Feb. 22, 1927. 1,618,510

J. M. BROWNING

AUTOMATIC FIREARM

Filed June 28, 1923 2 Sheets-Sheet 1

Fig. 1.

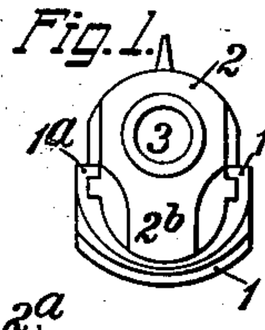


Fig. 2.

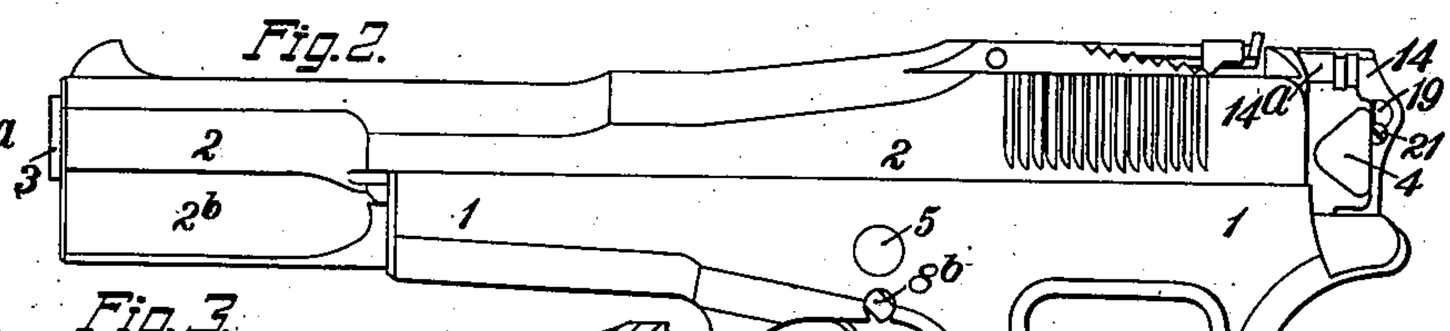


Fig. 3.

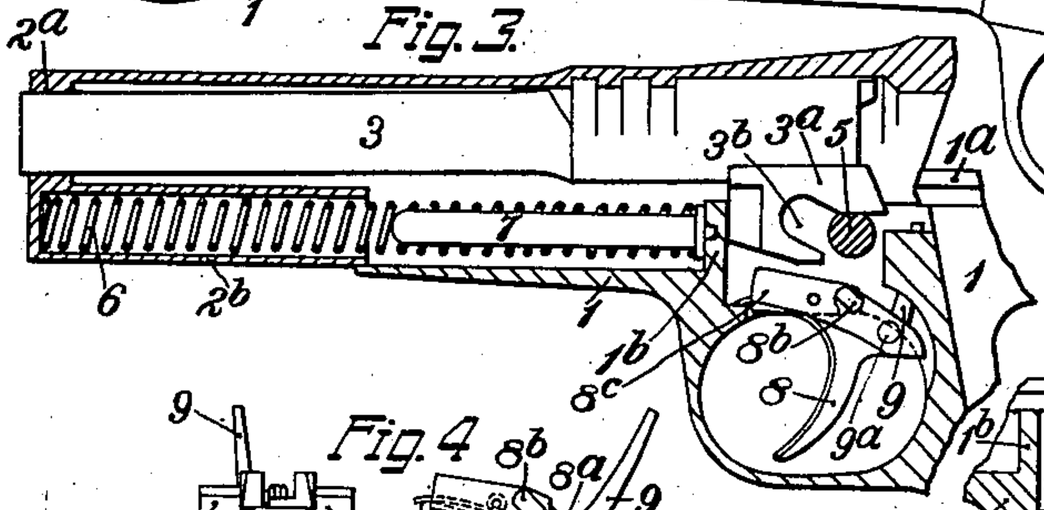


Fig. 4

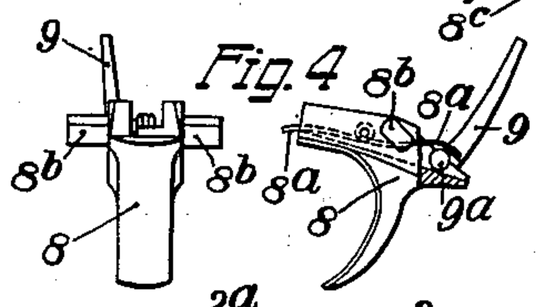


Fig. 5

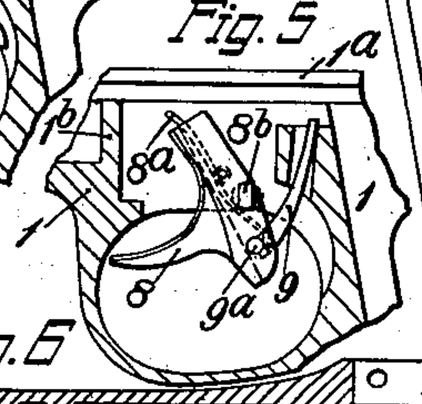


Fig. 6

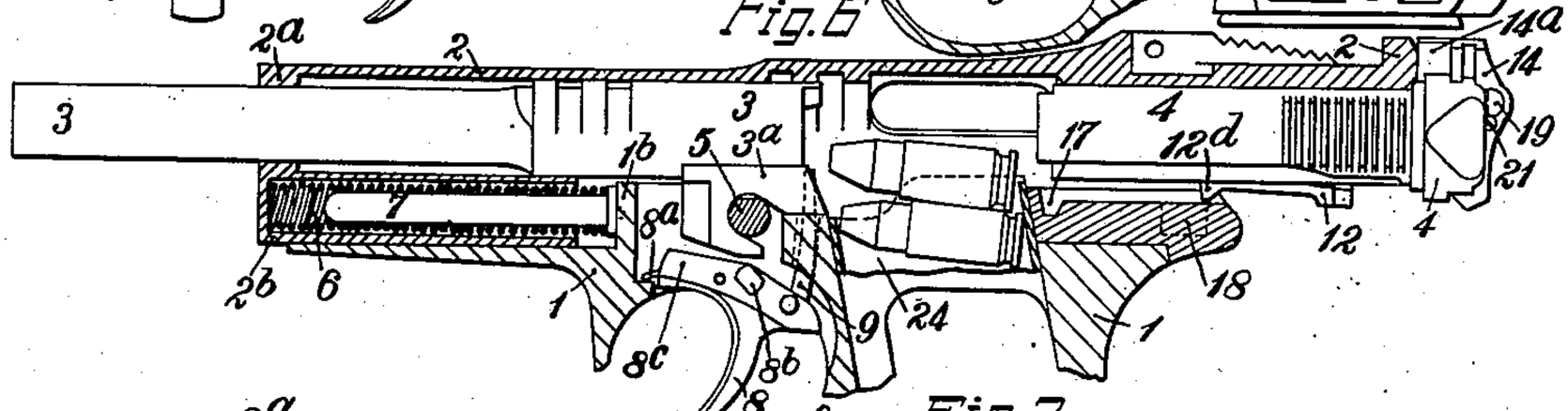


Fig. 7

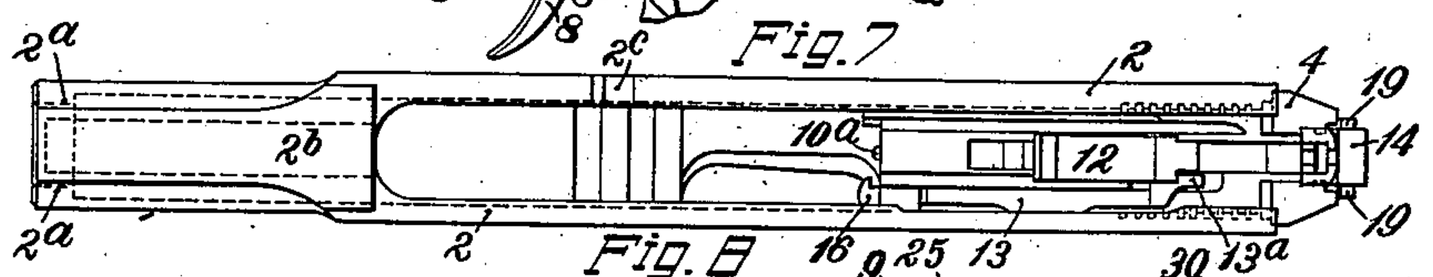


Fig. 8

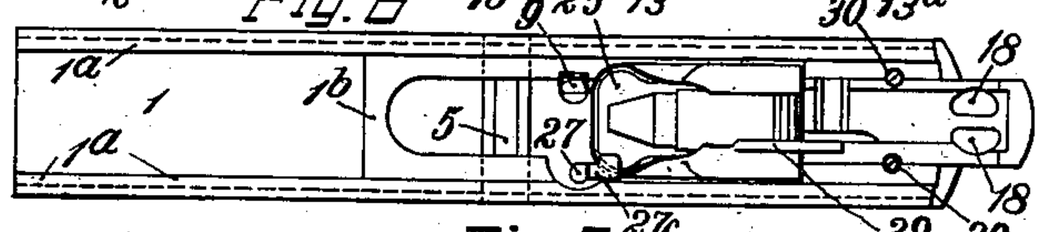


Fig. 11.

