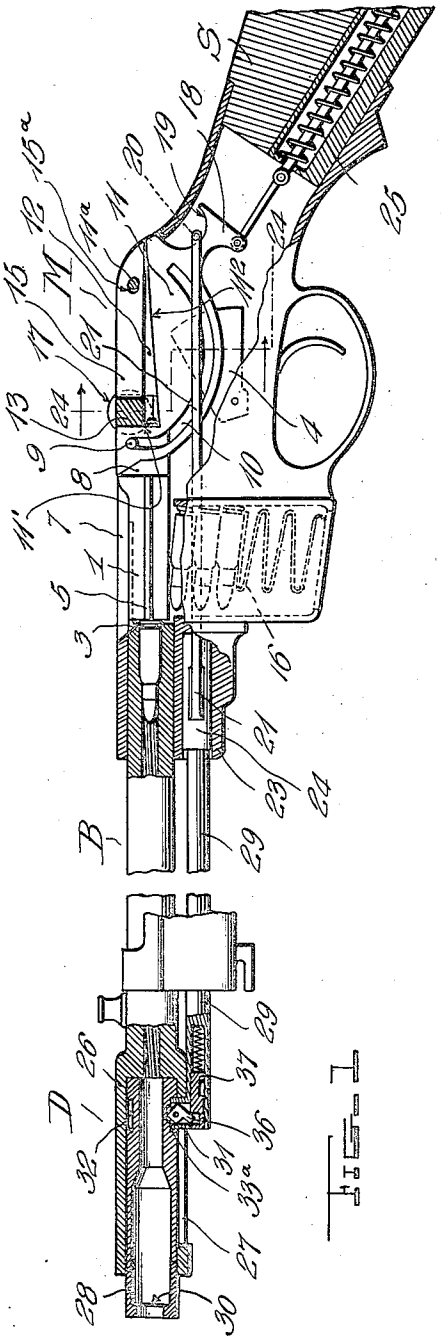


FIG. 1

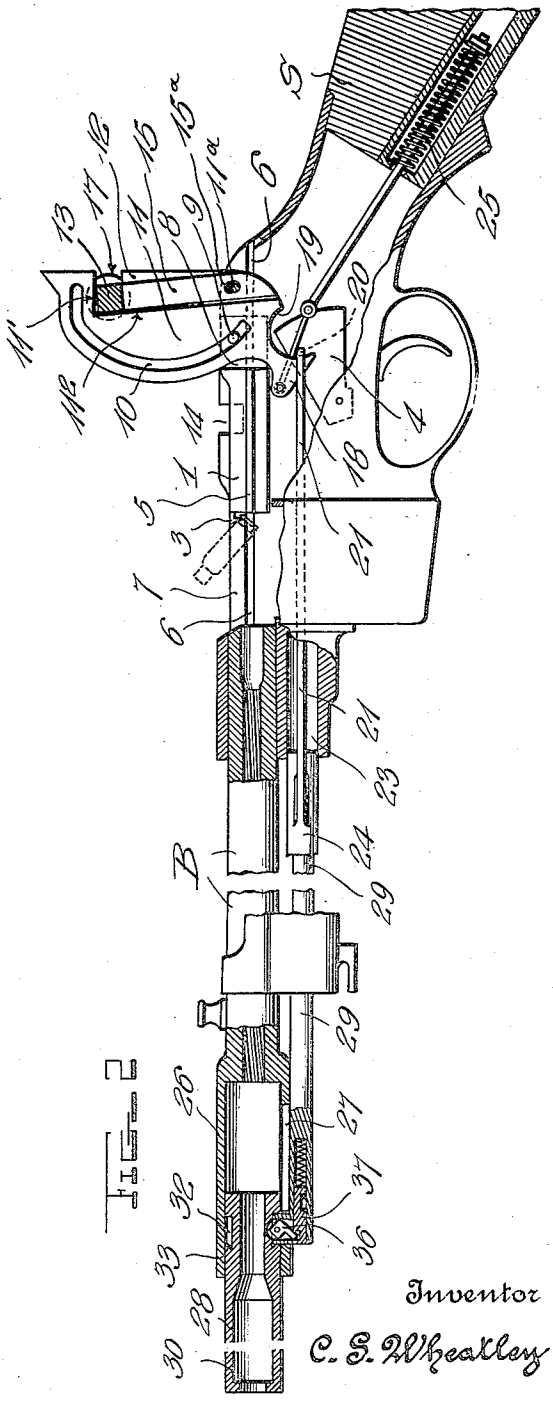


FIG. 2

Witnesses

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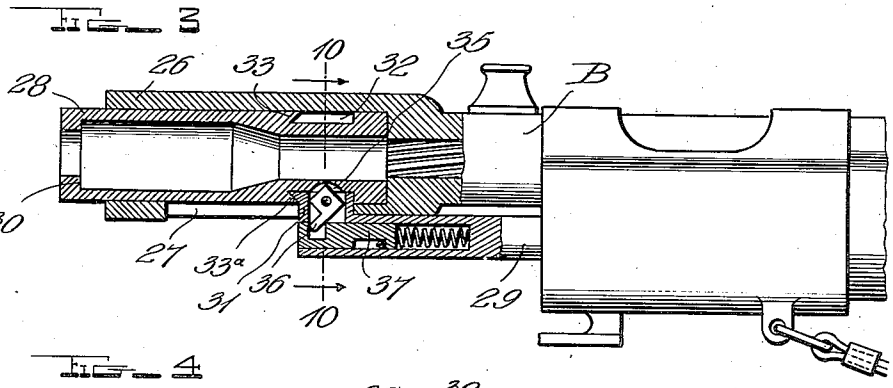


