

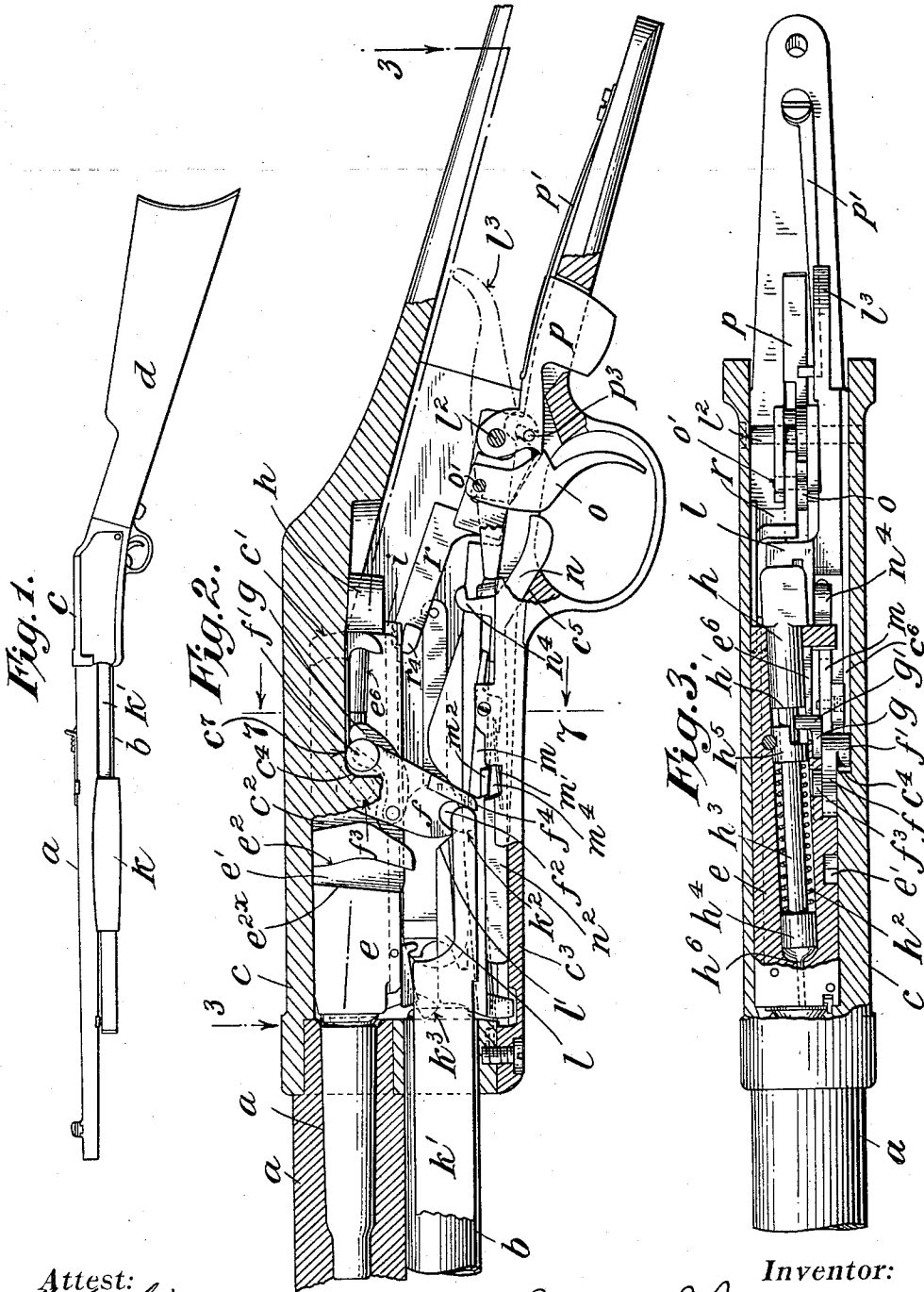
E. E. REDFIELD.
FIREARM.

APPLICATION FILED DEC. 22, 1910.

Patented July 2, 1912.

4 SHEETS-SHEET 1.

1,031,373.



