

[54] **FALLING BREECH BLOCK ACTION
FOR A SINGLE SHOT FIREARM**

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[57] **ABSTRACT**

A hammerless falling breech block action for a breech loading single shot firearm which has a breech block within a recess in the receiver and which is raised and lowered by a finger lever pivoted under the receiver.

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[51] Int. Cl.....F41c 11/04
[58] Field of Search.....42/23, 24

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8 Claims, 9 Drawing Figures

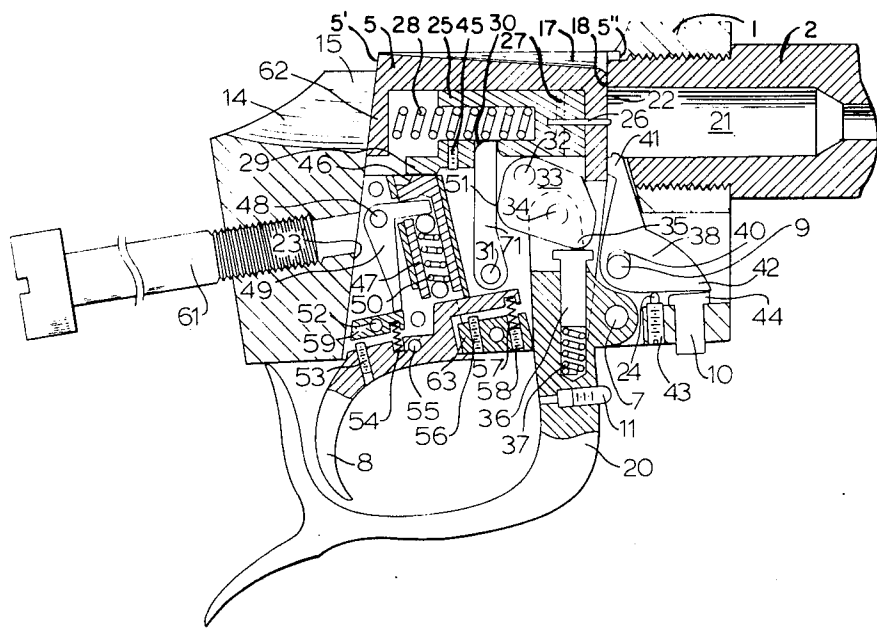


Fig. 1

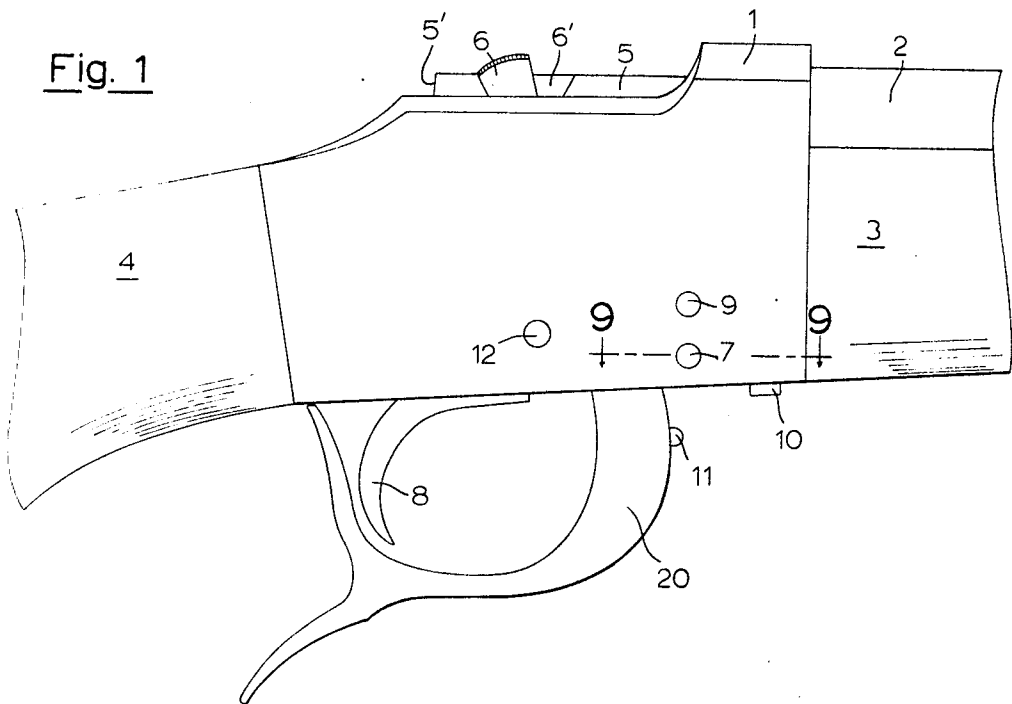
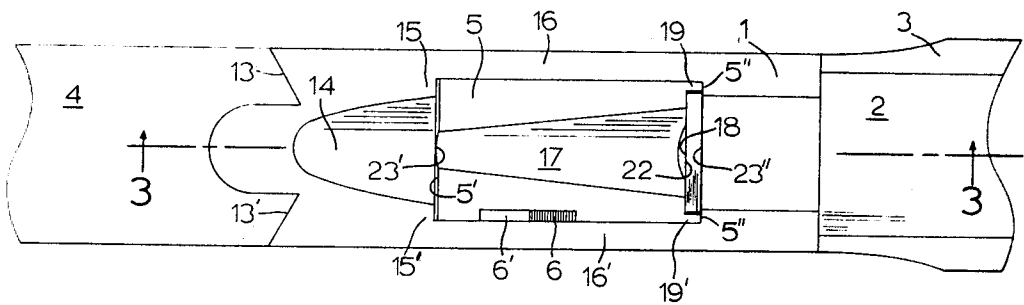