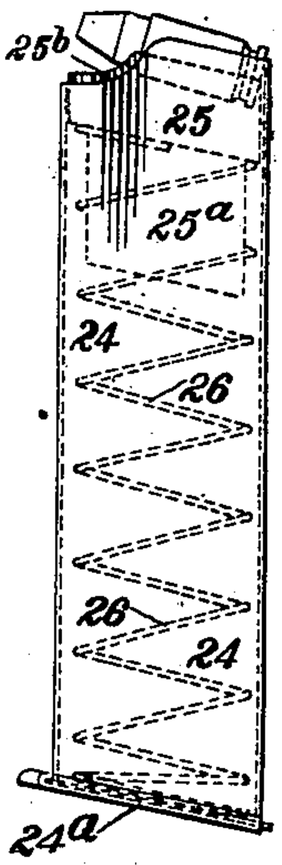


Fig. 9

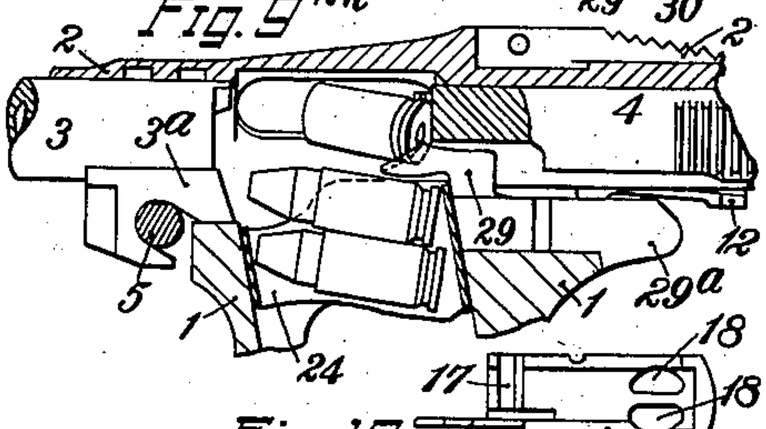
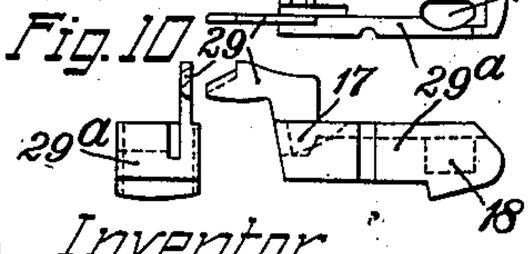


Fig. 10



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Cancelled
Japan 3 Oct. 6, 1923

Feb. 22, 1927. 1,618,510

J. M. BROWNING

AUTOMATIC FIREARM

Filed June 28, 1923 2 Sheets-Sheet 2

Fig. 12.

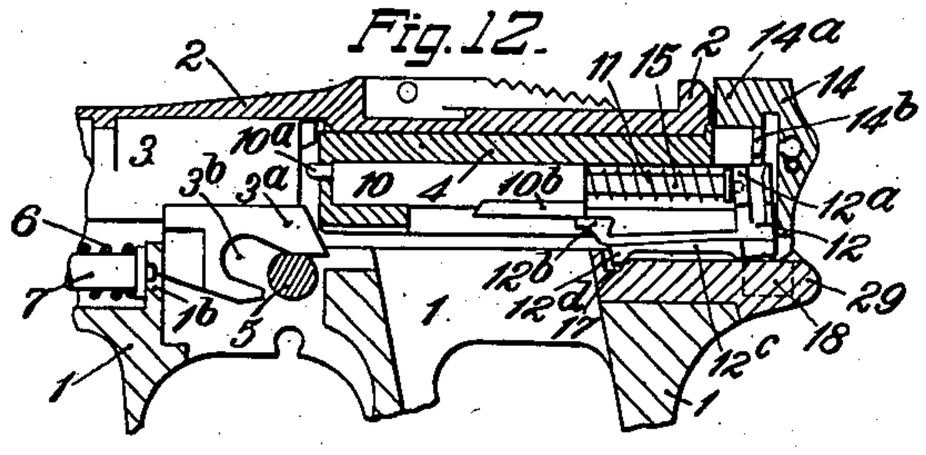


Fig. 13.

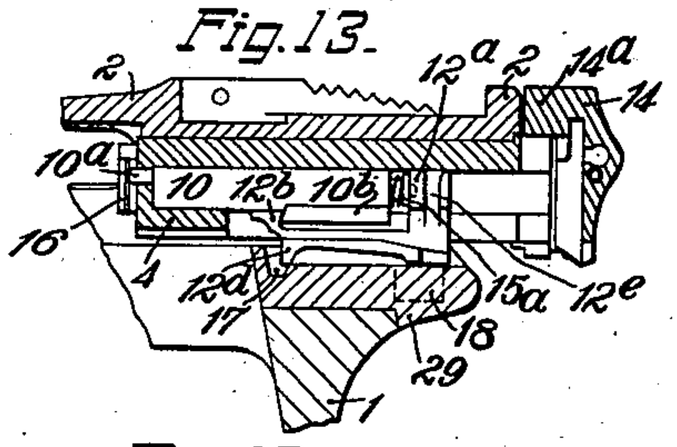


Fig. 14.

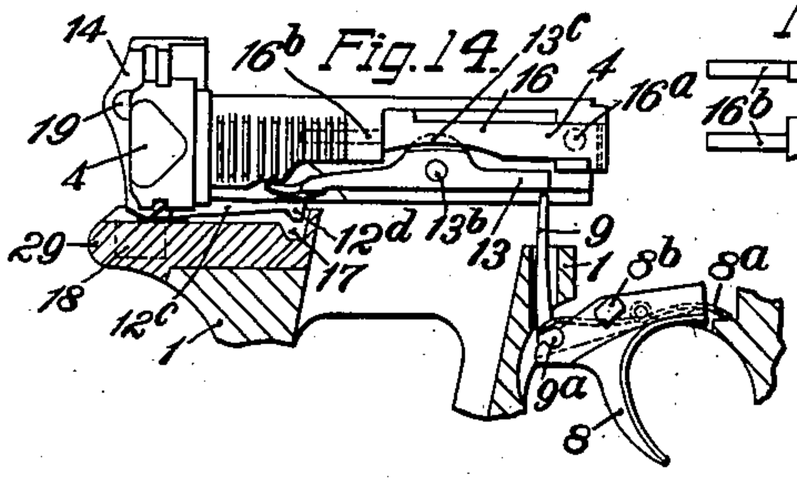


Fig. 16.

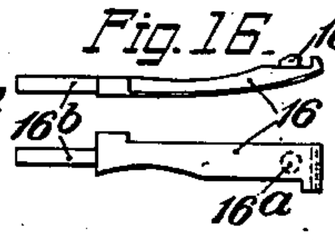


Fig. 15

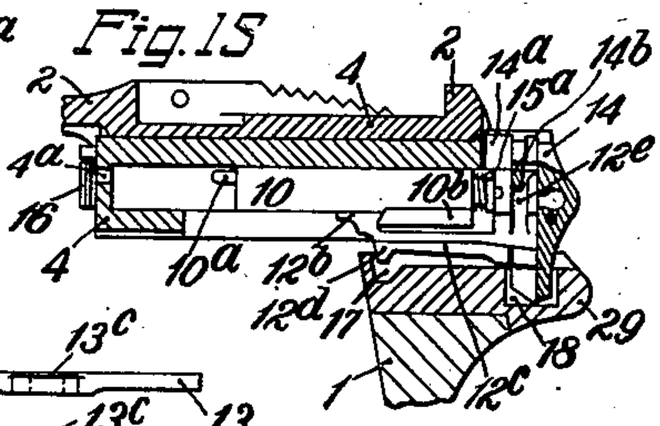


Fig. 17.

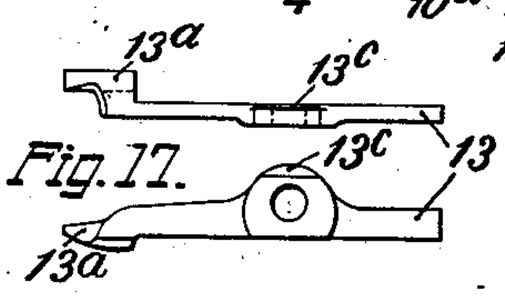


Fig. 18.

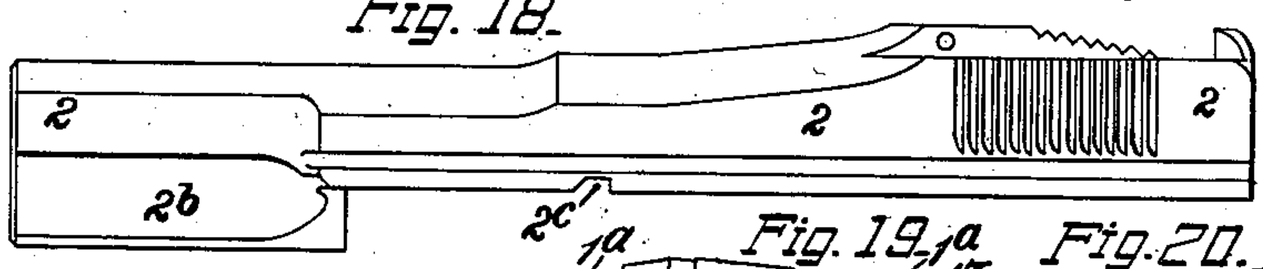


Fig. 19.

