

984,489.

E. E. REDFIELD.  
AUTOMATIC FIREARM.  
APPLICATION FILED MAY 31, 1910.

Patented Feb. 14, 1911.

4 SHEETS—SHEET 1.

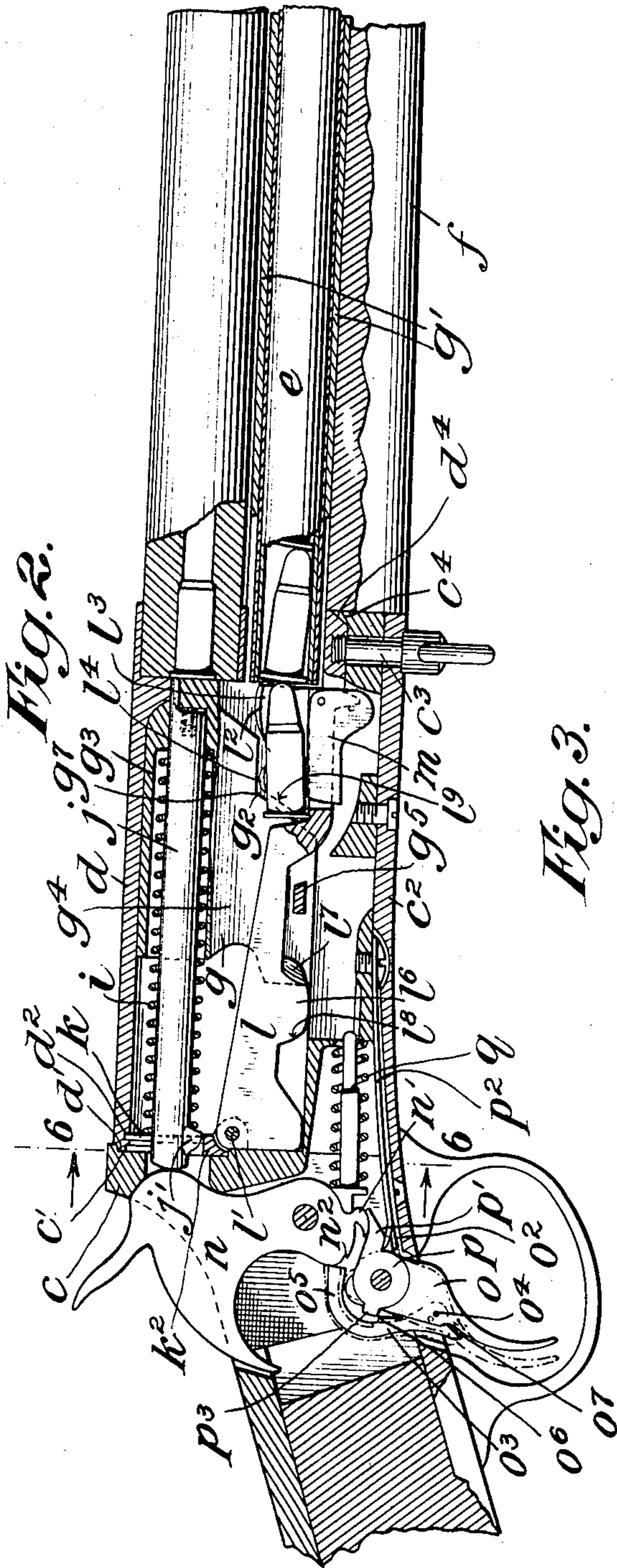
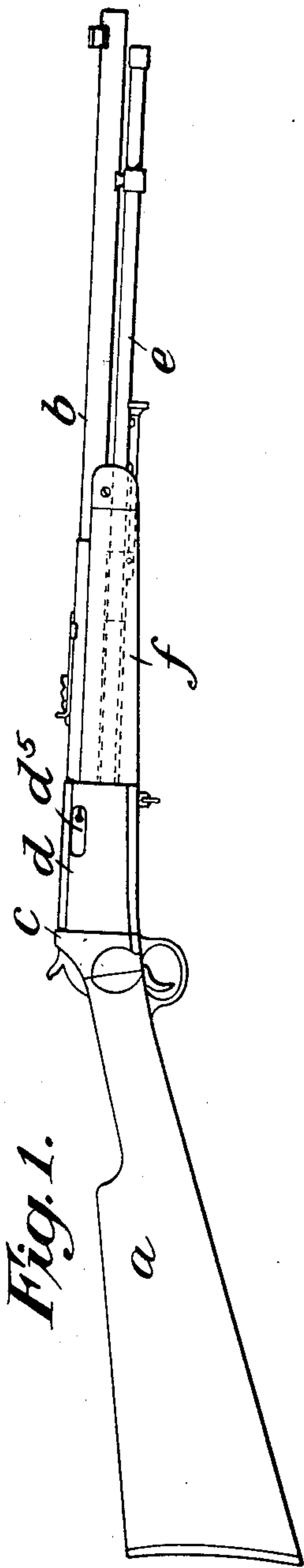
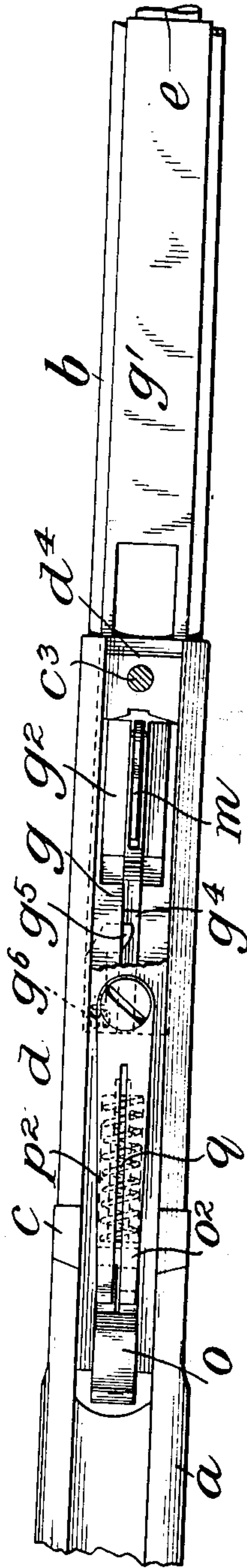


Fig. 3.



