Dec. 26, 1950 M. W. PASTORE ET AL 2,535,156

SEMIAUTOMATIC FIREARM WITH TRIGGER OPERATED COCKING MECHANISM

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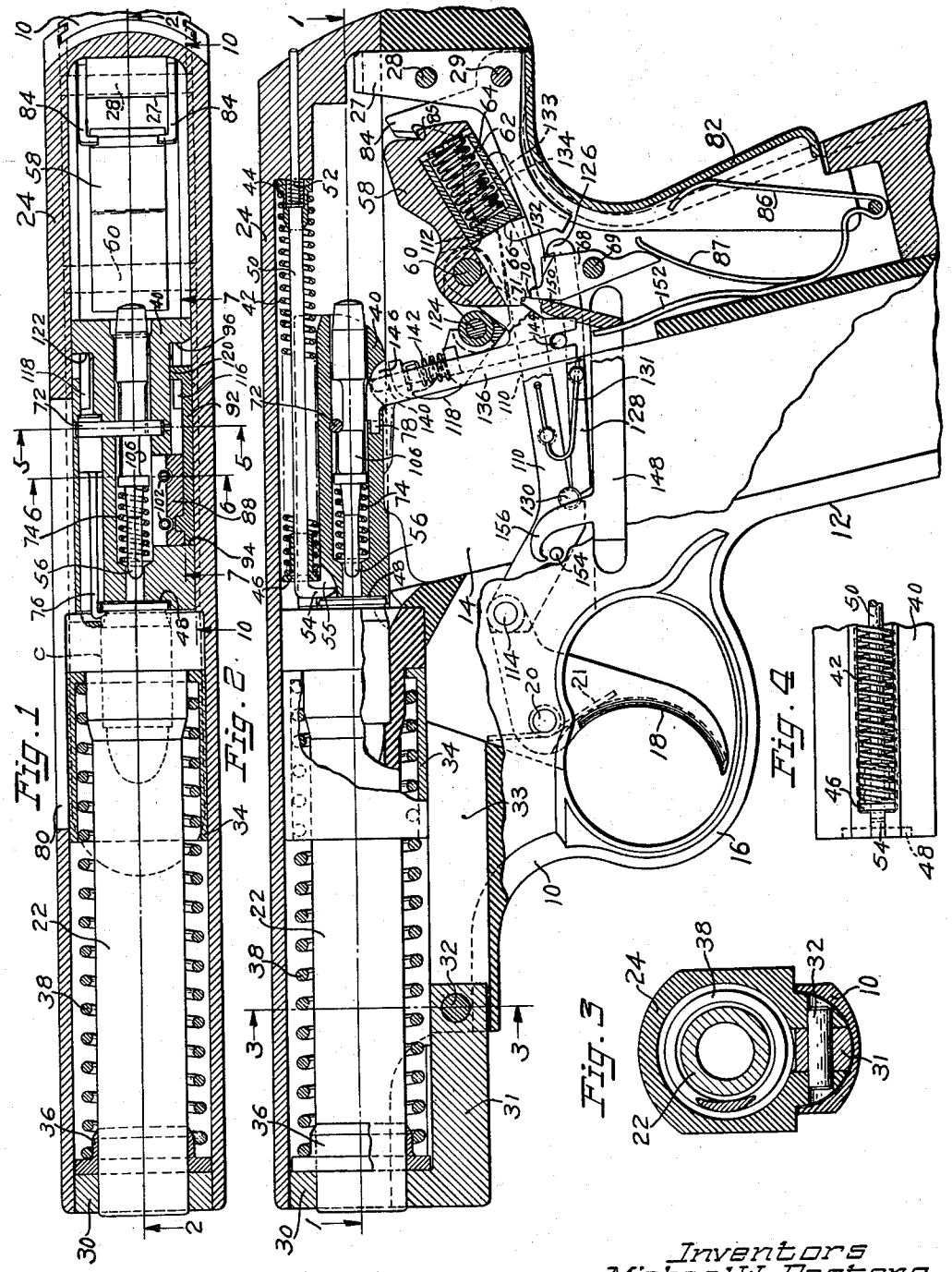


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Inventors
Michael W. Pastore
John C. Rothwell
By Richard S. Haworth
Attorney

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SEMIAUTOMATIC FIREARM WITH TRIGGER OPERATED COCKING MECHANISM

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Fig. 5

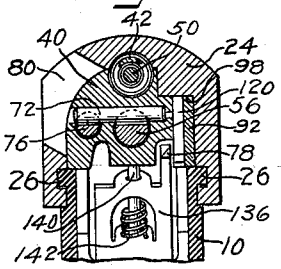


Fig. 7

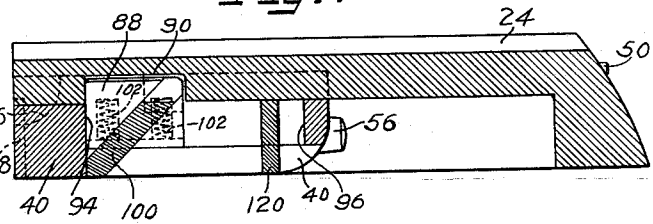


Fig. 8

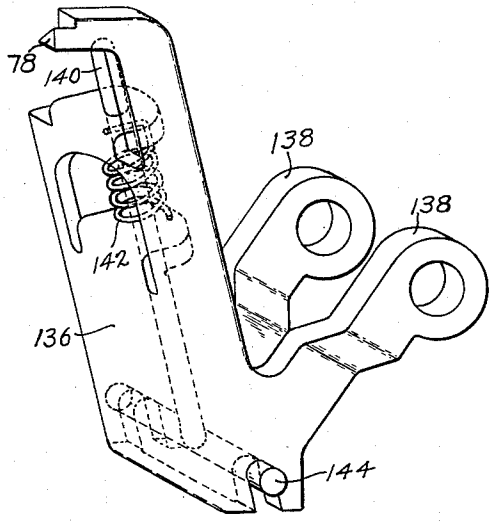


Fig. 6

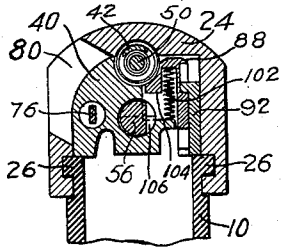
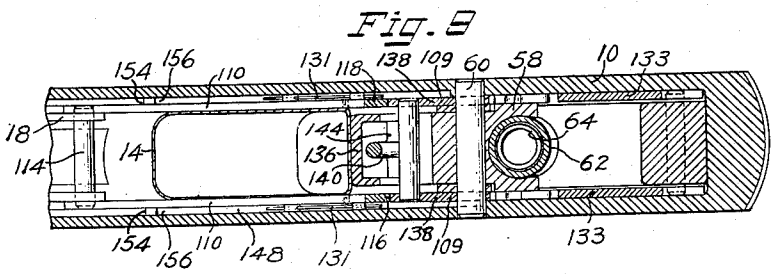


