Apr. 10, 1923. 1,451,443

E. FOWLER

MACHINE GUN

Original Filed Dec. 4, 1918 5 sheets-sheet 1

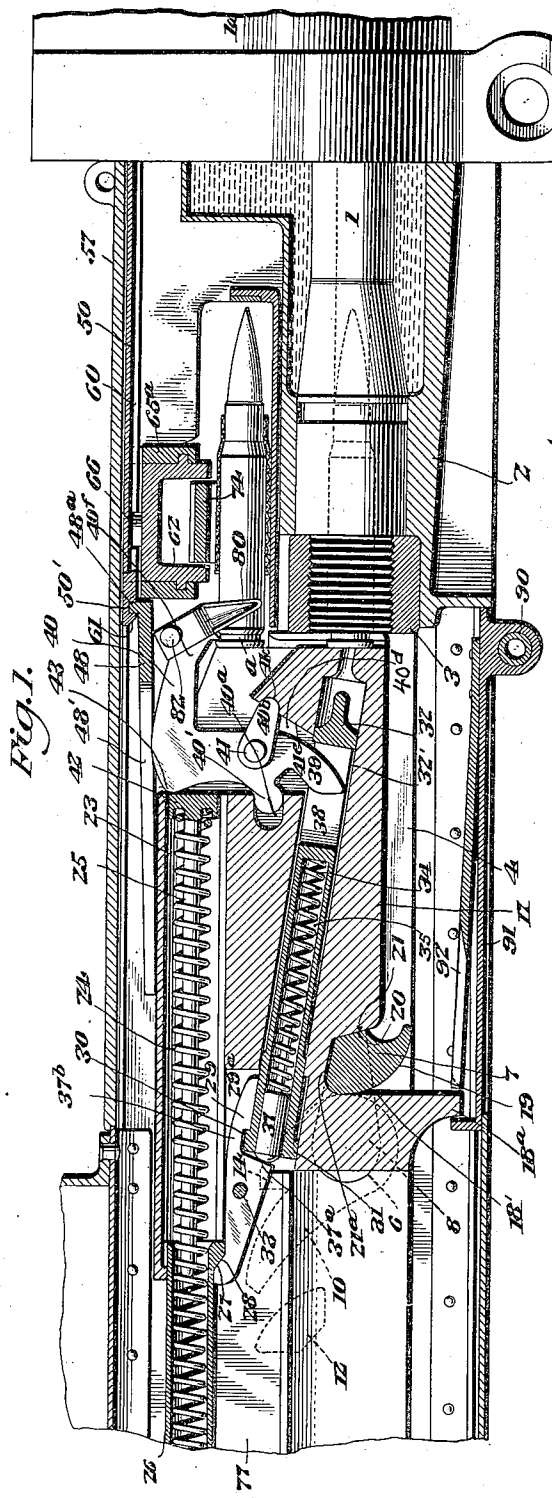


Fig. 1.

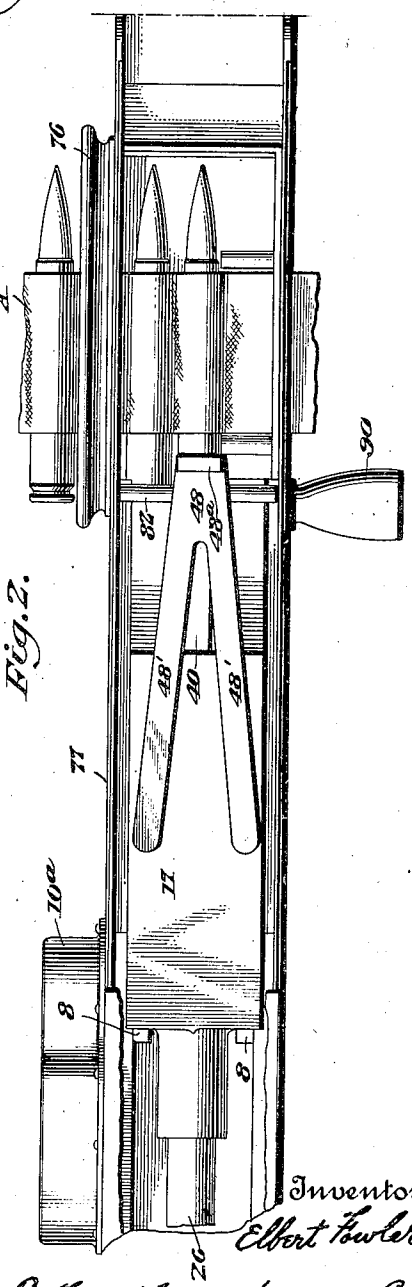


Fig. 2.

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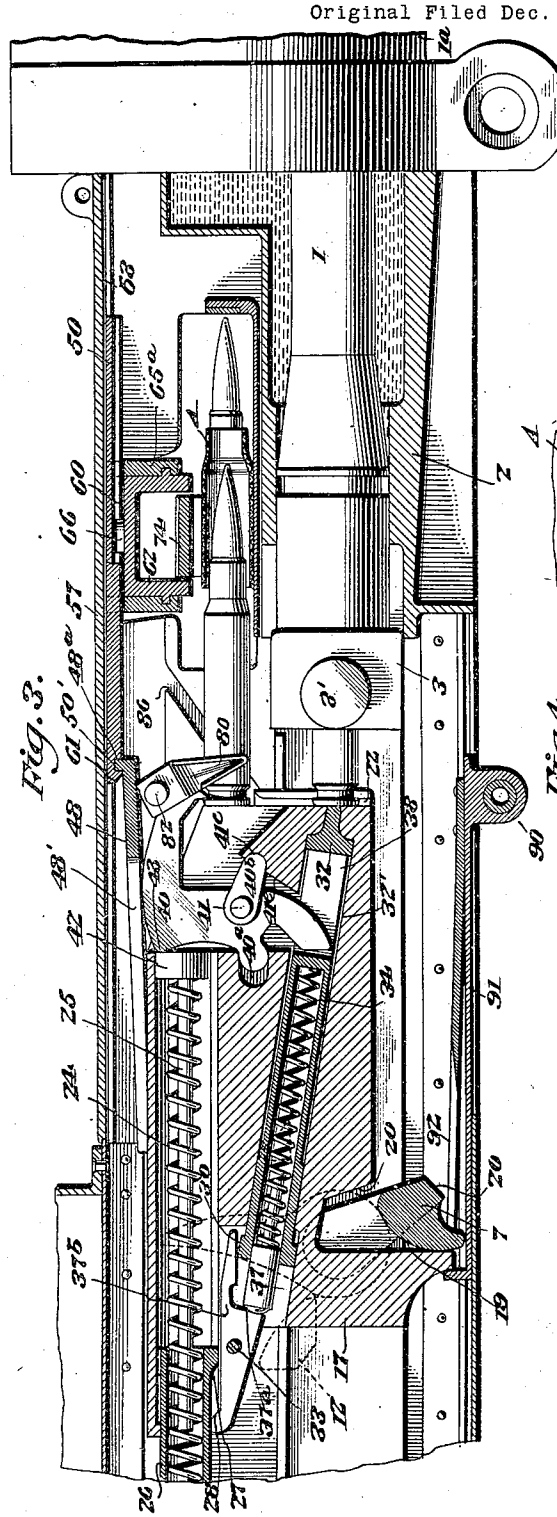


