

1,057,170.

Fig. 1.

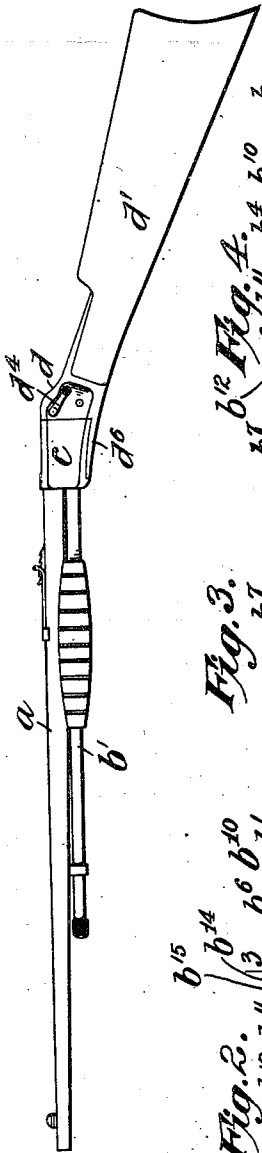


Fig. 3.

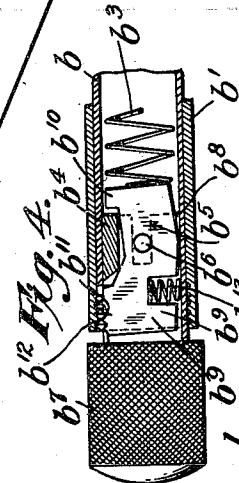


Fig. 2.

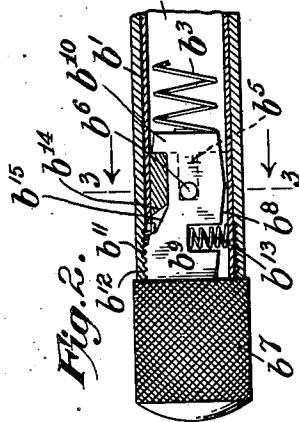
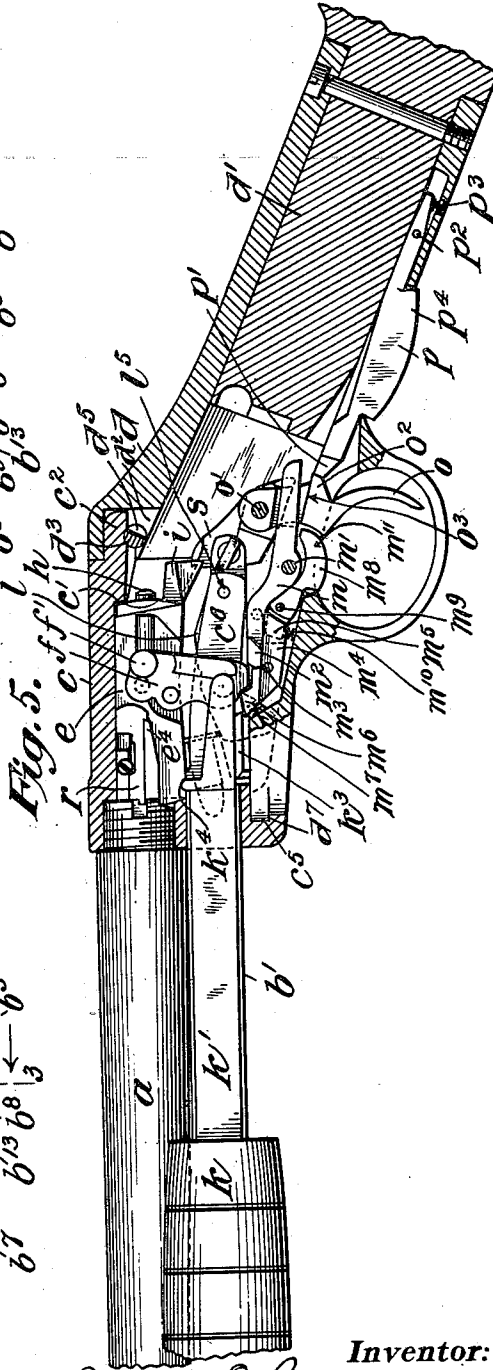


