April 14, 1925. 1,533,968

J. M. BROWNING

AUTOMATIC RIFLE

Filed Jan. 6, 1923

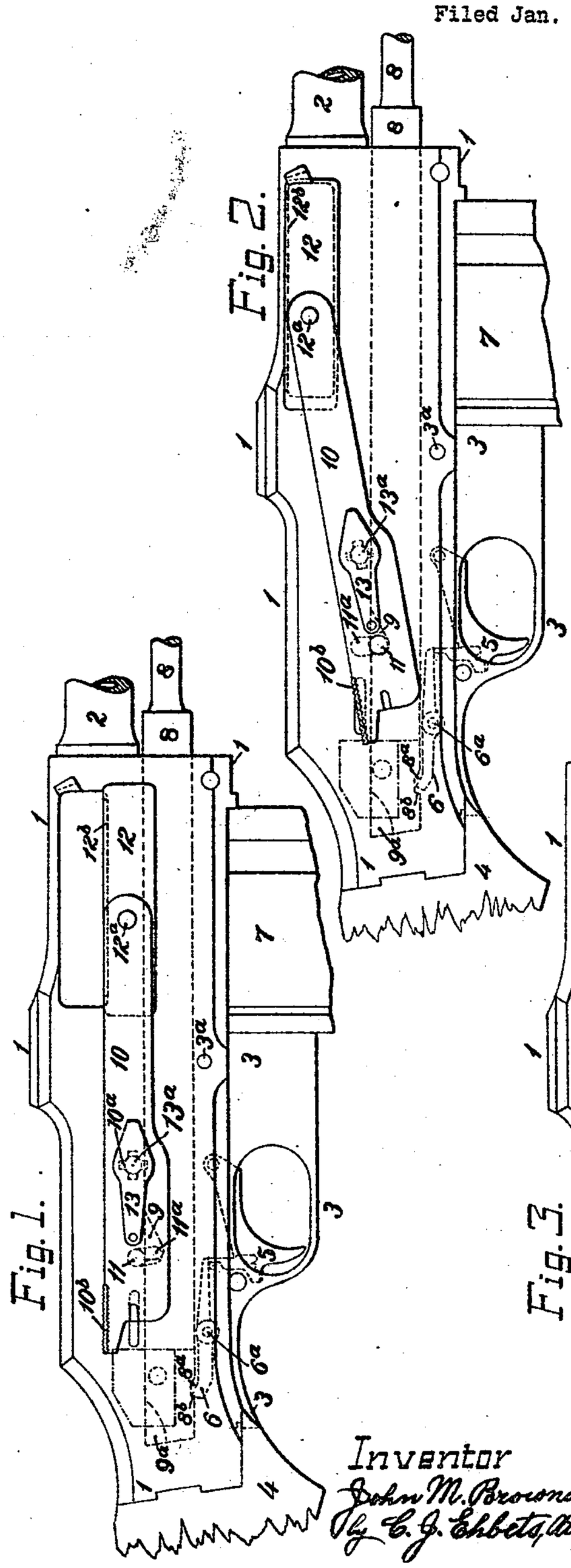

Fig. 1.

Fig. 2.

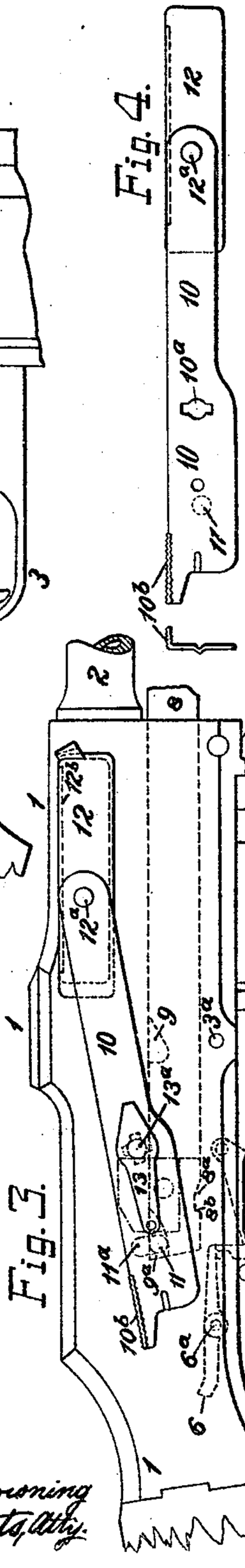

Fig. 3.

Fig. 4.

Fig. 5.

