W. D. POLITE.

GUN.

APPLICATION FILED SEPT. 29, 1916.

1,218,458.

Patented Mar. 6, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

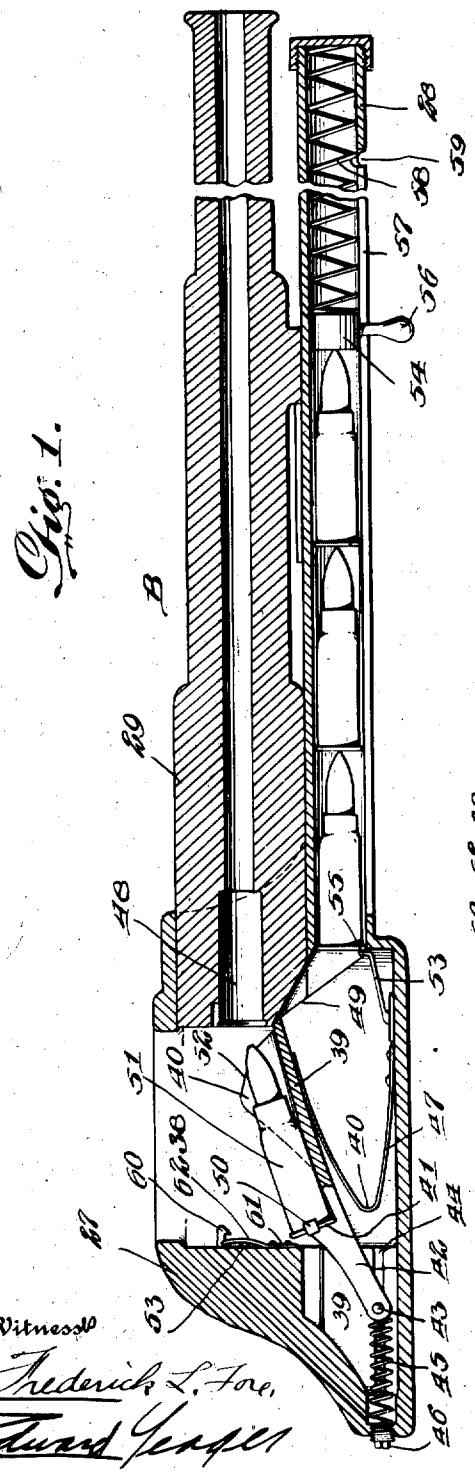
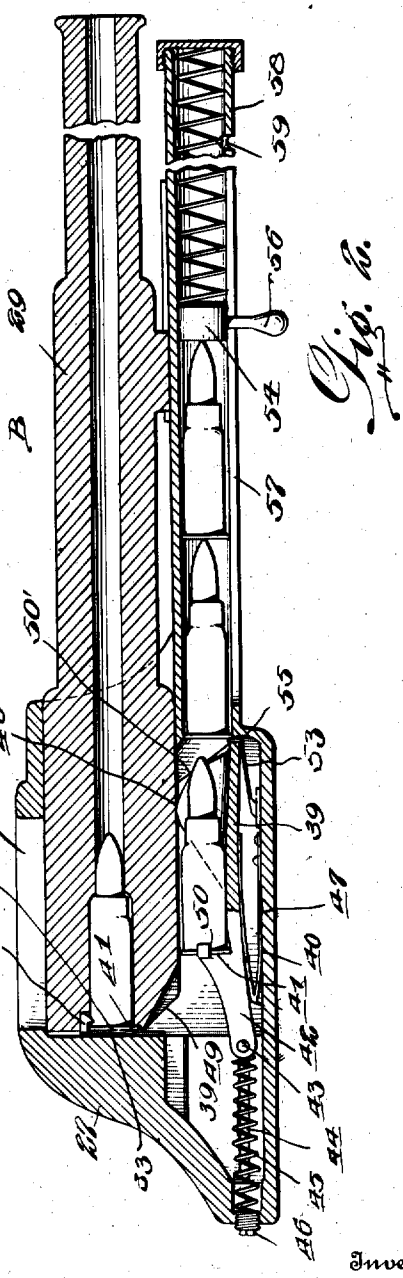


Fig. 2.