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Inventor:
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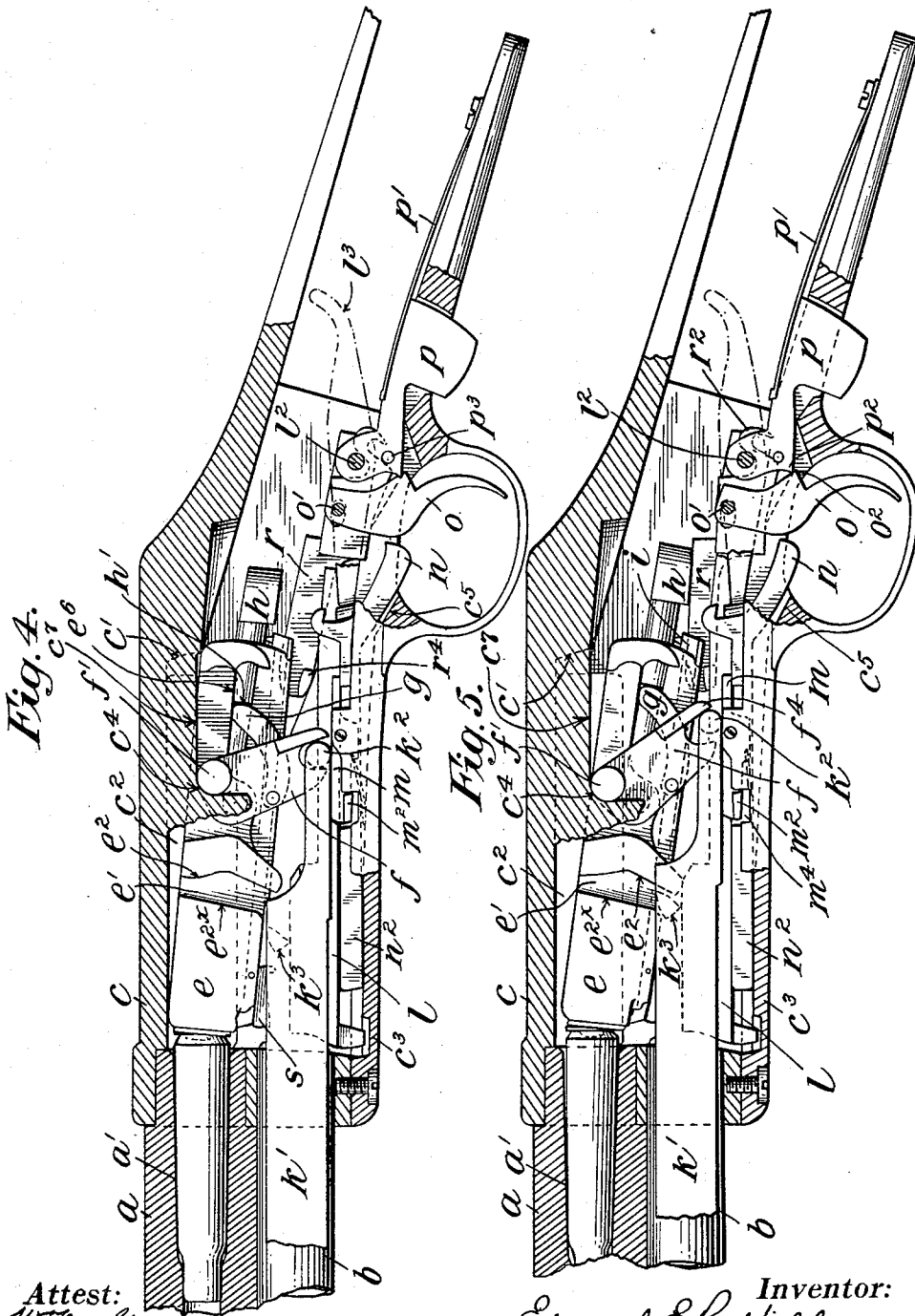
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4 SHEETS—SHEET 2.

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4 SHEETS—SHEET 3.

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Fig. 6.

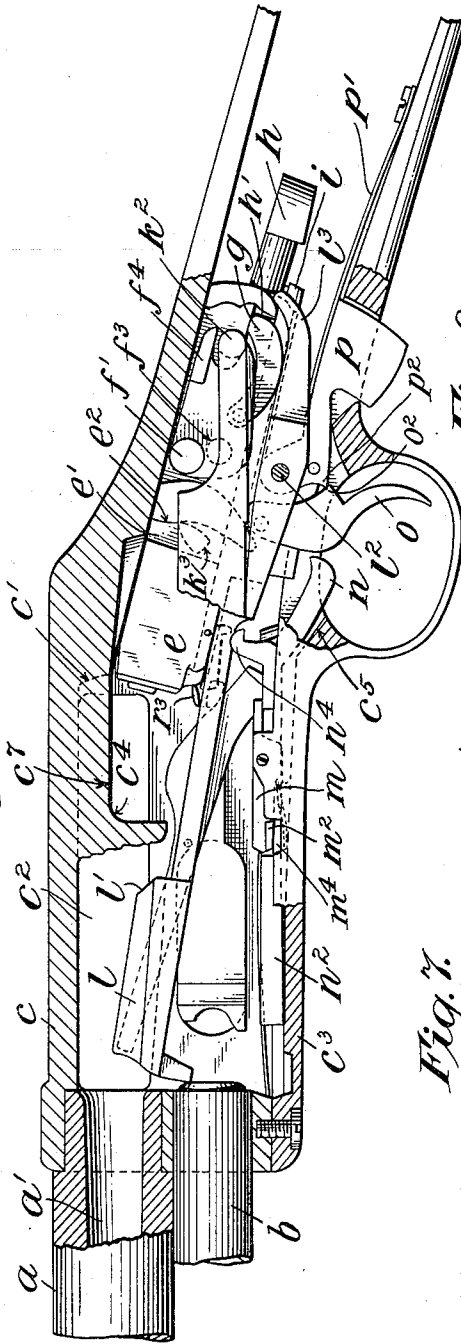


Fig. 8.