Fig. 2



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Fig. 3

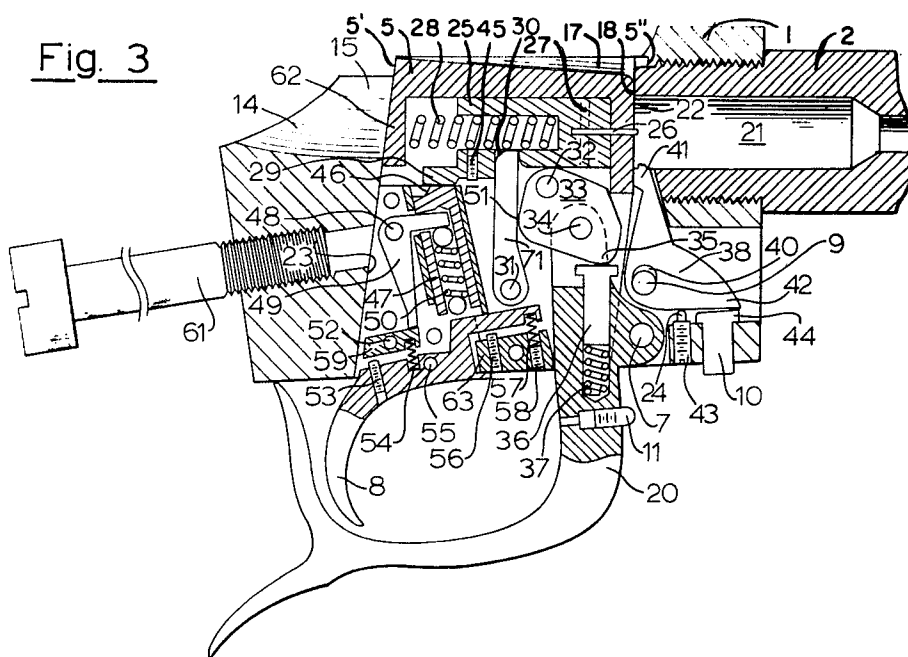
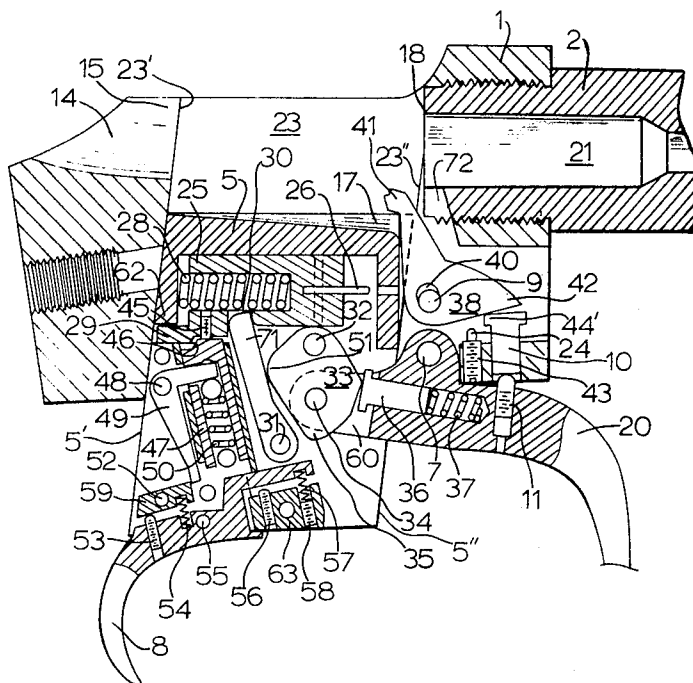