Witnesses

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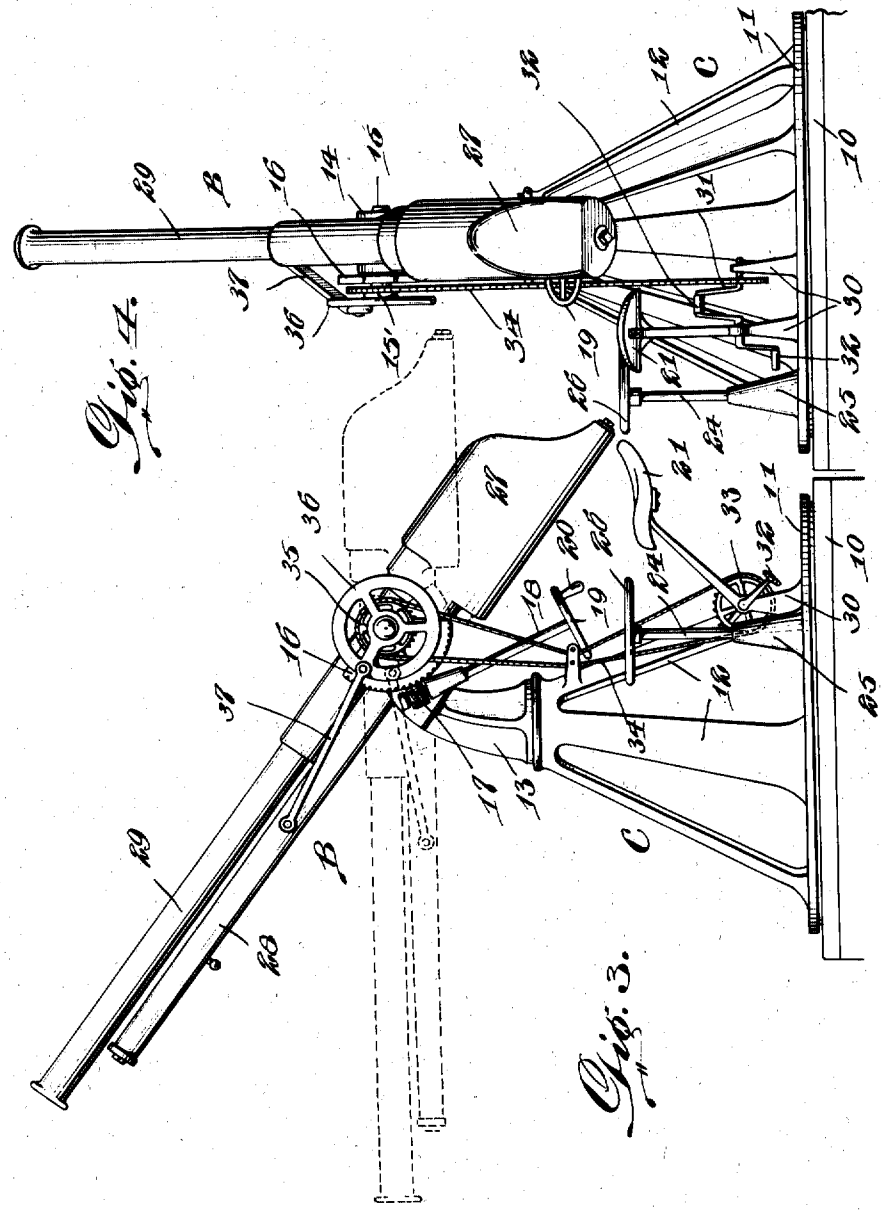


Fig. 4.

Fig. 3.

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3 SHEETS—SHEET 3.