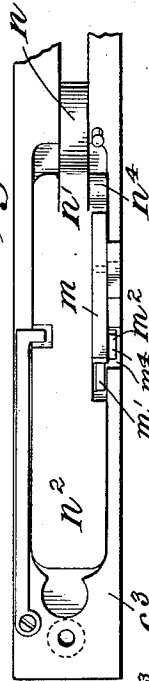


Fig. 9.

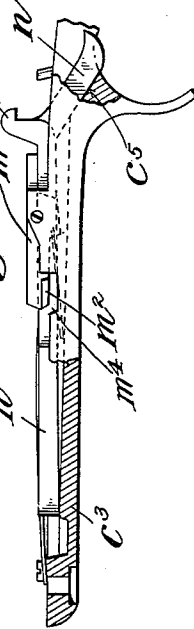
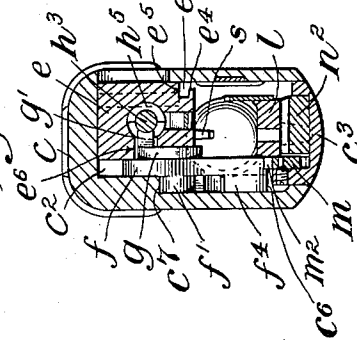


Fig. 7.



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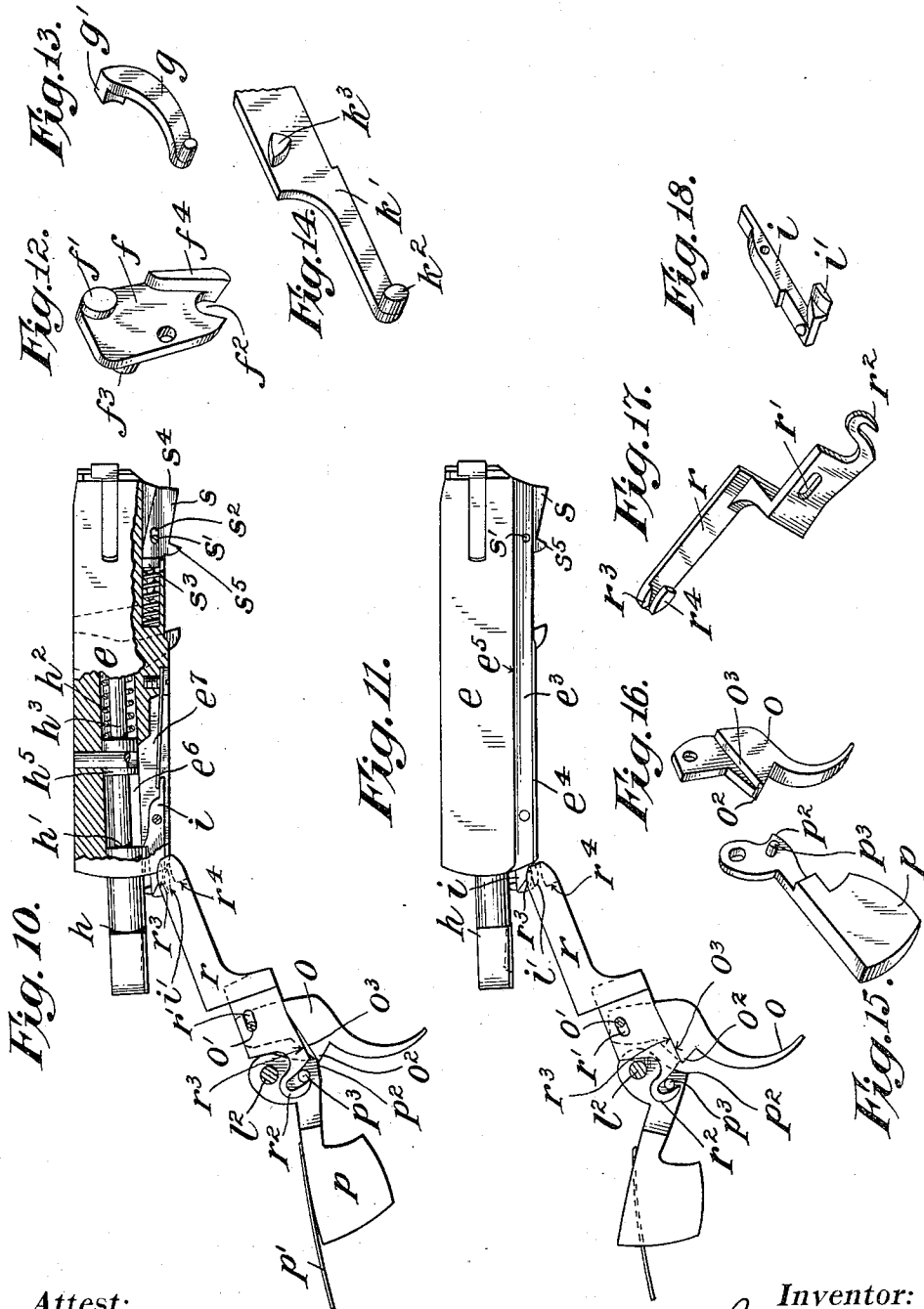
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4 SHEETS—SHEET 4.

