Dec. 19, 1944. M. A. BROWNING 2,365,389

FIREARM

Filed Nov. 4, 1941 2 Sheets-Sheet 1

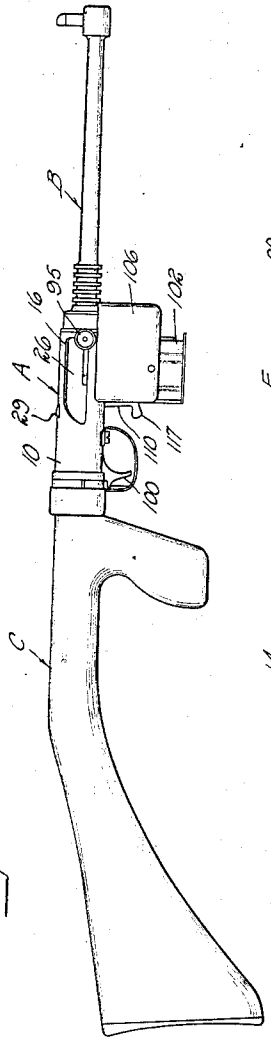


Fig. 1

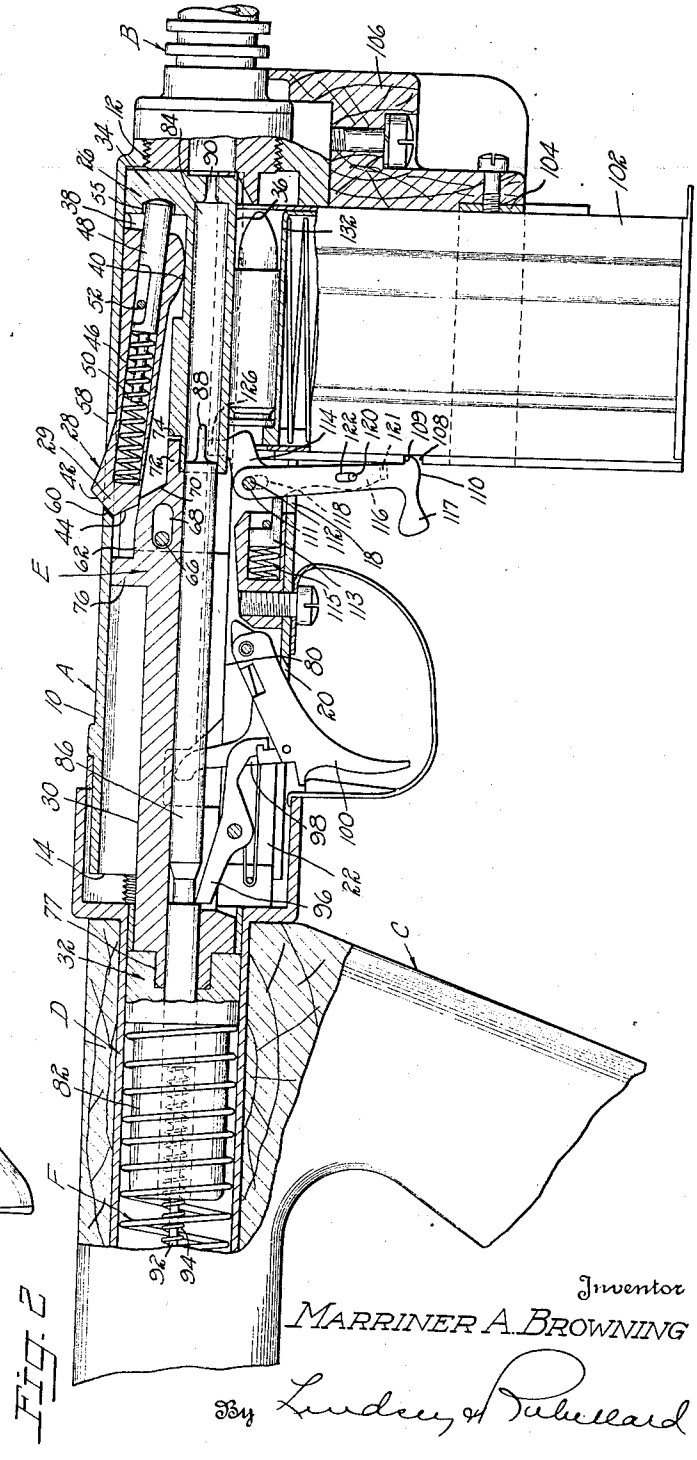


Fig. 2

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FIREARM

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Fig. 3

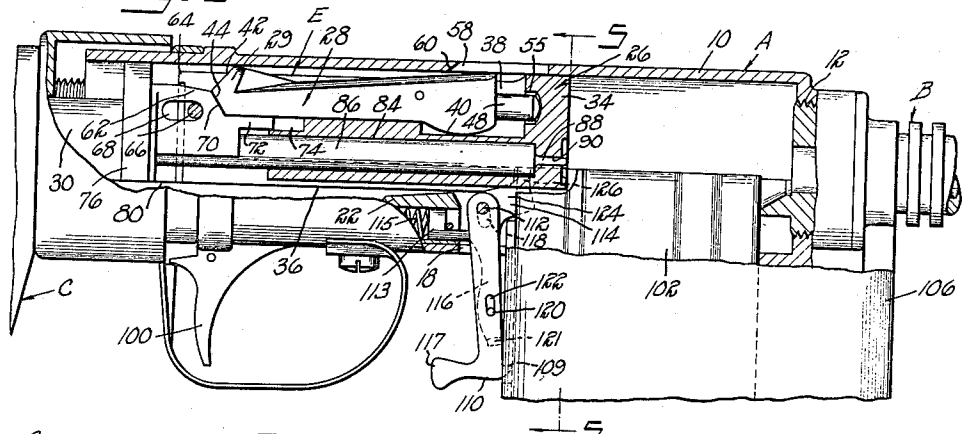


Fig. 4

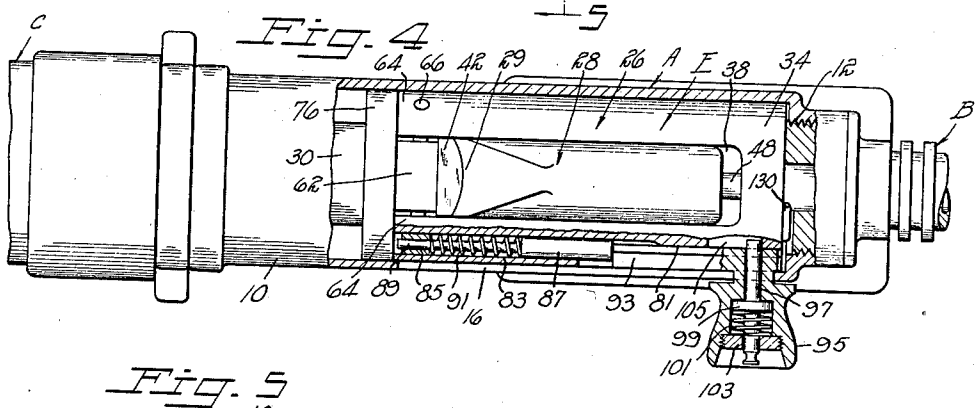
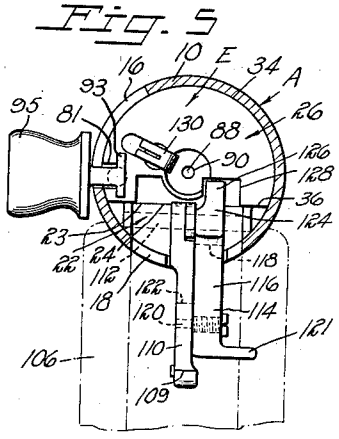


Fig. 5



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2,365,389

UNITED STATES PATENT OFFICE

2,365,389

FIREARM

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Application November 4, 1941, Serial No. 417,753

10 Claims. (Cl. 42—3)

The present invention relates to repeating firearms and more particularly to the type of firearm shown and described in the copending application of Val A. Browning, Serial No. 401,602, filed June 9, 1941.

In said application, the firearm disclosed is of the blow-back type—that is, the recoil mass is in axial alignment with the cartridge, and, upon explosion of the cartridge, it moves rearwardly while retaining such axial alignment. In the firearm disclosed in said application, the recoil mass is made of a plurality of parts adapted to successively move rearwardly and then forwardly and, in so doing, to absorb and disintegrate the recoil shock.

The object of the present invention is to provide in a gun of the above-indicated type means cooperating with the recoil mass, which means further assist in absorbing and disintegrating the recoil shock.