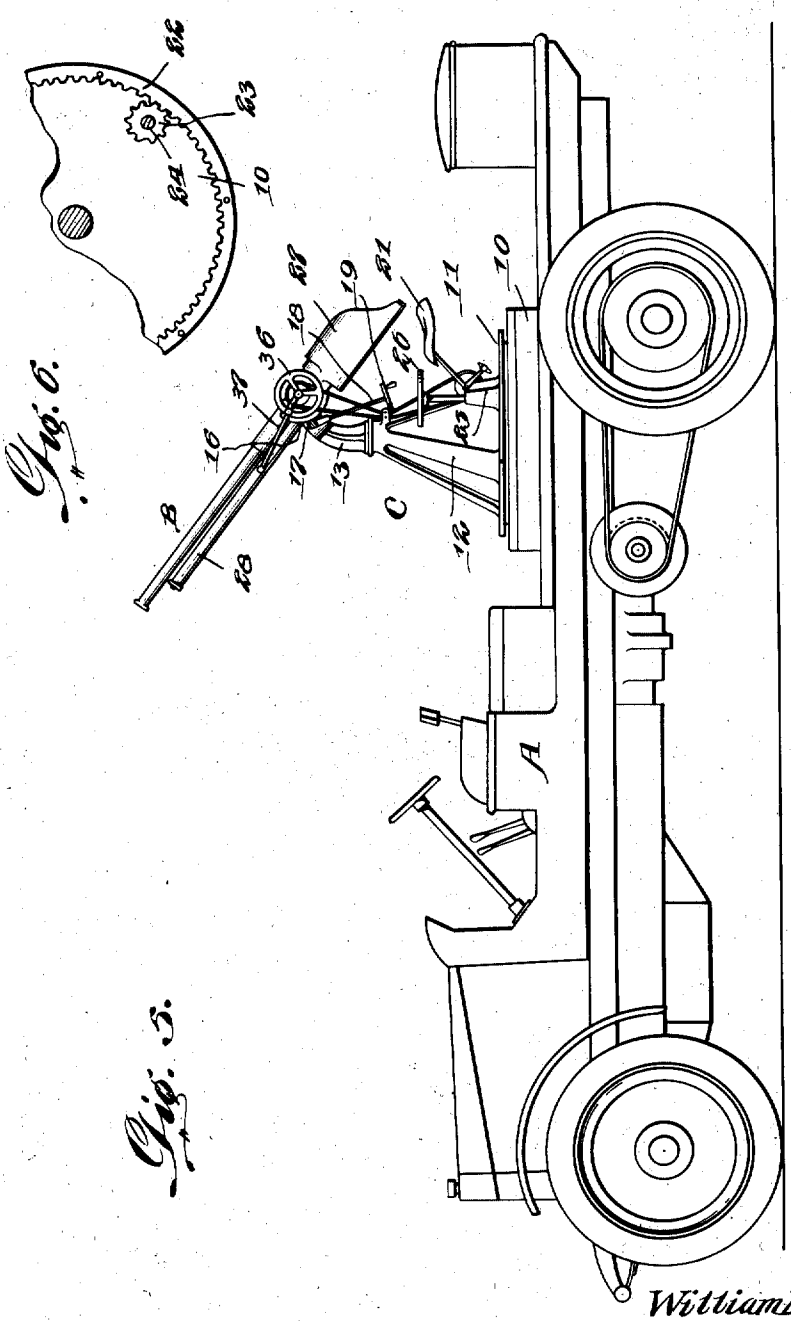


Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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GUN.

1,218,458. Specification of Letters Patent. Patented Mar. 6, 1917.

Application filed September 29, 1916. Serial No. 122,909.

To all whom it may concern:

Be it known that I, WILLIAM D. POLITE, a citizen of the United States, residing at Wilmington, in the county of New Hanover and State of North Carolina, have invented new and useful Improvements in Guns, of which the following is a specification.

This invention relates to quick firing guns having particular reference to the antiaircraft type, and embodies a shell magazine and breech block which as a unit is susceptible of adjustment longitudinally of the barrel of the gun for various purposes to be hereinafter fully set forth.

One of the principal characteristics of the invention resides in the provision of foot operated means for adjusting the shell magazine and breech block as a unit in the manner above stated.

In carrying out the invention I provide means for automatically removing the shells singly from the magazine and positioning each shell with respect to the firing chamber, to insure its introduction thereinto as the breech block is moved in one of its directions.

The invention further contemplates the provision of means for automatically removing the shell from the barrel of the gun immediately subsequent to the firing of the same, and ejecting the shell through an opening in the breech block.

The invention also has for an object the mounting of the gun in a manner whereby the same can be quickly adjusted in either a horizontal or vertical plane, so that any desired movement of the gun may be obtained.