Fig. 4



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Fig. 5

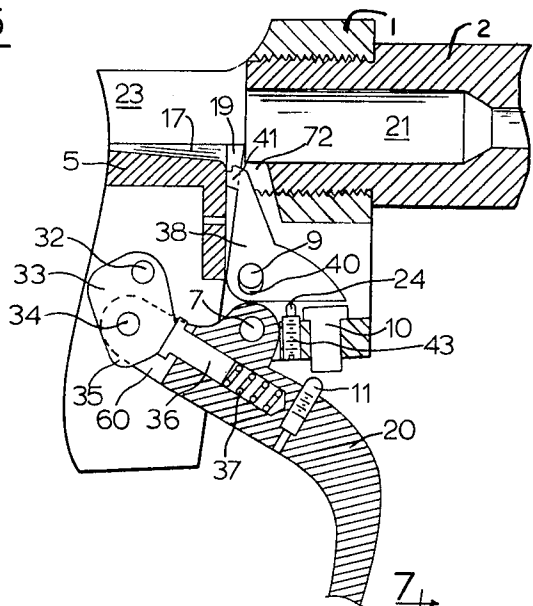


Fig. 7

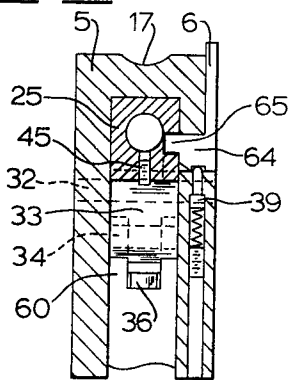


Fig. 6

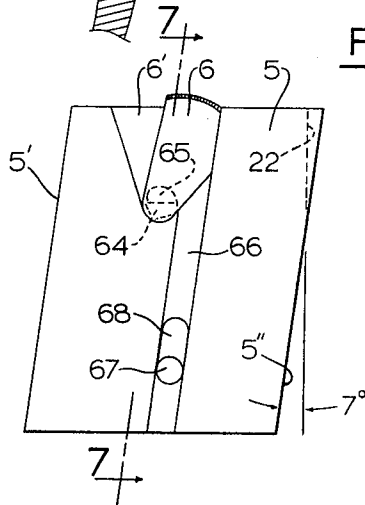


Fig. 9

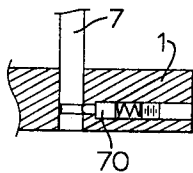
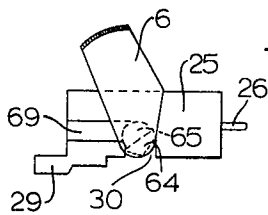


Fig. 8



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FALLING BREECH BLOCK ACTION FOR A SINGLE SHOT FIREARM

BACKGROUND OF THE INVENTION

This invention relates to firearms; particularly to a hammerless falling breech block single shot action for a firearm, and more particularly to the breeching, firing and extractor systems of such an action.

The hammerless actions of falling breech block single shot firearms now produced, whether of the internal swinging hammer or striker type, wherein the firing pin or striker assembly fits in a hole or recess in the breech block, the opening to this hole or recess extends through the front or rear walls of the breech block, with this opening closed with a cap, plug, bushing or some other closure. The use of such a closure often weakens the wall of the breech block wherein it is fitted, and often, if the rifle is dry-fired or fired a lot, or if the closure is removed and replaced often, it may become damaged or loose, in which case the loose or damaged closure could adversely affect the safety and normal operation of the rifle. Previously, falling breech block actions made which had the breech block moving up and down in the receiver at a slight angle to the axis of the bore, the breech blocks often were of less depth than the receiver and/or had part of the front or rear surface cut away so that the entire front or rear surface of the breech blocks were not in full depth contact with the front and rear walls in the breech block opening in the receiver when the action was closed and in maximum contact when the action was open. Actions in which the breech block is not in maximum contact front and rear with the receiver often tend to bind as the action is operated. In falling block single shot actions previously produced no adequate provision was made in the rimless cartridge extractor to supply as much force to keep the extractor hook engaged with the cartridge head during extraction as was applied to actuate the extractor itself, nor combined with any means to adjust and synchronize the extractor movement with the opening of the action. Similarly, these actions have not been provided with a means to adjust and synchronize the striker with the trigger mechanism or provided with means to adjust and synchronize the trigger mechanism from the outside of the action. These and other faults and deficiencies we intend to correct and/or eliminate in the invention described.

BRIEF DESCRIPTION OF THE INVENTION

The invention provides for a one-piece receiver into which the barrel is threaded, an almost vertical rectangular recess through the receiver at the rear of the barrel for the breech block, a finger lever pivoting on a pin in the lower front portion of the receiver and a link connecting the finger lever with the breech block, so that on swinging the finger lever down the breech block is pulled down to expose the cartridge chamber in the breech end of the barrel, and on swinging the finger lever up the breech block is raised to lock the cartridge in the chamber. A spring actuated plunger is provided in the base of the finger lever to bear against a hump on the bottom of the link connecting the finger lever with the breech block to provide tension for holding the finger lever against the receiver when the breech block is closed, and to hold the breech block in position for loading when the finger lever is swung down.

The firing mechanism comprises a rectangular bore-aligned striker within a recess in the one-piece breech block, with the firing pin attached to the striker with a cross pin, a coil main spring partly inside the hollowed striker and compressed between the striker and the solid rear wall of the breech block which provides the power to actuate the striker to fire the rifle. Below the striker and pivoted on a pin through the breech block is the cocking lever, with its upper end engaging in a notch in the bottom of the striker. The link, which connects the finger lever to the breech block, and which is positioned just forward of the cocking lever and just below the striker to hold the striker in place, has a hump which pivots the cocking lever back as the link rotates when the finger lever is swung down, causing the firing pin to be drawn into the receiver before the breech block begins to move downward and which further causes the striker to be cocked when the breech block is closed after being opened. The link is also a safety means which prevents the striker from going fully forward to firing position unless the finger lever and breech block are fully raised.

The invention provides for a trigger mechanism fitted within the recess in the breech block and is so constructed to hold the striker and cocking lever back in cocked position as the breech block is lowered and raised, and for the rifle to be fired by pulling the trigger which releases a combination of levers and plungers to allow the striker to move forward. Three exposed adjustment screws are provided on the trigger mechanism for a full range of trigger adjustments, and an adjustment screw fitted in the striker to allow it to be synchronized with the trigger mechanism.

