

D. G. HENNICK.
AUTOMATIC FIREARM.
APPLICATION FILED NOV. 4, 1909.

1,004,424.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

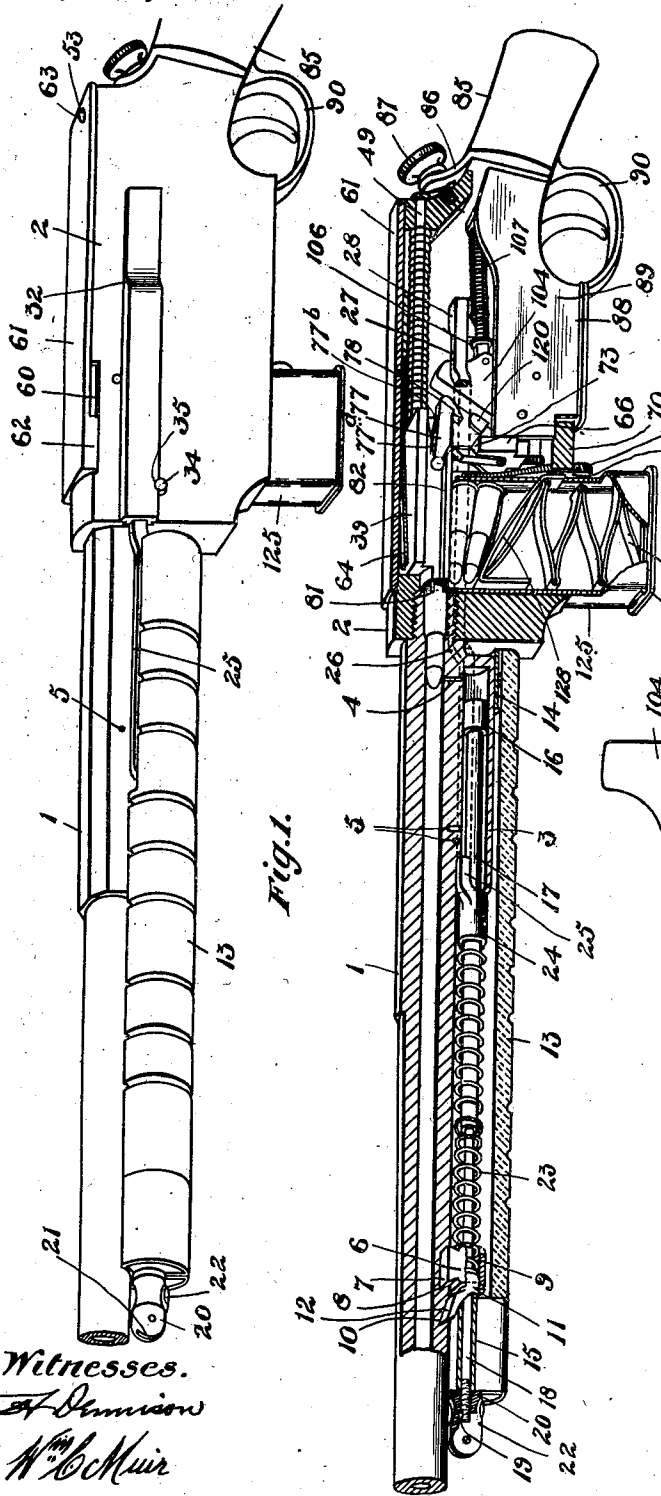


Fig. 1.

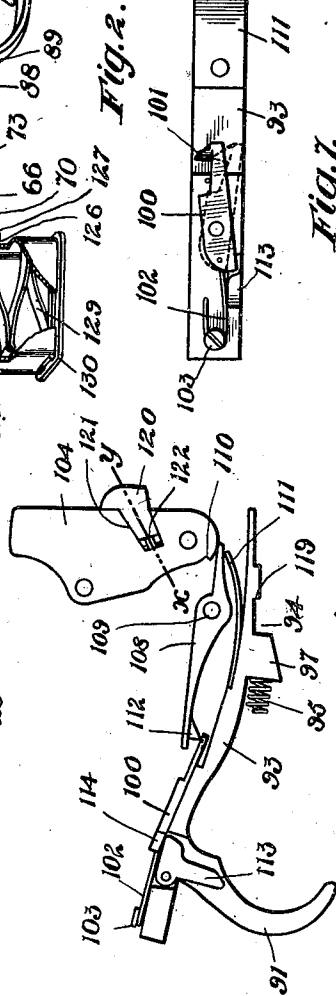
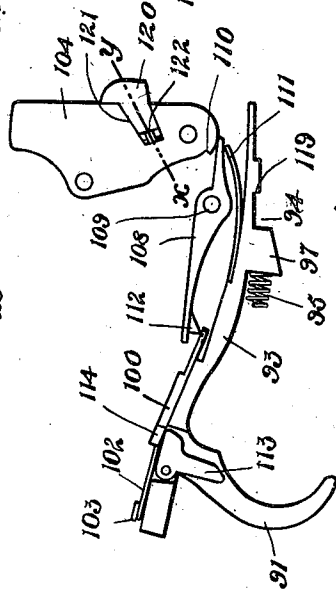


Fig. 2.