Fig. 9



Inventors
Michael W. Pastore
John C. Rothwell
By Richard S. Haynes
Attorney

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SEMIAUTOMATIC FIREARM WITH TRIGGER OPERATED COCKING MECHANISM

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Fig. 10

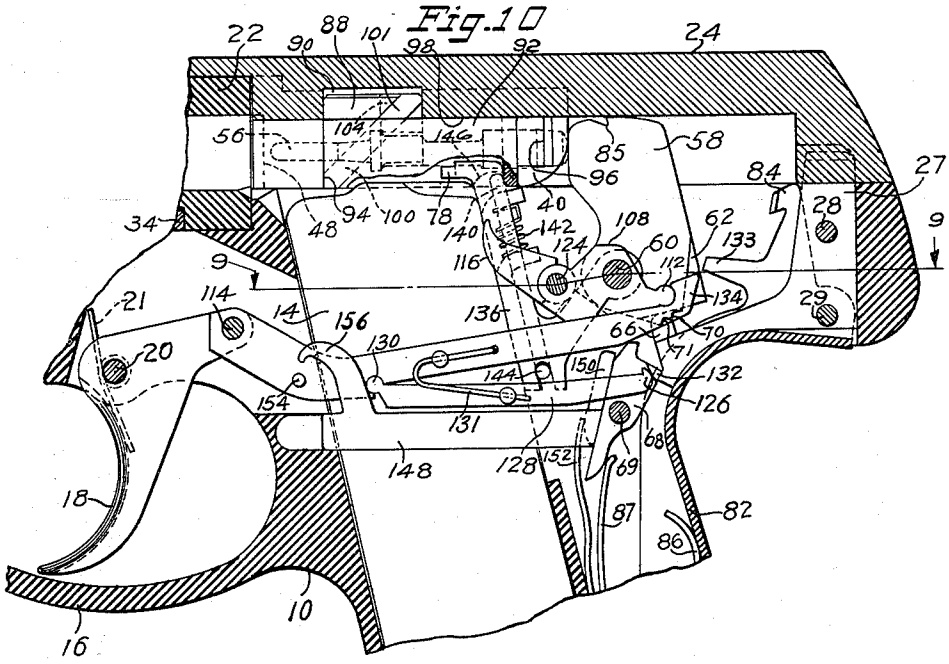
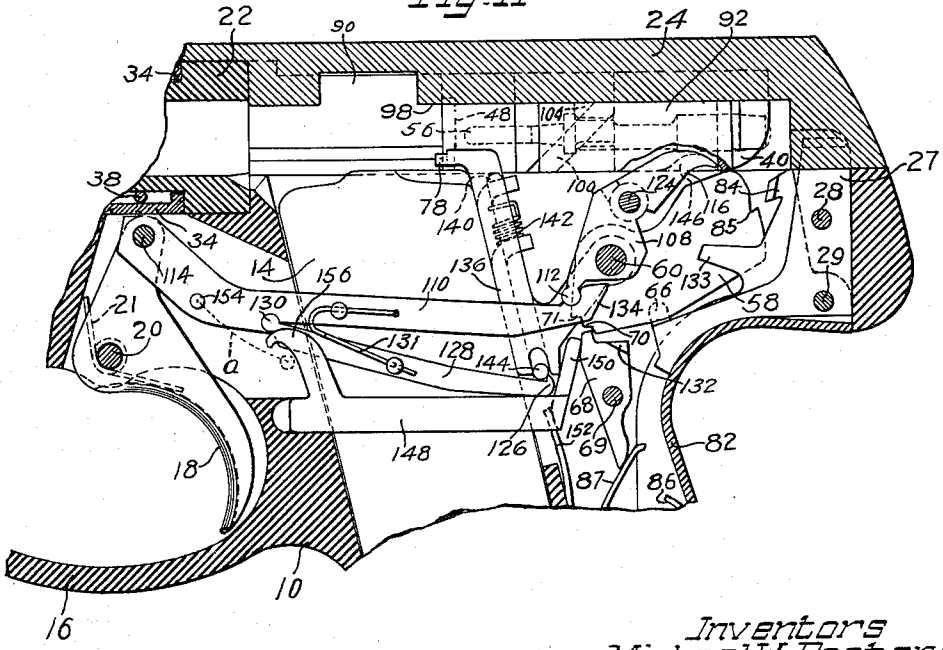


Fig. 11



Inventors
Michael W. Pastore
John C. Rathwell
By Richard S. Haywood
Attorney

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SEMIAUTOMATIC FIREARM WITH TRIGGER OPERATED COCKING MECHANISM

Michael W. Pastore, Hartford, and John C. Rothwell, Bolton, Conn., assignors to Colt's Manufacturing Company, Hartford, Conn., a corporation of Connecticut

Application April 8, 1948, Serial No. 19,696

34 Claims. (Cl. 89—196)

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The invention relates to semiautomatic firearms and while not so limited is particularly applicable to semiautomatic pistols.

The general object of the invention is to provide a semiautomatic firearm having mechanism operable by the trigger for moving the bolt rearward independently of the reaction spring to cock the firing mechanism, the bolt being then movable forward by a spring separate from the reaction spring to effect loading. When the firearm has a main slide, the reaction spring is connected with the main slide and the bolt is moved rearward not only independently of the reaction spring but also independently of the main slide.

A more specific object of the invention is to provide mechanism such as described which not only moves the bolt rearward but also releases it after rearward movement so that it is moved forward by the separate spring independently of the said mechanism.

Another specific object of the invention is to provide mechanism such as described which upon one movement of the trigger rearward from its forward position moves the bolt independently of the reaction spring to effect cocking and loading and which upon a subsequent movement of the trigger rearward from its forward position releases the sear to effect firing.

Still another specific object of the invention is to provide, in conjunction with mechanism such as described, a device for locking the firing pin to prevent movement thereof relative to the bolt when the bolt is being moved independently of the reaction spring.

Still another specific object of the invention is to provide, in conjunction with mechanism such as described, a stop which normally permits only a relatively small movement of the trigger for normal firing and which when the firing mechanism is in released position permits a relatively large movement of the trigger for causing independent movement of the bolt to effect cocking and loading.

Still another specific object of the invention is to provide, in conjunction with mechanism such as described, automatic mechanism which prevents release of the firing mechanism when the bolt is positioned otherwise than in its forward position, the said automatic mechanism also preferably preventing release of the firing mechanism when the magazine has been removed.

Further specific objects of the invention are to provide various details of construction which

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are necessary or useful for attaining the other before-stated objects.

Still further objects of the invention will be apparent from the drawings and from the following specification and claims.

As to certain of its broader aspects the invention is applicable to semiautomatic firearms of a variety of types, but it is more particularly applicable to automatic pistols. In the drawings the invention is shown as applied to an automatic pistol, but it will be understood that the drawings are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawings:

Fig. 1 is a horizontal sectional view of a semiautomatic pistol embodying the invention, the section being taken along the line 1—1 of Fig. 2.

Fig. 2 is a combined elevational and longitudinal sectional view of the pistol as shown in Fig. 1, the major portion of the section being taken along the line 2—2 of Fig. 1.

Fig. 3 is a vertical transverse sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary plan view of the front portion of the bolt and of the immediately associated parts.

Fig. 5 is a vertical transverse sectional view taken along the line 5—5 of Fig. 1.

Fig. 6 is a vertical transverse sectional view taken along the line 6—6 of Fig. 1.

Fig 7 is a fragmentary vertical longitudinal sectional view taken along the line 7—7 of Fig. 1, but showing only the main slide and the bolt and the immediately associated parts.

Fig. 8 is a perspective view of the disconnector mechanism.

Fig. 9 is a fragmentary horizontal sectional view taken along the line 9—9 of Fig. 10.

Fig. 10 is a fragmentary longitidinal view partly in section along the line 10—10 of Fig. 1, this view showing the hammer in its released position and showing associated parts in corresponding positions.

