Aug. 28, 1928. 1,682,704

C. C. LOOMIS

FIREARM

Filed Dec. 12, 1925

Fig. 1

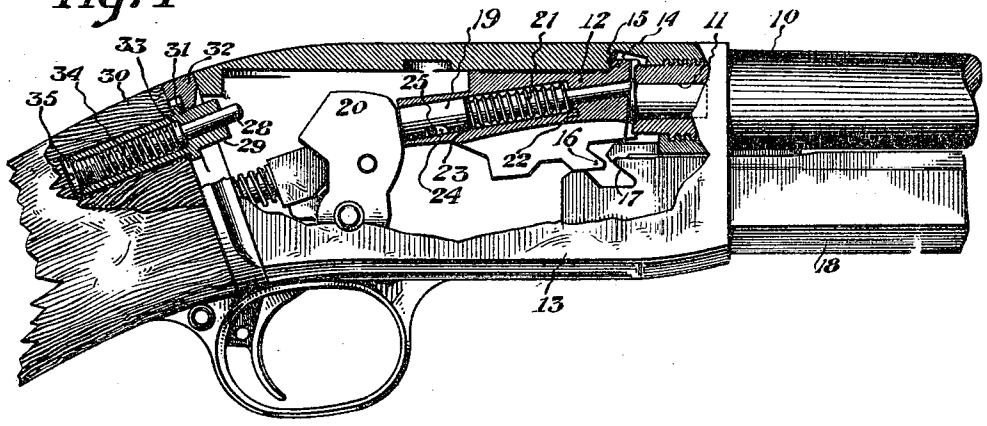


Fig. 2

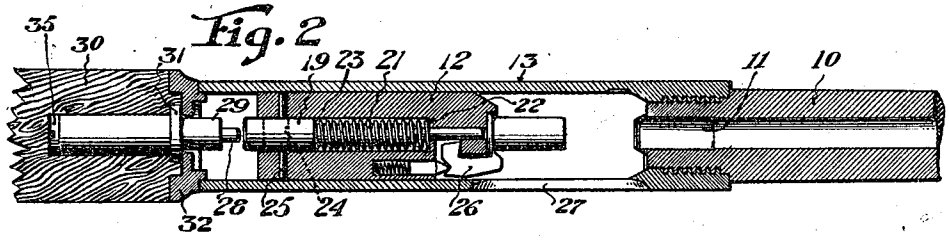


Fig. 3

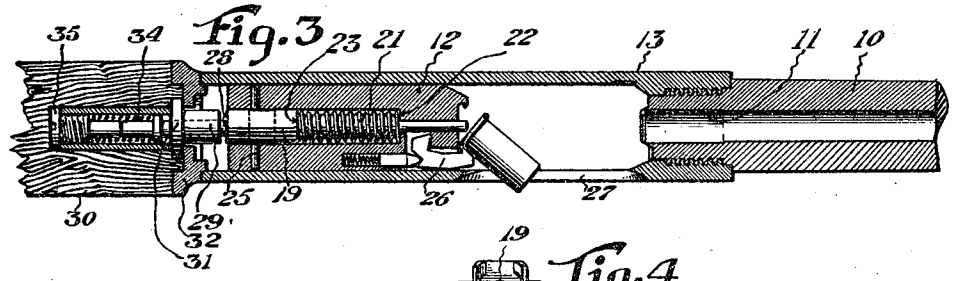
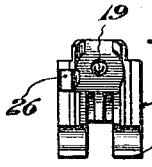


Fig. 4



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Patented Aug. 28, 1928. 1,682,704

UNITED STATES PATENT OFFICE.

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FIREARM.

Application filed December 12, 1925. Serial No. 74,946.

This invention relates to firing and cartridge case ejecting mechanism for firearms and is specially adapted to firearms of relatively small caliber shooting cartridges having relatively short and light cartridge cases, although its utility is not limited to firearms of this particular type.

Cartridge case ejecting mechanisms for repeating guns are of two general types. In the first type, the cartridge case, which is extracted from the chamber and moved rearwardly into the receiver in engagement with the front face of the breech block, is ejected from the receiver by engagement with an abutment extending inward from the side of the receiver; this abutment being fixed to the receiver wall or being adapted to be projected to strike the cartridge case at a certain point in the rearward movement of the breech block. The second type of cartridge case ejecting device comprises an ejector member which extends longitudinally of the breech block and is adapted at the end of the rearward movement of the breech block to engage a fixed abutment, usually the rear wall of the receiver, and to be thereby projected forward against the head of the cartridge case to effect its ejection. In this type of construction, the same member is sometimes made to perform the function of transmitting a blow of the hammer to the cartridge primer, as well as the function of ejecting the cartridge case. In any type of ejecting mechanism which is associated with repeating mechanism adapted for manual actuation, faulty ejection is apt to result if the breech mechanism is retracted very slowly. Either type of ejector is actuated directly by the movement of the breech block and if this movement is slowly performed, the movement of the ejecting member is also very slowly performed. The cartridge case is held firmly against the face of the breech block at this time by a hook shaped extractor which effects its withdrawal from the chamber, and in the event that the ejector mechanism is very slowly actuated, the cartridge case is slowly pushed free from the gripping extractor and may fall within the receiver instead of being ejected therefrom. When this occurs, it is necessary to remove the loose cartridge case from the receiver before a fresh cartridge can be placed in the chamber or the gun action closed. This operation is necessarily troublesome, and a serious jamming of the mechanism may result, if an attempt is inadvertently made to close the action without first removing the loose cartridge case.