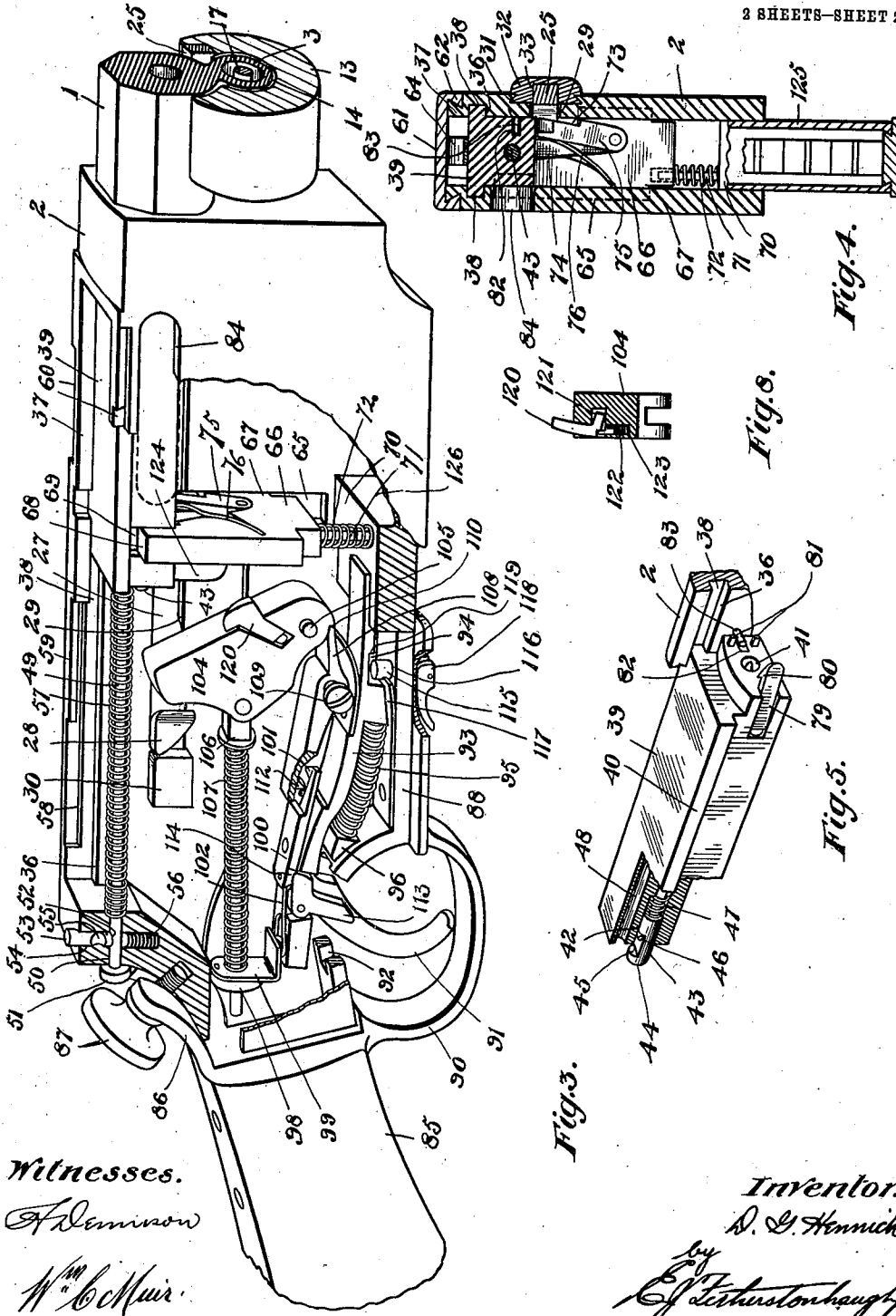


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

DANIEL G. HENNICK, OF MITCHELL, ONTARIO, CANADA.

AUTOMATIC FIREARM.

1,004,424.

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To all whom it may concern:

Be it known that I, DANIEL G. HENNICK, a subject of the King of Great Britain, and resident of Mitchell, in the county of Perth, in the Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

The invention relates to improvements in automatic fire arms, as described in the following specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially in the novel construction and arrangement of parts, whereby the breech mechanism is operated automatically to eject the shell and reload immediately following the firing by a spring operated mechanism actuated by the gases of the explosion and whereby the firing may be operated either singly or in automatic succession.

The objects of the invention are to devise an automatic fire-arm which may be operated to fire singly or in automatic succession, of simple and neat construction, easy to operate and positive and safe in its action.

In the drawings, Figure 1 is a perspective view of my device showing the stock and barrel broken away. Fig. 2 is a longitudinal sectional perspective view showing some of the parts broken away. Fig. 3 is an enlarged perspective view of the breech and hammer mechanism partly broken away. Fig. 4 is a vertical cross sectional view through the breech block and the receiver showing the means for locking the said breech block. Fig. 5 is an enlarged perspective view of the breech block shown partly broken away and disclosing the firing pin. Fig. 6 is an enlarged side elevational view of the trigger and hammer mechanism. Fig. 7 is an enlarged plan view of the trigger showing the pawl for operating the hammer sear. Fig. 8 is a sectional view through the hammer on the line $x-y$ Fig. 6. Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, 1 is the barrel of the rifle secured in the receiver 2 in the usual manner.

3 is a cylinder secured to the underside of

the barrel 1 at the rear end thereof, said cylinder having its forward end open and the end adjacent to the receiver closed.

4 is a small orifice through the barrel 1 forming a communicating passage between the said barrel and the rear end of the cylinder 3 and adapted to conduct a portion of the gases of the explosion from said barrel into the said cylinder.

5 are orifices bored diagonally through the wall of the cylinder 3 and opening into the said cylinder adjacent to its forward end.

6 is a block having a dove-tailed portion secured in the dove-tailed slot 8 formed in the underside of the barrel 1 toward its forward end, said block having a horizontally arranged tapered orifice 9 therethrough, said orifice tapering toward the rear end of the barrel.

