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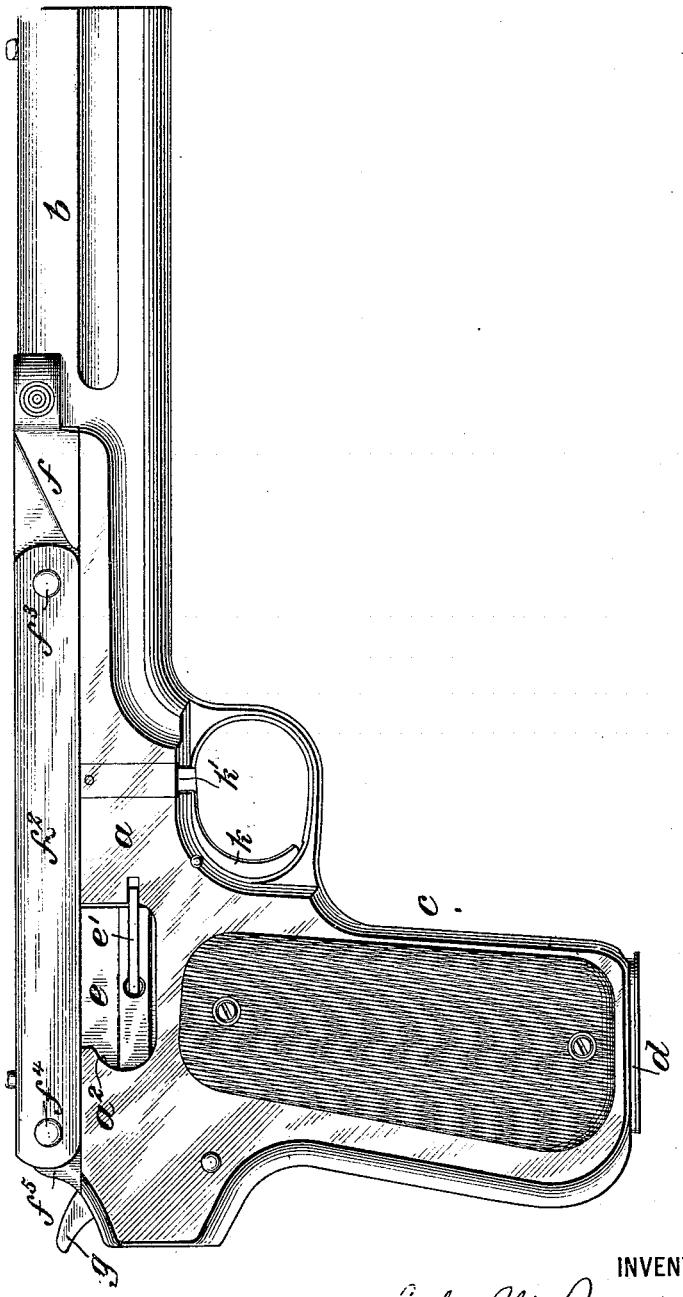
J. M. BROWNING.

FIREARM.

No. 580,923. Patented Apr. 20, 1897.