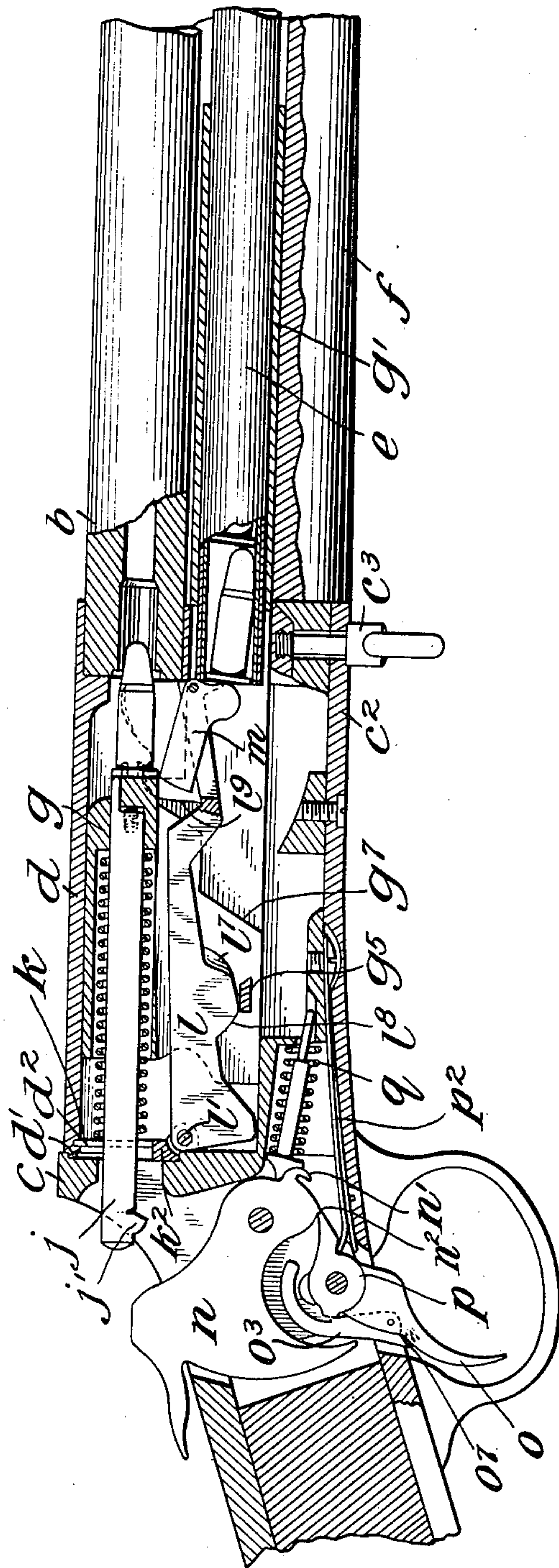
Attest:  
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*Redding, Greeley & Austin*  
Attys.



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4 SHEETS—SHEET 2.