1,031,373.



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UNITED STATES PATENT OFFICE.

EDWARD E. REDFIELD, OF GLENDALE, OREGON.

FIREARM.

1,031,373.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed December 22, 1910. Serial No. 598,781.

To all whom it may concern:

Be it known that I, EDWARD E. REDFIELD, a citizen of the United States, residing in Glendale, in the county of Douglas, in the State of Oregon, have invented certain new and useful Improvements in Firearms, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates mainly to magazine firearms of the "slide-action" type, in which the operations of extracting the empty shell, cocking the gun and placing a fresh cartridge in the chamber of the barrel are performed through the movement of a grip-piece which moves parallel with the axis of the barrel, and the several features of improvement have been designed with reference to their use together in a firearm of the character referred to, but some of the features of invention are capable of use independently of others and in firearms of different types.

One object of the invention, as applied to a slide-action firearm, has been to provide a lever connection between the slide bar and the breech-block so that the power exerted, especially during the first part of the opening movement of the firearm, shall be multiplied, not only for the purpose of enabling a tightly fitting cartridge shell to be started from the chamber of the barrel without difficulty, but also to permit the cocking operation to be effected more easily.

Another object of the invention has been to increase the reliability of the safety locking devices, provision being made whereby the sear as well as the trigger are locked against accidental movement, and whereby the possibility of release of the hammer until the parts are locked in firing position is wholly eliminated. The slide locking devices are also improved with a view to making them also absolutely reliable in operation and to preventing the possibility of the opening of the gun before the explosion of the cartridge in the case of a hang-fire, while at the same time provision is made for unlocking the slide automatically through the explosion of the cartridge so that rapid firing is facilitated. The dan-

ger of explosion of the cartridges within the receiver and of battering the noses of the bullets through the churning of the cartridges in the magazine and the receiver as the gun is fired is also eliminated, as well as the jamming of cartridges within the receiver through movement thereof too far to the rear.

The means whereby these objects of the invention are accomplished and other features of improvement will be more particularly pointed out hereinafter with reference to the accompanying drawings in which, for purposes of explanation of the nature of the invention, it is illustrated as embodied in a firearm of the type referred to and in which—

Figure 1 is a view in side elevation of a rifle which is constructed in accordance with the invention. Fig. 2 is a detail view, on a larger scale, partly in elevation and partly in section longitudinally through the frame, showing the parts in the position which they assume immediately after firing and before the gun is opened. Fig. 3 is a view in horizontal section on the plane indicated by the line 3—3 of Fig. 2. Figs. 4, 5 and 6 are views similar to Fig. 2 but showing the parts in successive positions which they occupy during the opening movement of the slide. Fig. 7 is a view in transverse section on the plane indicated by the line 7—7 of Fig. 2. Figs. 8 and 9 are detail views showing particularly the inertia block and the slide locking lever with a portion of the frame. Fig. 10 is a detail view showing the breech-block, partly in section, with its appurtenances and the trigger with its associated devices. Fig. 11 is a view similar to Fig. 10, but showing the breech-block in elevation and the trigger and its associated devices in different positions. Fig. 12 is a view in perspective of the starting lever. Fig. 13 is a view in perspective of the cocking lever. Fig. 14 is a view in perspective of the rear end of the slide bar. Fig. 15 is a view in perspective of the trigger safety lock. Fig. 16 is a view in perspective of the trigger. Fig. 17 is a view in perspective of the trigger lever. Fig. 18 is a view in perspective of the sear.

