N. BEETS.

BLOCK ACTION FOR REPEATING ARMS.

APPLICATION FILED DEC. 11, 1918.

1,387,460. Patented Aug. 16, 1921.

2 SHEETS—SHEET 1.

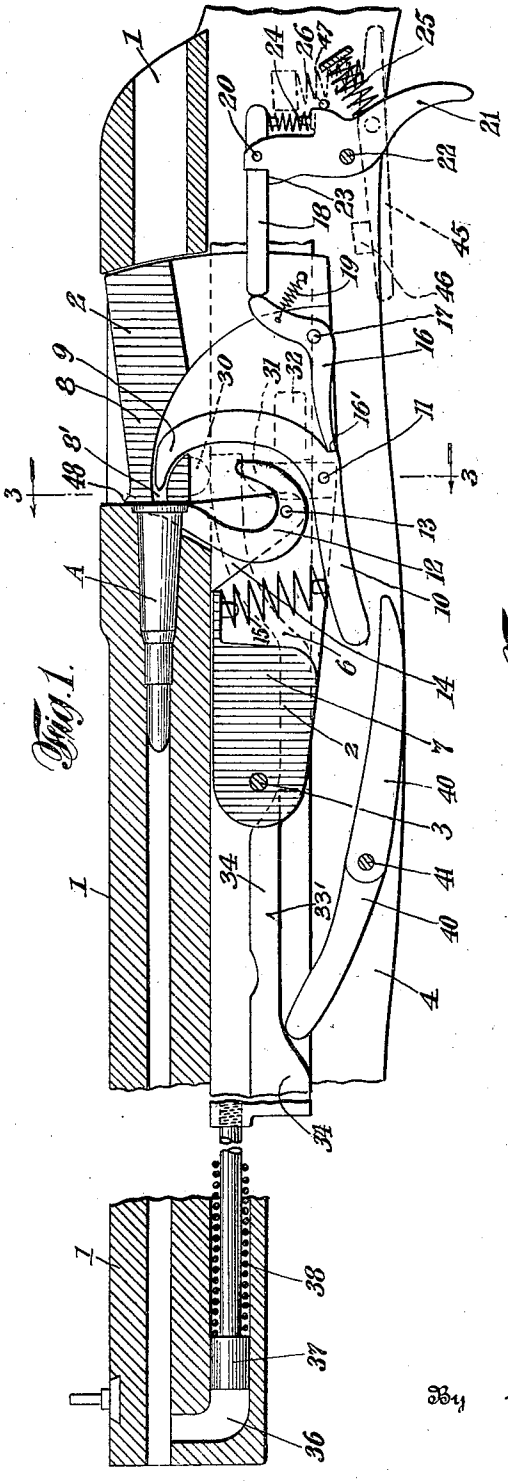


Fig. 1.