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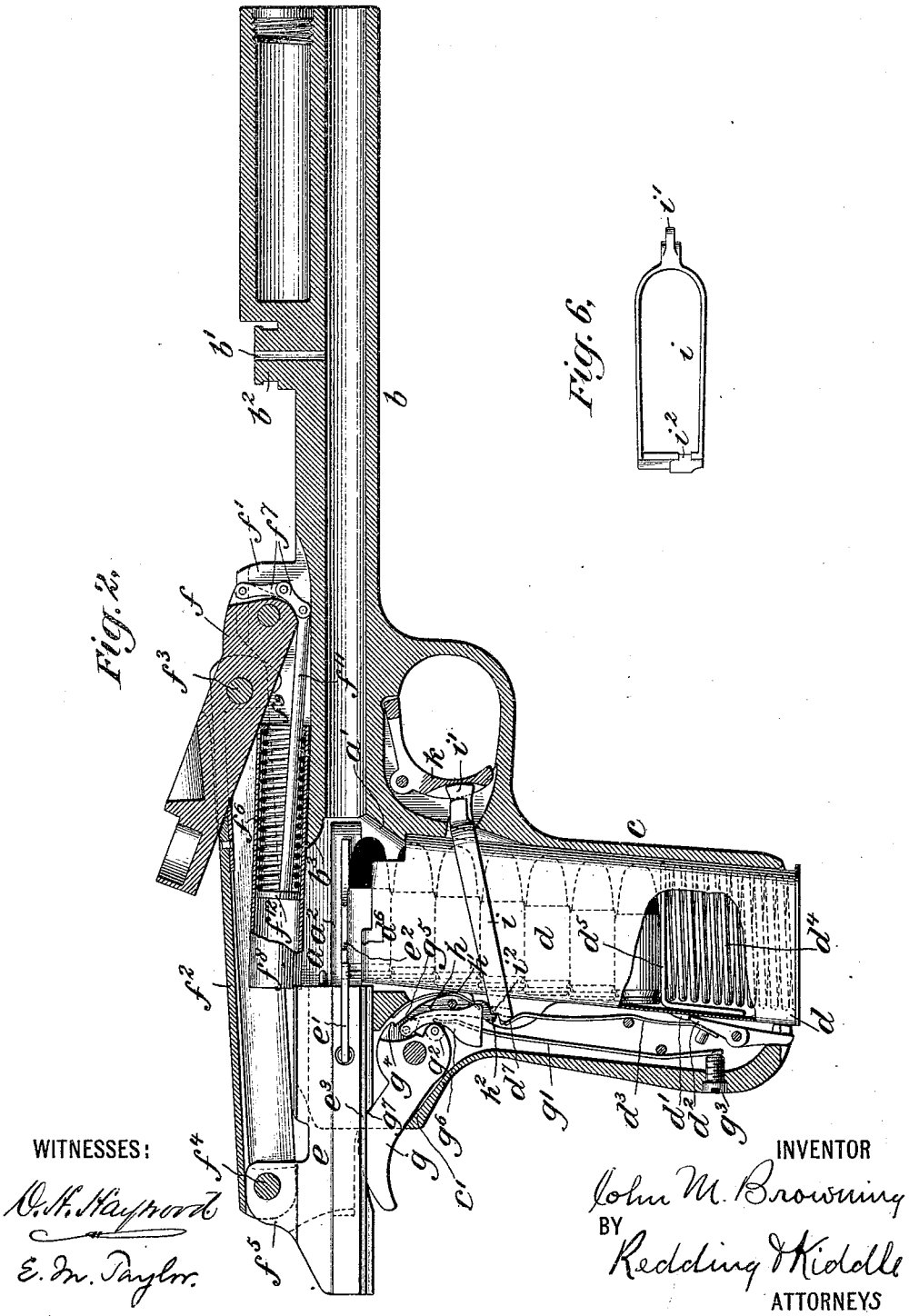

