J. C. WHITE.

FIREARM.

APPLICATION FILED AUG. 14, 1907.

1,052,394.

Patented Feb. 4, 1913.

2 SHEETS—SHEET 1.

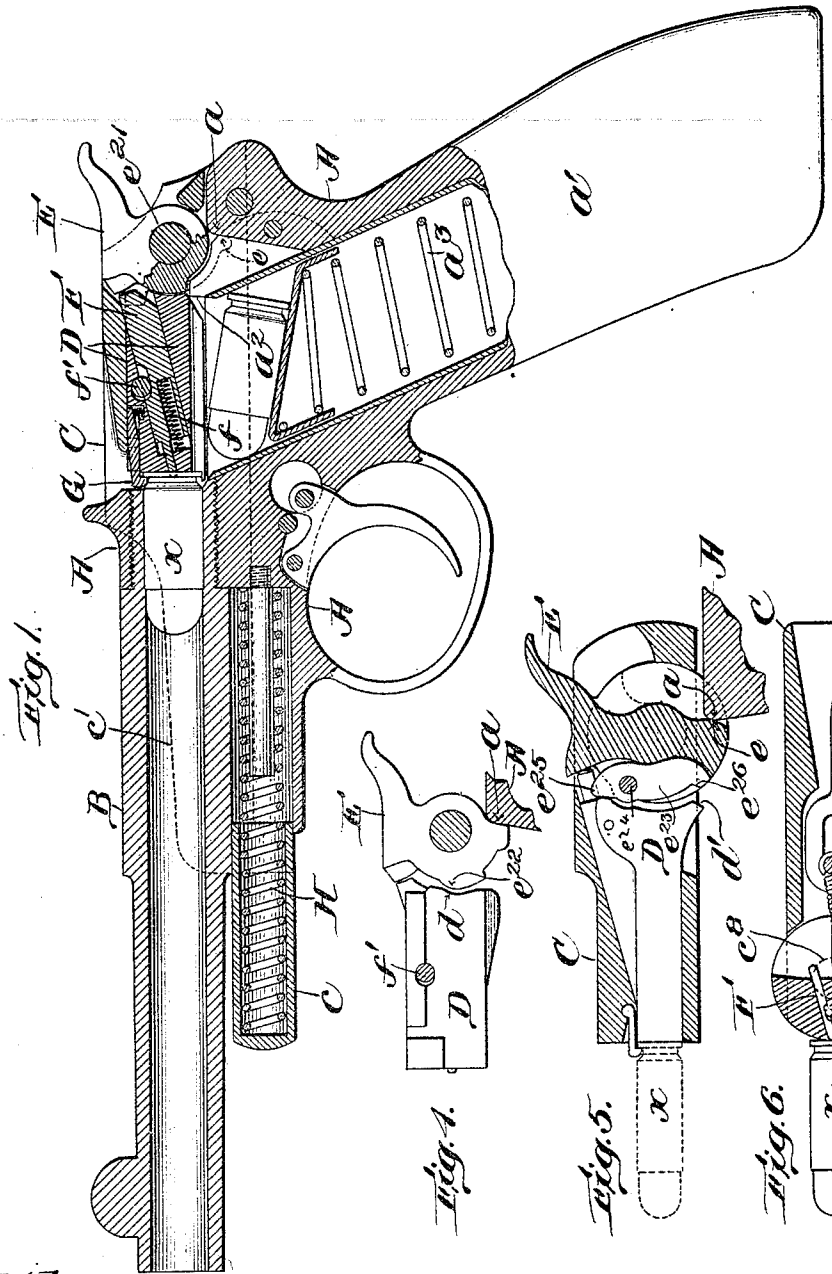

Fig. 1.

Fig. 4.

Fig. 5.

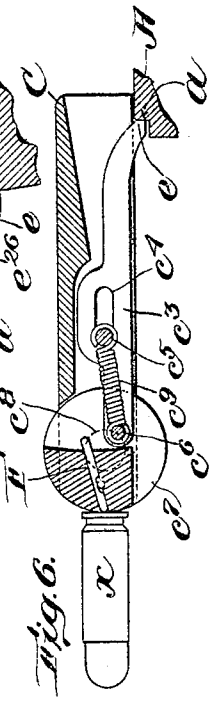

Fig. 6.