10 is a notch cut in the underside of the barrel 1 a short distance forward of the dove-tailed slot 8, said notch sloping upwardly and forwardly.

11 is a tapered bushing fitting within the tapered orifice 9 in the block 6 and having an upwardly extending lug portion 12 fitting into the notch 10.

13 is a hand grip formed hollow and open at the upper side and fitting snugly against the underside of the barrel 1, the rear end being held securely by the spring clip 14 which clips around the outer side of the cylinder 3.

15 is a metal bushing secured in the forward closed end of the grip 13 and arranged in central alinement with the cylinder 3 and the tapered bushing 11, the rear end abutting the bushing 11.

16 is a piston operating in the cylinder 3 and having the piston rod 17 extending forwardly therefrom. The front end 18 of the piston rod 17 is slightly reduced and extends through the bushings 11 and 15 and is threaded at its outer extremity and formed with a narrow slot 19 in the end thereof.

20 is a nut secured on the threaded end 18 of the piston rod 17 and abutting the end of the grip 13, said nut having a longitudinal slot 21 at its front end.

22 is a leaf secured in the slotted front end of the nut 20 and folding snugly thereinto, said leaf being adapted to be swung outwardly to facilitate the turning of the nut

and in its inward position extending into the slot 19 of the piston rod and locking the nut securely.

23 is a spiral compression spring encircling the piston rod 17 and at its forward end abutting the tapered bushing 11.

24 is a collar encircling the piston rod 17 intermediate of its length and rigidly secured thereto so that the rear end thereof is arranged adjacent to the forward end of the cylinder 3 when the nut 20 abuts the forward end of the grip 13.

25 is a rod fixedly secured to or forming part with the ferrule 24 and extending rearwardly from the side thereof and offset upwardly and outwardly at 26, as shown in dotted lines in Fig. 2, the portion beyond the offset extending parallel with the forward portion and having an inward offset 27 toward its extremity and also an inwardly projecting portion 28 at its extremity. The inwardly projecting portion 28 extends downwardly below the underside of the said rod and its forward edge is beveled from its outer face inwardly and the rear edge of the said projection is beveled downwardly and forwardly. The receiver 2 is formed with a longitudinal slot 29 in one side thereof adapted to receive the offset end 27 of the rod 25, the said slot extending from the forward end of the said receiver to a point adjacent to the back.

30 is a block rigidly secured to or forming part with the receiver 2 and extending inwardly at the back end of the slot 29.

31 is a longitudinal dove-tailed recess formed in the outer wall of the receiver 2 and extending on each side of the slot 29 and parallel therewith for the major portion of its length.

32 is a slide formed with a dove-tailed inner side adapted to slide into the dove-tailed recess 31 and having a rectangular shaped slot 33 in its inner side, said slot forming a guide for the squared rod 25.

34 is a pin extending outwardly from the side of the receiver 2 and spring held and engaging a notch 35 in the under edge of the slide 32, said pin locking said slide securely in position.

The receiver 2 is open at the top for the major portion of its length and the sides thereof are formed with the ledges 36 on the inner side extending from end to end thereof of a short distance below the top.

37 are flanges projecting inwardly from the sides of the receiver 2 above the ledges 36 and forming the longitudinal grooves 38, said flanges extending backwardly from the forward portion of the opening in said receiver for about one half of its length.

39 is a breech block having the longitudinal side flanges 40 extending from end to end of the top thereof, said flanges resting

upon the ledges 36 and sliding in the grooves 38.

41 is a circular orifice extending through the breech block from end to end thereof having the enlarged portion 42 at the rear end.

43 is the firing pin slidably arranged in the orifice 41 and having an enlarged end 44 within the enlarged portion 42 of the orifice 41, said enlarged end having a notch 45 formed in its upper side.

46 is a pin secured in the breech block and extending across the enlarged portion of the orifice 42 and through the notch 45 and securing the firing pin in place, the length of the notch allowing for the longitudinal movement of the said firing pin.

47 is a spiral compression spring encircling the firing pin and arranged between the shoulder formed by its enlarged end and the shoulder formed by the enlarged portion of the orifice 41.

48 is a circular orifice in the breech block 39 arranged centrally above the orifice 41 and extending parallel therewith throughout the major portion of the length of the said breech block.

49 is a circular rod extending through the orifice 50 in the rear end of the receiver 2 and into the circular orifice 48 in the breech block 39, said rod having a head 51 at its rear end and a notch 52 formed in one side thereof adjacent to said head.

53 is a pin arranged in the vertical orifice 54 in the rear end of the receiver 2, said pin extending into the notch 52 in the rod 49 and holding it securely in place.

55 is a notch formed in the pin 53 and so arranged that on the depression of said pin in its orifice the rod 49 may be withdrawn. 56 is a spiral spring inclosed within the orifice 54 and holding the pin 53 in engagement with the rod 49.

57 is a spiral spring encircling the rod 49 between the inner side of the end of the receiver 2 and the back end of the breech block 39 and adapted to return the breech block to its forward position following its rearward movement.

The rod 49 is removably secured in place in order that the breech block may be removed if desired. In order to remove the breech block the pin 53 is depressed until the notch 54 is brought into alignment with the rod 49 and said rod withdrawn. The spring may then be taken out and the breech block moved backwardly until the flanged portion clears the flanges 37 of the receiver. The block may then be lifted out of the receiver.

58 are longitudinal slots formed in the inner wall of the sides of the receiver 2 above the ledges 36 and closed in at one end by the inwardly projecting flanges 59.

