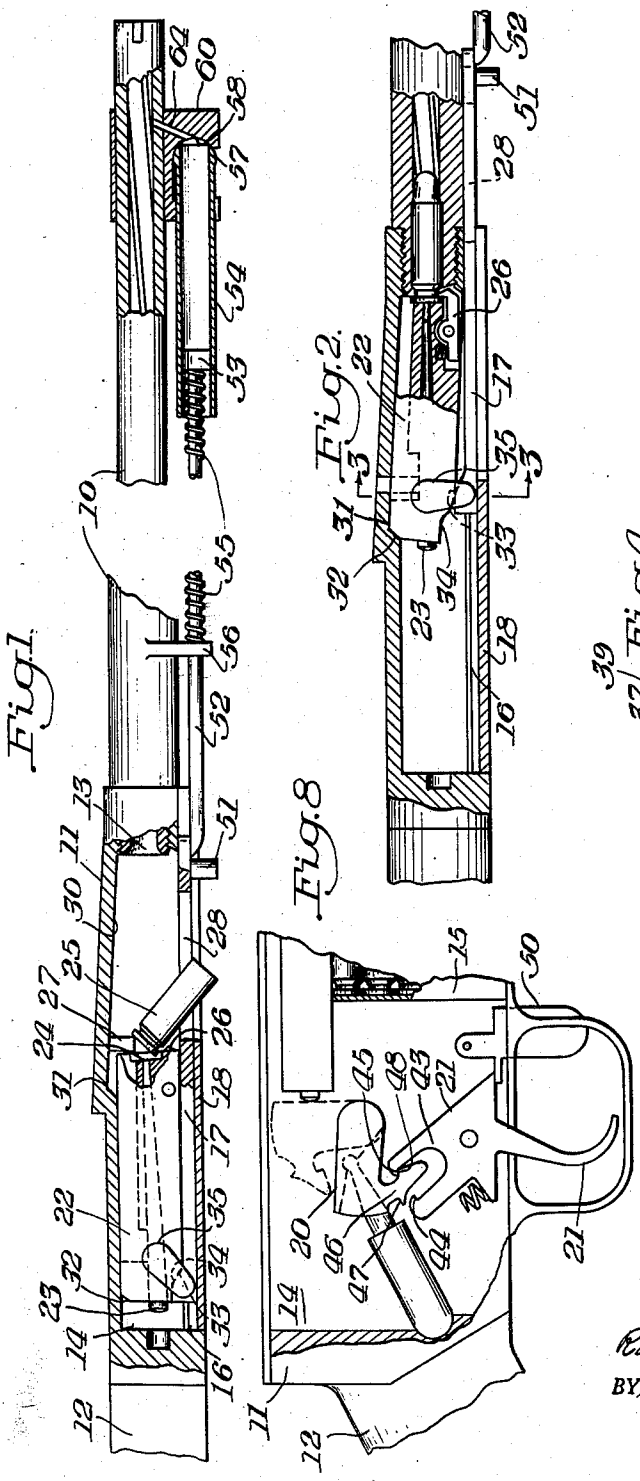
Jan. 30, 1951 R. J. TURNER 2,539,644

TILTING BREECH BOLT LOCK ACTUATING MECHANISM

Original Filed Jan. 3, 1942 2 Sheets-Sheet 1



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TILTING BREECH BOLT LOCK ACTUATING MECHANISM

Original Filed Jan. 3, 1942 2 Sheets-Sheet 2

Fig. 3.

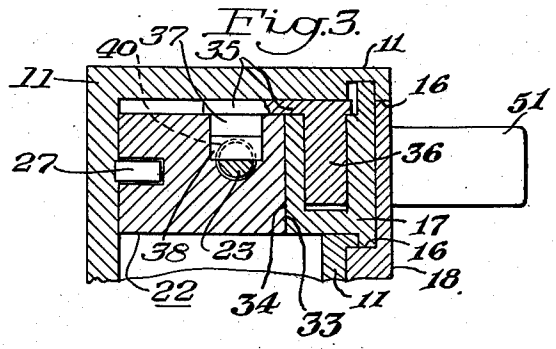


Fig. 5.

