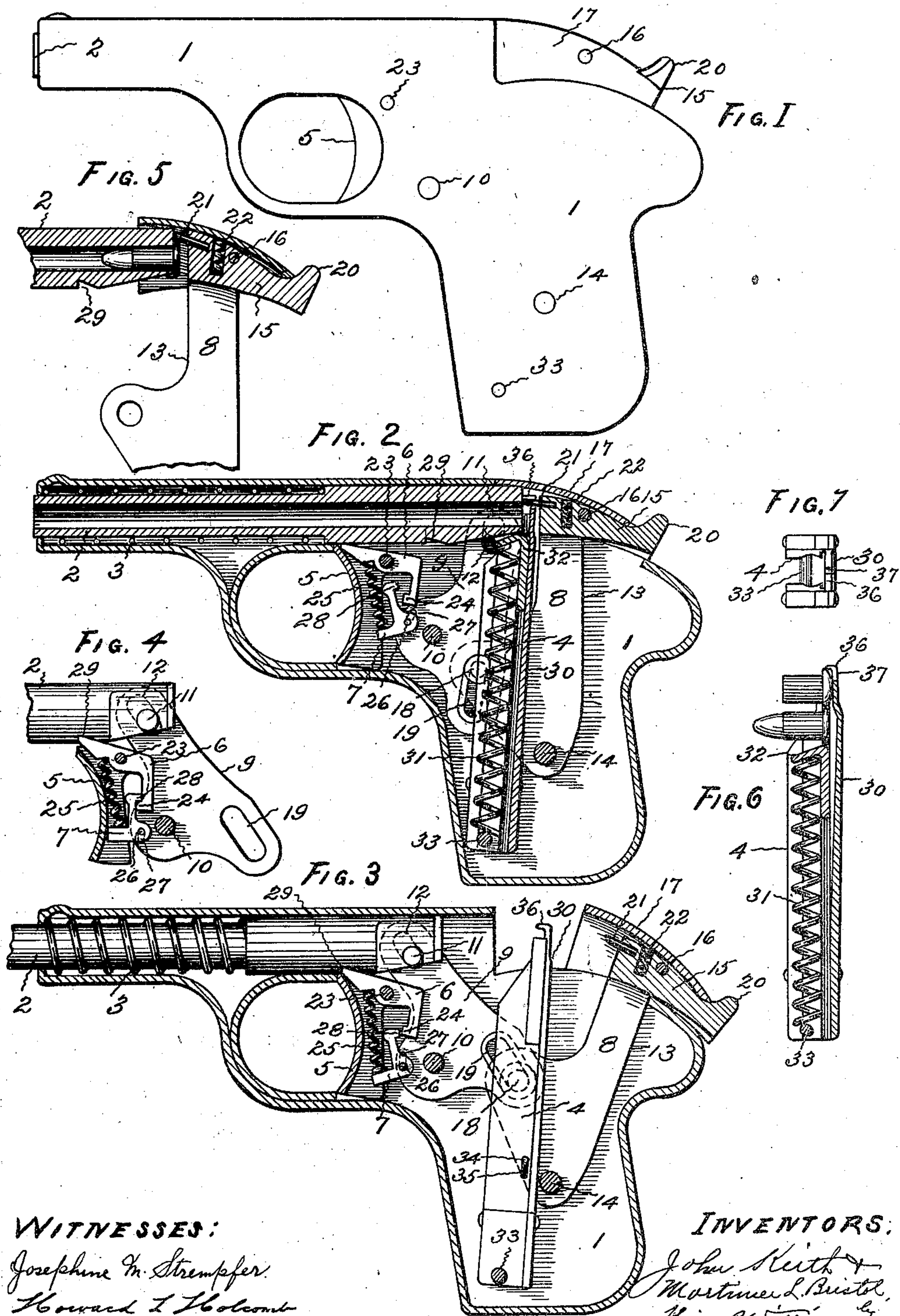


FIREARM.

