

March 6, 1945.

F. W. WOODHULL

2,371,012

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Filed Aug. 9, 1941

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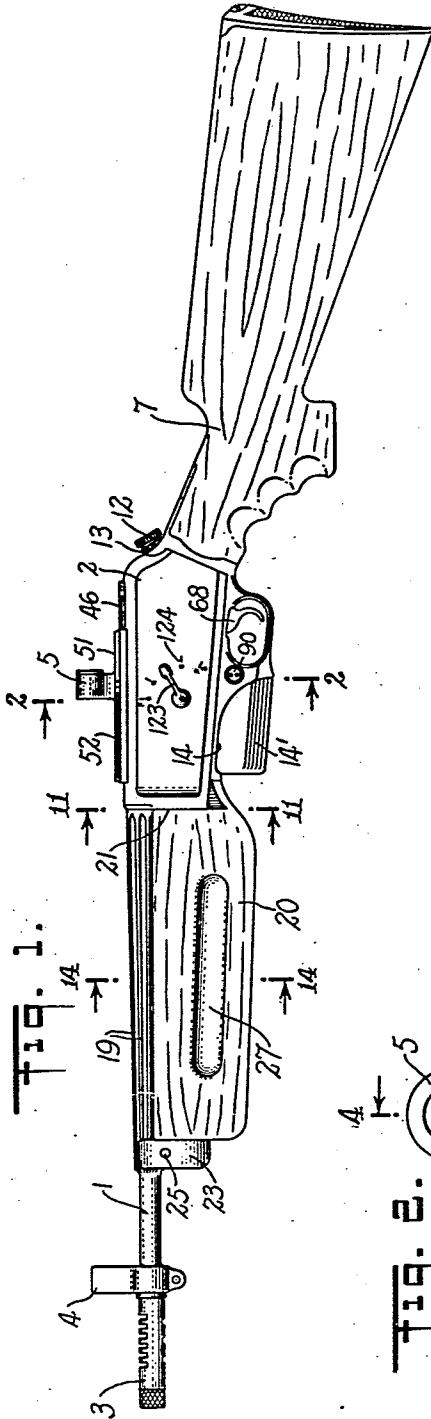
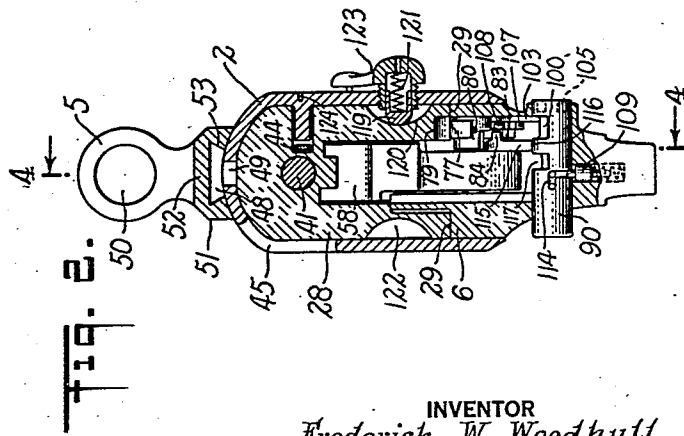
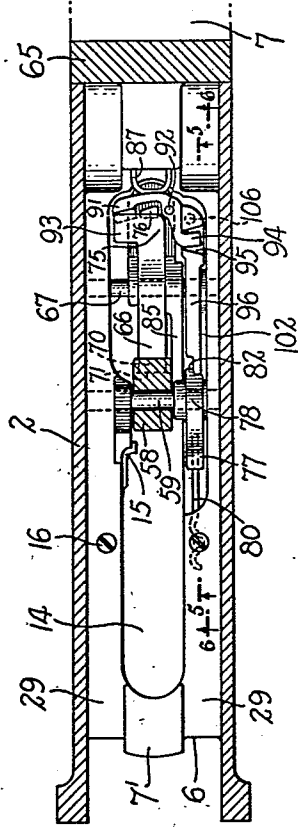


Fig. 3.