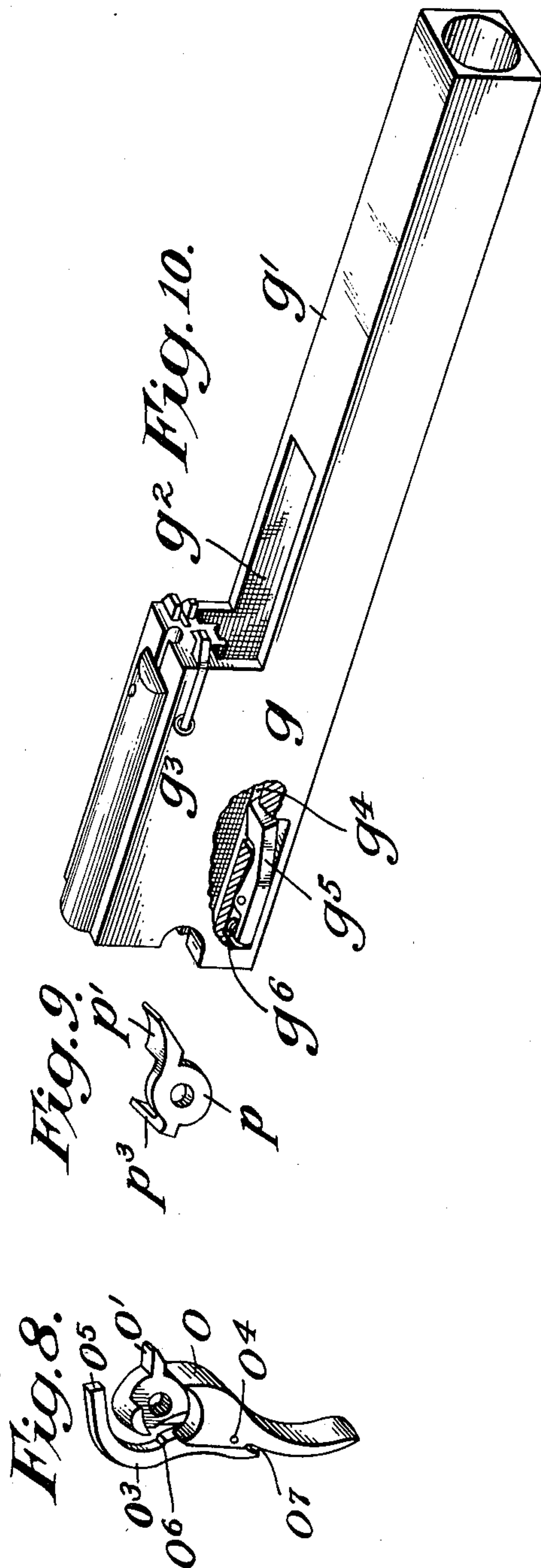
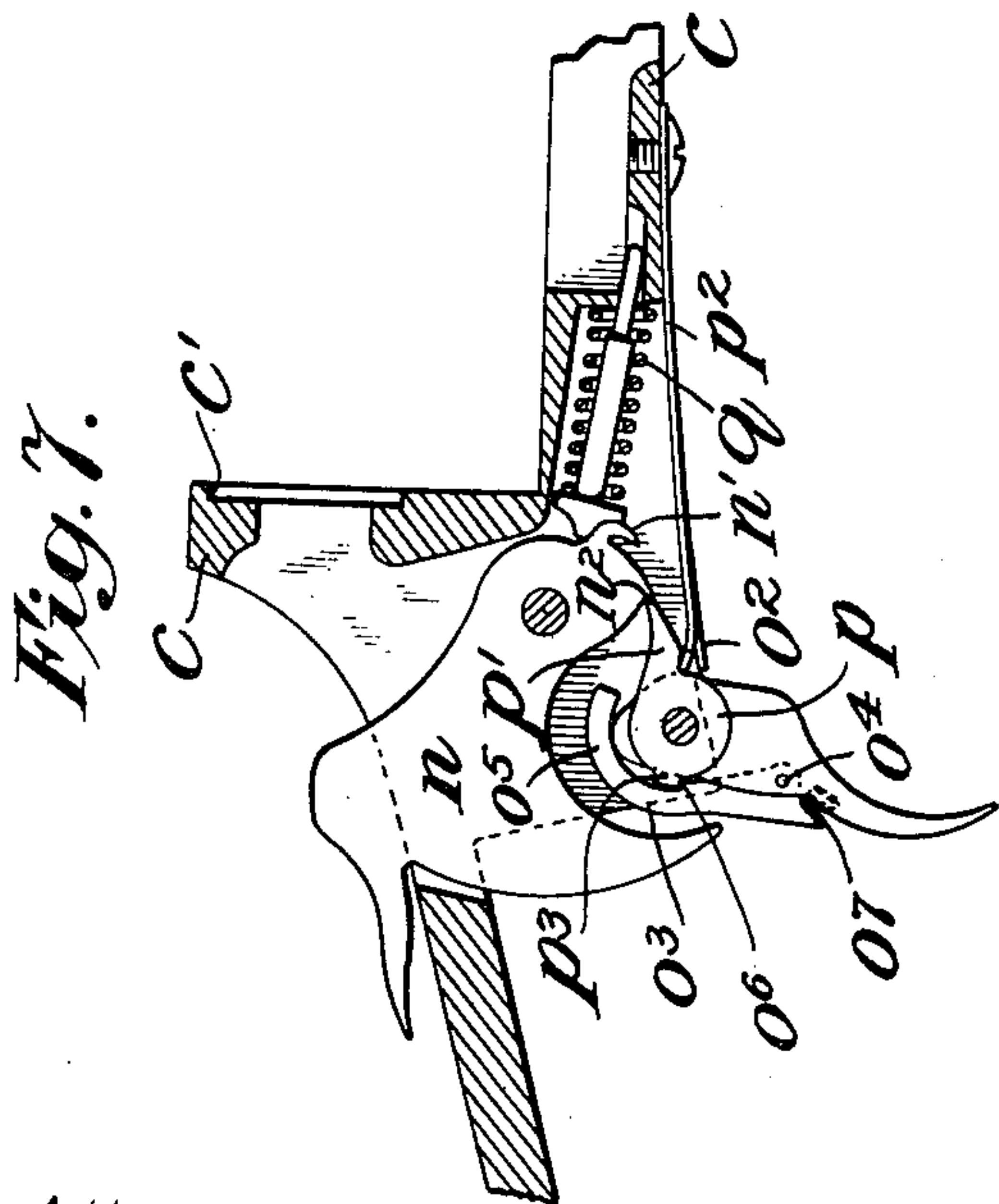
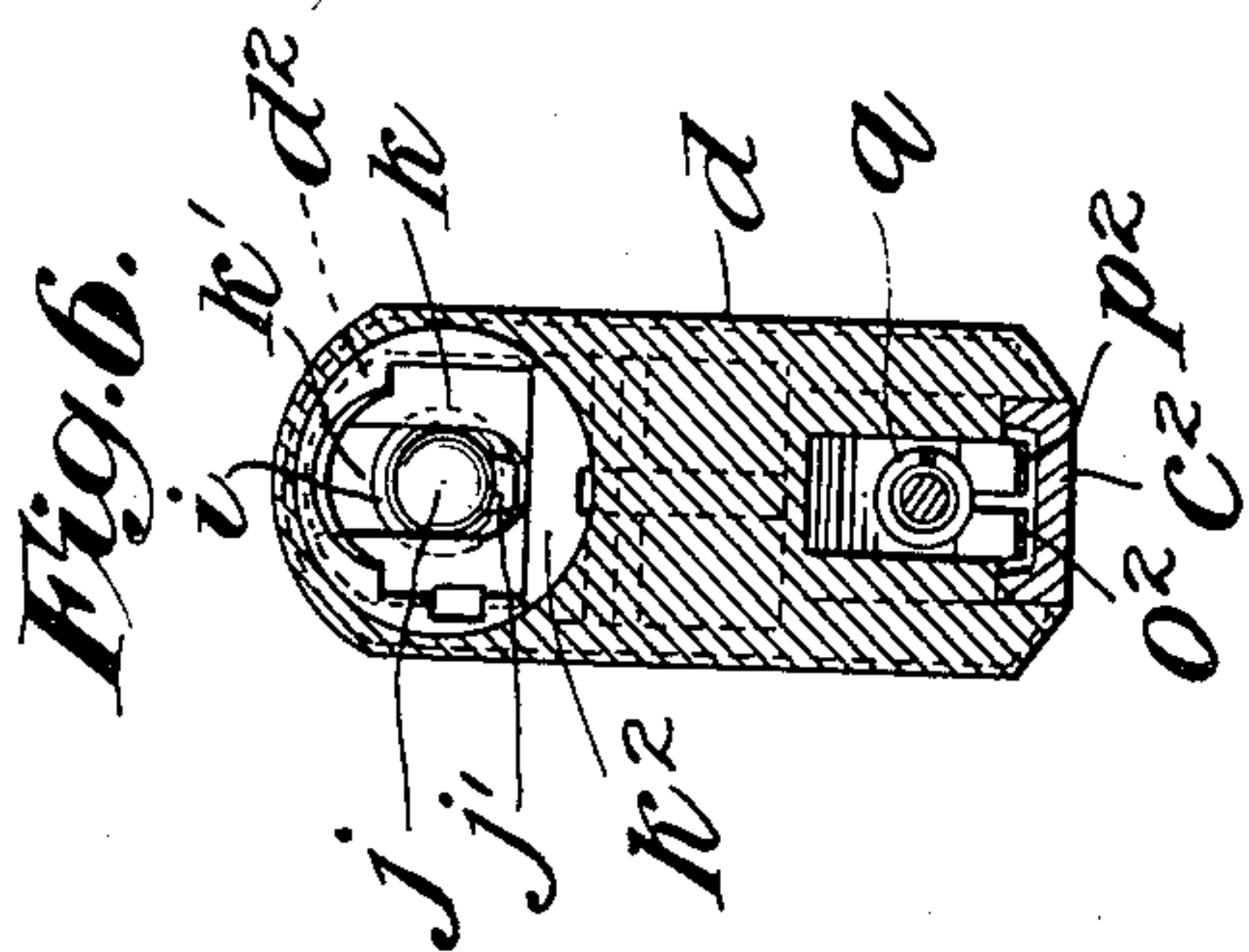