The present invention, an illustrative embodiment of which is shown in the drawings and will be hereinafter described in detail, contemplates the provision of an ejector mechanism which functions to positively and forcibly eject the cartridge case regardless of the rapidity or the slowness with which the action of the gun is opened and the breech block retracted. As an incidental, but not entirely necessary feature, the embodiment of the invention which has been selected for the purpose of illustration, comprises a single member which functions as a firing pin, when the gun action is closed, and, when the gun action is opened, is so controlled as to forcibly eject the cartridge case even though the movement of opening the action be performed very slowly.

In the drawings:—

Figure 1 is an elevation partly in section of so much of a firearm as is necessary to show the application of one embodiment of the present invention thereto.

Figure 2 is a horizontal section through the receiver, breech block and part of the stock of a firearm embodying the form of the invention illustrated in Figure 1, the firing pin ejector being shown in its retracted position.

Figure 3 is a view similar to Figure 2 showing the operation of ejecting the shell.

Figure 4 is a front elevation of a breech block embodying the invention.

The barrel 10 of the firearm is provided with a cartridge receiving chamber 11, which chamber is adapted to be closed by a breech block 12, said breech block being mounted for a vertical and longitudinal movement in a receiver or frame 13. The breech block is locked in breech closing position by the engagement of a recoil shoulder 14 thereon with a locking shoulder 15 in the top of the receiver, and is adapted to be both moved downward out of locking engagement with said shoulder and thereafter longitudinally retracted by the engagement of a foot 16 thereon with suitably shaped surfaces 17 on an action bar 18.

The breech lock comprises a centrally lo-

cated longitudinal bore or recess adapted to receive a member 19. Member 19 serves, when the breech is closed, to transmit the blow of the firing hammer 20 to the cartridge primer, and likewise serves, by its cooperation with mechanism to be hereinafter described, to eject the empty shell case, when the breech block is retracted. A spring 21 surrounds an intermediate section of the firing pin-ejector member 19 and bears at its forward end against a shoulder 22 in the breech block and at its rear end against a shoulder 23 on the firing pin. A notch 24 in member 19 comprises stop shoulders which limit the longitudinal movement of this member and receives a pin 25 which extends transversely through the breech block.

The drawings illustrate the application of the invention to a gun shooting rim fire ammunition. It will be seen that when the breech block is in the elevated and locked position illustrated in Figure 1, the firing pin-ejector member 19 is in alignment with the top of the cartridge rim. At this point the rim is solidly backed by the chamber wall, whereas at the sides the chamber wall is cut away to provide clearance for the cartridge rim receiving guides on the breech block. When the firing pin strikes the rim at the top where it is solidly supported the full effect of the blow of the hammer is transmitted to the primer charge, and a cause of misfires eliminated.

When the breech is to be opened after a cartridge has been fired, the breech block must first be moved downward until the recoil shoulder 14 clears the locking shoulder 15. In this downward movement the breech block moves past the head of the cartridge case in the chamber until the end of member 19 comes approximately opposite the center of the cartridge case head. Member 19 now functions as an ejector. As the breech block is retracted the cartridge case is withdrawn from the chamber by a spring controlled extractor 26 which engages the rim of the cartridge case on the side adjacent to the ejector opening 27, and holds the cartridge case against the face of the breech block. The end of the member 19 is now in alignment with the extractor 26 and the ejector opening, and the cartridge case may be ejected through said opening if the member 17 is quickly thrust forward through the breech block. However, in order to project the cartridge case toward the ejector opening, the forward thrust of the ejector member 19 must be rapidly performed. If this ejector is slowly pushed against the cartridge case head, its only effect is to rock the cartridge case about its point of contact with the breech block face beneath the extractor hook. In this movement the hook is pushed outward against the tension of its spring, as shown in Figure 3, and the force thus created tends to move the cartridge case head inward across the breech block, away from the ejector opening. When the cartridge case has rotated a small amount this force is sufficient to overcome the friction between the cartridge case head and the breech block face, and the cartridge case head is projected away from rather than toward the ejector opening. If the cartridge case is comparatively short and light, and its center of gravity thus close to the base, the case will inevitably fall within the receiver, instead of being expelled through the ejector opening, and even long and heavy cases will frequently fail to fall clear of the receiver.