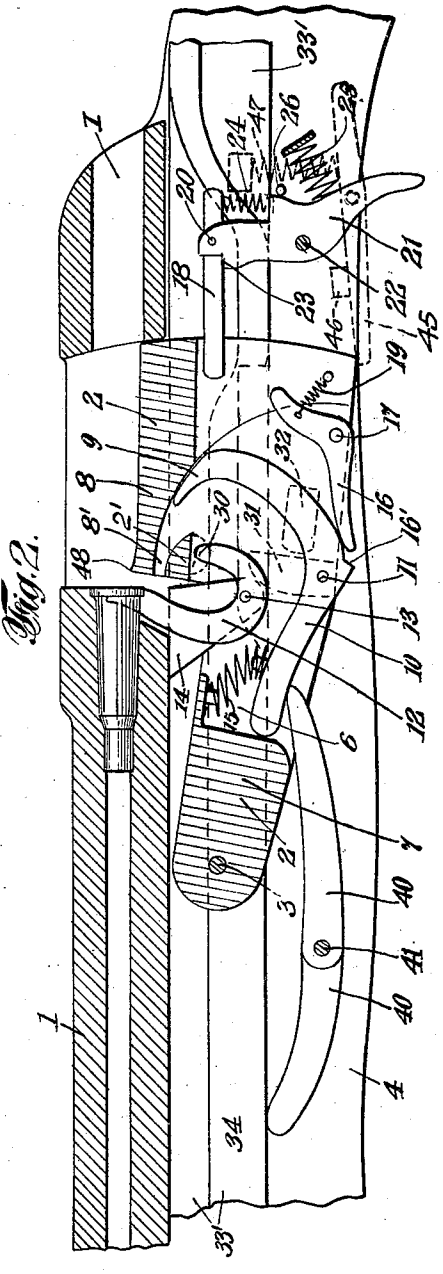


Fig. 2.

Inventor
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2 SHEETS—SHEET 2.

Fig. 3.

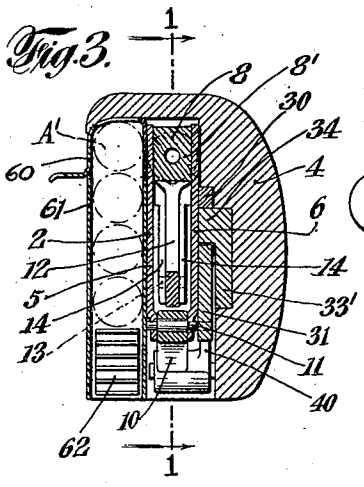
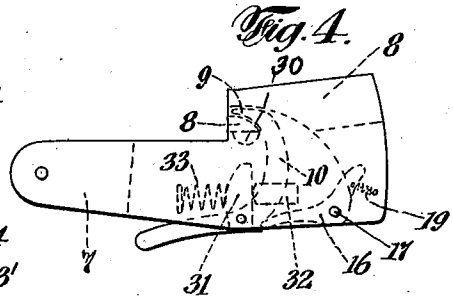


Fig. 4.



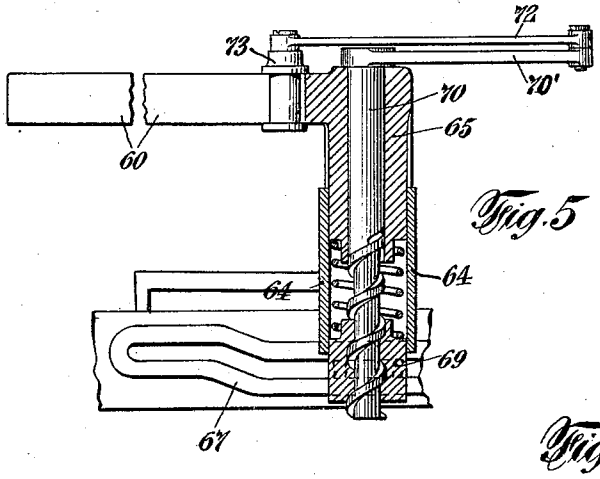
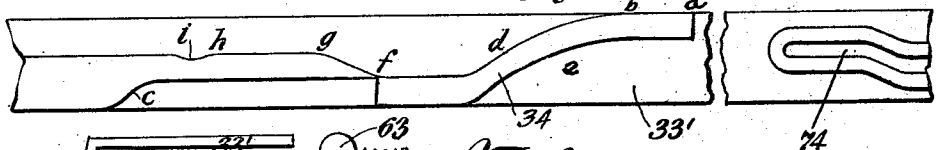


Fig. 5

Fig. 7



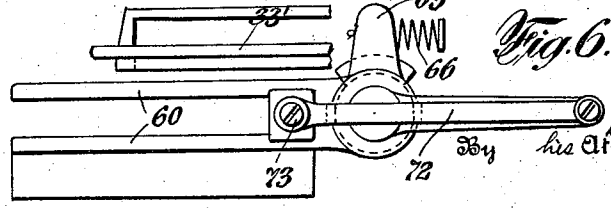


Fig. 6.