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4 SHEETS—SHEET 3.



Attest:  
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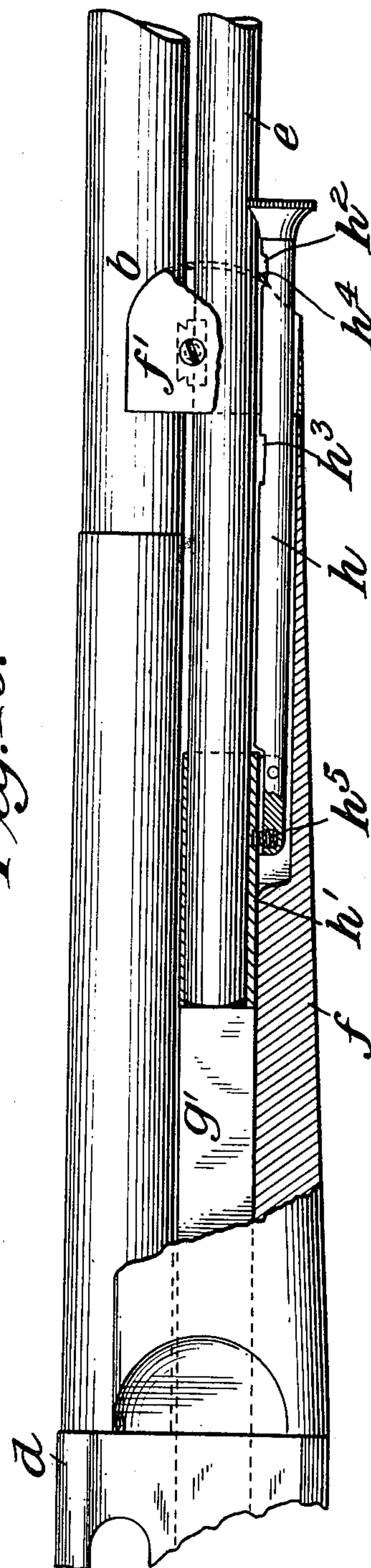
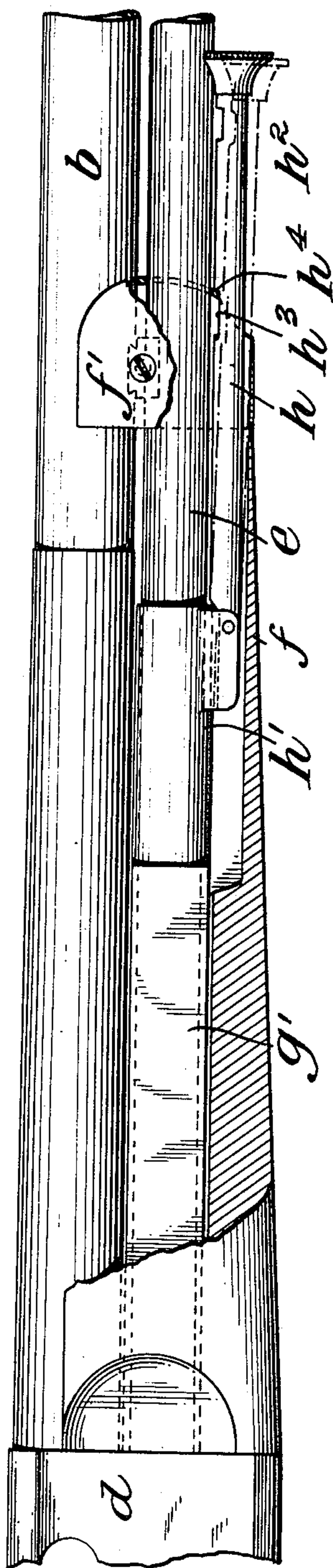
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

EDWARD E. REDFIELD, OF GLENDALE, OREGON.