The nature and advantages of the invention, including other important objects, will appear from the following description when taken in connection with the accompanying drawings, the invention residing in the construction, combination and arrangement of parts as claimed.

In the drawings forming part of this specification like numerals of reference indicate similar parts in the several views and wherein:—

Figure 1 is a longitudinal sectional view through the gun showing the breech block in one of its positions and the shell arranged to be introduced into the firing chamber.

Fig. 2 is a similar view showing the breech block in its closed position, and the manner of introducing one shell into the firing chamber, and the removal of a new shell from the magazine.

Fig. 3 is a side elevation of the gun mounted upon its support.

Fig. 4 is an end elevation.

Fig. 5 is a view showing the invention used in connection with a motor vehicle.

Fig. 6 is a detail sectional view of the supporting means.

The use of the invention in connection with a motor vehicle is sufficiently characteristic of its utility, admirably illustrating the invention, and constituting one of its most useful applications. But it is desired to have it understood that the invention is susceptible for use on board ship, and in connection with other suitable supports, and such general application is contemplated by the claims.

Referring more particularly to the drawings in detail A indicates generally a motor vehicle. B the gun, and C the support therefor. The support embodies a circular base 10 upon which is mounted for rotation a table 11. Rising from the table 11 is a plurality of standards 12 supporting a bracket 13, the latter being preferably bifurcated at its upper end, while the separated portions 14 defined by the bifurcation are suitably apertured to receive the trunnion 15 projecting from opposite sides of the gun B. The gun is thus mounted for vertical adjustment, and to accomplish this end I preferably employ an arcuate-shaped rack bar 16 with which meshes a worm gear 17 mounted upon the shaft 18, which latter is journaled in suitable bearings on the bracket 13. The lower extremity of the shaft 18 carries a wheel 19, from which a handle 20 depends for rotating the shaft 18 with a consequent adjustment of the gun B. It might here be stated that a seat 21 is provided for the operator, being mounted upon the table 11 and to one side of the gun, and that the handle 20 is located in the vicinity of the seat, in convenient reach of the operator. The circular base 10 is provided with an internal circumferential series of rack teeth 22 with which a pinion 23 meshes, the pinion being carried on the lower end of a vertical shaft 24 which is journaled in a suitable bearing 25 rising from the table 11. The shaft 24 is provided with a manipulating wheel 26 mounted on the opposite extremity of the shaft and in

convenient reach of the operator occupying the seat 21. Obviously, as the shaft 24 is rotated through the instrumentality of the wheel 26, the pinion 23 meshing with the rack teeth 22 will rotate the table 11 with respect to the base 10, and the gun B adjusted in a horizontal plane. It is therefore clear that the gun can be adjusted vertically or horizontally with a view of obtaining the desired range.

The breech block 27 and the shell magazine 28 constitute a unit that is adjustable longitudinally with respect to the barrel 29 of the gun, with the magazine 28 disposed beneath the barrel in parallelism therewith, and the breech block 27 slidably mounted upon the barrel and receiving the adjacent extremity of the latter. These parts are susceptible of this adjustment for several very important purposes essential in a gun of the class in question, and this adjustment is accomplished by foot operated means to be presently described. Rising from the table 11 are a pair of spaced brackets 30, one of which is extended to provide the standard for the seat 21. Journaled between these brackets is a crank shaft 31 whose formation defines pedals 32 which are disposed at opposite sides of the standard of the seat 21. Fixed upon the crank shaft 31 is a sprocket wheel 33 over which is trained an endless chain 34, the chain being also trained over a sprocket 35 loosely mounted upon the trunnion 15 at one side of the gun B. Manifestly, with the operator occupying the seat 21 and operating the pedals 32, the chain 34 actuates the respective sprocket wheels 33 and 35 with a consequent rotation of the sleeve 15′. Fixed upon this sleeve adjacent the sprocket wheel 35 is a relatively large wheel 36 which has one terminal of an operating rod 37 eccentrically connected thereto, the opposite end of this rod being secured to the shell magazine 28. As the wheel 36 is rotated with the sleeve 15′, coupled with the fact that the operating rod 37 is eccentrically connected with this wheel, a reciprocatory movement is imparted to the operating rod 37 to effect a longitudinal adjustment of the breech block and shell magazine as a unit longitudinally of the barrel 29 of the gun.

