Sept. 18, 1945. V. A. BROWNING 2,385,057

FIRING MECHANISM FOR REPEATING FIREARMS

Original Filed July 9, 1941 3 Sheets-Sheet 1

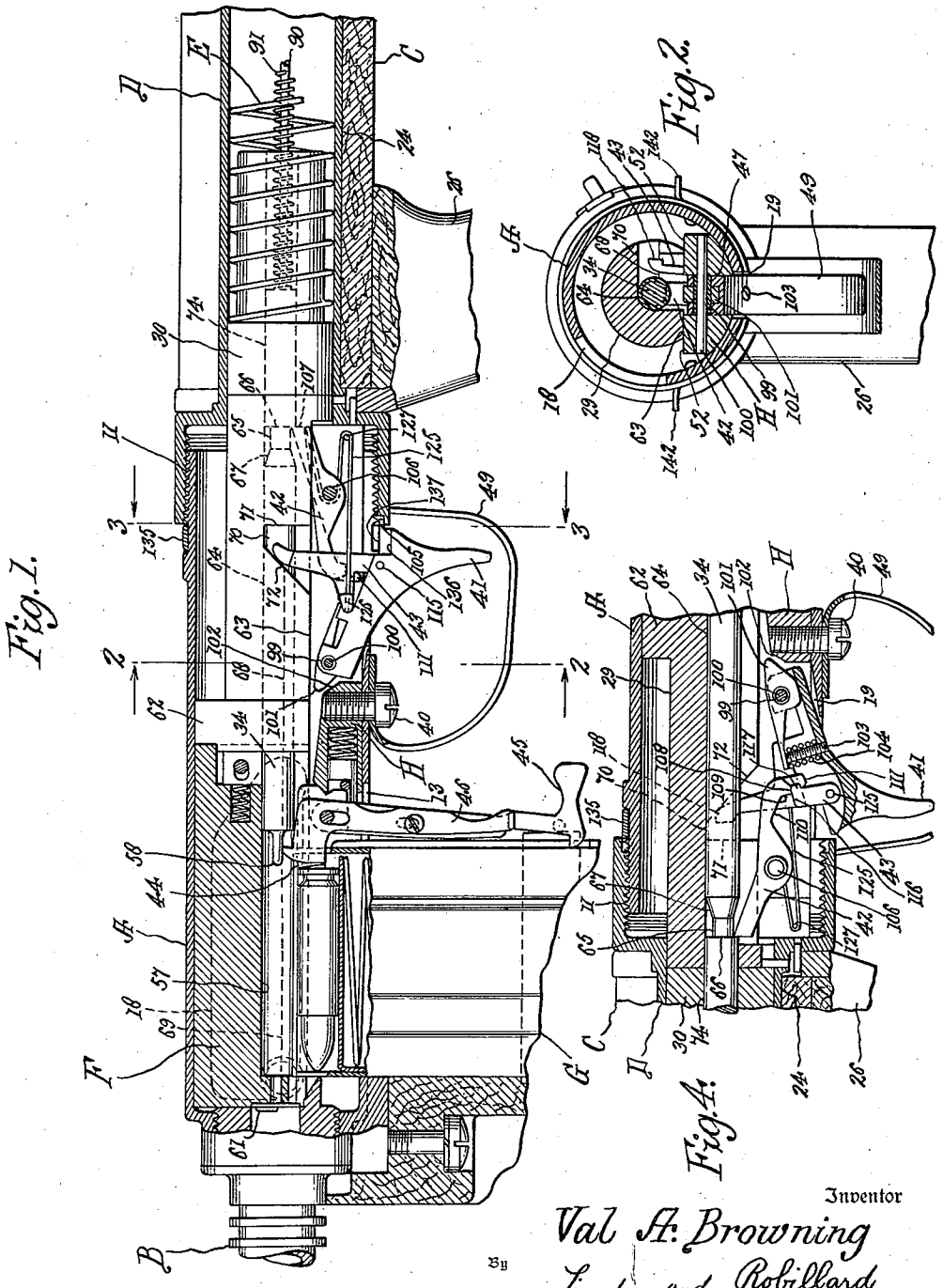

Fig. 1.

Fig. 2.

Fig. 4.

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FIRING MECHANISM FOR REPEATING FIREARMS

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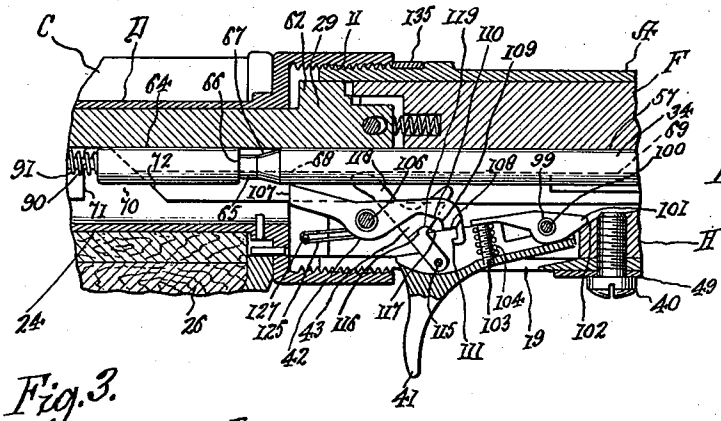

Fig. 5.