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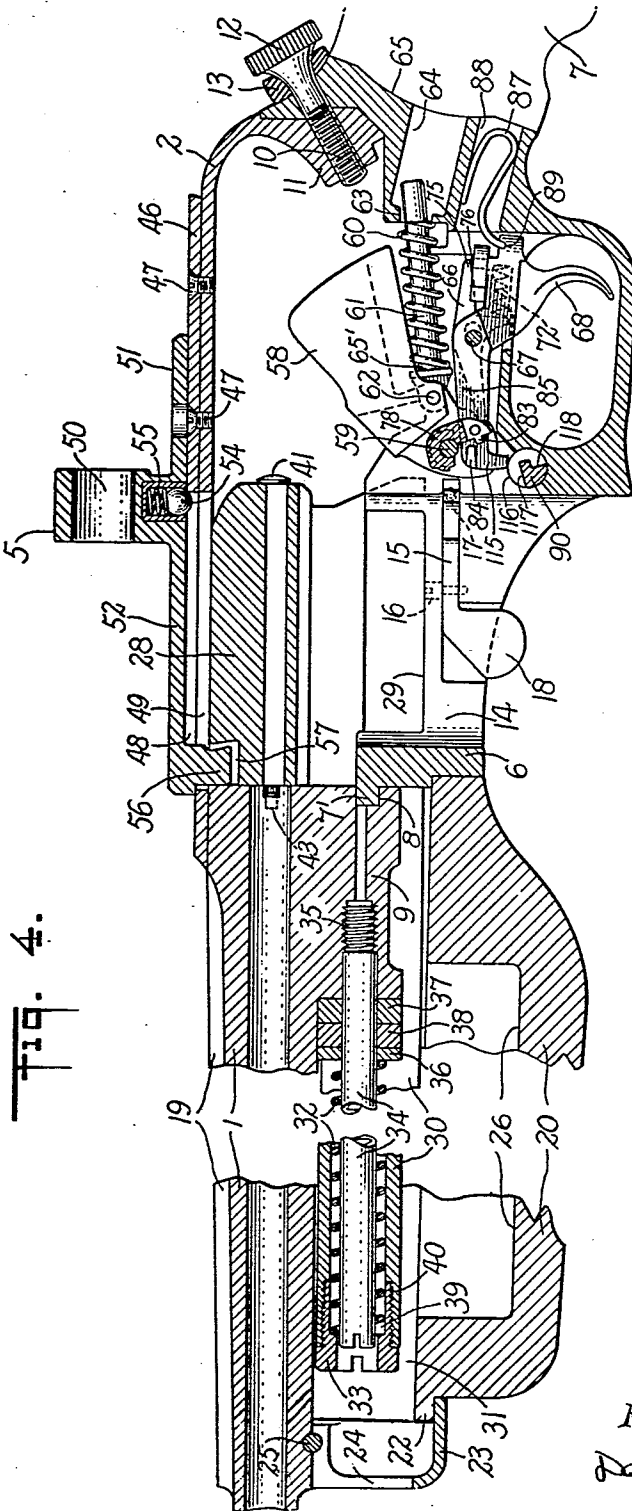
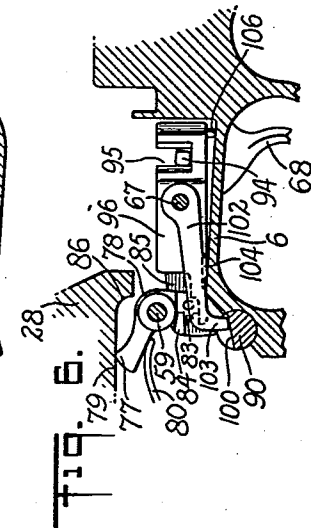
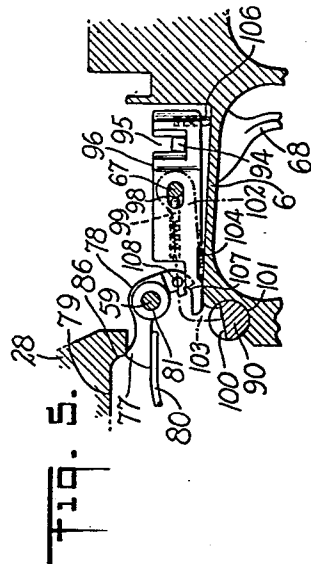
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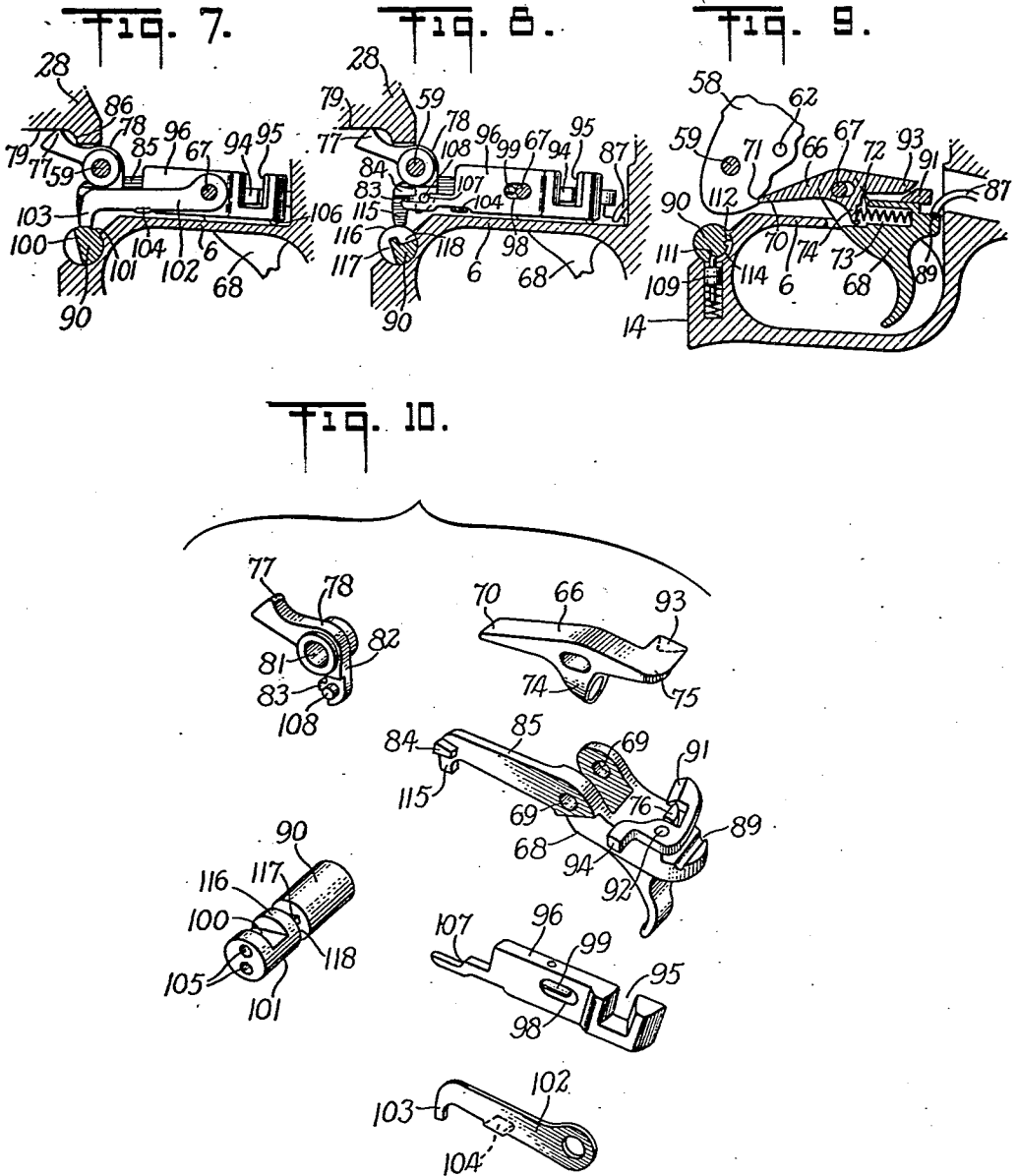
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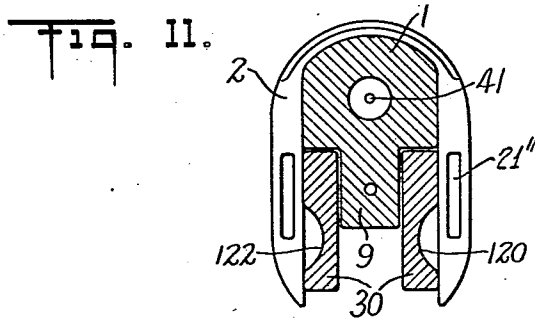
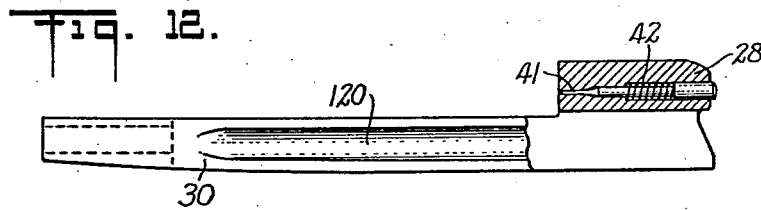
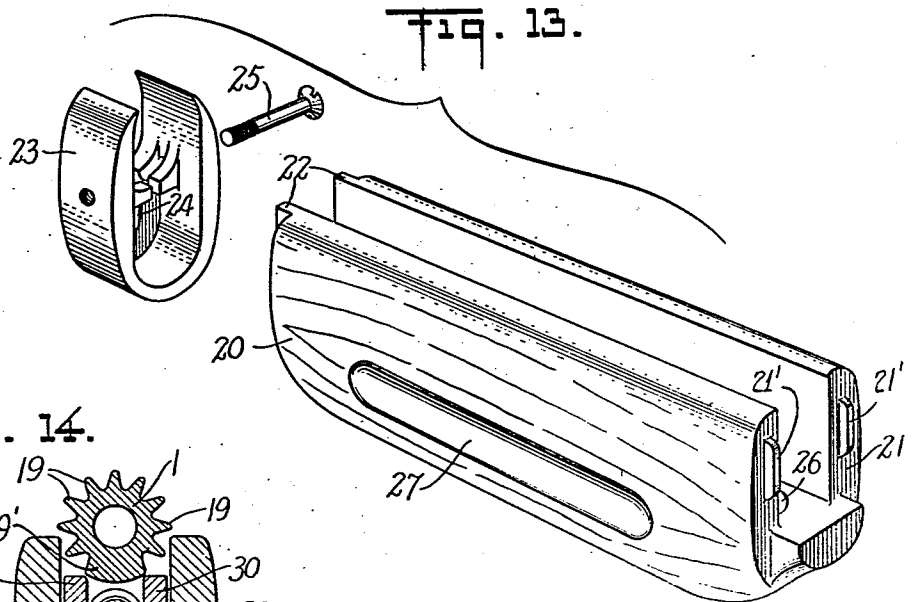
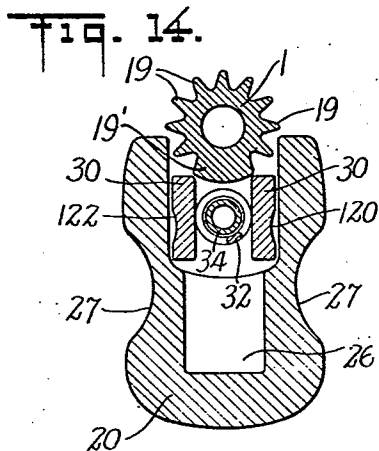
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5 Sheets-Sheet 4