## AUTOMATIC FIREARM.

984,489.

Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed May 31, 1910. Serial No. 564,216.

*To all whom it may concern:*

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

This invention relates to firearms in which the operations of extracting the empty cartridge shell, after a discharge, of placing a fresh cartridge in the chamber of the barrel, and of cocking the hammer, are accomplished through the action of the gases upon a movable breech block.

One object of the invention is to make it possible to take down the gun, that is, to separate the barrel from the stock, and to take apart the extracting, the ejecting and the reloading mechanism, without the use of tools or appliances of any kind, so that the thorough and frequent cleaning of those parts which are particularly subject to the accumulation of burned powder, is rendered easy.

Another object of the invention is to improve the construction and operation of those parts which are directly concerned with the placing of a fresh cartridge in the chamber of the barrel.

Still another object is to improve the firing mechanism in such manner as to make it certain in operation and to prevent the possibility of accidental discharge.

In general, the object of the invention is to make firearms of the class referred to more efficient, more safe and more satisfactory in operation.

The invention is shown in the accompanying drawings as applied to a sporting rifle of well known type, the several features of the invention being embodied in one structure and adapted to coöperate one with another, although it will be understood that some of the features of the invention are capable of being used independently of other features and in firearms in which such other features may be replaced by equivalent devices of usual or suitable construction.

In the drawings—Figure 1 is a view in side elevation of the rifle. Fig. 2 is a detail view, on a larger scale, in vertical central section, through the forward part of the frame and the rear extremity of the barrel and magazine, showing an empty shell in

the chamber of the barrel and the various parts in the positions which they assume at the instant of discharge, dotted lines showing the position of the trigger while it is still subject to the pressure of the trigger finger. Fig. 3 is an underside view of the parts shown in Fig. 2 with the trigger guard removed and some parts broken away. Fig. 4 is a view similar to Fig. 2, but showing the parts in the extreme positions which they are compelled to assume by the recoil, a fresh cartridge being shown as having moved from the magazine on to the carrier. Fig. 5 is a view, also similar to Fig. 2, but showing the parts in intermediate positions which they assume during the reloading, the fresh cartridge being shown as in line with the barrel and in readiness to be pushed into the chamber thereof, while the hammer is shown as retained in its cocked position. Fig. 6 is a detail view in transverse section on the plane indicated by the line 6—6 of Fig. 2, looking in the direction of the arrows. Fig. 7 is a detail view showing the hammer in cocked position with the trigger and sear. Fig. 8 is a perspective view of the trigger. Fig. 9 is a perspective view of the sear removed from the trigger. Fig. 10 is a perspective view of the breech-block, partly broken out to show a detail of construction. Fig. 11 is a perspective view of the carrier. Figs. 12 and 13 are detail views showing the relation of the operating rod, for effecting the initial loading operation, and its relation to the breech-block.

In the gun shown in the drawings the stock *a*, the barrel *b*, the frame *c*, the receiver *d*, the magazine tube *e* and the fore-end *f* are constructed and arranged substantially as usual, except so far as hereinafter pointed out. Thus, the receiver *d*, to which the barrel *b* and the magazine tube *e* are secured as usual, has on its rear face a projection or shoulder *d'* which is adapted to be seated in a recess *c'* in the front face of the frame *c*, while the forwardly extending tang *c<sup>2</sup>* of the frame, which lies in a slot in the underside of the receiver *d*, carries at its forward end a thumb screw *c<sup>3</sup>* which is adapted to engage the receiver *d*, the tang having also a toe or cam like projection *c<sup>4</sup>* to coöperate with an inclined shoulder *d<sup>4</sup>* of the receiver *d*, so that when the screw *c<sup>3</sup>* is turned home, the receiver, with the barrel and magazine tube, will be drawn back so that the rear end of the receiver shall be pressed firmly against



the forward face of the frame and held securely locked in position, as will be seen by reference to Figs. 2 and 3, the same parts being shown also in Figs. 4 and 5.

5 The receiver  $d$ , as shown in Figs. 2, 4 and 5, is suitably chambered to receive the sliding breech-block  $g$  which is shown in perspective in Fig. 10. As thus shown the breech-block has a forward tubular extension  $g'$  which telescopes the rear end of the magazine tube  $e$ , whereby the breech-block is properly guided in its movements and also permits the location of the recoil spring directly in rear of the chamber of the barrel, 10 and also the most desirable location of the carrier so that the cartridge can be lifted straight and clear from the end of the magazine tube to a position in alinement with the chamber, and further permits the direct co- 15 operation of the hand operated rod by which the initial loading of the gun is effected.

