(No Model.)

5 Sheets—Sheet 1.

C. J. EHBETS.

FIREARM.

No. 580,935. Patented Apr. 20, 1897.

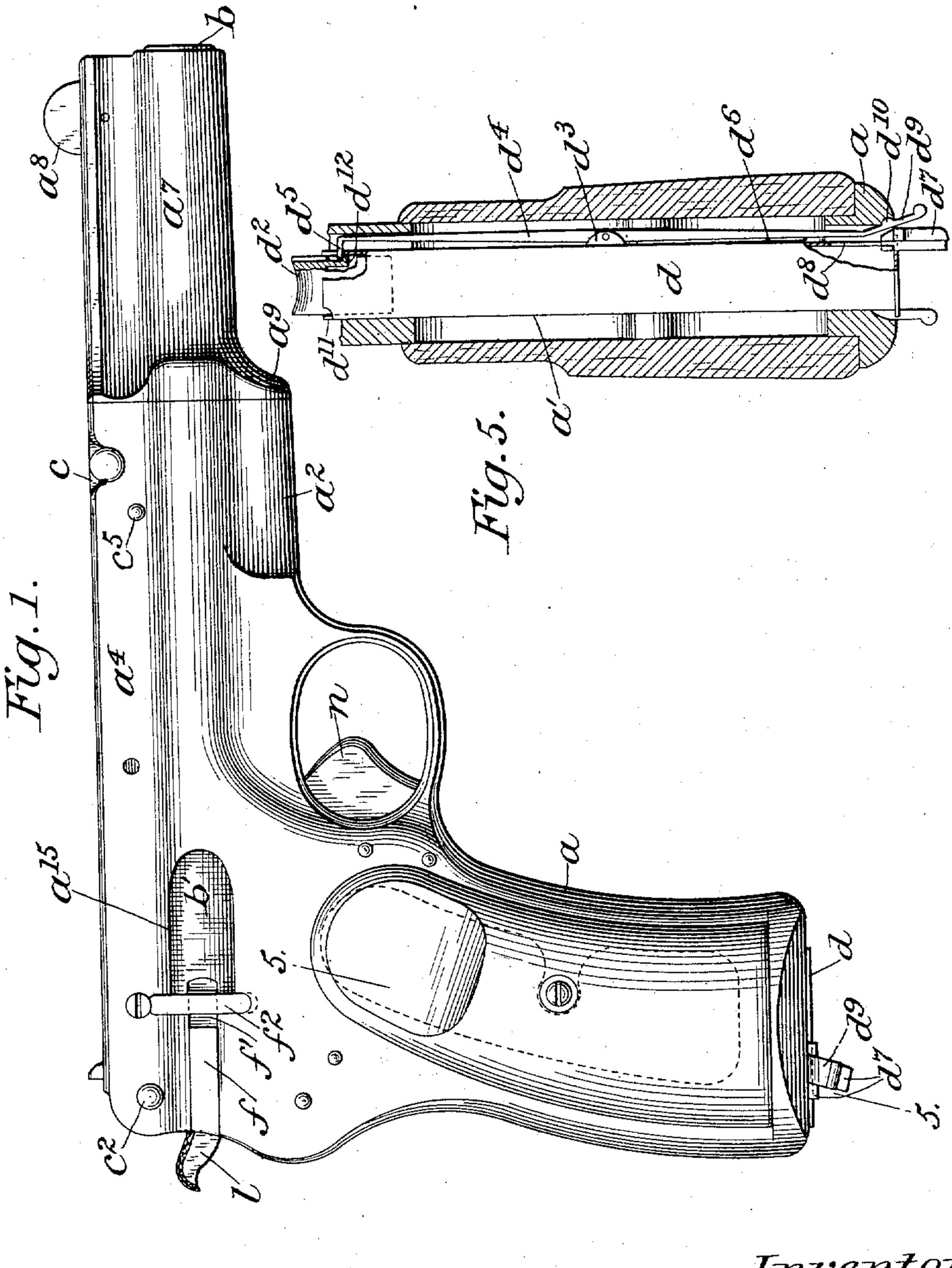


Fig. 1.

Fig. 5.

Attest:
A. N. Jesbera.
F. M. Eggleston.

Inventor:
Carl J. Ehbets
by Redding & Kiddle
Attys.

(No Model.) 5 Sheets—Sheet 2.

C. J. EHBETS.

FIREARM.

No. 580,935. Patented Apr. 20, 1897.

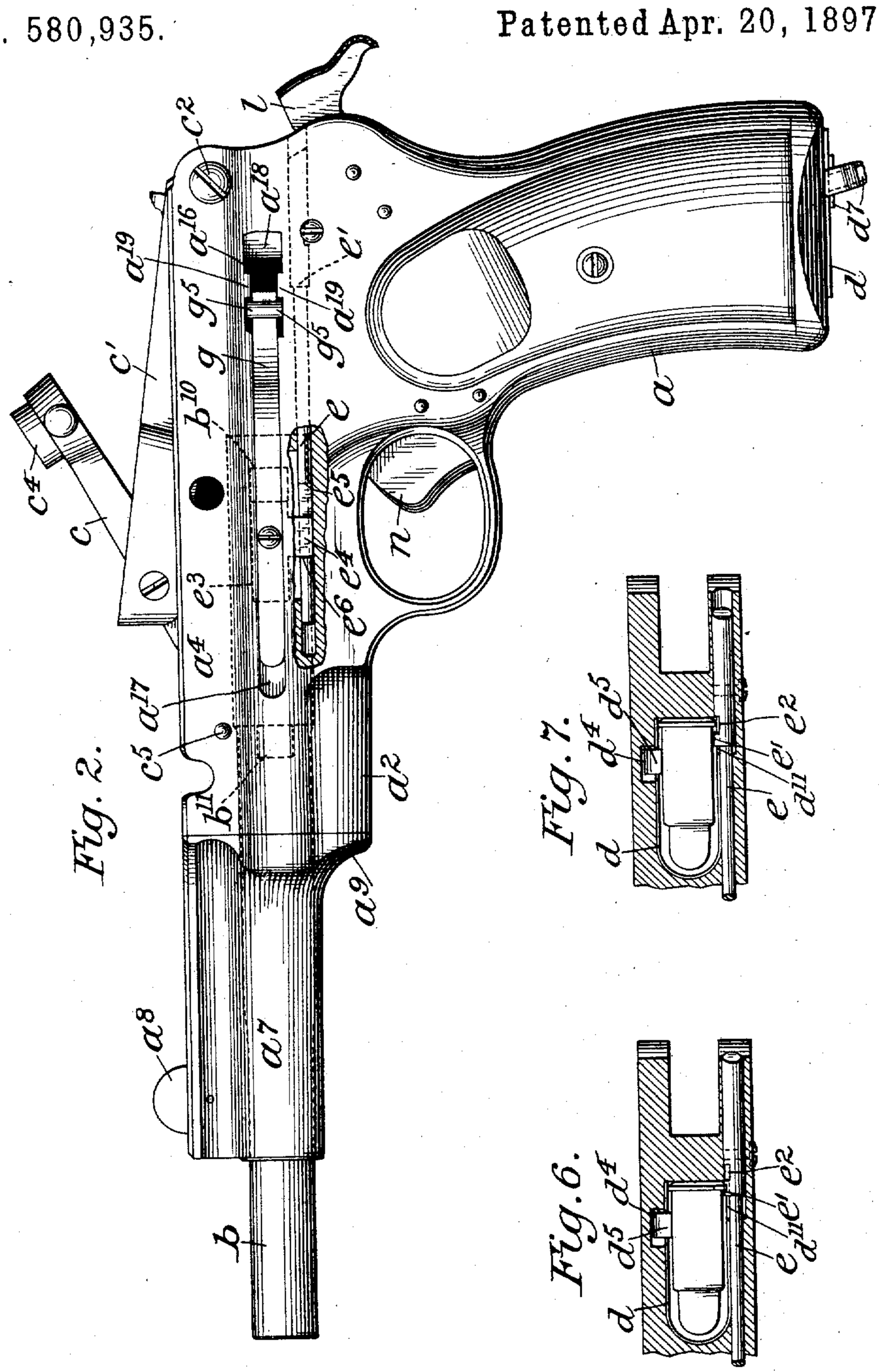


Fig. 2.

Fig. 7.

Fig. 6.

Attest:
A. N. Jesbera.
F. M. Eggleston.