Fig. 11 is a view similar to Fig. 10 but showing the parts in positions which they occupy when the bolt has been moved independently of the main slide to cock the hammer.

In the drawings, 10 represents the receiver or frame of an automatic pistol. Many of the details of the frame are or may be of conventional form. The frame has a grip portion 12 provided with a central opening therein adapted for receiving and holding a magazine 14 which may

be of any suitable type. The frame has a trigger guard 16 within which is a trigger 18 movable about a transverse pivotal axis at 20. The trigger is biased to its forward position by a spring 21. Carried by the frame 10 is a barrel 22.

When the firearm is an automatic pistol as shown, there is provided a main slide 24 which is longitudinally reciprocable with respect to the frame, being guided by longitudinal guideways 26 on the frame. Forward movement of the slide is limited by the upper portion of a stop member 27 which projects above the main frame and which is secured thereto by pins 28 and 29. As shown in Figs. 2 and 3, the forward portion of the slide 24 is shaped to surround or at least substantially surround the barrel 22. Fitting within the forward end of the slide and fitting around the forward end of the barrel is a bushing 30 having a rearward extending tail portion 31 located within a longitudinal slot in the bottom of the slide. This tail portion 31 is secured by a transverse pin 32 to the main body of the slide as shown in Fig. 3. Thus the bushing 30 is connected with the slide for reciprocal movement therewith. A clearance cut 33 is provided in the frame to permit rearward movement of that portion of the main slide 24 which is below the barrel.

A shouldered sleeve 34 surrounds the barrel near the rear and abuts against a shoulder thereon. A shouldered bushing 36 surrounds the barrel near the front and abuts the said bushing 30. A coil spring 38 extends within the sleeve 34 and surrounds the barrel and the bushing 36, the spring abutting against the shoulders on the said sleeve and bushing. Thus the spring 38 serves as a reaction spring which resists rearward movement of the main slide and which moves the main slide forward after it has been moved rearward, the slide being normally held in its forward position as shown in Figs. 1 and 2.

A bolt 40 is provided which is at the rear of the barrel and longitudinally reciprocable. As shown in Figs. 5 and 6, the bolt is guided at the bottom by a portion of the frame and engages at the top with longitudinal faces on the main slide 24. Under some conditions, as will be hereinafter more fully explained, the bolt is longitudinally reciprocable independently of the reaction spring and independently of the main slide. When the bolt moves independently it is guided at the bottom by a portion of the frame as already stated, and it is guided at the top by reason of its engagement with the said longitudinal faces on the main slide.

A spring 42 is provided which is separate from the reaction spring and which serves to resist independent rearward movement of the bolt and to move the bolt forward after such rearward movement. Preferably the spring 42 is connected not only with the bolt but also with the main slide so that it has no action when the bolt and main slide are moved in unison. As shown in Figs. 1, 5 and 6, the spring 42 is a longitudinal coil spring positioned in part in a semi-circular groove in the bottom of the upper wall of the slide 24 and in part in a semicylindrical groove in the top of the bolt 40. The spring abuts at the rear against a shouldered bushing 44 carried by the main slide and abuts at the front against a shouldered bushing 46 carried by the bolt. Normally the spring 42 tends to hold the bolt in its forward position, and it resists rearward or retracting movement of the bolt with respect to the main slide.

The bolt is recessed at its forward end to provide a head space 48 for a cartridge C located in the chamber of the barrel. The depth of the head space is such that, when a cartridge is in place, the head thereof holds the bolt slightly spaced from the barrel. Preferably a longitudinal rod 50 is provided which extends through the spring 42 and through apertures in the bushings 44 and 46. The rear end portion of the rod 50 is reduced in diameter and extends through a longitudinal hole in the rear part of the slide 24. A spring 52 biases the rod 50 in the forward direction. Carried by the front end of the rod 50 is an extension 54 which is movable in a notch 55 in the bolt and which is positioned to enter the head space 48 when no cartridge is in place. However, when there is a cartridge in place the extension 54 abuts against the head of the cartridge and forces the rod 50 rearward in opposition to the spring 52. When the rod 50 is in its forward position it is entirely within the aperture in the main slide. However, when it is forced rearward by the head of a cartridge the rear end thereof extends beyond the end of the main slide as shown in Fig. 1, and serves to indicate that there is a cartridge in place in the barrel.

A firing pin 56 is longitudinally movable in a longitudinal hole in the bolt, the axis of the firing pin being ordinarily in alignment with the axis of the barrel. When the firing pin is driven forward it serves to effect firing in the usual manner.

A spring-biased mechanism is provided for actuating the firing pin to effect firing, this mechanism being so related to the bolt that it is moved to cocked position upon rearward movement of the bolt. While the invention is not necessarily so limited, the firing mechanism as shown includes a hammer 58 which is pivotally movable on a transverse supporting pin 60. The hammer is spring biased so that it tends to move from its cocked position, as shown in Figs. 2 and 11, to its released or firing pin engaging position as shown in Fig. 10.

The details of the hammer do not constitute any part of the present invention, but as shown the hammer is provided with a cylindrical recess in which a bushing 62 is longitudinally movable, the bushing being closed at its lower or forward end. A coil spring 64 is located within the recess in the hammer and within the bushing, one end of the spring abutting against the main body of the hammer and the other end thereof abutting against the end wall of the bushing 62. The lower end of the bushing engages an abutment 66 carried by the frame. This abutment may conveniently be formed as an integral part of the aforementioned stop member 27. Inasmuch as the end wall of the bushing 62 rests against the abutment 66, the spring 64 acts upon the hammer to move it in the counterclockwise direction, that is, from the cocked position as shown in Figs. 2 and 11 to the released position as shown in Fig. 10.

A sear 68 is provided which is rotatable about a transverse axis at 69, the sear being adapted to engage a notch 70 in the hammer to hold it in cocked position. The sear is biased for movement in the clockwise direction. The hammer preferably has a safety notch 71 which can be engaged by the sear to prevent firing in the event that the sear fails to engage the notch 70 or is accidentally disengaged therefrom, as for instance when the pistol is dropped. When the hammer is in released position the sear is in a rear position as shown in Fig. 10. As the hammer is moved to its cocked position the sear is cammed for-

ward to a position for engaging the hammer to retain it in cocked position. The sear can be moved to release the hammer by a trigger operable mechanism to be hereinafter described in detail. When the sear 68 is so moved the hammer moves upward and forward under the action of the spring 64 to strike the firing pin 56 to drive it forward and thus effect firing.

The longitudinal movement of the firing pin 56 with respect to the bolt is limited by a transverse stop pin 72 which enters an elongated notch formed in the top of the firing pin. A coil spring 74 surrounding the front portion of the firing pin biases the said pin rearward to the extent permitted by the stop pin 72. When the hammer is in cocked position the spring 74 moves the firing pin to its rearward position as shown in Figs. 1 and 2 so that it can be struck by the hammer.

The bolt 40 is so shaped at the rear and is so related to the hammer that it serves upon rearward movement to engage the hammer and move it from its released position as shown in Fig. 10 to its cocked position as shown in Figs. 2 and 11, where it is engaged and retained by the sear 68.