Fig. 3.

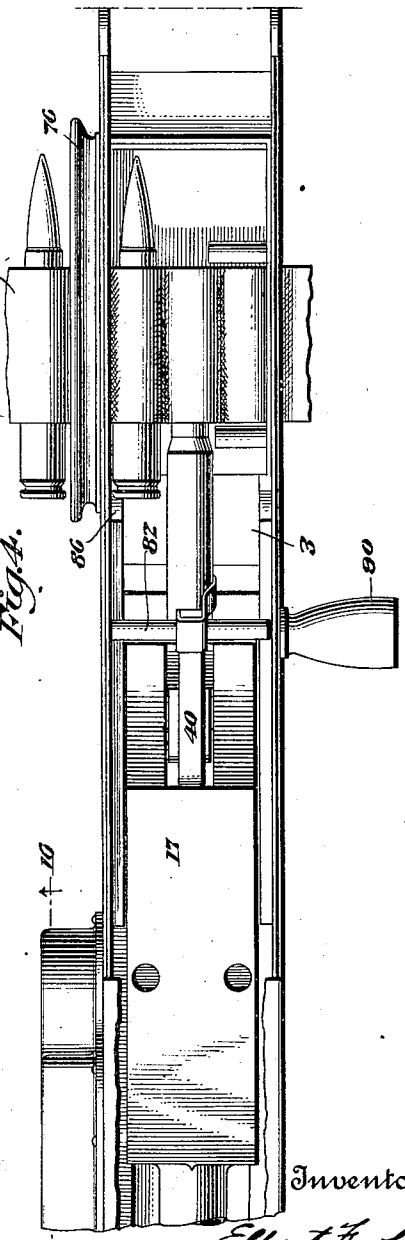


Fig. 4.

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Fig. 5.

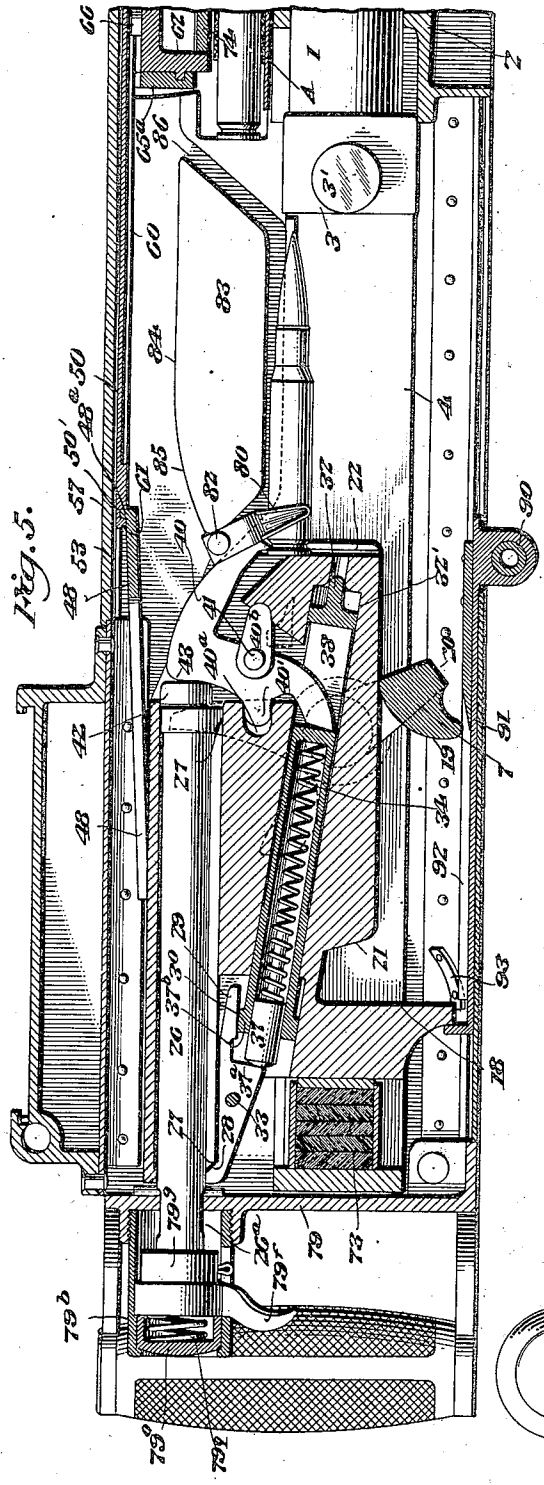
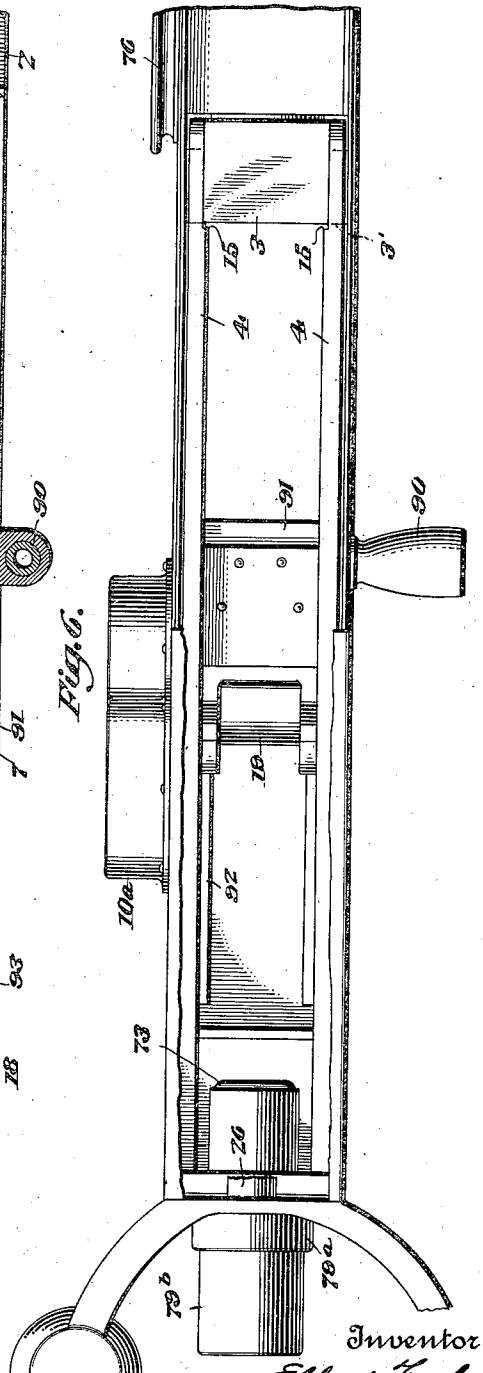