The invention further provides a pivoting safety lever recessed in the side of the breech block to engage in a notch in the striker when the striker is in the cocked position and the safety is tipped back, and disengaged from the striker when the safety is tipped forward. The safety, when tipped back, forces the striker backward enough to relieve the trigger mechanism of holding the striker back. The breech block can be lowered and raised with the safety either engaged or disengaged without danger of damaging any parts. Means are provided to make the safety engage automatically when the action is opened and closed, or to have the safety non-automatic in operation.

The cartridge extractor is pivoted on a pin through the center lower front portion of the receiver. The hole in the extractor on which the extractor pivots is oblong and with a spring provided under the extractor to make the extractor yieldable so that on closing the action its upper hook, which has a sloping forward surface, can move under and into the rim or extractor groove in the cartridge. A plunger positioned directly under the front arm of the extractor and through a hole in the lower receiver wall actuates the extractor to extract and eject a cartridge or cartridge case from the chamber on opening the action when the finger lever pushes the extractor plunger upwards. A set screw threaded into the finger lever at the point of contact with the extractor plunger provides an adjustment for movement of contact with the plunger and total movement of the plunger.

The invention provides a through stock bolt threaded into the rear of the receiver to secure the butt stock to the action, with the rear of the receiver grooved and the front of the stock mortised into it,

The finger lever pin and extractor pivot pin are retained in place by spring plungers so that both pins can be easily removed and replaced without tools to allow quick and easy removal of the breech block and extractor assemblies from the receiver.

From the foregoing brief description of the invention it is apparent that the important object of this invention is to provide an improved hammerless falling breech block single shot firearm action that is compact, strong and simple. The main objectives of this invention are, however: to provide a safer action with an improved breech block having solid walls; in which the breech block has front and rear surfaces which fully contact the front and rear walls in the receiver opening; in which the breech block is angled so that on closing the action the face of the breech block is forced against the face of the barrel; in which the breech block is raised and lowered by a finger lever operatively connected to the breech block by a toggle linkage arrangement which imparts much upward thrust to the breech block as the action is closed and in which the link further serves to hold the striker in place, cocks the striker via a cocking lever and acts as a safety to prevent the striker from falling entirely forward unless the action is fully closed; with a bore-aligned striker having a firing pin attached to it with a cross pin and having a set screw to control the amount of engagement with the trigger mechanism; which has an extractor that will handle rimmed, rimless or belted-head cartridges and that is actuated from below by the finger lever and screw adjustable plunger in such a manner that the extractor hook is forced to remain engaged with the cartridge rim during extraction; that has a trigger mechanism that has an independent sear and a full range of adjustments accessible from the outside; and that has a positive safety which locks the striker and fitted with a safety selector for choice of automatic or manual of the safety to the safe position.

Additional objects and advantages of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings which fully illustrate the invention.

FIGURES

FIG. 1 is a right side view of the single shot falling breech block action of the invention showing its configuration and safety.

FIG. 2 is a top view of the action shown in FIG. 1, showing configuration and butt stock-to-receiver mortising.

FIG. 3 is a sectional view taken at line 3—3 of FIG. 2 showing all the internal mechanism except the safety and showing the action closed and the striker in the fired position.

FIG. 4 is a view similar to FIG. 3 but showing the action fully opened, extractor tipped back and striker cocked.

FIG. 5 is a fragmentary portion of FIGS. 3 and 4 showing the action of the invention in the "load" position with the extractor at rest and the top of the breech block level with the bottom of the chamber.

FIG. 6 is a right side view of the breech block showing the safety and safety selector.

FIG. 7 is a sectional view of line 7—7 of FIG. 6 showing breech block, safety, striker in fired position and link assembly.

FIG. 8 shows the safety and striker in the safe position.

FIG. 9 is a fragmental sectional view of line 9—9 of FIG. 1 showing how the finger lever and extractor pins are retained in place in the receiver.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The falling breech block single shot firearm action illustrated in the drawings comprises a one-piece receiver 1 to which the barrel 2 and butt stock 4 are attached, as shown in FIGS. 1 and 2. The forearm 3 is attached to the barrel. The action further comprises a one-piece breech block 5, which moves in a recess or opening 23 (FIGS. 4 and 5) in the receiver, a finger lever 20 pivotally mounted on a pin 7 entirely through the receiver, and a pivotal link 33 (FIGS. 3 and 4) fastened to the base 60 of the finger lever and to the breech block 5 on the pins 32 and 34, so that on swinging the finger lever down the breech block is lowered within the receiver to expose the cartridge chamber 21 to allow a cartridge to be placed into it (FIGS. 4 and 5), and when the finger lever is swung upwards the breech block is raised (FIG. 3), completely enclosing the cartridge chamber behind the cartridge. A plunger 36, which is actuated by spring 37 (FIGS. 3, 4, 5 and 7), and which is positioned in a hole in the base 60 of the finger lever 20, and which is in slidable contact with the bottom of the link 33, provides tension to the finger lever. The bottom of the link has a hump 35 which in effect leaves two flat surfaces on both sides of it. As shown in FIG. 3, when the action is closed, the finger lever plunger 36 is bearing against one side of the hump on the link 33, holding the finger lever closed and against the bottom of the receiver. In FIG. 4 which shows the finger lever 20 swung completely down and the action open, the finger lever plunger 36 is bearing against the opposite side of the hump 35, so that on releasing pressure on the finger lever, it is automatically swung back a short amount as shown in FIG. 5 so the plunger is flat against the link 33, at which position the breech block 5 is raised to bring the groove 17 on top of the breech block (FIG. 2) level with the bottom of the cartridge chamber 21. A deep U groove 14 (FIG. 2) in the rear top of the receiver 1 provides access to insert a cartridge in the chamber over the lowered breech block and a passageway for the ejection of the fired cartridge case or cartridge.