If the ejector is projected from the breech block merely by engagement with a fixed abutment, it may be projected too slowly to properly eject the shell, since this operation is manually performed. In order to insure a rapid and positive ejecting movement of the ejector regardless of the speed with which the breech block is retracted, the present invention contemplates the provision of an abutment or ejector actuator which is adapted to yield a short distance when engaged by the rear end of the member 19, and upon this yielding movement to compress a spring which, when the ejecting movement of the member 19 is initiated, completes this movement with rapidity and precision. The invention further contemplates that the ejector actuator shall engage a fixed stop at the limit of its rearward movement, thereby initiating the forward movement of the ejector which is completed by the spring.

To this end, the embodiment of this device, which has been illustrated in the drawings, comprises an ejector actuator 28 which is mounted in a hollow cylindrical container or holder 29 which is let into the forward end of the stock 30. The holder 29 is secured in place by the engagement of a flange 31 thereon with the front face of the stock and the rear face of a suitably recessed part of a yoke or frame 32 which extends upward from the trigger plate and forms a part of the rear wall of the receiver. A collar 33 on the ejector actuator 28 engages a shoulder in the bore of the holder 29 to limit the forward movement of the ejector actuator. A spring 34 is compressed between the collar 33 and a screw 35, which is threaded into the rear end of the holder 29. The screw 35 also provides an abutment which is engaged by the end of the ejector actuator 28 when spring 34 is fully compressed, as illustrated in Figure 3. Thus, when the rear end of the member 19 engages the ejector actuator 28, the shell case being at this time firmly held in the breech block by the extractor hook, the ejector actuator 28 will move rearwardly compressing spring 34 until it engages the end of the screw 35. Further rearward movement of ejector 19 being thus positively stopped, as the rearward movement of the breech block continuous, this ejector is

positively thrust forward, rotating the cartridge case a sufficient amount to effect its release from the extractor, as hereinbefore described. As the cartridge case yields, compressed spring 34 snaps the ejector forward, projecting the cartridge case through the ejector opening.

It is to be understood that the foregoing description and the drawings merely illustrate a typical embodiment of inventions which may take a variety of different forms, all falling within the scope of the appended claims.

I claim:

1. In a firearm, in combination a longitudinally movable shell ejector, a movable actuator for said ejector, a fixed stop limiting the movement of said ejector actuator, and a spring interposed between said ejector actuator and said fixed stop.

2. In a firearm comprising a breech block adapted to be reciprocated longitudinally in a receiver, an ejector member extending longitudinally of said breech block, an ejector actuator device in the end of said receiver comprising a housing, an ejector engaging stud adapted to yield when engaged by said ejector, a fixed abutment, and a power device associated with said ejector actuator adapted to be energized on the yielding movement of said ejector actuator.

3. In a firearm comprising a chamber adapted to contain a cartridge to be fired, a breech block adapted to close said chamber and to be retracted to open said chamber, means for moving said breech block while in chamber closing position to lock it against retraction, a firing pin ejector contained in and extending from the face of said breech block and adapted when said breech block is in locked position to engage the head of the cartridge in the chamber near its rim and to be moved to a point adjacent the center of the cartrdige head when the breech block is moved to unlocked position.

4. In a firearm comprising a stock, a receiver, a reciprocating breech block in said receiver and a firing pin ejector member located substantially in the lateral center of and extending longitudinally through the breech block, a spring impelled ejector abutment device comprising a part which is let into the forward end of the stock and extends through and is held in place by the rear end of the receiver.

5. In a firearm comprising a stock, a receiver, a reciprocating breech block in said receiver and a firing pin-ejector member located substantially in the lateral center of and extending longitudinally through the breech block, an ejector abutment device comprising a holder which is let into the front end of the stock and extends through and is held in place by the rear end of the receiver, a fixed stop in the rear end of said holder, an ejector actuator in alignment with said fixed stop and projecting from the front end of said holder and a spring interposed between said fixed stop and said ejector actuator.

6. In a firearm comprising a stock, a receiver, a reciprocating breech block in said receiver and a firing pin-ejector member located substantially in the lateral center of and extending longitudinally through the breech block, an ejector abutment device comprising a holder which is let into the front end of the stock and extends through and is held in place by the rear end of the receiver, a fixed stop in the rear end of said holder, an ejector actuator in alignment with said fixed stop, projecting from the front of said holder and adapted to be engaged by said ejector member, a spring adapted to be compressed when the ejector engages the ejector actuator and the forward movement of the ejector is resisted, and to impel the ejector actuator forward when the resistance to forward movement of the ejector is decreased.

7. In a firearm comprising a stock, a receiver, a reciprocating breech block in said receiver and a firing pin-ejector member located substantially in the lateral center of and extending longitudinally through the breech block; an ejector abutment device comprising a holder which is let into the front end of the stock and extends through and is held in place by the rear end of the receiver, an ejector actuator projecting from the front end of said holder, a spring adapted to be compressed by rearward movement of said ejector actuator and a fixed abutment in the rear end of said holder adapted to be engaged by and stop the movement of said ejector actuator.

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