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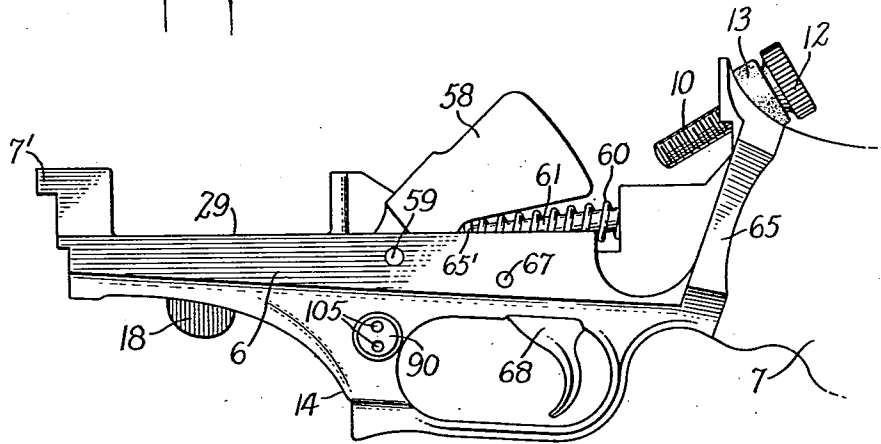
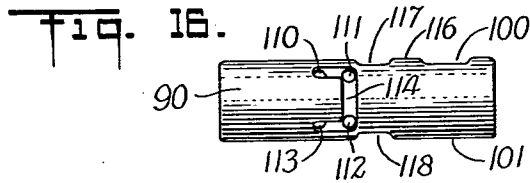
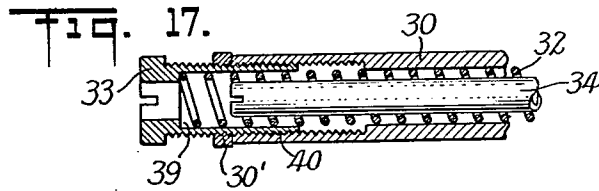
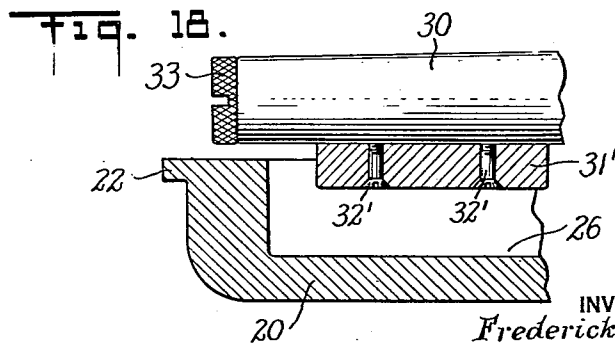
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Fig. 15.