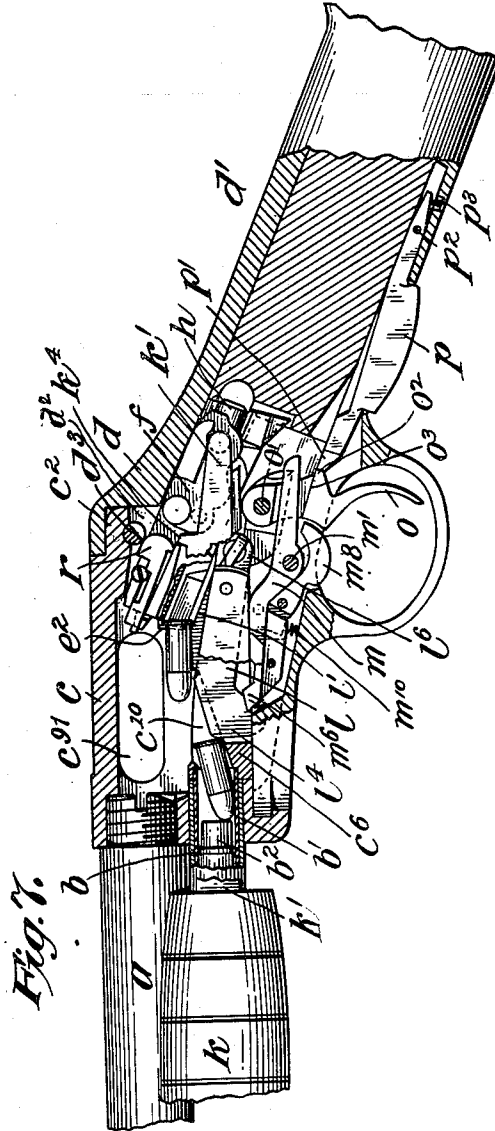
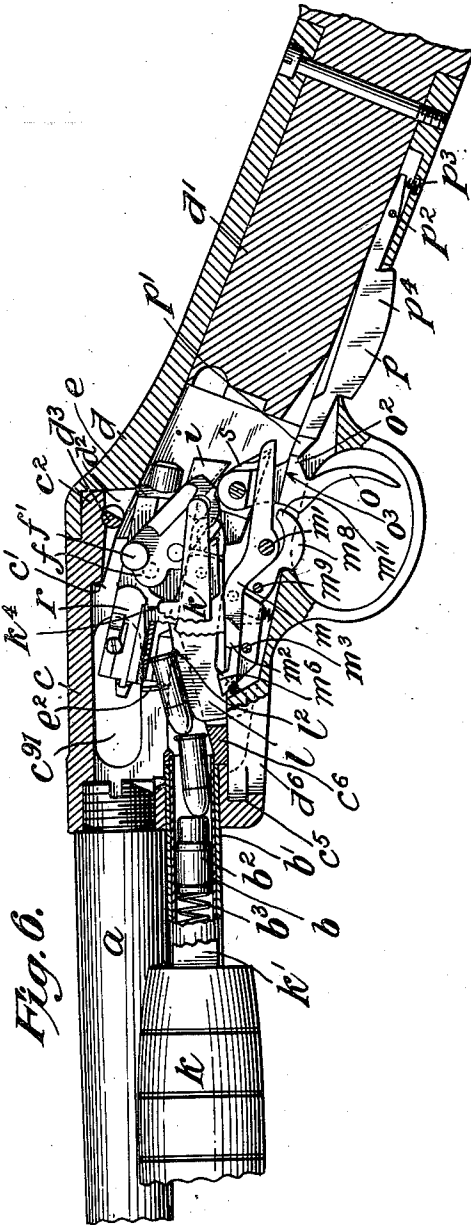
Fig. 5.



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E. E. REDFIELD.

FIREARM.

APPLICATION FILED AUG. 8, 1911.

Patented Mar. 25, 1913.

4 SHEETS—SHEET 3.

1,057,170.