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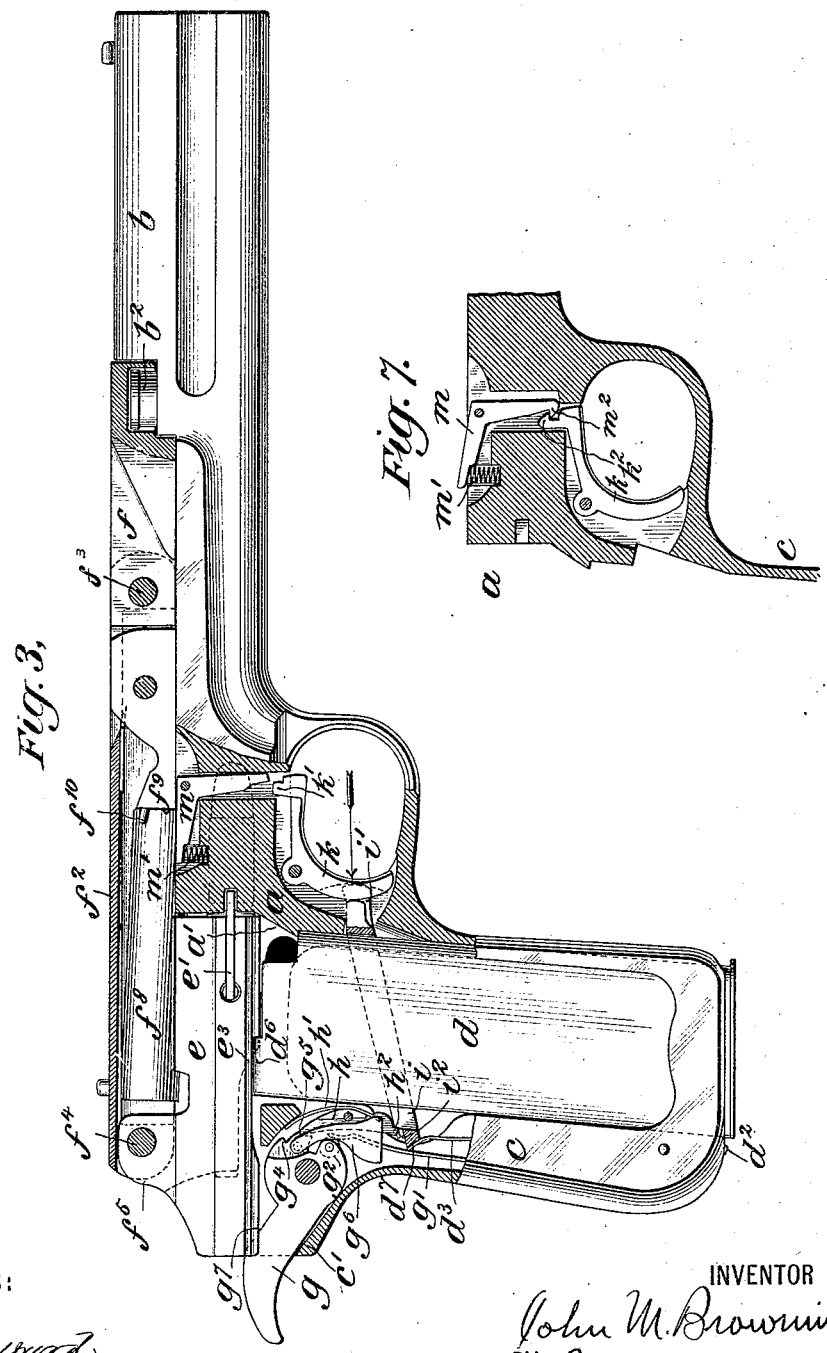

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No. 580,923. Patented Apr. 20, 1897.

Fig. 4.

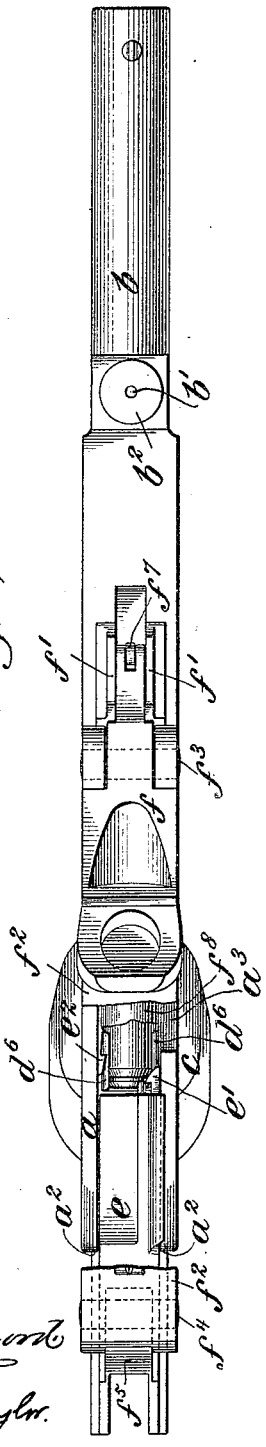
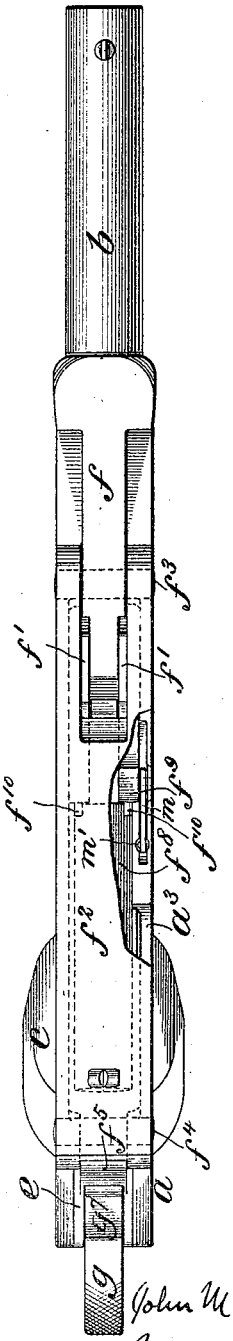


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

FIREARM.