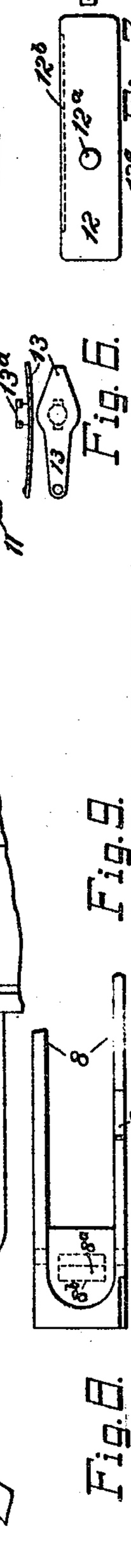

Fig. 6.

Fig. 7.

Fig. 9.

Fig. 8.

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Patented Apr. 14, 1925. 1,533,968

UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

AUTOMATIC RIFLE.

Application filed January 6, 1923. Serial No. 611,041.

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.

The invention relates to additions and improvements in automatic rifles, of the class shown and described in the 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, without change of the form or weight of the rifle, it is adapted for firing modern highly charged military ammunition.

The invention specially relates to novel additions in that class of gas-operated magazine rifles in which a vent in the barrel leads into the gas cylinder mounted below and alongside of the barrel, in which cylinder the powder gases may expand, the forward end of the gas cylinder being closed and the rear end of the same forming a block with an extension into the breech casing detachably secured therein.

The powder gases expanding in the gas cylinder and exerting pressure in rearward direction upon a movable piston therein, drive the same and its piston rod to the rear, and thus also drive rearward the action-slide of the rifle attached to said piston rod.

The action-slide enters into the frame of the rifle and, while bifurcated to clear the cartridge magazine in the usual magazine seat within the frame, it has an integral cross bar both at its forward and at its rear end.

The action-slide reciprocates lengthwise in the frame and its movements are transmitted to the breech mechanism of the rifle, thus actuating said mechanism. The rearward movement of the action-slide under the pressure of the powder gases compresses a reaction-spring, and the expansion of said spring effects the forward movement of the action-slide.

All these parts are arranged as usual and in the manner shown and described in my prior patent hereinbefore referred to.

When the rifle is in use by a party in a trench, or in the field, it should be kept closed against rain, snow or dirt. For this reason it is necessary that rifles originally manufactured with the heretofore usual unprotected opening in the frame in rear of the firing chamber of the barrel, through which the cartridge shells and unfired cartridges are thrown out during the rearward opening movement of the breech block, should be altered and have added to them a device by which entrance of disturbing foreign matter into the frame will be made impossible; this must be done, however, with the least possible changes in construction and operation of the interior mechanism of the rifle.

The object of the present improvement and addition is to provide a previously manufactured rifle of this class with a manually operated device for at will covering or uncovering the ejection-opening, combined with a safety device which shall positively prevent the firing of the rifle while the said ejection-opening is covered.

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

In the accompany drawings:

Fig. 1 is a right-hand side view of a rifle frame with a two-armed lever mounted thereon, the forward arm being lowered and a cover plate connected with said arm being also lowered, and the action-slide being near its rear position.

Fig. 2 is a side view similar to that shown in Fig. 1, but with the rear arm of the two-armed lever depressed and the forward arm and the cover plate raised, and the action-slide in its rearmost position.

Fig. 3 is a similar view of the rifle frame, showing the rear arm of the two-armed lever depressed and its forward arm and the cover plate raised, but with the action-slide moved some distance forward.

Fig. 4 shows the two-armed lever with the cover plate pivoted thereto, detached, in a side view and a rear view.

Fig. 5 shows a longitudinal section of the two-armed lever, detached, as seen from below.

Fig. 6 represents the detachable fastener holding the two-armed lever upon the side of the frame, detached, in a side view and in a top view.

Fig. 7 shows the cover plate detached in a side view, front end view and bottom view.

Fig. 8 shows a rear end view of the action-slide, detached.

Fig. 9 shows a side view of the action-slide, detached, and a top view of the rear portion of said action-slide.

It is a fact, and it must be obvious to parties learned in the art of manufacturing firearms, that to add a device to previously fully manufactured rifles without changing the interior mechanisms of the same to any great degree is a much more difficult task than to manufacture new rifles in which members of the interior mechanism may be specially constructed and adapted to co-operate with the novel improvement.