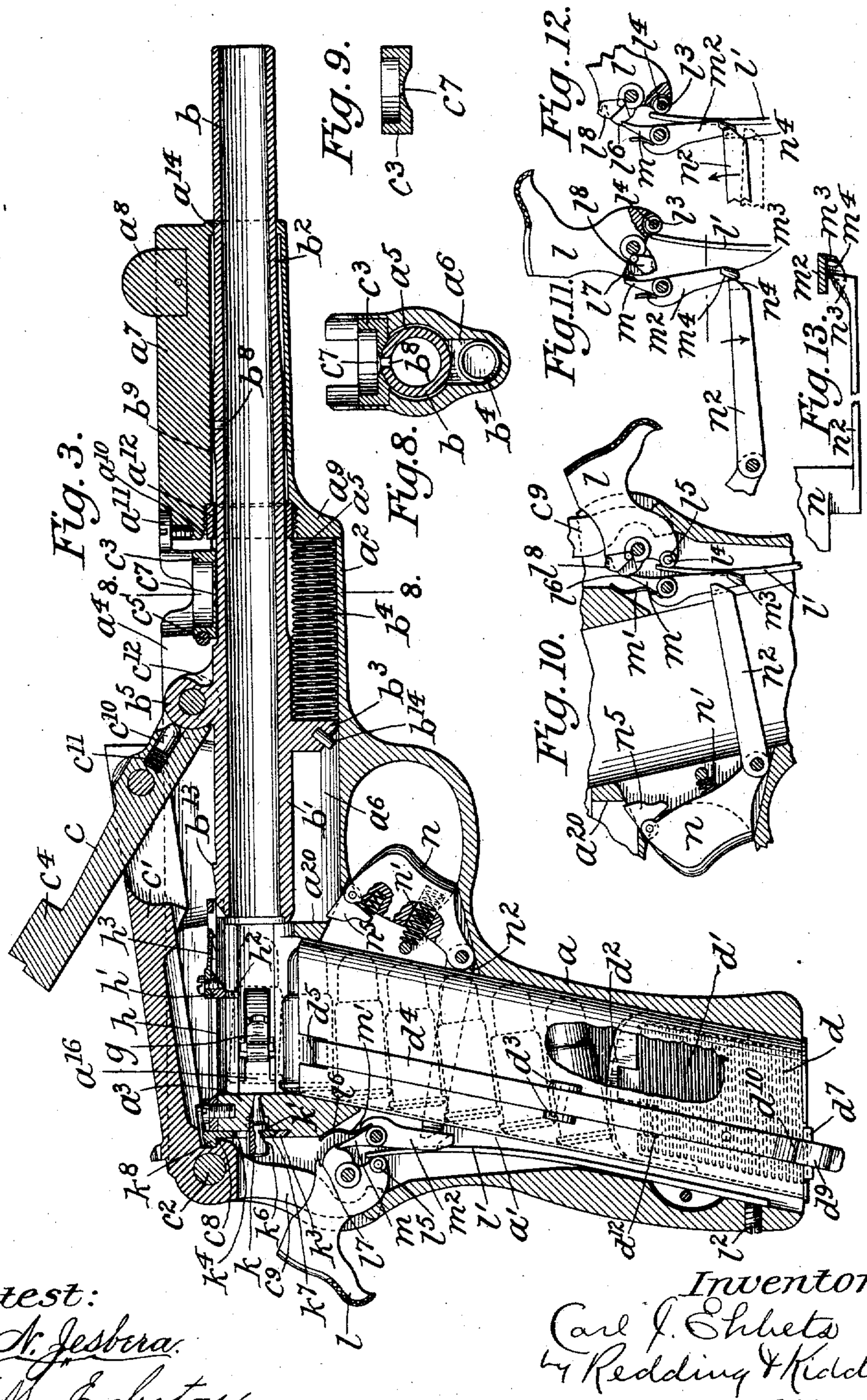
Inventor:
Carl J. Ehbets
by Redding & Riddle
Attys.

(No Model.) 5 Sheets—Sheet 3

C. J. EHBETS.

FIREARM.

No. 580,935. Patented Apr. 20, 1897.



Attest:
A. St. Jesbera.
F. M. Eggleston.

Inventor:
Carl J. Ehbets
by Redding & Riddle
Attys.

(No Model.) 5 Sheets—Sheet 4.

C. J. EHBETS.

FIREARM.

No. 580,935. Patented Apr. 20, 1897.

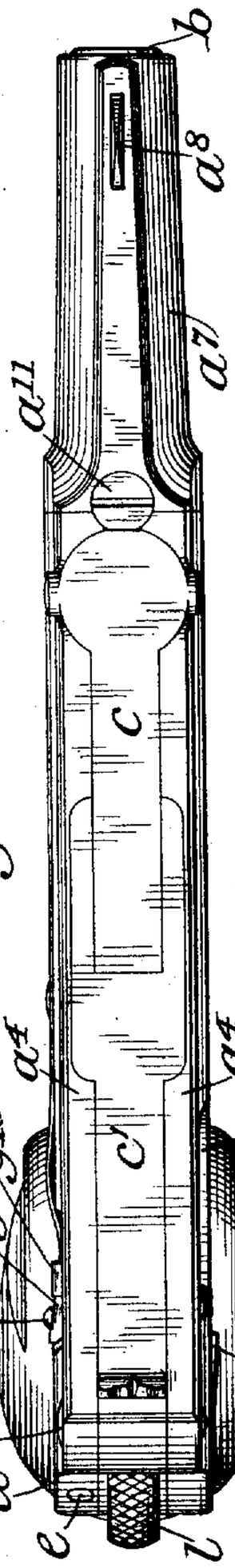


Fig. 4.

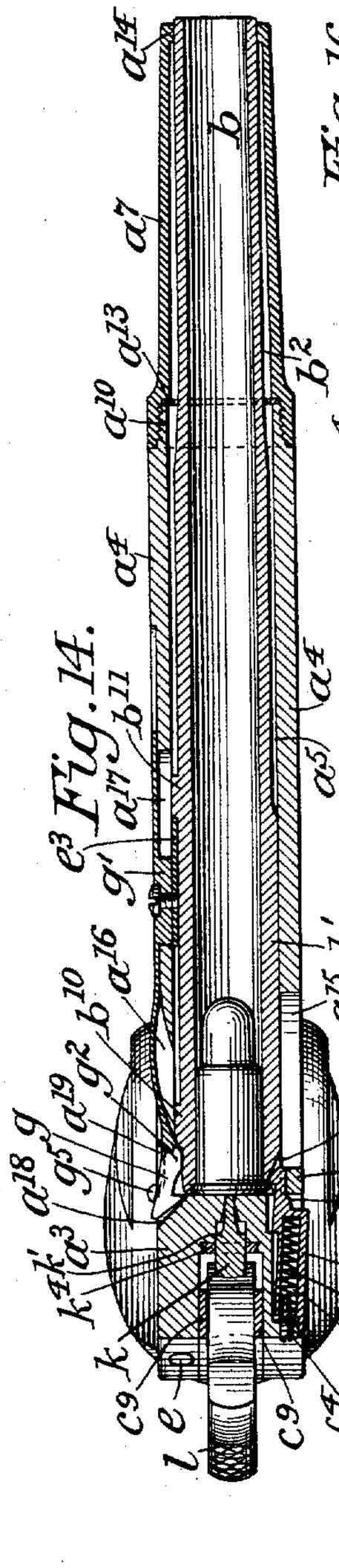


Fig. 14.

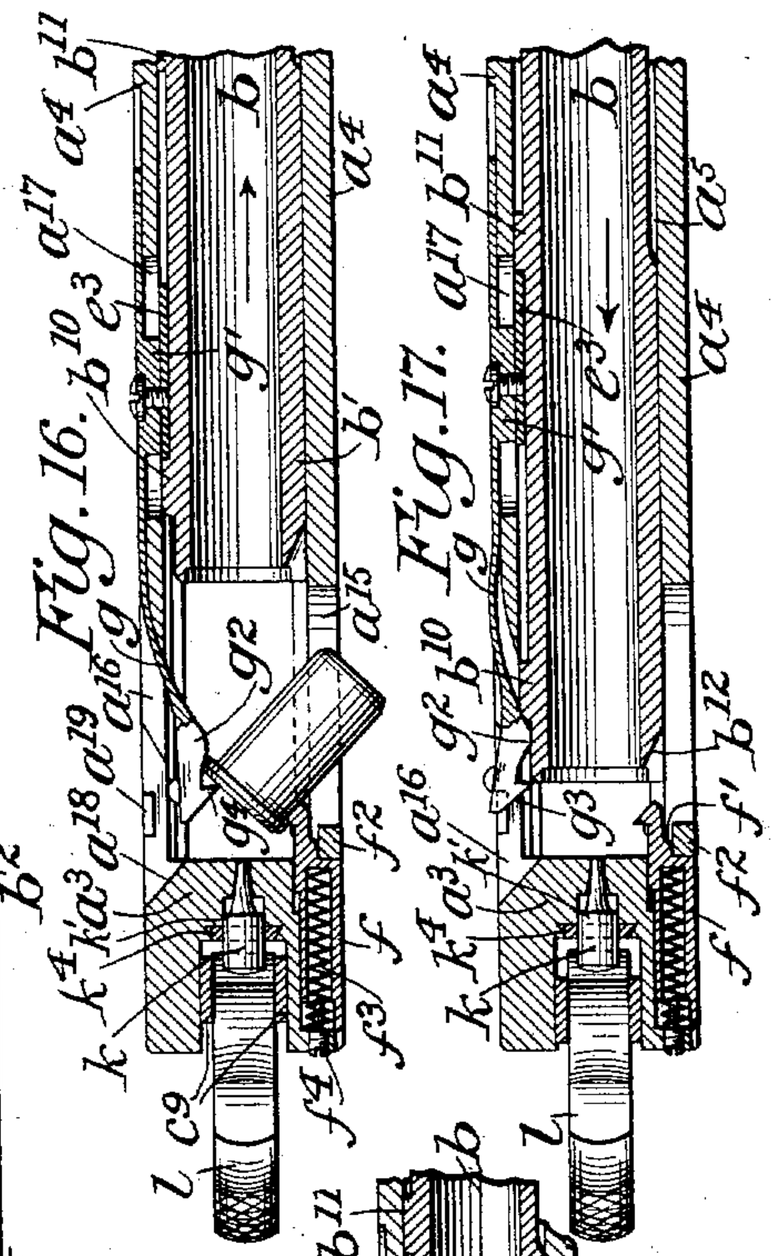


Fig. 16.

Fig. 17.

Fig. 15.

Attest:
A. H. Jesbera.
F. H. Eggleston.

Inventor:
Carl J. Ehbets
by Redding & Kiddle
Attys.

(No Model.) 5 Sheets—Sheet 5.

C. J. EHBETS.

FIREARM.

No. 580,935. Patented Apr. 20, 1897.

Fig. 22.

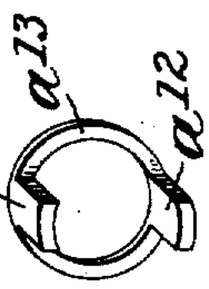


Fig. 24.

Fig. 21.

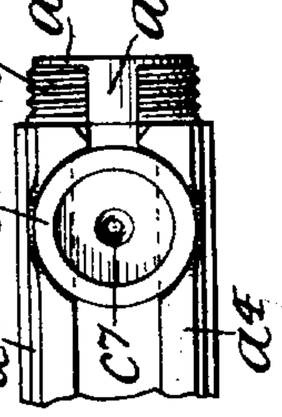


Fig. 20.