As shown in Figs. 12 and 13, the rod  $h$  is pivotally connected to a sleeve  $h'$  which slides on the magazine  $e$  and bears at its 25 rear end directly against the forward extension  $g'$  of the breech-block. The operating rod  $h$  is provided on its upper side with two notches  $h^2$  and  $h^3$  which are adapted to engage, respectively, with a lip  $h^4$  on 30 the cap  $f'$  of the fore-end  $f$ . The rod  $h$  is extended rearwardly beyond its pivot and is provided with a spring  $h^5$  which presses the forward end of the rod normally toward the barrel so that one or the other of the notches 35  $h^2$  and  $h^3$  shall engage the lip  $h^4$ . Through the engagement of the notch  $h^3$  with the lip  $h^4$  the operating rod is retained in its normal forward position, and through the engagement of the notch  $h^2$  with the lip  $h^4$  the op- 40 erating rod may be held in its rearward position, with the parts in the positions represented in Fig. 4. Inasmuch as when the gun is held in the hands of the user, in firing 45 position, one finger of the forward hand rests against the forward end of the rod  $h$  with a slight upward pressure, and the exertion of a downward pressure against the end of the rod is necessarily the result of an act of volition, any accidental or unin- 50 tentional movement of the breech-block is unlikely.

The breech-block, as will be seen by reference to Figs. 2 and 10, is chambered or 55 slotted vertically, as at  $g^2$ , in line with the magazine, so as to permit the movement of the fresh cartridge from the magazine rearwardly upon the carrier and then a movement straight up through the breech-block into alinement with the barrel in front of 60 the rear upper portion  $g^3$  of the breech-block which itself constitutes the actual and effective breech-block. In rear of the slot  $g^2$  the breech-block is chambered from its underside and rear end to receive the carrier 65 and is also chambered in its upper portion

$g^3$  to receive the recoil spring  $i$  and the firing pin  $j$  which supports the recoil spring  $i$ .

To form an abutment for the recoil spring and also to form a lock which can be re- 70 moved easily by the fingers to permit the disassembling of the parts for cleaning, repair, etc., there is provided an abutment or lock  $k$ , which is shown clearly in Figs. 6 and 11, as well as in Figs. 2, 4 and 5. This 75 is formed as a plate, slotted as at  $k'$ , to permit the firing pin to move rearwardly and adapted to be seated in a groove  $d^2$  formed in the wall of the receiver  $d$ , near its rear end. The plate is capable of vertical move- 80 ment within the receiver, the rear wall of the groove being cut away below the upper part thereof so as to permit the plate to be withdrawn bodily after it has been lowered sufficiently in the groove. On its rear face 85 the plate  $k$  is formed with a rearwardly projecting block  $k^2$  which, on its lower edge, completes the circle of the rearwardly projecting flange  $d'$  of the receiver  $d$ , as shown in Fig. 6, and is adapted to enter the lower 90 part of the recess  $c'$  formed in the front face of the frame  $c$ , as indicated in Fig. 2, so that when the gun is assembled, as shown in Fig. 2, the abutment  $k$  is not only held from downward movement in the receiver  $d$ , 95 thereby preventing the accidental movement of the abutment, but also bears against the recessed face of the frame  $c$ , thereby providing a solid abutment for the recoil spring. When the gun is taken down, the abutment 100 is still held from accidental downward movement by means to be referred to hereinafter, but when released it can be pulled down and out thereby permitting the breech-block, with all of the parts carried by it, to 105 be removed for cleaning or repair.

Both to prevent loss of the abutment  $k$  and also to afford a convenient point of support for the carrier  $l$ , which is shown in Figs. 2, 4 and 5 and in detail in Fig. 11, 110 the latter is pivoted to the former, as at  $l'$ . The carrier is formed, for the greater part of its length, as a vertical flat plate and at its forward end it is formed with a tubular holder  $l^2$  which is adapted to receive the 115 cartridge from the magazine, as shown in Fig. 2. The holder is slotted on its upper side, as at  $l^3$ , and the edges of the slot are provided at their rear ends with inturned lips  $l^4$ . Forward of the lips  $l^4$  the sides of 120 the holder are cut away, as at  $l^5$ . The edges of the forward portion of the slot  $l^3$  are at such a distance apart as to permit the passage between them of the body of the cartridge but not the rim of the cartridge. 125 The lips  $l^4$  are at such a distance apart as not to permit the passage between them of the body of the cartridge. The notches  $l^5$ , forward of the lips  $l^4$ , are so formed as to permit the cartridge, when its rim end has 130



been raised above the lips  $l^4$ , to be pushed forward into and through the forward portion of the holder and into the chamber of the barrel. On its underside, near its rear end, the carrier  $l$  is provided with a projection  $l^6$  which is beveled off in a vertical plane on its forward end, as at  $l^7$ , and is rounded off on its rear end, as at  $l^8$ . The vertical flat portion of the carrier  $l$  is adapted to move in a narrow vertical slot  $g^4$  (Fig. 3) in the rear lower portion of the breech-block  $g$  and on one of the side walls of the slot is pivoted to swing in a horizontal plane a tapered latch  $g^5$ . A spring  $g^6$  (shown in Fig. 10 and, in dotted lines, in Fig. 3) holds the latch normally in the position shown in Fig. 3. As the breech-block moves rearward from the position shown in Fig. 2 the latch  $g^5$  is pressed back into the wall of the breech-block by the beveled face  $l^7$  of the projection  $l^6$ , so that the carrier is not lifted from its lowest position in the rearward movement of the breech-block, but when the breech-block moves forward from its rearward position, which is shown in Fig. 4, the latch  $g^5$  coacts with the rounded rear end of the projection  $l^6$  and lifts the carrier from the position shown in Figs. 2 and 4 to its highest position, as shown in Fig. 5.