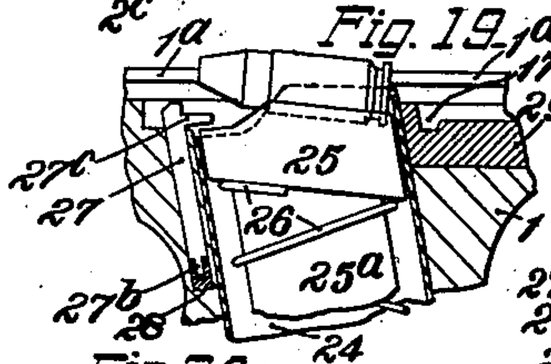


Fig. 20.

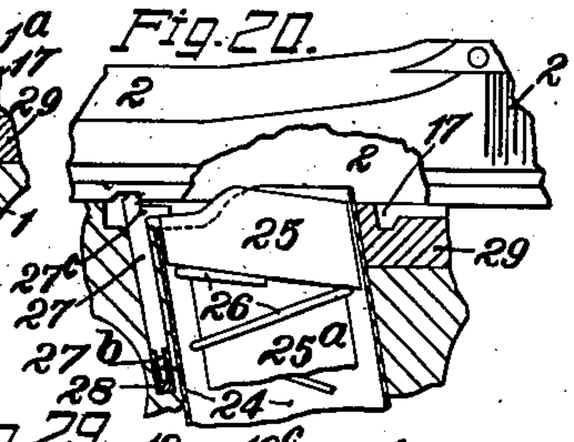


Fig. 21.

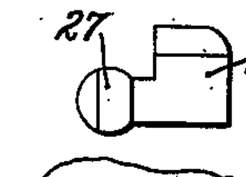


Fig. 22

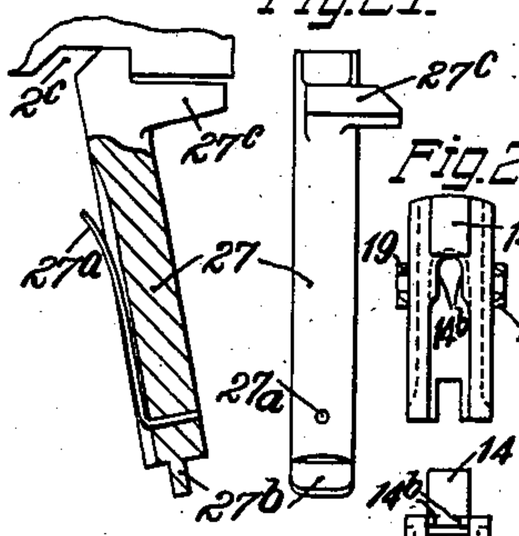


Fig. 24.

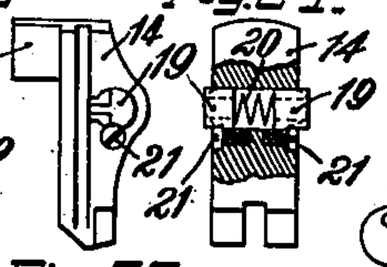


Fig. 23.

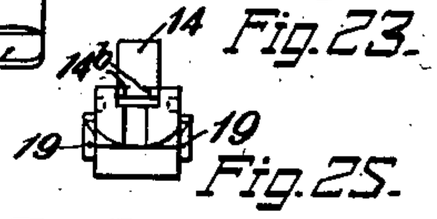


Fig. 29.

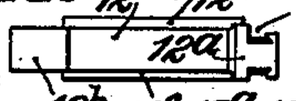


Fig. 27.

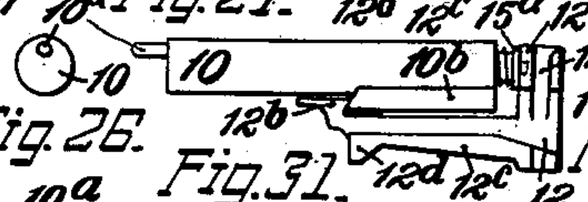


Fig. 26.

Fig. 30.

Fig. 28.

Fig. 31.

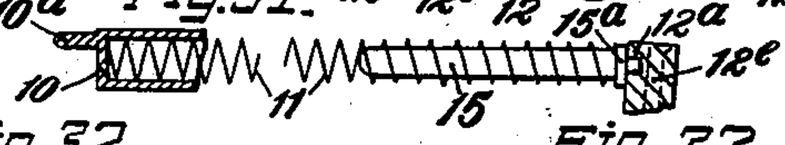


Fig. 35.

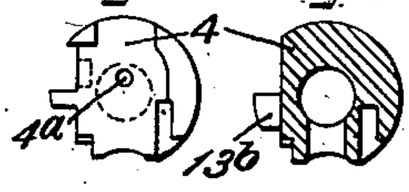


Fig. 36.

Fig. 37.

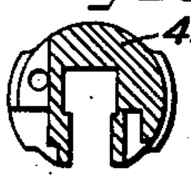


Fig 32.

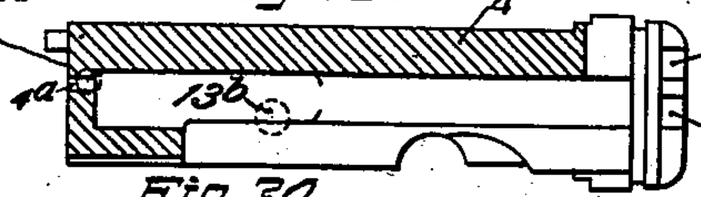


Fig. 33.

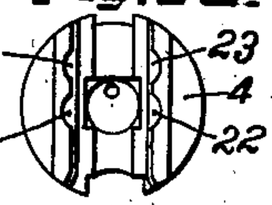
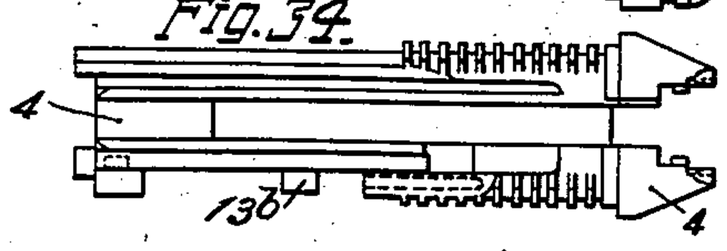


Fig. 34.



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Patented Feb. 22, 1927. 1,618,510

UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

AUTOMATIC FIREARM.

Application filed June 28, 1923. Serial No. 648,275.

My invention relates to automatic firearms of that description in which all operations of the mechanism, except that of the trigger, are automatically effected by the energy of recoil of movable parts.

A main object of the present invention is to provide an automatic pistol of this character which is strong, simple in construction, accurate, reliable and safe in operation, and easy and economical of manufacture. This object is attained by simplifying the mechanism employed in firearms of this class by providing a novel improved construction and co-ordination of certain members of the mechanism, thereby enabling these parts to perform several distinct functions and thus reducing the number of component parts and by giving to all parts such form and organizing them in such manner that they may be readily assembled or disassembled without requiring the use of any tools or accessories.

Other and further objects and advantages of my new improvements will appear from the specifications and drawings in which I show and describe an automatic pistol incorporating my improvements in a preferred form. Also the utility and value of some of my improvements are not limited to their use in an automatic pistol but they are equally valuable and useful in any automatic firearm of the recoil operated type.

In the accompanying drawings:

Fig. 1 is a front view of the forward portion of the frame, the breech slide and the barrel of a pistol embodying my new improvements.

Fig. 2 is a left-hand side elevation of said pistol.

Fig. 3 is a central vertical longitudinal section through the forward portion of the arm, showing the barrel and breech slide in their forward locked position, and the trigger in its normal position. Certain of the parts are shown in elevation.

Fig. 4 shows the trigger and the parts mounted thereon detached, in a front view and in a left-hand side view; in the side view, the rear portion of the trigger is shown in a vertical longitudinal section.

Fig. 5 is a central vertical longitudinal section of a portion of the frame, including the trigger guard, showing the trigger in elevation and in position for bodily downward movement to withdraw it from its seat in the frame, the barrel having been removed from the frame.

Fig. 6 is a central vertical longitudinal section through the upper portion of the arm, showing the barrel and breech slide in their rearward positions, and the trigger in its normal position. Certain of the parts are shown in elevation.

Fig. 7 is a bottom view of the breech slide with the breech bolt in place in the rear portion of said slide.

Fig. 8 is a top view of the frame, showing the cartridge magazine, having a cartridge remaining therein, in its seat in the frame and also showing the slide stop in its relation to the magazine follower.

Fig. 9 is a central vertical longitudinal section through a portion of the arm, showing the movable parts in the position they occupy at the instant when a shell is being ejected; in this view the forward portion of the breech bolt is vertically sectioned in the plane of the ejector and the ejector with the part of the frame with which it is integrally formed are shown in elevation.

Fig. 10 shows the ejector and the part of the frame with which it is integrally formed, detached, in a top view, in a left-hand side view and in a front view.

Fig. 11 is a left-hand side view of the magazine detached.

Fig. 12 is a central vertical longitudinal section through the upper rear portion of the arm, showing the barrel, breech slide and breech bolt in their forward position and the firing pin in the uncocked position, certain of the parts being shown in elevation.

Fig. 13 is a central vertical longitudinal section through the upper rear portion of the arm, showing the breech slide and breech bolt some distance rearward of their forward position and the firing pin and sear in the cocked position. Certain of the parts are shown in elevation.

Fig. 14 is a central vertical longitudinal section through the upper rear portion of the frame, as seen from the right, showing the breech bolt in its forward position and showing also the connections between the trigger and the sear. Certain parts are shown in elevation.