Fig. 6.



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Fig. 9.

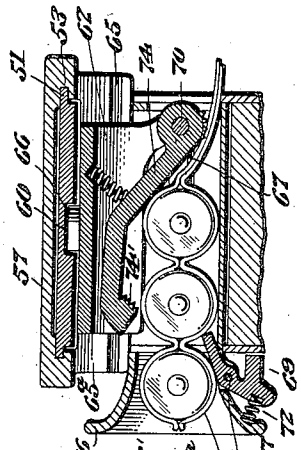


Fig. 8.

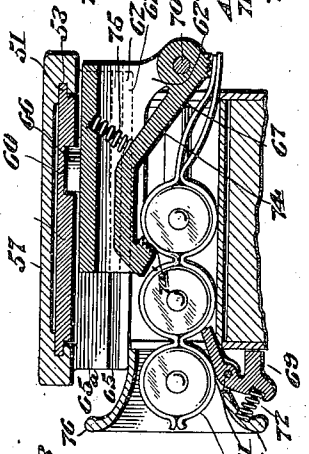


Fig. 7.

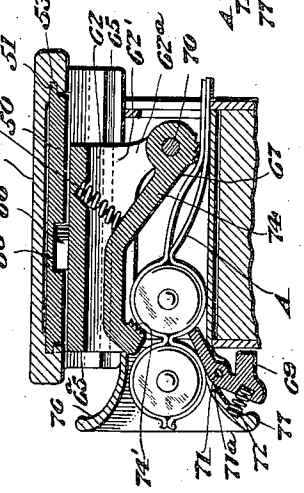
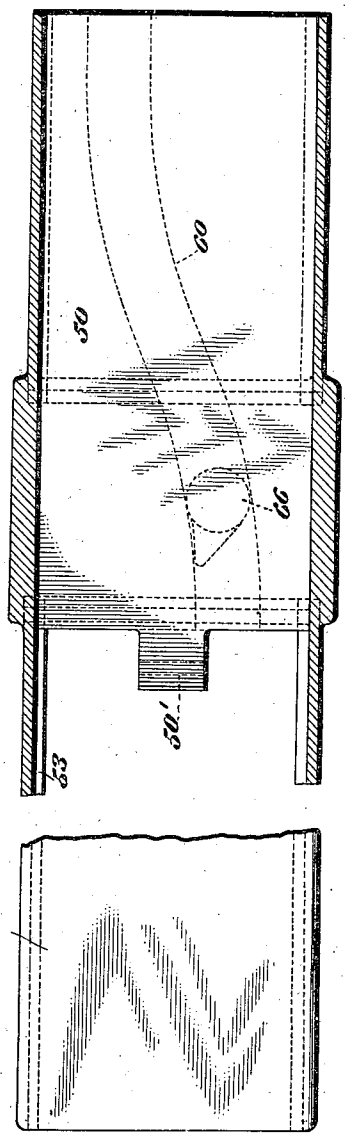


Fig. 10.



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Fig. 11.

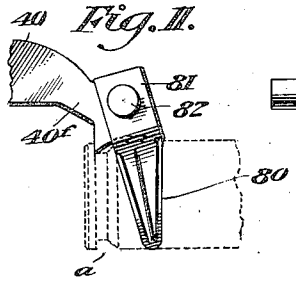


Fig. 12.

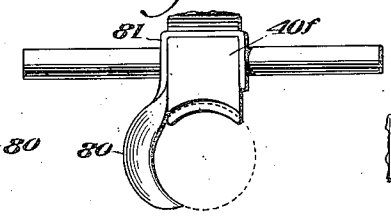


Fig. 13.

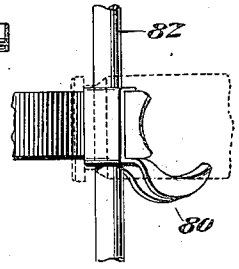


Fig. 14.