As shown in FIGS. 3, 4 and 6 the breech block 5 has parallel front 5'' and rear 5' surfaces which fit closely in a recess or opening 23 through the receiver with matching parallel surfaces 23' at the rear and 23'' at the front. Surfaces 23' and 23'' are angled 6° to 15 degrees downward to the rear of the breech face of the barrel 18 which is at 90° with the axis of the bore. The center portion of the upper front face 22 (FIGS. 2, 3 and 6) of the breech block 5 is parallel to the breech face of the barrel 18 so that this portion of the breech block which contacts the breech face of the barrel when the action is closed (FIG. 3) is square with the bore. As the breech block is lowered on opening the action, the face 22 of the breech block moves down and rearwardly from the breech face of the barrel serving to instantly free the breech block contact with a fired cartridge on the first downward motion, and when completely lowered puts the face of the breech block back far enough to provide ample room for the extrac-

tor 38 to tip back (FIGS. 4 and 5) as well as not requiring a cartridge to be fully inserted into the chamber before the action can be closed again. Conversely, on closing the action, the face 22 of the breech block moves up and forward against the breech face of the barrel 18, forcing the cartridge into the chamber. Ridges 19 and 19' (FIGS. 2 and 3) on each side of the breech block face 22 which are a continuation of the front surface 5'' of the breech block makes possible full contact of the breech block 5 with the front surface 23'' in the receiver at all times regardless of the position of the breech block (FIGS. 3 and 4) making for smooth and bind-free operation.

As shown in FIGS. 3 and 4 the extractor 38 is an L shaped member centrally hung inside the receiver 1 and pivotally mounted on a pin 9 which extends entirely through the receiver. The upper arm on the extractor is so made to form a hook 41 to engage the rim or extractor groove in a cartridge case, with the hook recessed at the rear to conform with the cartridge head or rim and with the front of the hook beveled so that on closing the action the extractor hook can slip under, and engage with, the cartridge head as the hook slips into a matching recess 72 (FIGS. 4 and 5) cut into the breech face of the barrel. The pivot hole 40 in the extractor is oblong to allow a certain amount of up and down movement of the extractor on its pin, as well as to allow the extractor to pivot on it.

The extractor 38 as shown in FIG. 4 is actuated or tipped back to extract and eject a cartridge case from the chamber on opening the action when the finger lever 20 contacts a square headed plunger 10 located directly under the lower arm 42 of the extractor and which extends through a hole in the bottom of the receiver 1. A set screw 11 in the finger lever 20 at the point where it contacts the extractor plunger 10, provides an adjustment to control the moment of contact with the extractor plunger and to control the amount of movement of the plunger.

The top surface on the head of the extractor plunger 10 is so made that one side 44 is slightly higher than the other 44' (FIGS. 3 and 4).

A spring loaded plunger assembly 43 threaded into the bottom of the receiver contacts the bottom of the extractor 38 when the action is closed (FIG. 3) provides upward tension to the extractor to keep the extractor hook 41 engaged in the extractor groove in the cartridge head and allows the extractor to move down and over a cartridge rim on the final closing of the action. The upward movement of the plunger 24 in the plunger assembly 43 is limited so that on opening the action the plunger no longer contacts the extractor after it is tipped back, as shown in FIG. 4, thus allowing the extractor to drop down and putting the extractor hook below the bottom of the cartridge chamber, in which position it will not interfere with inserting a cartridge into the chamber, as shown in FIG. 5. In the position as shown in FIG. 3, with the higher surface 44 of the extractor plunger positioned to contact the extractor arm 42 at its extreme end, on completely opening the action at which time the screw 11 in the finger lever 20 contacts the bottom of the plunger, initial camming power is exerted on the extractor to start the extraction of a fired case from the chamber. As the plunger 10 moves up and as the extractor arm 42 pivots up, as shown in FIG. 4, the lower side 44' of the plunger then comes in contact with the extractor arm, and being

closer to the pivotal axis of the extractor, the movement of the extractor plunger which provides the camming power now imparts more speed and snap to the extractor to fully extract and eject the fired cartridge case from the chamber.

For less extraction camming power and more snap for ejection, the extractor plunger 10 can be reversed to position its high surface 44 towards the rear or closer to the pivotal axis of the extractor.

As shown in FIGS. 3 and 4, power to activate the extractor comes from below the extractor; via the upward movement of the extractor plunger 10 against the bottom of the extractor 38. This upward force not only causes the extractor to be activated to extract a cartridge case from the chamber, it also forces and holds the extractor hook 41 in the extractor groove so that it cannot slip out or under away from it during the full time it is in contact with the cartridge head as the extractor hook pivots back. The upward force of the extractor plunger against the extractor so applied takes over the function of the extractor spring plunger 24 the moment the extractor begins to tip back.