In a narrow slot in the underside of the forward end of the carrier  $l$ , that is, in the bottom of the holder  $l^2$ , is pivoted an L-shaped booster  $m$ , the horizontal rearwardly extending arm of which is adapted to cooperate with the cartridge which then lies in the holder while the short, vertically depending arm is adapted, when the carrier is swung from its lowest position, shown in Figs. 2 and 4, to its highest position, shown in Fig. 5, to cooperate with the head of the rearmost cartridge in the magazine or with the end of the spring plunger therein, as the case may be. The pressure against the short, vertically depending arm of the booster causes the rearwardly extending arm to be thrown upward into the position shown in Fig. 5, thereby lifting the rear end of the cartridge, so that it lines with the bore, and, the forward end already having entered the chamber of the barrel, the cartridge is moved forward by the breech-block into the chamber of the barrel in a substantially straight line. By reason of the inwardly inclined edges of the slot  $l^3$  and by the inwardly turned lips  $l^4$  the cartridge which is being introduced from the magazine into the holder is prevented from being pressed upward by the next cartridge, thereby preventing jamming by two cartridges entering the carrier and, when the cartridge is pushed forward from the holder by the lower edge of the breech-block proper, the rim of the cartridge then resting on the booster  $m$ , the rim of the cartridge is lifted as soon as it passes forward of the lips  $l^4$

and is then pressed forward through the forward portion of the holder into the chamber of the barrel.

When the breech-block is in its forward position, as shown in Fig. 2, the inclined shoulder  $g^7$  which forms the rear wall of the wide opening  $g^2$  in the breech-block, overlies the similarly inclined rear end  $l^9$  of the holder  $l^2$  and therefore prevents the forward end of the carrier  $l$  from moving upward. At the same time the holder is supported near its middle by the latch  $g^5$ , as indicated in Fig. 5. Consequently, when the gun is assembled the abutment  $k$ , which is pivotally connected with the rear end of the carrier  $l$ , cannot be moved downward, whether the receiver is in position in the frame or out of it. It is therefore through the cooperation of the latch  $g^5$  with the carrier  $l$  that the abutment is then held securely locked in position. It cannot be moved down, when the gun is taken down, until, by the operating rod  $h$ , the breech-block  $g$  is moved rearwardly far enough to cause the latch  $g^5$  to be pushed back into the wall of the breech-block by the beveled forward end of the lug  $l^6$  so as to permit the rear end of the carrier with the abutment  $k$  to be dropped down.

The extractor and ejector devices, carried by the breech-block proper, are substantially of ordinary construction, as shown in Fig. 10, and need not be described herein, it being understood that the empty shell is ejected through the ejector opening  $d^5$  in the side of the receiver in the usual manner.

The hammer mechanism is shown particularly in Figs. 2-9. The hammer  $n$  is pivoted in the frame, being entirely inclosed therein except as to the usual thumb piece, and arranged to cooperate with the firing pin  $j$  which extends rearwardly through the abutment  $k$ . The hammer  $n$  is also arranged to be cocked by the rearward movement of the firing pin  $j$  with the breech-block  $g$ , the firing pin being shown as provided on its underside, near its rear end, with a lug  $j'$  to bear against the hammer during the cocking movement. The hammer is provided as usual with a safety notch  $n^1$  and a full-cock notch  $n^2$ . The trigger  $o$  is pivoted as usual in the frame and the sear  $p$  is pivoted independently of the trigger but preferably on the same pivot pin therewith. The main spring  $q$  is shown as a coil spring and cooperates with the hammer in the usual manner. The hammer mechanism is so constructed, as will now be described, that when the hammer has been cocked by the rearward movement of the breech-block it will be held in cocked position until the pull of the trigger is relaxed, so that the trigger is permitted to move forward, and is then pulled again. The sear  $p$ , as shown clearly in Fig. 9, is formed with a toe  $p'$  to engage



the notches  $n^1$  and  $n^2$  of the hammer as usual, and the end of the sear spring  $p^2$  bears against the underside of the toe  $p^1$  to press the toe toward the hammer. The heel  $p^3$  of the sear is adapted to be engaged by the trigger, as hereinafter described, to disengage the toe of the sear from the hammer. The trigger  $o$  has a lug  $o^1$  to form a bearing for the trigger spring  $o^2$  in the usual manner. The sear spring  $p^2$  and the trigger spring  $o^2$  are for convenience formed from one piece of spring metal, although they act independently. The trigger engages the sear, not directly, but indirectly through a latch  $o^3$  which is pivoted on the trigger, as at  $o^4$ , has a forward extension  $o^5$ , is provided with a sear engaging shoulder  $o^6$  and is acted upon by a spring  $o^7$  so that the upper part is normally thrown forward toward the pivot of the trigger and the sear, with the shoulder  $o^6$  in position to engage the heel  $p^3$  of the sear. As the hammer reaches its forward position, shown in Fig. 2, the hub of the hammer makes contact with the forward extremity of the latch  $o^3$  and throws the latch back so as to disengage the shoulder  $o^6$  from the heel of the sear. It will now be understood that when the breech-block is moved from its forward position, shown in Fig. 2, to its rearward position, shown in Fig. 4, the hammer  $n$  will thereby be moved to the full-cock position in which it will be held by the engagement of the sear  $p$  with the full-cock notch  $n^2$ . If there is no backward pressure on the trigger when the hammer is thus moved back to full-cock position, the latch  $o^3$  is then in such position that its shoulder  $o^6$  will slip under the heel  $p^3$  of the sear so that a single backward pull on the trigger will disengage the sear and release the hammer. If, however, the trigger is held in its rearmost position when the hammer is cocked, as is likely to be the case when the gun is operating automatically, the latch  $o^3$  is then held in the position indicated by dotted lines in Fig. 2 in which the shoulder  $o^6$  stands higher than the lower edge of the heel  $p^3$  of the sear and does not engage the heel of the sear. Consequently, if the hammer is cocked while the trigger is pressed back the sear will nevertheless engage the hammer and hold it in full-cocked position. In order to release the hammer it is then necessary to relax the pressure on the trigger and permit it to move forward until the shoulder  $o^6$  on the latch  $o^3$  drops below the heel  $p^3$  of the sear and then to pull the trigger, in which latter movement the sear will be coupled to the trigger by the latch  $o^3$  and will be disengaged from the hammer, permitting the latter to fall. As already stated, the hub of the hammer, as the latter reaches its forward position, throws the latch  $o^3$  back and disengages the shoulder  $o^6$  from the heel  $p^3$

of the sear, leaving the sear in position to engage the hammer when it is cocked again.

