W. H. GATES.

REPEATING FIREARM.

APPLICATION FILED AUG. 3, 1908.

934,158.

Patented Sept. 14, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

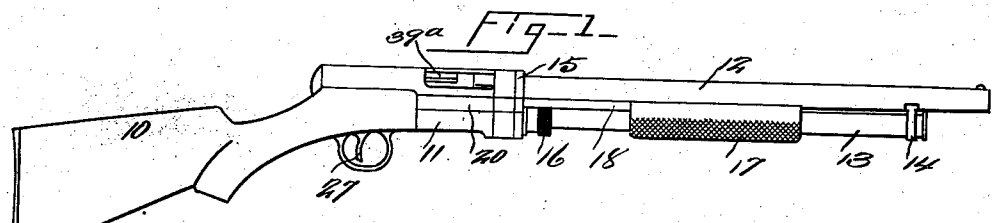


Fig. 2.

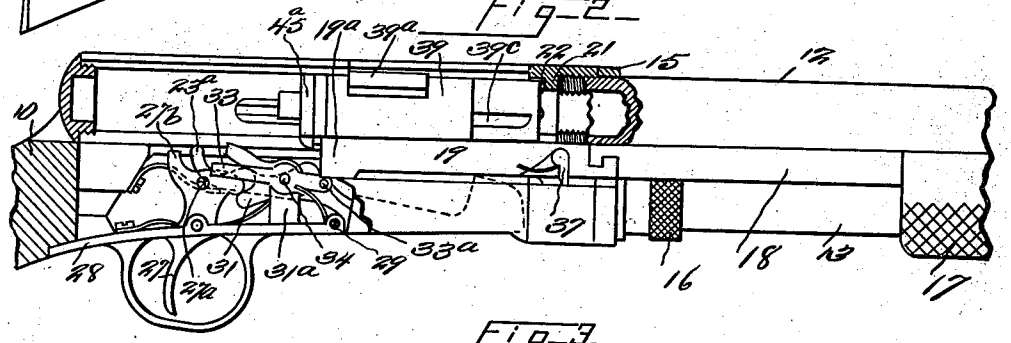


Fig. 3.

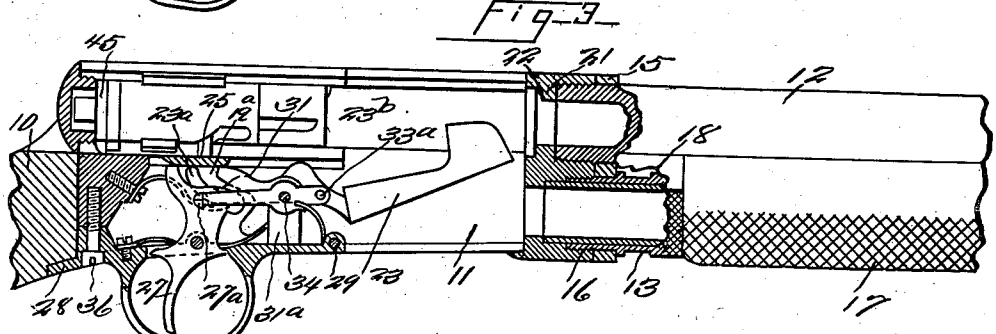
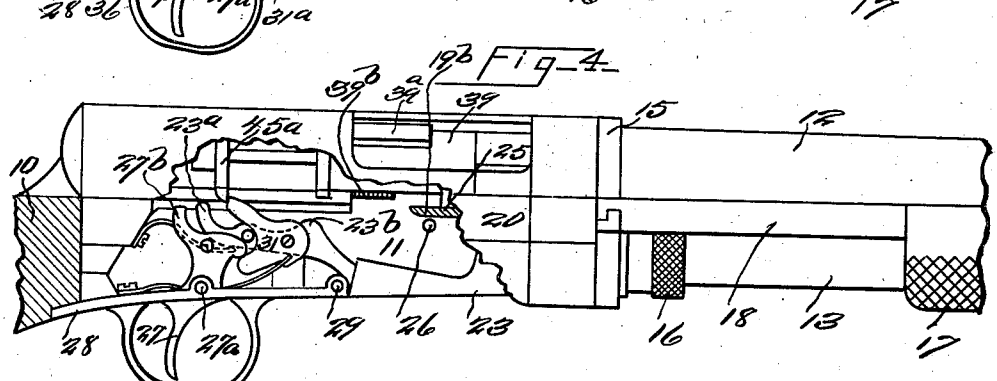


Fig. 4.