Fig. 15 is a central vertical longitudinal section through the rear portion of the

breech slide and through the breech bolt with the safety piece in its lower position locking the sear and the breech bolt; an adjacent portion of the frame and a portion of the safety piece cooperating with the frame and with the sear, being each shown in vertical section but slightly to the left of the vertical central plane of the arm.

Fig. 16 shows the extractor, detached, in a top view and in a right-hand side view.

Figs. 1 to 16, inclusive, each show the parts on a scale slightly reduced from their actual size.

Fig. 17 shows the sear connecting lever, detached, and in its actual size, in a top view and in a right-hand side view.

Fig. 18 is a left-hand side elevation of the breech slide, detached.

Fig. 19 is a vertical longitudinal section through the upper portion of the magazine and the adjacent portion of the frame, showing the relative position of the slide stop and the magazine follower with one cartridge remaining in said magazine. Certain parts are shown in elevation.

Fig. 20 is a vertical longitudinal section through the upper portion of the magazine and the adjacent portion of the frame, showing the relative position of the breech slide, slide stop and magazine follower after the last cartridge has been removed from the magazine and fired. Certain parts are shown in elevation.

Figs. 18 to 20 are on the same scale as Figs. 1 to 16.

Fig. 21 shows the slide stop, detached and on an enlarged scale, in a top view, in a rear view, and in a left-hand side view; the side view shows the lower portion of said stop in section and its upper portion in its operative relation to the breech slide.

Figs. 22, 23, 24 and 25 show the safety piece, detached, respectively in a front view, in a left-hand side view, in a rear view with a portion broken away to clearly show parts mounted therein, and in a bottom view.

Fig. 26 is a front view of the firing pin, detached.

Fig. 27 is a left-hand side view of the firing pin and sear in the cocked position, held together by the pressure of the mainspring.

Fig. 28 is a rear view of the firing pin, detached.

Figs. 29 and 30 show the sear, detached, respectively in a top view and in a rear view.

Fig. 31 shows the mainspring extended and a portion of the firing pin and the sear, in longitudinal vertical section and in their cooperative relation with said mainspring.

Figs. 32, 33, 34, 35, 36 and 37 show the breech bolt, detached, respectively in a central vertical longitudinal section, in a rear end view, in a bottom view, in a front end view, in a transverse section some distance back of its forward end, and in another transverse section slightly forward of the middle of the bolt.

Figs. 22 to 37, inclusive, show the parts in their actual size.

Similar reference characters refer to similar parts throughout the several views.

The pistol represented in the drawings comprises a frame 1 having vertical longitudinal flanges 1[a] prolonging its sides upwardly. Between the flanges the longitudinally movable breech slide 2 is secured against vertical movement and guided in its longitudinal movements by rib and groove connections, as shown. See Figs. 1, 2, 3, 7, 8, 18, 19 and 20. The slide 2 is recessed to receive, at its forward portion the barrel 3 between its side walls, and in its rear portion the breech bolt 4, detachably secured therein. The barrel 3 is supported and guided at its forward end by an inwardly projecting annular flange 2[a] on the slide and, at its rear end, by the sides of a cam groove 3[b] formed in the downwardly projecting barrel lug 3[a], the sides of the cam groove cooperating, for this purpose, with a fixed part of the frame, such as the transverse pin 5 extending through the rear portion of a recess formed in the frame 1 to receive the barrel lug 3[a]. See Figs. 3, 6, 9 and 12.

When in their forward firing position, as shown in Figs. 2 and 3, the breech slide 2 and the barrel 3 are interlocked by the usual transverse ribs and grooves formed, respectively, on the upper rear portion of the barrel and in the under surface of the top wall of the breech slide (Fig. 3). In this position of the parts, a horizontal rearward extension of the upper surface of the cam groove 3[b] engages the top surface of the transverse pin 5 in the manner clearly shown in Fig. 3. The top surface of pin 5 is preferably flattened as shown.

Upon the firing of a shot, the breech slide 2 and the barrel 3 recoil together until the forwardly and upwardly inclined lower surface of the cam groove 3[b] engages the pin 5, after the bullet has left the barrel, thereby causing the rear portion of the barrel to be cammed down during the further recoil movement and thus effecting the unlocking of said breech slide from said barrel. The rearward travel of the barrel is now stopped by the engagement of the front wall of the cam groove 3[b] with the transverse pin 5 (Fig. 6), but the momentum of the breech slide carries it rearward, as usual, its energy of recoil being utilized to extract and eject the shell and to cock the firing mechanism as hereinafter described.

During the rearward movement of the breech slide 2, the reaction spring 6, seated partly in a longitudinal seat formed in a downward projection 2[b] at the forward end of the breech slide and partly in a longitu-

dinal recess in the forward portion of the frame and bearing through its guide rod 7 against the wall 1b in the frame, is compressed and said spring reacts to return the recoiling parts to their forward position as soon as the rearward movement of the slide 2 is arrested. The barrel 3 remains in its rearward position, shown in Figs. 6 and 9, until the forward end of the breech bolt 4, during the return movement thereof with the slide 2, strikes the rear end of the barrel, whereupon the parts move forward together, and said rear end of the barrel is, during such movement, again raised to its interlocked relation with the breech slide by the inclined upper surface of the cam groove 3b and is there held in such raised position by the hereinbefore mentioned horizontal extension of said cam surface, engaging the top surface of the pin 5. The forward movement of the barrel 3 and slide 2 is limited by the engagement of the front rounded face of the barrel lug 3a with the corresponding rear face of the transverse wall 1b of the frame. See Figs. 3 and 8.

The inwardly projecting annular flange 2a at the forward end of the slide 2, in which the forward portion of the barrel is supported and guided, is of small width and there is sufficient play between said flange and the barrel to permit the slight tilting movement of the barrel for locking and unlocking said barrel and slide and also to permit the relative longitudinal movement between these parts, when unlocked, without binding or undue friction.

In order to facilitate the dismounting and inspection of the firing mechanism of the arm, all the parts of said mechanism are so constructed and arranged that they may be readily detached and withdrawn from the frame 1. To this end, the trigger 8 is removably pivoted in a vertical slot formed in the frame below the recess which receives the barrel lug 3a, and a trigger pawl 9 is pivoted to the trigger to transmit the action of said trigger to the other parts of the firing mechanism, said pawl being located in a vertical slot provided therefor in the frame from which it may be removed with the trigger. To this end also, the remaining parts of the firing mechanism, which comprise the firing pin 10, the main spring 11, the sear 12, and the sear connecting lever 13 for connecting the sear with the trigger and trigger pawl, are all mounted on the breech bolt 4 so as to be readily removable rearwardly from the frame. Also mounted on the breech bolt is the extractor 16.

The trigger 8 and its pawl 9 are in operative relation with the remaining parts of the firing mechanism only when the breech slide 2 is in its forward position with the breech slide and barrel locked and the breech closed. Then, the forward end of the sear connecting lever 13 (see Fig. 14) is located just above the upper end of the trigger pawl 9, so that pulling back the trigger 8 and thereby raising the pawl 9 causes the upper end of said pawl to engage said lever 13 and move it for actuating the sear 12 to fire a shot. In all other positions of the breech slide 2 the forward end of the lever 13 is removed from its operative relation with the trigger pawl 9; thus the arm cannot be fired, even if the trigger is pulled back, until the breech slide and barrel are fully locked and the breech closed.

The trigger pawl 9 is normally held in a rearward position, as shown in Figs. 3, 4, 6, 8 and 14, under the action of the trigger spring 8a which has one end thereof bearing on a rearward projection (Figs. 4 and 14) formed on the integral pivot 9a of said pawl. If the trigger is held back, after firing a shot, until the breech slide 2 and the parts movable therewith return to their forward position, the upper end of the pawl 9 will be swung forwardly against the tension of the spring 8a during the last portion of such return movement by the engagement of the forward end of the sear connecting lever 13 with said pawl, and it will therefore be impossible to fire another shot until the trigger is released. The release of the trigger 8 will allow its return forward under the tension of its spring 8a (Figs. 3, 4, 6 and 14) and during such return of the trigger, the pawl 9 will be lowered until its upper end moves below the forward end of the lever 13, thereby permitting said upper end to return rearward, also under the tension of the trigger spring 8a, to its normal position beneath the forward end of said lever 13, thus positioning the firing mechanism for firing another shot by again pulling the trigger back.

It will be seen, by referring to Figs. 3, 4, 5, 6 and 14, that the trigger 8, trigger pawl 9 and trigger spring 8a form a unitary organization of elements adapted for removal as a unit from the frame; the trigger spring being for this purpose, secured to the trigger between its ends and cooperating, at its forward end, with the frame and, at its rear end, with the trigger pawl, as hereinbefore described. For the purpose of easily dismounting said organization of elements, the cylindrical seats in the frame for the trigger pivot are connected with the under surface of the frame by vertical slots of less width than the diameter of said seats. (Figs. 2, 3, 5 and 12). The trigger 8 is formed on opposite sides thereof with integral trunnions 8b arranged to turn freely in said cylindrical seats and these trunnions are formed with flattened surfaces on opposite sides thereof to permit the passage of said trunnions through the vertical slots when the trigger is swung forwardly be-

yond its normal position, as shown in Fig. 5, against the tension of the trigger spring 8^a, which by pressing the trigger pawl against the rear face of the vertical slot in the frame in which said pawl is located yieldingly opposes such movement of the trigger. In order to positively prevent the trigger from becoming detached accidentally by forward pressure on the lower finger engaging portion thereof, or otherwise, the trigger has a forwardly extending portion 8^c, which by engaging the lower surface of the barrel lug 3^a limits the forward movement of the trigger and thus prevents disassembling of the trigger unless the barrel is first dismounted. See Figs. 3 and 6. The forward end of the spring 8^a protrudes forwardly from the slot in which it is seated in the upper forward portion of the trigger, and this end rests upon a shoulder formed for that purpose in the forward wall near the bottom of the trigger seat in the frame, thereby said spring 8^a performs the functions of a trigger spring by yieldingly holding the trigger finger piece in its normal forward position and by returning it to that position when released after each pull by which a shot has been fired. By normal position of trigger and pawl I mean the position shown in Figs. 3, 4, 6 and 14 when they are in position to actuate the sear connector to fire a shot.