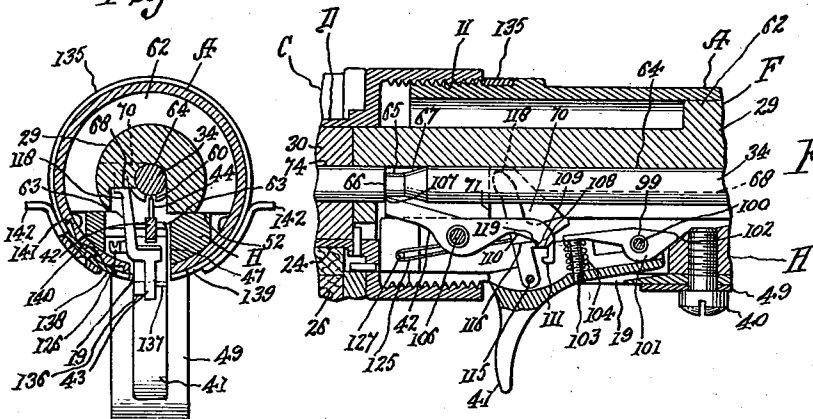

Fig. 6.

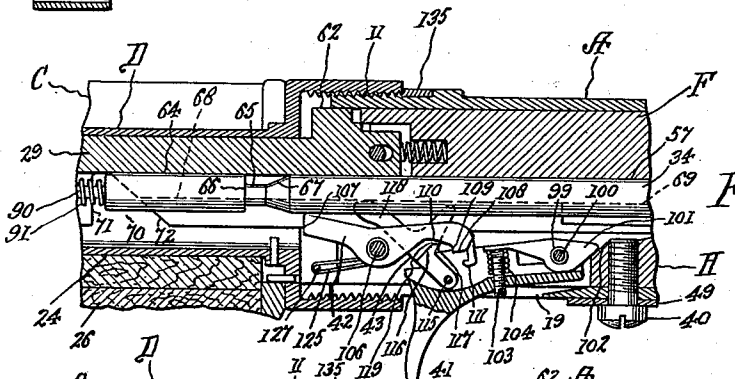

Fig. 7.

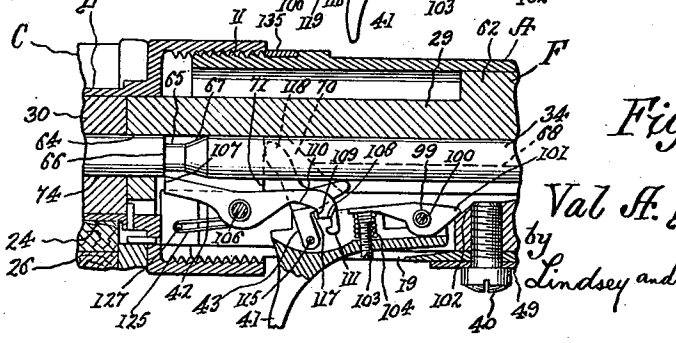

Fig. 8.

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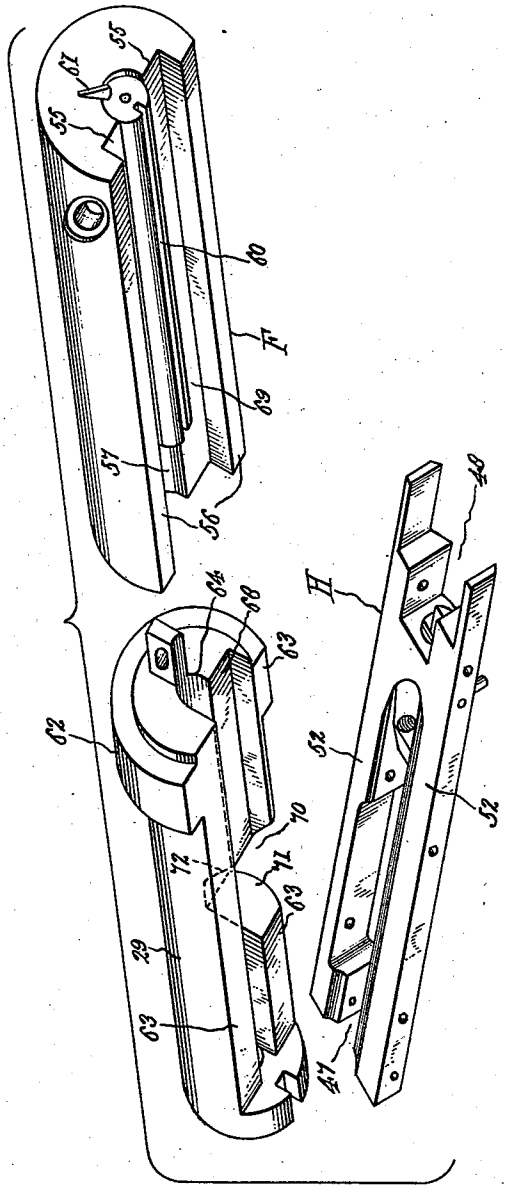
Fig. 9.