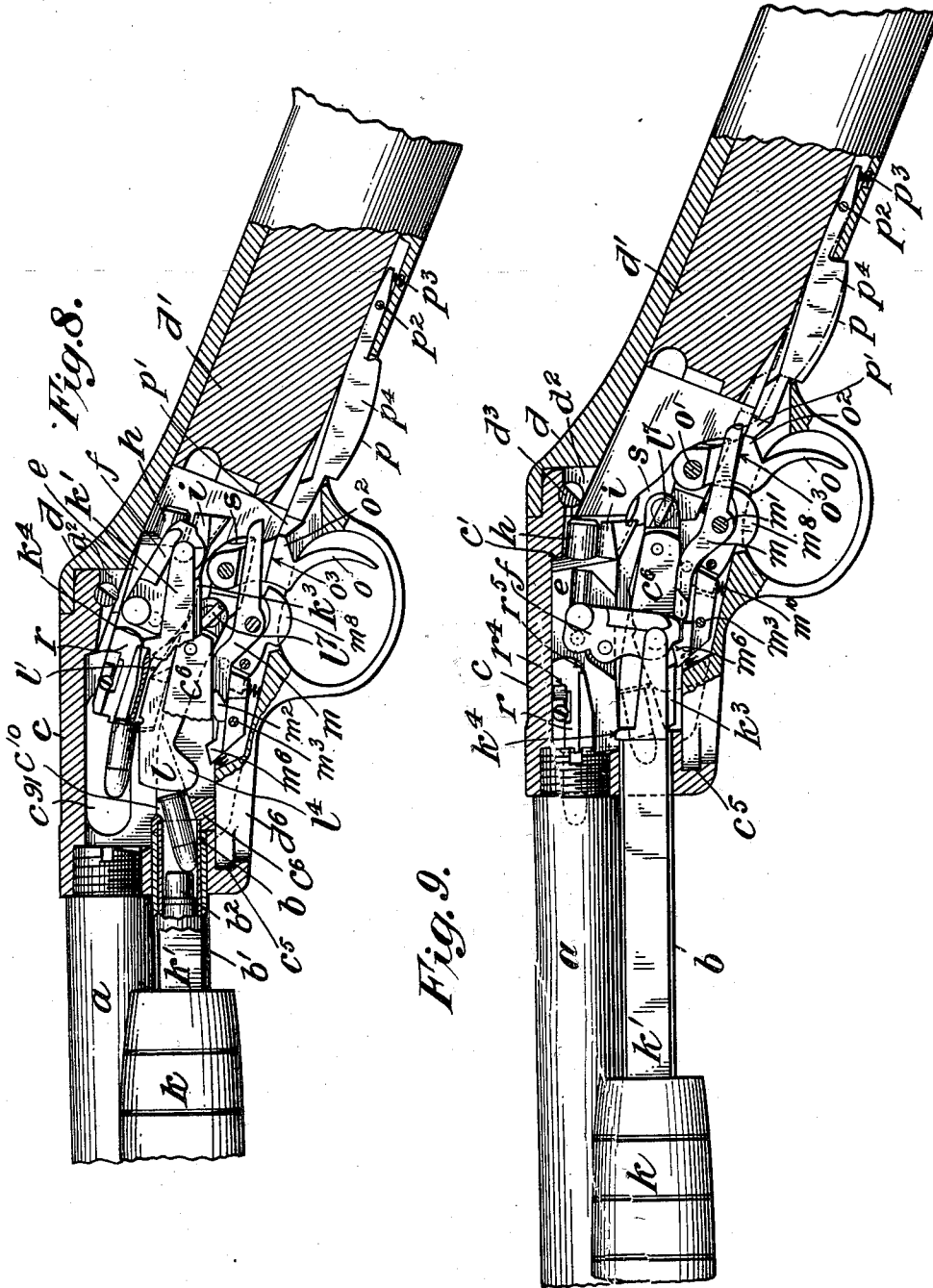


Fig. 9.

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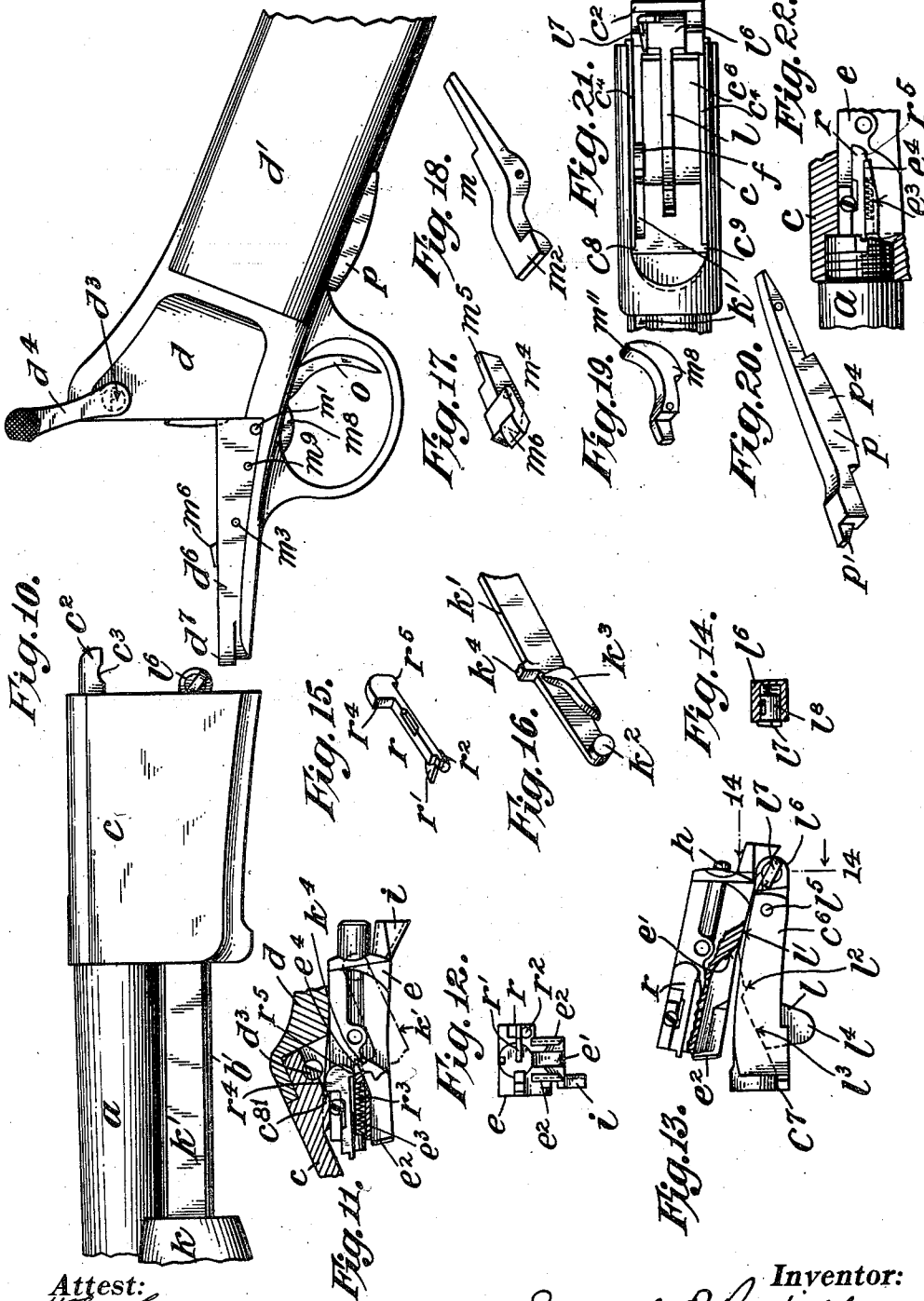
E. E. REDFIELD.  
FIREARM.