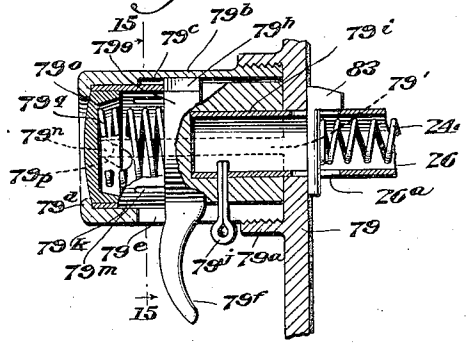


Fig. 15.

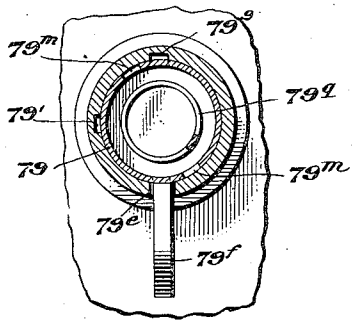
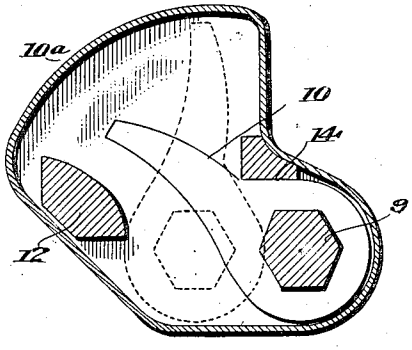


Fig. 16



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Patented Apr. 10, 1923. 1,451,443

UNITED STATES PATENT OFFICE.

ELBERT FOWLER, OF BALTIMORE, MARYLAND.

MACHINE GUN.

Application filed December 4, 1918, Serial No. 265,239. Renewed December 21, 1922.

To all whom it may concern:

Be it known that I, ELBERT FOWLER, captain, Ordnance Department, U. S. A., a citizen of the United States, residing at Baltimore, Maryland, have invented an Improvement in Machine Guns, of which the following is a specification.

This invention relates, generally, to automatic machine guns of that description in which all operations of the mechanism are automatically effected by the energy of the recoil of the movable parts, and is of the same general class as the Vickers machine gun, model of 1915, and the Browning machine gun, model of 1917.

The invention relates, particularly, to novel improvements in recoil-operated machine guns in which the barrel and breech parts recoil together, while interlocked, a limited distance and are then unlocked, the movement of the barrel being thereupon arrested, and the breech bolt continuing its recoil, during which energy is stored in a reaction spring, by which all parts are returned to the forward firing position.

One object of the invention is to produce an improved firearm of this class which is especially adapted for military service by reason of its reliability, accuracy, strength, absolute safety under all conditions, light weight, and extreme simplicity of construction, and because the parts are not likely to get out of order.

Another object is to provide a novel improved construction of machine gun in which certain parts of the mechanism perform several distinct functions, thereby reducing the number of the component parts and reducing the time and labor of assembling the parts and the cost of the gun as an entirety. For instance, in my construction, I have devised a single instrumentality of peculiar form, which serves the dual function of extracting the cartridge from the feed-belt and of cocking the firing-pin, this single member thus performing functions which are usually performed by two parts in machine guns as heretofore constructed.

Another object relates to the provision of a cartridge-extractor movable on an instant pivot, whereby the front end of said extractor moves downward in substantially a straight line, which construction is an improvement over other well known constructions, in which the front end of the extractor describes an arc in its movement, necessitating a special contour of the front end of the breech-bolt.

Another object relates to the manner of mounting the cartridge-extractor on the breech-bolt, whereby it may be removed from said bolt without withdrawing the latter from the gun, which construction is an improvement over other constructions, in which it is necessary to withdraw the breech-bolt from the gun before the cartridge-extractor can be removed.

Another object relates to the novel construction of the ejector which obviates the use of springs and whereby the cam-pin carried by the extractor constitutes, also, the support for the ejector.

Another object relates to the provision of novel and improved mechanism for locking the breech-bolt against the breech through the recoil plates of the barrel trunnion piece, whereby the barrel and breech-bolt recoil together, while interlocked, a limited distance, and are then automatically unlocked. And a complemental object is the peculiar construction of the breech-bolt locking member whereby it serves the additional function of a breech-bolt accelerator, thus combining in a single instrumentality functions which are usually performed by two parts, in machine guns as heretofore constructed.

Another object relates to the provision of novel and improved trigger-sear mechanism.

Another object relates to the provision of a buffer carried by the recoil-plates, against which the breech-bolt recoils during the latter portion of its rearward movement so that no strain is imposed in the rear end plate, as in other constructions.

Another object relates to the provision of novel and improved cartridge-belt feeding mechanism.

Another object relates to the provision of novel and improved mechanism for extracting the cartridges from the belt.

Another object relates to the provision of novel and improved safety locking means for the trigger.

The accompanying drawings disclose an exemplary embodiment of the underlying principles of my invention. Like reference characters denote corresponding parts throughout the several views. The different figures of the drawings may be briefly described as follows:

Fig. 1 is a central, vertical, longitudinal, sectional view through the gun, showing the

breech mechanism in its forward firing position;

Fig. 2 is a top plan view of the gun, showing the position of the parts corresponding to the position thereof shown in Fig. 1, the cover being removed to display the interior parts;

Fig. 3 is a view similar to Fig. 1, but showing the position immediately after firing the gun and the breech-bolt moved rearward by recoil a short distance;

Fig. 4 is a view similar to Fig. 2, but showing the position of the parts corresponding to the position thereof shown in Fig. 3;

Fig. 5 is a view similar to Fig. 1, but showing the position of the parts when the breech-bolt has reached the point of maximum recoil;

Fig. 6 is a top plan view of the gun, the bolt being removed to show the underlying parts;

Figs. 7, 8, and 9 are sectional views through the feed-slide and its operating mechanism, showing the relative positions of the feed-slide and feed pawl at different stages in the operation of the gun;

Fig. 10 is a horizontal sectional view through the cover;

Figs. 11, 12, 13 are detail views of the extractor and ejector;

Fig. 14 is a sectional detail view of the safety locking mechanism for the trigger;

Fig. 15 is a transverse section on the line 15—15, Fig. 14; and

Fig. 16 is a sectional view on the line 16—16, Fig. 4.