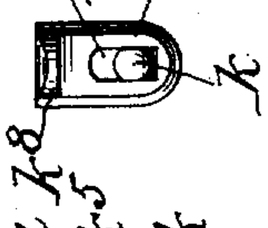


Fig. 23.

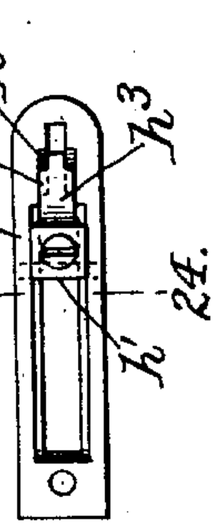


Fig. 19.

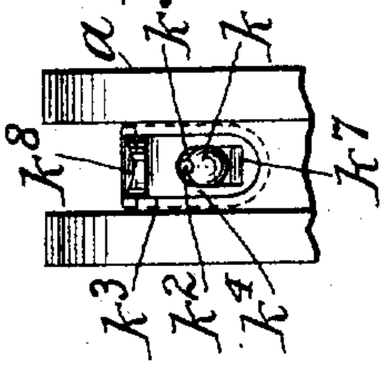


Fig. 25.

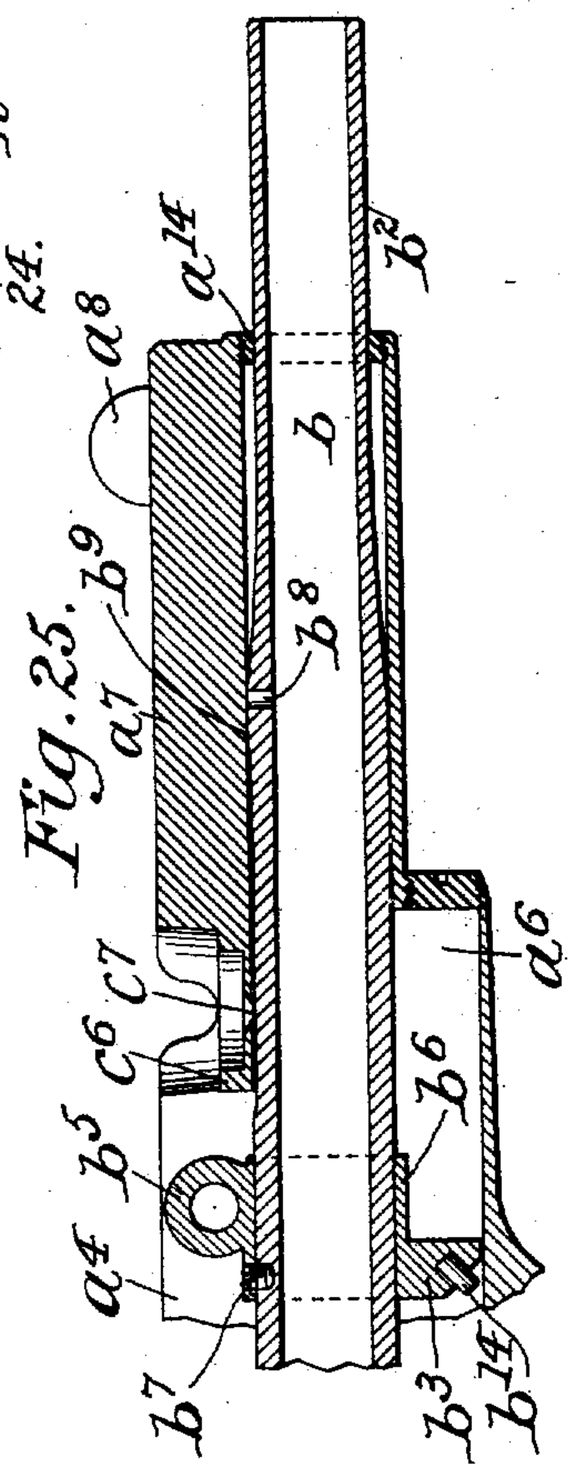
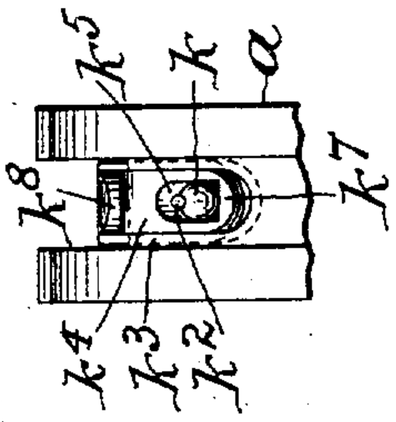


Fig. 18.



Attest:
A. N. Jesbera.
F. M. Eggleston.

Inventor.
Carl J. Ehbets
by Redding & Kiddle
Attys.

UNITED STATES PATENT OFFICE.

CARL J. EHBETS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE COLT'S PATENT FIRE ARMS MANUFACTURING COMPANY, OF SAME PLACE.

FIREARM.

SPECIFICATION forming part of Letters Patent No. 580,935, dated April 20, 1897.

Application filed February 14, 1896. Serial No. 579,229. (No model.)

To all whom it may concern:

Be it known that I, CARL J. EHBETS, a citizen of the United States, residing in the city and county of Hartford, State of Connecticut, 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.

The particular result which I have had in view in my present invention has been the production of an improved automatic magazine-pistol, and the invention may therefore be said to relate in a general way to automatic breech-loading firearms. It will be readily understood, however, especially as this description proceeds, that various features of the invention which are incidental to the attainment of the particular result aimed at and referred to above are not restricted in their applicability to firearms of the particular class referred to, but are capable of being applied with good results to firearms of other classes. It is therefore to be observed that while I have in the accompanying drawings illustrated the invention as embodied in an automatic magazine-pistol and have hereinafter described the various features of the invention in their most approved form with especial reference to their use in such a pistol nevertheless I do not intend thereby to restrict my invention to the particular construction shown and described, nor even to the combination of the several features together in a single firearm of any description, and that I do intend to cover each feature as broadly as the state of the art will permit without regard to the particular kind of firearm and without regard to the particular combination of other parts or features in which it may be employed.

In order that the detailed description of the particular construction which I have chosen to illustrate as an embodiment of the invention may be more easily understood and the relations of the various parts more quickly comprehended, I will proceed to enumerate some of the main features of the invention, indicating briefly and in a general way the character of each. In the first place my invention resides in part in the form and construction of the frame—that is to say, that portion of the firearm which supports the barrel, firing mechanism, &c.—the object being in part to adapt the frame for coöperation with other features of the invention and in part to improve the construction thereof without regard to the special character of other portions of the firearm. I have also improved the construction of the holder which in a magazine-firearm such as a pistol receives the cartridges and is itself inserted within the frame, whereby the cartridges are more securely held when the holder is outside of the frame and whereby the delivery of the cartridges from the holder to the cartridge-chamber of the barrel may be perfectly regulated and controlled.

The barrel of the firearm, as heretofore, is provided with a vent in rear of the muzzle, through which the gases escape to act upon mechanism by which the empty shell is extracted and ejected, a fresh cartridge inserted in the barrel, and the firing mechanism set; but in the improved firearm the barrel is arranged to slide in the frame instead of being fixed, whereby, as will more clearly appear hereinafter, the construction and arrangement of other operating parts of the firearm are simplified and improved and the liability to accident is reduced to a minimum. Devices are provided whereby the delivery of each cartridge in succession into the cartridge-chamber of the frame is so controlled as to render it practically impossible for any cartridge to get out of position in such a manner or to such an extent as to interfere in any way with the proper insertion of the cartridge in the barrel. The shell extracting and ejecting devices have also been improved, so as to insure the removal of each empty shell in succession with absolute certainty and without any possible interference with the feeding of the next fresh cartridge. The firing-pin is so constructed as that it shall be very small and therefore very light, which, as is well known, is a highly desirable quality. Provision is also made for retracting the firing-pin positively after each operation, so that it cannot by any possibility come in contact with the primer of the fresh cartridge until the firing mechanism is purposely operated.

The lock mechanism is so constructed as to dispense altogether with any loose intermediate part between the trigger and the sear, notwithstanding the location, in a pistol, of the trigger in front of the grip or handle, which constitutes the magazine, and of the hammer in rear of the same, and whereby the sear is left free to engage and hold the hammer at full-cock until the trigger has been released by the finger of the operator and again pressed, and the safety device, which prevents the effective movement of the trigger until all parts are in position for the discharge of another cartridge, is made extremely simple and certain in its action.

The several working parts of the pistol or other firearm are also so combined and arranged that the work to be done by the part set in motion by the escaping gases is distributed throughout the movement of such part, thereby preventing any excessive strain upon the working part at any one point and insuring the certain and proper action of all of such parts.

Other features and details of improvement will appear more clearly hereinafter.

In the accompanying drawings, in which I have illustrated an embodiment of my invention, Figure 1 is a right-hand side elevation of a gas-operated magazine-pistol closed—that is to say, with the parts in position for firing, but with the hammer down. Fig. 2 is a left-hand side elevation of the same, but open—that is to say, with the parts in a position which they assume during action and with the hammer cocked—a portion of the frame being broken out to show parts within. Fig. 3 is a vertical central section of the same seen from the right and with the parts in the positions represented in Fig. 2, the cartridge-holder being shown in side elevation and the position of the cartridge in the receiving-chamber above the magazine being indicated by dotted lines. Fig. 4 is a plan view of the pistol closed, as seen from above. Fig. 5 is a partial section on the plane indicated by the line 5 5 of Fig. 1, illustrating the construction and arrangement of the cartridge-holder in relation to the frame. Figs. 6 and 7 are partial horizontal sections through the rear of the frame, illustrating the construction, arrangement, and operation of the escapement device which controls the delivery of cartridges from the holder, the escapement device being represented in different positions in the two views. Fig. 8 is a transverse section on the plane indicated by the line 8 8 of Fig. 3. Fig. 9 is a detail view in cross-section of a slightly-different form of the gas-cup from that shown in Figs. 3 and 8. Fig. 10 is a view in elevation of the firing mechanism as seen from the left, a portion of the frame being also represented in vertical central section. Figs. 11 and 12 are detail views showing the different positions assumed by parts of the firing mechanism during operation. Fig. 13 is a detail plan view, on a somewhat larger scale than Figs. 10, 11, and 12 and partly broken out, illustrating the relation of the trigger-arm and sear. Fig. 14 is a horizontal section of the pistol in a plane of the axis of the barrel, the parts being represented in position for firing, with the hammer cocked. Figs. 15, 16, and 17 are partial views similar to Fig. 14, illustrating particularly the operation of the extractor and ejector and the movement of these parts during the operation of the pistol. Figs. 18 and 19 are rear views of the breech-block, illustrating particularly the construction and operation of the retractor for the firing-pin. Fig. 20 is a detail view illustrating a slightly-different form and arrangement of the firing-pin. Fig. 21 is a detail plan view of the forward portion of the fixed frame with the gas-cup in position and with the filling-ring, hereinafter referred to, in place. Fig. 22 is a perspective view of the filling-ring shown in Fig. 21. Fig. 23 is a detail plan view of the cartridge-stop. Fig. 24 is a section on the plane indicated by the line 24 24 of Fig. 23. Fig. 25 is a vertical central section of the forward part of the frame and of the barrel, illustrating a modification of construction hereinafter referred to.