60 are notches cut in the upper edges of the outer walls of the receiver 2 toward the front end and having the forward portions thereof beveled outwardly and upwardly.

61 is the breech cover adapted to rest upon the top of the receiver 2 and closing in the same, the said cover having the downwardly extending inwardly flanged lugs 62 at the forward end adapted to extend into the notches 60, said lugs having beveled edges to correspond with the beveled forward portions of the said notches. The rear portion of the breech cover 61 is cut inwardly and formed with outwardly extending flanges from the lower portion adapted to drop into the slots 58 and on being moved forward to engage the flanges 59, the said cover being thus held securely from lifting upwardly by the flanges and dove-tailed portions.

63 is a hole in the rear end of the cover 61 into which the spring pin 53 extends when the cover is slid forward, said pin locking the cover securely in place.

64 is a flat leaf spring fixedly secured to the underside of the cover 61 and resting upon the top of the breech block, said spring being adapted to hold the cover from rattling and particularly to guide the cartridges into the barrel as hereinafter more fully explained.

65 are vertical slots formed in the side walls of the receiver 2 intermediate of the length thereof and extending from the top downwardly.

66 is the breech lock slidably arranged between the side walls of the receiver 2 having the side extending portions 67 projecting into the vertical slots 65 and sliding therein.

68 is a projection extending upwardly from one side of the lock 66 into a notch 69 formed in one side of the breech block 39.

70 is a cross bar forming part with the receiver 2 and extending between the sides thereof below the lock 66.

71 is a pin secured in the cross bar 70 and extending upwardly into an orifice in the bottom end of the lock 66.

72 is a spiral spring encircling the pin 71 and holding the lock 66 into engagement with the breech block 39.

73 is a notch formed in the lock 66 on the side opposite to the projection 68, the bottom of said notch extending below the lowermost corner of the beveled portion 28 of the rod 25 and extending inwardly a sufficient distance to allow said portion 28 to pass the said lock.

74 is a recess formed in the front side of the lock 66 adjacent to the notch 73.

75 is a dog pivotally secured at the lower end of the recess 74 and spring held outwardly by a flat spring 76, the latter being

secured in a suitable recess formed in the front face of the lock 66. The side of the dog adjacent to the slotted side of the receiver is cut away slightly to allow the passage of the beveled portion 28 of the rod 25 and the upper end of said dog is beveled upwardly on the front side. On the forward movement of the rod 25 the front beveled edge of the inwardly extending portion 28 of said rod engages said dog and swings it laterally upon its pivot, said portion 28 passing through the notch 73 in the lock 66. The dog 75 springs in behind the member 28 and on the return movement of the rod 25 the back and under beveled side of the extension 28 engages the beveled upper edge of the said dog and forces the lock 26 downwardly. The bolt portion 68 of said lock is thus withdrawn from engagement with the breech block.

77 is a latch or pawl pivotally secured in a recess 77^a formed in the side of the breech block adjacent to the slot 29, said pawl having the downwardly extending catch portion 78 adapted to engage the rearward edge or corner of the inward extension 28 from the rod 25, said pawl being spring held downwardly by a suitable flat spring 77^b secured in the recess 77^a. The rod 25 in its backward movement, that is toward the butt end of the arm, withdraws the lock 66 from the breech block and immediately following the withdrawal of the block the rearward point of the projection 28 engages the pawl 77 and draws the breech block backwardly. The rearward movement of the arm 25 carries the breech block and pawl 77 backwardly until the said pawl comes in contact with the stationary block 30. The rear or inner end of the pawl 77 is beveled downwardly and forwardly and as the beveled edge of the said pawl engages the block 30 the said pawl is forced upwardly until freed from the inwardly extending catch portion 28 of the rod 25. Immediately on the release of the pawl 77 from the member 28 the spring 57 returns the breech block to its forward position.

79 is a spring dog secured to one side of the breech block 39 and having the notched outer end 80 adapted to engage the flange of the cartridge.

81 are a pair of pins secured in the forward end of the breech block and arranged to hold the opposite side of the cartridge flange.

82 is a longitudinal slot formed in the side of the breech block opposite to the dog 79 and arranged mid-way between the pins 81.

83 is a pin fixedly secured in the side of the receiver 2 and extending into the slot 82.

84 is an opening through the side of the receiver 2 adjacent to the dog 79 in the

breech block. The spring dog 79 engages the flange of the cartridge as it rests within the chamber of the barrel and on the backward movement of the block, withdraws the
 5 shell from the said chamber holding said shell securely until it comes in contact with the pin 83 and as the movement of the block is very fast, the pin impacts sharply against the shell and throws it clear of the
 10 spring dog, at the same time said dog gives the shell a side tilt which causes it to be ejected through the side opening 84.

85 is the stock having a bifurcated portion 86 on the upper side adapted to be
 15 secured to the rear end of the receiver 2 by a thumb screw 87 threaded into a suitably threaded orifice in said receiver. The bifurcated portion 86 forms part with a metal frame 88 secured to the stock and
 20 extending forwardly on the underside and engaging the cross bar 70 at the forward end, the side portion 89 being notched to receive the said cross bar.

90 is the trigger guard forming part with
 25 the frame 88.

91 is the trigger extending through a slot 92 above the trigger guard 90.

93 is a forward extension from the trigger 91, said forward extension having the
 30 forward end resting upon the cross bar 70 and adapted to slide back and forth thereon.

94 is a notch formed in the underside of the forward extension 93 of the trigger 91.

95 is the trigger spring arranged between
 35 the lug 96 from the frame 88 and the lug 97 projecting downwardly from the trigger 93.