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2,385,057

FIRING MECHANISM FOR REPEATING FIREARMS

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Original application July 9, 1941, Serial No. 401,602. Divided and this application December 31, 1942, Serial No. 470,844

11 Claims. (Cl. 42—3)

This invention relates to repeating firearms and has particular reference to firing mechanism for use in connection therewith. The invention finds particular application in a firearm of the blow-back type wherein the expanding power gases are utilized to automatically perform the functions of retracting the breech block and withdrawing the spent case.

The present application is a divisional of my application Serial No. 401,602, filed July 9, 1941, and entitled "Repeating firearm."

The aim of the invention is to provide an improved firing mechanism which has various features of novelty and advantage and which is particularly characterized by its simplicity in construction, economy in manufacture, and effectiveness and reliability in operation.

A further aim of the invention is to provide improved firing mechanism whereby the firearm may be conveniently fired in either a semi-automatic or a full automatic manner at the immediate selection of the shooter.

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 sectional view taken generally longitudinally and vertically through the receiver of the firearm and shows the various parts in their normal or firing positions;

Fig. 2 is a transverse sectional view through the receiver in the plane which includes the pivot for the trigger, this view being taken substantially on line 2—2 of Fig. 1 looking rearwardly in the direction of the arrows;

Fig. 3 is a transverse sectional view through the rear end of the receiver, this view being taken substantially on line 3—3 of Fig. 1 looking forwardly in the direction of the arrows;

Fig. 4 is a longitudinal vertical sectional view through the rear end of the receiver looking towards the right hand side of the firearm with the parts of the firing mechanism shown in normal or firing position and with the screw 103 so adjusted that the gun can be fired in a semi-automatic manner only;

Fig. 5 is a view similar to Fig. 4 but showing the parts in fired position, the trigger being shown as having been pulled and the breech block and firing pin being illustrated in substantially their rearmost positions;

Fig. 6 is a view similar to Figs. 4 and 5 but showing the parts in the positions which they have when the trigger is maintained in pulled position after firing and the breech block and firing pin have returned to their normal firing positions;

Fig. 7 is a view similar to Fig. 5, the screw 103 having been backed off and the trigger being held in a position to effect full automatic firing;

Fig. 8 is a view similar to Fig. 7 but showing the manner in which the connector cams the sear to a release position when the recoil mass moves to its forward position while the trigger is maintained pulled to effect full automatic firing; and

Fig. 9 is a view showing the breech block, the extension block, and the trigger plate in perspective.

As the present invention is primarily directed to the firing mechanism, only so much of the firearm is illustrated as is necessary to show one application of the invention. For a fuller description of the firearm to which my improved firing mechanism is shown as being applied, reference may be had to my said co-pending application Serial No. 401,602.

Referring to the drawings, A designates generally a receiver; B, a barrel secured in any suitable manner to the forward end of the receiver; C, a stock which may be of the usual construction; D, a tube or sleeve for housing the recoil spring E, this sleeve being mounted in the forward end of the stock and having its forward end demountably connected to the rear end of the receiver; F, the breech block forming a part of the multi-part recoil mass mounted in the receiver; G, a cartridge magazine of the usual construction; and H, the trigger plate located within the receiver and supporting the trigger mechanism, the magazine latch, and the stop-open latch, as described more in detail hereinafter.

The receiver A is in the form of a cylindrical tube, the forward end of which is internally threaded so as to receive the rear end of the barrel B which may be of the usual construction. The rear end of the receiver is externally threaded as at 11 so as to be demountably screwed into the internally threaded enlarged forward end of the recoil spring tube D. The receiver, adjacent its rear end and on its under side, is longitudinally slotted, as at 13, so as to provide a loading opening which accommodates the upper end of a replaceable magazine G which also

may be of the usual sort. The receiver, adjacent its forward end and on its right hand side, has an ejection opening 18 through which the spent case is thrown upon recoil of the breech block in the usual manner. The receiver, at its rear end and on its under side, has a slot 19 for accommodating the trigger 41. The casing or tube D is mounted within a bore 24 in the forward end of the stock C and serves to house the recoil spring E and to guide certain parts of the recoil mass. The rear end of the tube is closed by a suitable closure, which is not shown in the present instance, and the rear end of the spring E is adapted to abut against this closure. The stock may be provided at its forward end with a depending pistol grip 26. The recoil mass is shown as including the breech block F, an extension block 29, and a follower block 30. The numeral 34 designates the firing pin.

