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1,533,967

J. M. BROWNING

AUTOMATIC RIFLE

Filed Dec. 29, 1922

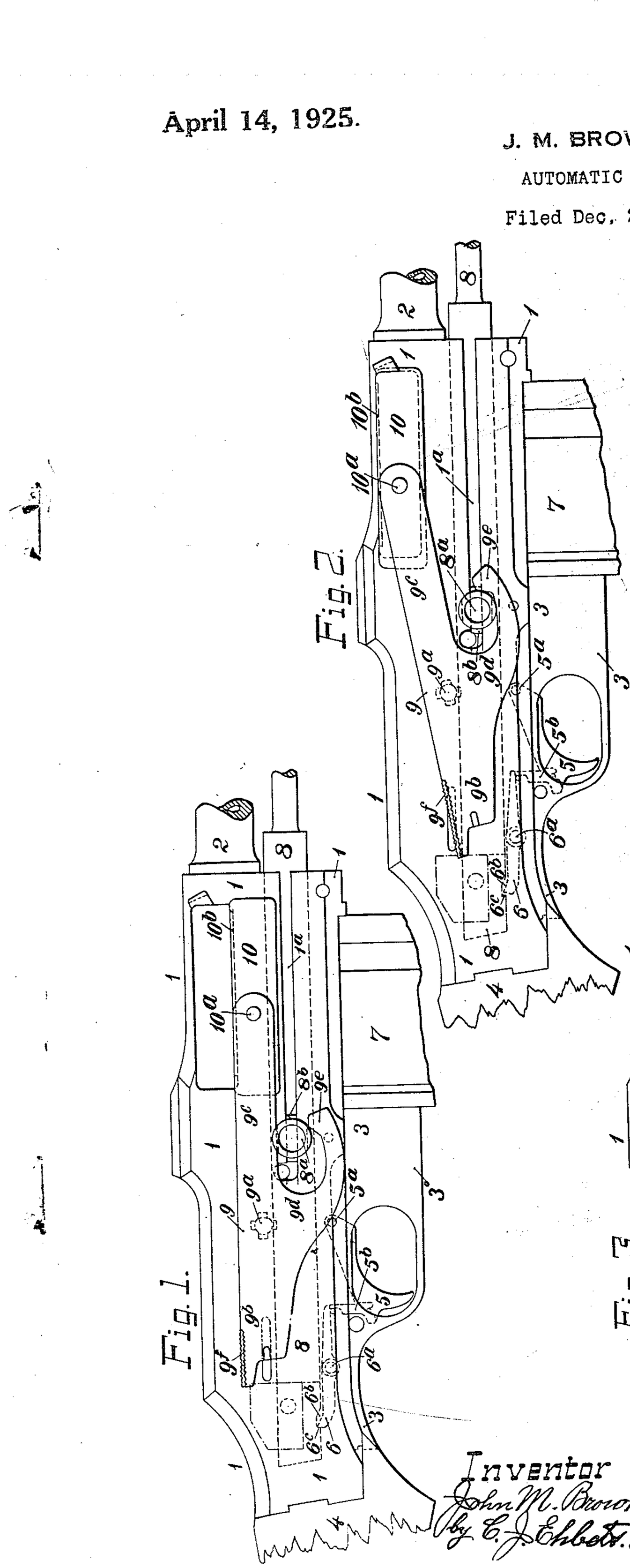

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

AUTOMATIC RIFLE.

Application filed December 29, 1922. Serial No. 609,675.

To all whom it may concern:

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

This invention relates to novel and useful Improvements in Automatic Rifles, such as are shown and described in Letters Patent of the United States, No. 1,293,022, granted to me on February 4, 1919.

The invention generally relates to automatic rifles in which all operations of the breech mechanism, except that of the trigger, are automatically effected, and in which the form and weight of the rifle adapt it for firing modern highly-charged military ammunition, the shooter either lying prone upon the ground or standing erect with his hands and shoulder supporting the rifle.

The invention specially relates to novel improvements in that class of gas-operated magazine rifles in which a vent in the barrel leads into a gas cylinder mounted below and alongside the barrel, in which cylinder the powder gases may expand before the bullet leaves the muzzle of the barrel.