Fig. 3

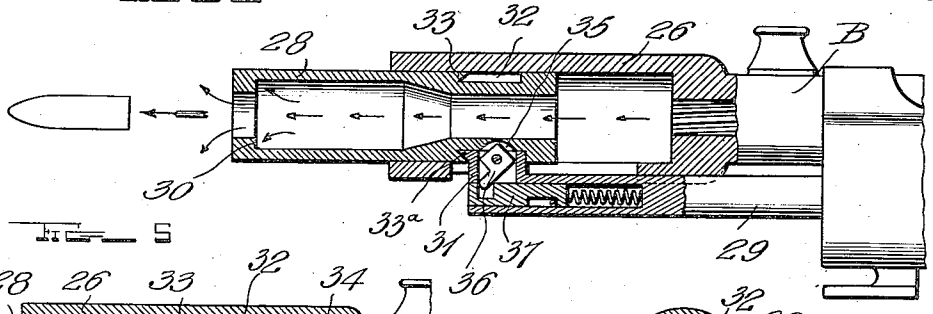
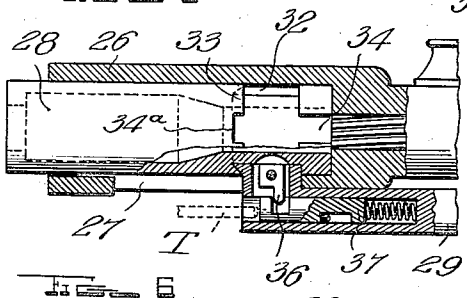


Fig. 4

Fig. 5



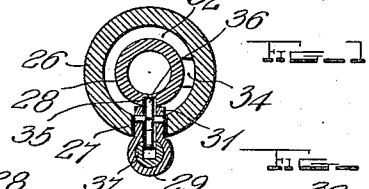


Fig. 10

Fig. 8

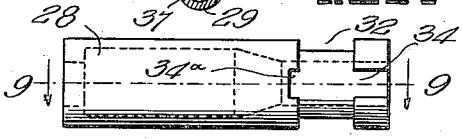


Fig. 6

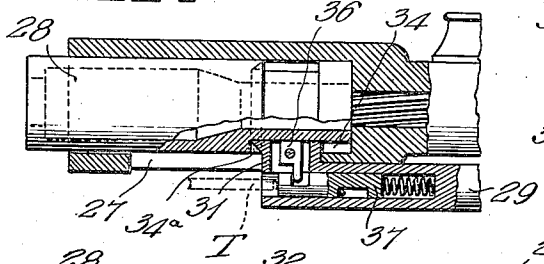
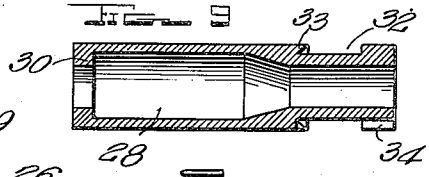


Fig. 9



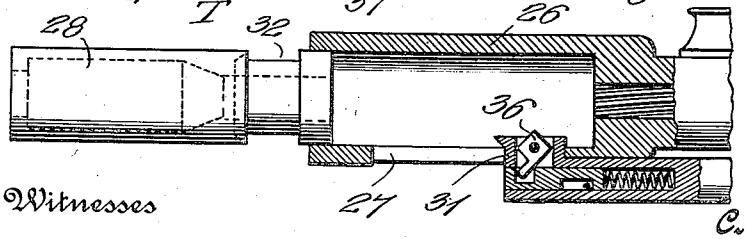


Fig. 7

Witnesses

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4 SHEETS—SHEET 3.