As shown in Figs. 1, 2, and 3, in the present improvement, a two-armed lever 10 is pivotally attached upon the exterior surface of the right-hand side wall of the rifle. The inner and the outer surfaces of this lever 10 are perfectly plain from the front and rearward to the pivot hole 10^a of the lever and for quite a distance beyond said hole. The pivot hole 10^a in the thin lever 10 has above and below its center two grooves, and in the side wall of the rifle frame a similar pivot hole is cut with similar rectangular grooves above and below its center; these holes, that in the lever and that in the side wall of the frame, correspond exactly with each other. As shown in Fig. 6 the pivot for the lever 10 is carried by a separate lever fastener 13 which has on its inner surface an integral inwardly projecting pivot 13^a and this pivot carried by the fastener is provided at its inner end with two spline-shaped projections, one in front and one in rear of its center, these projections are thin and leave under them a considerable portion of the pivot cylindrical in form.

With the lever 10 held against the side of the frame in the position in which the pivot hole 10^a in the lever corresponds with the hole in the side of the frame, and, with the fastener 13 turned on its axis through an angle of 90°, the projections on the inner end of the pivot 13^a of the fastener will readily pass inward through the grooves in the lever 10 and through those in the side of the frame. If then the fastener 13 is turned until it occupies the position relative to the lever 10 shown in Figs. 1, 2 and 3, the fastener 13 will be locked against outward movement by the engagement of the projections on the end of its pivot 13^a with the inner surface of the side wall of the frame. At its rear end the fastener 13 has a slight circular projection on its inner surface, formed by an indentation of the metal of the fastener, and the lever 10 has a corresponding small hole with which the projection of the fastener 13 engages, thereby holding the fastener frictionally in its position upon the lever 10, but allowing the lever 10 and the fastener 13 to vibrate together upon the side of the rifle frame.

Slightly in rear of said small hole the lever 10 carries on its inner surface an integral cylindrical laterally projecting stud 11, and a corresponding segmental slot 11^a is cut through the wall of the frame in such a manner that, when the lever 10 is attached to the side of the frame as hereinbefore explained, the stud 11 extends through the slot 11^a into the interior of the rifle frame and projects inward a distance beyond the inner surface of said wall, for the engagement of said stud 11 by the action-slide 8 and for the consequent co-operation between the action-slide 8 and the lever 10.

As seen in Figs. 1, 2, 3 and 4, the rear portion of the lever 10 is vertically considerably broader than the forward portion of said lever; by this construction the lever 10 entirely covers the segmental slot 11^a in the side wall of the frame when the rear portion of the lever 10 is in its lowest position, see Figs. 2 and 3, as well as when said rear portion of the lever is in its highest position, see Fig. 1, and in this manner the lever 10 positively prevents entrance of any disturbing matter into the frame of the rifle.

Near the end of its forward portion the lever 10 has a hole for the stud 12^a of the cover plate 12; as clearly shown in Fig. 7 the cover-plate 12 carries the stud 12^a on its outer surface and it also carries on its upper edge an inwardly projecting rib 12^b; when the lever 10 and the plate 12 are operatively assembled, the cover-plate 12 is pivotally and detachably connected with the forward portion of the lever 10. When said forward portion of the lever 10 is in its lowest position, see Fig. 1, the cover-plate 12 also is lowered and thereby has uncovered the ejection-opening in the rifle frame, whereas, when the forward portion of the lever 10 is raised, see Figs. 2 and 3, the cover-plate 12 also is raised and thereby has covered the ejection-opening in the rifle frame; in both of these positions the longitudinal inwardly projecting rib 12^b holds said cover-plate parallel to the ejection-opening by engaging either the upper or the lower edge of said opening.

At its rear end the lever 10 is provided at the top with an outwardly projecting finger piece 10^b, by pressure against which with his thumb the shooter may at will raise or depress the rear portion of the lever 10, and thus depress or raise the forward portion of

the lever 10 and thereby uncover or cover the ejection-opening in the frame.

Below the outwardly projecting finger piece 10^b, the rear end of the lever 10 has a low rounded inwardly projecting longitudinal rib, formed by an indentation in the surface of the lever, and in the outer surface of the rifle frame a corresponding longitudinal groove is cut; this rib and this groove are parallel to the upper edge of the lever 10, see Fig. 1, and serve to frictionally hold the lever 10 in its horizontal position in which its rear portion is raised, and its front portion depressed, and the cover plate 12 is lowered and thereby the ejection-opening is uncovered.

The inwardly projecting stud 11 on the rear portion of the lever 10 is so located that, when this portion of the lever and with it the stud 11 are raised, the stud 11 stands just above the upper edge of the rear portion of the action-slide 8 reciprocatorily mounted within the frame, and therefore, the stud does not interfere with either the free rearward or forward stroke of the action-slide 8, see Fig. 1; but when the action-slide 8 is in the rearward position, the stud 11 may be lowered, by depressing the rear portion of the outside lever 10, and thereby raising the forward portion and with it the cover-plate 12 so as to cover the ejection-opening.