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UNITED STATES PATENT OFFICE

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GUN

Frederick W. Woodhull, Millington, N. J., assignor of two per cent to Dryden Kuser, as trustee, one and one-half per cent to Louise M. Kuser, both of Bernardsville, N. J., and six per cent to Ida G. Blish

Application August 9, 1941, Serial No. 406,080

8 Claims. (Cl. 42—3)

This invention relates to a firearm that will fire either automatically or semi-automatically; that is provided with a selector to convert the arm from automatic to semi-automatic firing, or vice versa; that is provided with means by which the rate of automatic firing may be controlled; that is provided with a safety to prevent the accidental firing of the arm when set for either automatic or semi-automatic firing or during the transition from one to the other; that is so constructed that it may be fired at least 80° from the horizontal in either upward or downward directions; that is provided with cooling fins for the barrel which assist in preventing the deflection of the bore of the barrel under the influence of the heat developed during firing; that is so constructed that it may be easily assembled and disassembled; that is so constructed that foreign matter will be excluded from the operating mechanisms, but in which the operating mechanisms are so constructed and arranged that they will successfully operate even should foreign material, perchance, enter the areas in which the operating mechanisms are located; that requires substantially no lubrication; that may be quickly, easily and cheaply manufactured, and in which the replacement of parts that become worn may be accomplished with the expenditure of the minimum time, energy and expense; that will be light, strong and well balanced to insure ease and accuracy of firing; that is so constructed that the breech bolt will remain in its retracted or breech opening position when the last cartridge in the magazine has been fired; that is so constructed that the old magazine may be removed and a new magazine inserted with the breech bolt in either open or closed positions; that is capable of being used as a hand functioning arm in case the self-loading feature is disabled; and that is so constructed that the operating parts may be assembled and disassembled without the use of special tools.

Many other desiderata are accomplished by this invention, but they will not, in this preliminary statement, be enumerated since they will appear, and it is thought will be more understandable, as the description of the invention progresses.

The invention has been embodied in a .30 caliber rifle which weighs slightly over five pounds, and is illustrated in the drawings hereof.

In these drawings:

Figure 1 is a side elevation of the rifle;

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1, with the parts of the action mechanism in the positions that they will occupy when the gun is adjusted for semi-automatic firing, when it is ready to fire but when the safety device is so adjusted that firing is prevented;

Figure 3 is a fragmentary horizontal sectional

view with the parts in the positions disclosed in Figure 2;

Figure 4 is a fragmentary vertical sectional view with the parts in the positions illustrated in Figure 2, the section being taken on a vertical plane indicated by the line 4—4 of Figure 2;

Figure 5 is a fragmentary sectional view with the parts in the relative positions illustrated in Figure 2, taken on a vertical plane indicated by the line 5—5 of Figure 3;

Figure 6 is a view similar to that of Figure 5, except that it is taken on a vertical plane indicated by the line 6—6 of Figure 3;

Figures 7, 8 and 9 are views similar respectively to Figures 5, 6 and 4;

Figure 10 is an exploded perspective view of elements of the action mechanism;

Figure 11 is a vertical sectional view on a plane indicated by line 11—11 of Figure 1;

Figure 12 is a view of the breech bolt;

Figure 13 is an exploded perspective view of the forearm and forearm cap;

Figure 14 is a section on a plane indicated by the line 14—14 of Figure 1;

Figure 15 is a view of the trigger plate showing the same attached to the stock or butt with the hammer in association therewith;

Figure 16 is an elevation of the cross bolt showing the sockets for the cross bolt locking pin;

Figure 17 is a fragmentary sectional view showing a modification of the arrangement of the breech bolt operating spring;

Figure 18 is a fragmentary view showing a modification of the breech bolt.

The rifle that embodies the invention that is illustrated in the drawings is of the type in which the breech bolt moves into breech-closing position under the influence of a spring, and into breech opening or retracted position under the influence of the recoil developed by the chamber pressure that is created upon firing.

A firing pin is carried by the breech bolt and is normally spring-pressed in a rearward direction but may be moved forwardly when the breech bolt reaches its breech closing position by a spring-actuated hammer. The operation of this hammer, when the gun is adjusted for full automatic action, is under the control of the reciprocating breech bolt, and when the gun is adjusted for semi-automatic action is under the control of the operator.

Referring specifically to the form of the rifle illustrated in the drawings, there is provided a barrel 1, which is rigid with a receiver 2, and which is preferably but not necessarily provided at its forward end with a compensator 3.

The barrel carries a front sight 4 and the receiver carries a rear sight and cocking lever 5.

The receiver 2 is substantially inverted U-shape in cross section and open at the bottom, as shown

in Figure 2 of the drawings. The bottom of the receiver is closed by a removable trigger plate 6, such as shown in Figure 15 of the drawings, which trigger plate is attached to the stock or butt 7 by any suitable means such as screws. At its forward end the trigger plate is provided with a projection 7', which is adapted to engage in a notch 8 in an extension 9 of the barrel, and at its rear end it is provided with securing means such as a screw 10 adapted to engage with screw threads in a projection 11 of the receiver 2. Interposed between the knurled head 12 of the screw 10 and the extension of the trigger plate which forms the stock plate is a compressible and preferably resilient washer 13, which is adapted to absorb any strains that otherwise would be transmitted to the head 12 of the screw by virtue of any tendency to relative movement between the stock or butt of the rifle and the projection 11 of the receiver 2.

Thus the stock and the trigger plate, together with the firing mechanism that is carried by the latter, may be easily removed from the receiver by backing off the screw 10, dropping the trigger plate and butt and withdrawing the projection 7' from the notch 8 in the barrel extension.

The trigger plate is provided with an opening 14 for the reception of a magazine 14', which magazine may be held in its operative position by means such as a catch 15 that is pivoted at 16 and is actuated to engage the magazine by a spring 17, but which may be actuated to disengage the magazine and permit the latter's removal through a thumb piece 18.

The barrel 1 is provided with longitudinally extending fins 19 which act not only to radiate the heat generated by the explosion, but also to prevent the warping of the barrel under the influence of the generated heat. The lowermost of these fins 19' is relatively larger than the remaining, although each of the fins throughout the entire circumference of the barrel may be made of the same dimensions as each of the others if it is so desired.

A forearm 20 has a face 21 abutting a complementary face on the forward end of the receiver and projections 21' which extend into complementary sockets 21'' on the receiver to support the rear end of the forearm. A flange 22 on the forward end of the forearm engages within a forearm cap 23, which cap is provided with a bifurcated slot 24 to provide two arms of a clamp that embrace the barrel 1. This cap 23 is held in position on the barrel and in turn holds the forearm in position by a forearm cap screw 25 that, when operated, tightens the arms of the forearm cap about the barrel. This screw is seated in a groove in the barrel so as to prevent any longitudinal sliding movement of the forearm. Thus the clamp, in cooperation with the projections 21', will hold the forearm in position.