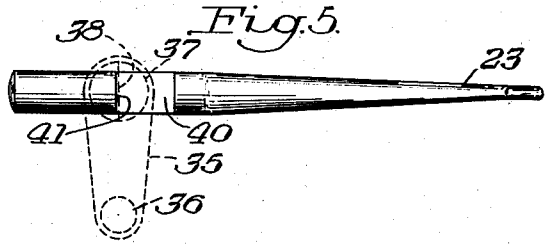


Fig. 6.

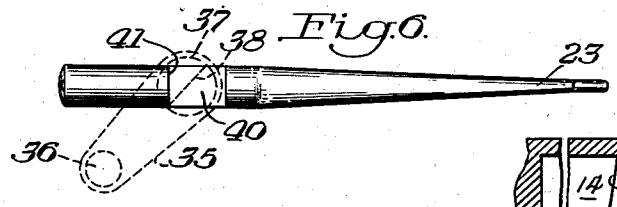


Fig. 7.

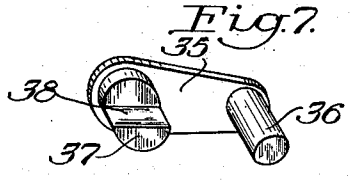
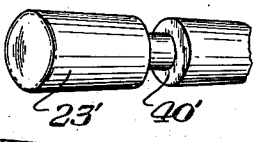


Fig. 9.



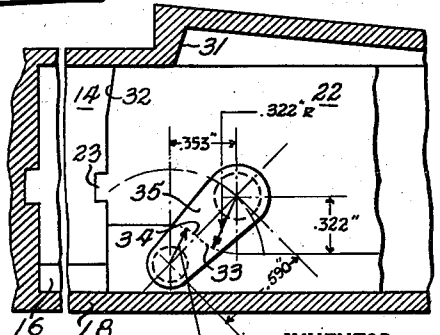


Fig. 10.

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Patented Jan. 30, 1951 2,539,644

UNITED STATES PATENT OFFICE

2,539,644

TILTING BREECH BOLT LOCK ACTUATING MECHANISM

Russell J. Turner, Butler, Pa.

Original application January 3, 1942, Serial No. 425,541. Divided and this application June 15, 1944, Serial No. 540,404

16 Claims. (Cl. 89—184)

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This invention relates generally to firearms and more particularly to breech loading gas-operated automatic firearms.

This is a division of the application on which United States Letters Patent No. 2,365,142 was granted on December 12, 1944, for Firearms.

This invention may be conveniently applied to all types of full and semi-automatic firearms such as machine guns, heavy rifles, light carbines, automatic pistols and other similar self or automatic loading weapons.

The principal object of this invention is the provision of an accurate and rugged automatic firearm the structure of which is reduced to a very few number of parts making the firearm simple in construction and in operation and economical to manufacture.

Another object is the provision of an automatic firearm that may be completely dismantled without the use of hand tools.

Another object is the provision of a breech loading gas-operated automatic firearm that employs the gas pressure of the charge to unlock, withdraw and open the breech, cock the piece, extract and eject the shells, insert a fresh load from the magazine, lock the breech and fire the load.

Another object is the provision of a double stepped trigger that converts the full automatic firearm into a semi-automatic firearm which requires the trigger to be pulled to fire each shot.

Another object is the provision of an operating arm having a cam surface which locks the breechblock in its firing position and when initially retracted by gas pressure unlocks the breechblock by withdrawing the cam surface from its operating position.

Another object is the provision of a novel link which connects the operating arm with the breechblock and serves to dislodge the breechblock from its seat and slide it rearwardly to open the breech, cock the piece, and extract and eject the empty shell.