The breech bolt 4, shown detached in Figs. 32 to 37 inclusive, is substantially cylindrical in form and is provided at its rear end with an enlarged portion which projects rearwardly beyond the breech slide 2, as shown in Figs. 2, 6 and 7. In order to secure the bolt 4 rigidly to the breech slide 8, so that they may together form a heavy breech closure, a known fastening means is provided, comprising a series of ribs on the bolt adapted to interlock, by giving the bolt a rotary motion after it has been inserted into the slide, with a corresponding series of grooves formed in the slide, as shown in Figs. 6 and 7. To prevent accidental rotary movement of the breech bolt in the breech slide, the breech bolt is locked by a safety piece 14, shown detached in Figs. 22 to 25 inclusive, and in its assembled relation in Figs. 2, 6, 7 and 12 to 15 inclusive, this piece serving at the same time to close the rear end of the longitudinal seat formed substantially in the axis of the bolt 4 to receive the firing pin and the sear. The safety piece 14 slides, for these and other purposes, as will be described later, in a vertical groove formed in the rear end of the breech bolt, being guided therein and locked against movement in a horizontal direction by the well known rib and groove connection. A forward extension 14^a at the upper end of piece 14 is adapted to extend into a corresponding recess formed in the top wall of the breech slide, as shown in Figs. 2 and 6, thereby locking the breech bolt against rotary movement.

As is clearly shown in Figs. 26, 27 and 28, the body portion of the firing pin 10 is cylindrical in form and mounted for longitudinal movement in the afore-mentioned seat in the breech bolt 4, said seat being of cylindrical form at its forward portion and substantially rectangular in cross section throughout its rear portion, as is clearly shown in Figs. 32, 33, 36 and 37.

The firing point 10^a is adapted to protrude through an opening 4^a (Figs. 15 and 32) therefor in the forward wall of the firing pin seat of the breech bolt and the firing point and the opening therefore are positioned to be in line with the axis of the bore of the barrel when the barrel is in locked position and to strike the center of a cartridge seated in the barrel chamber. In the particular embodiment of my invention here shown, the firing point 10^a is eccentrically disposed above the center of the forward cylindrical portion of the pin in order that it may properly contact with the primer of a cartridge seated in the barrel chamber. The firing pin 10 is formed on the under side of its rear portion with a longitudinal guide rib 10^b which projects into a slot formed in said breech bolt below the firing pin seat therein. See Figs. 12, 13, 15, 32, 33, 34, 36 and 37. This rib forms a cocking shoulder at its forward end for engagement by the sear 12 when the parts are in the cocked position.

The sear 12 consists, as shown in Figs. 12, 13, 15, 27, 29 and 30 of a member having two arms arranged substantially at right angles to each other and is mounted for sliding movement longitudinally of the breech bolt, as well as for the usual pivotal movement to release the firing pin. Said sear is supported vertically on said breech bolt by the laterally enlarged upper end 12^a of its vertical arm, which is guided in the rearward rectangular portion of the longitudinal seat in the breech bolt (Figs. 12, 13, 30, 34 and 37). This laterally enlarged upper end of the sear arm serves also as the abutment for the main spring 11, being adapted to receive the thrust of said spring through a collar 15^a formed at the rear end of the guide rod 15, a small tit-shaped projection on the rear surface of said collar entering a recess in the upper end 12^a of the vertical rear arm of the sear (Fig. 31) to position the guide rod 15 and spring 11. The forward end of the spring extends into a seat therefor in the firing pin 10. (Fig. 31). The upper portion of the horizontal arm and also an intermediate portion of the vertical arm of the sear are guided in the aforementioned vertical slot in the breech bolt, and, at its forward end, the horizontal

arm is formed with an upward projection 12^b forming a rearward shoulder which co-operates with the hereinbefore described cocking shoulder on the guide rib 10^b of the firing pin 10. From the foregoing description and the showing in Figs. 13, 15 and 27, it will be seen that, when the forward end of the sear is swung upwardly to bring the rearward facing shoulder thereon in front of the cocking shoulder on the firing pin, the main spring 11 will be under compression and will operate to keep the firing pin and sear engaged.

The comparatively deep cocking shoulder on the rib 10^b slopes downwardly and forwardly and co-operates with the corresponding cocking shoulder on the sear when the sear is in cocking position under the tension of the main spring to hold the firing pin and sear so firmly united that they cannot be separated by any unusual jars to which the pistol may be subjected. It will be noted that my form of sear, in its relation to the firing pin and other co-operating parts, acts not only to cock and uncock the firing pin, but serves also, by its rear vertical arm, as the seat against which the rear end of the main spring bears, thereby permitting this spring to function not only as the main spring but also as a sear spring. This organization of sear and firing pin makes a unit of these two parts when they are in cocked position, whereby the sear partakes of a portion of the longitudinal movement of the firing pin, whereby these two parts occupy a minimum of space, and whereby they may be readily inserted into and removed from the breech bolt as a unit. Also, when the parts are cocked and the breech bolt has returned to its forward position, the rear vertical arm of the sear is in position to be engaged by the safety piece 14 to be locked by said piece against movement to release the firing pin, as hereinafter described.

Along the lower portion of its horizontal arm the sear 12 is widened to form longitudinal ledges 12^c on the opposite sides thereof, the upper surfaces of these ledges, when the horizontal arm of the sear is raised at its forward end, acting to guide and steady the sear in its longitudinal movement by their engagement with the under side of the breech bolt, 4 at the opposite sides of the vertical slot therein. The ledge 12^c formed on the right hand side of the sear 12 has the additional function of providing a shoulder of substantial width and length (Fig. 29) positioned to project under the lateral inward extension 13^a (Figs. 7 and 17) at the rear end of the sear connecting lever 13. This lever is pivoted on a stud 13^b (Figs. 14, 34 and 36) formed on the right hand side of the breech bolt. To hold the lever on its pivot stud when the breech bolt is removed from the breech slide said lever may be formed with a thin lip 13^c at its upper edge adapted to project under a portion of the extractor 16, thereby preventing removal of the lever without first removing the extractor.

The automatic cocking of the arm is brought about during the rearward movement of the slide 2 and breech bolt 4 by means now to be described.

The sear is formed at its forward end with a downward projection 12^d, which is located above a transverse recess 17 formed in the upper surface of the frame, as shown in Fig. 14, when the parts are in the firing position. If now, the trigger 8 is pulled back, it operates in the manner hereinbefore described, to raise the forward end and lower the rear end of the sear connecting lever in such manner that the inward projection 13^a bears upon the forward end of the ledge 12^c of the sear (Fig. 14) and thus depresses the forward end of the sear 12 to release the firing pin 10 to fire a shot, assuming that a cartridge is located in the barrel chamber. When the firing pin strikes the primer, the parts will occupy the positions shown in Fig. 12, the forward end of the sear being there shown depressed with its downward projection 12^d lowered into the transverse recess 17, and being held in this position against the tension of the main spring 11 by the engagement of the flat surface formed on the upward projection 12^b with the under surface of the firing pin rib 10^b. During the first part of the rearward movement of the breech slide, the sear 12 is accordingly held stationary because of the engagement of the rear surface of its downward projection 12^d with the rear wall of the recess 17 and the engagement of the upper surface of projection 12^b with the under surface of firing pin rib 10^b, and since the firing pin 10 is constrained to move rearward with the breech slide 2 and breech bolt 4 the main spring 11 will be compressed against the vertical rear arm of the sear until the rearward movement of the firing pin has brought the cocking shoulder on its guide rib 10^b opposite the co-operating shoulder on the sear 12. When the parts arrive in this position, the camming action of the inclined rear surface on the downward projection 12^d of the sear against the correspondingly inclined rear wall of the recess 17 in the frame and the tension of the main spring 11 together cause the sear to swing upwardy at its forward end to assume the position shown in Fig. 13. The downward projection 12^d having left the recess 17 in the frame, the sear will now participate in the further rearward movement of the breech slide, the lower portions of the sear being guided in a shallow longitudinal groove formed in the top of the frame from the transverse recess 17 to the rear of the frame. During the return movement of the breech slide 2 the

downward projection 12[d] at the forward end of the sear 12 comes into engagement with the upper portion of the forward wall of the recess 17 in the frame, the forward wall being higher than the rear wall of said recess (Figs. 6, 14 and 15), and the sear and firing pin are thus prevented from taking part in the final movement of the breech slide, thereby bringing them in the cocked condition to a rearward position in the breech bolt 4 as shown in Figs. 14 and 15.

It will be seen by reference to Figs. 14 and 17 that the lateral inward extension 13[a] at the rear of the sear connecting lever 13 is formed with a lower surface which slopes upwardly from front to rear in a gradual curve. It is this surface of the extension 13[a] which engages the ledge 12[c] on the sear and this construction provides in a convenient and simple form for a "double pull" whereby the user of the arm is warned of the approximate point in the pull of the trigger when the firing pin will be released. By making the engaging surface of the extension 13[a] slope upwardly in a gradual curve from front to rear, the point of contact between extension 13[a] and the sear ledge will move rearwardly along the sear ledge as the trigger is drawn rearwardly and the sear is depressed, thereby decreasing the leverage force exerted on the sear and requiring increased pull on the trigger as the firing point is approached. This necessity for an increased pull on the trigger gives the shooter warning of the time of release of the firing pin.