Another advantage is that the additional means disclosed in the present application provides additional resistance to the pressure created upon firing without increasing the weight of the recoil mass.

A further advantage is that the additional means is so constructed as to provide a temporary retarding action which impedes rearward movement of a part of the recoil mass during a portion of the movement of another part of the recoil mass and wherein the retarding or locking action may be readily varied by varying the construction of the means for providing such locking and retarding action.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings:

Figure 1 is a side elevational view of a repeating firearm embodying the invention herein;

Fig. 2 is a sectional view taken generally longitudinally and vertically through the receiver and showing the various parts in their firing position;

Fig. 3 is a view generally similar to Fig. 2, but showing the parts in position at the completion of the recoil operation;

Fig. 4 is a plan view partly in section to show the manual cocking means; and

Fig. 5 is a view taken generally along the line 5—5 of Fig. 3.

Referring to the drawings, the gun comprises generally a receiver A, a barrel B, and stock C in which there is located a recoil housing D which is arranged in axial alignment with the barrel and receiver. Located within the receiver A and extending into the housing D is a recoil mass E comprising a plurality of parts which, upon the firing of the gun, separate slightly from one another and move rearwardly to compress a recoil spring F in the housing D; the spring then expanding and moving the recoil mass forwardly.

More specifically, the receiver A comprises a tube 10 of relatively light material provided at its forward end with an internal thread 12 for securing the barrel and at its after end with an external thread 14 for securing the enlarged end of the housing D. The receiver is further provided at one side with an opening 16 through which the cartridges are ejected and in its base with a forward loading opening 18 and an after trigger opening 20. Located within the base of the receiver is a trigger plate 22 having a parti-cylindrical lower surface conforming to the internal periphery of the tube 10. The trigger plate has, on opposite sides of its center line, raised lands 24 provided with flat top surfaces 23 upon which a portion of the recoil mass E is slidably mounted.

Referring now to the recoil mass E, it comprises a breech block 26, an extension block 30, and a follower block 32. These parts are successively arranged and are so designed that upon the firing of the gun the parts will successively move to recoil position with the extension and follower block definitely separating from the breech block. In the present embodiment, this separation is assured by temporarily retarding the initial rearward movement of the breech block by locking and cushioning means which comprise a locking block 28 and a spring. The locking block or member 28 in turn is restrained in locking position by the extension block until the latter has definitely separated from the breech block. Upon firing the gun, the several blocks of the recoil mass are successively stopped in their rearward movements whereby the shock of recoil is smoothed out or distributed and the spring 50 assists in cushioning the shock, as hereinafter described. Further, this spring serves to ease or distribute the shock when the breech block rebounds to its foremost position against the rear end of the barrel.

Referring particularly to the breech block, it has a parti-cylindrical upper surface 34 having a

radius corresponding to the tube 10 in which it slidably fits and a flat lower surface or base 36 adapted to overlie and ride on the lands 24 of the trigger plate. The top of the breech block is cut out to provide a substantially rectangular channel 38 closed at its forward end and in which the locking and cushioning means is positioned.

As best seen in Figs. 2 and 4, the locking block 28 is substantially rectangular, having on its lower surface adjacent its forward lower end a rounded portion 40 about which the member may fulcrum or rock. At its after end, block 28 terminates in a wedge-shaped enlargement 29 having an upwardly and forwardly extending camming and locking shoulder 42 and a downwardly and forwardly extending camming shoulder 44. Locking block 28 further includes a longitudinally extending bore 46 open at its forward end to receive a pin 48 and the compression spring 50. The spring 50 normally tends to urge the pin 48 out of the bore, but the latter is retained by a pin 52 extending transversely of the bore and through a U-shaped recess 54 in the pin. Also, as best seen in Fig. 2, the forward end of the pin 48 fits into a recess 55 in the forward wall of the channel 38 of the breech block and is not otherwise connected thereto. When the parts are in firing position, the locking block 28 assumes the locking or latching position shown in Fig. 2 with the enlarged after end 29 of the block partially projecting through an opening 58 in the top of the tube 10 with the upper camming and locking surface 42 spring pressed into engagement with the rear wall of the opening 58 which constitutes a locking stop 60.