Upon firing, the bolt 40 and the slide 24 are driven rearward in unison, being so driven in opposition to the reaction spring 38. As the bolt moves rearward it moves the hammer to its cocked position as already described, the hammer being then engaged by the sear 66. The bolt 40 carries a resilient extractor 76 having a hook at its forward end which enters the annular groove in the cartridge so as to be adapted to withdraw or extract the shell of the cartridge during manual rearward movement of the bolt. When the bolt moves rearward upon normal firing the cartridge shell moves with the bolt and the extractor. As shown, the extractor 76 is mounted in a longitudinal hole in the bolt and is held in place by the same transverse pin 72 which serves as a stop to limit longitudinal movement of the firing pin. As the cartridge shell is moved rearward by the extractor or simultaneously therewith, it is engaged by an ejector 78 which extends upward within a clearance groove in the bolt 40 as shown in Figs. 2 and 5. The ejector serves to force the cartridge laterally and outward through a port 80 formed in one side of the slide 24. After the bolt has been moved rearward as described it is moved forward, under the action of the reaction spring 38. In moving forward the bolt engages the uppermost cartridge in the magazine 14 and forces it forward from the magazine and into the chamber of the barrel 22, this loading action being conventional for firearms of the type here involved.

Preferably a grip safety member 82 is provided, this being generally U-shaped in horizontal section and being pivoted for movement on the transverse pin 29. The grip safety member has two transversely spaced upward extending arms 84, 84, as shown in Figs. 1 and 2, these arms having inward projecting hook portions which are adapted to engage a notch 85 in the outer part of the body of the hammer. The grip safety member 82 is normally held in its hammer engaging position by a leaf spring 86 as shown in Fig. 2. A portion 87 of the spring 86 serves to bias the sear 68. The grip safety member, when engaged with the hammer as described, prevents the relase of the hammer even though the trigger 18 be pressed to move the sear 68 out of its hammer retaining position. However, when the grip

12 of the pistol is held in the normal manner by the hand of the user, the lower portion of the grip safety member 82 is pressed inward or forward, thus moving the hook portions of the arms 84, 84 out of engagement with the hammer and moving them out of the path of hammer movement so that the hammer is free to move for firing and during cocking.

During normal firing, the movement of the bolt 40 is controlled by the reaction spring 38 and when there is a main slide such as 24 the bolt is normally connected therewith. However, the bolt is connected with the reaction spring and main slide in such a manner that it is disconnectible therefrom for independent reciprocable movement. While the invention is not necessarily so limited the bolt is preferably connected with the main slide by means of a latch or lock 88 which is relatively movable transversely. The details of the lock may be widely varied, but preferably the said lock is carried by the bolt and is vertically movable relatively thereto. The lock is guided in a suitable opening in the bolt and when it is in its upper position as shown in Figs. 7 and 10 it projects into a notch 90 in the main slide so as to lock the bolt and the main slide for movement in unison. When the lock is in its lower position as shown in Fig. 11 it is withdrawn from the notch 90 and the bolt is free to move relatively rearward with respect to the main slide.

For relatively moving the lock 88 there is provided a lock slide 92 which has limited longitudinal movement with respect to the bolt. The bolt has a notch therein for receiving the lock slide, the notch being bounded at the front and at the rear by vertical walls 94 and 96 which limit the movement of the lock slide. The lock slide is guided at the top by a longitudinal wall 98 on the main slide and is guided at the bottom by a longitudinal wall on the top of the frame. The slide 92 is provided with an inward projecting integral tongue 100 which is inclined at an angle of approximately 45° and which fits a corresponding inclined groove 101 in the lock 88. It will be seen that when the slide 92 is moved relatively rearward the lock 88 is moved downward out of the notch 90. When the slide 92 is moved relatively forward the lock is moved upward into the notch 90. Two springs 102, 102 are provided which bias the lock 88 in the upward direction thus tending to move it into the notch 90. By reason of the described connection between the lock 88 and the slide 92 the springs 102, 102 serve not only to bias the lock in the upward direction but also to bias the lock slide in the forward direction.

Preferably the lock 88 is provided with an inward extending lug 104 which enters a notch 106 in the firing pin 56 when the lock is in its lower position thus locking the firing pin against relative movement. It will be seen that the lug 104 serves to lock the firing pin against movement with respect to the bolt whenever the bolt is disconnected from the main slide for independent movement. As will presently be more readily apparent, the slide 92 is moved to cause downward movement of the lock 88 only when the hammer is in released position as shown in Fig. 10. When the hammer is in this position the firing pin is pressed forward from the position shown in Figs. 1 and 2 so that the notch 106 therein is in vertical register with the lug 104 on the lock.

A trigger operable mechanism is provided for

disconnecting the bolt and for moving it rearward or retracting it independently of the reaction spring and independently of the main slide. The said mechanism and other associated mechanisms will be best understood by referring to Figs. 10 and 11. In these views the grip safety member is shown in the position to which it is moved to permit firing. Fig. 10 shows the hammer in released position with the other parts in corresponding positions, the trigger being in the position to which it was moved for releasing the hammer. The hammer may be in the position shown in Fig. 10, if there was no cartridge in the chamber of the barrel or if there was a cartridge which failed to fire. The hammer has moved the firing pin forward in opposition to the spring 74 so that the notch 106 in the pin is in vertical register with the lug 104 in the lock 88. Fig. 11 shows the hammer and other parts in positions to which they are moved by the aforesaid trigger operable mechanism, the hammer having been moved to cocked position as the result of rearward movement of the bolt but the bolt retractor, hereinafter described, being in a position slightly forward from its extreme rearward position.

The details of the before-mentioned trigger operable mechanism may be widely varied but there is preferably provided a bolt retractor 108 having two spaced arms 108, 109 which are pivotally engaged with the transverse pin 60 at opposite sides of the hammer 58, as shown in Fig. 9. At least one link 110 is provided and preferably there are two such links which are at opposite sides of the opening for the magazine 14. These links are pivotally connected at the rear with the retractor at 112, as shown in Fig. 11, and are pivotally connected at the front with the trigger at 114. It will be seen that when the trigger is moved rearward to a relatively large extent the links 110, 110 are moved forward thus moving the retractor 108 in the clockwise direction. Supported on the retractor 108 and constituting the upper portion thereof are two similar pawls 116 and 118, the upper ends of which are movable about the axis of the pin 60 in arcuate paths which intersect the path of rearward movement of the bolt. The slide 92 has an inward projecting vertical flange 120, as shown in Figs. 1 and 7, which flange is engageable by the pawl 116 as it moves upward and rearward. When the flange 120 is engaged by the pawl 116 the slide 92 is moved rearward thus moving the lock 88 downward so as to disconnect the bolt from the main slide. As soon as the slide 92 has reached its limit of relative rearward movement continued engagement of the pawl 116 with the flange 120 acts to move the bolt rearward relatively to the main slide. The bolt has a forward facing shoulder 122, as shown in Fig. 1, which shoulder is so positioned that it is in transverse register with the forward face of the flange 120 when the said flange is in its rearward position with respect to the bolt. Therefore, as soon as the slide 92 has reached its rearward position with respect to the bolt the pawl 118 engages the said shoulder 122 and the two pawls 116 and 118 cooperate to move the bolt rearward relatively to the main slide. As the bolt is moved rearward by the pawls 116 and 118 it moves the hammer to its cocked position as already described. It will be seen that the described rearward movement of the bolt is independent of the reaction spring 38 but is resisted by the separate spring 42.

Preferably the pawls 116 and 118 constituting the upper portion of the retractor are not rigidly connected with the main body thereof but are pivotally connected with the said main body for relative movement about a transverse axis at 124. Stops are provided for preventing the pawls 116 and 118 from moving forward relatively to the main body of the retractor beyond the position shown in Figs. 2 and 10. However, the pawls are free to move rearward to a limited extent with respect to the said main body, but they are biased toward the front so that they are normally held in the positions shown.