Inventor

Nicolaas Beets

By his Attorneys

by Kenyon & Kenyon

UNITED STATES PATENT OFFICE.

NICOLAAS BEETS, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WILLIAM J. WILKINSON.

BLOCK-ACTION FOR REPEATING ARMS.

1,387,460. Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed December 11, 1918. Serial No. 266,201.

To all whom it may concern:

Be it known that I, NICOLAAS BEETS, a subject of the Queen of the Netherlands, residing in New York, N. Y., and whose post-office address is % William J. Wilkinson, 424 West 33rd street, New York city, have invented certain new and useful Improvements in Block-Actions for Repeating Arms, of which the following is a specification.

This invention relates to repeating arms and more particularly to an improved block action therefor. The object of the invention is to provide a device of this character having increased efficiency of operation.

In order that the invention may be more clearly understood, attention is hereby directed to the accompanying drawings forming a part of this specification, and illustrating one embodiment of my invention.

In the drawings Figure 1 is a fragmentary sectional view taken on line 1—1 of Fig. 3.

Fig. 2 is a similar view showing the mechanism in a different position from that of Fig. 1.

Fig. 3 is a section taken on line 3—3 of Fig. 1.

Fig. 4 is a side view of the block forming a part of the mechanism as shown.

Fig. 5 is a view partly in vertical section and partly in elevation of mechanism for charging the weapon.

Fig. 6 is a plan view of the device shown in Fig. 5.

Fig. 7 is a view in elevation of the slide forming a part of the block actuating mechanism.

Referring to the drawings and more particularly to Figs. 1 to 4 inclusive, the numeral 1 designates a gun barrel of usual construction at its inner or rear end. The gun barrel is adapted to have its rear or charging closed by a block 2, which, as shown, is pivoted at 3 to the frame 4 of the gun. Referring more particularly to Figs. 3 and 4, the block 2 is formed, as shown, with two side plates 5 and 6, which are held spaced intermediate their ends by means of members 7 and 8, the member 7 being arranged at the pivoted end of the block 2 and the member 8 at the opposite end of said block. The member 8 is provided with a passage way 8′ to permit the pointed or firing-pin end 9 of the hammer 10 to move into and out of engagement with the cartridge A. The hammer 10 is pivoted, as shown at 11, to the plates 5 and 6 of the block 2. An extractor 12 for withdrawing the shell of the discharged cartridge from the barrel 1 is pivoted, as shown at 13, to lugs 14 depending from the barrel 1. The upper end of the extractor is forked so as to fit about the rear end of the cartridge, the fork however, being adapted to engage the flange or rim at the rear end of the cartridge to effect the withdrawal of the shell. A spring 15 tends to move the hammer 10 toward firing position. For controlling the movement of the hammer, suitable trigger mechanism may be provided, the mechanism as shown comprising a lever 16 which is pivoted, as shown at 17, to the block 2. The rear end of the lever 16 is held in engagement with a member 18, as by a spring 19, when the trigger mechanism is in latched condition with the forward end of the lever 16 engaging a shoulder 16′ on the hammer 10. The member 18 is pivoted, as shown at 20, to the trigger 21 which is pivoted as shown at 22 to the frame of the gun. The member 18 is held against downward movement with respect to the trigger by a projection 23 on the trigger, a spring 24 tending to yieldingly hold the member 18 in engagement with said projection. Means, such as a spring 25, are provided to yieldingly hold the trigger in inoperative position, the movement of the trigger being limited by suitable means such as a stop 26. The object of mounting the member 18 upon the trigger 21 as shown, is to permit upward movement of the said member in case the trigger is still held in the firing position when the block 2 carrying the lever 16 moves upwardly toward closing position. In this case the lever 16 lifts the member 18 until the trigger is released whereupon the member 18 moves rearwardly into engagement with the lever 16, as shown in Fig. 1. It will be seen that by drawing rearwardly on the lower end of the trigger 21 the forward end of the lever 16 will be disengaged from the shoulder 16′ permitting the spring 15 to move the hammer 10 into engagement with the cartridge A to cause the same to be exploded.