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4 SHEETS—SHEET 4.

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# UNITED STATES PATENT OFFICE.

EDWARD E. REDFIELD, OF GLENDALE, OREGON.

## FIREARM.

1,057,170.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Application filed August 8, 1911. Serial No. 643,058.

*To all whom it may concern:*

Be it known that I, EDWARD E. REDFIELD, a citizen of the United States, residing in Glendale, Douglas county, 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, which form a part hereof.

This invention relates to magazine or repeating firearms of the "slide-action" type, in which the several operations of extracting and ejecting the empty shell, placing the fresh cartridge in the chamber of the barrel and cocking the hammer are performed by the reciprocating movement of a fore-end or grip piece which is generally mounted on the magazine tube below the barrel.

The invention is illustrated herein as embodied in a rifle which comprises some of the novel features of the rifle shown and described in another application for Letters Patent filed December 22, 1910, Serial No. 598,781. Such features of construction as are common to the rifle shown in said application and that shown in the present application will therefore be described only so far as an understanding thereof is necessary to an understanding of the present invention. The present case, however, covers some modifications or further improvements of some of the improvements covered in said former application and some improvements in parts of the gun which were not made the subject of improvements in said former application.

One object of the present invention is to improve the devices for retaining the magazine in the magazine tube and releasing the same.

Another object of the invention is to provide improved "take-down" devices.

The invention is also concerned with the construction of the ejector mechanism by which the empty shell is ejected from the receiver, with the devices for lifting the fresh cartridge from the plane of the magazine to the plane of the barrel, and with the slide locking devices.

The various features of improvement will be more particularly described hereinafter with reference to the accompanying drawings in which they are illustrated and it will be

understood that some of the present improved devices are capable of use independently of other features of improvement and in guns of other construction than that shown.

In the drawings Figure 1 is a view in side elevation of a take-down rifle to which the several features of invention are applied. Fig. 2 is a detail view, partly in longitudinal section, of the front end of the magazine and magazine tube, illustrating particularly the devices for retaining the magazine within the magazine tube, the scale being larger than that of Fig. 1. Fig. 3 is a view in section on the plane indicated by the broken line 3—3 of Fig. 2. Fig. 4 is a view similar to Fig. 2 but showing the parts in the position which they assume when the magazine tube is unlocked. Fig. 5 is a detail view, partly in section through the receiver and frame, with a portion of the barrel and of the grip piece, the slide-bar and the parts within the receiver and frame shown in elevation, the parts being shown in the positions which they assume when the gun has been fired and the slide-latch has been operated to release the slide-bar in readiness for rearward movement. Fig. 6 is a similar view, but showing the parts in the positions which they assume when the breech-block has moved part way to the rear. Fig. 7 is a similar view but showing the parts in the positions which they assume when the breech-block has reached its extreme rearward position. Fig. 8 is a similar view but showing the parts in the positions which they assume when the breech-block is moving forward. Fig. 9 is a similar view but showing the parts in the positions which they occupy when the breech-block has moved to its extreme forward position and the slide-bar is locked, the gun being then in readiness to be fired. Fig. 10 is a view in side elevation showing the receiver and barrel detached from the frame and illustrating particularly the take-down devices. Fig. 11 is a detail view partly in side elevation and partly in longitudinal section, showing the relation of the ejector to the breech-block, the receiver and the slide-bar. Fig. 12 is an end view of the breech-block. Fig. 13 is a view in side elevation of the cartridge guide within the frame with the lifter, a portion of the

breech-block being shown in section. Fig. 14 is a detail view in section on the plane indicated by the broken line 14-14 of Fig. 13. Fig. 15 is a view in perspective of the ejector removed from the breech-block. Fig. 16 is a detail view in perspective of the rear end of the slide-bar as seen from the right hand. Fig. 17 is a detail view in perspective of the lever which is acted upon by the breech-block in the last of its forward movement to move the slide-latch into locking position. Fig. 18 is a detail view in perspective of the slide-latch. Fig. 19 is a detail view in perspective of the finger lever by which the slide-latch is moved to release the slide-bar. Fig. 20 is a detail view in perspective of the safety lever which coöperates with the trigger. Fig. 21 is an underside view of the receiver illustrating particularly the relation of the cartridge guide to the receiver. Fig. 22 is a detail view showing a modification in the construction of the ejector.