This forearm 20 is recessed at 26 for lightening purposes and is provided on its opposite outer surfaces with finger accommodating grooves 27.

It will be noted that this forearm extends longitudinally of the rifle and radially of the barrel to substantially no greater distance than the trigger guard. This makes it possible to elevate the rifle or to depress the rifle while the stock is held against the shoulder of the operator to at least, and perhaps more than, 80° from the horizontal.

Having described the general make-up of the gun and its manner of assembly and disassembly, I shall now describe the action mechanism.

A breech bolt 28 is mounted to reciprocate within the receiver 2 on trackways 29 (see Figure 2) of the trigger plate to breech closing and breech opening positions.

In order that the breech bolt may be moved to its breech closing position rapidly and positively, it is provided with a forward extension 30 that is located within a recess 31 in the forearm 20, and beneath the barrel 1. This breech bolt extension is bifurcated to accommodate the portion 9 of the barrel and is tubular near its forward end, as indicated in Figure 4. A bolt spring 32 lies within the tubular portion of the extension 30 of the bolt and abuts at one end against a bolt spring bushing 33. This spring surrounds a bolt spring guide rod 34 that is preferably tubular in form and rigidly attached at 35, preferably by screw threads, to the enlargement 9 of the barrel. The bolt spring 32 abuts at the end opposite the bushing 33 against a washer 36, between which and a second washer 37 a buffer 38 which may be of any suitable compressible and resilient material is disposed, the rod 34 passing preferably through these washers 36 and 37 and the buffer 38.

It will be noted that the bushing 33 is provided with a socket 39 in which the spring 32 is seated and that the bushing is in screw-threaded engagement at 40 with the end of the breech bolt extension 30. This socket and screw-threaded arrangement makes it possible easily to assemble the spring for the end of the spring may be engaged in the socket 39 before the screw threads 40 take engagement and when they do take engagement upon the manual compression of the spring, the spring will maintain its proper position during the movement of the bushing 33 into its final position.

This is particularly advantageous during assembly because when the spring is under no tension, its end extends beyond the end of the rod 34 and therefore does not have the benefit of the guiding action of this rod until the screw threads 40 are engaged.

Thus when the breech bolt is in its rearmost position, that is to say in its breech-opening position, the spring 32 will be under compression and when the breech bolt is free to move forwardly to its breech-closing position in a manner which will later be described, the spring, operating against the washer 36, will move the breech bolt quickly and positively to its breech closing position.

The buffer 38 will take up the final thrust of the breech bolt and when compressed arrest the rearward movement of the bolt.

In the modification illustrated in Figure 17 I have provided for the adjustment of the tension of the spring 32 by lengthening the screw threads 40 so that the bushing 33 may be engaged with the breech bolt to different degrees and thus vary the compression of the spring 32. When this construction is to be used, the bushing 33 may be locked to the breech bolt extension 30 by a lock nut 30'.

The breech bolt carries a firing pin 41, which is urged rearwardly within the breech bolt by a coil spring 42, but which is adapted to move forwardly when impacted by the hammer to fire the primer of the cartridge against the reaction of said spring.

The breech bolt is provided with an extractor 43, which cooperates with an ejector 44 on the receiver to extract and throw the spent cartridges through the opening 45 in the receiver.

In Figure 18 of the drawings I have shown a modification of the breech bolt wherein the breech bolt extension 30 is provided with a removable auxiliary weight 31' which may be attached to the extension 30 in any suitable manner such, for instance, as by a dovetail engagement between the weight and the bolt extension or by screws 32'. This weight, or weights of varying magnitudes, may be attached to the breech bolt extension to add to the effective weight of the breech bolt and thus affect its reciprocation.

In operation the weight will operate within the recess 26 of the forearm as indicated in Figure 18.

The initial cocking of the gun of course is manual, and in order that this may be accomplished and the breech bolt thereafter permitted to reciprocate automatically, the rear sight and cocking lever includes a rear sight base plate 46, which is secured to the upper side of the receiver 2 by suitable means such as screws 47, and is slotted at 48 toward its forward end, which slot aligns with a corresponding slot 49 in the receiver 2. The rear sight 50 has a base 51 with a forward extension 52 that covers the slots 48 and 49 during the firing of the rifle, which base is in sliding dovetailed engagement with the base plate 46 as shown at 53 in Figure 2. The rear sight is normally held in its forward position by a spherical latch 54 which is pressed into the slot 48 by a spring 55 but which is adapted to ride upon the upper surface of the base plate 46 when the rear sight and cocking lever is drawn rearwardly. The forward end of the extension 52 is provided with a finger 56 which projects through the slots 48 and 49 and into a notch 57 in the forward end of the breech bolt, which notch is open upwardly and forwardly so as to permit the disengagement of the finger 56 with the breech bolt as the latter reciprocates during its action after the initial cocking. Thus to initially cock the rifle the combined rear sight and cocking lever may be drawn rearwardly on the base plate 46 against the action of the latch 54—55 and this rearward movement, because of the engagement of the finger 55 in the notch 57, will draw the breech bolt to its rearmost position and at the same time compress the spring 32, in which position the breech bolt will be held by mechanism that later will be described.

When the combined rear sight and cocking lever is moved forwardly to the position shown in Figure 4, it will remain in that position independent of any movement of the breech bolt during both automatic and semi-automatic firing until it is desired again to manually cock the arm.

A hammer 58 is pivoted, by means of a hammer pin 59, on the trigger plate 6 and is adapted to be moved about its pivot by a spring 60. This spring surrounds a rod 61 that is pivoted at 62 to the hammer between the pivot 59 and the opposite end of the hammer. The opposite end of the rod 61 projects into an opening 63 of a socket 64 formed on the stock plate 65 and is adapted to have rocking and sliding movements in said openings 63. The spring 60 abuts against a shoulder 65' on the forward end of the rod 61 and at its rear end against the outer face of the socket 64.

A sear 66 is mounted on the trigger pin 67, for both pivotal and sliding movements, which pin is mounted in the trigger plate and supports the trigger 68 for movement pivotally about the axis 67. The pin passes through the aligned openings 69 of the trigger, as shown in Figure 10.