The frame which receives and supports the various working parts preferably combines in one piece a grip or handle a, which is hollowed out to form a magazine-chamber a' for the reception of the cartridge-holder, hereinafter referred to, and a receiver a^2, which supports the barrel. The grip or handle a is recessed as may be necessary to receive and support the firing mechanism and near its top is provided with an abutment a^3, Figs. 3, 14, 15, 16, and 17, which unites the side walls of the frame and forms a solid breech-block, which is integral with the frame, and therefore removes altogether the danger which exists in the use of pistols with movable breech-blocks of injury from the flying backward of the breech-block in case of the breakage of its connection. The upper part of the grip and the receiver a^2 are milled or otherwise hollowed out from the upper surface downward to form two side walls or cheek-pieces a^4, between which the levers hereinafter referred to are received and supported, and to form a seat a^5, Figs. 3, 8, and 14, in which the barrel is supported with freedom to slide longitudinally. The frame is also recessed below the seat a^5 to form a communicating chamber a^6 for the reception of a reaction-spring, hereinafter referred to, being thus divided vertically from the top downward to but not through the under side of the receiver. For convenience in manufacture the receiver a^2 is preferably made quite short, and an independent extension a^7 is provided to properly support the barrel and front sight a^8, as well as to form an abutment a^9 for the reaction-spring and to stiffen and bind together the two parts of the divided frame. To support this extension or jacket a^7, the

forward end of the frame or receiver a^2 is provided about the aperture of the barrel-seat a^5 with a screw-threaded boss a^{10}, Figs. 3, 4, 14, and 21, upon which the extension or jacket a^7 is screwed, being locked in position by a screw a^{11}, whose head is seated partly in the top of the receiver and partly in the top of the jacket or extension. In the construction represented in Figs. 3 and 21 this boss a^{10} is slotted at top and bottom to correspond with the recessing of the receiver a^2 and to permit the introduction of the barrel, as hereinafter described. In order that the receiver may be practically rigid when all of the parts of the arm are assembled, I have provided filling-pieces to fit in and fill the slots in the boss or in the extremity of the frame, and which yet are readily removable to permit the removal of the barrel when required. These filling-pieces are formed as lugs a^{12} on a ring a^{13}, (shown clearly in Figs. 21 and 22,) which has a seat formed therefor in the rear of the extension or jacket a^7.

The barrel b in the embodiment of the invention represented in the drawings is arranged to slide longitudinally in the frame in the seat a^5, formed for that purpose, and in the extension or jacket a^7, and in order that the friction on the barrel may be reduced to a minimum the rear end of the barrel is made slightly larger than the body thereof, as at b', so as to have a close sliding fit in the seat a^5, while the forward extremity of the extension or jacket a^7 is formed with a narrow annular bearing a^{14} to have a close sliding fit on the reduced forward portion b^2 of the barrel b, while between these two bearings the barrel and the frame are practically out of contact. On its under side the barrel is provided with a lug or projection b^3, which enters and moves in the spring-chamber a^6 and receives the pressure of the reaction-spring b^4. On its upper side the barrel is provided with a lug or projection b^5, which furnishes a point of attachment for the gas-lever, hereinafter referred to. These lugs b^4 and b^5 in the construction represented in Fig. 3 are integral with the barrel, which necessitates the slotting of the boss a^{10} and of the forward extremity of the frame, as already described, so that the barrel may be introduced into the seat a^5 of the frame from the front. If for any reason, however, it is undesirable to slot the boss a^{10} and the extremity of the frame, as stated, the lugs b^3 and b^5 may be formed upon a band or ring b^6, as represented in Fig. 25, which may fit closely about the barrel, but yet permit the barrel to be inserted into it while it is held in the frame, the band or ring being further secured by a screw b^7 or by any other suitable means. This modification permits the front extension or jacket a^7 to be made integral with the frame, as shown in Fig. 25, the front opening of the barrel-seat being closed by the bushing a^{14} and the spring-chamber by a screw-plug.

At a suitable point in rear of the muzzle the barrel is provided with an opening or vent b^8, through which a portion of the gases of explosion may escape to act upon the mechanism through which the operation of the working parts of the arm is effected. The escaping gases act upon a gas-lever c, (shown in Figs. 2, 3, and 4,) but instead of being pivoted to the frame or to any other fixed part, as heretofore, the gas-lever in the present case is pivoted directly to the sliding barrel b, the lug b^5 being provided for this purpose, and in the construction herein described provision is made for permitting the required longitudinal movement of the barrel by supporting the gas-lever by means of a brace-lever c', which is pivoted between the side walls a^4 of the frame, as at c^2, and is forked at its forward end to embrace the gas-lever c, so that when the arm is closed, as represented in Figs. 1 and 4, both the brace and the gas lever shall lie down snugly between the walls a^4 of the frame, in which position the end of the gas-lever overlies the vent b^8 of the barrel b. In order that the escaping gases may act upon the gas-lever properly, I prefer to provide a gas-cup c^3, which is supported wholly by the frame, is entirely independent of the barrel b, which must of necessity move with respect to the gas-cup, and is entered by a plug c^4 on the gas-lever c.

If the forward end of the frame is slotted from the top downward, as hereinbefore described, the gas-cup c^3 is not integral with the frame, but is held to its seat therein by a pin c^5 or by other suitable means. The gas-cup, as well as the forward extension or jacket a^7, may, however, be made integral with the frame, as shown at c^6 in Fig. 25, in which case the extremity of the frame is not slotted. The lugs b^3 and b^5 are secured to the barrel b, after its insertion in the forward end of the frame, by means of the band or ring b^6, as already described, and the front bearing a^{14} is in form of a bushing attached to the frame after the insertion of the barrel. Whether the gas-cup be integral with the frame or independent thereof, it is formed with a hole c^7, which registers with the vent b^8 of the barrel b when the latter is at rest in its rearward position, so that at the instant of explosion the gases may impinge upon the gas-lever and effect the desired movement of the parts. The bottom of the gas-cup is formed to fit against the barrel when the latter is in its normal position, as already described, and preferably the bottom is reduced in thickness about the hole c^7 to form a thin knife-edge, which shall operate in the well-known manner of a gas-check to prevent leakage of gases, at the instant of explosion, between the gas-cup and the barrel, the pressure of the gases between the bottom of the gas-cup and the plug c^4 forcing the thin knife-edge down against the barrel. Although this close fit of the bottom of the gas-cup against the barrel is desirable at the instant of explosion, nevertheless it is equally desirable that immedi-

ately thereafter, and as the barrel commences to move, the gas-cup shall be free from the barrel, so as to reduce the friction on the latter. For this purpose the barrel is reduced in its external diameter a trifle a short distance in rear of the vent b^8, so as to form a seat for the gas-cup at the instant of explosion, but to provide for clearance between the barrel and the gas-cup after the barrel has moved forward slightly, such arrangement being represented in Fig. 3 at b^9.

The frame having a suitable opening a^{15}, Figs. 1 and 14 to 17, inclusive, primarily intended for the ejection of the empty shells, but which will also permit the introduction of a loaded cartridge into the cartridge-receiving chamber in rear of the barrel when the latter is in its forward position for insertion into the barrel as the latter is moved back, it is obvious that, if desired, the arm may be operated manually to effect the loading and that cartridges may be introduced and fired one at a time. The arm is, however, intended for use as a magazine-firearm, and for this purpose the grip or handle a is made hollow to form a magazine-chamber. The cartridges are preferably placed first in a holder d, which is then introduced into the magazine-chamber through the aperture in the bottom of the grip. The construction and arrangement of the holder which I prefer to employ for this purpose are clearly represented in Figs. 3 and 5. It comprises a suitable case of sheet metal, which is adapted to receive the cartridges one upon another and is provided with a spring d' and follower d^2, which press the cartridges upward toward the delivery end of the holder. In a suitable bracket d^3 upon one side of the holder is pivoted a lever d^4, which has at its upper end a finger d^5 to project inward over the cartridges, and thereby prevent their escape from the holder when the latter is outside of the grip or handle, while its lower end is in proximity to the lower end of the holder in convenient position to be operated by a finger of the same hand which grasps the holder in charging it. A spring d^6 acts upon the lever d^4 to maintain the finger normally in the path of the cartridges, while permitting the lever to be operated to withdraw the finger, and thereby permit the feed of the cartridges to be regulated and controlled by other means. In order to prevent the accidental release of the cartridges when the holder is out of the arm, a block d^7 is mounted to slide in a slot d^8, formed in the holder under the lower end of the lever d^4, so that when said block is pushed upward under the end of the lever the latter will be held positively from movement to release the cartridges, while at the same time the block may be readily pushed from under the end of the lever to leave it free. The lower end of the lever d^4 is bent outward or otherwise formed with an incline or cam-surface d^9 for coöperation with the lower edge of the grip a, so that as the holder is inserted in the grip the lever d^4 is shifted to withdraw the finger d^5 from the path of the cartridges. The inclined portion of the lever is preferably also provided with a rounded projection d^{10} for engagement with a corresponding recess in the lower edge of the grip to retain the holder in place. The lever has sufficient movement when the holder is in place in the grip to permit of the engagement of said projection with the recess and its disengagement therefrom by the application of pressure upon the projecting end of the lever. The block d^7 stands in line with the wall of the chamber in the grip, so that as the holder is introduced the block is by the same action thrust outward to release the lever d^4. The upper left-hand rear corner of the holder is notched or cut away, as at d^{11}, for a purpose presently to be described.