The barrel *a*, chambered, as at *a'*, to receive the cartridge, the magazine *b* in which the cartridges are placed and are pressed to the rear by a spring follower, not shown, the frame or receiver *c* (except as hereinafter indicated) and the stock *d* may all be constructed and arranged in any usual or suitable manner. The frame or receiver *c* is closed, that is, it has a solid abutment, as at *c'*, in line with the barrel and with the breech-block when the latter is in firing position, although, in the opening movement of the gun, the breech-block passes rearwardly below the abutment *c'*. The frame or receiver is suitably chambered, as at *c''*, to permit the proper movement of the breech-block and other parts, as hereinafter explained, and the trigger plate *c'''*, for convenience in manufacture, is formed separately from the receiver and fits in a slot in the underside thereof, being held in place by screws at the ends of the trigger plate. The breech-block *e*, provided at its forward end with an extractor and an ejector which may be of usual construction, is mounted movably within the frame. When the gun is closed its rear end abuts against the abutment *c'* of the frame, and during the opening movement of the gun the rear end of the breech-block first drops below the abutment *c'*, and then the breech block moves bodily to the rear, being supported and moved by means to be described. On its left hand side, near its forward end, the breech-block *e* is grooved or recessed transversely, as at *e'*, to form a shoulder *e''*, for coöperation with the slide, as hereinafter described, and on its right hand side, near its lower edge, it is grooved longitudinally, as at *e'''*, the lower lip *e''''* coöperating with the trigger lever, as hereinafter described, while the upper shoulder *e'''''* coöperates in the usual manner with a longitudinal rib, not clearly shown, on the inner right hand wall of the receiver, near its forward end, so that the forward end of the breech-block is properly guided and supported during its movement. On the left hand side of the breech-block, in rear of the shoulder *e''*, is pivoted the supporting and starting lever *f* which has a lug *f'* to coöperate with a shoulder *c''''* on the inner left hand side of the receiver and is slotted at its lower end, as at *f''*, to coöperate with the slide bar, as hereinafter described. The cocking lever *g* is pivoted upon the starting lever *f* and is provided with a lug *g'* to project through a slot *e''''''* in the left hand wall of the breech-block and to coöperate with a shoulder *h'* of the hammer *h* which is longitudinally movable in the breech-block *e*. An actuating hammer spring *h''* is mounted upon the stem *h'''* of the hammer and bears at one end against the head *h''''* of the hammer and at the other end against a sleeve *h''''''* which is fixed within the

breech-block. In a slot *e'''''''* in the underside of the breech-block is pivoted the spring-pressed sear *i* which is adapted to engage the shoulder *h'* and hold the hammer in cocked position. The firing pin *h''''* is formed on the forward end of the hammer as usual and projects through the forward end of the breech-block.

The grip-piece *k* may be mounted upon the magazine tube *b*, as usual, and has extended rearwardly therefrom a slide bar *k'* which has at its extremity a lug *k''* which coöperates with the slotted end *f''* of the supporting and starting lever *f*, and the slide bar is also provided with a lug *k'''* to coöperate with the shoulder *e''* of the breech-block, as hereinafter described.

In order that the relations of other parts to the breech-block may be more readily understood, the operation of the parts already described will now be explained.

It being assumed that the breech-block is in closed or firing position, as shown in Figs. 2 and 3, and that the gun has been fired, the grip-piece or fore-end *k* is drawn to the rear. The lug *k''* at the rear end of the slide bar *k'* engages the supporting and starting lever *f* and first causes its lug *f'* to bear against the shoulder *c''''*. The starting lever being pivoted at *f'''* on the breech-block, the continued rearward movement of the slide bar *k'* and the consequent movement of the lever *f* cause the rear end of the breech-block to be thrown down out of line with the abutment *c'* and then the breech-block to be moved rearwardly with a powerful leverage, all as clearly shown in Figs. 4 and 5, thus enabling the user of the gun, without great effort, to start the cartridge from the chamber of the barrel even if it should be quite tight therein. As the slide bar moves from the position shown in Fig. 4 to the position shown in Fig. 5 the lever *f* swings to a position in which it is about to release the lug *k''* of the slide bar, while the lug *k'''* of the slide bar is about to engage the shoulder *e''* of the breech-block, so that in the continued rearward movement of the slide bar, after the cartridge has been started from the chamber of the barrel, the breech-block is moved rearwardly to its full extent and the cartridge shell is withdrawn from the chamber of the barrel and ejected through the side opening of the frame in the usual manner. Eventually, the slide bar, starting lever and breech-block reach the positions represented in Fig. 6. In the forward movement of the slide bar, the lug *k'''* thereon engages the shoulder *e''''''* forward of the groove *e'* and draws the breech-block forward, while the lug *k''* engages the notch *f''* of the starting lever *f* and draws it back to its initial position. As the starting lever reaches its initial position, its lower end

bears against the ledge c^0 which forms the bottom of the lateral recess in which the slide bar travels and thereby crowds the breech-block upward against the top of the receiver and firmly supports the breech-block in firing position. As the starting lever is swung about its pivot the cocking lever g throws back the hammer h , compressing the spring h^2 , until the hammer is engaged by the sear i . It will be observed that the rearward movement of the hammer is quickest while the spring is compressed least and that as the compression of the spring increases the leverage of the cocking lever also increases, so that the cocking of the hammer is effected with a minimum of effort.