If, while the parts are in the cocked position, shown in Figs. 14 and 15, it is desired to lock the firing mechanism, this may be done through the co-operation of the safety piece 14 with a part of the firing mechanism, namely, the sear 12, whereby said sear is locked against movement to release the firing pin. For this purpose the safety piece 14 can be moved to a lower position, as shown in Fig. 15. Inwardly projecting ribs 14[b] are provided at the opposite sides of the upper portion of a vertical groove (Figs. 15, 22 and 25), into which groove the rear portion of the vertical arm of the sear 12 projects when the parts are in the firing position as shown in Figs. 14 and 15. The ribs 14[b] engage in corresponding grooves 12[e] (Figs. 15 and 29) formed in the opposite sides of the upper portion of said sear arm, and thereby lock the sear against swinging movement to release the firing pin. When moved to its lower position (Fig. 15) not only does the piece 14 lock the firing mechanism, but it also serves to lock the breech bolt 4 and consequently the breech slide 2 against rearward movement. For this purpose, the bifurcated lower end of the safety piece 14 see Figs. 15, 22 and 24, is adapted to enter corresponding recesses 18 in the frame (Figs. 8, 10 and 15) when the safety piece is in its lower position.

In order to retain the safety piece 14 either in its upper or in its lower positions and to allow it to be readily shifted from one position to the other at the will of the shooter, co-operating means are provided on said piece 14 and the breech bolt 4 for yieldingly holding the piece in either position. To this end, the safety piece is provided with a transverse seat in which are arranged opposed plungers 19 actuated to project laterally from the safety piece 14 by a common spring 20 (Fig. 24) the outward movement of said plungers being limited by the engagement of stop shoulders formed thereon with the heads of the screws 21. The plungers 19 are adapted to engage corresponding recesses 22 and 23 (Figs. 32 and 33) formed in the side walls of the vertical groove in which the safety piece 14 is guided in the rear end of the bolt 4. These recesses are shallow and have their edges rounded or beveled (Fig. 33), and the portions of the plungers engaging said recesses are correspondingly formed (see Figs. 22, 23 and 24), whereby it is possible for the shooter by simply pressing upwardly on the piece 14 to move it from its lower position where the plungers 19 are in engagement with the lower recesses 22 to the upper position, the plungers being cammed out of the lower recesses 22 in so moving the safety piece 14 and finally snapping into the upper recesses 23 when they are moved opposite said recesses, and vice versa. Provision is made to prevent the accidental movement of the safety piece 14 upwardly above the position shown in Figs. 2, 6, 12 and 13, and such limiting means may consist in having the vertical grooves at the sides of the safety piece 14 terminate short of the lower end of said member, as shown in Figs. 22 and 23.

In order to prevent injury to the parts, if the safety piece 14 should be accidentally moved to its lower position while the slide 2 is in its rearward position, the lower forward portion of said piece is formed with a beveled surface (Figs. 6, 13, 15 and 23) and a corresponding surface is formed at the rear of the frame (Figs. 2, 6, 9 and 12 to 15) so that even if the slide 2 is permitted to return forward under the tension of the reaction spring 6 when the safety piece 14 is in its lower position, no harm will result, because said piece will be automatically cammed up to its upper position by the engagement of its beveled surface with the corresponding surface on the frame.

The usual magazine is shown as held by the catch 31, Fig. 2, in a seat formed to receive said magazine in the downwardly extending grip portion of the frame, and is provided with the follower 25 which is moved toward the top of the magazine, as

the cartridges are removed, by the follower spring 26 which is guided at its upper end by the downward projection 25ª on the follower, and which bears at its lower end against the bottom 24ª of the magazine. As shown in Figs. 11, 19 and 20 the forward portion of the magazine is of less heiglit than the rear portion which permits the front portion of the follower to project above the forward edge of the magazine when the last cartridge is gone. This is for a purpose about to be described.

To indicate to the shooter that the magazine has become empty, means are provided to co-operate with the follower 25, when it rises to its highest position (Fig. 20) after the last cartridge has been removed from the magazine and fired, to stop the breech slide 2 in its rearward position, as shown in Figs. 6 and 20. Such means may comprise a substantially cylindrical slide stop 27 having its lower portion extending into a hole formed in the frame just forward of the magazine seat and adjacent the left hand side of the frame. A light spring 27ª secured at one end to the body of the slide stop, as shown in Fig. 21, and bearing with its opposite end against the wall of the hole, frictionally holds said stop either in its operative or in its inoperative position. Near its upper end the stop 27 is formed with a rearward projection 27ᶜ which extends over the low forward wall of the magazine 24 into the path of the magazine followers 25. See Fig. 8.

Normally the slide stop 27 is in its inoperative position shown in Fig. 19, where it permits unobstructed movement of the slide 2, but after the last cartridge has been removed from the magazine, the follower 25 in rising to its uppermost position shown in Fig. 20, engages the rearward projection 27ᶜ on the slide stop and lifts the same, when the breech slide recoils after the firing of said last cartridge, so that its upper end projects into a recess 2ᶜ formed in the bottom of the left-hand wall of the breech slide 2, and holds the slide retracted near its rearmost position by the engagement of a flat rearwardly facing surface on the stop 27 with the vertical rear wall of said recess 2ᶜ (see Figs. 20 and 21). The shooter can now remove the empty magazine and replace it with a magazine containing cartridges, after which the slide stop 27 is depressed by simply grasping the slide 2 and retracting it to its rearmost position, during which movement an inclined surface at the forward end of the recess 2ᶜ in the slide engages a corresponding surface on the forward side of the upper end of the slide stop 27, thereby camming the stop to its lower inoperative position. The breech slide 2 can now be moved forward to firing position, at the same time forcing the topmost cartridge from the magazine into the chamber of the barrel and thus again conditioning the arm for continued firing as long as there are any cartridges in the magazine. It will be noted that the frame is wider than customary and the slide is carried inside the frame. The stop 27 can therefore cooperate with the slide and yet be entirely concealed within the frame where it can not be tampered with.

A flattened extension on the lower end of the slide stop 27 permits the slide stop to serve as a small screw driver if one is desired.

The cartridge extractor 16 (Figs. 14 and 16) is provided with the usual hook-shaped forward end for engaging the groove at the base of a cartridge and is formed at its rear end as shown in Fig. 16 with a thin rounded extension 16ᵇ adapted to be inserted into a longitudinally extending hole on the breech bolt (Figs. 14 and 37). The extractor is held against longitudinal movement by an inwardly projecting stud 16ª near its front end engaging in a recess therefor in the bolt 4, and it is also held against vertical movement at its forward end by reason of its location between two projecting lugs on the bolt 4 (Figs. 14 and 35). The side of the bolt opposite the extractor is formed with the usual forward projection (Figs. 34 and 35) to support the head of a cartridge on the side thereof opposite said extractor.

The ejector 29 as clearly shown in Fig. 9, projects upwardly into a vertical longitudinally extending groove formed in the under side of the left-hand side of the breech bolt 4, and when the breech bolt recoils with the breech slide 2 after the firing of a shot, the extractor 16 withdraws the cartridge case from the barrel chamber and carries it rearwardly until it reaches the position shown in Fig. 9, where the ejector is shown projecting from the front face of the breech bolt and engaging the base of the cartridge to swing it out laterally through the ejection opening in the right-hand side of the breech slide in the usual manner. For convenience of manufacture, the ejector is, as shown in Figs. 8, 9 and 10, integrally formed at the forward portion of a piece 29ª, constituting a part of the frame 1 of the arm but formed separately from the main body of said frame, being securely united to said body by any suitable means, such as the screws 30, shown in Fig. 8.

The main parts of the arm can be readily disassembled as follows: The magazine 24 is removed by pressing in the magazine catch 31 allowing the magazine to drop out of the frame. The breech slide 2 is now drawn rearwardly to its rearmost position, where the safety piece 14 can be removed by downward pressure thereon. This leaves the rear end of the breech bolt 4 open for the withdrawal of the firing pin 10 and sear 12

in the cocked condition shown in Fig. 27. After the withdrawal of these parts from the bolt 4, it can be rotated through approximately 90° to disengage the rib and groove connection, locking the bolt to the breech slide, thereby permitting said bolt to be withdrawn rearwardly. By raising the forward end of the arm so as to cause the barrel 3 to remain in its rearward position, the breech slide 2 can now be slid off the frame in a forward direction, permitting the removal of the reaction spring 6 and its guide rod 7 and allowing the barrel 3 to be lifted off the frame. The trigger 8 and the parts attached thereto can now be removed from the frame 1 in the manner hereinbefore described.

The arm can be re-assembled by proceeding in the reverse order.

It will be evident that though I have chosen a pistol as an embodiment of my improvements and for the purpose of explaining the nature of my improvements, various features of my invention may be employed independently of the rest and in hand-operated or other firearms of a different kind from that which I have described herein, and that various changes in the form and arrangement of the parts may be made without departing from the spirit of my invention.

What I claim and desire to secure by Letters Patent is:

1. In an automatic firearm, the combination of a frame, a recoiling breech slide mounted for longitudinal movement on said frame, a recoiling barrel mounted for longitudinal movement relative to said frame, means for interlocking said barrel, and frame, a cam on said barrel and a transverse pin on said frame adapted to cooperate with said cam to render said interlocking means operative when said barrel and frame are in their forward firing position, to maintain said parts in their locked relation during the initial recoil of said parts and thereafter to unlock said parts during their further recoil.