The follower d^2 is provided with a dropped shoulder d^{12} for engagement with the finger d^5 of the lever d^4, which at all times projects at least slightly within the wall of the case d and into the path of said shoulder, so that the follower is permitted to rise to the height necessary to place the last cartridge in position in the chamber above the magazine and yet is prevented from being itself thrown out of the case.

As the cartridges are no longer held by the finger d^5 of the lever d^4 when the holder is in place in the arm, it becomes necessary to provide an escapement device of some sort, which shall be operated at the proper times to permit or prevent the escape of the cartridges from the holder into the cartridge-receiving chamber of the frame. The device which embodies this part of my invention is represented in Figs. 2, 6, and 7. As there shown it comprises a rod e, which is arranged to have a limited longitudinal movement in a suitable hole formed therefor alongside of the barrel-seat a^5. This rod normally stands in the position represented in Fig. 6 and is provided with a projection or shoulder e', which projects into the notch d^{11} in the holder d and therefore stands in the path of the head of the uppermost cartridge in the holder, and the distance between such projection or shoulder e' and the opposite side of the holder d is less than the diameter of the cartridge-head, so that the cartridge cannot escape. In rear of the projection or shoulder e' the rod e is reduced or formed with a notch e^2, which in the forward movement of said rod e is brought into line with the head of the cartridge and permits it to escape into the cartridge-receiving chamber of the frame. It will of course be understood that the forward end of the uppermost cartridge is overlaid by the barrel except when the latter is in its extreme forward position and that the function of the escapement device is therefore mainly to hold down the head end of the cartridge, so that when the cartridge is finally released it shall move into the cartridge-receiving chamber of the frame with its axis substantially in parallelism with the axis of

the barrel. The movement of the escapement device to release the head of the cartridge will therefore take place when the barrel approaches the limit of its forward movement and after the empty shell has been ejected from the chamber. I prefer, therefore, to cause the barrel itself to actuate the escapement-rod at the proper time, and for this purpose the rod is provided with two shoulders or projections for engagement with the barrel or with an intermediate part, the one at the end of the forward movement of the barrel to release the cartridge and the other at the end of the rearward movement of the barrel to move the projection e' into the path of the head of the next cartridge. The lost motion between the barrel and the escapement permits the latter to be stationary except when movement is required and reduces the length of movement requisite to effect the desired purpose. Between the barrel and the frame is disposed a slide-plate e^3, which serves an additional purpose, hereinafter referred to, but as it may be employed also to actuate the escapement it is used for this purpose instead of actuating the escapement directly by contact with the projection on the barrel. This plate or slide e^3 has a tongue e^4, which is arranged to make contact with either the shoulder e^5 or the shoulder e^6 on the rod e, as clearly shown in Fig. 2, and it is itself adapted to be moved in one direction or the other near the end of the forward or the end of the rearward movement of the barrel by lugs or projections b^{10} b^{11}, which are formed on the side of the barrel b, as clearly shown in Figs. 14, 15, 16, and 17. It will be observed that there is lost motion both between the barrel b and the plate e^3 and between the plate e^3 and the rod e, the parts being so adjusted and arranged, however, as to give the required movement to the rod e.

The extractor or extractor-hook f is mounted in a groove in the right-hand side of the frame, alongside of the stationary breech-block a^3, as shown clearly in Figs. 1, 14, 15, 16, and 17, and is adapted to engage the head of the cartridge when the barrel is in its rearward position, as shown clearly in Fig. 14, the end of the barrel being recessed and beveled off, as at b^{12}, to permit of such engagement. The extractor has a limited longitudinal movement with respect to the breech-block, so that as the barrel starts forward the extractor moves a short distance with it before it holds the shell, so that it shall be withdrawn from the barrel, as clearly represented in Fig. 15. At the same time it is caused to move inward positively to engage the head of the cartridge, having been hitherto only in position for engagement. For this purpose the extractor is formed with an incline or cam-surface f', which engages a cross-bar or abutment f^2, carried by the frame, the incline being so formed that the extractor is forced inward as it moves forward. A spring f^3 is arranged to impel the extractor forward when such movement is permitted by the forward movement of the barrel, and the rear end of the extractor is held in place by a screw-pin f^4, which is threaded through the frame and enters loosely the hole f^5 in the extractor, in which the spring f^3 is seated, the screw-pin thus serving as a fulcrum for the lateral movement of the extractor.

The ejector, by which the empty shell is thrown out of the arm after it has been withdrawn from the barrel, is shown clearly in Figs. 2, 3, 14, 15, 16, and 17. It is constructed with especial reference to the fact that there is but a limited relative movement in a longitudinal direction of the shell and the extractor, and it is also arranged to coöperate with the extractor and prevent the escape of a shell therefrom until it has been entirely withdrawn from the barrel. It will be observed that, as between the ejector and the breech-block, provision is made for a limited relative longitudinal movement, and that, as between the barrel and the ejector, there is also a relative longitudinal movement. In the construction shown the ejector derives its movement from the movement of the barrel, and in the figures of the drawings referred to it is shown as a hook g, which is normally impelled inward by spring action, being itself preferably of spring metal. It is arranged to slide in a slot a^{16} in the left-hand side of the frame and is secured, by means of a boss g', to the plate e^3, hereinbefore referred to, through a slot a^{17}, forward of the slot a^{16}. The means for actuating the plate e^3 having been fully described already, it will be obvious that the ejector is drawn forward as the barrel approaches the end of its forward movement and is moved backward to its original position as the barrel approaches the end of its rearward movement. The movement of the ejector is not wholly due, however, to the movement of the barrel. It will be observed that the ejector has a heel g^2, which when the barrel is in its rearward position rests upon the barrel. It will also be observed that as soon as the barrel moves forward the inclined end g^3 rests against an incline a^{18} of the frame, which has such a pitch that as soon as the ejector is left free to be impelled inward by the action of its own spring-shank it will cause the ejector to move forward from the position shown in Fig. 14 to the position shown in Fig. 15, in which the heel g^2 rests against the body of the empty shell and the hook g^4 engages the head of the shell. In this position the ejector holds the shell against the extractor, and in order that the shell may be held rigidly at this time, so as to prevent with certainty its escape from the extractor, the parts of the ejector and of the extractor between which the shell is held are concaved to fit the latter, and the ejector is provided with lugs or ears g^5, which in this position underride lugs or ears a^{19} on the sides of the slot a^{16}, these lugs a^{19} forming an abutment which

holds the ejector positively from outward movement at this time. The forward movement of the ejector with the barrel pulls the shell from the position shown in Fig. 15 toward the relative position shown in Fig. 16, and as the distance between the ejector and the extractor is thus diminished the ejector is impelled inward with sufficient rapidity to throw the shell outward through the aperture a^{15} in the frame. As the forward movement of the ejector continues it is moved outwardly by contact with the incline formed in the wall of the frame between the two slots a^{16} and a^{17} of the correspondingly-inclined inner side of the ejector. This outward movement of the ejector is so timed and adjusted that the ejector is withdrawn from the cartridge-receiving chamber in the frame before the final forward movement of the barrel and of the rod e, permitting a cartridge to escape from the holder d to the receiving-chamber. As the barrel thereafter moves rearward it underrides the heel of the ejector, so that as the ejector is moved backward toward the end of the rearward movement of the barrel the lugs g^5 thereon ride outside of the lugs a^{19} on the frame.

It will be understood that during the rearward movement of the barrel, when a fresh cartridge has been admitted to the cartridge-receiving chamber, the end of the barrel rides over the front end of the uppermost cartridge left in the holder, or over the follower, when the magazine is emptied, and keeps it down, the lower edge of the barrel being suitably chamfered for this purpose, the rear or head end of the cartridge being held by the escapement device already described. It will also be evident that some means should be provided to limit the upward movement of the front end of the cartridge as it passes from the holder into the empty cartridge-receiving chamber, so that it may be properly directed into the returning barrel. I have provided an effective device for this purpose, which is shown in Figs. 3, 23, and 24. As there shown this device comprises a longitudinally-slotted plate h, which is secured to the breech-block a^3, covers the cartridge-receiving chamber on the side opposite that through which the cartridges enter, and forms a guide for a sliding block h'. The latter has a downward projection h^2 to limit the upward movement of a cartridge, and is also provided with a hook h^3 to engage a projection b^{13} on the top of the barrel b, by which means the block and projection are drawn forward with the barrel.

In order that the block and projection or finger may be left at the proper point, a device is provided to disengage the hook h^3 from the barrel, such device comprising an incline h^4 on the plate h, which is engaged by a shoulder h^5 on the hook h^3 to raise the latter and effect its disengagement from the barrel. In the rearward movement of the barrel the block and finger are carried back by contact with the barrel, a recess being formed between the breech-block and the barrel, preferably in the barrel, for the reception of the projection or finger h^2.