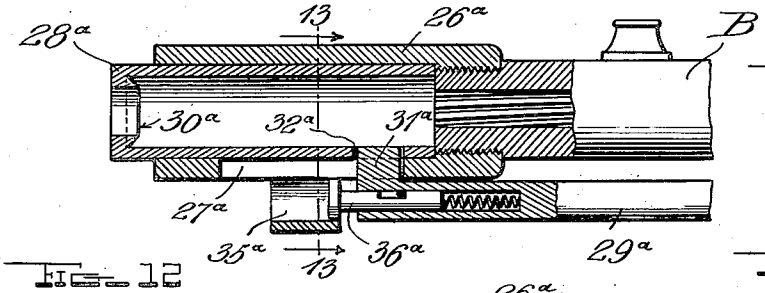


FIG. 11

FIG. 12

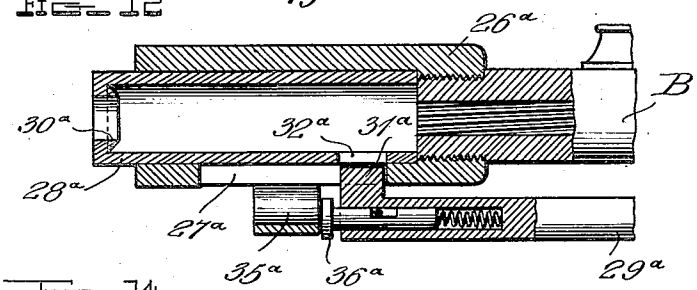


FIG. 13

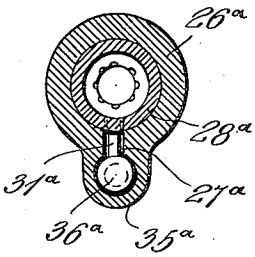


FIG. 14

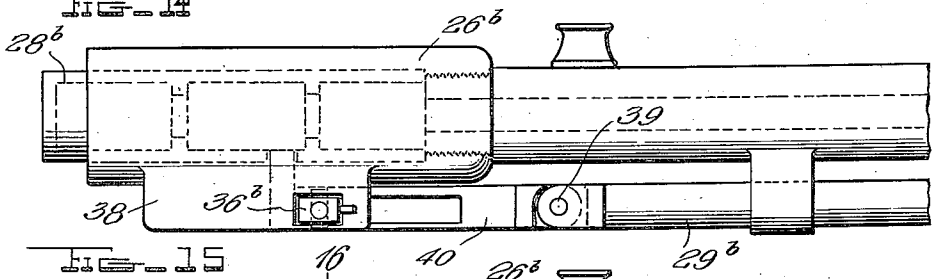


FIG. 15

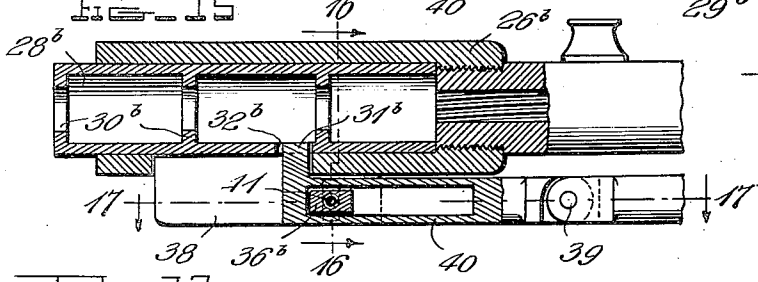


FIG. 16

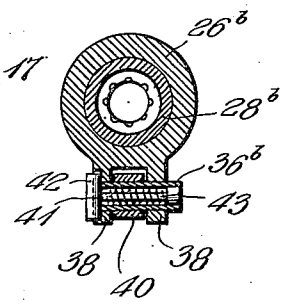


FIG. 17

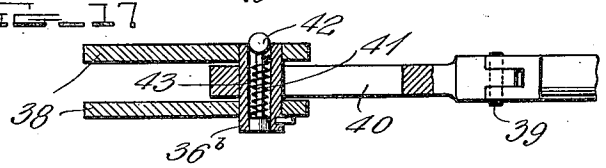
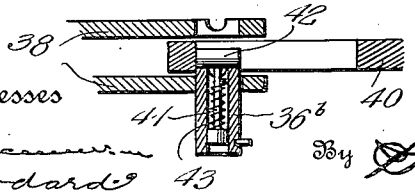


FIG. 18



Witnesses

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4 SHEETS—SHEET 4.