The breech block has an enlarged central compartment 38 which opens through the upper side of the block, and a relatively small compartment 39 located adjacent the base of the block and communicating with the large compartment 38. A shell lifter operates within the breech block 27, and as shown in this particular instance embodies a substantially U-shaped member including a base 39′, parallel side walls 40 and an end wall 41, and being further provided with a tail extension 42 from the opposite sides of which project the extremities of a pin 43 constituting a pivot for the shell lifter as a unit. The extremities of the pin 43 are fitted in suitable guide grooves 44 provided by the walls of the compartment 39 of the breech block 27, the pin 43 and grooves 44 serving to guide the shell lifter in its movement within the compartment 39 in the manner and for the purpose to be hereinafter described. An expansion spring 45 is arranged within the compartment 39 of the breech block, and has one end secured to the pin 43 and its opposite end secured to a nut 46, the spring tending to hold the shell lifter projected within the compartment 38 of the breech block. The nut 46 is adjustable in a suitable opening in the rear of the breech block as shown, and through the instrumentality of which the tension of the spring 45 can be regulated. Arranged within the compartment 38 is a substantially V-shaped spring 47 having one limb secured to the base of the breech block and its opposite limb bearing against the base 39 of the shell lifter, and operating to normally maintain the latter at the proper inclination with respect to the barrel of the gun, to insure the introduction of the shell into the firing chamber 48 when the breech block is adjusted in a forward direction. The barrel of the gun is formed with an inclined surface 49 which is engaged by the forward end of the shell lifter, the inclined surface in a sense serving to limit the adjustment of the shell lifter in an upward direction and thereby assist the spring 47 in positioning the shell carried by the lifter, with respect to the firing chamber 48 for introduction thereinto. The end wall 41 of the shell lifter is provided with resilient fingers 50 which engage the base or bead of the shell in the manner clearly illustrated in Fig. 1, to assist in holding the shell upon the lifter, but the pressure exerted by these fingers is very slight and in no way retards the removal of the shell from the lifter at the proper time.

Assuming that a shell has been removed from the magazine 28, in the manner to be hereinafter fully described, and arranged in the position shown in Fig. 1, the shell is introduced into the firing chamber as follows: The operator by working the pedals 32 effects an adjustment of the breech block 27 and the magazine 28 longitudinally of the barrel 29 in the manner above set forth, and as the breech block 27 moves forwardly, the end wall of the compartment 38 is brought into engagement with the adjacent end of the shell 51. A continued movement of the breech block in this direction tends to move the shell 51 from its lifter, forcing the shell into the firing chamber 48. It will be noted however that the base 39 of the lifter, by reason of its engagement with the inclined surface 49 of the barrel cannot move forwardly, and is consequently forced rearwardly, which movement is permitted

by the pin 43 riding in the grooves 44. The lifter continues to move rearwardly until the pin 43 reaches the limit of its adjustment in this direction by coming in contact with the end walls of the grooves, during which operation the spring 45 is compressed and placed under its maximum tension. However when further movement of the shell lifter in a rearward direction is prohibited, the forward extremity of the base 39 thereof starts to move downwardly against the inclined surface 49 of the barrel, and continues to move in this direction until it is wholly disposed beneath the barrel. It will be noted that the parallel sides 40 of the shell lifter provide cam surfaces 52 which follow the base 39 in turn to engage the inclined surface 49 of the barrel, and it is only when the highest points of these cam surfaces are wholly disposed beneath the barrel 29 of the gun, that the breech block 27 is permitted to assume its position at the limit of its adjustment in a forward direction, at which time the shell is exploded. This is accomplished by the firing pin 53 projecting from the rear wall of the compartment 38 being brought in contact with the adjacent end of the shell as will be readily understood.