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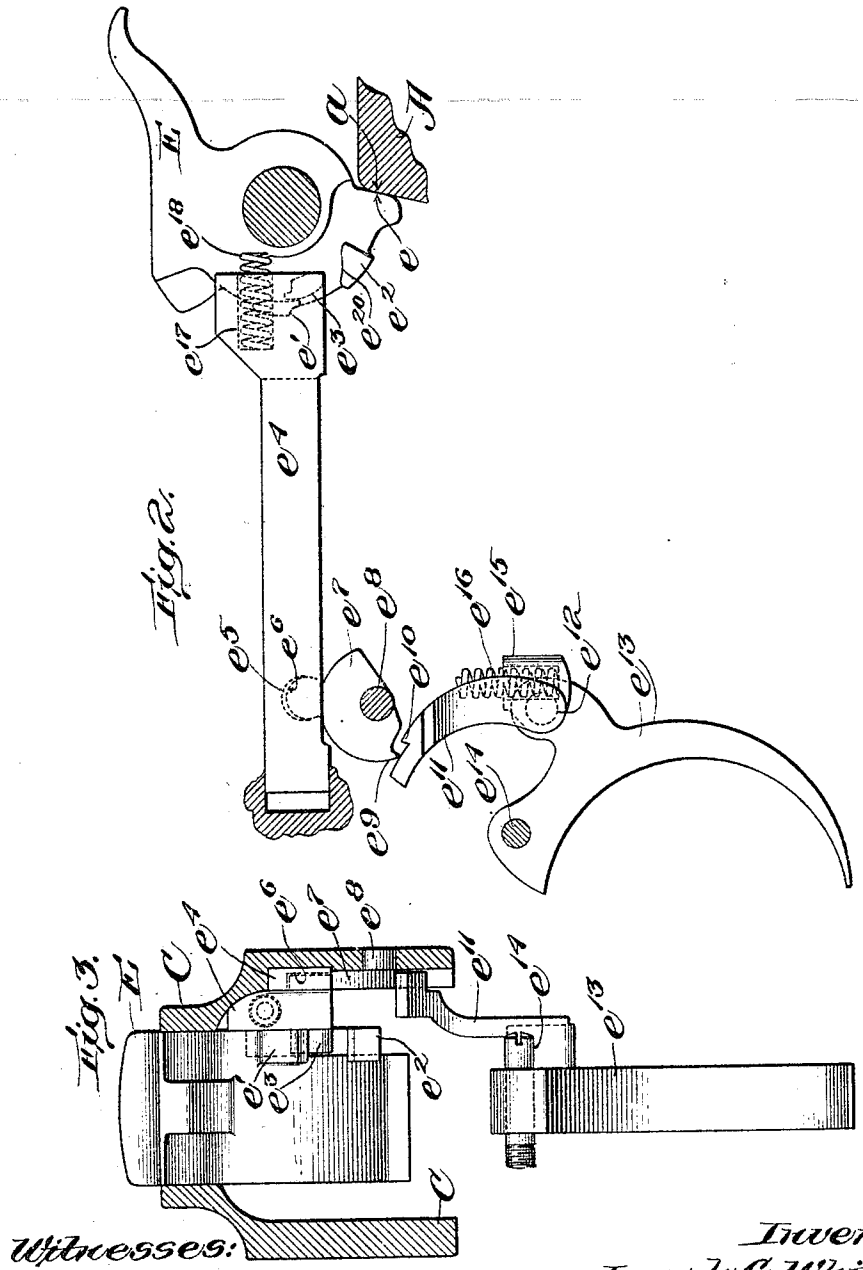

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UNITED STATES PATENT OFFICE.

JOSEPH C. WHITE, OF CHELSEA, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO WHITE-MERRILL COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

FIREARM.

1,052,394. Specification of Letters Patent. Patented Feb. 4, 1913.

Application filed August 14, 1907. Serial No. 388,448.

To all whom it may concern:

Be it known that I, JOSEPH C. WHITE, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Firearm, of which the following is a specification.