98 is a lug rigidly secured to or forming part with the side wall portion of the frame
 40 88 and having a central circular orifice therethrough.

99 is a swinging guide bracket substantially L-shaped in form and pivotally secured to the lug 98 above the orifice in said
 45 lug, said swinging bracket having an orifice therethrough corresponding with the orifice in the lug 98. The lower laterally turned portion of the bracket 99 engages the upper rear side of the trigger 91 and forms a
 50 guide therefor holding the said trigger in place.

100 is a latch member pivotally secured intermediate of its length to the upper side of the trigger 91 and having a forwardly
 55 projecting hook shaped portion 101, said hook shaped portion having its front edge beveled backwardly and the top surface of said hook shaped portion beveled downwardly and rearwardly.

102 is a spring having one end secured in the trigger and looped around a suitable pin or screw 103 and secured in the back end of the trigger and extending forwardly and
 60 pivotally secured to the rear end of the pivotal latch member 100.

104 is the hammer pivotally supported on the pin 105, the latter being secured in the permanent side of the frame 88 said hammer being adapted to strike the outer protruding end of the firing pin 43.

106 is a rod pivotally secured to the hammer 104 and extending through the holes in the brackets 99 and lug 98 and sliding thereon.

107 is a spiral spring encircling the rod 106 and abutting the bracket 99 at one end and a shoulder formed on the rod 106 at the other end and exerting a forward push on said rod to swing the hammer on its pivot.

108 is the sear pivotally supported on a screw 109 the latter being secured in the side walls on the trigger frame, said sear having its forward portion adapted to engage the bent 110 in the hammer 104 to hold
 85 the said hammer in its cocked position.

111 is a flat leaf spring secured to the upper side of the forwardly extending portion of the trigger and bearing against the under side of the sear 108 holding said sear
 90 in contact with the rounded bottom portion of the hammer. The rear end of the sear 108 extends over the hook shaped end 101 of the latch 100 and has a downwardly projecting spur 112 having a rearwardly inclined forward edge, said spur being adapted to engage the hook end of the latch member 100. The pulling of the trigger moves the whole trigger member rearwardly against the spring 95. The rearward movement brings the hooked end of the latch 100 into engagement with the forward sloping edge of the spur 112 extending downwardly from the sear 108 and tilts said sear on its pivot, swinging the forward end downwardly and withdrawing it from the bent in the hammer, thus releasing the said hammer and allowing it to swing forwardly to strike the firing pin. The spring 95 returns the trigger to its normal position immediately it is released. As the trigger moves forwardly the forwardly sloping edge of the latch 100 engages the straight rear edge of the spur 112 from the sear 108 and said
 100 latch swings sidewise on its pivot and passes the said spur, the hooked end of said latch swinging back into its place in front of said spur as soon as it clears the same.

113 is a pivotal cam member secured to the side of the trigger 91 having a sloping inner side adapted to engage the sloping portion 114 of the latch 100. The cam 113 in its normal position rests in a recess in the side of the trigger but when the lower end is swung forwardly the upper beveled portion engages the latch 100 and swings it on its pivot moving the front hook shaped end to clear the spur 112 of the sear 108. The trigger mechanism is thus rendered inoperative and the discharging of the arm by the
 135

accidental pulling of the trigger is obviated.

115 is a pin extending through the orifice 116 in the bottom side of the frame 88 and having the horizontal notch adjacent to its upper end, into which the end of the flat leaf spring 117, secured to the top of the said frame, extends, said spring lifting upwardly on said pin.

118 is a cam lever pivotally secured to the bottom end of the pin 115 beneath the frame 88, said lever being adapted to be swung downwardly and outwardly to allow the spring 117 to lift the pin 115. The pin 115 in its raised position engages the shoulder 119 formed by the cross notch 94 in the trigger 91. In this position, that is to say, with the shoulder 119 abutting the end of the pin 115, the hooked end of the latch 100 does not clear the spur 112 but holds the sear tilted out of engagement with the hammer so long as the trigger is held.

120 is a pivotal stop member secured in the recess 121 formed in the side of the hammer 104 and spring held inwardly by the spring held pin 122 arranged within the recess 123 extending laterally from the recess 121.

124 is a projecting lug extending rearwardly from the lock 66 and arranged in alinement with the stop member 120 on the hammer so that when the said lock is withdrawn from the breech block, the said lug 124 will engage the front edge of the stop member 120 and prevent the hammer swinging forwardly to strike the firing pin in the bolt before the said bolt is locked. The inner face of the stop member 120 is beveled upwardly and outwardly, and as the lock moves downwardly to release the breech block the lug 124 will push the said stop member aside, said stop member springing back to its position immediately the said lug passes below the under edge.

125 is the magazine for holding the supply of cartridges, said magazine fitting into the opening 126 between the forward end of the receiver and cross bar 70.

127 is a spring catch fixedly secured to the rear side of the magazine and having a notched portion adapted to engage the cross bar 70 and hold said magazine securely in place.

128 is a follower of the magazine adapted to support the cartridges, said follower being in turn supported by the multiple leaf spring 129 arranged between the follower 128 and the removable bottom 120. The spring 129 holds the cartridges upwardly against the underside of the breech block and on the withdrawal of the breech block the upper cartridge is moved in front of the said block and on the return movement of the said breech block the said cartridge is carried forward to the firing chamber.