Referring now in detail to the drawings:

The barrel I passes lengthwise through the cooling-jacket I^a, from the front of which its muzzle projects some distance; while the rear portion of the barrel is supported in a seat provided for it in the trunnion block 2. The breech end of the barrel is screwed into the transverse barrel trunnion piece 3, on the trunnions 3′, 3′ of which are journaled the forward ends of right and left hand recoil plates 4, 4. Suitable means are provided for locking the breech-bolt 17 against the breech during the combined rearward movement of the barrel, the barrel trunnion piece, the breech-bolt and the recoil plates, and, in this instance, the following described means are used:

The rear ends of the recoil plates 4, 4 are provided with bearings 6, 6, in which cranks 8, 8 are free to swing through an angle of approximately 60%. The cranks 8, 8 are connected by a member 7, operable to lock the breech-bolt 17 against the breech through the recoil plates 4, 4, as shown in Fig. 1.

The breech-bolt locking-member 7 is provided with an arcuate cam surface or face 19, which, in the movement of said member to releasing position, bears upon the vertical face 18′ of a depending projection 18 carried at the rear of the breech-bolt 17, and acts as an accelerator for the breech bolt 17.

As the breech bolt 17 moves from the position thereof shown in Fig. 1, to its rearmost position, as shown in Fig. 5, mechanism about to be described is operative to swing the cranks 8, 8 on the arc of a circle, so that the cam surface 19 of the locking member 7 rolls and slides in contact with the vertical face 18′, of the depending projection 18 of the breech-bolt, to throw the breech bolt rearward. The locking member 7 is provided, opposite the inclined cam face 19, with a beveled locking face 20, which, in the raised or locking position of the member 7, bears against the corresponding wall 21 of a recess in the under surface of the breech-bolt 17.

It will thus be seen that the member 7 is a combined breech-bolt locking member and accelerator.

The locking member 7 is positively forced into its upper locking position by suitable means. In this instance, the means shown in the drawing is given as an example, and will now be described. Projecting through a longitudinally-extending slot in the side plate 77, is a boss 9 (Fig. 16), which engages a correspondingly-shaped socket in the adjacent crank 8. Fast on this boss 9, is an arm 10 for actuating the cranks 8, 8 and, consequently, the locking member 7. The arm or lever 10 is disposed in a casing 10^a secured to one of the side plates 77 (see Figs. 2, 4, 6 and 16). The inner surface of the wall of said casing carries a locking cam 14 and an unlocking cam 12. In the forward and rearward movements of the recoil plates, the lever 10 strikes against said cams, thus swinging the cranks 8, 8 on their pivots 6, 6, and throwing the locking member 7 into and out of locking position with respect to the breech bolt 17. The lever 10 with the cam 12 serves to limit the rearward movement of the barrel and the plates 4 due to recoil and the force required to operate the lever serves to absorb the shock of recoil of these parts.

Carried by the recoil plates 4, 4 are ribs 15, 15, which fit in corresponding grooves in the sides of the breech-bolt 17, these ribs thus forming tracks on which the breech-bolt reciprocates.

On the front face of the bolt 17 is a flangeway 22 for receiving and guiding the heads of cartridges, as usual, and for extracting the cartridge shell after the cartridge has been fired. (See more particularly Fig. 5.)

Extending longitudinally through said breech-bolt 17, near the top thereof, is an opening 23. In said opening is a coiled reaction spring 24, for returning the breech-bolt 17 to forward firing position, after re-

coil thereof and restoring the barrel and plates 4 to normal position. The reaction spring is, in this instance, shown as encircling a rod 25 having at its forward end, a head 42, against the rear face of which one end of said spring is seated.

Projecting into the rear end of said opening 23, is a trigger-tube 26, into which the rod 25 projects. Said trigger-tube is provided, on its bottom, with a depending lug 27, having an inclined rear face, as shown, constituting a sear releasing member (as presently appearing).

The trigger-tube 26 extends rearward and projects (see more particularly Fig. 14), at its rear end, through an aperture provided therefor in the handle block or plate 79, and into a trigger-casing 79^b. The trigger-tube is provided, at the point where it projects through the plate 79, with two longitudinally extending, diametrically opposed longitudinal slots 26^a, 26^a, through which projects a pin 83, against which the rear end of the spring 24 bears. The rear face of said handle block 79 carries an annular, internally-threaded nipple 79^a, in which is threaded a tubular open-ended trigger-casing 79^b, having a longitudinally extending groove 79^c in its inner face, a longitudinally extending slot 79^e diametrically opposite the groove 79^c, and an inturned annular flange 79^d at its rear end.

The trigger 79^f is provided with a head 79^g annular in cross section and having a rib 79^h diametrically opposite the trigger finger piece 79^f, for a purpose presently appearing. The head 79^g is elongated so as to project forwardly of the trigger piece 79^f and normally rests, at its forward end, against the outer face of the plate 79, as shown in Fig. 14. The head 79^g is provided with an axial recess 79^i extending from the end thereof farthest from the finger trigger piece 79^f and terminating short of the other end thereof, in which recess is seated the rear end of the trigger tube 26. Suitable means are provided for securing the trigger-head 79^g to the trigger-tube 26 and, in this instance, a cotter pin 79^j is shown as projecting transversely through the slot 79^e and through said head and trigger-tube. Any other securing means may, however, be used, as this is an unimportant detail, in the nature of a mere mechanical expedient.