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3 SHEETS—SHEET 2.

Fig. 5.

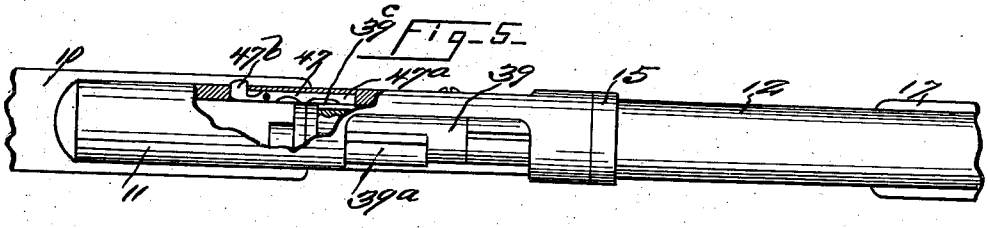


Fig. 6.

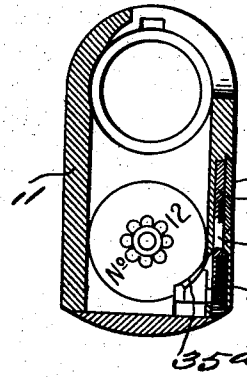


Fig. 7.

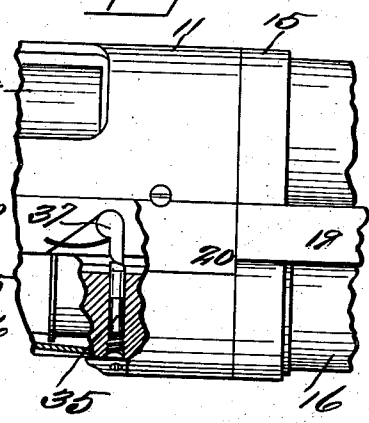


Fig. 8.

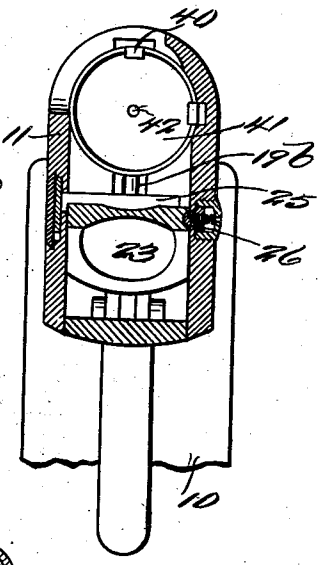
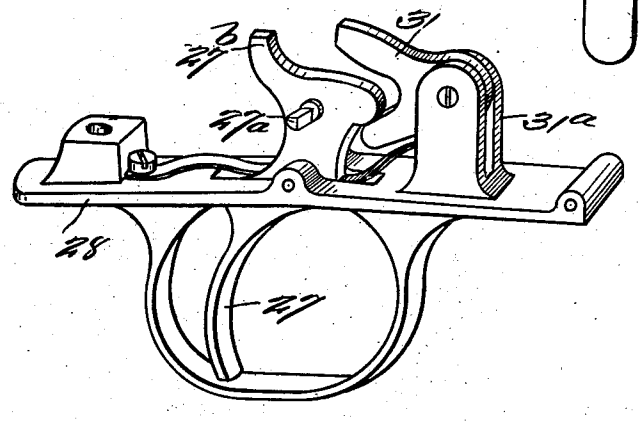


Fig. 9.



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3 SHEETS—SHEET 3.

Fig. 10.