As best shown in FIGS. 3 and 4, the firing mechanism comprises a rectangular striker 25 (FIG. 7), firing pin tip 26 fitted to the front of the striker in a hole and secured with a cross pin 27, coil main spring 28 positioned partly in a hole in the rear of the striker and compressed between the striker and the solid rear wall 62 of the breech block 5 and the cocking lever 71 which is pivotally mounted on pin 31 through the breech block. The top of the cocking lever engages in a notch 30 in the striker so that the striker moves as the cocking lever pivots. The cocking lever 71 is positioned directly in back of the link 33, and the link so made as to have a rounded hump 51 where it contacts the cocking lever.

As the action is opened, the link 33 is pivoted in an arc by the swinging finger lever 20 which causes the cocking lever 71 and striker 25 to be forced rearwards. By positioning the holes for the finger lever pin 7 and the two link pins 32 and 34 in a straight line with each other when the action is closed (FIG. 3), and positioning the link so it just contacts the cocking lever when the striker is in the fired or full forward position, on swinging the finger lever down to open the action the striker is pushed back sufficiently before the start of any downward motion of the breech block to draw the firing pin tip 26 entirely into the face 22 of the breech block, and thus preventing the firing pin tip from hanging up in a spent primer in a cartridge case. As shown in FIG. 7 the link is as wide as the striker and is so pivotally mounted inside the breech block that its upper radial surface contacts the lower surface of the striker, holding the striker in place and guiding it so it can move only backward and forward. The link also provides a safety means in that unless the action is completely closed and the finger lever against the receiver, the link would prevent the striker from falling entirely forward, halting it before the firing pin could protrude from the breech face. The toggle linkage between the finger lever and the breech block also provides a power linkage set-up so that only a light pressure on the finger lever on the initial opening motion and on the final closing motion of the finger lever exerts much more force to start the downward motion and final closing motion of the breech block. The link is so structured that its combined function is to raise the lower the

breech block, hold the striker in place, cock the action, act as a safety means to prevent the striker from falling entirely forward unless the action is closed, and under tension from the finger lever plunger and spring, holds the finger lever closed and the action in the "load" position.

The trigger mechanism as shown in FIGS. 3 and 4 comprises several parts which are contained in a housing 63, which is in turn fitted into and held in the recess in the breech block by two or more pins. The trigger 8 is pivotally mounted in the bottom of the trigger housing on a pin 55, with the pivot hole in the trigger positioned approximately midway in the trigger mass. Two adjustment screws accessible from the outside are provided in the front portion of the trigger housing; the weight of pull adjustment screw 58 which compresses the trigger spring 57 between it and the front part of the trigger, and the trigger stop or over-travel adjustment screw 56 which halts the movement of the trigger the moment the sear becomes disengaged. A third adjustment screw 53 through the trigger, which is also accessible from the outside, contacts the bottom of the sear 59 and is used to adjust the sear engagement with the sear lever 49.

The sear 59, under light tension from a coil spring 54, is pivotally mounted on a pin 52 through the trigger housing, and is independent of the trigger. A set screw 53 through the trigger 8 contacts the underside of the sear 59 and pivots the sear when the trigger is pulled. The sear engagement adjustment screw and the sear are arranged in such a manner that a minimum amount of trigger movement will trip the sear.

A round hollow plunger 47 at an inclined angle to the striker is positioned in a hole in the upper part of the trigger housing 63 (FIGS. 3 and 4). Geared to this plunger is a sear lever 49 pivotally mounted on pin 48 in the trigger housing.

Inside the hollow plunger and positioned below the short arm of the sear lever which is geared to the plunger is a coil spring 50 which supplies upward tension equally to the sear lever and plunger. The long arm of the sear lever extends down to engage with the sear 59 on operating the action, and to disengage from it when the trigger 8 is pulled. The top of the plunger 47 has a flat beveled surface 46 where it contacts the round edged shoulder 29 on the bottom rear of the striker 25 when the action is operated, as shown in FIG. 4. A set screw 45 (FIGS. 3, 4 and 7) in the striker 25 can be adjusted to limit the amount of contact of the plunger 47 with the striker. The angled slope on the surface 46 on the top of the plunger is such that only a moderate upward force on the plunger will hold the striker back under compressed power of the main spring, and when this upward pressure is released, the striker pushes the plunger down and is so released. The plunger is held up (FIG. 4) when the action is closed by the lower arm of the sear lever 49 engaged over the top forward edge of the sear 59, with the lever made to give an additional leverage advantage, so that with the combination of the beveled contact surfaces between the plunger and striker, and the leverage advantage of the sear lever, the powerful force of the main spring transmitted to the sear is reduced many times, allowing the trigger to be adjusted to a very short travel and a very light weight of pull.

FIGS. 1 and 2 show the location of the pivoting safety 6 positioned in a recess 6' in the side of the breech

block 5. Tipped or pivoted back (FIGS. 1 and 8) the safety is in the safe position, holding the striker back so that the firearm cannot be fired.

Tipped or pivoted forward (FIGS. 2, 6 and 7) the safety is in the fire position, disengaged from the striker, and the firearm can be fired. FIG. 7 is a sectional view of line 7-7 of FIG. 6 which shows the details of the safety mechanism. The safety 6 pivots on a round stem 64 positioned in a hole in the side of the breech block 5 to coincide with the side of the striker 25 and the cocking lever notch 30 across the bottom of the striker. A half round projection 65 on the end of the safety stem 64 lies within a groove 69 in the side of the striker (FIGS. 7 and 8) so that when the striker is cocked the safety can be tipped back to force the projection on the end of the safety stem behind the shoulder where the groove ends, forcing the striker back and off the plunger 47 (FIG. 4) in the trigger mechanism. On tipping the safety forward the projection 65 on the safety stem moves into the groove in the striker (FIG. 7) freeing the striker and allowing it to move slightly forward to rest on, and be held back by the plunger in the trigger mechanism. The safety cannot be tipped back to engage the striker unless the striker is cocked, thus enabling the shooter to use the safety as an indicator to determine if the action is cocked or not. The action can be opened and closed with the safety in either the safe or fire position without harm to any parts of the action.