The slide is locked automatically in its forward position by a slide locking lever m which is pivoted on the trigger plate and is actuated by a spring m' so that its forward end rises behind the extremity of the slide, or rather behind a lug f^4 of the starting lever f which is interposed between the end of the slide bar and the locking lever, and thereby prevents the rearward movement of the slide until the locking lever is released. In order to relieve the pivot of the locking lever from strain the forward end of the locking lever is provided with a lug m^2 which stands in a corresponding notch m^4 formed in the side of the receiver. The locking lever is released by upward movement of the safety latch n , the rear end of which projects within the trigger guard, in front of the trigger, in convenient position to be operated by the trigger finger. This safety latch n is formed on the yielding rear end n' of an inertia block n^2 , the rear end of the inertia block underlying the rear end of the locking lever m , so that when the safety latch n is pressed upward by the finger the rear end of the locking lever m is also pressed upward and the forward end is moved downward to release the slide bar. When the gun is fired a relative forward movement of the inertia block takes place with respect to the frame or receiver and the inclined rear end of the block rides up on an incline c^5 of the trigger plate c^3 to press the rear end of the locking lever upward and to throw down the forward end of the locking lever, so that the firing of the gun itself unlocks the slide bar and rapid firing is therefore facilitated. At the same time, as the slide bar is not unlocked automatically until the explosion of the cartridge has taken place, and as even in the case of a hang-fire the explosion of the cartridge will take place before the slide bar can be released by the finger, it is practically impossible for the gun to be open when a hang-fire explosion takes place. In the opening movement of the breech-block the

lower end of the starting lever f strikes a lug n^4 on the rear end of the inertia block and draws the inertia block to the rear slipping over the lug n^4 as the rear end of the inertia block drops down when permitted by the projection of the end of the safety latch n within the trigger guard.

The cartridge lifter l , mentioned above, is pivoted at l^2 and has a rearwardly projecting finger with which the rear end of the breech-block coöperates as the breech-block reaches its extreme rearward position, causing the forward end of the lifter to be raised in the usual manner.

The trigger mechanism, shown in part in Figs. 2-6, is illustrated in detail in Figs. 80 10, 11 and 15-18. The trigger o is pivoted at o' in the trigger plate and in rear of the trigger is pivoted the trigger safety latch p , which is pressed by a spring p' so that its toe p^2 stands normally in rear of the heel o^2 of the trigger o and prevents effective movement thereof. As will be seen presently, the trigger safety latch p also operates to prevent movement of the sear, and therefore still further prevents the possibility of accidental discharge. The trigger o does not act directly upon the sear i , but acts thereon indirectly through a trigger lever r which is mounted upon the pivot pin o' of the trigger o but with a slotted or elongated bearing r' , so that it has a longitudinal as well as a pivotal movement. At its rear end the trigger lever r has a hook r^2 to engage a pin p^3 on the trigger safety lock p and as will be seen hereinafter, the trigger lever cannot be moved to release the sear until it has been drawn rearwardly by the operation of the trigger safety lock p . The effective movement of the trigger lever r is accomplished by a shoulder o^3 on the trigger which coöperates with the lower edge r^3 of the trigger lever in rear of the pivot o' , to throw the forward end of the trigger lever down. On the left hand side of the forward end of the trigger lever are two lugs r^3 and r^4 which are adapted to receive between them freely the lip e^4 of the breech-block e , so that the breech-block may travel forward and backward without disturbing the trigger lever. The upper lug r^3 rests upon the lip e^4 except when the breech-block and the trigger lever are in firing position and therefore locks the trigger lever and the trigger against effective movement except when the breech-block and the trigger lever are in firing position. The sear i has on the right hand side of its rear end a lug i' which stands normally in the plane of the lip e^4 , so that when the breech-block is in its forward position and the lug r^3 on the trigger lever is clear of the lip e^4 , pressure on the trigger throws down the forward end of the trigger lever which car-

ries with it, through contact of the lug r^3 with the lug i' of the sear, the rear end of the sear and releases the hammer. The function of the lug r^4 is to prevent the accidental release of the sear by a jar or shock when the breech-block is nearly in firing position so that the lug r^3 partly overlies and rests upon the lug i' , for as the lug r^3 is still held by contact with the lip e^4 of the breech-block from downward movement at such time, the lug r^4 then furnishes a support for the lug i' so that movement of the sear to release the hammer is prevented until the breech-block moves into firing position and carries the lip e^4 from under the lug r^3 . The trigger latch p can be moved at any time and the trigger lever can be drawn thereby to the rear at any time, but as the trigger lever cannot have an effective movement until the breech-block is in firing position both the trigger and the sear are thereby locked against effective movement until the breech-block is in firing position.