Now, when the shell lifter in its entirety has been moved in the manner just described to a position below the barrel 29 of the gun, the spring 45 at that time being compressed under its maximum tension, this spring immediately expands forcibly driving the shell lifter in a forward direction in the position illustrated in Fig. 2. During this movement of the shell lifter the forward end of the base 39 thereof strikes the inclined surface 50′, which inclined surface directs the base 39 of the lifter downwardly, compressing the V-shaped spring 40 which compression allows the base 39 of the shell lifter to move the spring detent 53 downwardly out of the path of movement of the adjacent shell within the magazine 28. As the spring 53 is thus lowered, a spring pressed follower 54 positioned within the magazine 28 moves the shells in the magazine in a direction whereby one of the shells is forced upon the lifter occupying the position shown in Fig. 2. However it is to be borne in mind that the base 39 of the shell lifter and the spring 53 act in unison, allowing but a single shell to be ejected from the magazine 28 onto the shell lifter, as the parts enumerated quickly return to a position whereby the offset terminal 55 of the spring 53 is again disposed in the path of movement of the shells, thus allowing but one shell at a time to be ejected from the magazine. The spring pressed follower 54 is provided with a handle 56 which projects through a longitudinal slot 57 in the shell magazine 28, which permits the follower to be retracted against the tension of the spring 58 when it is desired to refill the magazine with shells. The slot 57 at one end merges into a bayonet slot 59, so that when the handle 56 reaches this point a slight turn of the same into the bayonet slot 59 will serve to hold the follower 54 in a retracted position.

Now assuming that the parts occupy the positions illustrated in Fig. 2, and that the shell in the barrel has been exploded, the breech block 27 is adjusted rearwardly to the position illustrated in Fig. 1. During this movement of the block the shell is removed from the barrel through the instrumentality of a hook-like element 60 which engages over the base of the shell in the manner shown in Fig. 2. Secured to the rear wall of the compartment 38 immediately beneath the hook-like element 60, is a spring 61, preferably of Y-shaped formation, the spring being secured at one end to the wall of the compartment, while its branches 62 are bowed outwardly normally as shown in Fig. 1. The spring 61 together with the hook-like element 60 constitutes an ejector for removing the shell from the barrel 29 and also from the breech block 27 at the proper time. It will be noted that when the breech block is in the position shown in Fig. 2 the branches 62 of the spring are substantially flattened and thereby placed under tension, so that when the shell is entirely retracted from the barrel by means of the hook-like element 60, the branches 62 of the spring in assuming their normal positions exert sufficient pressure against the shell to eject the latter from the breech block 27 through the open top thereof.

Again, as the breech block 27 is being adjusted from the position illustrated in Fig. 2 to the position which it occupies in Fig. 1, the shell lifter is being simultaneously adjusted to position the shell carried thereby immediately at the rear of the barrel, in the position shown in Fig. 1. This movement of the shell lifter begins when the inclined surface 50′ of the magazine is brought into alinement with the inclined surface 49 of the barrel, at which time the V-shaped spring 40 begins to expand causing the free end of the base 39 of the lifter to move upwardly over the inclined surfaces 49 and 50′ of the barrel 29 and shell magazine 28 respectively. These inclined surfaces in a measure retard the movement of the shell lifter to its position occupied in Fig. 1, which is desirable in order to eliminate all possibility of the shell becoming disengaged from the lifter, which would most likely be the result if the lifter was forcibly and too rapidly returned or adjusted to this position. However I do not rely entirely upon the inclined surfaces above mentioned for regulating the quickness with which the shell lifter is adjusted to the position illus-

trated in Fig. 1, as it will be obvious that as the shell lifter is elevated under the influence of the spring 40, the said inclined surfaces 49 and 50′ effect a rearward adjustment of the lifter, during which time the spring 45 is partly compressed, and thereby acts as a cushioning means for the shell lifter in its entirety. Now with the parts returned to the positions which they initially occupy, and clearly illustrated in Fig. 1 the gun is ready for a second firing of the shell resting upon the lifter. By reason of the manner in which the parts are operated, it will be readily understood that a number of shells can be fired in rapid succession, and the exploded shells just as quickly ejected, the structure in its entirety being positive in its operation.

While it is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to this precise construction, as what is herein shown and described is merely illustrative of the preferred embodiment of the invention, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What is claimed is:—

1. A gun of the character described embodying a breech block, and a shell magazine capable of movement longitudinally of the barrel of the gun, a shell lifter pivotally mounted within said block and automatically operable to assume a position to receive a shell from the magazine upon adjustment of the block in one direction, yieldable means supporting said lifter and operating to elevate the latter within the block at a predetermined interval upon adjustment of the latter in a reverse direction, and means for limiting the upward movement of the lifter whereby said shell is properly positioned relative to the barrel of the gun.