In the firearm shown in the drawings, the barrel *a*, chambered to receive the cartridge, the magazine *b*, placed within the magazine tube *b'* and provided with a follower *b<sup>2</sup>* and a spring *b<sup>3</sup>* by which the cartridges are pressed to the rear, the receiver *c*, the frame *d*, and the stock *d'* are constructed substantially as usual, except as hereinafter pointed out. The receiver *c* has, forward of its rear end and forward of the takedown joint, a shoulder *c'* against which the breech-block abuts in the firing position, the breech-block passing rearwardly below the shoulder when the gun is open. The receiver has at its rear end a rearwardly extended lug *c<sup>2</sup>* which is adapted to enter the frame and has in its underside a notch *c<sup>3</sup>*. In a recess *d<sup>2</sup>*, in the forward end of the frame and entered by the lug *c<sup>2</sup>* of the receiver, is mounted a locking bolt *d<sup>3</sup>* which is provided externally of the frame with an operating handle *d<sup>4</sup>* and is flattened on one side, as at *d<sup>5</sup>*. When the frame and receiver are assembled, the operating handle *d<sup>4</sup>* is turned to the position shown in Fig. 10, with the flat side of the bolt *d<sup>3</sup>* uppermost. The lug *c<sup>2</sup>* then slips over the bolt until the notch *c<sup>3</sup>* stands in line therewith, when the bolt is turned by the handle *d<sup>4</sup>* into the position shown, for example, in Fig. 5, so that it enters the notch and securely locks the receiver to the frame. The frame itself is provided at its lower side with a forward extension *d<sup>6</sup>* which bears against longitudinal shoulders *c<sup>4</sup>* on the sides of the receiver, to guide the frame and receiver together properly and also to hold them in proper relation, and has at its forward end a toe *d'* adapted to enter a recess *c<sup>5</sup>* in the forward end of the receiver as shown in Fig. 5, to prevent the lifting of the receiver with respect to the frame. It will now be seen that when the lever *d<sup>4</sup>*

of the locking bolt is turned to the position shown in Fig. 10 the frame and receiver are united by a straight longitudinal movement and are locked together by turning the lever *d<sup>4</sup>* down into the position shown in Fig. 1.

The magazine *b*, as usual, is slipped into the magazine tube or supporting shell *b'* from the forward end. The devices by which it is secured within the outer tube or shell are shown in Figs. 2-4. The block *b<sup>4</sup>*, fitting loosely within the forward end of the magazine *b* and slotted as at *b<sup>5</sup>* to straddle the pin *b<sup>6</sup>*, carries at its forward end a finger piece *b<sup>7</sup>* by which the block can be pulled forward slightly with respect to the magazine *b* and by which, after release, the magazine can be pulled forward out of the supporting tube *b'*. The block *b<sup>4</sup>* is also slotted as at *b<sup>8</sup>*, to receive the locking dog *b<sup>9</sup>* which is pivoted on the pin *b<sup>6</sup>* and is provided at its rear end, back of the block *b<sup>4</sup>*, with a head *b<sup>10</sup>* against which bears the spring *b<sup>3</sup>*. At its forward end the dog *b<sup>9</sup>* is provided with teeth *b<sup>11</sup>* which are adapted to engage corresponding teeth *b<sup>12</sup>* formed on the interior of the shell *b'* at its forward end. The teeth *b<sup>11</sup>* and *b<sup>12</sup>* may be formed conveniently as screw threads. A spring *b<sup>13</sup>* acts upon the dog *b<sup>9</sup>* to press the teeth *b<sup>11</sup>* thereof into engagement with the teeth *b<sup>12</sup>* of the tube. The block *b<sup>4</sup>* is provided with a cam shoulder *b<sup>14</sup>* which is adapted to coöperate with a cam shoulder *b<sup>15</sup>* of the dog *b<sup>9</sup>*. It will now be seen that when the finger piece *b<sup>7</sup>* is grasped and pulled forward, the block *b<sup>4</sup>* is moved forward also to the extent permitted by the dog *b<sup>9</sup>*, and that in such movement the cam shoulder *b<sup>14</sup>* of the block coöperates with the cam shoulder *b<sup>15</sup>* of the dog to rock the dog on its pivot, against the pressure of the spring *b<sup>13</sup>*, to disengage the teeth *b<sup>11</sup>* from the teeth *b<sup>12</sup>* thereby permitting the magazine to be drawn out of the supporting tube or shell, the pivot pin *b<sup>6</sup>* forming a connection between the dog and the magazine *b*, while the shoulders of the dog and block form a connection between the two when the further rocking movement of the dog is prevented by the contact of the forward portion of the dog with the interior of the magazine *b*. The magazine is thus released easily when necessary, but cannot be disengaged by any movement other than a straight, forward pull of the finger piece *b<sup>7</sup>*.