In the operation of this device, if it is desired to fire single shots, the cam lever 118 is thrown into the position shown in Fig. 3, drawing the pin 115 downwardly so that the shoulder 119 formed by the cross notch 94 in the trigger member 93 will pass the top of said pin on the pulling of said trigger. The hand grip is then pushed forward with a quick movement to compress the spring 23 and is then released. The spring 23 returns the grip to its original position and drives the rod 25 backwardly. On the return movement of the rod 25 the beveled under edge of the portion 28 of the rod engages the sloping forward side of the dog 75 and throws the lock 66 downwardly freeing the breech block. The rearmost end of the member 28 engages the pawl 77 secured to the breech block 39 just before the lowermost portion of said member passes over the top end of the dog 75, thus drawing the bolt backwardly before the lock is released, consequently when the lock springs upwardly after the said member 28 has passed the locking portion merely springs against the underside of the said breech block. The rod 25 moves rearwardly carrying with it the breech block and said block engaging the hammer 104 swings it upon its pivot until the sear 108 engages the bent in the hammer to hold it in the cocked position. The rod 25 continues its rearward movement, carrying the breech block with it, until the rigid block 30 extending inwardly from the side of the receiver 2 engages the beveled end of the pawl 77. The impact of the pawl against the block 30 forces the said pawl upwardly releasing the hook portion thereof from the member 28 thus releasing the breech block which is returned to its normal position by the spring 57. As the breech block moves backwardly it slips over the upper cartridge in the magazine and immediately the forward end of said breech block clears the said cartridge. The magazine spring forces it upwardly in front of the breech block and against the flat leaf spring 64. The breech block in its return pushes the cartridges into the firing chamber, the spring 64 guiding the point into the said chamber, and the spring dog 80 engages the flange of the cartridge. The lock 66 springs upwardly into place locking the breech block securely the instant the said breech block comes to rest.

The above operations load and cock the arm and it is ready to be fired. To fire the arm, the trigger is pulled, causing the hooked end of the latch to engage and lift the spur 112 on the sear 108, thereby tilting the said sear and releasing the hammer. The hammer swings forwardly on its pivot and strikes the firing pin, discharging the cartridge. Immediately after the bullet passes the orifice 4 leading from the barrel

to the cylinder 3 a portion of the gases of the explosion enters the cylinder 3 through the said orifice and forces the piston 16 forwardly, said piston compressing the spring 23. The piston moves forward until its rear end passes the orifices 5 at the forward end of the cylinder 3 when a portion of the gases escapes from the said cylinder, thus relieving the pressure on the piston so that it will not be driven sharply to a sudden stop and jar the arm before the escape of the bullet from the barrel. As the bullet leaves the barrel the gases escape and release the spring 23 and said spring operates the rod 25 and coacting parts in the same manner as previously described. The breech block moving rearwardly withdraws the discharged shell from the firing chamber and said shell is ejected through the side opening 84 by the operation of the ejector pin as previously described. Immediately following the ejection of the empty shell the next succeeding cartridge within the magazine is forced upwardly by the magazine spring 25 and is placed in the firing chamber in the same manner as previously described and the breech block locked securely. The reloading of the arm is automatically repeated in the manner above described after each shot. It will, therefore, be understood that very rapid firing may be accomplished if desired, that is to say, it is merely necessary to pull the trigger for each shot.

If it is desired to discharge the cartridges in rapid automatic succession it is merely necessary to throw the cam lever 118 downwardly allowing the spring 117 to lift the pin 115 into the notch 94 in the trigger extension 93. The movement of the trigger is thus limited by the shoulder 119 engaging the pin 115 and the latch 100 only moves sufficiently far to lift the sear clear of the hammer and does not pass under the spur 112. The sear is thus held in its tilted position clear of the hammer so long as the trigger is held. Following the discharge of the first cartridge the breech block moves backwardly discharging the empty shell and immediately reloads. The hammer is forced back by the receding bolt and follows the said bolt on its forward movement until the stop member 120 engages the lug 124 on the lock 66. The forward movement of the hammer is thus arrested until the breech block reaches the limit of its closing movement and the hammer is released by the upward movement of the lock 66, the lug 124 moving clear of the stop member 120 and allowing the hammer to strike the firing pin. It will be understood from this description that the hammer follows the breech block very closely and discharges the cartridges immediately following the locking of the breech block the ejection of the empty shell and the reloading occurring in auto-

matic succession while the trigger is held. The firing will, however, immediately cease on the release of the trigger as the sear will immediately swing upwardly and engage the bent in the hammer on the latch 100 moving out of engagement with the spur 112.

All the parts to this device are very simple and very positive in their operation and through the arrangement of the various parts perfect safety of operation is insured. The cartridges cannot possibly be discharged until the breech block is locked and further the device may be rendered perfectly safe against the accidental pulling of the trigger by swinging the safety catch to its forward position, throwing the latch 100 out of operating contact with the sear. All of the parts are very simple to construct and there are no delicate parts likely to get out of order. An arm such as described will be very successful for many purposes and not only renders the very rapid firing possible, but enables the person shooting at a moving object to maintain his sight for a second shot very much better than if he has to operate the reloading by any movements of his own hands and in cases of emergency the whole magazine full of cartridges may be discharged in automatic succession.