Another object is the provision of a novel firing pin and an extension on the breechblock connecting link which prevents the firing pin from engaging the primer unless the breechblock is fully locked in its closed position.

Another object is the provision of a shoulder in the side of the receiver against which the breechblock may be seated and locked in its closed position.

Another object is the provision of a receiver which is tightly closed when the breechblock is locked in the firing position and is opened instantaneously when the empty shell is ejected through an opening in the operating arm when in its retracted position.

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Other objects and advantages appear in the following description and claims.

In the accompanying drawings a light semi-automatic carbine is employed as a practical embodiment to illustrate the principles of this invention wherein:

Fig. 1 is a top plan view of the firearm with parts in section and parts broken away, showing the breechblock in its retracted position.

Fig. 2 is a view similar to Fig. 1 showing the breechblock in its closed and fully locked position.

Fig. 3 is an enlarged transverse sectional view illustrating the breechblock and operating link in the position shown in Fig. 2 with parts broken away.

Fig. 4 is a side elevation of the operating arm and the breechblock with parts in section and parts broken away.

Fig. 5 is a top plan view of the firing pin in the firing position with the link illustrated in dotted lines.

Fig. 6 is a view similar to Fig. 5 illustrating the firing pin locked in its retracted position.

Fig. 7 is a perspective view of the under side of the link.

Fig. 8 is a side elevation of the hammer and trigger mechanism with parts broken away, illustrating the semi-automatic feature.

Fig. 9 is an enlarged view of a modified firing pin.

Fig. 10 is an enlarged view of the firing chamber with the breechblock partially retracted from its firing position.

Referring to the drawings the body of the firearm comprises three parts, the barrel 10, the receiver or frame 11 and the grip or stock 12. The breech end 13 of the barrel is fitted to the front end of the receiver 11 and projects into the forward end of the receiver chamber 14. The stock 12 is secured to the rear end of the receiver or frame 11. The forward end of the receiver chamber 14 is open at the bottom to admit the cartridge magazine 15. The right side of the receiver is provided with opposed grooves 16 in a longitudinally extending slot which extends for the full length thereof and which slidably carry the action or operating arm 17. On the same side the rear portion of the receiver chamber 14 is closed by a removable cover plate 18 which retains the operating arm 17 and covers the hammer 20 and the trigger mechanism 21. By first

removing this cover plate the whole firearm may be dismantled.

The breechblock 22 is arranged to slide longitudinally within the receiver chamber 14 and carries the firing pin 23. The front end of the breechblock is recessed in the usual manner as indicated at 24 to receive the rim and primer of the cartridge shell 25. The extractor claw 26 is pivoted in the side of the breechblock and extends forwardly and inwardly to catch on the rim of the cartridge to extract it from the breech of the barrel. An ejector 27 is fixed to the wall of the chamber 14 and is arranged to strike the rim of the cartridge shell and swing it toward the extractor claw when the breechblock is substantially fully retracted. An aperture 28 is provided in the forward portion of the operating arm 17 to permit the shell to be thrown out of the receiver chamber when the operating arm is in its retracted position.

In the left side at the front of the receiver chamber 14 a pocket 30 is provided which tapers towards the breech from the beveled shoulder 31. The corresponding side of the back of the breechblock is provided with the beveled surface 32 which is complementary to and is received by the shoulder 31. When the breechblock is brought forward until the front end engages the end of the barrel it is then shoved sideways to seat the surface 32 on the shoulder 31. The front end of the breechblock is at this time normal to the axis of the barrel and held tightly thereagainst.