In order that the cartridges in the magazine shall be cushioned so that there shall be no danger of explosion of any cartridge in the magazine or of battering of the end of the bullet, through the churning of the cartridges in the magazine at the time of firing, the breech-block is provided with a yielding stop s which is pivoted on a pin s' in a slot in the underside of the breech-block at its forward end with a slotted or elongated bearing s^2 and is seated at its rear end, above the plane of the pivot, against a yielding plunger s^3 . The stop is thus held normally in the position shown in Figs. 10 and 11 with its forward end s^4 projecting down behind the head of the cartridge in the magazine but is capable of yielding upwardly so as to permit cartridges to be thrust into the magazine from the rear as usual. As this stop is spring supported at its rear end, it thus furnishes a yielding cushion for the cartridges which is sufficient to prevent either the explosion of the cartridges in the magazine through the striking of the primer of one against the nose of the bullet of the cartridge next to the rear, or the battering of the noses of the bullets against the heads of the cartridges in front. The stop s is also provided with a lug s^5 which projects downwardly from the rear end of the pivoted stop sufficiently to prevent the last cartridge which is pushed into the magazine from the rear from being forced back into the receiver far enough to interfere with the proper movement of the moving parts.

Although the several features of improvement are shown and described herein as cooperating with one another for the attainment of the general purpose of improving the gun as a whole, it is obvious that they are not all necessarily used together but

that some of them might be used in co-operation with other features of construction than those shown and furthermore that the invention is not limited to the precise details of construction and arrangement shown, since many of such details may be varied more or less to suit different conditions of use.

I claim as my invention:

1. In a firearm, the combination of a frame chambered to receive the breech-block, a breech-block movable therein, a slide bar, a lever connection between the slide bar and the breech-block by which the movement of the breech-block is started, and a direct connection between the slide bar and the breech-block by which the movement of the breech-block is continued.

2. In a firearm, the combination of a frame chambered to receive the breech-block and having a substantially vertical shoulder, a breech-block movable therein, a slide bar, and a lever engaging the breech-block and the slide bar and having a bearing against said shoulder on the frame in a horizontal plane different from that in which it engages the breech-block, whereby the breech-block is started rearwardly with a powerful leverage.

3. In a firearm, the combination of a frame chambered to receive the breech-block and having a substantially vertical shoulder, a breech-block movable therein, a slide bar, and a lever pivoted on the breech-block, engaged by the slide bar and having a bearing against said shoulder on the frame in a horizontal plane different from that of its pivot, whereby the breech-block is started rearwardly with a powerful leverage.

4. In a firearm, the combination of a frame chambered to receive the breech-block and having a substantially vertical shoulder, a breech-block movable therein, a slide bar, and a lever pivoted on the breech-block, having at its upper end a lug to bear against said shoulder on the frame and having its lower end slotted for engagement by the slide bar, whereby the breech-block is started rearwardly with a powerful leverage.

5. In a firearm, the combination of a frame chambered to receive the breech-block and having a substantially horizontal shoulder, a substantially vertical shoulder and an abutment for the breech-block, a breech-block movable therein, a slide bar, and a lever engaging the breech-block and the slide bar and having a bearing against the horizontal shoulder on the frame to start the breech-block downwardly and also having a bearing against the substantially vertical shoulder in a plane different from that of its axis to start the breech-block rearwardly.

6. In a firearm, the combination of a frame chambered to receive the breech-block,

a breech-block movable therein, a slide bar and a lever connection between the slide bar and the breech-block, the breech-block having a transverse shoulder and the slide bar having a lug to cooperate with said shoulder in the continued movement of the breech-block.

7. In a firearm, the combination of a frame chambered to receive the breech-block, a breech-block movable therein, a slide bar and a lever pivoted on the breech-block, having a lug to bear against a shoulder on the frame and adapted to be engaged by the slide bar, the breech-block having a transverse shoulder and the slide bar having a lug to cooperate therewith in the continued movement of the breech-block.

8. In a firearm, the combination of a frame chambered to receive the breech-block, a breech-block movable therein, a hammer carried by the breech-block, a slide bar, a starting lever pivoted on the breech-block and engaged by the slide bar, a cocking lever carried by the starting lever and adapted to engage the hammer, and a sear to engage the hammer.

9. In a firearm, the combination of a frame chambered to receive the breech-block, a breech-block movable longitudinally therein, a hammer movable longitudinally in the breech-block, a slide bar, a starting lever pivoted on the breech-block and adapted to be engaged by the slide bar, a cocking lever pivoted on the starting lever and adapted to engage the hammer, and a sear to engage the hammer.