Referring to Figs. 1, 3 and 4, the block 2 has projecting outwardly from one side

thereof a projection 30. Mounted on the same side or face of the block 2 is a member 31, which as shown, is a lever pivoted for movement about the same axis 11 as the hammer 10. The member 31 is normally held in its upright position against an abutment 32 formed on the block 2 by suitable means, such as a spring 33, permitting the movement of the member 31 away from the abutment 32 upon the application of suitable pressure. Mounted for sliding movement longitudinally of the frame of the gun in a suitable groove provided for that purpose is a slide 33′ which is provided with a cam 34 normally arranged so as to engage the lower surface of the projection 30 and the upper surface of the member 31. As soon substantially as the cartridge is discharged by the striking of the percussion cap by the hammer, but before the bullet has left the barrel 1, the slide in the form of the invention shown is thrown backward. This movement of the slide may be effected in various ways. In the form of the invention shown (see Fig. 1) a by-pass 36 is provided in the forward end of the gun barrel, this by-pass having a portion in which a piston 37 fits for movement in a direction longitudinally of the direction of movement of the slide 33′. The piston is suitably connected to the slide, and means such as a spring 38 tends to move the piston to its forward position, the spring engaging between one face of the piston and a suitable abutment not shown.

Just before the bullet leaves the forward end of the gun, a volume of gas under pressure is inclosed in the gun barrel; this gas passing into the by-pass 36 moves the piston 37 against the spring 38 so as to shift the slide. The slide with the cam thereon are shown clearly in Fig. 7. The cam 34 being engaged between the projection 30 and the member 31 will now cause the block 2 to move to certain positions as hereinafter described. Before the block is free to move downwardly, however, the pointed end of the hammer must be removed from the percussion cap of the shell. To accomplish this I have provided a lever 40 pivoted intermediate its ends to the frame of the rifle, as shown in Fig. 1. The rear arm of the lever 40 lies under the forward arm of the hammer and the forward arm of the lever 40 lies against the cam 34. When the slide is moved rearwardly, the block will remain for a short time without movement because the cam has its initial portion which then coacts with the projection 30 and member 31, parallel to the axis of the movement thereof. During this time the projection 30 travels from point *a* to point *b* upon the cam (see Fig. 7). At the latter instant the forward arm of the lever 40 has been moved downwardly by the incline *c* of the cam, the rear arm of the said lever having lifted the forward arm of the hammer to withdraw the pointed end of the hammer from the percussion cap. During the movement of the cam from *a* to *b*, the cam serves not only to permit the withdrawal of the firing-pin on the hammer before the block 2 is permitted to fall, but also serves to prevent the block from being forced downwardly about the pivotal axis 3 thereof, which, as shown, is located below the gun barrel, by the rearward pressure of the gases and shell in the gun barrel upon the discharge of the cartridge.

The block 2 will be moved downwardly when the portion of the cam from *b* to *d* passes between the projection 30 and the member 31. During the latter part of the movement between *b* and *d* with respect to the projection 30 and member 31, the empty shell is thrown partly out of the rifle by the ejector 12 because between a certain part, for example, between *c* and the point *d*, in the travel of the cam with respect to the projection 30, the block at its surface 2′ engages the rear arm of the extractor (see Fig. 2) to move the latter in a clockwise direction referring to Figs. 1 and 2. When the projection 30 occupies the position *e* with respect to the cam, the block 2 is in such a position that the portion of the upper surface of the block to the rear of the lip 48 is opposite the lowest point of the rim of the cartridge. Inasmuch as the axis of the block lies below the barrel the block in falling not only moves downwardly, but also moves backwardly and gives a space between the block and the barrel permitting a free movement of the extractor. When the projection 30 occupies a position beyond the point *d* with respect to the cam, further movement of the cam permits the block to remain stationary, this being for the purpose of insuring the complete discharge of the empty shell from the gun barrel. As the projection 30 by the movement of the slide changes its position from *f* to *g* with respect to the cam, the block 2 is again raised to a certain extent, being at the same elevation when the projection is at the point *g* as when said projection is at the point *e*. During this interval the upper surface of the member 31 will not engage the under surface of the cam. Upon the point *e* and any point between *g* and *h* upon the cam becoming coincident with the projection 30 in the movement heretofore described, the block 2 reaches a position in which it rests upon the forward arm of a lever 45 which is normally held up in an elevated position in engagement with the projection 46 by suitable yielding means such as a spring 47, this spring being compressed when the cam moves from the point *e* to the point *d* with respect to the projec-