Suitable mechanism may be provided for normally maintaining the trigger in safe position against unpremeditated release of the sear by the trigger-tube controlled by the trigger. The exemplary means shown in the drawing will now be described:

A rotatable locking annulus 79^k is disposed between the rear face of the head 79^g of the trigger and the flange 79^d of the trigger-casing 79^b. The annulus is provided with diametrically-opposite, longitudinally-extending slots 79^m, 79^m extending from the front end thereof, which, in the rotation of the ring, are adapted to be brought into registry with the projection 79^h, and with the upper end of the trigger finger-piece 79^f. Means are provided for normally holding the ring in such position that said slots are out of registry with the projection 79^h and with the upper end of the trigger finger-piece 79^f, and for returning said ring, after rotation thereof, to normal position. The trigger-casing 79^b is provided with a longitudinally-extending slot 79′ in which slides a pin 79^n carried by a button 79^o slidably disposed within said annulus 79^k, the latter having a cam slot 79^p, into which said pin projects. It will thus be seen that the button moves along a rectilinear path and has no rotatable movement, and that the annulus 79^k rotates and has no rectilinear movement. Consequently, in view of the construction described, it will be apparent that, by pressing upon the button 79^o, so as to move the same toward the head 79^b of the trigger, the slots 79^m, 79^m will be brought into registry with the projection 79^h, and with the upper end of the trigger finger-piece 79^f, so that said trigger may be moved rearward, said projection 79^h and the upper end of the trigger finger-piece moving in said slots. The means for automatically returning the button 79^o and the annulus 79^k to normal position, after actuation thereof, comprises a coiled spring 79^q, one end thereof being secured to the button 79^o and the other end thereof to the head 79^g.

By virtue of the relative arrangement of the trigger and its safety locking means, the operator may press with the thumb of one hand upon the button 79^o, and with a finger of the same hand against the trigger 79^f. The sear 29, carried by the breech-bolt 17, is movable to swing through a slight angle in a recess 29^a communicating with the channel 23, and is pivoted on a pin 33. The inclined face 28 of the sear, in the cocked position of the gun, is in engagement with the inclined face of the lug 27 at the forward end of the trigger tube 26.

Forwardly of the pivotal point of said sear, the latter is provided with a bearing face 37^a, at the top of which is a forwardly-extending arm 37^b. At the bottom of said arm is a recess 30, forming the locking recess for the head 31 of the firing pin 32.

The firing pin 32 is seated in a longitudinally extending recess 32′ in the breech-bolt, and is provided, toward its forward end, with a longitudinally-extending slot 38 and with a longitudinally-extending recess 35 extending from the rear end of the firing-pin and terminating short of the slot 38. In said recess 35 is disposed a coiled spring 34, constituting a driving spring for the firing pin. The rear end of the spring bears upon

a plunger 37 projecting through the rear end of said firing pin and contacting with the bearing face 37^a of the sear 29, thereby constantly tending to force the rear end of the sear upward.

The combined cocking lever and extractor 40 is disposed in a vertical recess 40^d, in the breech-bolt 17, and is provided with a rearward-projecting tail 39 depending into the slot 38 of the firing-pin 32; at the upper end, with a forwardly extending arm 40^f, terminating in an arcuate edge engageable with the groove *a* in a cartridge; on its rear face, with a shoulder 43, against which the head 42 of the driving spring rod 25 constantly engages; also on its rear face, with a knuckle $40'$ projecting into a socket 40^a in the breech-bolt 17; and with a forwardly-extending link 40^b pivotally supported at one end thereof, on the pivoted pin 41 disposed intermediate the ends of the extractor, the other end of the link having a bearing in a socket 41^c in the wall 41^e of the recess 40^d in the breech-bolt.

It will be noted by the construction described that the extractor may be removed from the breech-bolt without removal of the latter from the gun, which is a distinct and material advantage over well-known constructions, in which it is necessary to remove the breech-bolt from the gun in order to remove the extractor. It will be also noted, by the construction described, that the extractor swings on an instant center.

The cartridge extractor 40 carries the depending shell-ejector 80. The ejector comprises a curved beak, as shown, and the strap 81, which embraces the forward end of the arm 40^f of the extractor 40, and is secured thereto by a cam pin 82 which extends through the strap and through said forward end of the arm 40^f and projects beyond the same on each side thereof, to form as it were, horns. The ejector 80 is constructed of spring material and may be stamped up from sheet metal. It will be noted that the pin 82 is a combined cam-pin and supporting pin for the ejector. The cam-pin, while having a tight fit in the transverse hole in the arm 40^f, is removable therefrom; so that, should the ejector break it may be easily removed and a perfect ejector substituted therefor.

The cam pin 82 is adapted to guide the extractor 40 in extracting a cartridge, and in properly positioning the same, and for this purpose, the side plates 77, 77 are provided with cam plates 83, 83, each having an upper edge which is straight for the greater portion of its length and thence gradually downwardly inclined toward its rear end, as shown at 85. The cams are also provided with a straight lower edge and oppositely inclined sides as shown. At the bottom and inclined sides of the cam-plates is a groove 86.

On top of the breech-bolt 17 is secured a feed-cam connector 48, comprising, in this instance, two converging arms $48'$, $48'$, as shown in Fig. 2, and a lateral, upstanding lug 48^a which engages a corresponding groove $50'$ in the rear end of the feed cam 50. Said rear end of the cam is provided with a beveled face 61. The feed cam 50 is provided with longitudinal side tongues 51, 51, which engage and slide in corresponding grooves 53, 53 in the cover 57. Thus, the feed cam 50, under the compulsion of the connector 48, which is secured to the breech bolt 17, slides front and rear, as the breech bolt reciprocates.

The feed cam is provided, on its under face, with a cam-groove 60, in which is seated a lug 66 carried on the upper surface of the feed slide 62.

The feed-slide 62 comprises a top plate which carries the lug 66, and sides $62'$, $62'$, carrying transverse tongues or ribs, which engage and slide in corresponding transversely extending grooves 65. 65 in the transversely-disposed, dependent brackets 65^a, 65^a carried by the cover 57, whereby the feed-slide moves transversely with respect to said cover and to the feed cam 50, and whereby a backward and forward movement of the latter causes a movement of the feed slide transversely thereof.

The sides $62'$, $62'$, of the feed-slide 62 carry lateral, depending arms 62^a, 62^a, connected, at their lower ends, by a pin 70, constituting a pivot for a cartridge feed pawl, 74 provided with a ramp 67, which causes the feed pawl to rise up over a cartridge which may not have been extracted on the previous rearward movement of the pawl due to mal-function. This prevents the feed pawl from engaging the succeeding cartridge, thus automatically preventing the succeeding cartridge from being moved over into interference with the preceding cartridge which the extractor failed to withdraw from the cartridge belt A, and eliminating the possibility of the occurrence of one of the worse types of jams known in machine gun work. In this connection, attention is directed to the fact that this result is accomplished without the use of an extension finger, as in other machine guns.