The forward end of the gas cylinder is closed, and an extension from the open rear end of the same is detachably secured to the lower forward portion of the frame or breech casing of the rifle. The powder gases expanding in the gas cylinder exert pressure in rearward direction upon a piston fitted therein, a piston rod extending to the rear from the piston and at its end taking the form of an action-slide which enters the frame of the rifle; during the rearward movement of the action-slide under the pressure of the powder gases, a reaction spring, located in rear of the action-slide and connected with the same, is compressed and by its subsequent expansion said spring returns the action-slide forward again. The central portion of the action-slide, which enters the frame of the rifle, is bifurcated for the passage through it of a cartridge magazine located in a vertical magazine seat in the frame, but in rear of said bifurcated central portion of the action-slide and in front thereof the two sides of the action-slide are united by integral transverse bars. The movements of the action-slide are transmitted to the breech mechanism of the rifle, thereby actuating said mechanism, the greater portion of which is located above the action-slide in the rifle frame and comprises a reciprocating breech-block for closing and opening the firing chamber of the barrel, and a cartridge-shell extractor carried by the breech-block. The rifle frame is provided with an injection-opening through which the empty cartridge-shells are ejected during the last of the opening movements of the breech-block in a well known manner.

In modern warfare the use of automatic rifles of this class by military parties is required in the trenches and in the field under conditions which make it necessary to provide a cover-plate over the ejection-opening in order to prevent the entrance of rain, snow or dirt into the rifle; but the said cover-plate must be positively removed whenever the breech mechanism is opened in order to allow the cartridge shell to be ejected.

The object of the present novel improvement is to provide a rifle of this class with a manually operated means for covering or uncovering the ejection-opening, such, as for example, a lever for at will raising or lowering the cover-plate for said opening, combined with a safety device to prevent the firing of the rifle by positively locking the action-slide and, thereby, the means transmitting its movement to the breech mechanism, while the ejection-opening is closed.

This object is attained by providing mechanism of simple and strong construction, inexpensive and not liable to get out of order, but positive and effective in operation.

In the accompanying drawings:

Fig. 1 is a side view of the rifle frame, with the forward lever-arm and the ejection-opening cover-plate lowered.

Fig. 2 is a side view of the rifle frame, with the forward lever-arm and ejection-opening cover-plate raised, and the action-slide near its rearmost position.

Fig. 3 also is a side view of the rifle frame, with the forward lever-arm and ejection-opening cover-plate raised, but with the action-slide some distance forward of its rearmost position.

Fig. 4 is a side view of the two-armed lever, detached, carrying on its inner side the ejection-opening cover-plate. This Fig. 4

also shows a rear end view of the rear arm of said lever, and a front end view of said cover-plate.

Fig. 5 is a bottom view of the two-armed lever, detached; this figure also shows the cover-plate, detached, seen from below.

Fig. 6 is a rear end view of the action-slide and its integral handle.

Fig. 7 is a side view of the action-slide, detached, with its integral handle.

Similar numerals refer to similar parts throughout the several views.

The main part of this device is a lever 9 having two arms 9^b and 9^c and an integral transversely projecting pivot 9^a, by which said lever is detachably held upon the outside of the right-hand side wall of the rifle frame 1. To the forward lever arm 9^c the cover-plate 10, for the ejection-opening in rear of the barrel 2, is attached by a pivot stud on the outer surface of said cover-plate 10 which projects into a corresponding pivot hole in the lever-arm 9^c. The cover-plate 10, provided with the integral pivot stud 10^a, has at its upper edge an inwardly projecting longitudinal lip 10^b which holds said plate parallel to the ejection-opening by engaging either the upper or the lower edge of said opening, in such a manner that the cover-plate 10, when raised or lowered by the raising or lowering of the lever-arm 9^c, remains parallel to the edges of the ejection-opening in both positions.

The inner surface of the rear lever-arm 9^b, as well as that of the forward lever-arm 9^c, is perfectly plain, with the exception that the rear lever-arm 9^b at the center of its end, is provided with an inward low rounded longitudinal rib, formed by an indentation in the outer surface of the lever by which the metal of the same has been forced to project inward, and in the outer surface of the rifle frame a corresponding shallow longitudinal groove is cut; this rib and this groove serve to frictionally hold the lever 9 in its horizontal position, see Fig. 1, in which the forward lever-arm 9^c is depressed and the cover-plate 10 is lowered and the ejection-opening is uncovered. At the top of its rear end the rear lever-arm 9^b is also provided with an outwardly projecting finger piece 9^f, by pressure against which with his thumb the shooter may at will raise or depress the rear lever-arm 9^b, thereby covering or uncovering the ejection-opening.

Within the rifle frame 1 the usual longitudinally reciprocated action-slide 8 is located, said action-slide being bifurcated in its central portion for the free passage through it of the usual cartridge-magazine 7 arranged in its magazine seat, but at both ends the action-slide 8 has an integral cross-bar uniting the two side bars of its bifurcated portion.