tion 30. The distance between the points *e* and *f* must be made great enough to secure the complete ejection of the empty shell out of the barrel and to prevent it from being caught between the barrel and the lip 48 upon the forward upper end of the block 2. During the movement of the cam from the point *e* to the point *d* with respect to the projection 30, the movement of the extractor takes place, the further movement of the cam from the point *d* to the point *f* securing the complete removal of the empty shell out of the barrel. When the cam reaches the point *g* with respect to the projection 30, the ejected shell lies on the block 2 and thereupon the block remains in the same position during the movement of the cam from the point *g* to the point *h* with respect to the projection 30. During the earlier part of this movement the old shell is pushed off the block and a new cartridge pushed onto the same by means to be hereinafter more fully described. During the movement of the cam the latter part of the distance between *g* and *h* with respect to the projection 30, the new cartridge is pushed forwardly along the block into the barrel, during which time the block must remain in a fixed position. The block as heretofore stated is provided adjacent its forward end with a lip or shoulder 48 which would normally prevent the flange upon the cartridge being moved past the same into the barrel. To make possible the movement of the lip away from the position in which it prevents the movement of the cartridge completely into the barrel, the cam is provided with a depression *i* permitting downward movement of the projection 30 and of the block 2 against the pressure of the spring acting upon the lever 45.

When the cartridge has been moved completely into the barrel the block 2 is then moved upwardly automatically by the last named spring, the lip or shoulder 48 partially covering the adjacent end of the gun barrel so as to prevent the cartridge from being thrown back out of the barrel. It is to be understood that if the cartridge moved partly out of the barrel before the block 2 was raised to closing position, it might prevent the closing of the barrel by the block. The new cartridge is now in the barrel, the old shell is ejected and the slide is thereupon automatically moved forward again to its original position by suitable means such as the spring 38 heretofore described, there being no gas pressure in the gun barrel which prevents the spring 38 from returning the slide to its normal position.

By reason of the fact that the member 31 is pivoted at 11, it yields against the action of the spring 33 (see Fig. 4) whenever it strikes an obstruction, such as the part of the cam under the point *f* upon the movement of the slide in a forward direction. Accordingly as the cam returns from the point *g* to the point *e* with respect to the projection 30, the member 31 after being turned by the lower portion of the cam under the point *f* in an anti-clockwise direction will be held down against the action of the spring 33 out of its normal position, the lever 45 supporting the block in the position with respect to the barrel shown in Fig. 2. It will accordingly be seen that on the return stroke of the slide the block 2 is never supported sufficiently low to permit the cartridge to leave the barrel, the lip or projection 48 forming an obstruction until the block is again movable to closed position as shown in Fig. 1.