The breechblock is shoved sideways into the pocket 30 by means of the complementary cam surfaces 33 and 34 at the rear ends of the operating arm 17 and the breechblock 22 respectively. The operating arm is permitted more travel forward than the breechblock. When these two members are retracted to the rear of the receiver chamber 14 the cam surfaces 33 and 34 intermesh as illustrated in Figs. 1 and 10 and the forward travel of the operating arm moves the breechblock forwardly through these cam surfaces until the front end of the breechblock engages the end of the barrel. The breechblock is stopped but the operating arm continues to move forwardly and the cam surface 33 rides up the cam surface 34 and shoves the rear end of the breechblock to the left into the pocket 30. The breechblock is of such length that the beveled surface 32 seats firmly on the shoulder 31 and is locked in place by the cam surface 33 resting on the outermost surface of the cam 34.

The complementary surfaces 31 and 32 are beveled to such a degree that the blowback of the recoil would unseat and force the breechblock to the back of the receiver chamber 14 if it were not for the fact that the cam 33 locks the breechblock in its seated position.

The operating arm and the breechblock are operatively connected by the link 35 which is provided with a depending stub shaft at each end thereof. The stub shaft 36 is journaled in a vertical opening in the rear end of the operating arm and the stub shaft 37 is journaled in the vertical opening 39 which extends into the firing pin chamber of the breechblock. The curved portion of the cam surfaces 33 and 34 are arcs struck from the axis of the stub shaft 37 which eliminates any interference between the action of the cam surfaces and the action of the link. There is no play or clearance permitted between the link and its associated parts. Thus the operation of the cam surfaces and the link

are in phase which produces a smooth and uniform action.

A portion of the outer end of the stub shaft 37 is cut away, leaving the vertical cam face 38 which lies in a plane passing through the axes of the stub shafts 36 and 37. The end of the shaft 37 carrying the face 38 extends within the firing pin bore and is received in the slot 40 cut in the upper surface of the firing pin 23. If the firing pin is large enough in diameter a circular groove 40' may be employed in place of the slot 40 which would permit the firing pin 23' to rotate as shown in Fig. 9. In the structure illustrated in Figs. 3 and 6 the firing pin is prevented from rotating because the end of the stub shaft 37 contacts or lies closely adjacent the bottom of the slot 40.

When the breechblock is seated and locked in the firing position as shown in Fig. 2 the longitudinal axis of the link 35 and the cam face 38 is disposed parallel to the transverse shoulder 41 in the firing pin forming the back of the slot 40. In this position the shoulder 41 is spaced approximately five hundredths of an inch from the face 38 as illustrated in Fig. 5. This clearance provides ample movement for the firing pin to discharge the primer of the cartridge for such movement may be five hundredths of an inch or less. If the link 35 is swung through a few degrees the cam face 38 engages the shoulder 41 to retract the firing pin 23 and prevent any forward movement thereof. Thus accidental striking of the firing pin by the hammer 20, or any other unforeseen object, prevents the firing pin from engaging the primer unless the breechlock is fully locked in its firing position with the link 35 positioned at right angles to the axis of the gun. It will be noted from the enlarged view of Fig. 5 that it takes very little swinging movement of the link 35 before the cam face 38 on the shaft 37 engages the shoulder 41 of the firing pin. This firing pin safety thus becomes effective before the breechblock is unlocked from its firing position.

The firearm used for the purpose of illustrating this invention is of the semi-automatic type wherein the trigger mechanism is provided with an upwardly extending fork member 43 having opposed shoulders 44 and 45 on the inner edges of the fork members. When the piece is being cocked by the breechblock sldiing rearwardly the hammer tongue 46, which is provided with the shoulders 47 and 48 complementary to the shoulders 44 and 45, is inserted between the forked members of the trigger, permitting the shoulder 47 on the tongue to engage under the shoulder 44 of the trigger before the latter has been released after the first firing. As the trigger is released the shoulder 44 slides off the shoulder 47 and the shoulder 45 engages the shoulder 48 on the hammer tongue. When the trigger is pulled the shoulder 45 slides off the shoulder 48 and releases the hammer so that it is free to strike the firing pin 23. Before the trigger can be released the shell is fired and ejected and the hammer is recocked with the shoulder 47 again engaging on the shoulder 44. If the hammer shoulder 47 did not engage the trigger shoulder 44 while the trigger was still held back the firearm would continue to shoot automatically.