All of the parts of the operating mechanism of this device are very easily accessible. The trigger and hammer mechanism may be instantly removed from the receiver by loosening the thumb screw 67 and freeing the bifurcated portion 86 and the stock and trigger frame may be withdrawn. The breech block may be removed by pressing inwardly on the spring pin 53 and sliding the cover 61 rearwardly and on its removal the spring pin 53 may be depressed and the rod 49 withdrawn and on the withdrawal of said rod and its spring, the breech block may be moved to the rear end of said receiver and lifted out, the breech block may then be slipped out of its retaining grooves. The hand grip 13 is held to the piston rod by the nut 20 and the said piston rod may be adjusted so as to adjust the rod 25 properly to bring the pawl 77 into proper engagement with the block 30, that is to say, the point of the cam member 28 may be adjusted to and from the block 30 by turning the nut 20 upon the threaded end of the piston rod. In order to remove the piston from its cylinder and consequently to remove the rod 25 the spring pin 34 may be pressed inwardly to free the slide 32, said slide may then be drawn forwardly out of its retaining groove, the nut 20 is then removed from the end of the piston rod and the grip 13 slipped off the end thereof. Following this, the bushing 11 may be removed from its notch and the spring and piston rod withdrawn. It will thus be seen that all the parts may be easily cleaned and replaced and also that the

hammer and trigger mechanism is very easily and quickly detached from the barrel and receiver for the purpose of packing the gun in a case or for adjustment.

5 What I claim as my invention is:—

1. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a pawl pivotally supported from said breech block, means for locking said breech block in its closed position, a cylinder having a port leading to its rear end from said barrel, a piston operating in said cylinder, a compression spring holding said piston to its rearward position, a rod rigidly connected to said piston and adapted to unlock said locking means and to engage said pawl to retract said breech block, a stationary member within said receiver adapted to disengage said pawl from said rod, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and operated by said breech block, and means for controlling the movement of said hammer.

2. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a pawl pivotally secured to said breech block, means for locking said breech block in its closed position, a cylinder having a port leading to its rear end from said barrel, a piston operating in said cylinder, a compression spring holding said piston to its rearward position, a rod rigidly connected to said piston and having a cam shaped end extending into said receiver, said cam shaped end being adapted to unlock said locking means and to engage the pawl of said breech block to retract said breech block, means within said receiver for releasing said pawl from engagement with the cam shaped end of said rod, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and operated by said breech block, and means for controlling the movement of said hammer.

3. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a pawl pivotally secured in a recess formed in the side of said breech block, means for locking said breech block to its closed position, a cylinder having a port leading to its rear end from said barrel, a piston operating in said cylinder, a compression spring holding said piston to its rearward position, a rod rigidly connected to said piston and extending into said receiver and having a cam shaped end, said cam shaped end being formed with a downwardly and forwardly sloping under edge and an outwardly beveled front edge, the upper corner of said cam being adapted to engage the hooked end of the said pawl, means for releasing said pawl

from engagement with said cam, means for returning said breech block to its forward closed position, a hammer pivotally supported in said receiver and operated by said breech block, and means for controlling the movement of said hammer.

4. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a vertically operating spring held bolt sliding in vertical grooves in the side walls of said receiver and engaging and holding said breech block in its closed position, means for operating said locking bolt actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and operated by said breech block, and means for controlling the movement of said hammer.

5. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver and having a vertical notch cut in one side thereof, a locking bolt slidably supported in vertical grooves formed in the inner walls of the receiver and spring held upwardly and having an upward extension adapted to engage the notch cut in the side of said breech block and a recess in the forward face thereof and a notch in the edge opposite the locking extension, a dog pivotally supported in the recessed portion of said locking bolt and spring held toward the inner wall of the receiver, said dog having its front face beveled backwardly at the top, a cam member having a beveled front edge and a downwardly and forwardly beveled under edge, said beveled front edge being adapted to swing said dog on its pivot on the forward movement and said under edge being adapted to engage the beveled top of said dog and draw said locking block downwardly to free the breech block on the rearward movement of said cam member, said cam member being adapted to engage said breech block in its rearward movement, means operated by the gases of explosion for moving said cam member forwardly, means for returning said cam member to its rearmost position, a hammer pivotally supported in said receiver and operated by said breech block, and means for controlling said hammer.

6. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block, means actuated by the gases of explosion for actuating said unlocking and retracting means, means for releasing said breech block from said retracting means, a spring compressed by said retracting means and adapted to return said breech block to its closed position following its release, a spring operated pivotal ham-

mer supported in said receiver and operated by said breech block, means carried by said locking means and said hammer for retarding the forward movement of said hammer until the breech block is locked, and means for controlling the movement of said hammer independent of the aforesaid means.

7. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a firing pin extending through said breech block and secured therein, a vertically operated locking member for securing said breech block in its closed position, said locking member having a rearwardly projecting lug therefrom, means actuated by the gases of explosion for operating said breech block and locking member, a spring actuated hammer supported in said receiver and adapted to strike said firing pin and having a forwardly projecting member adapted to engage the lug on said locking member when said locking member is withdrawn from said breech block, said lug and projecting member from said hammer being adapted to withhold said hammer from striking the firing pin until the breech block is securely locked, and independent means for controlling the movement of said hammer.

8. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, a locking bolt adapted to lock said breech block in its closed position, said locking member having a rearwardly projecting lug therefrom, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a spring actuated hammer pivotally supported in said receiver, an obstructing member supported in a recess formed in said hammer and extending forwardly therefrom in vertical alinement with the lug projection from said locking bolt, said obstructing member being spring held to its inward position and adapted to spring outwardly to allow the said lock to be withdrawn from the breech block and adapted to engage the rearward edge of the said lug to withhold said hammer from striking the firing pin until the block is raised to its uppermost position locking said breech block, and a trigger mechanism adapted to control the movement of said hammer.

9. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and

spring operated and having a bent formed in its lower end, a sear pivotally supported on said receiver and spring held in engagement with said hammer, said sear having a spur member extending downwardly from its under side, and a trigger having a rigid extension slidably supported in said receiver, and a projecting member adapted to engage the spur of said sear to tilt said sear and swing it clear of said hammer.

10. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and spring operated and having a bent formed in its lower end, a sear pivotally supported from said receiver and spring held in engagement with said hammer, said sear having a downwardly projecting spur member formed with a downwardly and rearwardly inclined forward edge, a trigger member slidably supported within said receiver, and a spring held latch member pivotally secured to the upper side of said trigger member and having a hook shaped forward end adapted on the rearward movement of the trigger member to engage the sloping forward edge of the downwardly projecting spur from said sear to tilt said sear on its pivot and release said hammer and adapted on the forward movement of said trigger member to swing laterally on its pivot and pass said spur.

11. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and spring operated and having a bent formed in its lower end, a sear pivotally supported from said receiver, and spring held to engage the bent in said hammer, a trigger mechanism adapted to engage the downward projection from said sear to tilt said sear to free said hammer, and means for limiting the movement of said trigger mechanism to hold said sear in its disengaged position clear of said hammer.

12. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a

hammer pivotally supported in said receiver and spring operated and having a bent formed in its lower end, a sear pivotally supported from said receiver and spring held to engage the bent in said hammer and having a downwardly projecting spur therefrom, a trigger mechanism adapted to engage the downwardly extending spur from said sear to tilt said sear to free said hammer, a pin spring held upwardly and adapted to engage said trigger mechanism to limit the movement thereof to hold said sear in a disengaged position from said hammer, and means for operating said pin.

13. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver and spring operated and having a bent formed in its lower end, a sear pivotally supported in said receiver and spring held to engage the bent in said hammer, a trigger member slidably supported within said receiver and spring held forwardly and having a cross notch in its under side adjacent to the forward end, means secured to said trigger member for tilting said sear on its pivot, a pin extending through a vertically arranged slot in the bottom of the trigger frame and spring held upwardly and adapted to extend into the notch in the under side of said trigger member, and a cam lever pivotally secured to the outer end of said pin and adapted to raise and lower said pin within said receiver to control the movement of said trigger.

14. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a hammer pivotally supported in said receiver, a rod pivotally secured to said hammer and extending rearwardly therefrom, a lug extending inwardly from the side wall of the receiver, a compression spring encircling said rod between the hammer and said lug and exerting a forward pressure against said hammer, a swinging flanged member pivotally supported from said lug and having a hole therethrough through which said hammer rod extends, a sear pivotally supported upon a suitable pin secured in the side of the receiver, a trigger member slidably supported at its forward end on the cross bar extending across the receiver bottom and retained in place by the

flanged end of the swinging member secured to the lug from the said frame, means secured to said trigger member adapted to tilt said sear on its pivot, a flat-leaf spring secured to said trigger member and engaging the forward end of said sear and holding it to engagement with said hammer, and means for throwing said trigger mechanism out of operating connection with said sear.

15. In an automatic fire arm, the combination with the barrel and receiver, of a breech block slidably supported in said receiver, means for locking said breech block in its closed position, means for unlocking and retracting said breech block actuated by the gases of explosion, means for returning said breech block to its closed position, a spring actuated hammer pivotally supported within said receiver, a sear pivotally supported within said receiver, a trigger member slidably supported in said receiver, a spring held dog pivotally secured to said trigger member and adapted to tilt said sear, and a pivotal cam lever secured to the side of said trigger member and adapted to swing the pivotal dog out of engagement with said sear.

16. In an automatic fire arm, a barrel, a receiver secured to said barrel and formed of a pair of side plates joined together at the ends, said side plates each having a ledge formed in the inner wall and extending from end to end thereof and an overhanging flange extending from the forward end backwardly about one half the length of the opening in said receiver, said side walls also having longitudinal slots in the inner wall thereof above the aforesaid ledges open at the rear ends and longitudinal grooves in the outer side toward the forward end, a cover in the form of a flat plate having downwardly extending flanges adapted to extend into the forward notches and the rearwardly upward slots in said receiver wall and a hole in the rear end thereof extending therefrom, a spring pin supported within a recess in the rear end of said receiver and extending upwardly through a hole in said cover and holding said cover in place closing in the top of said receiver, a flat leaf spring secured to the underside of said cover and having its forward edge extending downwardly adjacent to the entrance to the firing chamber in the barrel, a breech block having outwardly projecting side flanges resting upon the ledges formed in the side walls of said receiver and sliding thereon, means actuated by the gases of explosion for operating said breech block, a hammer pivotally supported within said receiver and operated by said breech block, and a trigger mechanism for controlling the movement of said hammer.

17. In an automatic fire arm, a barrel, a receiver, a breech mechanism operating in

said receiver, a cylinder having a passage leading from its inner end to the inner end of said barrel, a piston and piston rod operating in said cylinder, the forward end of said piston rod extending forwardly beyond the end of said cylinder, a block secured to the underside of said barrel and having an orifice therethrough through which said piston rod extends, a bushing secured in the orifices in said block and encircling said piston rod, a compression spring encircling said piston rod and abutting said bushing at one end, a hand grip inclosing said cylinder and piston rod and spring held in position, said grip having an

opening through the forward end thereof through which the forward threaded end of said piston rod extends, a nut secured on the threaded end of said piston rod, means for holding said nut from turning, and means for operating said breech mechanism rigidly connected to said piston rod.

Signed at the town of Mitchell, in the county of Perth and Province of Ontario, this 18th day of August, A. D. 1909.

DANIEL G. HENNICK.

Witnesses:

F. A. CAMPBELL,
T. H. THOMPSON.