The locking block 28 is retained in the aforedescribed position by an abutment 62 extending forwardly from the extension block 30 and positioned between rearwardly projecting ears 64 of the breech block. The extension block and breech block are connected at this point by a lost motion connection comprising a pin 66 extending through aligned openings in the breech block ears 64 and an elongated slot 68 in the abutment 62. The forward end of abutment 62 is formed to provide a downwardly and forwardly extending cam 70 which cooperates with the cam shoulder 44 of block 28 to urge the latter, when the breech block reaches the end of its forward movement, to latching or breech block retarding position and to then restrain the locking block in said position.

To guide the locking block there extends forwardly from the abutment 62 a rectangular tongue 72 seated within a corresponding rectangular recess 74 in the breech block 26 and upon which the after end of the block 28 rests as the parts move to and from firing position.

Rearwardly of the abutment 62 the extension block has a parti-cylindrical collar 76 having a radius corresponding to that of the tube 10 to permit it to slidably fit therein, and rearwardly of the collar 76 this radius is decreased to that of the tube D for slidably guiding the extension block therein. The extension block 30 is further cut away to provide a flat base 80 extending substantially its full length and adapted to overlie and slide on the lands of the trigger plate.

Referring now to the follower black, this is wholly contained within the housing D just rearwardly of the extension block 30, and, if desired, it could be an integral part thereof. However, for simplicity in manufacture, these parts are made separate but with a telescoping connection 77 to maintain them in proper alignment. The follower block 32 also terminates in a portion 82 to seat one end of the recoil spring F; the other end of the spring abutting a buffer (not shown) at the rear end of the housing D.

When the parts are in their forward firing positions shown in Fig. 2, the breech block is forced against the rear end of the barrel, and the breech block, extension block, and follower block are forced together by the recoil spring F so that the three blocks act as an integral mass to close the breech. Furthermore, the cushioning spring 50, acting through the pin 48 and the locking block 28, resiliently urges the breech block against the rear end of the barrel so that the force of this spring is added to the weight of the breech block, extension block, and follower block to properly resist rearward movement of the breech block against the pressure of the exploding cartridge at the time of firing. It may be stated here that the force of this spring is added to the inertia of the recoil mass to properly resist the rearward motion of the breech block upon firing because, particularly in a light gun, the inertia mass itself may not be of sufficient weight especially where the gun has a straight blow-back action such as is here shown. The operation, upon firing of the gun, is as follows: At the instant a cartridge in the firing chamber is fired, the power gases generated initially act upon the breech block, extension block, and follower block as though they were one integral mass, and this mass is driven violently to the rear against the force of the recoil spring F. However, upon such rearward movement, the cushioning spring 50 retards the movement of the breech block, thus causing the breech block to lag behind the extension block so that these blocks will separate to the extent allowed by the lost motion connection comprising the pin 66 and the slot 68, and when these blocks so separate, the lug 62 of the extension block rides from underneath the locking block 28 with the result that the locking and cushioning means assumes the position shown in Fig. 3 and in which position the spring acts as a cushion between the breech block and the extension block and, thereafter, the extension block will move rearwardly at the same rate as the breech block. Furthermore, due to the lag exerted on the extension block through the breech block, the follower block will separate slightly from the extension block. Rearward travel of the follower block is limited by the impingement of that block against the buffer (not shown) fixed in the rear end of the recoil spring tube D. The extension block then stops against the forward end of the follower block, and then the breech block stops against the forward end of the extension block. Thus, the several blocks of the recoil mass are separately and successively stopped in their rearward movement, these stoppages being effected in an almost imperceptible period of time but they are spaced apart sufficiently in time to permit of a smoothing out or distribution of the shock of recoil over that which would result should such movement between the several parts not be permitted. It may be that the extension block will rebound forwardly before the breech block completes its rearward movement. The cushioning spring 50 has the advantage in that it plays an effective part in smoothing out the shock of recoil, it being observed that when the breech block moves rearwardly against the stopped or rebounding extension block, the spring 50 will be compressed so as to give a cushioning action which assists in neu-