As the pawls 116 and 118 continue to move rearward they reach a position wherein they are disengaged from the bolt, this position being just beyond that shown in Fig. 11. As soon as the pawls move beyond their bolt engaging position the bolt is released and it is moved forward by the separate spring 42. During forward movement of the bolt, the pawls 116 and 118 are cammed downward, moving about their axis at 124 and thus permitting free forward movement of the bolt. As the bolt moves forward it engages a cartridge in the magazine and forces it into the chamber of the barrel in the manner already described. As has been stated the lock 88 is biased for upward movement and as soon as the bolt reaches its forward position the lock moves upward to enter the notch 90 in the main slide, the slide 92 at the same time being moved relatively forward. Thus the bolt is again locked to the main slide. Upward movement of the lock releases the firing pin and the firing pin is then moved relatively rearward by the spring 74 into the position shown in Figs. 1 and 2, the pin thus being in position for engagement by the hammer 58.

When the trigger is released, the retractor 108 and the links 110 are restored by the spring 21 to the positions shown in Fig. 2. The pawls 116 and 118 move forward with the main body of the retractor and in so moving they engage the rear of the bolt 40. By reason of their before-mentioned pivotal connection with the main body of the retractor at 124, the pawls are pressed relatively rearward with respect to the said main body and are thus enabled to move past the bolt. As soon as they have cleared the bolt they are restored to their normal forward positions as shown in Fig. 2.

A trigger operable mechanism is provided for moving the sear so as to release the hammer and permit firing in the usual manner, this being effected by a relatively small movement of the trigger. Proferably one or both of the before-mentioned links 110, 110 serve as a part of this last-mentioned mechanism. There is at least one sear hook 126 which is preferably at the rear end of a link 128 pivoted to one of the links 110, at 130. As shown there are two sear hooks 126 and two links 128. Springs 131 bias the links 128 for relative upward movement. The sear is provided with transversely extending beveled projections 132 which are adapted to be engaged by the hooks 126. As the trigger 18 moves to its forward position, after having been moved rearward to effect independent rearward movement of the bolt, the links 110 and the links 128 move rearward. The hammer is in cocked position and the sear is in hammer retaining position as shown in Fig. 11. When the said links 128 move rearward, they are cammed downward by the beveled front faces of the projections 132 on the sear and the hooks 126 then snap into

engagement with the said sear projections as shown in Fig. 2. The trigger is now connected with the sear and is ready to move it and release the hammer.

A relatively small rearward movement of the trigger moves the links 128 forward so as to move the sear and release the hammer for normal firing action. At the same time the retractor is moved to a small extent by the links 110, but the movement is not sufficient to cause the pawls 116 and 118 to engage the slide 82 or the bolt. As the links 128 are moved forward by the trigger and by the links 110 the rear ends of the said links 128 are cammed downward as hereinafter described so as to cause the hooks 126 to disengage the sear 68 and leave it free for reengaging the hammer when the hammer is returned to cocked position upon automatic rearward movement of the main slide and bolt.

In order to provide additional safety, the said grip safety member 82 is provided with a stop which prevents movement of the trigger and its connected links when the said grip safety member is in released position. The grip safety member is provided with horns 133 which are in the path of movement of extensions 134 on the links 110 when the member 82 is in released position, as shown in Fig. 2. When the trigger is pressed the links 110 tend to move generally rearward but there is a pivotal movement of the rear ends thereof about the axis of the pin 60. The said pivotal movement has a downward component and, by reason of the angles on the engaging faces of the horns 133 and of the extensions 134, the said horns prevent downward movement of the said extensions, thus preventing movement of the sear to release the hammer. However, when the grip safety member 82 is moved to the position shown in Figs. 10 and 11, the horns 133 are so positioned that the links 110 can be moved, thus permitting movement of the trigger to effect firing.

A disconnecting mechanism is provided which has several functions. One of its functions is to disconnect the sear from the trigger after normal firing action and also to disconnect the sear from the trigger in the event that the hammer is released with no firing action. The said mechanism also serves to disconnect the sear from the trigger when the bolt is held or retained in any position other than its forward position and the mechanism may also serve to disconnect the sear from the trigger when the magazine 14 has been removed. The disconnecting mechanism is shown in detail in Fig. 8 and is also shown in Figs. 2, 10 and 11.

A plate 136 is provided having arms 138, 138 which are apertured to fit the transverse pin 60, these arms being positioned at the outer sides of the hammer and at the inner sides of the before-mentioned arms 109 of the retractor 108, as shown in Fig. 9. The front face of the plate 136 is positioned to be engaged by the upper portion of the rear wall of the magazine 14 and when the magazine is in place the plate is held in the position shown in Figs. 2, 10 and 11. The plate is or may be biased for movement in the counterclockwise direction. The before-mentioned ejector 78 is preferably formed as an integral part of the plate 136. The desrcibed pivotal movement of the plate 136 permits the ejector 78 to be swung forward so that it is below the bottom of the main slide. When the plate and the ejector have been so moved the main slide may be removed from or assembled with the frame without encountering any interference with the ejector.

The plate 136 carries a pin 140 which is biased in the upward direction by a spring 142. The upper end portion of the spring extends through a transverse hole in the pin, thus limiting upward movement thereof. The lower end of the pin 140 is connected with a transverse pin 144 which is guided in slots in side flanges formed on the plate. The end portions of the pin 144 normally engage the tops of the links 128 which carry the sear hooks 126. The upper end of the pin 140 normally extends into a notch 146 formed in the bottom of the bolt 40. With the bolt 40 in its normal forward position, the pin 140 is in its upper position and the pin 144 permits the links 128 and the sear hooks 126 to remain in their normal upper positions. However, when the bolt is moved rearward from its normal forward position the inclined wall of the notch 146 forces the pin 140 downward, thus causing the pin 144 to move the links 128 and the hooks 126 downward so that the hooks can no longer engage the projections 132 on the sear. Thus the sear is disconected from the trigger whenever the bolt is in any position other than its normal forward position.

As has been stated, the plate 136 is normally held in the position shown by reason of its engagement with the magazine 14. However, when the magazine is removed the plate 136 swings in the counterclockwise direction about the transverse pivot pin 60. As the plate so moves the pin 144 moves bodily downward thus forcing the links 128 and the hooks 126 downward so as to disconnect the hooks from the projection 132 on the sear. Thus the sear is disconnected from the trigger whenever there is no magazine in place.

It has already been stated that, when the trigger is pressed to release the sear for normal firing action, the links 128 are cammed downward so as to cause the hooks 126 to disengage the sear and leave it free for reengaging the hammer when the hammer is returned to cocked position after automatic rearward movement of the main slide and bolt. When there is a disconnecting mechanism such as described this disconnecting mechanism serves to cam the links 128 downward to disconnect the hooks from the sear. It will be seen that when the bolt 40 moves rearward the pin 140 is forced downward thus forcing the transverse pin 144 downward. The pin 144 engages the links 128 to move them downward, thus disengaging the hooks 126 from the sear.

The disconnector mechanism also serves to disconnect the sear from the trigger in the event that firing does not occur, that is, when the bolt and hammer remain in the positions shown in Fig. 10. During trigger movement the pivotal connection 130 at the front of the links 128 moves forward and upward, but the said links are engaged with the transverse pin 144 which remains stationary. As the result of the upward component of the movement of the axis 130 the rear parts of the links 128 are swung downward sufficiently to disengage the hooks 126 from the sear. As soon as the sear is thus disengaged it moves to the position shown in Fig. 10.