SPECIFICATION forming part of Letters Patent No. 580,923, dated April 20, 1897.

Application filed September 14, 1895. Serial No. 562,577. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, a citizen of the United States, and a resident of Ogden, Weber county, Territory of Utah, have invented certain new and useful Improvements in Breech-Loading Firearms, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to automatic magazine-firearms, and particularly to firearms of that general description which are adapted to be operated by the gases of explosion.

The main object I have in view in this invention is to provide means to prevent the release of the hammer after a single discharge until the trigger has been released and is again pressed by the finger; and, further, to provide means to prevent the full or effective movement or release of the trigger until all of the parts are in proper position for the discharge of a cartridge.

The improvements referred to are herein represented as embodied in a gas-operated magazine-pistol, but it will be understood that these improvements and the improvements to be referred to hereinafter are not necessarily restricted in their use and application to such a firearm or class of firearms nor to their use in the same or in one common structure.

The further improvements which form a part of this invention relate more especially to the construction and arrangement of the parts comprising a practical and efficient magazine-pistol and will be more particularly described hereinafter.

In the accompanying drawings, wherein I have represented an embodiment of my invention and which form a part hereof, Figure 1 is a view in side elevation of a magazine-pistol embodying the improvements herein referred to, the breech being closed. Fig. 2 is in general a longitudinal center section of the same, some parts being shown in elevation and the breech being open. Fig. 3 is a view, partly in side elevation and partly in section, with the breech closed. Fig. 4 is a top view of the same with the breech open and with some parts broken away to show others beneath. Fig. 5 is a top view with the breech closed and with parts broken away to show others beneath. Fig. 6 is a plan view of the connecting-piece between the trigger and the other parts of the hammer-releasing devices. Fig. 7 is a detail view, partly in section, illustrating a modification of the devices for preventing the release of the trigger.

The receiver a is represented as having the barrel b and the grip-stock or handle c formed in one piece therewith, but it will be understood that the parts are so represented for convenience and that they might be formed separately and be secured together in any suitable manner. The barrel b is provided, substantially as usual in firearms of this class, with a vent or aperture in rear of the muzzle, as at b', through which the gases of explosion may act upon the means for operating the shell extracting and reloading devices, the vent being formed through a suitable nipple, as b^2. The grip-stock or handle c is disposed substantially at right angles to the receiver and is shown as arranged to form or constitute or contain the magazine in which are placed the loaded cartridges, one upon another, and from which they are fed, one by one, to the cartridge-chamber of the barrel.

The grip-stock is preferably open at its lower end and is adapted to receive a cartridge-holder d, which is provided with a lug d' to be engaged by a catch d^2 for the purpose of retaining the holder in place. The catch d^2 is pivoted in the handle and is pressed at one end into engagement with the cartridge-holder by a spring d^3, which also serves another purpose, to be referred to hereinafter. The other end of this catch d^2 projects slightly beyond the end of the grip-stock in position to be pressed by the finger in order to release the holder. The holder itself is formed as a flattened tube adapted to receive within it the cartridges one upon another.

Within the lower portion of the tube is placed a feeding-spring d^4 and a follower d^5, which are adapted to press the cartridges upwardly. The upper end of the tube is open, but is provided with ears d^6, which are bent inward slightly to engage the uppermost cartridge and prevent its being forced out of the holder by the spring d^4. The upper forward corner of the holder is cut away to permit the ejection of a cartridge from the

holder in a generally longitudinal direction toward the cartridge-chamber of the barrel, and the ears d^6 extend forward only a short distance from the rear of the holder, so that each cartridge is readily released from the holder by a short forward movement thereof. The uppermost cartridge is therefore held in the holder with the upper portion thereof projecting above the walls of the holder and in position to be engaged by the breech-bolt (hereinafter referred to) in its forward movement and to be pushed toward and into the barrel. An overhang b^3 projects from the rear of the barrel and is cut away at an incline on its under side to guide the cartridge properly into the barrel, and the receiver is likewise cut away at an incline below the cartridge-chamber, as at a', for the same purpose.