The sear 66 is provided with a forwardly ex-

tending toe 70 which is adapted to engage a notch 71 in the hammer 58 between the pivot point 62 of the rod 61 and the pivot point 59 of the hammer. A trigger spring 72 is mounted in a socket 73 in the trigger 68 and abuts against a depending ear 74 on the sear to urge the sear pivotally to engage its toe portion 70 with the notch 71 in the hammer and to urge the sear forwardly on the pivot 67.

When set for semi-automatic firing the heel 75 overlies an upward projection 76 on the trigger 68 to the rear of the trigger pivot 69. In this position a pull on the trigger causes the projection 76 to rise in an arcuate path and in rising lifts the heel 75 of the sear and disengages the toe 70 from the notch 71 in the hammer.

The spring 60, with the hammer thus released, moves the hammer about its pivot 59 to strike the firing pin 41, carried by the breech bolt which is at this time in breech-closing position.

If the firer releases the trigger after firing as the breech bolt moves rearwardly under the recoil pressure, its initial movement allows the forward end 77 of a timing tripping lever 78 to move into a longitudinal groove 79 in the lower face of the breech bolt. The movement of the forward end 77 of the timing tripping lever into the groove 79 is caused by a spring 80 which is mounted on the trigger plate. This timing tripping lever 78 is of the bell-crank type, being pivoted at 81 (see Figure 10) on the hammer pivot 59 and being provided with a downwardly extending arm 82 remote from the forward end 77 thereof. A projection 83 on the arm 82 of the timing tripping lever 78, when the forward end 77 of the timing tripping lever moves into the groove 79, passes beneath an ear 84 at the forward end of the trigger extension 85 (see Figures 4 and 10) to prevent the trigger from being moved about its pivot 67.

In semi-automatic firing this locked condition of the trigger prevails until the breech bolt again returns to its breech closing position under the influence of the spring 32 which has been compressed during the rearward movement of the breech bolt under the influence of the chamber pressure, at which time the forward end 77 of the timing tripping lever 78 rides out of the groove 79 upon a cam 86. This cam depresses the forward end of the lever against the action of the spring 80, moves the lever pivotally and disengages the projection 83 from the ear 84 on the trigger extension to permit the trigger to again be pulled against the action of the trigger spring 87 which is mounted in a recess 88 in the stock plate 65, and has its forward end engaging in a notch 89 at the rear of the trigger.

Assuming that the firer has not released the trigger, the projection 83 on the timing lever 78 will not lie below the ear 84, but on the contrary will lie above this ear, thus preventing the pivotal movement of the trigger to its forward position. If this last-mentioned condition prevails, the heel 75 of the sear will drop from the forward edge of the projection 76 on the trigger and abut the forward face thereof so that the projection may not then operate to lift the rear end of the sear, this action being permitted by the sliding movement of the sear on the sear pin 67.

Thus even though the toe 70 of the sear 66 has become engaged with the notch 71 of the hammer, as the hammer is moved about its pivot by the rearward movement of the breech bolt and maintains the hammer in its cocking position, the sear cannot be actuated by the trigger

until the projection 83 is moved out of the path of movement of the ear 84 on the trigger extension 85, which does not occur until the forward end 77 of the timing lever rides upon the cam 85 at the end of the groove 79 in the breech bolt and this only occurs when the breech bolt has become fully seated.

Then if the firer releases the trigger after the breech bolt has fully seated, the projection 83 will have moved out of the path of movement of the ear 84 and the movement of the trigger about its pivot 67 under the influence of the spring 87 will result in a downward arcuate travel of the projection 76 on the rear end of the trigger to allow the heel 75 of the sear to ride over the upper face of the projection 76, which movement of the sear is caused by the action of the hammer spring 60 acting through the hammer and moving the sear slidably upon the trigger pin 67.

Thus if the firer holds the trigger back until the breech bolt seats it will automatically move into its forward position upon the release of the manual pressure ready for firing, but if he releases the trigger during the forward travel of the breech bolt the trigger will be held in its rear position until the breech bolt completes its forward movement and seats. With either manual action, firing may not occur in this semi-automatic adjustment until the breech bolt is completely seated. Thus semi-automatic or single-shot firing may be accomplished.

Whether or not the arm operates as a full automatic or semi-automatic depends upon the adjustment of a selector cross bolt 90 in cooperation with certain other mechanism that will now be described. The automatic firing is caused by a cam 91 which is pivoted at 92 to the rear of the trigger 68 and is adapted to move horizontally on its pivot beneath and away from a projection 93 on the heel 75 of the sear.

This cam in the form of a bell crank lever has a finger 94 that is engaged in a notch 95 of a link 96 which link has both pivotal and sliding movements on a pin 67 mounted in the trigger plate, this sliding movement being permitted by a slot 98 in the link. The link is moved forwardly to rock the cam 91 about its pivot to move the same rearwardly from beneath the heel of the sear by a spring-pressed plunger 99 (see Figure 8) which is housed within the link and abuts the pin 67. The rearward movement of the link to move the cam beneath the heel of the sear to disengage the sear from the hammer in automatic action is accomplished by the depression of the forward end 77 of the timing tripping lever 73 when it engages the cam 86 at the rear end of the groove 79 in the breech bolt which occurs, as heretofore stated, when the breech bolt is seated.

The connection between the link 96 and the timing lever 73 is breakable and when broken the timing tripping lever is ineffective to move the link and the link in turn is ineffective to move the cam 91 beneath the sear to disengage the sear from the hammer. This disconnection is effected in the following manner:

The cross bolt 90 is provided with a notch forming a dale 100 and a hill 101 (see Figures 5 and 6). A link lever 102 is pivoted on the pin 67 which is the same pin on which the link is pivoted, and is provided with a finger 103 that may be supported on the hill 101 of the cross bolt or dropped into the dale 100 thereof. This link lever is also provided with an abutment 104

which is located beneath the forward end of the link 96, and is adapted to engage it upon the upward movement of the forward end of the link lever. When the selector cross bolt 90 is rotated by means of a special tool which is engageable with apertures 105 therein to align the dale 100 with the finger 103 of the link lever, the abutment 104 on the link lever moves downward away from the forward end of the link 96, and permits a spring-actuated plunger 106 housed within the rear end of the link 96 to move the link about its pivot to depress its forward end, the plunger operating against the floor of the trigger plate 6. This depression of the forward end of the link disengages the link from the timing lever by dropping the shoulder 107 away from the pin 108 so that the timing lever may rotate about its pivot 81 upon the reciprocation of the breech bolt without imparting any movement to the link 96 and in turn without operating the cam 91 to move it beneath the sear. Thus the selector permits the semi-automatic action of the gun.