In its under side the rear cross-bar of the action-slide 8 has a recess 6^b for the point of the sear, and at the rear end of said recess is the cocking shoulder 6^c. At the bottom the rifle frame 1 is closed by the trigger plate 3 and at the rear by the butt stock 4.

In the trigger-plate 3, the trigger 5 is mounted on the trigger-pin 5^a and carries the trigger pawl 5^b for engaging and for releasing the forward arm of the sear 6 mounted on the sear pin 6^a in the trigger-plate; the rear point of said sear 6 being adapted to engage the cocking shoulder 6^c of the action-slide, unless the sear 6 is engaged and its point depressed by the trigger 5 and the trigger pawl 5^b when the trigger is pulled back. This arrangement is the usual one in rifles of this class, and it is fully shown and described in my prior patent cited hereinbefore.

Fixed in the right-hand side bar of the action-slide 8 is an outwardly extending handle 8^a by which the action-slide 8 may at will be manually moved to its rearward or to its forward position, the portion of said handle next to the action-slide being vertically narrow but lengthwise of considerable width, and the right-hand side wall of the rifle frame 1 has a corresponding slot 1^a, vertically narrow, cut through it. This slot in the frame wall is open at the front and extends rearward sufficiently to allow said handle and with it the action-slide 8 to freely make one complete stroke such as is required for the actuating of the mechanism of the rifle.

By this construction the right-hand outer surface of the action-slide 8 within the rifle frame closes the slot 1^a in the side wall of said frame 1 and thereby prevents the entrance into the frame through the slot of rain, snow or dirt, or any disturbing matter.

The portion of the handle projecting beyond the side of the frame is cylindrical in form and of a size adapted to be grasped by the shooter; in order to lighten said handle without weakening the same, it may be bored out for some distance inward from its outer end.

On its lower edge and slightly forward of its pivot 9^a the two-armed lever 9 carries an integral strong downwardly and forwardly extending portion 9^d, the forward end 9^e of which projects upward and is adapted to engage the cylindrical lower part of the action-slide handle 8^a if the action-slide 8 and its handle 8^a are in their rear position and if the rear lever-arm 9^b is manually depressed and thereby the forward lever-arm 9^c and the cover-plate 10 attached to it by the pivot stud 10^a, are raised to close the ejection-opening as hereinbefore described, see Fig. 2. This engagement of the said handle 8^a by the forward and upward projection 9^e on the extension 9^d serves to positively lock the handle and the action-

slide in their rear position, and prevents the breech block of the rifle from being closed and thereby adapted for firing, until after the rear lever-arm 9^b is again raised and the ejection-opening is uncovered. While these parts, that is, the action-slide 8 and its handle 8^a are in the rearward locked position, the pulling of the trigger produces no effect, even though the breech mechanism of the rifle may be in the cocked condition, until said breech block has been closed and locked.

The upper rear corner of the upward projection 9^e on the lever 9, which, when raised, engages the action-slide handle 8^a and locks the same, is slightly rounded over in such a manner that when said corner first engages the handle 8^a it cams the handle and the action-slide a short distance to the rear, thereby producing a clearance for the point of the sear 6 which remains raised in the sear recess 6^b of the action-slide, and insuring the sear 6 to take its hold against the cocking shoulder 6^c of the action-slide.

If, after the action-slide handle 8^a has reached its most forward position, (in which it is indicated by dotted lines in Fig. 3 at 8^c,) and the handle 8^a has then been again moved rearward until it encounters the forward end of the upward projection 9^e of the lever 9, as shown in Fig. 3, the upwardly and rearwardly inclined form of said forward end will cause continued rearward movement of said handle 8^a to automatically depress the forward arm 9^c of the lever 9 and through it uncover the ejection-opening and thereby also automatically raise the rear arm 9^b of the lever 9 and thus adapt the rifle for being fired.

The two-armed lever 9, if detached from the frame, is slightly sprung or bent in its length, but being thin and elastic it yields to pressure against it and becomes straight when it is attached to the side of the frame 1 of the rifle. The integral pivot 9^a of the lever 9 has on the sides of its end two opposite thin spline-shaped projections, and the pivot hole in the side of the frame has corresponding grooves, one above and one below its center. In order to removably attach the lever 9 to the frame 1 of the rifle, the lever 9 is turned through an angle of substantially 90° until its two arms extend vertically at substantially right angles to their operative position on the frame, then the pivot may be readily inserted into the pivot hole, the projections on the pivot passing inward through the grooves in the pivot hole, until, under the pressure against the outside surface of the lever 9, the projections on the pivot pass inwardly beyond the pivot hole; then the lever 9 may be turned back again on its pivot until its arms resume their operative positions, while its integral pivot is held locked in the pivot hole, and in this position the resiliency of the lever will cause the same to be frictionally and yieldingly held.