A coiled spring 75, one end thereof bearing against the end face of the top of the feed slide 62 and the other end against the feed pawl 74, serves to normally actuate the latter downward toward the cartridges in the cartridge belt A.

The feed pawl 74 is provided, at the end thereof opposite the pivotal end, with a serrated, cartridge-engaging face $74'$.

At the inlet end of the cartridge feed channel is a cartridge feed-box, which, in

this instance, comprises the flaring upper and lower portions 76 and 77, respectively. Pivoted in the lower portion 77 at 71, and projecting through an aperture 71ª in said portion, is a dog 69, with its upper end yieldingly held, by a spring 72, in the path of the cartridge belt A in the feed channel. This dog prevents, in the usual manner, the cartridge belt moving in the wrong direction. This dog does not require the usual finger piece for moving it at will out of the path of the feed-belt, in case of a stoppage of the same; since the belt may, if necessary, be instantly and readily moved, raised, or adjusted in the feed-channel by simply opening the cover 57, which gives free access to the feed belt.

At their rear, the recoil plates 4, 4 are bent toward each other, forming a carrier for the buffer 73. It will be noted by this construction that the rear end plate of the gun is relieved of all strain, as the buffer is not seated thereagainst, as in other constructions.

The operation of the belt-feeding mechanism is as follows:

As the breech-bolt 17 moves to the rear under recoil, the feed cam 50, which is connected to the bolt through the connector 48, moves with it. Since the stud 66 on the feed-slide 62 operates in the cam groove 60 of the feed cam 50, this rearward movement of the bolt causes a movement from right to left of the feed slide, during which movement the feed-pawl 74 rises over a cartridge in the belt A, against the resistance of the feed-pawl spring 75, and hence is in a position to engage this cartridge and move it from left to right when the bolt 17 again moves forward.

After having reached its limit of rearward travel, the bolt 17 moves forward, under impetus of the reaction spring 24, and forces the feed-cam 50 forward, which, since the stud 66 of the feed cam 50 works in the cam-groove 60 of the cam 50, causes the feed-slide to move from left to right, thus bringing the next cartridge into the ready-to-feed position.

Attention is called to the fact that the movement of the belt feeding mechanism is not derived from the sudden and short movement of the barrel-recoil, as in one well known type of gun; nor is it transmitted through the belt feed lever (which is easily bent) operating on a belt-feed lever pivot (which easily works loose). In my construction, the force necessary to feed the belt is applied directly at the point at which the energy is required.

As the breech-bolt 17 moves to the rear, the extractor 40, which is in engagement with a cartridge, drags the same from the belt A and moves it to the rear, without any downward movement, until the horns 82, 82 of the extractor strike the downward curved surfaces 85 of the cams 83, which causes a downward swing of the extractor, since the reaction spring 24 exerts a constant pressure, through the head 42, on the upper shoulder 43 of the extractor. When the horns 82, 82 reach the switch point of the cams 83, that is, when they reach the lower end of the downward curved portion 85 (as shown in Fig. 5), the extractor is being acted upon by the breech-bolt spring 24 and by the firing-pin spring 34. At this instant, the bolt-spring 24 is fully compressed and lies entirely within the trigger-tube 26, while the firing-pin spring 34 is partially compressed. Since the breech-bolt spring 24 is working through a longer lever arm than the firing pin spring 34, said spring 24 exerts the greater pressure and, consequently, causes the extractor to swing downward, which does away with the use of any kind of switch.

As the bolt 17 moves forward, the downwardly and forwardly sloping rear end surface of the cams 83 permit the extractor to move farther downward, thus increasing the pressure against the rear wall of the slot 38 of the firing pin and moving the firing pin 32 farther rearward, so that the head 31 of the firing-pin is brought into registry with the locking recess 30 of the sear, whereupon the sear rocks slightly, so that the head locks in said recess. This same downward movement of the extractor causes the ejector 80 to kick the empty shell, which has been extracted upon rearward movement of the bolt by reason of its head being engaged in the flange way 22, out of place. Simultaneously the cartridge which is engaged by the extractor 40 is lowered into line with the barrel. Upon the breech bolt moving forward, said cartridge is inserted in the barrel.

For the purpose of manually moving the breech bolt rearward and forward, a handle 90, as shown in Figs. 2, 4, 6, is inserted into the bottom slide plate 91 near its front end, the rear end of the slide being provided with an upturned flange in position to be engaged by lug 18 of the bolt 17 upon rearward movement thereof. A spring catch 92 on the upper face of the bottom slide plate 91 is in the path of lug 18, so that, when the slide is manually moved rearwardly said catch will engage the lug 18 to move the bolt also rearwardly. An unlocking cam, such as 93, is positioned adjacent the rear limit of travel of catch 92, in position to force catch 92 downward when the slide has reached the extreme rearward position.

With the foregoing description of its construction the operation of the breech mechanism will be readily understood. After a feed-belt, with cartridges in the pockets thereof, has been inserted into the feed-channel from the left side to the right, the

breech bolt is moved twice by hand to the rear. By the second motion a cartridge is withdrawn from the feed belt, and, when the handle is released, the breech-bolt is returned forward by the reaction spring 24 and the cartridge, properly lowered by the feed-extractor, is inserted into the barrel, while the next step of the feed-belt brings another cartridge above the barrel within reach of the feed-extractor. On pulling the trigger and releasing the same, the first cartridge is fired and the operation of the breech bolt is automatically repeated, and the next cartridge is seated in the barrel ready for firing. In this manner, single shots may be fired at will, the pulling of the trigger rocking the sear each time to release the firing pin, the sear thereupon returning to locking position to hold the firing pin again in a cocked position.