FIG. 19

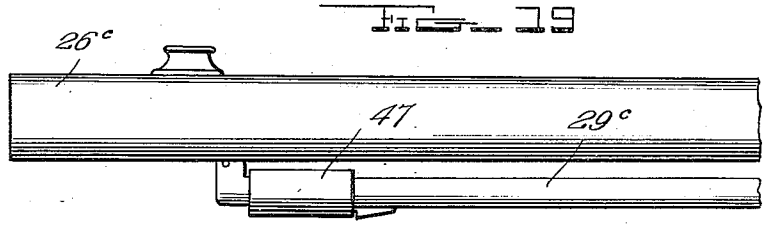


FIG. 20

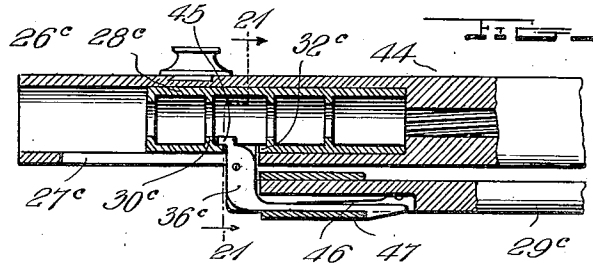


FIG. 21

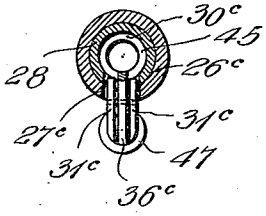


FIG. 22

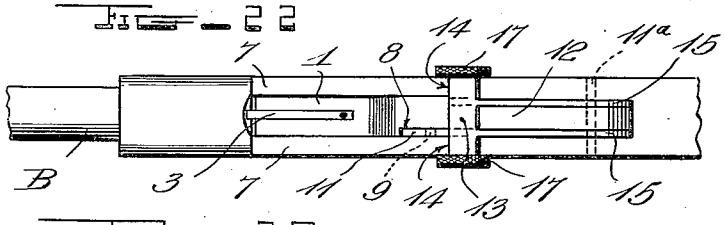


FIG. 23

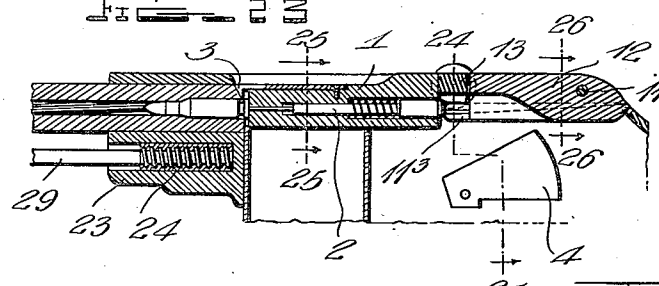
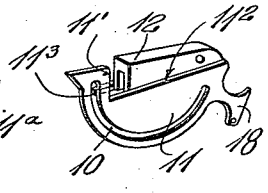


FIG. 27



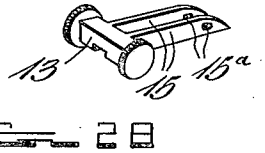


FIG. 24

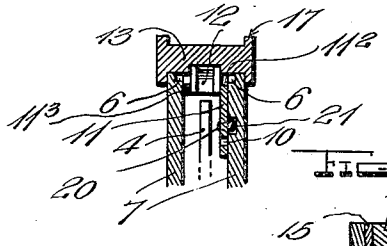


FIG. 28

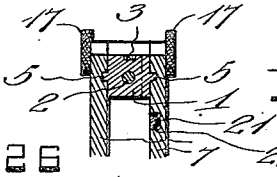
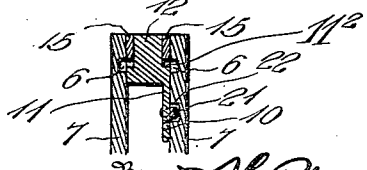


FIG. 25

FIG. 26



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES S. WHEATLEY, OF NEEDHAM HEIGHTS, MASSACHUSETTS.

AUTOMATIC-RELOADING RIFLE.

1,195,307. Specification of Letters Patent. Patented Aug. 22, 1916.

Application filed November 8, 1915. Serial No. 60,302.

To all whom it may concern:

Be it known that I, CHARLES S. WHEATLEY, a citizen of the United States, residing at Needham Heights, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic-Reloading Rifles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates broadly to improvements in firearms, and more particularly to automatically reloading rifles such as those used for military as well as for numerous other purposes.

The most important objects of the invention are to provide a rifle of the class specified which although being efficient and durable, will be only of approximately the same weight as such rifles without the improvements applied; to eliminate the use of sliding or shunting barrels, "blow back" breeches, recoil springs and inertia weights, and yet derive the same advantages in a very simple and effective manner; to provide loading and ejecting means operated by the forward force of the exploding powder after the bullet or projectile has left the fire arm, and to include in the same device used for operating the loading and ejecting mechanism, means for silencing the report of the arm to an appreciable extent. These objects are obtained by the provision of certain novel features of construction and by unique combinations of parts to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawings wherein:

Figures 1 and 2 are side elevations of a rifle constructed in accordance with my invention, with parts broken away and in section, these views disclosing respectively, the normal positions of parts before firing of the arm, and the positions which such parts assume immediately after firing; Fig. 3 is an enlarged detail side elevation partly in section of the parts at the front end of the barrel, with such parts disposed as shown in Fig. 1; Fig. 4 is a similar view showing substantially the position of the parts disclosed in Fig. 2; Figs. 5, 6 and 7 are views similar to Figs. 3 and 4, disclosing the forwardly shiftable gas trapping member partly in elevation and showing the several steps in removing the same; Fig. 8 is an under side view of such member; Fig. 9 is a vertical section thereof taken on the plane designated by the line 9—9 of Fig. 8; Fig. 10 is a vertical transverse section as seen on the plane designated by the line 10—10 of Fig. 3; Figs. 11 and 12 are detail side elevations partly in section, showing a different form of construction and illustrating the mode of removing the forwardly shiftable gas trapping member; Fig. 13 is a vertical transverse section taken on the plane designated by the line 13—13 of Fig. 11; Fig. 14 is a side elevation showing yet another form of construction; Fig. 15 is a longitudinal section thereof with parts in elevation; Fig. 16 is a vertical transverse section taken on the plane indicated by the line 16—16 of Fig. 15; Fig. 17 is a horizontal section viewed on the plane of the line 17—17 of Fig. 15; Fig. 18 is a similar view showing the different positions of parts; Fig. 19 is an elevation similar to Fig. 14, showing an additional manner in which parts of the invention may be constructed; Fig. 20 is a longitudinal section of the construction shown in Fig. 19 with parts in elevation; Fig. 21 is a vertical transverse section taken on the plane of the line 21—21 of Fig. 20; Fig. 22 is a top plan view of the structure at the breech of the gun; Fig. 23 is a central longitudinal section thereof; Fig. 24 is a detail vertical transverse section taken on the plane indicated by the lines 24—24 of Figs. 1 and 23; Figs. 25 and 26 are detail vertical sections taken on the planes designated respectively by the lines 25—25 and 26—26 of Fig. 23; Fig. 27 is a perspective view of the cam plate and the parts directly associated therewith; and Fig. 28 is a similar view of the locking block and its arms.

In describing the invention, I shall refer to these drawings by similar reference characters placed on corresponding parts throughout the several views, but since the construction of the device D at the muzzle of the barrel B is embodied in a number of forms whereas the mechanism M at the breech of the barrel preferably remains the same throughout the several types of the invention, such mechanism M will be first de-

scribed after which the numerous types of the device D coöperating with the same will be entered into specifically.

The construction of all of the breech mechanism M is shown most clearly in Figs. 1, 2, 22, 23, 24, 25 and 26, such mechanism comprising a forwardly and rearwardly shiftable breech bolt 1 having therein an appropriate firing pin 2 and carrying a common type of extractor 3 at its front end. As is common with devices of this class, the pin 2 is forced forwardly against the tension of its retracting spring, by a trigger tripped hammer 4 whose operating means forms no part of the present invention and need not therefore be shown or described. The opposite upright sides of the bolt 1 are provided with longitudinal ribs 5 which are received in grooves 6 formed longitudinally in the inner faces of the upright cheek plates 7, the latter having any preferred type of connection with the gun stock S, and one of the rear corners of the bolt is provided with a right-angular notch 8 into which a laterally extending stud 9 projects, said stud being received by a cam slot 10 in an upright elongated cam plate 11 which is pivotally mounted at 11^a between the intermediate portions of the plates 7.

The upper edge of the plate 11 is shown as formed integrally with one side of a horizontally elongated stop block 12 spaced in rear of the breech bolt 1, the front end of said block being disposed in close proximity to the rear side of a transverse locking block 13. The block 13 bears against the rear end of the breech bolt 1 and is received in notches 14 formed in the upper edges of the plates 7, the block in question being carried by a pair of parallel rearwardly extending arms 15 which straddle the block 12, their rear ends being formed with slightly elongated openings 15^a, through which the pivot pin 11^a passes. Thus, when a cartridge is fired within the barrel of the gun, the back pressure exerted on the bolt 1 will be imparted to the locking block 13, but will not be exerted upon the pin 11^a.

It is to be observed that the upper edge of the plate 11 is formed with a substantially right-angular notch, one of whose walls 11′ stands upright in close proximity to the front side of the block 13, while its other wall 11^2 extends rearwardly from said wall 11′ to the rear end of the plate 11, being spaced below the block 13. The wall 11^2 is also positioned below one of the arms 15, a rib 11^3 being formed on the side of the block 12 opposite the plate 11 and being positioned beneath the other arm 15, said rib being extended forwardly from the block 12 beneath the block 13 and being positioned in the same horizontal plane with the wall 11^2.

By the construction just described, when the plate 11 is moved upwardly from the position shown in Fig. 1, the upright front end of the slot 10 will allow it to move a predetermined amount without imparting movement to the bolt 1. This initial movement imparts a considerable amount of momentum to the plate 11 and block 12 before the wall 11^2 and the rib 11^3 contact with the locking block 13. The result is that said block 13 is suddenly kicked from its notches 14, in spite of the fact that considerable back pressure from the gun barrel may now be exerted against said block by the breech block 1. After the block 13 is thus released, the curved portion of the cam slot 10 comes into action and retracts the bolt 1, thereby ejecting a spent shell preparatory to the insertion of another. However, since the construction of the reloading mechanism constitutes no part of the invention, it need not be described or illustrated in detail. Its location is designated at 16 on the drawings.

Under most circumstances, the breech bolt is to be retracted automatically by the means yet to be described, in which case the locking block 13 will be automatically released, but if the breech is to be opened manually a pair of knurled heads 17 on the opposite ends of said block may be grasped, thus allowing the cam plate to be raised to withdraw the breech bolt.