When in the act of mounting the lever 9, it is placed upon the side of the frame 1, care must be taken to have the pivot hole in the forward lever arm 9^c engage the stud 10^a upon the outer surface of the cover-plate 10, then the resiliency of the lever 9 will also serve to press the cover-plate 10 against the side of the frame to prevent the separation of said cover plate 10 from the lever arm 9^c and to frictionally hold the cover plate in either of its two positions.

In order to detach the lever 9 and the cover plate 10 from the side of the frame 1 of the rifle, it is only necessary to proceed in the reversed order, lift the forward lever-arm from the pivot stud 10^a of the cover plate, then turn the lever until the lever arms again extend vertically, when the lever may be readily removed from the side of the frame.

While I have herein disclosed the novel improved device as applied to an automatic rifle of the class shown in my prior patent hereinbefore referred to, it will be understood that said device is applicable to other classes of automatic firearms.

What I claim is:

1. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member, means for closing said opening, and means positively actuated in the closing of said opening to lock said firing member against firing movement.

2. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member, a cover for said opening, means for moving said cover to operative or inoperative position, and means positively actuated in the movement of said cover to its operative position to lock said firing member, whereby firing movement of the same is prevented when the ejection-opening is closed.

3. In an automatic firearm, the combination of a frame having an ejection-opening, a cover for said opening, a member mounted for longitudinally reciprocating movement, manually-operable means to move said cover to a position covering said opening, and means positively actuated in such movement of the cover to lock said member in rearward position.

4. An automatic firearm comprising a frame having an ejection-opening, a slidable cover-plate for said opening, a member having longitudinal reciprocatory movement in said frame, and a manually-operable lever for actuating said cover-plate, said lever carrying means co-operating with said member for locking the same in rearward position while said cover-plate is in a position covering said opening.

5. An automatic firearm comprising a frame having an ejection-opening and having a longitudinal slot in a side wall, a member mounted for longitudinal reciprocatory movement within said frame and constructed and arranged to close said slot in all operative positions of said member, an actuating-handle on said member projecting outward through said slot, and means for covering said ejection-opening and simultaneously engaging said handle to lock it and the member in rearward position.

6. In an automatic firearm, the combination of a frame having an ejection-opening and having a longitudinal slot in a side wall, a member mounted for longitudinal reciprocatory movement within said frame and having an actuating-handle projecting outward through said slot, and a combined ejection-opening cover and lock for said member comprising a lever having a projection thereon co-operating with said handle when the same is in rearward position to keep said handle and the member in such position while the ejection-opening is covered.

7. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member mounted for longitudinal movement in said frame and having a handle projecting through a longitudinal slot in said frame for the manual operation of said member, a cover-plate for said ejection-opening, and a lever for actuating said cover-plate, said lever having a hook-shaped projection for engagement with said handle to lock said member in rearward position while said ejection-opening is covered.

8. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member mounted for longitudinal reciprocatory movement in said frame and having a cocking shoulder, a sear having a sear point for co-operation with said shoulder to hold said member in rearward cocked position, and means for covering said ejection-opening and for simultaneously locking said firing member, independently of said sear, against firing movement, said means, when moved to its operative position while said member is in rearward cocked position, causing said member to move rearwardly a short distance thereby forming a clearance between said shoulder and said sear point, and thereafter locking said member in such rearmost position.

9. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member provided with a cocking shoulder, a sear having a sear point in engagement with said shoulder when said member is in cocked position, and a combined ejection-opening cover and safety device, said device comprising a part constructed and arranged for engagement with said firing member, when the same is in its cocked position, to move said member a short distance in a direction to retract said shoulder from said sear point, and thereafter, to lock said member in such retracted position, the moving and locking of said member taking place simultaneously with the covering of said ejection-opening, thereby positively preventing the firing of the arm while the ejection-opening is covered.

10. In a firearm, the combination of a frame having an ejection-opening, a cover for said opening, a lever for, at will, moving said cover to either its operative or its inoperative position, a member mounted for longitudinal reciprocatory movement in said frame, and co-operating devices on said lever and said member comprising a cam surface on the one and a lateral projection on the other of said parts, whereby, during the rearward stroke of said member, said lever is automatically actuated to move said cover from its operative to its inoperative position.