The trigger plate H is secured by means of a screw 40 within the cylindrical receiver A rearwardly of the loading opening 13. This trigger plate supports the firing mechanism which includes the trigger 41, the sear 42, and the connector 43. The trigger plate further supports, at its forward end, an ejector 44, a magazine latch 45, and a stop-open latch 46. The latter is for automatically latching the breech block in its retracted position after the last shot in the magazine has been fired or for manually latching the breech block in its retracted position at will. The trigger plate, as will be seen from Fig. 2, is a parti-cylindrical member with its under surface conforming to, and seating snugly against, the internal periphery of the receiver. The upper surface of the plate to opposite sides of the center line thereof is flat and smooth so as to provide lands 52 which slidably support the breech block F and extension block 29 of the recoil mass. The plate, at its rear end, is longitudinally slotted, as at 47, so as to accommodate the trigger mechanism, and the plate, at its forward end, is slotted, as at 48, so as to accommodate the latches 45 and 46. As stated, the trigger plate is secured against the bottom portion of the receiver by the screw 40, and this screw is also employed to hold a trigger guard 49 in place.

As stated in my said co-pending application, the recoil mass includes two or more parts arranged in succession and mounted one behind the other, these parts having a limited relative movement in the direction of the axis of the gun upon firing in order to disintegrate the shock of recoil. The breech block F of this recoil mass consists of a parti-cylindrical member slidably fitting within the receiver above the trigger plate. The under side of the breech block is longitudinally grooved, as at 55, to each side of its center and has, laterally beyond these grooves, flat surfaces 56 which engage the lands 52 of the trigger plate. The upper wall 69 of the left hand groove 55 serves as a connector holding surface. The breech block has a central or axial bore 57 which slidably receives the firing pin 34 which has, on its forward end, a firing point 58. The under wall of the bore is longitudinally slotted, as at 60, so as to accommodate the ejector 44 which may be of the usual construction. Mounted on the forward end of the breech block is an extractor 61 for withdrawing the spent case from the firing chamber of the barrel upon recoil of the breech block when the gun is fired. This extractor may be of the ordinary kind, the same being diagrammatically shown in the drawings.

The extension block 29 has a cylindrical body portion slidably fitting within the tube D and an enlarged head 62 on its forward end slidably fitting within the cylindrical bore of the receiver. The under side of the extension block up to just short of its rear end is slabbed off so as to provide surfaces 63 which ride upon the lands 52 provided on the upper surface of the trigger plate. The extension block has an axial bore 64 aligned with the bore 57 of the breech block for accommodating the firing pin. This bore 64 is open at its under side so as to accommodate the rear end of the sear during longitudinal movement of the extension block and to permit the sear to engage in the notch 65 of the firing pin for holding the firing pin in cocked position. It may be stated here that this notch, at its rear end, has a shoulder 66 against which the rear end of the sear is adapted to engage. The notch, at its forward end, is tapered as at 67. The extension block has, on its under side and to the left hand side of the bore 64, a connector-holding surface 68 which is above the plane of the surfaces 63. This surface 68 is in the same plane as, and, in effect, forms a continuation of, the surface 69 which defines the upper wall of the left hand groove 55 in the under side of the breech block F. At the rear end of this surface 68 is a notch 70 which opens into the left hand side of the extension block. The rear wall 71 of this notch is abrupt or perpendicular, and its front wall 72 is forwardly and downwardly inclined for a purpose to be later explained.

The follower block 30 is slidably located within the tube D. The rear end of this block is of somewhat reduced diameter so that the forward end of the recoil spring E may surround the same and abut against the shoulder provided by the rear end of the forward enlarged portion. This block has an axial bore 74 in line with the central bores of the breech block and extension block so that these several bores may accommodate the firing pin 34. The firing pin is provided with a rearwardly extending rod or stem 90 for supporting a firing pin spring 91 coiled thereabout. This spring, at its forward end, abuts against the rear end of the body portion of the firing pin and, at its rear end, abuts against a closure or disk (not shown) located at the rear end of the tube D.