This downward movement of the rear portion of the lever 10 and of the stud 11, when the action-slide 8 is near its rearmost position, is made possible by a recess 9 cut in the right-hand portion of the action-slide 8 into which the stud 11 may enter, see Fig. 1; the rear wall of the recess 9 is substantially vertical and of such a form that when the stud has entered said recess it positively locks the action-slide 8 in its rear position, thereby making it impossible to fire a shot while the forward portion of the lever 10 is raised and the ejection-opening is covered by the cover-plate 12. In this position of the parts, the trigger 5 of the rifle may be pulled without producing any effect.

If now the rear portion of the lever 10 is raised, and with it the stud 11, the forward portion of the lever 10 is lowered and with it is lowered the cover-plate 12 so as to uncover the ejection-opening, and at the same time the stud 11, rising out of the recess 9 in the action-slide 8, frees said action-slide and allows it to be forced forward to close and lock the breech closing part, and thus adapt the rifle for being fired. Even when the firing mechanism of the rifle is in the cocked condition, but with the ejection-opening still remaining covered, the stud 11 on the lever 10 having fully entered into the recess 9 in the top of the action-slide 8, positively locks said action-slide 8 as hereinbefore described. If now the rear portion of the lever 10 is raised to uncover the ejection-opening, the sear 6, the point of which remains raised in the recess 8^a in the under side of the integral rear cross bar of the action-slide 8, at once takes its hold against the cocking shoulder 8^b of the action-slide, thereby causing the sear 6 and the trigger 5 to become again operative.

In order that the sear point may freely rise in front of the cocking shoulder when the trigger is released, the rear angle formed at the junction of the rear wall of the recess 9 with the top of the action-slide 8 is rounded over, and so shaped that the lowering of the stud 11 into said recess, when the rear portion of the lever 10 is depressed, cams back the action-slide 8 a short distance and thereby insures an endwise clearance for the raised sear point to take its hold against the cocking shoulder 8^b of the action-slide, thus making the sear as well as the trigger operative for at will firing a shot when the breech of the barrel of the rifle is closed and locked.

When the action-slide 8 is moved to its forward position, the rear portion of the lever 10 and the stud 11 may be lowered, because then the stud 11 is some distance in rear of the rear end of the action-slide which, therefore, does not prevent the lowering of the stud 11 and of the rear portion of the lever 10. At its right-hand side the rear end of the action-slide is provided with a recess 9^a inclining in the forward and upward direction, see Figs. 8 and 9; when, during its rearward movement, the end of the action-slide encounters the lower stud 11 of the lever 10, the stud 11 will enter said recess and, by the incline of the same, the stud 11 will be forced upward so as to resume again its position above the top edge of the action-slide.

As indicated in Fig. 5, the lever 10 is slightly curved or bow-shaped in its length, and, as shown in Fig. 6, the lever fastener 13 is also curved or bow-shaped; both the lever 10 and the fastener 13 are elastic and, when pressed from the outside against the surface of the wall of the rifle frame, these parts readily become straightened, and in that condition they are frictionally held in their raised or lowered position to either of which they may have been moved manually.

While I have herein described the novel improved device as applied to previously manufactured automatic rifles of the class shown in my prior patent hereinbefore referred to, it will be understood that it is also applicable to rifles of this class in process of manufacture and to other classes of automatic firearms.

I claim:

1. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member, and means for covering

said ejection-opening and simultaneously locking said member against firing movement, said means comprising an element mounted for movement on the outside of said frame and having a projection extending into said frame for co-operation with said firing member to positively lock the same against firing movement while the ejection-opening is covered.

2. In an automatic firearm, the combination of a frame having an ejection-opening, a firing member having a locking shoulder thereon, and means for covering said opening comprising a lever mounted for movement on the outside of said frame, said lever having a lateral projection thereon extending into said frame for co-operation with said shoulder to lock said member against firing movement while said ejection-opening is covered.

3. In an automatic firearm, comprising a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame, a cover plate for said opening, and a lever for actuating said cover plate, said lever being mounted for movement on the outside of said frame and having a lateral stud thereon extending through a slot in the frame for co-operation with said member to lock the same in a rearward position while said ejection-opening is covered.