The before-mentioned relatively large movement of the trigger is necessary only when the hammer is in released position as shown in Fig. 10, and is otherwise undesirable. A mechanism is therefore provided for preventing the relatively

large movement of the trigger when the hammer is to be released from its cocked position as shown in Fig. 2. A longitudinally movable member 148 is provided, this member preferably being a slide guided in grooves formed in the side walls of the grip portion of the pistol. The slide 148 has two lateral portions and also has a transverse connecting portion 150 at the rear which normally abuts against the sear 68. The slide 148 is biased in the rearward direction, this being effected by a portion 152 of the before-mentioned spring 86. The links 110 carry two outward projecting pins or stops 154 and the slide 148 has two upward and forward extending hooks 156 which are shaped and positioned to serve as abutments which cooperate with the stops 154.

When the several parts are in the positions shown in Fig. 2, the slide 148 is held by the sear but it is not in its extreme forward position as it will be moved further forward when the sear is moved forward to release the hammer. The parts are so formed and related that the stops 154 move along a curved path as indicated at *a* in Fig. 11, and it will be seen that, if the slide 148 and the hooks 156 were to remain stationary, the stops 154 would move past the hooks without engaging them. However, the slide and the hooks do not remain stationary but move forward with the sear when the trigger is pressed. This last said forward movement brings the hooks or abutments 156 into positions wherein they engage the stops 154 to limit forward movement of the stops and to thus limit rearward movement of the trigger.

During normal firing action the sear is released from its connection with the trigger and moves momentarily to the rear position shown in Fig. 10, and in the absence of any provision to the contrary the slide 148 might move to a position at least as far toward the rear as that shown in Fig. 2 and it might move to an extreme rear position as shown in Fig. 10. If the slide 148 were to so move rearward the hooks 156 would be out of the paths of movement of the stops 154, thus permitting a relative large trigger movement and defeating the intended purpose of the hooks or abutments. However, when the trigger is pressed for ordinary firing action the stops 154 are pressed against the abutments 156 in such a manner as to prevent rearward movement of the slide 148. Preferably the front pin engaging portions of the hooks or abutments are curved downward as shown, so that the slide is positively prevented from moving rearward so long as the trigger is held in the position to which the hooks permit it to move.

When the hammer is in its released position as shown in Fig. 10. the slide 148 is in a position at least as far toward the rear as that shown in Fig. 2 and it may be in an extreme rear position as shown in Fig. 10. It is shown in the extreme rear position but a somewhat smaller amount of movement would be sufficient. The hooks 156 are out of the path of movement of the stops 154 along the line *a*. Thus the trigger is free to move to the larger extent which is necessary for effecting independent movement of the bolt. As the hammer approaches cocked position the sear is cammed forward and engages the hammer as shown in Fig. 11. The slide 148 and the hooks 156 are in the positions shown in Fig. 11 and when the trigger is released the parts move from the position shown in Fig. 11 to the position shown in Fig. 2. The stops 154 move along the path *a* to the position shown in Fig. 2, and they so move without engaging the hooks 156.

The following is a brief summary of the manner of operation of the pistol. With the parts in the positions shown in Figs. 1 and 2 and with a supply of cartridges in the magazine 14 the grip of the pistol is held in the normal manner, the grip safety member 82 being thus moved out of the position shown in Fig. 2 and to the position shown in Figs. 10 and 11. The trigger 18 is pressed to effect firing and when so pressed it moves the sear 68 to release the hammer 58. The extent of trigger movement is limited by the engagement of the stops 154 with the hooks or abutments 156. When the hammer is released it drives the firing pin 56 forward to fire the cartridge. Thereupon the slide 24 and the bolt 40 are driven rearward in opposition to the reaction spring 38, the bolt 40 engaging the hammer 58 to move it to cocked position. As the bolt 40 moves rearward the disconnector pin 140 is forced downward so as to disconnect the hooks 126 from the sear 68, thus leaving the sear free to reengage the hammer. As the main slide and bolt are returned in the forward direction by the reaction spring a cartridge is engaged by the bolt and is removed from the magazine and forced into the chamber of the barrel. When the trigger is released it moves forward to the position shown in Fig. 2 and the hooks 126 are reengaged with the sear, the pistol being ready for further firing.

The hammer may be in its released position as shown in Fig. 10. This may result when the trigger is pressed to release the hammer after the last cartridge has been fired, or it may result from the failure of a cartridge to fire. With the parts in the position shown in Fig. 10, the trigger is in the position to which it was moved to release the hammer. The sear is in its rearward position and the slide 148 is also in a position at least as far rearward as that shown in Fig. 2, the hooks or abutments 156 thus having been moved out of the path of the stop 154 so that the trigger can be moved to an extent much greater than the smaller extent which was necessary for normal firing action. With the parts in the positions shown in Fig. 10 the trigger is additionally moved so as to move the links 110 in the forward direction and so as to thus pivotally move the retractor 108 in the clockwise direction. As the retractor 108 so moves the pawl 116 moves the lock slide rearward to unlock the bolt from the main slide and the pawls 116 and 118 then move the bolt rearward independently of the main slide to the position shown in Fig. 11, the spring 42 being compressed. As the bolt so moves rearward it moves the hammer to cocked position, the hammer being retained in such position by the sear 68. When the retractor reaches its rearmost position the bolt is released and is moved forward by the spring 42 and in so moving it engages a cartridge in the magazine and forces it into the chamber of the barrel. When the trigger is released, the trigger and the several parts of the trigger operable mechanism are automatically restored to the positions shown in Fig. 2. The firearm is then ready for firing in the manner which has been described.

It will be seen that when the hammer is in released position it is necessary for the trigger to be pressed twice in order to effect firing. The trigger is first moved to a relatively large extent to effect cocking and loading. Then it must be

permitted to return to its forward position to enable the sear hooks to reengage the sear. After that the trigger is moved to a relatively small extent to effect firing.

It is always possible, in the event of an emergency, to engage the main slide manually and move it rearward to effect cocking and loading in the manner which is conventional for pistols of the type shown and described. If the bolt, after being moved independently rearward, should for any reason fail to move forward to the full extent, the main slide can be moved rearward manually until the lock 88 automatically enters the notch in the slide.

What we claim is:

1. In a semiautomatic firearm, the combination of a frame, a barrel, a reaction spring, a reciprocable breech bolt normally connected with the reaction spring to enable the said spring to resist rearward movement of the bolt upon firing and to thereafter move it forward, the said bolt being disconnectible from the spring for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased mechanism for actuating the pin to effect firing, which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable by the trigger for disconnecting the bolt from the reaction spring and for then moving the bolt rearward independently of the said reaction spring so as to move the firing mechanism to cocked position and a trigger operable connection for moving the sear to release the firing mechanism.

2. A semiautomatic firearm as set forth in claim 1, wherein the trigger operable mechanism after moving the bolt rearward releases it to permit the said separate spring to move it forward independently of the said mechanism.

3. In a semiautomatic firearm, the combination of a frame, a barrel, a reaction spring, a reciprocable breech bolt normally connected with the reaction spring to enable the said spring to resist rearward movement of the bolt upon firing and to thereafter move it forward, the said bolt being disconnectible from the spring for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased hammer movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the hammer in cocked position, a trigger, a mechanism operable by the trigger for disconnecting the bolt from the reaction spring and for then moving the bolt rearward independently of the said reaction spring so as to move the hammer to cocked position, and a trigger operable connection for moving the sear to release the hammer and permit it to strike the firing pin to effect firing.