If it is desired to fire a succession of shots, or a burst, the trigger is pulled and held by the finger of the operator, which tilts the sear, so that the upper end thereof bears against the lug 27 of the trigger-tube 26. Since the trigger is held in the rear position, the bevel on the sear comes into engagement with the bevel on the lug under the driving spring tube, thus automatically tripping the sear and releasing the firing pin each time the bolt approaches the extreme forward and locked position, thus constituting a safety provision which prevents any movement of the trigger tube from being communicated to the sear prematurely.

It is evident that various changes in the form and arrangement of the parts may be made without departing from the spirit of the invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine gun or the like, a combined firing-pin cocking-member, cartridge-extractor and shell ejector.

2. In a machine gun or the like, a combined firing-pin cocking member and cartridge extractor in one piece and a shell ejector carried thereby.

3. In a machine gun or the like, a combined tiltable firing pin cocking member, and cartridge extractor.

4. In a machine gun or the like, a combined tiltable firing pin cocking member and cartridge extractor, and spring means for tilting said combined firing pin cocking member and cartridge extractor.

5. In a machine gun or the like, a feeding mechanism for successively feeding cartridges in a cartridge belt to a position above and in line with the barrel, a firing pin, and a combined firing-pin cocking member and cartridge extractor engageable with said firing pin to cock the same, and with the cartridges in the cartridge belt to extract the same successively therefrom.

6. In a machine gun or the like, feeding mechanism for successively feeding cartridges in a cartridge belt to a position above and in line with the barrel, a firing pin, and a combined firing-pin cocking member and cartridge extractor engageable with said firing pin to cock the same and with the cartridges in the cartridge belt to extract the same successively therefrom, and means yieldingly bearing against said combined firing pin cocking member and cartridge extractor for tilting the same.

7. In a machine gun or the like, feeding mechanism for successively feeding cartridges in a cartridge belt to a position above and in line with the barrel, a cartridge extractor engageable with the cartridges in the cartridge belt to extract the same successively therefrom, and trigger mechanism comprising a trigger, a tube movable with said trigger, and a spring projecting into said tube and bearing against said cartridge extractor for tilting the same.

8. In a machine gun or the like, feeding mechanism for successively feeding cartridges in a cartridge belt to a position above and in line with the barrel, a cartridge-extractor engageable with the cartridges in the cartridge belt to extract the same successively therefrom, a breech bolt carrying said cartridge extractor, and a reaction spring for returning said breech bolt to firing position after the recoil thereof, said spring constantly bearing against said extractor to tilt the same.

9. In a machine gun or the like, feeding mechanism for successively feeding cartridges in a cartridge belt to a position above and in line with the barrel, a firing pin provided with a recess, a cartridge extractor engageable with the cartridges in the cartridge belt to extract the same successively, and projecting into said recess of the firing pin to cock the latter.

10. In a machine gun or the like, a breech bolt having a recess for the reception of a cartridge extractor, one wall of said recess being cut away to form a pocket, a cartridge extractor projecting into said recess and having a knuckle projecting into said pocket, and means yieldingly engaging said cartridge extractor to tilt the same.

11. In a machine gun or the like, a breech bolt having a recess for the reception of a cartridge extractor, one wall of said recess being cut away to form a pocket, a cartridge-extractor projecting into said recess and having a knuckle projecting into said pocket, and a link connecting said extractor with the front wall of said recess, and means for yieldingly engaging the said extractor to tilt the same.

12. In a machine gun or the like, trigger mechanism, a firing pin having a longitudinally extending recess, a sear for holding the firing pin in cocked position and a firing pin driving spring housed in said recess and maintaining said sear in constant contact with said trigger mechanism.

13. In a machine gun or the like, trigger mechanism, a firing pin, a sear for holding the firing pin in cocked position, said firing pin having a longitudinally extending recess, a plunger projecting into said recess at one end thereof and bearing against said sear, and a firing-pin driving-spring housed in said recess and bearing against the inner end of said plunger for constantly maintaining the same in forcible contact with said sear.

14. In a machine gun or the like, the combination, with the recoil plates of the barrel, of a breech bolt having a recess in its bottom surface, and a swinging locking member for locking said breech-bolt against the breech through said recoil plates, said locking member having a curved face bearing against the flat rear wall of said recess.

15. In a machine gun or the like, the combination with the recoil plates of the barrel, of a breech bolt having a recess in its bottom surface, and a swinging locking member for locking said breech bolt against the breech bolt through said recoil plates, said locking member having a curved face bearing against the rear wall of said recess, and a straight face bearing against the front wall of said recess.

16. In a machine gun or the like, the combination with the recoil plates of the barrel, of a breech bolt, swinging cranks carried by said recoil plates, and a locking member carried at the lower ends of said cranks and movable into and out of locking relation with said breech bolt.

17. In a machine gun or the like, the combination with the recoil plates of the barrel, of a breech bolt, swinging cranks carried by said recoil plates, a locking member carried at the lower ends of said cranks and movable into and out of locking relation with said breech bolt, and an operating arm connected with said cranks for moving the same.

18. In a machine gun or the like, the combination, with the recoil plates of the barrel, of a breech-bolt, swinging cranks carried by said recoil plates, a locking member carried at the lower ends of said cranks and movable into and out of locking relation with said breech bolt, an operating arm connected with said cranks for moving the same, and cams in the path of movement of said operating arm for moving the same to throw the locking member into and out of locking relation with respect to said breech bolt.

19. In a machine gun or the like, a breech bolt, a combined firing pin cocking member and cartridge extractor carried thereby and movable on an instant center and means for moving said combined cocking member and cartridge extractor whereby the front end of said member moves vertically in substantial parallelism with the front face of the breech bolt.

20. In a machine gun or the like, the combination, with a breech-bolt, of a combined spring-tilted firing-pin cocking-member and cartridge-extractor carried thereby and removable therefrom, without withdrawal of said bolt from the gun, by manual movement rearward of said member, against the tension of its spring.

21. In a machine gun, a cartridge-extractor carrying a removable cam-pin, and an ejector supported upon said pin and comprising a strap-portion bent over said extractor and through which said pin projects, and a longitudinally-curved, depending beak.

In testimony whereof I affix my signature.

ELBERT FOWLER.