4. In an automatic firearm, the combination of a frame having an ejection-opening and having a segmental slot in a side wall, a member mounted for longitudinal reciprocatory movement in said frame, and means for covering said opening comprising a lever mounted for swinging movement on the outside face of said side wall and having an integral stud thereon projecting through said slot into the frame for co-operation with said member to lock the same in a rearward position while said ejection-opening is covered, said lever being of a width to close said slot in all operative positions of the lever.

5. A firearm, comprising a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame, a cover-plate for said opening, a lever for actuating said cover-plate, said lever being arranged for movement on the outside of said frame and having a lateral stud projecting inside of said frame and into the path of said member when said opening is covered, and a cam surface on said member for co-operation with said stud whereby the ejection-opening is automatically uncovered during the rearward stroke of said member.

6. In a firearm, the combination of a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame, a cover-plate for said opening, a two-armed lever arranged for movement on the outside of said frame and having its forward arm connected to said cover-plate whereby the cover-plate can be manually moved to cover said opening when the member is in a forward position, and means for automatically moving said lever and the connected cover-plate to uncover said opening during the rearward stroke of said member, said means comprising an inward projection on the rear arm of said lever extending into the path of said member when said opening is covered, and a forward and upward incline at the rear end of the member.

7. In an automatic firearm, the combination of a frame having an ejection-opening therein, a member mounted for longitudinal reciprocatory movement in said frame, and manually operable means for covering and uncovering said ejection-opening, said means comprising a lever mounted for movement on the outside of said frame, a stud on said lever projecting inside said frame and, when said ejection-opening is covered while said member is in a rearward position, arranged to co-operate with said member to lock the same rearward, said stud, when said opening is covered while the member is in a forward position, being also arranged to co-operate with a cam surface at the rear end of said member for automatically uncovering said opening during the rearward stroke of said member.

8. In an automatic firearm, the combination of a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame and having a locking recess, a cover-plate for said opening, and means comprising a lever mounted for movement on the outside of said frame for actuating said cover-plate, said lever being formed with a lateral projection extending into said frame and movable into said recess to lock said member while said opening is covered, but permitting free movement of said member while said ejection-opening is uncovered.

9. In an automatic firearm, the combination of a frame having an ejection-opening, a member mounted for longitudinal reciprocatory movement in said frame and having a locking recess, a cocking shoulder on said member, a sear having a sear point for engagement with said shoulder to hold said member in rearward cocked position, and means for covering said ejection-opening and simultaneously locking said member in such position, said means comprising a lever mounted for movement on the outside of said frame and having a rounded stud projecting into said frame and arranged to engage the rear wall of said locking recess in the member with a camming action as said lever is moved to cover the ejection-opening,

thereby causing a clearance between said cocking shoulder and said sear point and simultaneously locking said member rearward while said opening is covered.

10. In a firearm, the combination of a frame having an ejection-opening, means for covering and uncovering said opening, a lever for actuating said means, and means for pivotally and detachably securing said lever to said frame, said means being constructed and arranged to permit a portion thereof to be passed through registering openings in said lever and said frame, respectively, when said means is angularly displaced from its normal position, and thereafter, by rotation back to its normal position, securing said lever to said frame, said means further comprising a device co-operating with said lever for frictionally holding said means and said lever against relative rotation, when assembled.

11. In a firearm, the combination of a frame having an ejection-opening, a closure for said opening, a lever for actuating said closure and means for pivotally and detachably securing said lever to said frame, said means comprising a pivot member passing through registering opening in said lever and in said frame, respectively, and having radial projections at its inner portion for co-operation with the inside surface of said frame to secure said lever to said frame, and also having a resilient lateral arm at its outer portion, said arm being formed with a rounded projection engaging a recess in said lever for frictionally holding said lever and pivot member against relative rotation, when assembled, but permitting said rotation for dis-assembling the parts.

12. In a firearm, the combination of a frame having an ejection-opening, a cover for said opening, a lever for actuating said cover, and means for pivotally and detachably securing said lever to said frame comprising a pivot member having radial projections at its inner end and constructed and arranged, when it is angularly displaced a given amount from its normal position, to be inserted into registering openings having grooves corresponding to said projection and formed in said lever and said frame, respectively, a distance sufficient to cause said inner end with the projections thereon to pass inwardly beyond the inner surface of said frame, said member comprising resilient means placed under tension by the act of inserting said member, whereby after said member is rotated back to its normal position, it is frictionally held against rotation relative to said lever and simultaneously presses said lever against the adjacent surface of the frame, thereby frictionally holding said lever and said cover in either their operative or their inoperative position.

This specification signed and witnessed this 28th day of December, A. D. 1922.

JOHN M. BROWNING.

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