2. In an automatic firearm, the combination of a frame, a recoiling breech slide mounted for longitudinal movement on said frame, a recoiling barrel mounted for longitudinal movement relative to said frame, means for interlocking said barrel and frame, a cam on said barrel, and a transverse pin on said frame adapted to cooperate to render said interlocking means operative when said barrel and frame are in their forward firing position, to maintain said parts interlocked during their initial recoil, thereafter to unlock said parts during their further recoil and to limit the rearward movement of the barrel.

3. In an automatic firearm, the combination of a frame having a recess, a recoiling breech slide and a recoiling barrel mounted thereon, said barrel being so mounted as to be capable of being tilted relative to said slide, means for interlocking said barrel and slide, a lug on said barrel extending into said recess in said frame and having a cam groove, and a fixed transverse pin in said recess positioned to cooperate with said cam groove, whereby said barrel and slide are held interlocked when in their forward firing position and during their initial recoil, whereby the barrel is tilted out of interlocked relation with said slide during their further rearward movement and whereby the rearward movement of the barrel is limited by engagement of said pin with the front end of said groove.

4. In an automatic firearm, the combination of a frame, a breech slide mounted for longitudinal movement on said frame, a barrel also mounted for longitudinal movement relative to said frame, means for interlocking said barrel and slide, a lug on said barrel having a cam groove, a cam pin on said frame, and an abutment on said frame, said cam groove and pin cooperating during the rearward movement of said barrel and slide to unlock said barrel and slide and to limit the rearward movement of said barrel and said lug engaging said abutment on the frame on the forward movement of said barrel and slide and limiting the forward movement of said barrel and slide.

5. In a firearm, the combination of a frame, a trigger pivotally mounted therein, means whereby said trigger may be dismounted from said frame by rotating it a predetermined distance beyond its normal movement in one direction, and means to yieldingly oppose such rotation of the trigger.

6. In a firearm, the combination of a frame having a seat for the trigger pivot and a slot narrower than the diameter of said seat extending from said seat to the outer surface of the frame, and a trigger having a pivot with flattened sides permitting said pivot to be passed through said slot for assembly or disassembly of the trigger when the same has been rotated a predetermined distance beyond its normal limit of movement in one direction.

7. In a firearm, the combination of a frame, a trigger pivotally mounted therein, a trigger pawl pivotally mounted on said trigger, a common spring for said trigger and said pawl also mounted on said trigger, and means whereby the trigger and the parts mounted thereon may be disassembled as a unit from the frame by rotating said trigger a predetermined distance beyond its normal limit of movement in one direction.

8. In a firearm, the combination of a frame, a barrel removably mounted thereon, a trigger pivotally mounted in said

frame, means whereby the trigger may be dismounted from the frame by rotating it a predetermined distance beyond its normal limit of movement in one direction, and means comprising a part of said barrel for preventing such abnormal movement while the barrel is in assembled position on the frame.

9. In a firearm, the combination of a frame having a recess therein, a barrel having a lug projecting into said recess, a trigger mounted in said frame below said lug, and means whereby said trigger may be disassembled from the frame by rotation beyond its normal limit of movement in a forward direction, said barrel lug being so positioned as to prevent such rotation of the trigger while the barrel is in assembled position in the firearm.

10. In a firearm, the combination of a frame having an abutment, a trigger pivotally mounted in said frame and demountable by rotating it a predetermined distance beyond its normal limit of movement in one direction, a trigger pawl mounted on said trigger in co-operative relation with said abutment, and a spring mounted on said trigger and normally holding said pawl against said abutment, as and for the purpose specified.

11. In an automatic firearm, the combination of a frame, a recoiling breech slide, a recoiling barrel, means for interlocking said barrel and slide when in their forward position, a lug on said barrel having cam surfaces, a cam pin on said frame, and a trigger pivotally mounted in said frame, means whereby said trigger may be removed from said frame when it has been rotated a predetermined distance beyond its normal limit of movement in one direction, said lug being so positioned as to co-operate with said cam pin to unlock the barrel and frame during their recoil and to engage said trigger when it is rotated beyond its normal position and thereby prevent disassembly of said trigger from said frame when the barrel is in assembled position in said firearm.

12. In an automatic firearm, the combination of a frame, a trigger mounted in said frame, a breech closure mounted for longitudinal reciprocatory movement on said frame, a spring-actuated firing pin and a sear for holding said firing pin in cocked condition, both carried by said breech closure, a sear connecting lever mounted on said closure, and means operatively connecting said trigger and said lever only when the breech closure is in its forward position.

13. In an automatic firearm, the combination of a frame, a trigger mounted in said frame, a breech bolt mounted for longitudinal movement on said frame, a firing pin and a sear carried by said bolt, a sear connecting lever mounted on said bolt, and means operatively connecting said lever with said trigger, said means comprising a trigger pawl pivotally and yieldingly mounted on said trigger whereby it will yield longitudinally of the frame if the trigger is held back when the bolt moves to its forward position and will return into operative relation with said lever upon the release of said trigger.

14. In a firearm, a breech bolt having a longitudinal seat, a firing pin mounted for longitudinal movement in said seat, a main spring therefor, and a sear mounted in said seat and forming an abutment for said main spring.

15. In a firearm, a breech bolt having a longitudinal seat open to the rear, a firing pin mounted for longitudinal movement in said seat, a main spring therefor, a sear mounted in said seat and forming an abutment for said main spring, and a closure for the rear end of said seat for retaining said firing pin, main spring and sear in assembled relation with said breech bolt.

16. In a firearm, a breech bolt having a longitudinal seat open to the rear, a firing pin, main spring and sear independent of said firing pin insertable as a unit into said seat through said open rear end, and a closure for the rear end of said seat for retaining said firing pin, main spring and sear in assembled relation with said bolt.

17. In a firearm, a breech bolt, a firing pin having a cocking shoulder, a main spring having one end thereof bearing against said firing pin, a sear serving as an abument for the other end of said mainspring and having a shoulder for operative engagement with the cocking shoulder on said firing pin, whereby said mainspring serves to hold the firing pin and the sear together in the cocked condition, and a seat in said breech bolt in which the firing pin, mainspring and sear are mounted for longitudinal movement whereby said bolt and said pin, spring and sear may have relative longitudinal movement.

18. In a firearm, a breech bolt having a longitudinal seat, a firing pin, main spring and sear insertable as a unit into said seat in the cocked condition, a closure for the rear end of said seat for retaining said firing pin, main spring and sear mounted in said seat, said closure being adapted to lock the sear against movement to uncock the firing pin.

19. In a firearm, the combination of a breech bolt, a firing pin and sear mounted in said breech bolt, said firing pin and said sear having cooperating cocking shoulders, said sear having an abutment, and a main spring bearing at one end against the firing pin and at the other against the sear abut-

ment, whereby said spring will yieldingly hold said cocking shoulders in cocking engagement.

20. In a firearm, the combination of a firing pin having a cocking shoulder, a floating sear having a horizontal arm with a cocking shoulder to cooperate with said shoulder on the firing pin and a vertical arm, and a spring abutting at one end against the firing pin and at its other end against said vertical sear arm, whereby when the cocking shoulders are in cocking engagement said spring will be compressed and yieldingly hold said shoulders in firm engagement.

21. In an automatic firearm, the combination of a frame, a breech bolt mounted for longitudinal movement on said frame, firing mechanism movably mounted in said bolt, and means carried by said bolt for simultaneously locking said mechanism against firing movement and said bolt against longitudinal movement on the frame.

22. In an automatic firearm, the combination of a frame, a breech bolt mounted for longitudinal movement on said frame, a spring-actuated firing pin carried by said bolt, a sear also carried by said bolt and operative to hold said firing pin in cocked condition, and a slidable safety member mounted on said bolt and movable to lock said sear against movement to uncock said firing pin and to lock said breech bolt against longitudinal movement.

23. In an automatic firearm, the combination of a breech bolt, a spring-actuated firing pin mounted in said bolt, a sear mounted for pivotal movement in said bolt and operative to cock said firing pin, and a slidably safety member on said bolt, said sear and said safety member being formed with corresponding locking grooves and ribs, respectively, whereby said safety member may be moved to interlock said grooves and ribs and thereby to prevent movement of said sear to uncock the firing pin.

24. In an automatic firearm, combination of a frame, a breech bolt mounted for longitudinal movement on said frame, a firing pin and a sear mounted for longitudinal movement relative to said frame, and means for holding the sear against rearward movement during the initial rearward movement of said firing pin after firing a shot, whereby the firing pin in its rearward movement engages with said sear to automatically cock said pin.

25. In an automatic firearm, the combination of a frame having a shoulder, a breech bolt mounted for longitudinal movement on said frame, and a spring-actuated firing pin and a sear having cooperating cocking shoulders and both mounted for longitudinal movement, said sear having a shoulder cooperating with the shoulder on the frame to hold the sear against rearward movement during the rearward movement of said bolt and firing pin after firing a shot and until said cocking shoulders engage each other, whereby the firing pin in its rearward motion with said bolt engages with said sear to automatically cock said pin.

26. In an automatic firearm, the combination of a movably mounted firing pin, a movably mounted sear having an upwardly extending arm and a forwardly extending arm, a main spring abutting at one end against said firing pin and at its other end against said upwardly extending sear arm, and cooperating cocking shoulders on said forwardly extending sear arm and said firing pin, whereby the said spring will hold said shoulders in firm cocked engagement and whereby the firing pin and sear, when cocked, can be moved as a unit.