The cartridge is exploded, as usual, by a firing-pin, which is mounted in the breech-block and transmits the blow of the hammer to the primer of the cartridge. It is highly desirable that the firing-pin be as small and as light as possible, and it is also necessary to provide means for the retraction of the firing-pin after the explosion of the cartridge, so that its point may not project forwardly from the breech-surface and thereby occasion a premature explosion by the violent contact therewith of the primer of the cartridge as the parts of the arm assume position for firing. The construction and arrangement of the firing-pin and of the means for retracting the same are shown in Figs. 3, 14, 15, 16, 17, 18, 19, and 20. As there represented the firing-pin k is mounted in a suitable seat in the breech-block a^3, having a shoulder k' to limit the forward movement thereof. The pin may be round and held from turning in its seat by a spline k^2, as shown in Figs. 18 and 19, or it may be flattened vertically, as shown in Fig. 20, and held from turning by the retractor, presently to be described. In the rear face of the breech-block is formed a guideway k^3 for the reception of the retractor k^4, which is formed as a plate with a slot k^5 to embrace the rear end of the firing-pin. The firing-pin or the retractor is provided with a cam-surface whereby the movement of the retractor in the guideway causes a rearward movment of the firing-pin. As represented in Fig. 3, the pin k is notched on its under side to form a cam or incline k^6 for coöperation with the cross-bar k^7 of the retractor k^4, the said cross-bar being preferably beveled, as indicated. As the retractor is free to move transversely with respect to the firing-pin to a limited extent, it is evident that when the retractor is in one extreme position, as indicated in Fig. 19, the firing-pin is free to be moved forward by the impact of the hammer. As the retractor is moved to the other extreme position (represented in Fig. 18) the cross-bar k^7 thereof will act upon the incline or cam k^6 of the firing-pin to withdraw the latter positively into the position represented in Fig. 3. The retractor is actuated to withdraw the firing-pin at the proper time by some moving part of the arm. As represented in Figs. 3, 18, and 19, the retractor is arranged to move vertically and is provided with a lip k^8, to be engaged by a lip c^8 on the hub of the brace c', so that as the latter is turned upon its pivot by the action of the gas-lever c in its rearward movement the retractor is lifted and withdraws the firing-pin, while as the brace reassumes its closed position the retractor descends and leaves the firing-pin free. In assembling these parts the retractor is first dropped into the guideway and allowed to fall to the full extent permitted by said guideway, in which position the slot k^5 fully un-

covers the seat for the firing-pin, which is then inserted. Thereafter the brace c' is put in place, care being taken that its lip c^8 engages the lip k^8 of the retractor. When the pivot-pin of the brace is put in place, the retractor will be held slightly above its lowest position, and the cross-bar k^7 thereof will then engage the forward side of the notch in the firing-pin and will prevent the same from falling out of its seat in the breech-block.

The limbwork or firing mechanism of the arm remains now to be described. This comprises a hammer l, which is pivoted in a suitable recess in the frame in rear of the magazine-chamber, a mainspring l', which is secured in the frame and coöperates with the hammer in substantially the usual manner, a tension-screw l^2 being arranged to act upon the mainspring, a sear m, which is also pivoted in the frame in rear of the magazine-chamber, and a trigger n, which is pivoted in the frame in front of the magazine-chamber. This mechanism is represented in an approved form in Figs. 3, 10, 11, 12, and 13. The mainspring l' bears upon a roller l^3, carried by a pin l^4 in the heel of the hammer, the roller being located in a slot in the heel, as indicated in Figs. 11 and 12. The hammer is cocked in opposition to the pressure of the mainspring l' by an arm or arms c^9, which extend downwardly from the hub of the brace c' and engage the lugs or bosses l^5, which project externally from the sides of the hammer and support the ends of the pin l^4, the said arms c^9 straddling the hammer and allowing it to move between them to strike the firing-pin. It will be observed by an inspection of Fig. 3 that the brace c' during the complete movement of the gas-lever from front to rear position moves to its extreme position, carrying with it the hammer, and then retires somewhat from that extreme position, the hammer being held in its extreme rearward position by the sear, as usual. The gas-lever is thus made to do the work of cocking the hammer during the early part of its rearward movement, while the work of moving the shell-ejector is performed during the latter part of such rearward movement, whereby the work performed by the gas-lever is distributed over its entire movement and excessive resistance at any one point avoided. The hammer is provided as usual with a full-cock notch l^6 and an undercut half-cock notch l^7, and is further provided with the well-known fly l^8, which acts in the usual manner to prevent the engagement of the sear with the half-cock notch during the fall of the hammer. The sear m is pivoted in proper position with relation to the hammer and is normally pressed into engagement therewith by the usual sear-spring m'. As represented in the drawings, the sear has an arm m^2 extended below its pivot, which arm is preferably provided with a lateral projection m^3 for coöperation with the trigger-arm, hereinafter referred to. The trigger n is pivoted in the frame in front of the magazine-chamber and preferably at a point below the line of pressure of the finger of the operator when firing, a trigger-spring n' being arranged to press the trigger normally forward. The trigger has formed in one piece therewith or secured rigidly thereto an arm n^2, which extends rearwardly toward the sear at one side of the cartridge-chamber and has at its rear end a lug or projection n^3 to correspond and coöperate with the lug or projection m^3 of the sear.

In order that the discharge of the arm may be controlled so that but one shot may be fired at a time, the trigger and sear must be so related and must so coöperate that the pressure of the finger upon the trigger shall first disengage the sear from the hammer to permit the hammer to fall and shall then release the sear, so that it shall be free to engage and hold the hammer as soon as it is cocked, it being further required that the trigger shall be released and again pressed by the finger before the arm can be fired again. Otherwise the rapidity of action of the arm is such that two or more of the cartridges would be fired before the operator could release the trigger. Accordingly the arm n^2 of the trigger in its rearward movement must first disengage the sear from the hammer and then move clear of the sear, and in its forward movement it must pass by the sear without disturbing it. In the normal position of the parts the projection n^3 of the trigger-arm stands slightly above the projection m^3 of the sear-arm, as represented in Fig. 10, and the movement of the rear end of the arm will be downward, as indicated in Fig. 11. Accordingly the lug or projection m^3 of the sear-arm is formed with a cam-surface which inclines downward and forward, while the lug or projection n^3 of the trigger-arm has a cam-surface which inclines in the opposite direction, or upward and rearward. Hence the downward movement of the rear end of the trigger-arm will cause a rearward movement of the lower end of the sear-arm and will thereby disengage the sear from the hammer. As the movement of the trigger is completed the rear end of the trigger-arm will pass below and clear of the lower end of the sear-arm, thereby immediately leaving the sear free to be acted upon by its spring m' and restored to position to engage and hold the hammer as it is brought to full-cock. With the hammer at full-cock and the trigger in its rearmost position the lateral projection on the trigger-arm stands below the lateral projection on the sear-arm, and in the upward movement of the trigger-arm as the trigger is released, as indicated in Fig. 12, the one projection will strike the other. Accordingly provision is made whereby the trigger-arm may slip by the sear-arm. To this end the trigger-arm n^2 is made wide enough to be rigid and unyielding in the plane of its effective movement, that is, in a vertical plane in the construction shown, and is

made thin enough to be yielding and flexible in the transverse plane. Furthermore, the projections m^3 and n^3 are beveled or rounded off laterally in opposite directions, whereby as the trigger is released the projection on the trigger-arm slips by the projection on the sear-arm without disturbing the sear. To guard against the possibility of the slipping of the projection n^3 from the projection m^3 during the effective movement of the trigger, I have undercut the cam-surfaces m^4 and n^4 somewhat, so that they may interlock during the effective movement of the trigger and prevent lateral displacement, notwithstanding the lateral flexibility of the arm n^2.

The safety device, which prevents the possibility of operating the trigger until all of the parts of the arm are in position for firing, is operated by the movement of the barrel, as indicated clearly in Figs. 3 and 10. It comprises a spring-pressed pawl n^5, which is pivoted in the upper end of the trigger n, and projects into the spring-chamber a^6 of the frame sufficiently to engage a shoulder a^{20} of the frame, and thereby prevent movement of the trigger. The pawl, however, is arranged to be struck by the lug b^3 of the barrel or by a pin b^{14} therein when the barrel reaches its rearmost position and to be disengaged thereby from said shoulder to permit the rearward movement of the trigger. The pivoting of the trigger at the bottom permits this device to be exceedingly simple in construction, as well as absolutely certain in operation. The relative position of the centers of the trigger and pawl and the locking-shoulder is such that any pressure upon the trigger when the parts are not in position for firing only makes the engagement of the pawl with the shoulder more certain.

When the arm is closed, the centers of the pins, which connect the gas-lever with the barrel, the gas-lever with the brace, and the brace with the frame, are not in one straight line; but the pin between the gas-lever and the brace lies slightly lower than a straight line through the centers of the other two pins, wherefore the action of the spring b^4 will not tend to hold the gas-lever down firmly in its seat, nor prevent its rebounding slightly when the barrel is thrown to the rear. When the hammer is down, however, it and the main spring will act, through the arms c^9 of the brace, to hold the gas-lever firmly to its seat and prevent rebounding; but if the arm is not used as an automatic arm, but is manually operated, the hammer may be at full-cock or at half-cock when the arm is closed, and in order to prevent rebounding under such circumstances I prefer to provide a device of the general character of that represented in Fig. 3, in which a small piston c^{10} is seated upon a spring c^{11} in a hole in the gas-lever c and slips into a recess c^{12} in the forward side of the lug b^5 on the barrel c when the gas-lever reaches its lowest position, and thereby prevents the rebounding.

The operation of the arm in firing will be readily understood in view of the foregoing description of the construction and operation of the several parts.

Let it be assumed that the arm is closed, as represented in Fig. 1, with the hammer at full-cock and a cartridge in the barrel, as indicated in Fig. 14. In this position of the parts the safety-pawl n^5 is held out of engagement with the coöperating shoulder, and the trigger is therefore free to be moved. The hammer being released by the movement of the trigger explodes the cartridge, and some of the gases of explosion escape through the vent b^8 and throw the gas-lever c violently backward. The brace c' rises, permitting the end of the gas-lever, which is connected to the barrel, to throw the latter forward against the force of the spring b^4. During this movement of the barrel the empty shell is extracted and ejected and a fresh cartridge is released from the holder and is held in position to be inserted into the barrel. The movement of the brace c' brings the hammer to full-cock, in which position it is held by the sear and at the same time raises the retractor k^4 and positively withdraws the firing-pin. As soon as the barrel has completed its forward movement it is immediately returned by the reaction-spring b^4, and the fresh cartridge, being supported at the rear by the abutment a^3, is caused to enter the barrel. As the barrel reaches its seat the safety-pawl n^5 is disengaged from the shoulder a^{20} and the arm is in readiness for a second discharge.