The firing mechanism, which includes the trigger 41, the sear 42, and the connector 43, will now be described. The trigger is pivoted on a pin 100 located adjacent the forward end of the slot 47 in the trigger plate. Also pivoted on this pin and between the ears on the forward end of the trigger is a pressure lever 101 the under side of the forward end of which is adapted to abut against a shoulder 102 on the trigger plate for the purpose of limiting the extent of upward pull on the trigger. Preferably, in order to prevent cramping between the trigger and the pressure lever, a bearing sleeve 99 (see Fig. 2) is interposed between the pin 100 and the trigger, and the pressure lever is journalled on this sleeve. This lever 101, as hereinafter described more in detail, is held against pivotal movement relative to the trigger when the gun is to be fired only in a semi-automatic manner by a screw 103 mounted for axial adjustment in a threaded opening in the body of the trigger. About this screw and between the tail end of the lever and the trigger is a coiled spring 104 the purpose of which will be hereinafter described more in detail. Downward movement of the trigger is limited by the

engagement of a small rearwardly extending stud 105 against the bottom portion of the receiver, as shown more clearly in Fig. 1.

The sear 42 is pivoted between its ends on a pin 106 carried by the trigger plate rearwardly of the pin 100. The rear end of this sear has a shoulder 107 adapted to engage the shoulder 66 of the firing pin for holding that pin in the firing position shown in Figs. 1 and 4. The forward end of the sear has a downwardly facing connector engaging face 108 which terminates at its rear end in a connector locking abutment 109 disposed generally at right angles to the face 108. The sear further has, rearwardly of the abutment 109 and meeting the upper end of that abutment at an obtuse angle, a cam surface 110. The extreme forward end of the sear also has a rearwardly facing depending hook 111 which is adapted to interlock with the connector 43 in order to prevent the sear from being jarred from firing pin holding position.

The connector 43 is pivoted to the trigger as at 115. This connector has a sear engaging portion located beneath and in the vertical plane of the forward end of the sear, and this portion has a normally upwardly facing sear actuating surface 116 which is positioned beneath and in opposition to the connector engaging surface 108 of the sear when the firing mechanism is in the normal or firing position shown in Figs. 1 and 4. At the forward end of the surface 116 is a forwardly extending lug 117 which is adapted to take into the hook 111 (see Figs. 1 and 4). The forward end of this lug constitutes an abutment at the forward end of the surface 116 and this abutment is adapted to engage the connector locking abutment 109 of the sear as shown in Fig. 6 for the purpose of preventing the connector from swinging forwardly to a position where the surfaces 108 and 116 are opposed until the trigger is released after the trigger has been pulled and the gun has been fired in a semi-automatic manner. The upper forward corner 119 of the sear engaging portion of the connector, that is, the corner between the surface 116 and the abutment formed by the forward surface of the lug 117 is adapted to engage the cam surface 110 of the sear so as to automatically release the sear from the firing pin when the firearm is being fired in a full automatic manner. Extending upwardly from the sear engaging portion of the connector and located to one side of the sear is a finger 118 which extends into the notch 70 of the extension block when the recoil mass is in its forward position (see Figs. 3 and 4). The upper end of the finger is in engagement with the connector engaging surfaces 68 and 69 of the extension block and breech block during the rearward and forward movements of such blocks (see Figs. 5 and 7).

The sear is normally urged into its firing pin holding position, the trigger is normally urged towards its unpulled position, and the connector is normally urged forwardly into a sear actuating position by a very economical, simple, and effective spring arrangement which may be easily and quickly installed. These functions are obtained by a single spring 125 (see Fig. 1) which is preferably in the form of a round spring wire bent generally into S form. The sear is longitudinally grooved on its under side so as to provide a kerf which accommodates the upper arm of the spring with the upper bend or crook of the spring in partial encircling relation to the pin 106 on which the sear is pivoted. The forward end of the lower arm of the spring is received by a hole in a projection 126 extending forwardly from the base of the finger 118 of the connector. Extending through the bottom crook or bend of the spring is a transverse pin 127 removably carried by the trigger plate. To install the spring, it is merely necessary to slip the upper arm thereof into the sear, slip the forward end of the lower arm into the hole in the projection 126, and then slip the pin 127 into the bottom crook of the spring.