A spring actuated plunger 39 (FIG. 7) in the breech block wall contacting flat surfaces on the safety stem provides tension to the safety 6 to hold it in either the safe or fire position.

The plunger 39 also serves to hold the safety in the breech block when the breech block assembly is removed from the receiver.

The safety selector device is shown in FIGS. 2 and 7. It is a stationary lipped boss 67 which is mounted inside the receiver through a hole in the receiver wall. A groove 66 located vertically in the side of the breech block allows the breech block to pass over the selector 67 without interference. The selector is so positioned that with its long lip 68 up (FIG. 7), as the breech block is lowered on opening the action, the lip contacts the safety 6 if it is tipped forward and causes it to be tipped back (FIGS. 1 and 8), thereby placing the safety in the safe position as explained previously, so that when the action is closed the safety is engaged with the striker and the firearm cannot be fired. If the shooter prefers to have the safety non-automatic or manually operated, then the selector 67 is repositioned so that its long lip 68 is pointed down, in which position the selector does not contact the safety as the action is opened.

OPERATION

The falling breech block action of the invention is operated and functions as follows: Beginning with the action closed and with the striker down as in FIG. 3, to open the action the shooter places his thumb or palm on the fingerpiece on the finger lever 20 and swings it down and forward. On the initial swing of the finger lever the spring loaded plunger 36 in the finger lever base 60 is depressed by the pivotal motion of the link 33 as its hump 35 moves over the plunger.

At the same time the hump 51 on the rear of the link contacts the cocking lever 30 and begins to pivot it to the rear. This immediately causes the striker 25 with its

attached firing pin 26 to move back, pulling the firing pin tip inside the breech block 5. Also at this point the finger lever has pivoted the link enough so that further motion of the finger lever begins to pull the breech block downwardly into the receiver. As the finger lever is swung all the way down and forward, the link continues to push the striker back via the cocking lever and pulls the breech block down until the swing of the finger lever has been stopped when its base contacts the bottom of the receiver. Just before the finger lever is stopped in this manner, the extractor plunger screw 11 in the finger lever has contacted the extractor plunger 10 and pushed it up as far as it will go. At this point, if a cartridge or fired case has been in the chamber, it would be extracted from the chamber 21 by the extractor 38 and ejected depending on the position of the extractor activator plunger 10 and on how smartly the shooter opened the action. At this point the striker has been pushed back to allow the plunger 47 in the trigger mechanism to rise ahead of the shoulder 29 on the striker, which motion causes the sear lever 49 to tilt and engage with the sear 59 as shown in FIG. 4. This final motion of the finger lever has also pulled the breech block all the way down to expose the chamber and caused the extractor plunger to tip the extractor hook 41 back over the top front edge of the breech block. At this point the top edge of the extractor hook has pivoted below the bottom line of the chamber and causes no interference with the ejection of the case from the chamber.

On releasing the finger lever, after it has been fully swung down and forward, the spring powered plunger 36 bearing against the bottom of the link 33 causes the finger lever to swing back a slight amount, which also causes the extractor to be relaxed and drop down, and brings the groove 17 in the top of the breech block nearly level with the deep groove 14 in the receiver 1 and with the bottom of the chamber, or in the "load" position as shown in FIG. 5. At this point a cartridge can be dropped or inserted into the chamber with no interference from the extractor hook. If the cartridge does not fully enter the chamber for some reason, and part of the cartridge head still projects out of the chamber, this is of no consequence since due to the slight rearward angle of the breech block in the receiver, the breech block face 22 has moved back approximately $\frac{1}{8}$ inch or so from the breech face of the barrel 18 and the cartridge head can project this much or slightly more without hindering the closing of the action.

To close the action the shooter swings the finger lever back and up until it contacts the receiver. This pushes the breech block upwards, pushing the cartridge into the chamber, sealing the chamber and positions the firing pin hole in line with the cartridge primer. As the breech block begins to move up the striker is held back in cocked position by the plunger in the trigger assembly. Also, as the breech block rises behind the cartridge, it pushes the extractor hook forward, and if the cartridge head is ahead of the extractor hook, the hook is pushed forward to move down and over the cartridge rim and be pushed up again into the extractor groove by the extractor plunger 24.

If the safety selector 67 was positioned with its long lip 68 up, on opening the action as the breech block moves downwardly in the receiver the lip on the selector would tip the safety back to the safe position, in which position the striker will be locked after the ac-

tion is closed. With the selector set so its long lip is down, the safety will not be disturbed regardless of the position of the safety before opening the action.

When the action is fully closed, and as best illustrated in FIG. 2, the breech block 5 is fully supported and held against the breech end of the barrel by being supported by the receiver side-walls 16 and 16' and by the rear wall 23' of the receiver and the two shoulders 15 and 15' on each side of the U-shaped loading groove 14.