I have described with much particularity the construction of the various devices shown in the accompanying drawings as embodying or as coöperating with the various features of my invention, but it will be understood, as I have hereinbefore pointed out, that I do not intend thereby to limit my invention to the precise construction and arrangement of parts shown and described, as many variations therefrom might be made without departing from the spirit of my invention.

I claim and desire to secure by Letters Patent—

1. In a cartridge-holder for magazine-firearms, the combination of a removable case to receive the cartridges, a spring and follower to feed the cartridges forward in said case, a lever of a length substantially equal to that of the case, having a finger at one end of said case to engage the cartridges and pivoted to the case at about its middle while its other end stands free at the other end of the case, and a spring to hold said lever with its finger normally in the path of the cartridges.

2. In a cartridge-holder for magazine-firearms, the combination of a case to receive the cartridges, a spring and follower to feed the cartridges forward in said case, a lever having a finger at one end to engage the cartridges and pivoted to the case, and a spring to hold said lever with its finger normally in

the path of the cartridges, said lever having an incline to coöperate with a fixed part of the firearm to move said lever against the spring and release the cartridges as the holder is inserted in the firearm.

3. In a cartridge-holder for magazine-firearms, the combination of a case to receive the cartridges, a spring and follower to feed the cartridges forward in said case, a lever having a finger at one end to engage the cartridges and pivoted to the case, a spring to hold said lever with its finger normally in the path of the cartridges, and a block sliding on said case under the free end of said lever to hold said lever positively against movement.

4. In a magazine-firearm, the combination with a frame and a cartridge-holder to enter the same, of a lever pivoted to the holder and having at one end a finger to engage the cartridges and being formed at the other end to engage said frame to retain the holder therein, and a spring to maintain said lever in normal position.

5. In a magazine-firearm, the combination with a frame and a cartridge-holder to enter the same, of a lever pivoted to the holder and having at one end a finger to engage the cartridges and being formed at the other end to engage said frame to retain the holder therein, a spring to maintain said lever in its normal position, and a block sliding on said holder under the free end of said lever to prevent movement thereof and to be moved from under the end of the lever by contact with the frame as the holder is placed therein.

6. In a cartridge-holder for magazine-firearms, the combination of a case to receive the cartridges, a spring and follower to feed the cartridges forward in said case, a lever pivoted to the case having a finger at one end to engage the cartridges, a spring to hold said lever with its finger normally in the path of the cartridges, said lever having an incline to coöperate with a fixed part of the firearm to move said lever and release the cartridges from the finger as the holder is inserted in the firearm, and a shoulder on the follower in the path of said finger, whereby the follower is prevented from being entirely thrown out of the holder, while permitted to move the cartridge resting on said follower beyond the end of the holder.

7. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame, firing mechanism including a trigger, and a trigger-detent standing normally in the path of the barrel and operated thereby to permit movement of the trigger.

8. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame, firing mechanism including a trigger, and a detent-pawl pivoted in the trigger and normally engaging a shoulder of the frame and operated by the movement of the barrel to permit movement of the trigger.

9. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame, firing mechanism, a trigger pivoted in said frame at a point below the line of pressure on said trigger, and a trigger-detent carried by said trigger above said line of pressure and standing normally in the path of movement of the barrel.

10. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-lever actuated by the escape of gas through said vent, and a connection between said lever and said barrel whereby said barrel is moved by said lever.

11. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-lever actuated by the escape of gas through said vent, a connection between said lever and said barrel, and a spring acting upon said barrel to return the same.

12. In a breech-loading firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-lever actuated by the escape of gas through said vent, and a brace pivoted to said frame and having the gas-lever pivoted to itself.

13. In a breech-loading firearm, the combination of a frame recessed vertically to form a seat for a barrel and a spring-chamber, one above the other, a barrel sliding freely in said seat and having a lug or projection to enter the spring-chamber, a reaction-spring disposed in said chamber and acting against said lug or projection, and a gas-lever mounted on said frame above said seat and intermediate mechanism to move said barrel against the spring.

14. In a breech-loading firearm, the combination of a frame having a seat to receive the barrel, a barrel mounted to slide in said seat, a spring-chamber below said seat, a gas-lever mounted on said frame above said seat and intermediate mechanism to move said barrel in one direction and a spring in said chamber to engage a projection from said barrel to move the same in the opposite direction, said barrel having at its rear end a narrow annular bearing with a close-working fit in said seat and said frame having at its forward end a narrow annular bearing with a close-working fit on said barrel, said barrel and frame being out of contact at intermediate points, whereby said barrel is accurately guided and supported with a minimum of friction.

15. In a breech-loading firearm, the combination of a frame recessed from its upper surface downward to form a seat for a barrel and a spring-chamber, one above the other, a barrel sliding freely in said seat and having a lug or projection on its lower side to enter the spring-chamber and a lug or projection on its upper side, a spring to coöperate with the first-named lug or projection, a gas-lever connected to the last-named lug or projection and operated by gas escaping from the barrel, and a brace for said gas-lever.

16. In a breech-loading firearm, the combi-

nation of a frame recessed from its upper surface downward to form a seat for a barrel and a spring-chamber, one above the other, and having at its forward end a screw-threaded boss divided to correspond with the frame, a jacket screw-threaded to engage said boss and forming an extension of said frame to guide and support the barrel, and a barrel sliding in said seat in said frame and having a lug or projection to enter the spring-chamber thereof.

17. In a breech-loading firearm, the combination of a frame recessed from its upper surface downward to form a seat for a barrel and a spring-chamber, one above the other, and having at its forward end a screw-threaded boss divided to correspond with the frame, a ring having lugs to enter and fill the openings in the wall of said boss, a jacket screw-threaded to engage said boss and forming an extension of said frame to guide and support the barrel, and a barrel sliding in said seat in said frame and having a lug or projection to enter the spring-chamber thereof.

18. In a gas-operated firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-cup supported by said frame and having a hole to register with the vent of the barrel when the barrel is in its normal position, and a gas-lever connected to said barrel and having a plug to enter said gas-cup.

19. In a gas-operated firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-cup supported by said frame and having a hole to regsiter with the vent of the barrel when the barrel is in its normal position, the bottom of said gas-cup being formed to fit upon the barrel and reduced to form a knife-edge about said hole, and a gas-lever connected to said barrel and having a plug to enter said gas-cup.

20. In a gas-operated firearm, the combination of a frame, a barrel sliding in said frame and having a vent in rear of the muzzle, a gas-cup supported by said frame and having a hole to register with the vent of the barrel when the barrel is in its normal position, the bottom of said gas-cup being formed to fit upon the barrel about said vent and said barrel being reduced in the rear of said vent whereby as said barrel is moved it is cleared from the gas-cup, and a gas-lever connected to said barrel and having a plug to enter said gas-cup.

21. In a gas-operated firearm, the combination of a frame, a barrel having a vent in rear of the muzzle, a gas-lever, a brace pivoted to the frame and supporting the gas-lever and a hammer, said brace having an arm or extension to engage and to cock the hammer as it swings upon its pivot.

22. In a gas-operated firearm, the combination of a frame, a barrel having a vent in rear of the muzzle and sliding in said frame, a gas-lever connected to said barrel, a brace pivoted to the frame and supporting the gas-lever and a hammer, said brace having an arm or extension to engage and to cock the hammer as it swings upon its pivot.

23. In a gas-operated breech-loading firearm, the combination of a frame, a barrel having a vent in rear of the muzzle, a gas-lever actuated by the escape of the gases through said vent, a second lever connected to said gas-lever, a breech-block, a firing-pin and a retractor formed to engage said firing-pin to withdraw the same and itself engaged and actuated by the second-named lever.

24. In a breech-loading firearm, the combination of a fixed breech-block having an aperture to receive the firing-pin, ways formed on the rear face of said breech-block on either side of said aperture, a firing-pin, a retractor mounted to slide in said ways and having an opening to surround the firing-pin and being formed to engage the firing-pin with a cam action and means to move said retractor to withdraw the firing-pin.

25. In a breech-loading firearm, the combination with a frame having a chamber to receive the cartridges and means to feed the cartridges into said chamber in position for insertion into the barrel, of a breech-block and a barrel, one of said parts being movable toward and from the other, a guide-plate closing one side of said cartridge-receiving chamber, and a cartridge-stop mounted on said guide-plate and engaged by said movable part to be brought thereby into the line of the cartridge-feed to limit the movement of each cartridge in succession.

26. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber and means to feed the cartridges into said chamber in position for insertion into the barrel, of a breech-block and a barrel, one of said parts being movable toward and from the other, a guide-plate closing one side of said cartridge-receiving chamber, a cartridge-stop mounted to slide on said guide-plate, and a hook connected to said stop to engage said movable part, said guide-plate having an incline to disengage said hook from said movable part.

27. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber and means to feed the cartridges into said chamber in position for insertion into the barrel, of a breech-block fixed in said frame, a barrel sliding in said frame, a guide-plate supported by said frame to close one side of said cartridge-receiving chamber, and a cartridge-stop mounted on said guide-plate and engaged by said barrel to be brought thereby into the line of the cartridge-feed to limit the movement of each cartridge in succession.

28. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and a cartridge-holder having a spring-follower to feed the cartridges into said chamber in position for insertion into the

barrel, of a breech-block and a barrel, one of said parts being movable toward and from the other, a guide-plate closing one side of said cartridge-receiving chamber, and a cartridge-stop mounted on said guide-plate in opposition to said spring-follower and engaged by said movable part to be brought thereby into the line of the cartridge-feed during the movement of each cartridge in succession.

29. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and means to feed the cartridges into said chamber in position for insertion into the barrel, of a breech-block and a barrel, one of said parts being movable toward and from the other, and a recess being formed in the end or face of one of said parts, a guide-plate closing one side of said cartridge-receiving chamber, a block mounted on said guide-plate and engaged by said movable part to be moved into and out of line of the cartridge-feed, and a downwardly-projecting plate carried by said block and adapted to enter said recess when said movable part is in proximity to the stationary part, and to be moved by said block into position to limit the movement of each cartridge in succession when said movable part is moved to open the cartridge-chamber.