Projecting laterally from the lower edge of the cam plate 11, is a crank arm 18 having in its rear edge an arcuate notch 19 receiving therein a stud or the like 20 which projects laterally from a rod extension 21 which is slidable longitudinally in a groove 22 in one of the cheek plates 7 (see Figs. 1, 2, 24, 25 and 26), the free end of said rod being projected forwardly of the ammunition magazine into a tubular guide 23 beneath the rear end of the barrel B, at which point it is secured in any preferred manner to a plunger 24 which is mounted to reciprocate in the aforesaid guide 23, it being evident that forward movement of said plunger will dispose the several parts at the breech of the fire arm to the position shown in Fig. 2, thus placing the spring 25 under tension which is exerted to again return the several parts to their normal positions and at the same time to insert a new cartridge in place of the spent shell ejected by rearward movement of the breech bolt. For operating the plunger 24 in this manner, the device D in numerous forms has been provided. The device in question illustrated in Figs. 1 to 10 inclusive, comprises a tubular guide 26 which is shown as formed integrally with the muzzle of the barrel B, as alined strictly with said barrel, and as having a smooth bore of greater diameter than that of said barrel, the lower side of the guide 26 being provided with a longitudinally extending slot 27. Slidably mounted in the guide 26 is a tubular barrel extension member 28

which is so designed as to momentarily trap an amount of exhaust gases expelled from the barrel after a bullet or projectile has left the same, the effect being that the member 28 is forced forwardly from the position shown in Fig. 1 to approximately that disclosed in Fig. 2. This movement, through the instrumentality of a connecting rod 29, forces the plunger 24 forwardly, ejects the spent cartridge, and simultaneously places the spring 25 under tension to exert its power to return all parts of the rifle to normal position and at the same time to insert a new cartridge. It is to be observed that the ejecting and reloading operations are performed by pressure exerted forwardly by the exhaust gases passing from the muzzle of the barrel after the projectile leaves the gun, the result of this movement being that the recoil is reduced to a minimum, which result cannot be obtained by the types of reloading rifles in which the breech block is blown open by the rearward kick exerted upon the discharge of a shell. Furthermore, by the exact disposition of the member 28 shown in the drawings, the report of the rifle is muffled or silenced to an appreciable extent, the action taking place being very similar to that produced by the well known "Maxim silencer". The member 28 is illustrated as having its bore enlarged at its front end to provide a gas pocket and as having at the front end of such enlargement, an internal annular shoulder 30 which faces the muzzle of the barrel B. This is merely typical of one of the many interior formations which may be applied to use for allowing the discharging gases to produce the desired effect.

The rod 29 may be secured to the plunger 24 by threading as disclosed in Fig. 23, or in any other preferred manner, while the front end of said rod is provided with a socketed lug 31 which extends upwardly therefrom through the slot 27 in the guide 26 and is normally received in a pocket formed in the exterior of the member 28, such pocket being shown in the present embodiment of the invention in the form of a groove 32 extending entirely around the rear end portion of the aforesaid member 28 and preferably having one undercut wall 33 which receives therein a nose 33^a on the lug 31. Leading rearwardly from the groove 32, is a channel 34 while alined with such channel and formed in the undercut wall 33 is a notch 34^a. By this arrangement of parts, when the member 28 is turned to the position shown in Figs. 6, 7 and 9, the free end of the rod 29 may be sprung downwardly since no obstruction will be encountered by the nose 33^a. This becomes essential in case it is necessary to remove the rod 29 without withdrawing the member 28 from its guide 26. Furthermore, when the member in question stands in the position shown in the figures just mentioned, it may be well withdrawn without dislocating the rod 29 and parts carried thereby.

When, however, the member 28 is turned to position the channel 34 and notch 34^a as or approximately as shown in Figs. 5 to 10, the nose 33^a is retained by the undercut wall 33 and thus the parts are effectively held together, but it becomes expedient to provide simple means for preventing unintended rotation of the member 28. For this purpose, a socket 35 is formed in the bottom of the groove 32 at a point spaced from the channel and notch as clearly shown in Figs. 5 and 10, and normally received in said socket, is one corner of a rectangular catch member 36 (see more particularly Figs. 3 and 4), the member 36 being confined in the socket of the lug 31 and being rocked to active position by a spring pressed plunger 37 slidable in the tubular front end of the rod 29. By this means, it will be evident that the member 28 cannot be rotated until the catch member 36 is disposed to the position shown in Figs. 5 and 6, for which purpose, the plunger 37 may be forced rearwardly against the tension of its spring by the application of an appropriate tool such as that indicated at T in the aforesaid figures. With the parts standing in this position, the member 28 may be rotated to position the lug 31 in alinement with the channel 34 and the notch 34^a, whereupon either the rod 29, the member 28, or both, may be removed at will.