As previously stated, when the screw 103 carried by the trigger is screwed home so that the pressure lever 101 can have no relative movement with respect to the trigger, the gun can be fired only in a semi-automatic maner. Assuming, for the present, that that condition pertains, the functioning of the mechanism is briefly as follows. Figs. 1 and 4 show the firing mechanism in its normal position, that is, the breech is closed and the gun is ready for firing. It will be observed that the sear is in cocked position, the trigger is down in unpulled position, and the connector is in its forward position with its sear engaging surface 116 opposed to the downwardly facing surface 108 on the forward end of the sear and with its finger extending into the notch 70 of the extension block. Upon pulling of the trigger, the connector is raised resulting in actuation of the sear and release of the firing pin. The firing pin, under the compression of the firing pin spring 91, moves sharply forward so that this pin strikes the primer of the cartridge located within the firing chamber of the barrel. On the resulting explosion, the power gases drive the recoil mass backwardly, and as this mass starts backwardly, the inclined camming surface 72 on the extension block engages the finger 118 of the connector and cams the connector to the position shown in Fig. 5 and in which position it is thereafter held by the connector engaging surfaces 68 and 69 of the extension block and breech block during the rearward and forward movements of those blocks providing that the trigger is held in the pulled position shown in Fig. 5. Upon the return of the recoil mass to its forward position, the trigger still being maintained in pulled position, the connector and sear assume the positions shown in Fig. 6. As therein shown, the sear is in cocked or firing pin holding position but the connector is held from moving forwardly to its full forward position by the engagement of the connector against the abutment 109 on the sear. In other words, the connector is maintained by the sear from moving to its normal position in which the face 116 of the connector is beneath the face 108 of the sear. This means that in order to again fire the gun, the trigger must be released and again pulled between which movements the connector would be released from the sear bringing the face 116 of the connector beneath the face 108 of the sear. Of course, if, during the movement of the recoil mass, the trigger is released, the parts automatically assume the positions shown in Fig. 4 when the recoil mass reaches its forward or normal breech closing position. It will be observed that when the gun is set to operate in a semi-automatic manner, the extent to which the trigger can be raised is limited to the position shown in Figs. 5 and 6 and in which position the camming corner 119 on the connector is not high enough to engage the camming surface 110 of the sear.

When it is desired to adapt the firearm so that it may be selectively operated in either a

semi-automatic manner or a full automatic manner by varying the pull of the operator's finger on the trigger, the screw 103 is backed off, as shown in Figs. 7 and 8, to permit of a pivotal movement of the trigger with respect to the pressure lever 101. This allows the trigger to be selectively moved to the position shown in Figs. 5 and 6 in which semi-automatic firing is obtained, or to the higher position (by exerting a greater pull on the trigger) shown in Figs. 7 and 8 in which full automatic firing is obtained so long as the trigger is maintained in its fully pulled or highest position. Assuming that the screw 103 has been backed off, the operation of the firing mechanism is now briefly as follows. Starting with the parts in their normal firing positions shown in Fig. 1, if it is desired to fire the firearm in a semi-automatic manner, the trigger is pulled to the intermediate position shown in Figs. 5 and 6 and in which position, it being assumed that the screw 103 has been backed off, the coiled spring 104 is not compressed or at least is not compressed to any appreciable extent. The operation will now be the same as that previously described in connection with the semi-automatic firing. If it is desired to fire in a full automatic manner, it is merely necessary to exert a harder pull on the trigger thus raising the trigger to its upper limit of movement shown in Figs. 7 and 8, it being observed that, due to this harder pull, the spring 104 is compressed. Upon upward movement of the trigger from its unpulled position shown in Fig. 1, the connector will release the sear from the firing pin in the same manner as heretofore described, resulting in the first firing of the gun. Upon recoil of the recoil mass, the cam surface 72 of the extension block will cam the connector backwardly to the position shown in Fig. 7 in which position it will be held by the connector engaging surfaces 68 and 69 of the extension block and breech block during the rearward and forward movements of those blocks. It will be observed that the connector has a more rearward position than that shown in Fig. 5 because the pivot 115 for the connector is in a higher position during full automatic firing than it has during semi-automatic firing. During forward movement of the recoil mass, the rear end 107 of the sear will automatically engage the shoulder 66 of the advancing firing pin and thereby hold the firing pin in cocked position until the recoil mass reaches its breech closing position. As the recoil mass approaches such position, the vertical wall 71 of the notch 70 will engage the finger 118 and positively swing the connector forwardly so that the corner 119 on the body portion of the connector will engage and ride along the cam surface 110 of the sear, thus camming the forward end of the sear upwardly and the rear end downwardly with the result that when the recoil mass has fully reached its breech closing position the firing pin is automatically released and the firearm is fired a second time. The firearm will continue to fire in a full automatic manner so long as the trigger is held in its fully raised position and so long as cartridges are supplied to the gun. As long as the trigger remains in full pulled position, the upwardly facing shoulder 116 on the connector cannot come below the connector engaging surface 108 of the sear for each time that the connector is swung forwardly by the extension block, the forward face of the lug 117 forms a stop-face for engagement with the rearwardly facing abutment 109 of the sear. The perpendicular shoulder or wall 71 of the notch 70 of the extension block pushes the connector substantially to the last mentioned position but not beyond it. When it is desired to cease full automatic firing, it is merely necessary to release the trigger in which case the parts again assume the position shown in Fig. 1. It is thus noted that the operator may very quickly and readily change from firing in a semi-automatic manner to a full automatic manner and vice versa by merely changing, at any time he may desire, the amount of pressure which he exerts on the trigger.