To fire the rifle, the shooter pushes or tips the safety forward to disengage it from the striker, allowing the striker to move slightly forward to rest against the trigger plunger. Then the trigger 8 is pulled back, which causes the trigger to trip the sear 59 which in turn releases the sear lever 49 and the trigger plunger 47 to allow the striker 25 to snap forward to ignite the primer in the cartridge, leaving the action as shown in FIG. 3. This ends the cycle, and to recycle the action is opened and closed again. The striker can be lowered without snapping the action by holding the trigger back while closing the action, which allows the striker to move slowly forward under restraint of the link.

Although the preferred embodiments of the invention have been herein illustrated and described in order to provide an example of the manner in which the invention is to be practiced, it will be understood that various modifications and structural changes can be imparted to the described and depicted structures without departing from the basic principles of the invention.

We claim:

1. An improvement in a falling breech block single shot action for a firearm which comprises a receiver, a breech block within a recess in the receiver wherein it is raised and lowered, a finger lever pivotally mounted on a pin through the receiver and which is operatively connected to the breech block by a toggle link pivotally mounted on two pins and a spring-tensioned bore-aligned striker fitted in a recess in the breech block which moves longitudinally with the axis of the bore; wherein the upper part of the link has a radial upper surface and is so mounted on a pivot pin under the striker that the striker, though slidable, is held in place.

2. An improvement in a falling breech block single shot action for a firearm as defined in claim 1 in which the link is formed with a cam hump, a cocking lever pivotally mounted on a pin behind and in slidable contact with the cam hump on the rear of the link and below the striker, said cocking lever having an upper round-edged end engaged in a notch in the bottom of the striker whereby when the finger lever is swung down and the breech block lowered with it, the link pushes the cocking lever back to cock the striker.

3. An improvement in a falling breech block single shot action for a firearm as defined in claim 1 in which the breech block is so structured that except for the firing pin tip hole and safety hole, the walls surrounding and covering the recess for the striker are solid.

4. An improvement in a falling breech block single shot action for a firearm as defined in claim 1 in which the front and rear surfaces of the recess in said breech block are parallel and at a 6 to 15 degree angle back and downward from the breech face of the barrel, with the breech block having parallel front and rear surfaces; wherein the face or center of the upper front portion of the breech block is made parallel to the breech face of the barrel leaving a ridge on each side of the

face, which ridges leave the front surface straight from top to bottom for maximum contact with the front surface in the receiver recess.

5. An improvement in a falling breech block single shot action for a firearm as defined in claim 2 in which the striker in the breech block is cocked on opening the action by the pivotal camming motion of the link against the cocking lever, and which has a trigger mechanism in the breech block recess to hold the striker back on closing the action and to release the striker to fire the rifle; which trigger mechanism comprises a housing into which the trigger parts are assembled, a spring tensioned hollow plunger in the housing movable at an angle to the striker and having a flat beveled surface on top for engagement with a round edged extension on the bottom rear of the striker, a pivotally mounted gear lever having a short arm in operative connection with the plunger and a longer arm below said short arm having a sharp edge, a pivotal spring-tensioned independent sear pivotally mounted on a pin in the housing and having a sharp forward top edge to engage with the long arm of the gear lever, and a pivotal spring-tensioned trigger mounted in said housing and having a round-ended set screw threaded into it and positioned so that when the action is cocked and the trigger pulled, the set screw contacts the bottom rear of the sear to trip it, which in turn releases the gear lever, plunger and striker.

6. An improvement in a falling breech single shot action for a firearm as defined in claim 5 having a plunger in the trigger mechanism which has a flat beveled surface on its upper end to engage with and hold the striker back when the action is closed; wherein the striker has a set screw just forward of the round-edged extension which contacts the plunger when the striker is cocked so that the cocked striker and the trigger mechanism can be synchronized.

7. An improvement in a falling breech block single

shot action for a firearm as defined in claim 1 and which has an extractor system comprising an L-shaped extractor pivotally and yieldably mounted on a pin through the receiver, having a hook with a beveled front surface to slide under and engage in the extractor groove in the head of a cartridge in the chamber, said extractor including a forward lower arm; wherein the extractor is provided tension by a spring pressing the extractor upwards only when the action is closed, an actuator plunger having a head with a raised cam surface on one side, and a round ended set screw threaded into the finger lever and so positioned and adjusted that the near final swing of the finger lever on opening the action the set screw pushes the actuator plunger up thereby holding the extractor hook in engagement with the cartridge and forcing the extractor to pivot back to extract and eject the cartridge or cartridge case from the chamber.

8. An improvement in a falling breech block single shot action for a firearm as defined in claim 5 having a bore-aligned striker within a recess in the breech block and which has a pivoting safety fitted into a recess in the side of the breech block with the safety having a stem with cam surface to engage a shoulder on the side of the striker so that when the safety is tipped back the striker is forced back out of engagement with the plunger in the trigger mechanism and held back so the firearm can not be fired; wherein said breech block includes a vertical groove in the side thereof and forward of the safety pivot hole, a safety selector boss having a long lip, said selector boss being fitted in a hole inside the receiver wall and extending into said groove so that with the long lip of the selector boss up, on opening the action the lip will automatically tip the safety back to safe position and with the lip down it will not contact the safety on opening the action thus leaving the safety to be manually operated.

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