Suitable safety means 50 are provided to lock the trigger mechanism 21.

The fore end of the operating arm 17 is provided with a knob 51 which may be grasped by the hand to retract the operating arm. Upon

releasing the knob the operating arm springs forward and the front of the breechblock picks up a shell from the magazine 15 and inserts it into the breech of the barrel. The piece is thus cocked loaded and ready to fire.

An actuating rod 52 is detachably connected at one end to the fore part of the operating arm 17 and at its other end to the gas piston head 53 which is arranged to operate within the gas cylinder 54. The rod 52 and the operating arm 17 are normally retained in the forward position by the actuator spring 55 which is inserted under initial compression between the piston head 53 and the actuator bracket 56. The latter is secured to the barrel and is provided with a slot for receiving the actuator rod 52.

The fore end of the gas cylinder 54 is provided with the enlarged head 57, the peripheral surface of which is spherically ground to fit the spherically ground socket 58 in the gas cylinder block or support 60 that is secured to the side of the barrel adjacent the outer end.

In operation when the gun is closed and empty, and a full magazine has been inserted, the breechblock 22 is pulled all the way back by the knob 51 on the operating arm 17, which action cocks the piece. The knob is then released and the actuator spring 55 moves the breechblock forward, picking up a round from the magazine and inserting into the breech. Continued movement of the operating arm then locks the breechblock in place. When the cartridge is fired the bullet travels down the barrel 10 and after it passes the gas vent 64 a portion of the propellant gas blows back through the vent, filling the gas cylinder space and driving the piston 53, the operating arm and the breechblock back to the end of their stroke. The initial movement of the operating arm causes the two opposing cam surfaces 33 and 34 on the arm and breechblock to slide relative to one another to unlock the breechblock. When the operating arm 17 starts to the rear the link 35 is swung clockwise, causing the face 38 on the shaft 37 of the link to engage the shoulder 41 in the end of the slot 40 in the firing pin 23. The swinging of the link draws the firing pin back from the forward end of the breechblock and locks the same against forward movement. Any accidental breakage of the trigger mechanism causing the hammer to fall at the wrong time could not fire the gun. Thus the initial rearward movement of the operating arm swings the link 35 which locks the firing pin and simultaneously slides the cam surface 33 rearwardly of the cam surface 34 until they intermesh as shown in Fig. 1 at which time the breechblock is completely unlocked. The cam surfaces 33 and 34 thus unlock the breechblock independently of the link 35.

If a round has been fired the breech pressure will force the unlocked breechblock off the shoulder 31 and out of the pocket 30. The force of the breech pressure on the breechblock acts through the cam surfaces 34 and 33 to aid the force, previously transmitted to the operating arm, in moving the mechanism to the rear of the chamber. The link 35 takes no part in the action of these forces other than to maintain the cam surfaces in contact during the complete operation.

If the breech is opened manually by drawing back the operating arm by means of the knob 51, then the link 35 gradually withdraws the rear end of the breechblock from the pocket 30 and off the shoulder 31 as the cam surfaces 33 and 34 slide over one another and the breechblock is completely withdrawn from the pocket when these cam surfaces intermesh as shown in Fig. 1. Further retraction of the operating arm draws the breechblock to the rear of the chamber. Under these conditions the link 35 not only functions to lock the firing pin but it also acts as a coupling to pull the breechblock out and back. When the knob 51 is released the spring 55 drives the operating arm forward. The cam surface 33 forces the breechblock forward, seats it and locks it by riding over the cam surface 34. The link 35 is not employed to transmit force to the block during this forward movement.