It may be desirable at times to selectively render the firearm operable for either semi-automatic firing or for full automatic firing without embodying the selective arrangement just described, and to this end I provide a manually adjustable selector which also serves the purpose of locking the trigger of the firing mechanism in "safety" or unpulled position. This manually adjustable selector comprises a split metal band 135 mounted for angular adjustment in a groove provided in the receiver adjacent the rear end thereof. The trigger, adjacent its rear end and behind the connector, is provided at opposite sides with two upwardly facing shoulders 136 and 137, the left hand shoulder being lower than the right hand one. The ends 138 and 139 of the band are spaced apart at the slot 19 in the receiver through which the trigger extends. The band is adjustably adjusted to three positions, it being resiliently held in each of these positions by the selective engagement of a small nib 140 carried by the band in notches 141 provided in the external periphery of the receiver (see Fig. 3). The band is provided with finger pieces 142 so that it may be more easily adjusted to its several positions. With this arrangement, when it is desired to fire the gun in a full automatic manner, the band is adjusted to the mid-position shown in Fig. 3, in which case both ends of the band are out of the path of movement of the trigger so that the trigger may be raised to the full automatic firing position shown in Figs. 7 and 8. When it is desired to fire the gun in a semi-automatic manner only, the band is adjusted counterclockwise with respect to Fig. 3 so that the left hand end 138 of the band overlies the shoulder 136 on the trigger. The trigger then can only be pulled to the intermediate position shown in Figs. 5 and 6. When it is desired to lock the trigger in safety position, the band is adjusted to its other extreme position in which case the right hand end (referring to Fig. 3) of the band lies immediately over the right hand shoulder 137 of the trigger. The trigger cannot now be lifted from its unpulled position. It has been previously pointed out that the sear has a rearwardly facing depending hook 111, and the connector has a forwardly extending lug 117 adapted to engage in the hook when the trigger mechanism is in normal condition. The purpose of this interlocking arrangement is to prevent the sear from being jarred out of its cocked position resulting in an accidental discharge of the firearm in the event the same were dropped or jarred. Thus, when the trigger is locked in safety position by the band 135, the sear is locked by the hook 111 against accidental movement. However, the gun may be cocked while the safety is in the "on" position without doing any damage to the parts because, upon the first opening movement of

the breech block, the inclined surface 72 on the extension block will swing the connector out of locking engagement with the sear.

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, a breech block therein, a firing pin, a sear for the firing pin pivotally supported by said receiver; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; and a connector between said trigger and sear and movable by said breech block to an inoperative position relative to the sear upon recoil movement of the breech block and movable by said breech block towards operative position when the breech block moves forwardly into breech closing position, said connector and sear being so constructed and arranged that when the connector moves from its inoperative position towards its operative position, while the trigger is in its extreme pulled position, the connector releases the sear from the firing pin to effect full automatic firing, and when said trigger is in intermediate position movement of said connector is ineffectual with respect to the sear.

2. In a firearm, a receiver, a recoil mass therein comprising a breech block, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; a connector between said trigger and sear having a sear actuating position when the trigger is in unpulled position, means on the recoil mass for moving said connector to an inoperative position with respect to the sear upon rearward movement of the breech block, and means on the recoil mass for moving the connector towards its sear actuating position as the breech block moves into its breech closing position while the trigger is in its extreme pulled position, said connector and sear being so constructed and arranged that when said last mentioned means moves said connector towards its sear actuating position, while the trigger is in its extreme pulled position, said connector will cam said sear from its firing pin holding position to effect full automatic firing of the firearm, and when said trigger is in its intermediate position movement of the connector towards its sear actuating position is ineffectual to operate the sear.

3. In a firearm, a receiver, a recoil mass therein including a breech block, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; a connector pivoted to said trigger and having a sear actuating position when said trigger is in unpulled position, means on the recoil mass for moving said connector rearwardly out of sear actuating position upon recoil movement of the breech block, means on the recoil mass for moving the connector forwardly as the breech block moves into its breech closing position while the trigger is maintained in its extreme pulled position, said sear having a cam surface and said connector being engageable with said cam surface when said last mentioned means moves the connector forwardly while the trigger is in extreme pulled position whereby said connector will cam said sear from firing pin holding position to effect automatic firing of the firearm, said connector being out of engagement with said cam surface of said sear when said trigger is in its intermediate position.

4. In a firearm, a receiver, a recoil mass therein, a firing pin; a pivoted sear for the firing pin having a shoulder at one end adapted to engage the pin and having at its other end a connector engaging face and a cam surface located behind said face; a pivoted trigger having an unpulled position, an intermediate position, and an extreme pulled position; and a connector pivoted to the trigger and having a sear actuating face, a camming portion at one end thereof engageable with said cam surface of the sear, and a finger cooperating with said recoil mass; said recoil mass having a cam surface adapted to engage said finger to cam the connector to inoperative position upon recoil of said recoil mass, said recoil mass having a shoulder adapted to engage said finger to cam said connector towards operative position as the recoil mass moves into its breech closing position to thereby cause the cam portion of said connector to engage the cam surface of said sear to release the sear and result in full automatic firing when the trigger is maintained in its extreme pulled position, said cam portion of said connector being out of engagement with the cam surface of said sear when said trigger is in its intermediate position.