The breech-block *e* is constructed, arranged and operated substantially as shown and described in said former application Serial No. 598,781 having pivoted thereon the supporting and starting lever *f* which has a lug *f'* to coöperate with shoulders (not shown) on the left hand side of the receiver, to drop the rear end of the breech-

block below the abutment  $a'$  of the receiver and to start the breech-block rearwardly, being actuated for this purpose through its engagement at the lower end with the slide-bar. The cocking lever, not shown, pivoted on the starting lever, coöperates as usual with the hammer  $h$  which is movable longitudinally in the breech-block. The hammer is held in its cocked position, against the tension of the hammer spring, by a sear  $i$  pivoted on the breech-block and adapted to be engaged by a trigger lever  $s$  which is actuated by the trigger  $o$ , all as described in said former application.

The grip piece  $k$  is mounted upon a magazine tube or shell  $b'$  as usual and has extended rearwardly therefrom a slide-bar  $k'$  which has at its rear end a lug  $k^2$  (see Fig. 16), to engage the supporting and starting lever  $f$ , which is provided, at its lower end, with a hole for engagement with the slide-bar, so that the entire rearward and forward movement of the breech-block is effected through such engagement of the slide-bar with the starting lever.

Rearward movement of the slide-bar is prevented by a slide-locking lever  $m$  (see Figs. 5 and 18), which is pivoted in the frame, as at  $m'$  and has at its forward end a lug  $m^2$ , which projects upwardly within the receiver into the path of the lower end of the starting lever  $f$ , to prevent rearward movement of the starting lever and therefore rearward movement of the slide-bar  $k'$ . The locking lever is not spring pressed, but is thrown upward into locking position by the last forward movement of the breech-block and is thrown down to unlock the slide-bar either by the operation of a slide-unlocking finger piece or by the operation of the trigger. As shown, there is pivoted in the frame, forward of the pivot of the slide-bar lever, as at  $m^3$ , a lever  $m^4$  which at its rear end,  $m^5$ , underlies the forward end of the locking lever  $m$ , and at its forward end has a cam lug  $m^6$  which projects upwardly into the path of the lower end of the lever  $f$ , carried by the breech-block. The forward end of the lever  $m^4$  is thrown upwardly by a suitable spring  $m^7$ . Thus, as shown in Fig. 9, when the breech-block reaches the limit of its forward movement, the lower end of the lever  $f$  acts upon the lever  $m^4$  to throw the forward end of the lever  $m$  upward behind the lower end of the lever  $f$  and thereby prevent rearward movement of the lever  $f$  and of the breech-block until the forward end of the lever  $m$  is depressed. This may be done by the finger lever  $m^8$ , which is pivoted at  $m^9$  in the frame and is provided, forward of the pivot, with a spring  $m^{10}$  which throws the rear end  $m^{11}$  downward. The rear end of the lever  $m^8$  (see Figs. 5 and 19), is so shaped as to project downwardly within the trigger

guard, for operation by the finger, while its extreme rear end extends upwardly below the lever  $m$  in rear of its pivot  $m'$ . Upward pressure against the finger lever  $m^8$  therefore throws the forward end of the lever  $m$  downwardly out of the path of the lower end of the lever  $f$ , as shown in Fig. 5, and thereby releases the lever  $f$  and therefore the slide-bar  $k'$  for rearward movement.

The trigger  $o$ , pivoted at  $o'$  in the frame, has a heel  $o^2$  in rear of the pivot  $o'$  for co-operation with the toe  $p'$  of the safety  $p$  which is here shown as a lever pivoted at  $p^2$  in the frame and acted upon by a spring  $p^3$  which tends to throw the forward end or toe  $p'$  of the lever downward into the path of the heel  $o^2$  of the trigger, so as to prevent effective movement of the trigger. A finger piece  $p^4$  projects downwardly through the frame so that the safety can be pressed upward, to release the trigger and permit the gun to be fired. The rear end of the lever  $m$  overlies a shoulder  $o^3$  of the trigger, so that the pull of the trigger actuates the locking lever  $m$  to release the slide.