During the rearward stroke of the breechblock the empty shell is carried back by the extractor claw 26 until the rim of the shell hits the ejector 27 which throws the shell through the operating arm aperture 28 and out of the gun. As the breechblock draws away from the breech the extractor claw withdraws the empty shell and carries it back until the rim strikes the ejector, pivoting the shell on the extractor claw and swinging it out through the aperture 28 in the operating arm, which at this instance is substantially fully retracted. During the rearward stroke the breechblock forces the hammer down, causing the shoulder 47 to engage under the shoulder 44 before the operator has a chance to release the trigger. The breechblock then strikes the rear wall of the receiver chamber with the operating arm. The actuator spring 55 is then fully compressed and the stored energy then moves the mechanism forward. Upon its forward movement the breechblock picks up another round from the magazine and inserts it into the breech. When the breechblock is stopped in its forward travel by the barrel 10 the continued pull of the actuator spring 55 on the operating arm causes the link to rotate counterclockwise and the two cam surfaces 33 and 34 slide upon one another, thus driving the end of the breechblock sideways into the pocket 30 and locking it on the seat 31.

When the operating arm 17 is in the forward position the aperture 28, through which the discharged shell is thrown, is forward of the receiver and any opening into the receiver chamber is closed against mud or sand or foreign matter that would ordinarily fall into the mechanism. The time that the aperture 28 is open during discharge is very short and the shell is on its way out during most of this time. Thus the firearm is very well protected and will continue to fire after being completely buried in mud. The cover plate 18 over the rear end of the receiver and back of which the operating arm 17 slides provides quick access to the hammer and trigger mechanism.

I claim:

1. In a firearm, the combination of a barrel, a receiver secured to the barrel and provided with a chamber, a breech-block member mounted in the chamber for longitudinal reciprocation therein, a pocket in the receiver and tapering forwardly to the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber, a spring-biased operating arm member for the breech-block mounted to slide in the receiver with the breech-block and on the opposite side of the chamber from the pocket, and continuously engaging and mating complementary cam surfaces of reversed curvature on the members interengaged in surface contact to transmit the blow back force between the members when they are retracted rearwardly of

the pocket and which ride upon one another to move the rear end of the breech-block member away from the operating arm and into seating engagement against the shoulder in the pocket when the front end of the breech-block member is in engagement with the front wall of the chamber.

2. In a firearm, the combination of a receiver, a breech-block member and a spring-biased operating arm member reciprocally carried by the receiver, a pocket in the receiver, a shoulder at the rear end of the pocket facing forwardly and outwardly to form a seat, continuously engaging and mating complementary overlapped cam surfaces of reversed curvature on said members interengaged in surface contact to transmit blow back forces and permit the spring-biased operating arm to move the breech-block to the front of the receiver and then slide over one another to seat and lock the breech-block member in the firing position in said pocket, and means to actuate said operating arm member.

3. In a firearm, the combination of a receiver, a breech-block member and an operating arm member reciprocally carried by the receiver, a pocket in the receiver, a shoulder at the rear end of the pocket facing forwardly and outwardly to form a seat, continuously engaging and mating complementary cam surfaces on said members having reversed circular-arc portions interengaged in surface contact to transmit blow back forces and move the breech-block to the front of the receiver and then slide over one another to seat and lock the breech-block member in the firing position in said pocket, and a link having spaced stub shafts pivotally connecting said members permitting limited relative movement therebetween, said link pivoting on the centers from which the cam surfaces are generated.