APPLICATION FILED DEC. 22, 1908.

930,865.

Patented Aug. 10, 1909.



WITNESSES:

Josephine M. Strempfer
Howard I Holcomb

INVENTORS:

John Keith &
Martimer L. Bristol
Harry P. Williams ^{by} atty

UNITED STATES PATENT OFFICE.

JOHN KEITH, OF HARTFORD, AND MORTIMER L. BRISTOL, OF WEST HARTFORD,
CONNECTICUT.

FIREARM.

No. 930,865.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed December 22, 1908. Serial No. 468,747.

To all whom it may concern:

Be it known that we, JOHN KEITH and MORTIMER L. BRISTOL, citizens of the United States, residing at Hartford and West Hartford, respectively, in the county of Hartford and State of Connecticut, have invented a new and useful Firearm, of which the following is a specification.

This invention relates to automatic fire arms of that class which operate on the "blow-back" principle. Heretofore, automatic recoil operated fire arms have been constructed either with sufficient mass in the breech-block unit to prevent too early opening of the cartridge chamber, or with some mechanism or lock which prevents any relative movement between the barrel and breech-block during the first part of the recoiling movement.

The object of this invention is to produce an automatic fire arm of very light weight compared with other arms using the same ammunition and of very simple construction, and one that will operate accurately with lighter cartridges than have heretofore been used in automatic fire arms. To accomplish this the inertia of the barrel is utilized to assist that of the breech-block in resisting the too early opening of the cartridge chamber, and also in completing that opening movement.

This invention is illustrated in the accompanying drawings as embodied in an automatic pistol, but it will be understood that its different features are applicable to other classes of fire arms.

Figure 1 of the drawings shows a side elevation of the pistol with the hammer in its normal position and closing the cartridge chamber. Fig. 2 is a central vertical section showing the hammer in its normal position closing the cartridge chamber and the firing pin in firing position. Fig. 3 is a central vertical section of the same showing the hammer raised ready to fire. Fig. 4 is a partial section showing the trigger and connecting parts in the positions which they occupy after firing and before the trigger is released. Fig. 5 is a partial sectional view showing the hammer in the position which it occupies after being lowered by the thumb and with the firing pin in "safe" position. Fig. 6 is a section of the magazine showing a cartridge before firing and a cartridge case after firing, with the head of the latter

deformed and escaping from the magazine. Fig. 7 is a top view of the magazine.

The frame 1 of the pistol shown in the drawings is of nearly uniform thickness, and incloses and supports the movable barrel 2 and recoil spring 3 which surrounds the forward end of the barrel and thrusts between a shoulder on the barrel and the end of the frame in such a manner as to tend to force the barrel backwardly. The rear part of the frame is formed into a hollow handle or grip, in which the magazine 4, the trigger 5, and the sear 6 and connector 7, hammer 8 and levers 9, which connect the hammer and the barrel, are arranged and supported.

There are two similar levers 9 pivoted on the pin 10 which is fixed in the frame, and projecting from the sides of the barrel near the breech are studs 11 which extend into oblong slots 12 in the upper ends of the levers 9, which embrace the rear end of the barrel. The hammer consists of two similar arms 13 pivoted on the pin 14 that is fixed in the frame, and the breech-block 15 that is pivotally attached to the arms by the pin 16. The arms 13 are preferably formed of sheet metal in one piece with their upper ends uniting and forming a cap 17 which conforms to the contour of the frame, and they extend downwardly at sufficient distance apart to permit the magazine to pass between them. The hammer arms are connected with the lower ends of the levers 9 by studs 18 which are fixed to the arms and project into slots 19 in the levers. As a result of this construction the forward movement of the barrel causes a rearward movement of the hammer and vice versa.