4. In a semiautomatic firearm, the combination of a frame, a barrel, a reaction spring, a reciprocable breech bolt normally connected with the reaction spring to enable the said spring to resist rearward movement of the bolt upon firing and to thereafter move it forward, the said bolt being disconnectible from the spring for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a movement of the trigger rearward from its forward position for disconnecting the bolt from the reaction spring and for then moving the bolt rearward independently of the said reaction spring so as to move the firing mechanism to cocked position, and a connection operable upon a subsequent movement of the trigger rearward from its said forward position for moving the sear to release the firing mechanism.

5. In a semiautomatic firearm, the combination of a reaction spring, a reciprocable breech bolt normally connected with the reaction spring and disconnectible therefrom, a firing pin carried by the breech bolt and movable relatively thereto to effect firing, a trigger, and a trigger operable mechanism for disconnecting the breech bolt from the reaction spring and for moving the breech bolt and firing pin rearward independently of the said reaction spring.

6. In a semiautomatic pistol having a barrel, a reciprocable breech bolt, a reaction spring, a firing pin, a spring-biased hammer, a sear and a trigger, the combination of a relatively movable element normally serving to releasably connect the bolt with the reaction spring, and a trigger operable mechanism for relatively moving the said element to release the bolt from its normal connection with the reaction spring and for then moving the bolt rearward independently of the reaction spring so as to cock the hammer.

7. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable by the trigger for disconnecting the bolt from the main slide and for then moving the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, and a trigger operable con-

nection for moving the sear to release the firing mechanism.

8. A semiautomatic firearm as set forth in claim 7, wherein the trigger operable mechanism after moving the bolt rearward releases it to permit the said separate spring to move it forward independently of the said mechanism.

9. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward movement of the bolt, a magazine for supplying a cartridge to a position for insertion into the barrel during forward movement of the bolt, a firing pin on the bolt, a spring-biased hammer movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the hammer in cocked position, a trigger, a mechanism operable by the trigger for disconnecting the bolt from the main slide and for then moving the bolt rearward independently of the said main slide so as to move the hammer to cocked position, and a trigger operable connection for moving the sear to release the hammer and permit it to strike the firing pin to effect firing.

10. A semiautomatic firearm as set forth in claim 9, wherein there is a device for engaging the firing pin to prevent movement thereof relative to the bolt when the bolt is disconnected from the main slide.

11. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a movement of the trigger rearward from its forward position for disconnecting the bolt from the main slide and for then moving it rearward independently of the said main slide so as to move the firing mechanism to cocked position, and a connection operable upon a subsequent movement of the trigger rearward from its said forward position for moving the sear to release the firing mechanism.

12. In a semiautomatic firearm, the combination of a reciprocable main slide, a reaction spring connected with the slide, a reciprocable breech bolt normally connected with the slide and disconnectible therefrom, a firing pin carried by the breech bolt and movable relatively thereto to effect firing, a trigger, and a trigger operable mechanism for disconnecting the breech bolt from the slide and for moving the breech bolt and firing pin rearward independently of the slide.

13. In a semiautomatic pistol having a barrel, a reciprocable main slide, a reaction spring, a firing pin, a spring-biased hammer, a sear and a trigger, the combination of a reciprocable breech bolt normally connected with the main slide and disconnectible therefrom, and a trigger operable mechanism for disconnecting the bolt from the main slide and for then moving the bolt rearward independently of the main slide so as to cock the hammer.

14. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable by the trigger for moving the lock to disconnect the bolt from the main slide and for then moving the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, and a trigger operable connection for moving the sear to release the firing mechanism.

15. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt guided by the main slide for independent reciprocable movement, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring connected with the bolt and the main slide and serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable by the trigger for moving the lock to disconnect the bolt from the main slide and for then moving the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, and a trigger operable connection for moving the sear to release the said firing mechanism.

16. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide partly surrounding the barrel and extending rearward beyond the barrel, a coil reaction spring surrounding the barrel and connected with the main slide and serving to resist rearward movement of the slide upon firing and to thereafter move it forward, a breech bolt within the rear portion of the main slide and guided thereby for independent reciprocable movement, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a coil spring within the rear portion of the main slide and connected with the bolt and with the

said main slide and serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased hammer movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the hammer in cocked position, a trigger, a mechanism operable by the trigger for moving the lock to disconnect the bolt from the main slide and for then moving the bolt rearward independently of the said main slide so as to move the hammer to cocked position, and a trigger operable connection for moving the sear to release the hammer and permit it to strike the firing pin to effect firing.

17. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally engaging the main slide to connect the bolt to the said main slide for reciprocation therewith, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin carried by the bolt, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a lock slide having limited longitudinal relative movement and serving upon movement in one direction to move the lock out of locking engagement, a trigger operable mechanism for engaging the lock slide to move it as last aforesaid and for then moving the bolt rearward independently of the main slide so as to move the firing mechanism to cocked position, and a trigger operable connection for moving the sear to release the firing mechanism.

18. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock on the bolt normally engaging the main slide to connect the bolt to the said main slide for reciprocation therewith, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin carried by the bolt, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a lock slide on the bolt having limited longitudinal relative movement and spring-biased to its forward position, the said lock slide being connected with the lock to move it out of locking engagement with the main slide when the lock slide is moved relatively rearward, a trigger operable mechanism for engaging the lock slide to move it relatively rearward and for then moving the bolt rearward independently of the main slide so as to move the firing mechanism to cocked position, and a trigger operable connection for moving the sear to release the firing mechanism.

19. A semiautomatic firearm as set forth in claim 18, wherein the trigger operable mechanism after moving the lock slide and bolt rearward releases them to permit the bolt to be moved forward by the said separate spring independently of the said mechanism and to permit the lock slide to move relatively forward and thus enable the lock to move into locking engagement with the main slide.

20. A semiautomatic firearm as set forth in claim 18, wherein there is a lug on the lock for engaging the firing pin to prevent movement thereof relative to the bolt when the lock is out of locking engagement with the main slide.

21. In a semiautomatic firearm, the combination of a frame, a barrel, a reaction spring, a reciprocable breech bolt normally connected with the reaction spring to enable the said spring to resist rearward movement of the bolt upon firing and to thereafter move it forward, the said bolt being disconnectible from the spring for independent reciprocable movement, a separate spring serving to resist independent rearward retracting movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a trigger operable connection for moving the sear to release the firing mechanism, a retractor having an upper portion normally in a forward position and movable rearward in a generally longitudinal arcuate path intersecting the path of rearward movement of the bolt, an element on the bolt engageable by the upper portion of the retractor and serving when so engaged to disconnect the bolt from the reaction spring, and a trigger operable linkage for moving the retractor to cause the arcuately movable upper portion thereof to move rearward, the said upper portion first engaging the said element on the bolt to disconnect the bolt from the reaction spring and then retracting the bolt independently of the said reaction spring so as to move the firing mechanism to cocked position.

22. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring serving to resist independent rearward retracting movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a trigger operable connection for moving the sear to release the firing mechanism, a retractor having an upper portion normally in a forward position and movable rearward in a generally longitudinal arcuate path intersecting the path of rearward movement of the bolt, an element on the bolt engageable by the upper portion of the retractor and serving when so engaged to move the lock and disconnect the bolt from the main slide, and a trigger operable linkage for moving the retractor to cause the arcuately movable upper portion thereof to move rearward, the said upper portion of the retractor first engaging the said element on the bolt to disconnect the bolt from the main slide and then moving the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position.