4. In a firearm, the combination of a receiver, a breech-block member and an operating arm member reciprocally carried by the receiver, a firing pin carried by the breech-block member, a pocket in the receiver, a shoulder at the rear end of the pocket facing forwardly and outwardly to form a seat, continuously engaging and mating complementary cam surfaces on said members having reversed circular-arc portions interengaged in surface contact to transmit blow back forces and move the breech-block to the front of the receiver and then slide over one another to seat and lock the breech-block member in the firing position in said pocket, a link having spaced stub shafts pivotally connecting said members permitting limited relative movement therebetween, said link pivoting on the centers from which the cam surfaces are generated, and means carried by said link for retracting and locking the firing pin upon initial movement of the operating arm before the breech-block is unlocked from the firing position

5. In a firearm, the combination of a receiver, a breech-block member and an operating arm member reciprocally carried by the receiver, a firing pin carried by the breech-block, a pocket in one side of the receiver, a shoulder at the rear end of the pocket facing forwardly and outwardly to form a seat, continuously engaging and mating complementary curved cam surfaces on said members having reversed circular-arc portions interengaged in surface contact to transmit blow back forces when the members are moved rearwardly of the pocket in the receiver and which slide over one another to seat and lock the breech-block member in the firing position in said pocket, a link having spaced stub shafts pivotally connecting said members permitting limited relative movement therebetween, said link pivoting on the centers from which the cam surfaces are generated, and means on the breech-block link shaft for retracting and locking the firing pin upon initial movement of the operating arm before the breech-block is unlocked from the firing position.

6. In a firearm, the combination of a receiver having a chamber, a barrel secured to the front end of the receiver, a breech-block slidably mounted to reciprocate longitudinally within the chamber of the receiver, a pocket on one side of the receiver chamber tapering from adjacent the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber, a reciprocating breech-block operating arm slidably supported by the receiver on the opposite side of the chamber from the pocket, a link having spaced stub shafts pivotally connecting the rear of the breech-block with said arm, and a surface on said operating arm to transmit blow back forces and to engage and move the breech-block forwardly and force the rear end thereof into the pocket and into seating engagement with the shoulder when the front end of the breech-block is in engagement with the front wall of the receiver in its firing position, said link withdrawing the breech-block from the shoulder and retracting it rearwardly in the receiver chamber when said operating arm is retracted.

7. In a firearm, the combination of a receiver having a chamber, a barrel secured to the front end of the receiver, a breech-block slidably mounted to reciprocate longitudinally within the chamber of the receiver, a firing pin carried by the breech-block, a pocket on one side of the receiver chamber tapering from adjacent the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber, a reciprocating breech-block operating arm slidably supported by the receiver on the opposite side of the chamber from the pocket, a link having spaced stub shafts pivotally connecting the rear of the breech-block with said arm, a surface on said operating arm to transmit blow back forces and to engage and move the breech-block forwardly and force the rear end thereof into the pocket and into seating engagement with the shoulder when the front end of the breech-block is in engagement with the front wall of the receiver in its firing position, said link withdrawing the breech-block from the shoulder and retracting it rearwardly in the receiver chamber when said operating arm is retracted, and means on one of the link stub shafts pivoted in the breech-block for holding the firing pin in its retracted position when the operating arm swings said link.

8. In a firearm, the combination of a receiver having a chamber, a barrel secured to the front end of the receiver, a breech-block slidably mounted to reciprocate longitudinally within the chamber of the receiver, a firing pin carried by the breech-block, a pocket on one side of the receiver chamber tapering from adjacent the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber, a reciprocating breech-block operating arm slidably supported by the receiver on the opposite side of the chamber from the pocket, a link having a pair of depending shafts, one shaft pivotally mounted in said arm and the

other shaft pivotally mounted in the breech-block, a surface on said operating arm arranged to transmit blow back forces and to engage and move the breech-block forwardly and force the rear end thereof into the pocket and into seating engagement with the shoulder when the front end of the breech-block is in engagement with the front wall of the receiver in its firing position, said link withdrawing the breech-block from the shoulder and retracting it rearwardly in the receiver chamber when said operating arm is retracted, a shoulder on the firing pin, and a cam face on the link shaft in the breech-block arranged to engage the shoulder on the firing pin to retract and hold it from firing when the operating arm swings said link.