11. In a firearm, the combination of a frame having an ejection-opening in a side wall, a cover-plate for said opening slidable on the outside face of said wall, a lever having a pivotal connection with said plate for actuating it, and inwardly extending means on said plate arranged for co-operation with the upper and lower edges of said opening to limit the movements of said plate and to hold the same parallel to the said edges of the opening when in either its operative or inoperative position.

12. A firearm comprising a frame having an ejection-opening, in a side wall, a cover-plate slidable on the outside face of said wall to cover and uncover said opening, and a lever pivoted to said side wall and connected to said cover-plate for actuating the same, said lever being formed with a lateral outward projection for the manual operation of the same and of the connected cover-plate, and with an inward rounded rib for engagement with a corresponding groove in the adjacent side wall of the frame for frictionally holding said lever and cover-plate in inoperative position.

13. In a firearm, the combination of a frame having an ejection-opening, a slidable cover-plate for said opening, a lever pivotally attached to a side wall of said frame and operatively connected to said cover-plate, said connection comprising a stud on one, and a pivot hole in the other of said parts, one of said parts being yieldable laterally to permit making or breaking said connection in assembling or disassembling, respectively, without disturbing the pivotal connection of said lever to said frame.

14. In a firearm, the combination of a frame having an ejection-opening in a side wall, a cover-plate for said opening arranged for vertical sliding movement on

the outside face of said wall, a stud on the outside surface of said cover-plate, and a manually-operable lever pivoted to said side wall of the frame and having an end thereof formed with a pivot hole to receive said stud, said lever being resilient, thereby permitting lateral flexing of said end to engage it with or disengage it from said pivot stud in assembling or disassembling, respectively, without disturbing the pivoted connection of the lever to the frame.

15. In a firearm, the combination of a frame having an ejection-opening in a side wall, a cover-plate for said opening, a lever for actuating said plate pivotally attached to said side wall, said attachment comprising an integral pivot on said lever having radial projections at the end thereof, and a pivot hole extending through said side wall and having grooves corresponding to said projection to permit, when said lever is angularly displaced from its operative position, insertion of said pivot into said pivot hole with the end of said pivot carrying said projection passing inward beyond the inner edge of said pivot hole, whereby, when said lever is turned about its pivot to its operative position, said radial projections, by resting against the inside face of said side wall, operatively lock said lever to said frame.

16. A firearm, comprising a frame having an ejection-opening, a cover-plate slidable on the outside surface of said frame to cover and uncover said opening, and a lever for actuating said plate pivotally attached to said frame, said lever being resilient whereby, in co-operation with the outside surface of said frame, said lever and said cover-plate are frictionally held in either of their positions.

17. A firearm, comprising a frame having an ejection-opening in a side wall, a cover-plate slidable on the outside of said wall to cover and uncover said opening, and having a lateral pivot stud, and an actuating lever for said cover-plate having a pivot hole at one end for releasably engaging said stud, said lever being resilient thereby insuring the connection between the same and said cover-plate and, at the same time, pressing said plate against the side wall of the frame, whereby said lever and said plate are frictionally held in either of their positions.

18. A firearm comprising a frame having an ejection-opening therein, mechanism for covering said opening, an action-slide mounted for longitudinal reciprocatory movement in said frame, co-operating devices on said mechanism and said action-slide for automatically moving said mechanism to its inoperative position during the rearward stroke of said slide, and means comprising co-operative parts on said mechanism and said frame for yieldingly holding said mechanism in such position.

19. An automatic firearm, comprising a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame, manual means for covering said ejection-opening when the member is either in a rearward position or in a forward position, said means serving to lock said member in the rearward position when the ejection-opening is covered with the member in such position, but if said member is in the forward position when the ejection-opening is covered, said means being automatically actuated to uncover said opening on the rearward stroke of said member.

20. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member, a closure for said ejection-opening, and means for moving said closure to operative or inoperative position, said moving means being constructed and arranged to directly lock the firing member against firing movement when said closure is in its operative position, whereby firing is positively prevented when the ejection-opening is closed.

21. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member movable to cocked position, a closure for said opening, and locking means for said firing member, said locking means being positively actuated to its operative position in the closing of said ejection-opening while the firing member is in cocked position, thereby preventing firing while the ejection-opening is closed.

This specification signed and witnessed this 21st day of December, A. D. 1922.

JOHN M. BROWNING.

In the presence of—
D. SELLIRK,
T. S. BROWNING.