In Figs. 11, 12 and 13, a slightly different form of construction is shown in which the bore of the tubular member 28^a is of uniform size throughout its length and is provided at its front end with a single shoulder 30^a which is undercut to allow the exhaust gases to more readily act thereon. In this type of the invention, the lower side of the member 28^a is provided with a pocket 32^a receiving therein a lug 31^a which rises from the front end of a rod 29^a identical with the rod 29, the lug in question being slidable within the longitudinal slot 27^a formed in the lower side of a tubular guide 26^a which is shown as being threaded upon the front end of the barrel B rather than being formed as an integral part thereof.

To normally retain the lug 31^a in the pocket 32^a, a spring projected catch member 36^a is forced normally forward into a socket 35^a here shown in the form of a loop depending from the guide 26^a. When this catch member 36^a is moved to the position shown in Fig. 12 by the insertion of an appropriate tool into the socket, the rod 29 may be sprung downwardly whereupon it, as well as the member 28^a, may be removed.

Figs. 14 to 18 inclusive disclose a tubular guide 26^b identical with the guide 26^a with

the exception that a pair of upright flanges 38 depend therefrom on opposite sides of the slot in its lower side. Slidable in the guide 26^b is a tubular member 28^b having on its interior a plurality of longitudinally spaced annular ribs or shoulders 30^b, the member 28^b having in its lower side a pocket 32^b receiving therein a lug 31^b rising from the front end of a connecting rod 29^b here shown as formed of two sections hingedly connected together at 39, the front section having therein a longitudinally disposed slot 40 through which and through rectangular openings in the flanges 38, a latch member 36^b is passed, said member having a bore in which the headed shank 41 of a rotatable locking button 42 is mounted, a spring 43 being provided to normally retain said button seated within appropriate notches in one end of the member 36^b, when said button is turned transversely of such member as shown in Fig. 16, it being evident that under these circumstances, the locking member cannot be removed, but when the button is turned as disclosed in Fig. 18, the member in question may be retracted, thus allowing the front section of the rod 29^b to be swung downwardly, whereupon the operating member 28^b may be removed at will. As shown most clearly in Figs. 16 and 18, the button 42 is normally received in notches in the outer side of one of the flanges 38 as well as in the notches in the member 43, it being necessary to force inwardly upon the head of the shank 41 and disengage the button from the numerous notches before it may be so turned as to allow it to stand as shown in the last named figure.

The form of operating mechanism illustrated in Figs. 19 to 21 inclusive, comprises a tubular barrel extension or guide 26^c having in its lower side a longitudinal slot 27^c, said extension or guide being shown as of a diameter corresponding to that of the barrel and as carried by the front end of the latter as indicated at 44. Slidable longitudinally in the guide 26^c, is a tubular operating member 28^c having therein a plurality of annular shoulders 30^c corresponding to these 30^b, but exceeding the latter in number. The lower side of the member 28^c is provided with a pocket in the form of a slot 32^c in which a lug 31^c rises from the front end of the connecting rod 29^c, said lug as well as the front end of the rod being bifurcated and receiving between their furcations, an L-shaped latch member 36^c having a nose 45 which projects through the slot 32^c and normally overlies the bottom of the member 28^c. The nose 45 is formed on the end of one arm of the member 36^c while the other end thereof is normally held in the bifurcated front end of the rod 29^c against the tension of a spring 46 by a sleeve 47 which is slidable on said rod and which may be moved to the right in Fig. 20 when the longer arm of the member 36 is sprung inwardly thereby allowing said member to be disposed to such a position as to allow the rod 29^c to be swung downwardly whereupon the member 28^c may be withdrawn.

All types of the device D produce the same results as the form first described, namely, so operating the mechanism at the breech of the gun, as to expel the shell of a spent cartridge and inject a new cartridge. All forms are positively automatic and although being very simple, they will be efficient and durable. Several types of detachable connections between the connecting rods and the gas trapping operating members 28 have been shown, as have likewise a number of forms of such members, but it is to be understood that the illustration is merely typical of some of the great number of ways in which the numerous details of the invention may be constructed to produce equally good results. It is to be noted that the several operating members project forwardly beyond their guiding means, this being essential since it allows the attachment of the common type of bayonet to the end of the gun, even though it be equipped with one of the devices D.

I claim:

1. In an automatic firearm, a barrel, extracting and reloading means at the breech thereof, a forwardly shiftable tubular gas trapping member in advance of the muzzle of the barrel and alined therewith, said member having a pocket opening through its outer side, a rod lying substantially parallel to the barrel and having connection with the extracting and reloading means, a lug projecting from the front end of said rod into the aforesaid pocket, and lock means for normally preventing removal of said lug.

2. In an automatic firearm, a barrel, extracting and reloading means at the breech thereof, a tubular guide alined with and carried by the muzzle of the barrel, a tubular forwardly shiftable gas trapping member slidable in the guide and projecting forwardly therefrom to provide means for the attachment of a bayonet, and connecting means between said member and the extracting and reloading means.

3. In an automatic firearm, a barrel, extracting and reloading means at the breech thereof, a tubular guide alined with and carried by the muzzle of the barrel, and having a longitudinal slot, a tubular forwardly shiftable gas trapping member slidable in the guide, a rod substantially parallel to the barrel having connection with the extracting and reloading means, and a projection extending from the front end of the rod through the slot and having connection with the aforesaid member.