27. In an automatic firearm, the combination of a recoiling firing pin, a longitudinally movable sear, cocking shoulders on said firing pin and sear, an abutment on said sear, a main spring bearing at one end against said firing pin and at the other against said sear abutment, means for holding said sear against rearward movement on the initial recoil of said firing pin, whereby said cocking shoulders will engage to cock said pin and said pin and sear will thereafter move rearwardly together, means for arresting the forward motion of said firing pin and sear and means for uncocking said pin whereby it will move to full forward position to fire a shot.

28. In an automatic firearm, the combination of a frame, a breech bolt mounted for longitudinal reciprocatory movement on said frame, a firing pin and a sear both mounted for longitudinal movement in said bolt, cocking shoulders on said pin and sear, an inclined surface on said frame and a like inclined surface on said sear, said surfaces cooperating to hold the sear against movement during the initial recoil of said bolt and pin and until said pin has reached a position where said cocking shoulders can engage each other and then moving said sear to cock said pin.

29. In an automatic firearm, the combination of a frame having a transverse recess formed in its upper surface, a longitudinally movable breech bolt, a firing pin mounted for longitudinal movement in said bolt and having a depending longitudinal rib forming a cocking shoulder, a main spring for actuating said firing pin, and a sear mounted for longitudinal and pivotal movement in said bolt and serving as an abutment for the main spring, said sear having a forwardly extending arm below said firing pin provided with a rearward facing shoulder for engagement with the cocking shoulder on the firing pin and provided also with a down-

ward projection near its forward end arranged above said transverse recess in the frame when the parts are in the firing position, said projection entering said recess when the sear is moved to uncock the firing pin and being held therein by the engagement of said sear arm with the under surface of said depending rib on the forward movement of the firing pin to fire a shot and said sear projection being held in said recess during the initial rearward movement of the firing pin and bolt whereby the automatic cocking of the arm is effected.

30. In an automatic firearm, combination of a frame having a transverse recess with a high front wall and a low rear wall, a longitudinally movable breech bolt, a longitudinally movable firing pin, a main spring, a longitudinally movable sear, co-operating cocking shoulders on said sear and pin, a downward projection on said sear positioned above said recess when the parts are in their cocked firing position, said projection entering said recess when the sear is moved to uncock the firing pin, the said low rear wall of said recess engaging said projection to hold the sear against rearward movement during the initial recoil of said bolt and pin whereby said cocking shoulders engage each other and said high front wall engaging said projection on forward motion of said pin and sear to hold said sear against full forward motion and to hold said pin from full forward motion until said cocking shoulders are disengaged, and means for disengaging said cocking shoulders.

31. In an automatic firearm, the combination of a frame, a breech slide mounted for longitudinal reciprocatory movement on said frame, a breech bolt adapted to be secured in said slid by a rotary movement, and a safety member movably mounted on said breech bolt and adapted to be at will moved into either of two operative positions, said safety member, when in one of said positions, being adapted to lock said breech bolt against rotary movement and, when in the other of said positions, being adapted to also lock said bolt and slide against longitudinal movement on the frame.

32. In an automatic firearm, the combination of a frame having a locking recess, a breech slide mounted for longitudinal reciprocatory movement on said frame, a breech bolt adapted to be secured in said slide by a rotary motion, a vertically slidable member at the rear end of said bolt and adapted to be at will moved into either of two operative positions, said member, when in its upper position, locking said breech bolt against rotary movement and, when in its lower position, also locking said bolt and slide against longitudinal movement by reason of the engagement of its lower portion with said locking recess in the frame, and means for yieldingly holding said member in either position.

33. In an automatic firearm, the combination of a frame having a recess at its rear end, a breech bolt mounted for longitudinal reciprocatory movement on said frame, a safety member mounted for vertical movement at the rear end of said bolt, said safety member being constructed and arranged, when in its lower position, to cooperate with said recess in the frame to lock the breech bolt in its forward position, and corresponding cam surfaces at the lower end of said member and at the rear end of said frame, respectively, said surfaces cooperating, if the safety member is moved to its lower position while the breech bolt is in a rearward position, to automatically move said safety member to its upper position during the forward movement of said bolt.

34. In an automatic firearm, the combination of a frame, a breech slide mounted for longitudinal movement on said frame, a breech bolt adapted to be secured in said slide, firing mechanism movably mounted in said bolt, a safety member slidably mounted on said breech bolt and adapted to be at will moved into either of two operative positions, said safety member, when in one of said positions, being adapted to lock said breech bolt from movement, relative to said slide and to also lock said firing mechanism against firing movement, and means for yieldingly holding said member in either position.

35. In an automatic firearm, the combination of a breech bolt having a longitudinal seat open at the rear, a firing pin mounted for longitudinal movement in said seat, a main spring therefor, a sear mounted for longitudinal movement in said seat and forming an abutment for said main spring, a closure movably mounted on said bolt at the rear of said seat for retaining said firing pin, main spring and sear in assembled relation in said bolt, and means on said closure for locking said sear against movement to uncock the firing pin.

36. In an automatic firearm, the combination of a reciprocatory breech slide, a breech bolt, means for interlocking said breech bolt with said slide, a longitudinal seat in said bolt open at the rear, a firing pin and sear mounted for longitudinal movement in said seat, a closure for the rear end of said seat movably mounted at the rear end of said bolt, means on said closure for locking said bolt from disengagement with said slide, and means on said closure for locking said sear from movement.

37. In an automatic firearm, the combination of a frame having a substantially vertical magazine seat therein, a cartridge magazine removably held in said seat and having a low forward wall, a spring actu-

ated magazine follower having a portion adapted, when the follower is in its uppermost position, to project above the low forward wall of the magazine, a breech slide of less width than the frame mounted for longitudinal reciprocatory movement on said frame and having an elongated recess formed in the bottom of a side wall thereof, a slide stop mounted for sliding movement in a substantially vertical direction in said frame forwardly of said magazine seat and below said side wall of the breech slide, a spring for frictionally holding said stop against movement, said stop having a rearward projection extending over the low forward wall of said magazine into the path of said follower, whereby said follower, after the last cartridge has been removed from the magazine and fired, lifts the slide stop to cause its upper end to project in front of the rear wall of said recess, thereby stopping said slide in a rearward position, and cooperating surfaces on the upper end of said stop and on the forward wall of said recess, respectively, whereby the stop may be automatically depressed to its inoperative position by manually retracting said slide rearwardly on the frame.

38. In an automatic firearm, the combination of a frame, recoiling mechanism mounted on said frame, a cartridge magazine and a follower therein, means mounted inside the frame and positioned to be actuated by engagement by said follower when in its raised position and the magazine is empty to engage said recoiling mechanism and stop its normal return movement after recoil, and means on said recoiling mechanism which will engage said stop means on retraction of said mechanism and return it to its normal nonengaging position when free from engagement by said follower.

39. In an automatic firearm, the combination of a trigger, a firing member, a sear, means for engaging said sear with said firing member to cock the same, means for operatively connecting said trigger with said sear, said means comprising a connecting lever positioned to engage said sear and to be engaged by said trigger, and means whereby the point of contact between said lever and said sear is, during the pull of the trigger, shifted in such manner as to decrease the leverage exerted by said lever and thereby necessitate an increased pull on the trigger as the moment of uncocking the firing member is approached.

40. In an automatic firearm, the combination of a trigger, a firing member, a sear, means for engaging said sear with said firing member to cock the same, a connecting lever positioned to transmit motion of the trigger to said sear to uncock said firing member and engaging surfaces on said lever and said sear, one of said surfaces being substantially convex whereby the point of contact between said surfaces is, during the pull on the trigger, shifted to decrease the leverage exerted by said lever on said sear to thereby necessitate an increased pull on the trigger as the moment of uncocking the firing mechanism is approached.

41. In an automatic firearm, the combination of a breech bolt, a firing pin, a sear, a sear connecting lever removably and pivotally mounted on said bolt, an extractor removably mounted on said bolt, and means for securing such extractor against movement relative to said bolt, said extractor overlying a portion of said lever and thereby holding the same in operative position on said bolt.

42. In an automatic firearm, the combination of a breech bolt, a sear, a sear connector pivotally mounted on said bolt, said connector having a projecting lip portion, and means on said bolt to overlie said lip portion and hold said connector in operative position on said bolt.

43. In an automatic firearm, the combination of a breech bolt, a sear connector pivotally mounted on said bolt and having a projecting lip portion, and an extractor mounted on said bolt, said extractor having a rearwardly extending portion overlying said lip and thereby holding said connector in operative position on said bolt.

44. In an automatic firearm, the combination of a frame, a trigger mounted in said frame, a breech closure mounted for longitudinal reciprocatory movement on said frame, a spring actuated firing pin and a sear for holding said firing pin in cocked condition both carried by said breech closure, a sear connecting lever, and means operatively connecting said trigger and said lever only when the breech closure is in its forward position.

45. In a firearm, a combination of a firing pin having a cocking shoulder, a sear having a horizontal arm provided with a shoulder to co-operate with the shoulder on the firing pin and a vertical arm, and a spring bearing at one end against the firing pin and at its other end against said vertical sear arm, whereby, when said shoulders are in engagement, said spring will be compressed and yieldingly keep said firing pin and sear together to permit assembling or disassembling these parts as a unit.

This specification signed and witnessed this 26th day of June, A. D. 1923.

JOHN M. BROWNING.