The lifter  $l$ , which is shown in its relations with other parts in Figs. 5-9 and also in Fig. 13, is pivoted upon a part, to be referred to hereinafter, which occupies a fixed relation with respect to the frame, so that, so far as concerns the immediate functions of the lifter  $l$  it may be regarded as pivoted in the frame. It is provided forward of its pivot with a cam surface  $l'$  which co-operates with a cam  $e'$  of the breech-block, with a notch  $l^2$  which coöperates with the rim of the cartridge, with a lifting surface  $l^3$ , and with a downwardly extended projection  $l^4$  which forms a cartridge stop and cut-off. In rear of its pivot  $l^5$  it has a short, rearwardly extending arm  $l^6$  and a cam lug  $l^7$  which is mounted on a spring plunger  $l^8$  (see Figs. 13 and 14), so that it may yield laterally. In the rearward movement of the breech-block, as the breech-block approaches the limit of its movement, as shown in Fig. 7, the breech-block acts upon the rearward extension  $l^6$  of the lifter to raise the forward end sufficiently to cause the forward end to stand in the path of movement of the next cartridge in the magazine, and as the breech-block moves forward from its rearward position, as shown in Fig. 8, a double cam lug  $k^3$  on the right hand side of the slide-bar  $k'$ , near its rear end, coöperates with the cam lug  $l^7$  to depress the rear end of the lifter and raise the forward end of the lifter to its full extent, bringing the cartridge thereon into line with the chamber of the barrel. The forward edge of the cam lug  $k^3$  is chamfered off so that in the rearward movement of the slide-bar the lateral surface of the cam lug  $k^3$  pushes the cam lug  $l^7$  laterally into the rear

end of the lifter and slips over it, while in the forward movement of the slide-bar the point of the cam lug  $h^3$  engages the rearward upper surface of the cam lug  $l^7$  and presses the rear end of the lifter downward, thereby lifting the forward end of the lifter to its full height, as shown in Fig. 8, which raises the cartridge into line with the chamber of the barrel so that in the continued forward movement of the breech-block the cartridge shall be pushed into the chamber of the barrel.

The lifter  $l$  is pivoted in a longitudinal slot in a tubular cartridge guide-block  $c^8$  which has at its forward end a T head  $c^7$  which engages vertical grooves  $c^8$  and  $c^9$  in the side walls of the receiver, as shown in Fig. 21. The block is locked in place by the rear end of the magazine  $b$  which, as shown in Figs. 6, 7 and 8, enters the tubular forward end of the block. In rear of the tubular forward end of the guide-block, the guide-way  $c^{10}$ , as best shown in Fig. 7, is inclined upwardly so that the rear end of the cartridge slides upwardly on the incline until its rim reaches the notch  $l^2$ , as best shown in Fig. 6. With the cartridge in this position, the breech-block continues to slide rearward over the rim of the cartridge until the flanges  $e^2$  at the forward end of the breech-block engage the rim and draw the cartridge rearwardly and also upwardly, the rim slipping out of the shallow notch  $l^2$ . In this way a proper engagement of the flanges  $e^2$  at the forward end of the breech-block with the rim of the cartridge is secured, this result being assisted by the downward movement of the breech-block, into the frame, over the end of the cartridge, the cartridge being moved upward at the same time by the first part of the upward movement of the lifter.

The ejector  $r$ , shown in detail in Fig. 15 and in its relation with other parts in Figs. 5-9 and 11 and 12, receives its effective movement from a spring and is cocked, like a longitudinally movable hammer, and released by the movement of the breech-block in the receiver. The ejector has an ejecting finger  $r'$  which is withdrawn into a slot in the face of the breech-block behind the left hand side of the head of the cartridge. On its underside it has a lug  $r^2$  which is arranged to travel in a recess  $e^3$  formed in the breech-block. In the recess, behind the lug  $r^2$ , is a spring  $r^3$  which throws the ejector forward when it is released. At its rear end, the ejector has an upwardly projecting lug which, in the beginning of the forward movement of the breech-block, engages a downwardly projecting lug  $c^{81}$  on the underside of the top of the receiver, so that, in the continued forward movement of the breech-block, the ejector is drawn back, relatively to the breech-block,

against the pressure of the spring  $r^3$  until a shoulder  $r^5$  on the underside of the ejector slips down behind a shoulder  $e^4$  on the breech-block and thereby holds the ejector in its cocked position. The spring  $r^3$  is so placed that its pressure does not tend to release the ejector. The cocking of the ejector takes place, as stated, in the beginning of the forward movement of the breech-block so that the ejector finger  $r'$  is out of the way of the cartridge as it is engaged by the flanges  $e^2$  at the forward end of the breech-block. When the breech-block is moved to the rear, with the empty shell engaged by the flanges, the empty shell rises up on the next cartridge partly out of the grasp of the flanges  $e^2$  and at the proper time, as the breech-block begins to move downwardly into the frame, the lug  $r^5$  of the ejector strikes a lug  $h^4$  on the upper side of the slide-bar and is raised thereby from behind the lug  $e^4$  on the breech-block, so that the ejector is released and snaps forward with a quick motion and throws the empty shell smartly out through the ejector opening  $c^{81}$  on the right hand side of the receiver. In the construction just described, the ejector is cocked by contact of its lug  $r^4$  with the lug  $c^{81}$  of the receiver as the breech-block begins its forward movement, but the ejector might be cocked at the last of the forward movement of the breech-block by direct contact with the rear end of the barrel, as shown in Fig. 22, in which figure it will be seen that the ejector  $r$  is constructed substantially as above, having a downwardly projecting lug  $r^5$  to cooperate with the lug  $e^4$  of the breech-block and to hold the ejector in its cocked position against the tension of the spring  $e^3$ . Instead, however, of having an upwardly projecting lug to engage a lug on the receiver, the forward end of the ejector projects forward of the front face of the breech-block and, as the breech-block approaches the forward limit of its movement, makes contact with the end of the barrel so that the ejector shall be pushed back, relatively to the breech-block, into its cocked position.