tralizing the shock effect. It is understood that the recoil spring F is compressed during recoil until the follower block strikes the buffer, and then that spring forces the recoil mass forwardly into the firing position shown in Fig. 2. During such forward movement, the extension block is maintained in spaced relation to the breech block by the cushioning spring 50 and the locking block 28, and the follower block will lag slightly behind the extension block. As the recoil mass reaches its foremost position, the forward end of the breech block first comes into contact with the breech part of the barrel and then the extension block will come against the rear end of the breech block, but before the extension block strikes the rear end of the now stopped breech block, the cam surface 70 will cam the locking block to the locking position shown in Fig. 2 and the lug 62 will ride beneath the locking block to restrain it in locking position. At the forward stopping point of the action, the cushioning spring 50 serves to iron out or distribute the shock, it being observed that the forward movement of the extension block, after the breech block has been stopped against the end of the barrel, is cushioned by this spring. It will thus be observed that the locking and cushioning means serves various functions including that of assisting the inertia mass to resist the rearward movement of the breech block against the pressure of the exploding cartridge at the time of firing, insuring that the extension block be held in spaced relation to the breech block during recoil and forward movements of the recoil mass, and assisting in cushioning the shock at both the rearward and forward limits of movements of the recoil mass.

With the foregoing arrangement, it will be seen that the block 28 not only functions as a locking means, but also as a cushioning means. Because of this, the weight of the parts of the inertia mass may be considerably reduced and the loss in weight compensated for by the locking action of block 28 and the strength of spring 50 within same. It is apparent that the locking action may be varied by increasing or decreasing the angle of the cams 42, 44, and 70 as well as by varying the length of the locking block 28.

As the extent of manual rearward movement of the breech block from firing position is limited by the locking block and extension block, in order to manually cock the gun it is necessary that means be provided for initially separating the extension block from the breech block. To accomplish this (see Fig. 4), the breech block 26 is provided, in transverse alignment with the cartridge ejecting opening 16, with a T-shaped guide groove 81 extending from the forward end of the block through approximately one-half the length thereof and is then provided with an enlarged bore 83 terminating at the rear end of the breech block in a reduced bore 85. Located within the bore 83 is a pin 87 having a reduced extension 89 extending through the reduced bore 85. Positioned on the reduced extension is a spring 91 which normally tends to urge the pin forwardly and outwardly of the recess. The pin is normally maintained in place by a slide member 93 of T cross section which fits within the T guide groove 81. The forward end of the slide 93 carries an operating handle 95 in which there is slidably mounted a retaining pin 97 of greater length than handle 95 and having an enlarged collar 99 intermediate of its ends. The pin is normally urged inwardly towards the breech block by a spring 101 positioned between the collar and a cover 103, whereby the pin's inner end is positioned within a groove 105 paralleling the T guide and also cut in the breech block. The cover 103 is in the form of a washer threaded into a recess in the handle 95 and in which recess the spring 101 is housed.

With this arrangement, upon moving the handle 95 rearwardly, the handle may move through the length of the slot 105 to force the pin 87 rearwardly. The rearward end of the pin will then contact the extension block, forcing it rearwardly and thereby moving the abutment 62 from under the locking block so as to release same. After the locking block has been released, the pin 97 will then abut the rear end of the slot 105 to simultaneously draw the breech block rearwardly. Upon release of the parts, handle 95 will be moved to its forward positon by spring 91. For convenience in assembly, it will be seen that the pin 97 may be pulled outwardly to permit the removal of the slide 93 from the guide 81 to allow the recoil mass to be withdrawn through the rear of the tube 10 upon removal of the stock C.

In order to fire the cartridge, the recoil mass is provided with a bore 84 in which there is mounted a firing pin 86, which pin terminates at its forward end in a firing point 88 adapted to project through a reduced bore 90 in the forward wall of the breech block to contact the cartridge. The rear end of the firing pin carries a reduced portion 92 on which there is mounted a spring 94, which spring normally tends to urge the firing pin towards firing position. The operation of the firing pin is controlled by a firing mechanism comprising a sear 96, connecter 98, and trigger 100. This firing mechanism may be of any suitable type which is automatically reset to firing position upon the recoil of the gun. However, in the present embodiment it is preferably of the type fully described in the copending application of Val A. Browning, Serial No. 401,602, filed June 9, 1941.