23. In a semiautomatic firearm, the combina-

tion of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring serving to resist independent rearward retracting movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a trigger operable connection for moving the sear to release the firing mechanism, a retractor having an upper portion normally in a forward position and movable rearward in a generally longitudinal arcuate path intersecting the path of rearward movement of the bolt, an element on the bolt engageable by the upper portion of the retractor and serving when so engaged to move the lock and disconnect the bolt from the main slide, and a trigger operable linkage for moving the retractor to cause the arcuately movable upper portion thereof to move rearward so that the said upper portion first engages the said element on the bolt to disconnect the bolt from the main slide and then moves the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, the said linkage finally moving the upper portion of the retractor to a position wherein it disengages the bolt and permits it to be moved forward independently of the retractor by the said separate spring.

24. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring serving to resist independent rearward retracting movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt during rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a trigger operable connection for moving the sear to release the firing mechanism, a retractor pivoted for movement about a transverse axis and having a main body and an upper portion and being biased to its forward position, the said retractor having its upper portion movable in a path intersecting the path of rearward movement of the bolt, an element on the bolt engageable by the upper portion of the retractor and serving when so engaged to move the lock and disconnect the bolt from the main slide, a trigger operable linkage connected with the main body of the retractor for moving it to cause the upper portion thereof to first engage the said element on the bolt to disconnect the bolt from the main slide and to then move the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, the said linkage finally moving the said upper portion of the retractor to a position wherein it disengages the bolt and permits it to be moved forward independently of the retractor by the said separate spring, and a yieldable connection between the upper portion of the retractor and the main body thereof which permits the said upper portion to move relatively to the said main body when the said upper portion engages the bolt during subsequent forward movement of the retractor.

25. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a breech bolt reciprocable independently of the main slide, a releasable lock normally connecting the bolt to the main slide for reciprocation therewith, a separate spring serving to resist independent rearward retracting movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased hammer pivoted for movement about a transverse axis and movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the hammer in cocked position, a trigger, a trigger operable connection for moving the sear to release the hammer and permit it to strike the firing pin to effect firing, a retractor pivoted for movement about the hammer axis and having its upper portion movable in a path intersecting the path of rearward movement of the bolt, an element on the bolt engageable by the upper portion of the retractor and serving when so engaged to move the lock and disconnect the bolt from the main slide, and trigger operable linkage for moving the retractor to cause the upper portion thereof to first engage the said element on the bolt to disconnect the bolt from the main slide and to then move the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position.

26. In a semiautomatic firearm, the combination of a frame, a barrel, a reaction spring, a reciprocable breech bolt normally connected with the reaction spring to enable the said spring to resist rearward movement of the bolt upon firing and to thereafter move it forward, the said bolt being disconnectible from the spring for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a relatively large trigger movement for disconnecting the bolt from the reaction spring and for moving the bolt rearward independently of the said reaction spring so as to move the firing mechanism to cocked position, a connection operable upon a relatively small trigger movement for moving the sear to release the firing mechanism, and an abutment normally permitting only the said relatively small trigger movement and automatically movable to permit the said relatively large trigger movement when the firing mechanism is in released position.

27. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mecha-

nism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a relatively large trigger movement for disconnecting the bolt from the main slide and for moving the bolt rearward independently of the said main slide so as to move the firing mechanism to cocked position, a connection operable upon a relatively small trigger movement for moving the sear to release the firing mechanism, and an abutment normally permitting only the said relatively small trigger movement and automatically movable to permit the said relatively large trigger movement when the firing mechanism is in released position.

28. A semiautomatic firearm as set forth in claim 27, wherein the abutment is movable by the sear and serves to prevent the said relatively large movement of the trigger when the sear is in the position to which it is moved to release the firing mechanism, the said abutment being movable to permit such movement of the trigger when the sear is in a position corresponding to the released position of the firing mechanism.

29. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a relatively large trigger movement for disconnecting the bolt from the main slide and for moving the bolt rearward independently of the said main slide to move the firing mechanism to cocked position, a connection operable upon a relatively small trigger movement for moving the sear to release the firing mechanism, a stop movable with the trigger, an abutment automatically movable to a stop engaging position upon movement of the sear to release the firing mechanism so as to permit only the said relatively small trigger movement, the said abutment being biased for movement out of its stop engaging position when the firing mechanism is in released position and the said abutment by reason of its engagement with the stop being prevented from movement out of stop engaging position so long as the trigger is pressed.

30. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide upon firing and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the firing mechanism in cocked position, a trigger, a mechanism operable upon a relatively large trigger movement for disconnecting the bolt from the main slide and for moving the bolt rearward independently of the said main slide to move the firing mechanism to cocked position, a connection operable upon a relatively small trigger movement for moving the sear to release the firing mechanism, a member movable longitudinally and normally abutting against the sear, the said member being movable by the sear to a forward position when the sear is moved to release the firing mechanism, a spring for biasing the member in the rearward direction, an abutment on the said longitudinally movable member, and a stop movable with the trigger and engaging the abutment when the last said member is in its said forward position so as to permit only the said relatively small trigger movement, the said stop by reason of its engagement with the said abutment preventing rearward movement of the said longitudinally movable member by the last said spring.

31. In a semiautomatic firearm, the combination of a frame, a barrel, a reciprocable main slide, a reaction spring serving to resist rearward movement of the main slide and to thereafter move it forward, a reciprocable breech bolt normally connected with the main slide for movement therewith and disconnectible therefrom for independent reciprocable movement, a separate spring serving to resist independent rearward movement of the bolt and to thereafter move it forward, devices for extracting and ejecting a cartridge shell during rearward bolt movement, a magazine movable into and out of an operative position for supplying a cartridge to a position for insertion into the barrel during forward bolt movement, a firing pin, a spring-biased mechanism for actuating the pin to effect firing which mechanism is movable to cocked position by the bolt upon rearward movement thereof, a sear biased to retain the retaining firing mechanism in cocked position, a trigger, a mechanism operable upon a relatively large movement of the trigger for disconnecting the bolt from the main slide and for then moving the bolt rearward independently of the main slide to move the firing mechanism to cocked position, the said mechanism including a longitudinal link connected at its forward end with the trigger and movable forward when the trigger is moved rearward, a sear hook bodily movable with the said longitudinal link and transversely movable relatively thereto, the said hook being biased for relative movement in one direction and having snap engagement with the sear when the link is in its rear position and when the sear is in position to retain the firing mechanism and the said hook upon a relatively small movement of the trigger and of the said longitudinal link serving to move the sear to release the firing mechanism.

32. A semiautomatic firearm as set forth in claim 31, wherein there is a mechanism serving to move the sear hook out of sear engaging position immediately after the sear has been moved sufficiently to release the firing mechanism.

33. A semiautomatic firearm as set forth in claim 31, wherein there is a mechanism serving when the bolt is in any position other than its forward position for holding the sear hook out of sear engaging position.

34. A semiautomatic firearm as set forth in claim 31, wherein there is a mechanism movable to a position wherein it serves to hold the sear hook out of sear engaging position, the said

mechanism being engageable by the magazine when the latter is in its operative position and being thereby held in a position wherein it permits the hook to engage the sear.

MICHAEL W. PASTORE.
JOHN C. ROTHWELL.

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