It will be understood that the various changes in details of construction and arrangement might be made to suit different conditions of use or different firearms to which the invention will be applied, and that the invention, therefore, is not limited to the details of construction and arrangement shown and described herein nor to the use, in a common structure, of all of the features of improvement shown and described herein.

I claim as my invention:—

1. In a take-down firearm, the combination of a frame having a recess in the upper portion of its front face and a forwardly extending projection from the lower side, a receiver adapted to be engaged by said projection and having a notched projection ex-

tended rearwardly from its upper side, and a cam lock mounted in the frame and adapted to engage said notched projection.

2. In a take-down firearm, the combination of a frame having a recess near its top and a forwardly extended projection from its lower side, said projection having a tongue, a receiver adapted to be engaged by said projection and having a recess to engage said tongue and having a rearwardly extended notched projection adapted to enter the recess in the frame, and a cam lock mounted in the frame and adapted to engage said notched projection.

3. In a take-down firearm, the combination of a frame having a recess in its upper front face and at its lower side a forwardly extended projection provided with a tongue at its forward extremity, a receiver having longitudinal shoulders on the inner sides of its side walls to receive and guide said projection and having a recess to be engaged by said tongue, said receiver also having its upper and rearwardly extended notched projection adapted to enter the recess in the frame, and a cam lock mounted in the frame and adapted to engage said notched projection of the receiver.

4. In a magazine firearm, the combination of a magazine, a supporting tube or shell, a block movable longitudinally in the forward end of the magazine and having a finger piece projected beyond the forward end of the magazine and a locking dog pivoted in the forward end of the magazine and adapted to engage the supporting shell or tube, the block and the dog being formed with cooperating cam surfaces whereby the dog is withdrawn from engagement with the supporting shell or tube by the forward movement of the block.

5. In a magazine firearm, the combination of a magazine, a supporting shell or tube, a block movable longitudinally in the forward end of the magazine and having a finger piece projected beyond the forward end of the magazine, said block being slotted longitudinally, and a spring-pressed dog pivoted in the end of the magazine, and located in the slot of said block and adapted to engage the supporting shell or tube, said block and said dog being formed with cooperating cam surfaces whereby the dog is withdrawn from engagement with the supporting shell or tube by a forward movement of the block.

6. In a magazine firearm, the combination of a magazine, a supporting shell or tube, a magazine spring, a block mounted movably in the forward end of the magazine and slotted longitudinally, and a spring-pressed dog pivoted in the forward end of the magazine and adapted to engage the supporting shell or tube and having in rear of the block a head to receive the pressure of the maga-

zine spring, said block and dog having cooperating cam surfaces whereby the dog is withdrawn from engagement with the supporting shell or tube by a forward movement of the block.

7. In a slide-action magazine firearm, the combination of a frame and receiver, a breech-block movable therein, a slide-bar, a slide-bar locking lever, and a lever actuated during the last of the forward movement of the breech-block to move said locking lever into locking position.

8. In a slide-action magazine firearm, the combination of a frame and receiver, a breech-block movable therein, a slide-bar, a lever forming a connection between the slide-bar and the breech-block, a slide-bar locking lever, and means actuated by the movement of said first named lever to move said locking lever into locking position.

9. In a slide-action magazine firearm, the combination of a frame and receiver, a breech-block movable therein, a slide-bar, a lever forming a connection between the slide-bar and the breech-block, a slide-bar locking lever, and an operating lever adapted to move said locking lever to locking position and having a projection in the path of said connecting lever, whereby as the breech-block reaches its forward position said operating lever is actuated to move the locking lever into locking position.

10. In a slide-action magazine firearm, the combination of a frame and receiver, a breech-block movable therein, a slide-bar, a slide-bar locking lever, and an operating lever pivoted in the frame and having a finger piece projecting downward within the trigger guard and adapted to cooperate with the locking lever to move the same to inoperative position.

11. In a slide-action magazine firearm, the combination of a frame and receiver, a breech-block movable therein, a slide-bar, a slide-bar locking lever, and a trigger in operative engagement with the slide-bar locking lever whereby said lever is moved to inoperative position by an effective movement of the trigger.

12. In a magazine firearm, the combination of a receiver, a breech-block movable longitudinally and downwardly therein, a pivoted cartridge lifter, the lifter having an extension in rear of its pivot for cooperation with the breech-block whereby the forward end of the lifter is raised as the breech-block moves rearwardly and downwardly, and means for raising the lifter higher after the breech-block has completed its rearward movement.

13. In a magazine firearm, the combination of a receiver, a breech-block movable longitudinally therein, a cartridge lifter, a cartridge guide mounted detachably in the receiver and adapted to direct the cartridge