As previously indicated, the under side of the tube 10 is provided with a loading opening 18 through which a magazine 102 may be inserted. The magazine is of the usual rectangular type adapted to extend through a rectangular metal slide 104 secured to a wooden U-shaped holding member 106, which member in turn is secured to the barrel B. To retain the magazine in place, its rear wall is provided with an opening 108 for receiving the latching hook 109 of a latch member 110. As indicated, the latch member comprises an elongated arm with the hook 109 at its lower end and an opening 111 at its upper end for pivotally mounting the latch on a pin 112 bridging a slot in the forward end of the trigger plate. The latch is normally urged into latching position by a plunger 113 positioned in a bore in the trigger plate and normally urged towards latching position by a spring 115. To manually release the latch 110, its lower end may likewise be provided with a fingerpiece 117.

Also associated with the latch 110 is a second latch 114, which latch functions both as a stop-open latch and as an ejecting member. More particularly, latch 114 includes a depending arm 116 provided with a vertical slot 118 for pivotally mounting it on the pivot pin 112. The lower end of the arm 116 further carries a laterally extending pin 120 extending through a slot 122 in the member 110. In this way, the latch 114 is mounted for pivotal movement simultaneously with the

latch 110, but is also capable of vertical movement relative thereto. Carried on the upper end of the arm 116 is a forwardly extending arm 124, and extending upwardly from this arm is a projection 126. The projection 126 normally lies, when the top latch is in lowermost position, within a groove 128 provided in the base of the breech block and also lies in the path of a cartridge withdrawn from the barrel by the usual extractor 130.

With this construction, during the firing operation, the upper end 126 of the stop latch functions as an ejector for throwing the cartridges out through the ejecting opening 16. However, as the last cartridge is fed into the gun, the follower 132 of the magazine will engage beneath the forwardly extending arm of the stop latch. As a result, when the breech block has moved rearwardly of the ejecting end 126 upon the next recoil, the follower will move the stop latch vertically and into the path of movement of the breech block. As the breech block then tends to return, it will engage the end 126, pivot the stop latch, and simultaneously pivot the latch 110, whereupon the cartridge magazine will be released and drop out of the loading opening.

Following a reloading of the gun, the stop latch may be moved downwardly by grasping a fingerpiece 121 provided at the bottom of the arm 116 to release the breech block and recondition the gun for firing operation.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a plurality of parts, one of which being a breech block adapted to close the firing chamber and another part being an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a locking shoulder engaging said stop shoulder when the breech block is in breech closing position, a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block, and means on the extension block for holding the locking block in stop shoulder engaging position when the extension block is in foremost position, said means being released from said locking block when said extension block separates from said breech block upon recoil when the gun is fired.

2. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a plurality of parts, one of which being a breech block adapted to close the firing chamber and another part being an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a locking shoulder engaging said stop shoulder when the breech block is in breech closing position, said locking shoulder being upwardly and forwardly inclined whereby when said locking block is released and said breech block recoils said locking block is cammed inwardly out of engagement with said locking shoulder, a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block, and means on the extension block for holding the locking block in stop shoulder engaging position when the extension block is in foremost position, said means being released from said locking block when said extension block separates from said breech block on recoil when the gun is fired.

3. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a plurality of parts, one of which being a breech block adapted to close the firing chamber and another part being an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts forwardly into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a camming and locking shoulder engaging said stop shoulder when the breech block is in breech closing position, and a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block, said extension block having a cam surface for camming said locking block into engagement with said stop shoulder as said extension block moves forwardly into engagement with said breech block after the latter reaches its breech closing position, said extension block further having an abutment for holding the locking block in stop shoulder engaging position when the extension block is in foremost position, said abutment being released from said locking block when said extension block separates from said breech block upon recoil when the gun is fired.

4. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a plurality of parts, one of which being a breech block adapted to close the firing chamber and another part being an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts forwardly into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a wedge-shaped rear end providing an upwardly and forwardly inclined locking shoulder adapted to engage said stop shoulder and a downwardly and forwardly inclined camming surface, and a cushioning spring between said locking block and breech block and resiliently urging said breech block in breech closing position when said locking block is in stop shoulder engaging position, said extension block having a cam adapted to engage said camming surface of the locking block to cam the latter into stop shoulder engaging position as the extension block moves into

its final forward position and also having an abutment for holding said locking block in said position when said extension block is in its foremost position.

5. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a breech block adapted to close the firing chamber and an extension block adapted to separate slightly from the breech block upon recoil, said breech block having a longitudinally extending channel with a recess at its forward end and said extension block having a camming surface at its forward end and an abutment therebehind, a recoil spring normally urging the extension block into engagement with the breech block and said breech block into breech closing position, a locking block carried within the channel of said breech block for pivotal and longitudinal movements relative to the breech block and having a camming and locking shoulder engageable with said stop shoulder and a camming surface engageable with said camming surface of said extension block, a pin positioned within a bore of said locking block and having its forward end engaged in said recess, and a cushioning spring within said bore between said pin and locking block, said abutment holding said locking block in operative position with said locking shoulder in engagement with said stop shoulder when said recoil mass is in firing position and said camming surface of said extension block being arranged to cam said locking block to said operative position while said extension block is moving forwardly to final position after said breech block has moved to breech closing position.

6. In a firearm, a receiver, a recoil mass mounted for sliding movement in the receiver and comprising a breech block adapted to close the firing chamber and an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts into engagement with one another and said breech block into breech closing position; cushioning and locking means comprising a locking block carried by the breech block for pivotal and longitudinal movements relative thereto and a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block; said cushioning and locking means being positioned between said breech block and receiver when the breech block is in firing position whereby initial recoil movement of the breech block is retarded when the gun is fired, and said cushioning and locking means being positioned between said breech block and extension block after the locking block is disengaged from the receiver whereby said breech block and extension block are resiliently maintained in separated relation and said cushioning spring cushions the shock upon recoil, and means on the extension block for holding the locking block in breech block retarding position when the parts are in firing position, said means being released from said locking block when said extension block separates from said breech block upon recoil when the gun is fired.

7. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and having a breech block adapted to close the firing chamber and an extension block adapted to separate slightly from the breech block upon recoil, said extension block having a camming surface, a recoil spring normally urging said parts of the recoil mass into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and engageable with said stop shoulder when the recoil mass is in firing position and engageable with said camming surface after the locking block has been released from the locking shoulder, said camming surface being arranged to cam said locking block into engagement with said stop shoulder while the extension block is moving forwardly into final position after the breech block has been moved forwardly to breech closing position, and a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block.

8. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and comprising a plurality of parts, one of which being a breech block adapted to close the firing chamber and another part being an extension block adapted to separate slightly from the breech block upon recoil, a recoil spring normally urging said parts into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a locking shoulder engaging said stop shoulder when the breech block is in breech closing position, a cushioning spring between said locking block and breech block and normally urging the locking block rearwardly of the breech block, and means on the extension block for holding the locking block in stop shoulder engaging position when the extension block is in foremost position, said means being released from said locking block when said extension block separates from said breech block upon recoil when the gun is fired, said extension block further having a forwardly facing surface against which the rear end of said locking block is engaged after said locking block is released from said stop shoulder.

9. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and having a breech block adapted to close the firing chamber and an extension block adapted to separate slightly from the breech block upon recoil, said breech block having a rearwardly facing surface and said extension block having a forwardly facing camming surface and an abutment therebehind, a recoil spring normally urging the recoil mass into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having a camming and locking shoulder engaging said stop shoulder when the breech block is in breech closing position, said locking block further having a camming surface engageable with said camming surface of said extension block during reciprocation of the recoil mass, and a cushioning spring between said locking block and said rearwardly facing surface of said breech block and normally urging the locking block rearwardly of the breech block, said cam surface on the extension block being arranged to cam the locking block into stop shoulder engaging position as the extension block approaches its foremost limit of travel and said abutment thereafter maintaining said locking block in said stop shoulder engaging position.

10. In a firearm, a receiver having a stop shoulder, a recoil mass mounted for sliding movement in the receiver and having a breech block

adapted to close the firing chamber and an extension block adapted to separate slightly from the breech block upon recoil, said extension block having an abutment with a downwardly and forwardly inclined camming surface at its forward end, a recoil spring normally urging said parts of the recoil mass forwardly into engagement with one another and said breech block into breech closing position, a locking block carried by said breech block for pivotal and longitudinal movements relative thereto and having an upwardly and forwardly inclined locking shoulder adapted to engage said stop shoulder when said breech block is in its foremost position, said locking block also having a downwardly and forwardly inclined surface adapted to engage said camming surface of said extension block during reciprocation of the recoil mass, and a cushioning spring between said locking block and breech block and normally tending to urge the same apart, said camming surfaces cooperating to cam the locking block into stop shoulder engaging position as the extension block approaches its forward limit of travel and said abutment thereafter holding said locking block in said position.

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