In the construction shown in the drawings the breech-bolt e is arranged in the receiver and is adapted for longitudinal movement backward and forward in the receiver in the rear of the open end of the barrel, suitable ways a^2 being formed in the sides of the receiver to guide the breech-bolt in its movement. The receiver is open at its top and at its rear end and is provided at one side with a suitable aperture a^3 to permit the ejection of the empty cartridge-shells. In the upper side of the barrel, at a suitable distance forward of the cartridge-chamber and in rear of the muzzle, is formed the aperture or vent b', through which the gases of explosion may escape as soon as the bullet has passed the aperture and before it has escaped from the barrel. A lever f is hung between ears f' on the top of the barrel in such position that its free end covers the aperture b' before referred to, whereby at each discharge the lever f is thrown backward upon its pivot. This movement of the lever f is imparted to the breech-bolt through a connecting-rod f^2, which is divided or forked to embrace the rear portion of the lever f, to which it is secured by a pin f^3, and at its rear end is forked to embrace and to be secured by a pin f^4 to a lug f^5, which projects upwardly from the breech-bolt e through the open top of the receiver a. The lever f is returned to its normal position to cover the aperture and to move the breech-bolt forward by a spring f^6, which acts upon the lever through a suitable link connection f^7, passing under the heel of the lever, and is suitably supported in a barrel f^8. The latter lies above the breech-bolt e, and space is provided for its reception by recessing or hollowing out the connecting-rod f^2.

The forward end of the spring-barrel f^8 rests against an abutment f^9, formed on the upper side of the barrel b of the pistol, and is held from lateral displacement by pins f^{10}, which project rearwardly from the face of the abutment. As the spring f^6 is always under tension the spring-barrel f^8 will therefore be held in position without requiring any additional holding devices and may be removed readily, when required, by pulling it backward to clear it from the pins f^{10} and letting it slip forward above the abutment f^9 to slacken the tension on the spring f^6 and to permit the disconnection of the links f^7. Preferably a rod f^{11}, having a head or follower f^{12} to bear upon the spring f^6, is inserted through the barrel f^8 and is connected to the last link of the series.

It will be evident that at each explosion of a cartridge the breech-bolt is moved backward through the described intermediate devices by the force of the gases of explosion which escape through the aperture b' and that it is immediately moved forward again by the action of the spring f^6. The breech-bolt in its forward movement feeds a cartridge from the holder into the cartridge-chamber and in its rearward movement, being provided with a cartridge-extractor e' of usual construction which engages the head of the cartridge-shell in the usual manner, it withdraws the empty shell from the cartridge-chamber. In its rearward movement the shell strikes an ejector e^2 of ordinary construction and is thereby thrown out from the receiver a through the aperture a^3 in the side wall thereof. The breech-bolt e overlies the hammer g, and in its rearward movement it cocks the same by direct contact therewith. The breech-bolt also carries the firing-pin, as usual, and as the same is arranged in the ordinary manner it has not been thought necessary to illustrate it.

The construction of the breech-bolt and its actuating devices having been described, and the operation of such devices having been explained, it now remains to describe the devices for controlling the hammer g.

The hammer is pivoted, as usual, in the receiver a and is acted upon by a mainspring g' in an ordinary manner, the hammer being provided with an antifriction-roller g^2, upon which the mainspring g' bears, and an adjusting-screw g^3 being set in the handle to bear upon the mainspring, so that the tension thereof may be regulated. The hammer g, as usual, is provided with a half-cock notch g^4 and a full-cock notch g^5, which are adapted to be engaged by a sear h, which is pivotally mounted in the upper portion of the handle and is pressed upon the hammer to engage the notches thereof by a suitable spring h'. Below its pivot the sear h is provided with a lip or shoulder h^2 for engagement with a connecting-piece i, which transmits the pressure of the trigger k to the sear h for the purpose of moving the same to release the hammer g. As the cartridge-holder intervenes between the trigger k and the hammer g and sear h, the connecting-piece i must be so shaped as to offer no obstacle to the introduction of the cartridge-holder d. Accordingly the connecting-piece is preferably made in the form of an open loop, as shown in Fig. 6, to partly or wholly embrace or surround the holder,

the opening through the loop being sufficiently large to permit the introduction of the cartridge-holder through the same and to permit the requisite movement of the connecting-piece itself.