My invention relates to automatic firearms, that is, firearms which when fired act automatically to open the breech and in some cases also to eject the shell of a fired cartridge and to feed a fresh cartridge into position in the breech of the barrel.

Experience has taught that uniformity of charge in cartridges used in automatic firearms is not to be had. Whether this is due to careless workmanship or to something inherent in the manufacture of cartridges I am not aware, but the fact remains that an excess charge in cartridges is very common and may result in rendering the firearm inoperative and in injury to the operator. At the same time a charge less than normal would also tend to render the firearm inoperative.

My invention has for its object to obviate these objections and particularly to provide an automatic firearm of very few parts which will operate equally well under variations of charge.

To these ends my invention consists is so constructing the firearm that the pressure of the gases in the barrel acts to prevent the opening of the breech block or receiver until after the pressure in the barrel has fallen to the desired point, or when the piece is fired the pressure in the barrel acts to prevent the opening of the receiver or breech block until the pressure in the barrel has fallen to such a relatively low point that the breech block or receiver will be actuated properly and without danger by that relatively low pressure. In some cases the parts may be adjusted so that the breech block or receiver is locked against opening until the pressure is entirely exhausted so long as it is freed before energy of the recoil is exhausted.

The main feature of my invention is that the opening of the breech block or receiver is retarded by the pressure of the gases in the barrel, which in the best form of my invention acts through a control member that moves with and preferably forms part of the breech block or receiver.

In the accompanying drawings: Figure 1 is an elevation partly in section of a firearm embodying one form of my invention. Fig. 2 is an elevation on an enlarged scale of the hammer and the trigger mechanism detached. Fig. 3 is an end elevation of the mechanism shown in Fig. 2 as viewed from the left of that figure with the addition of the receiver which is shown in section on a vertical plane through the pivot pin of trigger e^{13}. Figs. 4, 5, and 6 are views of modifications.

Having reference to the drawings, A is the frame of my improved firearm, B is the barrel, and C the receiver. At its rear end the barrel B is reduced and threaded to screw into a threaded socket in the frame A so that it is rigidly fixed to the frame. The receiver C is connected with the frame A so as to slide back and forth thereon in the usual manner so far as its mere movements with relation to the frame A are concerned. Within receiver C is slidably mounted a breech block D also referred to as the breech opening control member. On the receiver C is mounted a hammer E coöperating with the firing pin F mounted in the breech block D. The firing pin F is normally held retracted by a spring f and its movements in the breech block D are limited by a pin f' which also serves to hold the breech block D in place within the receiver with provision for limited relative movement sufficient to carry the inner end of the breech block into and out of contact with the hub of the hammer E. Mounted in the forward end of the breech block D is a shell extractor G. The hammer E on its under side is made with a shoulder e to coöperate with an abutment a on frame A. On one of its side faces the hammer E is made with two lugs e' and e^2 both of which coöperate with a lug e^3 forming part of a sear e^4. The sear e^4 at one end is made with a socket e^5 to receive lug e^6 projecting from a rocker e^7 having a trunnion e^8 journaled in one of the side walls of

the receiver C as shown in Fig. 3. The rocker e^7 is made also with a hook e^9 cooperating with a shoulder e^{10} on a dog e^{11}. The dog e^{11} is made with a trunnion e^{12} pivoted in the trigger e^{13} which in turn is pivoted at e^{14} to the frame A. The hub of the dog e^{11} is made with a socket e^{15} to receive one end of a spring e^{16} the other end of which bears against the frame A so that the free end of dog e^{11} is held against the rocker e^7. The sear e^4 is made with a socket e^{17} to receive one end of a spring e^{18}, the other end of which bears against an abutment (not shown) on receiver C so that the tendency of spring e^{18} is to thrust the sear e^4 to the left in Fig. 2 so as to hold the hook e^9 of rocker e^7 in engagement with the shoulder e^{10} of the dog e^{11}, the sear e^4 being mounted to slide in ways within the receiver C so that it can move endwise toward and from hammer E.