The breech-block which is pivotally connected with the hammer arms near their upper folded part is shaped to allow it a limited oscillatory movement in a vertical plane, and at its rear end it has a projecting thumb piece 20. The firing pin 21 projects from the front face of the breech-block and the spring 22 yieldingly holds the front face of the breech-block in its lowest position, and in that position the firing pin, when the hammer is thrown forward, will strike the fulminate charged part of the cartridge and explode it. If the hammer is lowered with the thumb on the thumb piece the breech-block is tilted up and this raises the firing pin so that it will rest above the edge of the

cartridge, as shown in Fig. 5. In that "safe" position the cartridge cannot be exploded, even though the pistol falls or a blow is imparted to the hammer. When the hammer is again raised and the thumb pressure removed, the spring depresses the forward end of the breech-block and the firing pin assumes firing position.

The sear 6 is pivoted below the barrel on the pin 23 which is fixed in the frame. The sear has a downwardly extending arm which at its lower end has a short forwardly extending lug 24. The trigger 5, which is also pivoted on the pin 23, is desirably formed from sheet metal bent so that its sides provide a recess for the spring 25 which is arranged to thrust between the detent end of the sear and the lower and forwardly extending end of the bell-crank-shaped connector 7, which has a pin 26 that extends through it and into slots 27 in the levers that connect the barrel and the hammer. The connector which is loosely pivoted between the levers has an upwardly extending arm with a short rearwardly projecting lug 28, at the top. When the lug 28 on the upper end of the connector is in front of the lug 24 on the lower end of the sear, it fills the space between the rear edges of the trigger and the lower end of the sear. With the parts in this relation (Fig. 3), a pull on the trigger is transmitted through the upper end of the connector to the lower end of the sear in such manner that the sear is turned on its pivot pin and the detent end withdrawn from a notch 29 in the underside of the barrel in which it rests while retaining the barrel in its forward position. This releases the barrel and allows it to be forced backwardly by the recoil spring. When the connector is raised so that the lug 28 is higher than the lug 24 the sear is free to turn under the action of the spring 25 until its detent end rests in the notch in the barrel (Fig. 4).

We are aware that for several years a mechanism has been in use in a fire arm whereby a reciprocating barrel is arrested in its forward position by a pawl which releases it when the trigger moves forward, but it will be observed that in our invention the rearward pressure on the trigger causes the release of the barrel.

The magazine is composed of the body 4, the leaf spring 30 attached to the back, the coil spring 31 arranged within it, and the spring follower 32 which is thrust upwardly by the coil spring for lifting the cartridges. The body of the magazine is pivotally mounted on a pin 33 fastened in the frame, and it is connected with the hammer arms 13 between which it extends by studs 34 which project from the arms into slots 35 in the sides of the body of the magazine. The body of the magazine as shown

in Fig. 7 is semi-tubular in cross section with the front side open. In the rear of the tubular part of the magazine body is a tee-shaped groove for receiving and guiding the cartridge heads and the spring follower. The tubular portion guides the coil spring which yields as the cartridges are placed in the magazine from the top and then forces them upward so that the uppermost one is held in position to enter the chamber in the barrel by the forwardly bent end 36 of the leaf spring that is attached to the back of the magazine body. The rear wall of the magazine body is cut away at the top so that the leaf spring bears against the cartridge heads and yields under the rearward pressure due to the firing of a cartridge, thus allowing the recoil energy to be transmitted to the hammer. An opening 37 is made in the upper end of the leaf spring to allow the firing pin to reach the cartridge head.

The blow of the firing pin on the upper edge of the cartridge head together with the bulging of the rear end of the head, due to the pressure of the exploding gases of the powder, as the firing pin is somewhat long and there is a small space left between the back of the head and front of the hammer, changes the shape of the cartridge enough so that after firing the shell will not be retained in the magazine by the stop 36, but will be forced out by the pressure of the lifting spring acting on the cartridge below, as shown in Fig. 6.