It will be obvious that some of the features of improvement hereinbefore described are capable of use independently of the other features and also that various changes in details of construction and arrangement of parts may be made without departing from the spirit of the invention, which is therefore not limited to the particular embodiment which has been chosen herein for illustration of the nature of the several features of the invention.

I claim as my invention:

1. In a firearm, the combination of a frame, a receiver, the proximate faces of said parts being formed respectively with an interengaging recess and projection adapted for engagement by straight endwise movement, a tang on one of said parts having a beveled shoulder to cooperate with a corresponding shoulder on the other of said parts, and means to draw said beveled shoulders together to force the frame and receiver together in a longitudinal direction.

2. In a firearm, the combination of a frame, a receiver, the proximate faces of said parts being formed respectively with an interengaging recess and projection adapted for engagement by straight endwise movement, a tang on one of said parts having a beveled shoulder to cooperate with a corresponding shoulder on the other of said parts, and a screw carried by said tang and adapted to engage the other of said parts to draw said beveled shoulders together to force the frame and the receiver together in a longitudinal direction.

3. In a firearm, the combination of a frame having a substantially vertical front face with a recess therein, a receiver having a substantially vertical rear face with a projection to enter said recess, a tang extended forwardly from the frame and having a beveled shoulder to engage a corresponding shoulder of the receiver and a screw passing through the tang into the receiver to draw said parts together.

4. In a firearm, the combination of a frame having an abutment for the receiver, a receiver, a barrel, the barrel and the receiver being secured together and removable together from the frame, a breech-block movable in said receiver and an abutment in rear of the breech-block and detachably secured in the receiver.

5. In a firearm, the combination of a frame having an abutment for the receiver, a receiver grooved internally and transversely near its rear end, a barrel, the barrel and the receiver being secured together and removable together from the frame and an abutment plate having its edges engaged in the grooves of the receiver.

6. In a firearm, the combination of a



frame having a substantially vertical front face with a recess therein, a receiver and an abutment detachably secured in the end of the receiver and projecting rearwardly therefrom to enter the recess in the frame.

7. In a firearm, the combination of a frame having an abutment for the receiver, a receiver, a barrel, the barrel and the receiver being secured together and removable together from the frame, a breech-block movable therein, said receiver being open at its rear end to permit the removal of the breech-block, and an abutment detachably secured in the open end of the receiver to prevent removal of the breech-block.

8. In a firearm, the combination of a frame having an abutment for the receiver, a receiver, a barrel, the barrel and the receiver being secured together and removable together from the frame, a breech-block movable in said receiver, said receiver being open at its end to permit the removal of the breech-block and being formed internally with transverse grooves, an abutment plate adapted to enter said grooves to close the receiver, and means to lock said abutment plate against movement in the grooves.

9. In a firearm, the combination of a frame having an abutment for the receiver, a receiver, a barrel, the barrel and the receiver being secured together and removable together from the frame, a breech-block longitudinally movable in said receiver, a firing pin extended rearwardly from the breech-block and an abutment detachably secured in the receiver and slotted to permit the movement of the firing pin therethrough.

10. In a firearm, the combination of a frame having an abutment for the receiver, a receiver, a barrel, the barrel and the receiver being secured together and removable together from the frame, a breech-block movable longitudinally in said receiver, a firing pin extended rearwardly from the breech-block, a recoil spring supported by the firing pin and an abutment detachably secured in the receiver to close the end thereof and slotted to permit the movement of the firing pin therethrough.

11. In a firearm, the combination with a receiver, a barrel and a magazine tube, of a breech-block movable longitudinally in the receiver and having a tubular forward extension to telescope the magazine tube, a

sleeve surrounding the magazine tube forward of the breech-block, a catch in fixed relation with the barrel, and a spring-pressed operating rod pivotally connected with the sleeve and notched to engage the catch.

12. In a firearm, the combination of a receiver, a chambered breech-block movable longitudinally therein, a pivoted cartridge carrier movable within the chambered breech-block and having on its lower side a cam lug, and a latch pivoted in the wall of the breech-block and adapted to cooperate with the cam lug to lift the carrier during the forward movement of the breech-block and to be pushed back by the cam lug during the rearward movement of the breech-block.

13. In a firearm, the combination of a receiver, a chambered breech-block movable longitudinally therein, a pivoted cartridge carrier movable within the chambered breech-block and having on its lower side a lug with a laterally beveled forward end and a cam-shaped rear end, and a latch pivoted in the wall of the breech-block and adapted to cooperate with the cam shaped rear end of the lug to lift the carrier during the forward movement of the breech-block and to be pushed into the wall of the breech-block by the beveled forward end of the lug during the rearward movement of the breech-block.

14. In a firearm, the combination of a receiver, a breech-block movable longitudinally therein, an abutment detachably secured in the receiver, a cartridge carrier pivotally connected with the abutment, and means to operate the carrier during the movement of the breech-block.

15. In a firearm, the combination of a hammer, a trigger, and a spring-pressed latch pivoted on the trigger and adapted to form an operative connection between the trigger and the sear, said latch having an extension for contact with the hammer, whereby, as the hammer falls, the latch is moved out of engagement with the sear.

This specification signed and witnessed this 26th day of May A. D. 1910.

EDWARD E. REDFIELD.

Signed in the presence of—

ALBERT F. CROWTHER,  
CHARLES R. LOVELAND.