At its forward end the connecting-piece i is formed with a lug i', against which the trigger k may bear, and at its rear end it is formed with a lip or shoulder i^2 for engagement with the lip or shoulder h^2 of the sear h. In accordance with this invention provision is made whereby the trigger k may be disconnected from the sear h by the fall of the hammer g. Accordingly the rear end of the connecting-piece i is held yieldingly against the sear h, the device which I have herein shown for this purpose consisting simply in the rearwardly-inclined upper end d^7 of the spring d^3, hereinbefore referred to, against and upon which the rear end of the connecting-piece i rests and by which it is held yieldingly upward against the end of the sear h. Connected with the hammer and preferably pivoted thereon is a dog or trip g^6, which is arranged to strike the rear end of the connecting-piece i at each forward or downward movement of the hammer g and to thrust said connecting-piece downward against the pressure of the spring d^7 and to disengage it from the sear h, the lip i^2 of the piece i moving to the rear of the lip h^2 of the sear. The subsequent engagement of the connecting-piece i with the sear h can be effected only by releasing the trigger k and permitting the connecting-piece i to move forward and upward. Consequently, although the hammer g is instantly recocked by the discharge which was effected by the first pull of the trigger k, nevertheless the hammer will be engaged and held by the sear h, although the pressure on the trigger has not been relieved. Therefore it is impossible that two or more explosions should follow one another in quick succession before the trigger k could be released, and it is necessary in order to effect a subsequent discharge to release the trigger and pull it again.

As a further safeguard against accidental explosions, means are provided to prevent an effective movement of the trigger until all of the parts of the pistol are in proper position for the explosion of a cartridge. These means are controlled by the actuating mechanism of the breech-bolt and operate to prevent either the release and forward movement of the trigger and the reëngagement of the connecting-piece i with the sear h, in the manner already described, or the rearward movement of the trigger and connecting-piece i, by which the sear is normally disengaged from the hammer.

As represented in Fig. 3 of the drawings, an elbow-lever m is mounted in a suitable recess formed in the side wall of the receiver a, and a spring m' is applied to said lever to cause one arm thereof to project through the open top of the recess in position to be struck and depressed by the connecting-rod f^2 as it returns to its position of rest. The other arm of the elbow-lever m stands normally in the path of a projection k' from the trigger k in position to prevent the forward movement of the trigger; but when the upwardly-projecting arm of the elbow-lever m is struck by the connecting-rod f^2 and depressed the other arm thereof moves out of the path of the projection k' on the trigger k and permits the movement thereof necessary for the reëngagement of the connecting-piece i with the sear h.

As represented in Fig. 7 of the drawings, the elbow-lever is provided with a hook m^2, which is adapted for engagement with the front end of the trigger or with a corresponding hook k^2, projecting therefrom, so that when the elbow-lever is in the position which it assumes when the breech-bolt e is thrown back the trigger is held from the movement necessary to disengage the sear h from the hammer g. As soon, however, as the breech-bolt and the connecting-rod have returned to their positions of rest the elbow-lever m is shifted to release the trigger and to permit the free movement thereof. The hooks upon the elbow-lever m and the trigger k are preferably beveled, so that the reëngagement of the trigger and elbow-lever will be effected automatically as soon as the trigger is released after it has been pulled.

It will be observed by reference to Figs. 2 and 3 of the drawings that the hammer g when in its rearmost position rests against a solid portion c' of the frame or upper portion of the grip or handle c in rear of the hammer, and that the hammer g is extended upward to form a shoulder, as at g^7, to coöperate with a shoulder or projection e^3 on the under side of the breech-bolt e. (Indicated clearly by a dotted line in Fig. 3.) The breech-bolt being held from upward movement by its guides in the receiver a, it is evident that the hammer thus forms a stop to limit the rearward movement of the breech-bolt should the pins or bearings which support the bolt in closed position break under the shock of discharge, whereby the bolt will be prevented from flying into the shooter's face.