Briefly stated the movements of the lock as caused by lug 30, member 31, and lever 45 are as follows: Upon the initial movement of the slide 33′ after firing the block is held in closed position by the lug 30 sufficiently long to permit the withdrawal of the firing pin from the base of the cartridge. The block is then pressed downward, the under surface of the cam engaging member 31. During the movement of the slide in its initial direction (rearward as shown) the member 31 is held in its normal position against the stop 32 (Fig. 4) by the spring 33, the cam tending to retain the member 31 in said position. When the block has moved downwardly to the position shown in Fig. 2, it engages the lever 45 and the further downward movement of the block is caused by the coaction of the member 31 with the lower side of the cam against the pressure of the spring pressed support 45. Extraction of the shell in the barrel begins approximately when the block 2 engages the lever 45, the further downward movement of the block moving the obstruction 48 completely out of the way so as to permit the shell to be freely extracted. The block is held in its lowermost position by the coaction of the member 31 with the lower surface of the cam a predetermined length of time to permit the shell to be completely extracted. Thereafter the block is raised by the coaction of the lug 30 with the upper surface of the cam, the lip 48 now forming an obstruction to the rear end of the barrel. At the proper moment this obstruction is removed by the cartridge as it is moved into the barrel, the rim of the cartridge pressing the block downwardly against the action of lever 45 and spring 47, the necessary downward movement of the lug 30 being permitted by the compression in the cam. As soon as the rim of the cartridge has passed the lip 48 the block automatically rises to the position shown in Fig. 2 thereby preventing the cartridge from leaving the barrel. Upon the return movement of the slide the block never moves below the position shown in Fig. 2, being

supported in this position either by the coaction of the lug 30 with the upper surface of the cam or by the lever 45 until the cam coacting with the lug 30 moves the block to closed position shown in Fig. 1. During this return movement the member 31 is moved by the cam into inoperative position as described above when it strikes an obstruction and accordingly does not effect the movements of the block.

Referring to Figs. 3, 5, and 6, I have shown means for automatically moving the cartridge into operative position in the gun barrel. These means, as shown, comprise a forked member 60 which is arranged to engage the opposite sides of a cartridge A′ and to move the same laterally out of the gun barrel. The forked member 60 may, as shown, be a movable upper part of the magazine. As shown in Fig. 3, I have provided a magazine 61 in which the cartridges are moved upwardly toward feeding position by means of a spring 62. It is understood that any suitable magazine may be provided. The cartridges may be inserted in the rear end of the magazine. To move the fork 60 laterally to operative position the slide 33′ may be arranged to engage an arm 63 which may be secured to a member 64 mounted for movement longitudinally but not rotatively with respect to the hub 65 of the fork 60. Means such as a spring 66 may be employed to move the fork back to normal position. As shown in Fig. 3 the fork is provided at its lower left hand edge with a projection or flange which prevents the cartridges from being moved upwardly by the spring 62 as long as the fork is to one side of the normal position as shown in the said figure. The member 64 is rigidly secured to a nut 69 which upon its upward movement or its downward movement is adapted to rotate in one direction or another a shaft 70 rotatably mounted within the part 65. The part 70 has secured upon the upper end thereof a crank 70′ which is pivotally connected as by means of the connecting rod 72 with the pusher 73 mounted within the fork and adapted upon a forward movement to engage the rear end of the cartridge and to push the same into the gun barrel. It is understood that the cam 74 which moves the nut 69 is connected to slide 33′ to push the cartridge into the barrel at the proper moment. The mechanism for moving the cartridge into the gun barrel is mounted in a suitable position upon the rear of the frame but has not been shown in Figs. 1 and 2, it being thought that the relation of this mechanism for feeding the cartridges with respect to other mechanism will be clear in view of the foregoing description and the disclosure of the accompanying drawings.

While I have shown the preferred embodiment of my invention, numerous changes may obviously be made in the disclosure of the foregoing detailed description without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent, is:

1. The combination of a barrel, of a block for closing one end thereof, means tending to support said block in position to form an obstruction to said end of the barrel without closing the same, and means controlling the movement of said block relatively to said barrel adapted to cause the block to be moved against the action of said first named means away from said end of the barrel sufficiently far to remove said obstruction and permit the free extraction of a shell.

2. The combination of a barrel, of a block for closing one end thereof, means tending to support said block in position to form an obstruction to said end of the barrel without closing the same, and means controlling the movement of said block relatively to said barrel, said controlling means and block being arranged for relative movement in opposite directions, and said controlling means causing the movement of said block against the action of said first named means away from said end of the barrel sufficient by far to permit the free extraction of a shell during said relative movement in one direction, but being inoperative to cause such movement of the block during said relative movement in the opposite direction.