2. A gun of the character described embodying a breech block, and a shell magazine capable of adjustment longitudinally of the barrel of the gun, a shell lifter pivotally mounted within said block, yieldable means supporting said lifter, said lifter being capable of assuming a position in line with said magazine upon adjustment of the block in one direction, means for automatically feeding the shells singly from said magazine onto said lifter, said yieldable means operating to elevate the lifter within the block at a predetermined interval when the block is adjusted in the reverse direction, and means for limiting the movement of the lifter in an upward direction.

3. A gun of the character described embodying a breech block, and a shell magazine capable of adjustment longitudinally of the barrel of the gun, a shell lifter yieldably supported within the block and capable of independent vertical and sliding movements, whereby said lifter is automatically adjusted to a position to receive a shell from the magazine upon movement of said block in one direction, and automatically elevated at a predetermined interval upon adjustment of the block in an opposite direction, and means for feeding said shells singly from said magazine onto the lifter.

4. A gun of the character described embodying a breech block, and a shell magazine capable of adjustment as a unit longitudinally of the barrel of the gun, a shell lifter arranged within the block and capable of independent vertical and sliding movements, when said block is adjusted, yieldable means associated with said lifter to be placed under compression during the sliding movement of the latter and upon adjustment of the block in one direction whereby said means operates to project said lifter at a predetermined interval during the continued movement of said block, to a position to receive a shell from said magazine, means for automatically feeding the shells singly from the magazine onto said lifter, and yieldable means supporting said lifter and operating to elevate the latter within the block at a predetermined interval during the adjustment of the latter in a reverse direction.

5. A gun of the character described embodying a breech block, and a shell magazine capable of adjustment as a unit longitudinally of the barrel of the gun, a shell lifter yieldably supported within the block, and automatically operable to assume a position upon adjustment of the block in one direction, to receive a shell from said magazine, means for automatically feeding said shells singly from said magazine onto said lifter, said yieldable means operating to elevate the lifter within the block at a predetermined interval during the adjustment of the block in a reverse direction, and cushioning means associated with the lifter for retarding the movement of the latter in an upward direction.

6. In combination, a base, a stand supported thereon, a gun pivotally mounted on the stand for vertical adjustment, means for adjusting said gun, said gun embodying a breech block, and a shell magazine capable of movement longitudinally of the barrel of the gun, means arranged within said block for automatically feeding said shells singly from the magazine to a position at the rear of said barrel, said block operating to introduce the shell from said position into the barrel, a seat mounted on the base, and foot operated means for effecting the adjustments of said block and magazine for the purpose described.

7. A gun of the character described em-

bodying a breech block, and a shell magazine capable of movement longitudinally of the barrel of the gun, a shell lifter pivotally mounted within said block and automatically operable to assume a position to receive a shell from the magazine upon adjustment of the block in its firing stroke, means carried by the block for extracting the shell from the barrel upon reverse movement of the block, said means operating to expel the shell from the block at a predetermined interval, yieldable means supporting said lifter and operating to elevate the latter within the block at a predetermined interval during the adjustment of the block in a reverse direction from its firing stroke, and means for limiting the upward movement of the lifter whereby said shell is properly positioned relative to the barrel of the gun for insertion therein.

8. A gun of the character described embodying a breech block, and a shell magazine capable of movement longitudinally of the barrel of the gun, a shell lifter pivotally mounted within the block and automatically operable to assume a position to receive the shell from the magazine upon adjustment of the block in its firing stroke, a hook-like element carried by the block for extracting the shell from the barrel during the reverse movement of the block, a yieldable means coöperating with said element for expelling the shell from the block at a predetermined time subsequent to its extraction from the barrel, yieldable means supporting said lifter and operating to elevate the latter within the block at a predetermined interval, and means for limiting the upward movement of the lifter whereby said shell is properly positioned relative to the barrel of the gun.

In testimony whereof I affix my signature.

WILLIAM D. POLITE.