In Fig. 2 the hammer is shown in its lowest or fired position, and it will be clear that when it is raised the lug e' will be carried above the lug e^3, and spring e^{18} will then shift the sear e^4 to the left in Fig. 2 so as to bring the lug e^3 under the lug e'. The hammer E being then freed the usual hammer spring (not shown) will swing the hammer forward so as to bring the lug e' down upon the top of the lug e^3 and the latter will hold the hammer in its half cocked position. The two lugs e' and e^3 are hook shaped as shown so that when thus brought into engagement pressure on trigger e^{13} can not disengage them. It will also be clear that if hammer E is thrown farther back into its full cocked position lug e' will be swung away from lug e^3 and as soon as the lug e^2 engages the lug e^3, the beveled surface e^{20} on lug e^2 by engagement with lug e^3, will shift the sear e^4 to the right as the lug e^2 passes the lug e^3. When the lug e^2 is above or past the lug e^3, spring e^{18} shifts sear e^4 to the left in Fig. 2 so as to bring the lug e^3 under the lug e^2 and thus lock the hammer in its full cocked position. It will now also be clear that when the parts are in these positions, pressure on trigger e^{13} will act to lift dog e^{11} and dog e^{11} will oscillate rocker e^7 and thereby shift sear e^4 to the right in Fig. 2 so as to remove the lug e^3 from beneath the lug e^2 thus freeing the hammer and firing the piece.

When the piece is fired the back pressure of the gases in barrel B forces the shell x of the cartridge rearwardly against breech block D and the latter in turn is forced against the hub of hammer E. This brings the pressure upon pin e^{21} but rearward movement of the receiver which carries pin e^{21} is prevented by the engagement of the shoulder e on hammer E with the abutment a on frame A, the frictional contact between breech block D and the hub of the hammer E being sufficient to overcome the tendency of the hammer E to rotate on pin e^{21} due to the engagement of the shoulder e with abutment a until the gas pressure on the breech block is reduced to the desired point or entirely dissipated. Thereupon the hammer is freed from the breech block and receiver C moves rearwardly drawing the shoulder e over the abutment a, and thus shifting the hammer into its full cocked position, where it is caught and held by sear e^4. The receiver C is moved back to its closed position by the recoil spring H, one end of which bears against the frame A and the other end against a yoke C that is part of the receiver. That is, the side walls of the receiver C are extended forward as shown by dotted lines in Fig. 1 at c' and connected by the yoke C at their forward ends, the yoke being chambered to receive the spring H.

The cartridges are stored in the usual manner within the hollow handle a' and each time receiver C moves to the right in Fig. 1, extractor G draws the shell x from barrel B against an abutment a^2 on the frame A so that the shell is discharged from the piece. Then, as receiver C returns to its closed position, the alvance end of breech block D pushes forward the topmost cartridge and forces the latter into barrel B. The cartridges within the hollow handle a' are supported in the usual fashion by a spring a^3.

In Fig. 4 I have shown a breech block D which differs from that shown in Fig. 1 only in that a more or less pronounced shoulder d is provided to coöperate with a more or less pronounced shoulder e^{22} on the hammer E.

In Fig. 5 the hammer E carries a latch e^{23} pivoted at e^{24} and having an arm e^{25} to be engaged by the breech block D. The latch e^{23} is made with a cam shaped shoulder e^{26} to coöperate with a cam shaped shoulder d' on breech block D. In the operation of this form of my invention the back pressure of the shell x shifts the breech block D rearwardly, and by the engagement of the latter with the arm e^{25} the shoulder e^{26} of latch e^{23} is swung into engagement with the shoulder d' and held there until the rearward pressure on breech block D has been so reduced that the frictional engagement between the shoulders d' and e^{26} is overcome by the tendency of the hammer E to rotate, due to the engagement of the shoulder e with the abutment a. The receiver C is then free to travel rearwardly under the influence of the recoil, and then back to its first position again as before.