Referring now to the operation and mode of use of the mechanism already described, it will be evident, in the first place, that a cartridge-holder fully charged may be readily inserted in the place of an empty holder which has been withdrawn from the magazine, no movement of the operative parts of the pistol being required to permit this. It being assumed that the cartridge-chamber of the barrel is empty, it is necessary, in the first instance, to effect by hand the movement of the parts necessary to place a cartridge therein. Accordingly, the end of the lever f is grasped by the fingers of one hand and is drawn upward and backward as far as possible. Through the connecting-rod f^2 this movement of the lever causes a rearward movement of

the breech-bolt e, which cocks the hammer g and permits it to be engaged and held by the sear h, and at the same time it releases the uppermost cartridge in the holder d and permits it to be pressed upward slightly, so that as the breech-bolt moves forward again under the influence of the spring f^6 the cartridge will be engaged thereby and will be pushed forward out of the cartridge-holder into the cartridge-chamber of the barrel, the inclined overhang b^8 and the incline a' properly directing the cartridge in its movement. When the lever f, connecting-rod f^2, and breech-bolt e have reached the limit of their forward movement, the several pivotal centers thereof will be in a single straight line and the breech-bolt will therefore be held firmly in a position to withstand the recoil of the cartridge when exploded. During the movement of the breech-bolt both backward and forward the elbow-lever m will be in such position as to prevent effective movement of the trigger k, as already described, and it will not be until the breech-bolt has reached its position of rest and the connecting-rod f^2 is resting upon its seat and depressing the elevated arm of the elbow-lever m that the trigger k will be released, so that it may be possible to effect the release of the hammer g and the explosion of the cartridge.

Upon the pulling of the trigger when the parts are in proper position the hammer will be released and will strike the firing-pin, causing the explosion of the cartridge. As soon as the bullet passes the aperture b' the gases of explosion will rush forcibly therethrough and will throw back the lever f, beginning again the cycle of operations already described. These operations take place so quickly that the operator might not have time to release the trigger until two or more cartridges were exploded, but, as already described fully, the trigger is disconnected automatically from the sear h at each forward movement of the hammer g, and therefore when the hammer is recocked it is engaged and held at full-cock by the sear, which cannot be again disengaged until the trigger has been released and thereby the engagement thereof with the sear again permitted.

It is evident that some of the features of my present invention are not restricted in their application to gas-operated firearms, but that they may be applied with equally good results to hand-operated firearms, and, furthermore, that the several features hereinbefore described are not necessarily combined together in one structure, but may be used separately without departing from my invention. It will be obvious also that various changes in the form and arrangement of parts may be made without departing from within the purview of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a breech-loading firearm, the combination of a frame or handle, a longitudinally-movable breech-bolt, and a hammer mounted in said frame or handle, the said frame or handle having a solid portion in rear of the hammer against which the hammer may rest in cocked position and said hammer having a shoulder to stand, when the hammer is in cocked position, in the path of the breech-bolt and to prevent rearward movement thereof beyond said shoulder, substantially as shown and described.

2. In a breech-loading firearm, the combination with a receiver, a barrel having an aperture in rear of the muzzle, a longitudinally-movable breech-bolt in said receiver, a lever operated by the gases of explosion, a rod connecting said lever and said breech-bolt, said connecting-rod being recessed or hollowed out from its under side, a spring and connections to said lever to return said lever and its connected parts to normal position, and a barrel supporting said spring mounted above said receiver and received within the recess of said connecting-rod, substantially as shown and described.

3. In a breech-loading firearm the combination with a breech mechanism, a hammer, a sear and a trigger to operate the sear, of a safety device to engage the trigger positively to prevent effective movement thereof and supported in proximity to the breech mechanism to be actuated thereby to release the trigger as the breech mechanism assumes its normal position, substantially as shown and described.

4. In a breech-loading firearm the combination with a breech mechanism, a trigger, a hammer mechanism, an intermediate piece operated by the trigger to release the hammer, a device operated by the movement of the hammer as it falls to positively disengage said intermediate piece from the sear, means to effect a reëngagement of said connecting piece with the hammer mechanism upon the release of the trigger, and a device to engage the trigger to prevent the release thereof and actuated by the breech mechanism to release the trigger, substantially as shown and described.

This specification signed and witnessed this 3d day of September, A. D. 1895.

JOHN M. BROWNING.

In presence of—
JOHN E. RAMSDEN,
WM. P. FOWLER.