When, however, the selector cross bolt 90 is rotated by means of the special tool so that the hill 101 thereof will engage the finger 103 of the link lever 102, the forward end of the link lever will be raised and in its rising movement the abutment 104 thereon will engage the forward end of the link 96 establishing a connection between the timing lever and the link by moving a shoulder 107 into the path of movement of the pin 108.

Then upon the reciprocation of the breech bolt the sear-actuating cam 91 will be actuated to move beneath and from beneath the projection 93 in the heel 75 of the sear 66 to effectuate automatic firing.

The selector cross bolt is maintained in its adjusted positions by a spring-pressed plunger 109 that engages in one of four seats 110, 111, 112 and 113 in the peripheral face of the selector cross bolt.

This spring-pressed plunger 109 is adapted to follow in a path or groove 114 which connects the seats 110 with 111, 111 with 112 and 112 with 113, but does not connect the seats 113 with 110. The provision of these four seats for the plunger 109 is so that the selector cross bolt will be locked in its adjusted positions irrespective of whether the cross bolt is set for semi-automatic or automatic firing, or whether or not it is set in a manner which will later be described, on safety to prevent any firing of the gun.

It has been said that the selector cross bolt 90 also operates as the safety. It will permit adjustment from semi-automatic to automatic or the reverse only when the trigger is locked against actuation. This is effectuated in the following manner:

The forward end of the trigger has a downwardly projecting finger 115 which, when in its raised position under the influence of the trigger spring 87, rests upon the peripheral face 116 of the selector cross bolt 90 (see Figure 4) whether the cross bolt be in position to permit semi-automatic or automatic firing. In this position of the trigger, the trigger may not be operated and firing cannot occur. This, therefore, is the position of safety.

However, when the cross bolt is pushed manually axially (from left to right in Figure 2), the finger 115 is brought into alignment with a notch that has two angularly arranged faces 117 and 118 into either of which the finger 115 may drop,

the finger dropping to the face 117 when semi-automatic firing is to be accomplished, and to the face 118 if full automatic firing is to be accomplished.

Thus the gun may be locked against firing when adjusted to either its semi-automatic or its full automatic positions.

The change from semi-automatic to automatic or the reverse may only be accomplished when the gun is on safety, that is, when the finger 115 is on the periphery 116 of the cross bolt 90, and this is controlled by the spring-pressed plunger 109 that has heretofore been referred to as engaging in one of the four seats 110, 111, 112 or 113. This is because the plunger travels in the U-shaped track 114 connecting the four seats. As there is no track or groove connecting the two seats 110 and 113, the plunger may not travel directly from the seat 110 to the seat 113 and as it may not do this the gun may not be changed from semi-automatic to automatic adjustment or the reverse as the absence of the track prevents such travel.

In Figure 2 of the drawings I have illustrated a firing speed control which consists of a plunger 119 pressed yieldably into engagement with a track 120 in the face of the breech bolt by a spring 121, the breech bolt being counter-balanced by an opposing cut out 122. The tension on the spring 121 may be varied by means of a control lever 123 (see Figures 1 and 2), which may be in the form shown in Figure 1, or a simple screw head. If in the form shown in Figure 1, the lever 123 may be moved to any one of several positions on the scale 124 to either decrease or increase the pressure of the plunger 119 on the breech bolt to slow up or permit a faster reciprocation of the breech bolt and consequently a controlled firing.

If desired, of course, the plunger 119 may be completely backed off to permit the untrammelled reciprocation of the breech bolt and the maximum rapidity of firing.

While I have described in great detail the construction and operation of a particular gun because it has been reduced to practice and successfully operated, I wish it to be understood that I do not intend to be confined to the particular details of construction here described, as the principles involved have a wider applicability as will readily be understood.

What I claim is:

1. In a rifle that includes a receiver, a reciprocable breech block carrying a movable firing pin in said receiver, a hammer pivoted in said receiver and having a cocking notch therein, and a trigger, the combination which includes: a sear pivoted between its ends in the receiver and having a toe portion for engagement with the cocking notch of a hammer, and an end with a cam face thereon; a spring interposed between the sear and the trigger for normally urging the toe of the sear into position to engage the cocking notch of the hammer when the latter is moved to its cocked position; a cam pivotally mounted on the trigger and arranged to move between the trigger and the cam face on the sear while the trigger is held to disengage the toe of the sear from the cocking notch of the hammer; and means within the receiver connecting said cam to the reciprocable breech block for moving the cam into and out of position between the trigger and cam face on the sear as the breech block reciprocates, said means including a cam on the breech block, a tripper lever having an arm co-

operating with said cam on the breech block, a link for connecting the tripper lever to the cam on the trigger whereby movements of the tripper lever will be imparted to said cam to move the same into and out of position between the trigger and the cam face on the sear, manually controlled means for raising the end of the link adjacent the tripper lever to establish connection between the said end and said tripper lever, and resilient means for automatically lowering said end of the link to destroy the connection between the link and the tripper lever when the last mentioned means is rendered inoperative.

2. In a rifle that includes a receiver, a reciprocable breech block carrying a movable firing pin in said receiver, a hammer pivoted in said receiver and having a cocking notch therein, and a trigger, the combination which includes: a sear pivoted between its ends in the receiver and having a toe portion for engagement with the cocking notch of the hammer and an end with a cam face thereon; a spring interposed between the sear and the trigger for normally urging the toe of the sear into position to engage the cocking notch of the hammer when the latter is moved to its cocked position, a cam pivotally mounted on the trigger and arranged to move between the trigger and the cam face of the sear while the trigger is held, means for connecting said cam to the reciprocable breech block for moving the cam into and out of position between the trigger and the sear as the breech block reciprocates, said means including a cam on the breech block, a tripper lever having an arm cooperating with said cam on the breech block, a link connected to the cam on the trigger and adapted to be connected to and disconnected from the tripper lever, said link being pivotally and slidably mounted within the receiver, a manually controlled link lever for raising the end of the link adjacent the tripper lever into engagement with the tripper lever and to maintain it in such position, means for rendering the link lever ineffective to maintain such engagement, and resilient means for automatically destroying such engagement when the link lever is rendered ineffective to maintain such engagement.