10. In a firearm, the combination of a frame, a breech-block movable therein, a slide bar, a slide bar locking lever pivoted in the frame and normally preventing movement of the slide bar and operated by the relative forward movement of the inertia block to actuate the locking lever to release the slide bar and an inertia block having a safety latch extended rearwardly and downwardly through the frame in position to be pressed by the finger, whereby the slide bar locking lever is operable by hand through the inertia block as well as by the relative movement of the inertia block by the recoil.

11. In a firearm, the combination of a frame, a breech-block movable therein, a slide bar, a slide bar locking lever pivoted in the frame and normally preventing movement of the slide bar, and an inertia block having its rear portion yielding with respect to its forward portion forming a slide latch operable by hand to actuate the locking lever to release the slide bar.

12. In a firearm, the combination of a frame, a breech-block movable therein, a slide bar, a slide bar locking lever pivoted in the frame and normally preventing movement of the slide bar, an inertia block hav-

ing its rear portion yielding with respect to its forward portion forming a slide latch operable by hand to actuate the locking lever to release the slide bar, and means actuated by the relative movement of the inertia block to actuate the locking lever to release the slide bar.

13. In a firearm, the combination of a frame, a magazine tube, a breech-block, a cartridge stop movable longitudinally and pivoted in the breech-block and having a lug at its rear end to prevent movement rearwardly into the frame of the last cartridge inserted in the magazine tube, and a spring acting upon the stop to press the same forward and permitting it to yield rearwardly.

14. In a firearm, the combination of a hammer, a trigger, a sear, a trigger lever interposed between the trigger and the sear and movable relatively thereto, said lever in one position engaging a relatively fixed stop and being held thereby from effective movement and in its other position being freed from said stop and in operative engagement with the sear, and means to move said lever.

15. In a firearm, the combination of a hammer, a trigger, a sear, a trigger lever interposed between the trigger and the sear and movable relatively thereto, said lever in one position engaging a relatively fixed stop and being held thereby from effective movement and in its other position being freed from said stop and in operative engagement with the sear, and means to move said lever, and a safety latch engaging the trigger lever to move the same into or out of operative position.

16. In a firearm, the combination of a hammer, a trigger, a sear, a trigger lever interposed between the trigger and the sear and movable relatively thereto, and a safety latch engaging the trigger lever to move the same into or out of operative position, said safety latch being also adapted to engage the trigger to prevent movement thereof.

17. In a firearm, the combination of a frame, a breech-block movable therein, a hammer, a sear, a trigger, and a trigger lever, the breech-block and the trigger lever being formed for interengagement to prevent effective movement of the trigger lever except when the breech-block is in firing position.

18. In a firearm, the combination of a frame, a breech-block movable therein, a hammer, a sear, a trigger, a trigger lever, the breech-block and the trigger lever being formed for interengagement to prevent effective movement of the trigger lever except when the breech-block is in firing position, said trigger lever being movable independently of the trigger, and means to move said

trigger lever into and out of operative position.

19. In a firearm, the combination of a hammer, a sear, a trigger lever adapted to engage the sear and movable independently of the trigger, means to prevent effective movement of the trigger lever in one position, and means to move the trigger lever into and out of operative position.

20. In a firearm, the combination of a hammer, a sear, a pivoted trigger, a trigger lever pivoted and movable longitudinally upon the pivot of the trigger, and a safety latch to move the trigger lever longitudinally into and out of operative position, and also cooperating with the trigger to prevent or permit movement thereof.

21. In a firearm, the combination of a hammer, a sear, a pivoted trigger, a trigger lever pivoted and movable longitudinally upon the pivot of the trigger, and a pivoted safety lock operable by hand and engaging the trigger lever to move the same into and out of operative position, and also cooperating with the trigger to prevent or permit movement thereof.

22. In a firearm, the combination of a frame, a breech-block movable longitudinally therein and having a longitudinal lip,

a hammer, a sear, a trigger, a trigger lever movable independently of the trigger and having a lug to cooperate with the sear when the breech-block is in firing position and otherwise to rest upon the lip of the breech-block, and means to move the trigger lever into and out of operative position.

23. In a firearm, the combination of a frame, a breech-block movable longitudinally therein and having a longitudinal lip, a hammer, a sear, a trigger and a trigger lever having a lug to cooperate with the sear when the breech-block is in firing position and otherwise to rest upon the longitudinal lip of the breech-block.

24. In a firearm, the combination of a frame, a breech-block movable longitudinally therein and having a longitudinal lip, a hammer, a sear, a trigger and a trigger lever having two lugs to cooperate with the sear when the breech-block is in firing position and to permit the longitudinal lip of the breech-block to move freely between them.

This specification signed and witnessed this 15th day of December, A. D. 1910.

EDWARD E. REDFIELD.

Signed in the presence of—

JOSEPH T. GROBUSKY,
MERRILL E. WESCOTT.