In use the action is as follows: Raise or draw back the hammer till the sear rests in the notch in the underside of the barrel, and retains the barrel in its forward position and the hammer cocked. The head of each cartridge is passed beneath the stop at the upper end of the spring that is attached to the back of the magazine and then pushed downward with the rim in the groove of the magazine until the stop can move forward and project above and engage the cartridge head. This is repeated until the magazine is full. All of the parts are now in the positions shown in Fig. 3 and the pistol is loaded ready to fire. A backward pull on the trigger presses rearward the connector which turns the sear on its pin and causes the detent end of the sear to be withdrawn from the holding notch in the barrel. The barrel then moves rearward under the pressure of the recoil spring, and as it does the magazine moves forward and a cartridge is thrust into the chamber in the breech. The movement of the levers which connect the barrel and the hammer, as the barrel moves backward, carries the pin 26 and consequently the connector upward until the lug 28 is no longer in front of the lug 24, but higher, leaving the sear free to rotate as pressed forward by the

spring 25, and lug 24 to take a position below the lug 28, as shown in Fig. 4. The rotation of the levers connected with the barrel, as the barrel moves backward, causes the hammer to be thrown forward toward the breech of the barrel. The parts are so designed that the rear end of the barrel and the breech block at the top of the hammer meet just as a cartridge is fully seated in the chamber, at which time the firing pin strikes and explodes the cartridge. The effect of the discharge is to move the barrel forward and the hammer rearward. As the hammer moves rearward the case of the exploded cartridge is extracted by the magazine, and as soon as free from the barrel is ejected by the cartridge next under it which rises to a position for entering the chamber. The forward movement of the barrel turns levers connected therewith on their axes and carries up the slot in which the pin projecting from the connector travels, thus leaving the connector free to be moved downward as soon as the lug 28 is released from the lug 24. The detent end of the sear enters the notch in the underside of the barrel as soon as the barrel reaches its forward position and thus prevents the barrel from moving rearward. However, the trigger is not yet released, the parts being in the positions shown in Fig. 4. The pin 26 is now at the upper end of the slots 27 in the levers 9 and the lug 28 is above the lug 24, which prevents the connector from moving downward. When the trigger is released the downward pressure of the spring 25 on the arm of the connector first rotates the connector on the pin 26 and withdraws the lug 28 from the lug 24 and then moves the connector bodily downward, the pin sliding in the slots and permitting this. This places the connector in the position shown in Fig. 3 with the lug 28 in front of the lug 24. All the parts are now in such positions that a pressure on the trigger produces a repetition of the above cycle of movements.

The invention is not limited to the specific details of construction herein shown and described, nor to a pistol, for the invention is applicable to rifles and other forms of fire arms.

The invention claimed is:

1. In a fire arm, the combination of a frame, a reciprocating barrel, a breech-block which moves coincidentally with the barrel, but in the opposite direction, and a sear arranged to arrest the barrel in its forward position.

2. In a fire arm, the combination of a reciprocating barrel, a sear which retains the barrel in its forward position, a trigger, a connector arranged between the trigger and the sear in such manner that when all the parts are in position to fire, a rearward mo-

tion of the trigger is transmitted through the connector to the sear and the barrel released, said connector being moved by the closing movement of the barrel so that the sear is released from the control of the trigger.

3. In a fire arm, the combination of a frame, a reciprocating barrel supported by the frame, a sear for holding the barrel forward and the parts in cocked position, a trigger supported in said frame, a connector arranged to alternately connect the trigger and sear and release the trigger from the sear, and a single spring returning the trigger, sear and connector to their normal positions.

4. In a fire arm, the combination of a frame, a reciprocating barrel, a lever pivoted in the frame and oscillated by the movement of the barrel, a trigger supported in the frame, a sear and a connector between the trigger and the sear, said connector being supported and carried by said lever.

5. In a fire arm, the combination of a frame, a reciprocating barrel, a lever pivoted in the frame and oscillated by the movement of the barrel, and a hammer which is moved from cocked position to striking position and vice versa by the oscillations of said lever.