3. In a rifle that includes a receiver, a reciprocable breech block carrying a movable firing pin in said receiver, a hammer pivoted in said receiver and having a cocking notch therein, and a trigger, the combination which includes: a sear pivoted between its ends in the receiver and having a toe portion for engagement with the cocking notch of the hammer and an end with a cam face thereon; a spring interposed between the sear and the trigger for normally urging the toe of the sear into position to engage the cocking notch of the hammer when the latter is moved to its cocked position, a cam pivotally mounted on the trigger and arranged to move between the trigger and the cam face of the sear while the trigger is held, means for connecting said cam to the reciprocable breech block for moving the cam into and out of position between the trigger and the sear as the breech block reciprocates, said means including a cam on the breech block, a tripper lever having an arm cooperating with said cam on the breech block, a link connected to the cam on the trigger and adapted to be connected to and disconnected from the tripper lever, said link being pivotally and slidably mounted within the receiver, a manually controlled link lever for raising the end of the link adjacent the tripper lever into engagement with the tripper

lever and to maintain it in such position, means for rendering the link lever ineffective to maintain such engagement, and resilient means for automatically destroying such engagement when the link lever is rendered ineffective to maintain such engagement, said resilient means including a spring pressed plunger carried by the link to move the link pivotally to depress the end of the link adjacent the tripper lever out of engagement with the tripper lever.

4. In a rifle that includes a receiver, a reciprocable breech block carrying a movable firing pin in said receiver, a hammer pivoted in said receiver and having a cocking notch therein, and a trigger, the combination which includes: a sear pivoted between its ends in the receiver and having a toe portion for engagement with the cocking notch of the hammer and an end with a cam face thereon; a spring interposed between the sear and the trigger for normally urging the toe of the sear into position to engage the cocking notch of the hammer when the latter is moved to its cocked position; a cam pivotally mounted on the trigger and arranged to move between the trigger and the cam face of the sear while the trigger is held; and means within the receiver for connecting the cam on the trigger to the reciprocable breech block for moving the cam into and out of position between the trigger and the sear as the breech block reciprocates, said means including a cam on the breech block, a tripper lever having an arm cooperating with said cam on the breech block, a link permanently connected at its rear end with the cam on the trigger and pivotally and slidably mounted within the receiver, the forward end of the link having a shoulder thereon, and a lug on the tripper lever adapted to engage the shoulder to slide the link rearwardly on its pivot to actuate the trigger cam in one direction, resilient means for moving the link in the opposite direction, means for establishing connection between said shoulder and said lug including a link lever mounted on the pivot of the link independently of the link and having a projection extending beneath the link and a manually operated bolt for raising said link lever to engage the link and move the forward end thereof upwardly to cause the engagement of the lug on the tripper lever with the shoulder on the link and for maintaining such engagement.

5. In a rifle that includes a receiver, a reciprocable breech block carrying a movable firing pin in said receiver, a hammer pivoted in said receiver and having a cocking notch therein, and a trigger, the combination which includes: a sear pivoted between its ends in the receiver and having a toe portion for engagement with the cocking notch of the hammer and an end with a cam face thereon; a spring interposed between the sear and the trigger for normally urging the toe of the sear into position to engage the cocking notch of the hammer when the latter is moved to its cocked position; a cam pivotally mounted on the trigger and arranged to move between the trigger and the cam face of the sear while the trigger is held; and means within the receiver for connecting the cam on the trigger to the reciprocable breech block for moving the cam into and out of position between the trigger and the sear as the breech block reciprocates, said means including a cam on the breech block, a tripper lever having an arm cooperating with said cam on the breech block, a link permanently connected at its rear end with the cam on the trigger

and pivotally and slidably mounted within the receiver, the forward end of the link having a shoulder thereon, and a lug on the tripper lever adapted to engage the shoulder to slide the link rearwardly on its pivot to actuate the trigger cam in one direction, resilient means for moving the link in the opposite direction, means for establishing connection between said shoulder and said lug including a link lever mounted on the pivot of the link independently of the link and having a projection extending beneath the link and a manually operated bolt for raising said link lever to engage the link and move the forward end thereof upwardly to cause the engagement of the lug on the tripper lever with the shoulder on the link and for maintaining such engagement, said bolt being operable to permit the link lever to move pivotally downwardly to destroy its support of the link, and resilient means for moving the forward end of the link downwardly to destroy the engagement between the shoulders on said link and the lug on said tripper lever.

6. In a rifle, a trigger plate, a trigger pivotally mounted on said plate, a sear pivotally mounted on the trigger pivot; a hammer pivotally mounted on the trigger plate and having a cocking notch therein, a cam pivotally mounted on the trigger for actuating the sear, a tripper lever pivotally mounted on the hammer pivot, a link pivotally and slidably mounted on the trigger pivot and having a permanent connection with the sear actuating cam at its rear end and having a breakable connection at its forward end with the tripper lever, and means for establishing and maintaining connection between the forward end of the link and the tripper lever.

7. In a rifle, a trigger plate, a trigger pivotally mounted on said plate, a sear pivotally mounted on the trigger pivot; a hammer pivotally mounted on the trigger plate and having a cocking notch therein, a cam pivotally mounted on the trigger for actuating the sear, a tripper lever pivotally mounted on the hammer pivot, a link pivotally and slidably mounted on the trigger pivot and having a permanent connection with the sear actuating cam at its rear end and having a breakable connection at its forward end with the tripper lever, means for establishing and maintaining connection between the forward end of the link and the tripper lever, and resilient means for moving the link about its pivot to break the connection between the forward end of the link and the tripper lever.

8. In a rifle, a trigger plate, a trigger pivotally mounted on said plate, a sear pivotally mounted on the trigger pivot; a hammer pivotally mounted on the trigger plate and having a cocking notch therein, a cam pivotally mounted on the trigger for actuating the sear, a tripper lever pivotally mounted on the hammer pivot, a link pivotally and slidably mounted on the trigger pivot and having a permanent connection with the sear actuating cam at its rear end and having a breakable connection at its forward end with the tripper lever, and means for establishing and maintaining connection between the forward end of the link and the tripper lever, said last mentioned means including a link lever pivoted on the trigger pivot and having a separable connection with said link, and a cam bolt for raising said link lever about its pivot to raise the forward end of the link to establish engagement between the forward end of the link and the tripper lever.

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