5. In a firearm, a receiver, a recoil mass therein, a firing pin; a pivoted sear for the firing pin having a connector engaging face, a cam surface, and an abutment therebetween; a trigger having an unpulled position, an intermediate position, and an extreme pulled position, a connector pivoted to said trigger and having a sear actuating face, a stop face, and a camming portion therebetween; means on the recoil mass for moving said connector to inoperative position with respect to the sear upon rearward movement of the recoil mass, and means on the recoil mass for moving the connector towards its sear actuating position as the recoil mass moves into its breech closing position while the trigger is in its extreme pulled position whereby said camming portion of the connector will engage said cam surface of the sear to release the sear and result in full automatic firing, said camming portion of the connector being out of engagement with said cam surface of the sear when the trigger is in intermediate position, said stop face being engageable with said abutment of the sear for preventing the connector from moving to sear actuating position while the trigger is maintained pulled.

6. In a firearm, a receiver, a breech block therein, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; a connector pivoted on said trigger and engageable with said sear, means associated with said breech block for moving the connector to an inoperative position relative to the sear upon recoil movement of the breech block and for moving said connector towards operative position when the breech block moves forwardly into its breech closing position, and means for selectively limiting the pull of the trigger to its intermediate and

full pulled position, said connector and sear being so constructed and arranged that when the connector moves from its inoperative position towards its operative position while the trigger is in its extreme pulled position the connector releases the sear from the firing pin to effect full automatic firing, and when said trigger is in intermediate position movement of said connector is ineffectual to operate the sear.

7. In a firearm, a receiver, a recoil mass therein, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; a connector between said trigger and sear, means on said recoil mass for moving the connector forwardly towards its operative position as the recoil mass approaches its breech closing position, camming means between said connector and sear for releasing the sear from the firing pin when the connector is so moved forwardly by the recoil mass and when the trigger is in its extreme pulled position to effect full automatic firing, a stop on the firearm, a stop on the trigger and engageable with said first mentioned stop when the trigger is pulled to its intermediate position, and a spring associated with one of said stops for demanding a greater pull on the trigger when it is pulled from its intermediate position to its extreme pulled position than that required to move the trigger from its unpulled position to its intermediate position.

8. In a firearm, a receiver, a breech block therein, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position when the firearm is fired in a semi-automatic manner, and an extreme pulled position when the firearm is fired in a full automatic manner; a connector between said trigger and sear, a fixed stop on the firearm, a stop lever pivoted on the trigger and engageable with said stop when the trigger is pulled to its intermediate position, and a spring between said lever and trigger for demanding a greater pull on the trigger when it is raised from its intermediate position to its extreme pulled position than that required to move the trigger from its unpulled position to its intermediate position.

9. In a firearm, a receiver, a recoil mass therein, a firing pin, a sear for the firing pin; a trigger having an unpulled position, an intermediate position, and an extreme pulled position; a connector between said trigger and sear, means on the recoil mass for moving the connector towards its operative position as the recoil mass approaches its breech closing position, camming means between said connector and sear for releasing the sear when the connector is so moved and the trigger is in its extreme pulled position, a fixed stop on the firearm, a stop lever pivoted on the trigger and engageable with said fixed stop, a spring between said lever and trigger for demanding a greater pull on the trigger when it is pulled from its intermediate position to its extreme pulled position than that required to move the trigger from its unpulled position to its intermediate position, and means for preventing movement between said stop lever and trigger when it is desired to fire the firearm in a semi-automatic manner only.

10. In a firearm, a trigger mechanism comprising a trigger plate, a trigger pivoted thereto, a sear pivoted to the trigger plate, and a connector between said trigger and sear and pivoted to said trigger, a single spring for urging said sear into firing pin holding position and said trigger and connector to operative positions, said spring comprising an S-shaped member having its upper arm engaging the under side of the sear and its lower arm engaging the connector, the upper bend of the spring being in partially embracing relation to the pivot of the sear, and a pin carried by the trigger plate and located in the lower bend of said spring.

11. In a firearm, a receiver, a trigger pivoted in the receiver and adapted to extend through a slot therein, said trigger having at opposite sides upwardly facing shoulders, the shoulder at one side being higher than that at the other, and an angularly adjustable spring band about said receiver having its ends spaced apart at said slot, said band having three positions of adjustment in the intermediate of which both ends of the band are out of the path of movement of the trigger to permit the trigger to be moved to a full pulled position, said band when in one of its extreme positions having one end overlying the lower shoulder to limit the pull of the trigger to an intermediate position, and said band when in its other extreme position having its other end overlying the higher shoulder in order to lock the trigger in unpulled position.

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