9. In a firearm, the combination of a barrel, a receiver secured to the barrel and provided with a chamber, a breech-block member mounted in the chamber for longitudinal reciprocation therein, a pocket in the receiver and tapering forwardly to the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber to form a seat, an operating arm member for the breech-block mounted adjacent the opposite side of the chamber from the pocket, continuously engaging and mating complementary cam surfaces on the members having reversed circular-arc portions interengaged to transmit blow back forces when the members are retracted rearwardly and which ride upon one another to seat and lock the breech-block member when moved into the pocket, and a link having spaced stub shafts pivotally connecting said members permitting limited relative movement therebetween, said link pivoting on the centers from which the cam surfaces are generated, the combined action of said cam surfaces and said link being arranged to force the rear end of the breech-block member on the shoulder and lock it in firing position when the front end of the breech-block member is in engagement with the front wall of the chamber and to unlock and retract the breech-block to the rear of the chamber.

10. In a firearm, the combination of a barrel, a receiver secured to the barrel and provided with a chamber, a breech-block mounted for longitudinal reciprocation in the chamber, an action arm arranged to lock the breech-block in the firing position, means defining a firing pin bearing disposed longitudinally in the breech-block, a firing pin operable therein, means defining a second bearing disposed normally to and intersecting the firing pin bearing, a shoulder on the firing pin adjacent the second bearing, and means operated by said action arm and journaled in the second bearing to swing and engage said shoulder and prevent the firing pin from operating as the action arm retracts.

11. The structure of claim 10, characterized in that said last mentioned means comprise a shaft having a notched section that permits movement of the firing pin when the breech-block is locked and engages said shoulder when the breech-block is unlocked.

12. In a firearm, the combination of a receiver, having a chamber, a barrel secured to the front end of the receiver, a breech-block slidably mounted to reciprocate longitudinally within the chamber of the receiver, a forwardly and outwardly facing seat on one side of the receiver chamber to be engaged by the breech-block when locked in firing position, a reciprocating operating arm slidably supported by the receiver, a bearing in the breech-block, a bearing carried by the operating arm, a link having spaced depending shafts journaled in the bearings of the breech-block and the operating arm for retracting the breech-block from said seat, and continuously engaging and mating complementary interengaging cam means of reversed curvature on the breech-block and the operating arm for transmitting forces therebetween and for seating and locking the breech-block on said seat.

13. The structure of claim 12 which also includes a firing pin carried by the breech-block, a shoulder on the firing pin adjacent the bearing in the breech-block, and means on the shaft in said last mentioned bearing for preventing the operation of the firing pin when the link swings before retracting the breech-block from said seat.

14. The structure of claim 12 which also includes a firing pin carried by the breech-block, means effective by the rotation of the shaft in said bearing for locking and unlocking the firing pin.

15. In an automatic firearm, the combination of a barrel, a receiver secured to the barrel and provided with a chamber, a breech-block member mounted in the chamber for longitudinal reciprocation therein, a pocket in the reeciver and tapering forwardly to the barrel, a shoulder at the rear end of the pocket facing forwardly and outwardly toward the chamber, an action arm member slidably mounted in the receiver on the side opposite to the pocket, continuously engaging and mating complementary cam surfaces on the members having reversed circular-arc portions interengaged in surface contact to transmit forces therebetween when the members are retracted rearwardly of the pocket, the curved portion of the cam surface on the action arm member being positioned behind the curved cam surface on the breech-block member when retracted, the curved cam surfaces riding upon one another to force the rear end of the breech-block member into the pocket and into seating engagement with the shoulder when the front end of the breech-block member is in engagement with the front wall of the chamber and when on top of one another to lock the breech-block member in firing position, and a link pivotally connected to each of said members on center points from which the convex portions of said cam surfaces are generated to continuously maintain the cam surfaces in contact.

16 The structure of claim 15 which also includes a firing pin carried by the breech-block, and means actuated by the swinging movement of the link to retract the firing pin when the action arm member is unlocking the breech-block before it is unseated.

RUSSELL J. TURNER.

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