6. In a fire arm, the combination of a frame, a reciprocating barrel, a breech-block, and means connecting the barrel and breech-block so that when the barrel moves in one direction the breech-block moves in the opposite direction.

7. In a fire arm, the combination of a frame, a reciprocating barrel, a lever pivoted in said frame and oscillated by the reciprocating movement of the barrel, and a breech-block which is moved from closed position to open position and vice versa by the oscillations of said lever.

8. In a fire arm, the combination of a hammer, a breech-block pivotally carried thereby, a firing pin rigidly mounted in said breech-block, and means normally retaining the breech-block with the firing pin in line with the explosive portion of a cartridge, said breech-block being so held by the hammer that pressure applied to the breech-block when lowering the hammer and breech-block will cause the latter to so move that the point of the firing pin is out of line with the explosive portion of the cartridge.

9. In a fire arm, the combination of a frame, a reciprocating barrel, a hammer, a lever connecting said barrel and said hammer so that the hammer and barrel move synchronously, and a breech-block carrying a firing pin pivotally mounted in said hammer, said breech-block being provided with a thumb piece for raising and lowering the hammer, said thumb piece being so arranged that when pressure is applied for lowering

the hammer the point of the firing pin is moved out of line with the explosive portion of a cartridge.

10. In a fire arm in combination, a magazine, and means connected with the magazine, said means being shaped to retain cartridges with heads of normal shape in the magazine and release cartridges having heads deformed as a result of firing.

11. In a fire arm, the combination of a frame, a barrel arranged to be carried forward by the force of the discharge, a spring for carrying the barrel rearward, a magazine movably mounted in the frame, and means adapted to move the magazine rearward and extract a cartridge shell when the barrel moves forward and to move it forward to meet the barrel as the latter returns rearward, and place a cartridge in and close the chamber by this latter movement.

12. In a fire arm, the combination of a frame, a reciprocating barrel, a lever pivoted in said frame and oscillated by the reciprocating movement of the barrel, and a magazine pivoted in said frame and connected with said lever so that it is moved by the oscillations of said lever in opposite directions to the movements of the barrel.

13. A fire arm having a frame, a barrel supported by the frame, a spring for moving the barrel rearwardly, a hammer pivotally mounted in the frame, a magazine pivotally mounted in the frame, and means connecting the barrel and the hammer and the magazine whereby the forward movement of the barrel causes a rearward movement of the hammer and magazine, and the rearward movement of the barrel produces a forward movement of the magazine and hammer.

14. A fire arm having a frame, a reciprocatory barrel supported by the frame, an oscillatory hammer supported by the frame,

a swinging magazine supported by the frame, a lever connecting the barrel and the hammer, and means connecting the hammer and the magazine whereby the parts move in synchronism but in opposite directions.

15. An oscillating hammer for a fire arm having an oscillatory breech-block carried thereby, a firing pin rigidly mounted in the breech-block, a spring normally holding the firing pin in line with the explosive part of a cartridge, and means carried by the breech-block by which the breech-block may be oscillated to move the pin out of firing position.

16. A magazine for an automatic fire arm having a semi-tubular body with grooves for receiving the rims of cartridges, a spring for lifting the cartridges, a yielding back for the magazine body, and a stop at the top of the said yielding back shaped to engage and retain cartridge heads of normal shape, but release cartridge heads of abnormal shape.

17. In a fire arm, the combination of a reciprocatory barrel, a sear for holding the barrel forward, a trigger for disengaging the sear from the barrel, and an oscillating and vertically movable connector between the trigger and the sear, said connector in one position being adapted to be oscillated to release the sear when the trigger is pulled, but when the sear is disengaged from the barrel, said connector is moved vertically into such position that it does not interfere with the oscillation of the sear.

JOHN KEITH.
MORTIMER L. BRISTOL.

Witnesses:

H. R. WILLIAMS,
JOSEPHINE M. STREMPFER.