4. In an automatic firearm, a barrel, ex-

tracting and reloading means at the breech thereof, a tubular guide alined with and carried by the muzzle of the barrel and having a longitudinal slot, a tubular forwardly shiftable gas trapping member slidable in the guide, a rod substantially parallel to the barrel having connection with the extracting and reloading means, a projection extending from the front end of the rod through the slot, and a detachable connection between said projection and the aforesaid member.

5. In an automatic reloading gun, a barrel, a member at the muzzle thereof shifted forwardly by the escape of gases from said barrel, a rod extending rearwardly from said member, a guideway extending rearwardly from the open breech of the barrel, a breech bolt shiftable forwardly and rearwardly in said guideway and adapted to actuate extracting and reloading means, a cam for retracting the bolt when shifted, said cam having connection with the rear end of the aforesaid rod, and spring means for returning all parts to normal position.

6. In an automatic reloading gun, a barrel, a member at the muzzle thereof shifted forwardly by the escape of gases from said barrel, a rod extending rearwardly from said member, a guideway extending rearwardly from the open breech of the barrel, a breech bolt shiftable forwardly and rearwardly in said guideway and adapted to actuate extracting and reloading means, a vertically swinging pivotally mounted cam plate for retracting the bolt when shifted, said plate having an eccentric connection with the rear end of the aforesaid rod, a breech bolt lock operating in conjunction with the vertically swinging cam plate and applied when said plate is lowered to lock the breech bolt in active position, but released when said plate is raised, and a spring for returning all parts to normal position.

7. In an automatic reloading gun, a barrel, a member at the muzzle thereof shifted forwardly by the escape of gases from said barrel, a rod extending rearwardly from said member, a guideway extending rearwardly from the open breech of the barrel, a breech bolt shiftable forwardly and rearwardly in the guideway and adapted to actuate extracting and reloading means, a stud projecting laterally from the bolt, a vertically swinging pivotally mounted cam plate having a cam surface engaging the stud to retract the bolt when the plate is shifted, said plate having an eccentric connection with the rear end of the aforesaid rod, and spring means for returning all parts to normal position.

8. In an automatic reloading gun, a barrel, a member at the muzzle thereof shifted forwardly by the escape of gases from said barrel, a rod extending rearwardly from said member, a guideway extending rearwardly from the open breech of the barrel, a breech bolt shiftable forwardly and rearwardly in the guideway and adapted to actuate extracting and reloading means, said bolt having in its rear end a notch and a stud projecting laterally into such notch, a vertically swinging pivotally mounted cam plate having an eccentric slot receiving the stud therein whereby to retract the breech bolt when the plate is raised, said plate having an eccentric connection with the rear end of the aforesaid rod, and a spring for returning all parts to normal position.

9. In an automatic reloading gun, a barrel, an operating member at the muzzle thereof adapted to be shifted forwardly by the escape of gases from said barrel, a rod extending rearwardly from said member, a guideway extending rearwardly from the breech of the barrel, a breech bolt shiftable forwardly and rearwardly in the guideway and adapted to actuate extracting and reloading means, a vertically swinging locking block contacting with the rear end of the breech bolt and having an arm extending rearwardly, a transverse pivot pin passing through said arm, and a vertically swinging breech block retractor mounted on the aforesaid pivot pin and having a kicking surface spaced below the locking block.

10. In an automatic reloading gun, a barrel, an operating member at the muzzle thereof and adapted to be forced forwardly by the escape of gases from said barrel, a rod extending rearwardly from the operating member, a guideway extending rearwardly from the breech of the barrel, a horizontal breech bolt slidable in said guideway toward and away from the breech, a laterally extending stud carried by said breech bolt, a transverse locking block contacting with the rear end of said breech bolt, the sides of the guideway being formed with notches receiving said block, a pair of spaced arms extending rearwardly from said block and having elongated openings in their rear ends, a transverse pivot pin passed through said openings, a vertically swinging block having its front end positioned contiguous to the rear side of the locking block and having its rear end pivotally mounted on the aforesaid pivot pin, and a cam plate carried rigidly by the second named block, said plate being eccentrically connected with the rear end of the aforesaid rod and having an arcuate cam surface which engages the stud on the breech bolt, said plate also having a notch in its upper edge whose lower wall is spaced below the locking block for the purpose specified.

11. In an automatic firearm, a barrel, extracting and reloading means at the breech thereof, a rigidly fixed tubular barrel extension projecting forwardly from said barrel and having an interior diameter greater than

that of said barrel, a tubular gas trapping member housed slidably in said extension and adapted to be moved forwardly by the escape of gas from the muzzle of the barrel, and means connecting said member and said extracting and reloading means for operating the latter when the former is shifted.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES S. WHEATLEY.

Witnesses:

HAROLD G. WYNNE,

SHERIDAN WHITAKER.