3. The combination of a barrel, of a block for closing one end thereof, means tending to support said block in position to form an obstruction to said end of the barrel without closing the same, said means yielding to permit the insertion of a cartridge into the barrel, and means controlling the movement of said block relatively to said barrel adapted to cause the block to be moved against the action of said first named means away from said end of the barrel sufficiently far to remove said obstruction and permit the free extraction of a shell, said controlling means being inoperative to cause such movement of the block after a cartridge has been inserted into the barrel, and before it is discharged.

4. The combination of a barrel, of a block for closing one end thereof, means tending to support said block in position to form an obstruction to said end of the barrel without closing the same, and means controlling the movement of said block relatively to said barrel adapted to cause the block to be moved against the action of said first named means away from said end of the barrel sufficiently far to remove said obstruction and permit the free extraction of a shell, said controlling means and block being arranged for relative movement in opposite directions, and said controlling means including a movable member causing the movement of said

block during said relative movement in one direction but inoperative during such relative movement in the opposite direction.

5. Mechanism as set forth in claim 4 provided with means tending to automatically maintain the movable member in operative position and means for moving said member from said position during the relative movement between the controlling means and block in one direction.

6. The combination with a barrel of a block for closing one end thereof, means for moving said block relatively to said barrel, said block being provided with means for preventing the movement of a cartridge out of said end of the barrel after it has been positioned in the barrel, and automatic means tending to hold said preventing means in operative position without moving the block to closing position, said automatic means being yielding so as to be movable into inoperative position by the cartridge upon movement thereof into the barrel.

7. The combination with a barrel of a block for closing one end thereof, means for moving said block relatively to said barrel, said block being provided with means for preventing the movement of a cartridge out of said end of the barrel after it has been positioned in the barrel, and a yielding support for said block tending to hold said preventing means in operative position.

8. The combination with a barrel of a block for closing one end thereof, means including a cam for moving said block relatively to said barrel, said block being provided with means for preventing the movement of a cartridge out of said end of the barrel after it has been positioned in the barrel, and a yielding support for said block tending to hold said preventing means in operative position.

9. The combination with a barrel of a block for closing one end thereof, means for moving said block relatively to said barrel, said block being provided with means for preventing the movement of a cartridge out of said end of the barrel after it has been positioned in the barrel, a yielding support for said block tending to hold said preventing means in operative position, said moving means including a cam and a member coacting with said cam to move said preventing means into inoperative position to permit the free extraction of a shell, said movable member being inoperative to render said preventing means inoperative after a cartridge has been inserted into the barrel.

10. The combination with a barrel, of a block for closing one end thereof, means controlling the movement of said block toward and away from the said end of the barrel and automatic means for effecting the obstruction of said end of the barrel after a cartridge has been loaded into the barrel and before said block is moved by said controlling means to closed position, whereby the extraction of the cartridge before firing is prevented.

In testimony whereof, I have signed my name to this specification.

NICOLAAS BEETS.

Correction in Letters Patent No. 1,387,460.

It is hereby certified that in Letters Patent No. 1,387,460, granted August 16, 1921, upon the application of Nicolaas Beets, of New York, N. Y., for an improvement in "Block-Actions for Repeating Arms," an error appears in the printed specification requiring correction as follows: Page 1, line 42, after the word "charging" insert the word *end;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of October, A. D., 1921.

[SEAL.]

KARL FENNING,

Acting Commissioner of Patents.

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It is hereby certified that in Letters Patent No. 1,387,460, granted August 16, 1921, upon the application of Nicolaas Beets, of New York, N. Y., for an improvement in "Block-Actions for Repeating Arms," an error appears in the printed specification requiring correction as follows: Page 1, line 42, after the word "charging" insert the word *end;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

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[SEAL.]

KARL FENNING,

Acting Commissioner of Patents.