30. In a breech-loading firearm, the combination with a frame having a cartridge-chamber and a breech-block and a barrel, one of which parts is movable toward and from the other, of a cartridge-holder below said chamber and cartridge-feeding devices and an escapement device located below said chamber and in proximity to the end of said holder and operated by said movable part and coöperating with the cartridge-holder to prevent or permit the escape of cartridges therefrom.

31. In a breech-loading firearm, the combination with the frame having a cartridge-chamber and a breech-block and a barrel, one of which parts is movable toward and from the other, of a cartridge-holder below said chamber and cartridge-feeding devices, and a rod sliding in said frame below said chamber and in proximity to the end of said holder and operated by said movable part, said rod having a shoulder to stand in the path of each cartridge-head and, in coöperation with said holder, to prevent the delivery of the cartridge from the holder or to be moved therefrom to permit the delivery of the cartridge.

32. In a breech-loading firearm, the combination with a frame having a cartridge-chamber and a breech-block and a barrel, one of which parts is movable toward and from the other, of a cartridge-holder below said chamber supported in said frame and having its rear upper corner cut away, cartridge-feeding devices, and a rod sliding in said frame below said chamber and in proximity to the end of said holder and operated by said movable part to bring a shoulder thereon into the cut-away portion of said holder to stand in the path of the cartridge-head or to be moved therefrom and, in coöperation with said holder, to prevent the delivery of the cartridge from the holder or to be moved therefrom to permit the delivery of the cartridge.

33. In a breech-loading firearm, the combination with a frame having a cartridge-chamber, a stationary breech-block and a barrel sliding in said frame, of a cartridge-holder below said chamber and cartridge-feeding devices, and a rod sliding in said frame below said chamber and in proximity to the end of said holder and operated by said sliding barrel, said rod having a shoulder to be moved therewith into or out of the path of the cartridge-head and, in coöperation with said holder, to prevent the delivery of the cartridge from the holder or to be moved therefrom to permit the delivery of the cartridge.

34. In a breech-loading firearm, the combination with a frame having a cartridge-chamber, a stationary breech-block and a barrel sliding in said frame, of a cartridge-holder below said chamber and cartridge-feeding devices, an escapement device located below said chamber and in proximity to the end of said holder to coöperate with the cartridge-holder and prevent or permit the escape of cartridges therefrom and a slide mounted on said frame to be operated by said barrel and actuating said escapement device.

35. In a breech-loading firearm, the combination with a frame having a cartridge-chamber, a stationary breech-block and a barrel sliding in said frame, of a cartridge-holder below said chamber and cartridge-feeding devices, a rod sliding in said frame below said chamber and in proximity to the end of said holder and having a shoulder to coöperate with the cartridge-holder to prevent or permit the escape of cartridges therefrom and having also operating-shoulders and a slide mounted on said frame and moved to and fro by said barrel to engage one or the other of said operating-shoulders.

36. In a breech-loading firearm, the combination of a frame, a sliding barrel, a fixed breech-block, and an extractor formed to engage each cartridge or shell as the barrel moves forward and sliding longitudinally and moving laterally to a limited extent in said frame, said extractor having a lateral cam-surface or incline to coöperate with an abutment, whereby as the extractor is moved forward with the barrel it is forced positively inward to engage said cartridge or shell.

37. In a breech-loading firearm, the combination of a frame, a sliding barrel, a fixed breech-block, an extractor formed to engage each cartridge or shell as the barrel moves forward and sliding longitudinally and moving laterally to a limited extent in said frame, said extractor having a lateral cam-surface or incline to coöperate with an abutment, whereby as the extractor is moved forward with the barrel and shell it is forced positively inward to engage said shell, and a spring to impel said extractor forward.

38. In a breech-loading firearm, the combi-

nation of a frame, a sliding barrel, a fixed breech-block, an extractor formed to engage each cartridge or shell as the barrel moves forward and sliding longitudinally and moving laterally to a limited extent in said frame, said extractor having a lateral cam-surface or incline to coöperate with an abutment, whereby as the extractor is moved forward with the barrel it is forced positively inward to engage said cartridge or shell, and a pin carried by said frame and entering loosely a recess in the end of said extractor to retain the same in the frame and form a fulcrum therefor.

39. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and a breech-block and a barrel, the one of said parts being movable toward and from the other to open the cartridge-receiving chamber, of an ejector forced inward with a spring-pressure and having its free end normally overlying the breech-block and held from the cartridge thereby, the said breech-block and the said ejector having relative longitudinal movement, whereby as the cartridge-chamber is opened the ejector is permitted to move inward into engagement with the shell.

40. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and a breech-block and a barrel, the one of said parts being movable toward and from the other to open said cartridge-receiving chamber, of an ejector, the said breech-block and the said ejector having relative longitudinal movements, whereby as the cartridge-chamber is opened the ejector is permitted to move inward into engagement with the shell, an extractor carried by the breech-block on the opposite side of the cartridge-receiving chamber and an abutment carried by the frame to engage the ejector and hold the same positively from outward movement, whereby the shell is held for the proper action of the extractor.

41. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and a breech-block and a barrel, the one of said parts being movable toward and from the other to open the cartridge-receiving chamber, of an ejector having a relative longitudinal movement with respect to the breech-block and moving inward into engagement with the shell during such longitudinal movement, an extractor carried by the breech-block on the opposite side of the cartridge-receiving chamber and having a limited longitudinal movement with respect to the breech-block, and an abutment carried by the frame to engage the ejector and hold the same positively from outward movement, whereby the shell is held for the proper action of the extractor.

42. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, a fixed breech-block and a barrel sliding in said frame, of a spring-ejector carried with the barrel and held normally from the cartridge when the barrel is in its rearward position by contact with the breech-block, whereby as the ejector is moved forward with the barrel it is permitted to move inward to engage the shell.

43. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, a fixed breech-block and a barrel sliding in said frame, of a spring-ejector carried with the barrel and held normally from the cartridge when the barrel is in its rearward position, an extractor carried by the breech-block on the opposite side of said cartridge-receiving chamber, and an abutment carried on said frame to engage said ejector as it is moved forward and inward to hold the same positively from outward movement.

44. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, a fixed breech-block and a barrel sliding in said frame, of an ejector sliding in a slot in the side of said frame, and moved longitudinally by the barrel at the end of its forward and of its rearward movement, said barrel being formed to underride said ejector and to hold the same during its rearward movement.

45. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, a fixed breech-block and a barrel sliding in said frame, a spring-ejector sliding in a slot in said frame and moved longitudinally therein by the barrel at the end of its forward and rearward movement, the forward end of said slot in the frame inclining forward and outward, whereby as the ejector is moved forward by the barrel it is permitted to move inward to engage the cartridge-shell, but as barrel and ejector approach the end of their forward movement, the ejector is positively moved outward from the cartridge-receiving chamber by contact with the inclined end of said slot.

46. In a breech-loading firearm, the combination with a frame having a cartridge-receiving chamber, and having its side wall longitudinally slotted, a fixed breech-block and a barrel sliding in said frame, a plate disposed within said frame and engaged by projections on said barrel and an ejector moving in said slot and secured to said plate to be moved therewith.

47. In a gas-operated firearm, the combination of a frame, a barrel having a vent in rear of the muzzle, a gas-lever, a brace pivoted to the frame and supporting the gas-lever, a hammer and a spring for yieldingly holding said hammer in its normal position, said brace having an arm to engage and cock the hammer as it swings on its pivot, whereby the pressure of said spring against the hammer, in its normal position, yieldingly holds the brace and the gas-lever in their closed position.

48. In a breech-loading firearm, the combination with a frame having a magazine-chamber, a hammer and a sear to engage said ham-

mer, said hammer and sear being pivotally mounted in rear of said chamber below the barrel, of a trigger pivoted at a point below the line of pressure thereon in front of said magazine-chamber and having a rigid arm extending rearwardly and formed with a cam to engage and move the sear.

49. In a firearm having a magazine-chamber, the combination with a hammer and a sear to engage the hammer, the said hammer and sear being mounted in rear of said chamber, of a trigger pivoted in front of said chamber having a rigid arm extended rearwardly toward said sear, said arm having a cam-like projection to engage a projection on the sear and release the sear and to pass beyond said projection in the continued movement of the trigger, leaving the sear free to engage the hammer again as the latter is cocked.

50. In a firearm, the combination with a hammer and a sear to engage the hammer, of a trigger having an arm extended toward said sear, said arm being rigid in one plane and flexible in another plane and having a cam-like projection to engage a projection on the sear, whereby as the trigger is moved in one direction the cam-like projection on said arm will engage and shift the sear and as the trigger is moved in the opposite direction said arm will yield to permit the projection thereon to pass by the sear, substantially as shown and described.

51. In a firearm, the combination with a hammer and a sear having a cam-like projection undercut in one direction, of a trigger having an arm extended toward said sear, said arm being flexible in one plane and having a cam-like projection to engage the projection on the sear and undercut in the opposite direction, whereby the movement of the trigger is caused to effect the movement of the sear and the disengagement of said cam-like projection during such movement is prevented, substantially as shown and described.

52. In a firearm, the combination with a hammer and a sear to engage the hammer, of a trigger having an arm extended toward said sear, said arm being rigid in one plane and flexible in another plane and having a projection with a cam-surface inclining to the rear and a second cam-surface inclined to one side, said sear having also a projection with cam-surfaces to coöperate respectively with the cam-surfaces of the projection on said arm, whereby during the movement of the trigger in one direction the projection on said arm effects movement of the sear to release the hammer and during movement of the trigger in the opposite direction the arm yields laterally and permits the projection thereon to slip over the projection on the sear, substantially as shown and described.

This specification signed and witnessed this 12th day of February, A. D. 1896.

CARL J. EHBETS.

In presence of—
JAS. S. BRYANT,
A. L. ULRICH.