In Fig. 6 the receiver C carries a lever c^3 made with a slot c^4 through which extends a pin c^5 that connects lever c^3 with the

receiver C. At its front end the lever c^3 is pivoted at c^6 to a rocker member c^7 having trunnions c^8 journaled in receiver C. This member c^7 constitutes an oscillating breech block and carries the firing pin F. At its rear end the lever c^3 is provided with the shoulder e to coöperate with the abutment a on frame A. This form of my invention operates as follows: The back pressure of the cartridge shell causes the shell to engage the member c^7 with so much friction that it is held against turning on its trunnions c^8 until the pressure of the gases has been dissipated, or fallen to the desired point. This friction is then so reduced that the tendency of receiver C to travel rearwardly and the engagement of shoulder e and abutment a acts to turn member c^7 on its trunnions c^8, and in so doing lower the pivot c^6 and elevate the shoulder e, the lever c^3 rocking on the pin c^5 as a fulcrum. As soon as the shoulder e is raised above the abutment a the receiver C is free and completes its rearward movement, and then returns to its forward position again. A spring c^9 connected at one end to the pivot c^6 and at its other end to pin c^5 serves to return the member c^7 and lever c^3 to the position shown.

It will be clear from the above that the action of the receiver under the influence of the pressure or recoil is determined by the effective pressure of the control member opposed to the leverage represented by the distance between the axis of pin e^{21} and shoulder e and that by varying the relation in this respect the effect of the pressure or recoil on the receiver may be varied as desired. It will also be clear that in my firearm the barrel can be and preferably is fixed rigidly to the frame thus obviating the objections to a movable barrel; that whatever may be the pressure exerted by the charge on the control member the receiver is retarded in its operation until that pressure is reduced to the desired point; and that my construction is exceedingly simple and not likely to be disarranged or injured.

What I claim is:

1. In a firearm of the character described the combination of a frame; a receiver on said frame; and means mounted on the receiver and acted upon by the pressure of the gases in the barrel when the piece is fired to momentarily lock the receiver against opening.

2. In a firearm of the character described the combination of a frame; a movable receiver on said frame; and means mounted on the receiver and acted upon by the pressure of the gases in the barrel when the piece is fired to momentarily lock the receiver against opening.

3. In a firearm of the character described the combination of a frame; a longitudinally movable receiver on said frame; and a breech-opening control member mounted on the receiver and acted upon by the pressure of the gases in the barrel to momentarily lock the receiver against opening.

4. In a firearm of the character described the combination of a frame; a longitudinally movable receiver on said frame; means to lock the receiver to the frame; and a breech-opening control member mounted on the receiver and acted upon by the pressure of the gases in the barrel to control said locking means.

5. In a firearm in combination a frame; a movable receiver on said frame; a hammer mounted on the receiver; an abutment on the frame coöperating with the hammer; and a breech-opening control member mounted on the receiver and acted upon by the back pressure of the gases in the barrel to lock the hammer against the abutment on the frame and thereby retard the breech-opening operation of said control member.

6. In a firearm in combination a frame; a movable receiver on said frame; a hammer mounted on the receiver; an abutment on the frame coöperating with the hammer; a breech-opening control member mounted on the receiver and acted upon by the back pressure of the gases in the barrel to lock the hammer against the abutment on the frame and thereby retard the breech-opening operation of said control member; and a trigger on the frame to operate the hammer.

7. In a firearm in combination a frame; a movable receiver on said frame; a hammer mounted on the receiver and having a shoulder; an abutment on the frame coöperating with the shoulder on the hammer; and a member movably mounted on the receiver and acted upon by the back pressure of the gases in the barrel to engage the hammer and momentarily lock the latter against the abutment on the frame and thereby retard the breech-opening operation of the said control member.

8. In a firearm in combination a frame; a movable receiver on said frame; a hammer mounted on the receiver and having a shoulder; an abutment on the frame coöperating with the shoulder on the hammer; and a breech-opening control member movably mounted on the receiver and acted upon by the back pressure of the gases in the barrel to frictionally engage the hammer and momentarily hold the latter against the abutment on the frame and thereby retard the breech-opening operation of said control-member.

9. In a firearm in combination a frame; a movable receiver on said frame; a hammer mounted on the receiver; an abutment on the frame coöperating with the hammer; a

breech-opening control member mounted on the receiver and acted upon by the back pressure of the gases in the barrel to lock the hammer against the abutment on the frame and retard the breech-opening operation of said control member; a sear coöperating with the hammer; and a trigger mounted on the frame and connected with the sear.

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Witnesses:
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