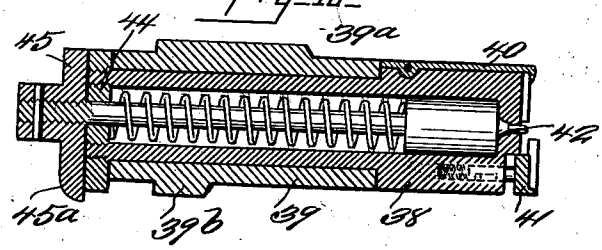
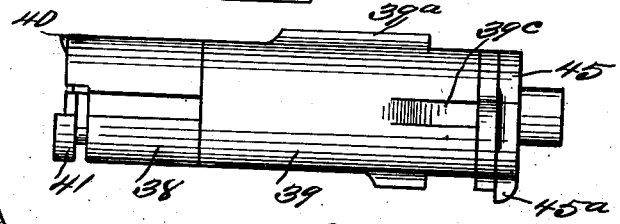


Fig. 11.



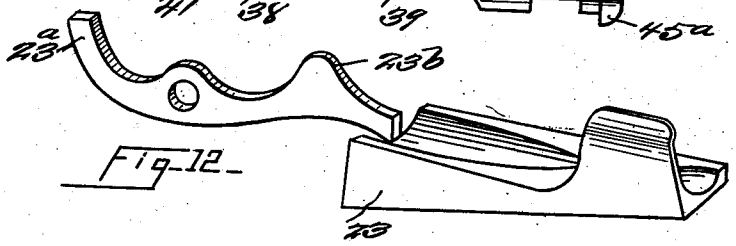


Fig. 12.

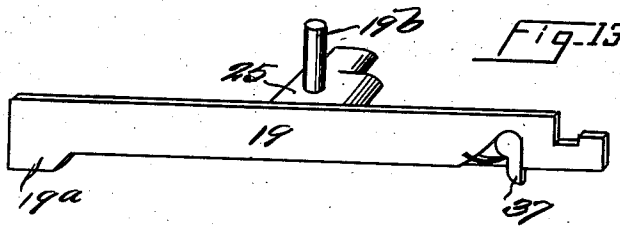
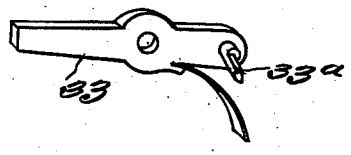


Fig. 13.

Fig. 14.



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WILLIAM H. GATES, OF NORWICH, CONNECTICUT.

REPEATING FIREARM.

934,158. Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed August 3, 1908. Serial No. 446,797.

To all whom it may concern:

Be it known that I, WILLIAM H. GATES, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented a certain new and useful Improvement in Repeating Firearms, of which the following is a specification.

This invention is in repeating fire arms, and has special relation to so called "slide action" repeating shot guns, although the dominating elementary features of my present improved arm could be as readily utilized in repeating rifles.

My present improvements relate chiefly to the lock and cartridge-handling mechanisms of such arms and I have particularly in mind to provide a strong, safe and simple "bolt" action which has no exposed projecting parts. I have also provided what I believe to be a novel type of gate, or cut-off, to prevent the passage of more than one cartridge at a time from the magazine to the carrier mechanism. Incidentally other features of the said arm have been improved, as I have explained hereinafter. These several features of improvement are clearly illustrated in the annexed drawings, Figure 1 being a side elevation of an arm embodying my said invention. Fig. 2 is a relatively enlarged side view of the frame or receiver of the arm with portions of the barrel and magazine tube attached thereto; said receiver being largely broken away to disclose the lock mechanism. In this view the operative parts are shown in the positions which they assume after the arm has been discharged. In Fig. 3 I have shown a similar view with the parts as they appear just as an empty cartridge shell has been withdrawn from the barrel and has been ejected through the then open upper side of the receiver, a fresh cartridge having been raised to a level with the barrel ready to be pushed into said barrel by the bolt. Fig. 4 is a similar view showing the same parts as they appear after the said cartridge has been thus pushed into the barrel and the carrier has been lowered to its normal position; the arm being cocked and ready for firing. Fig. 5 is a top view of the receiver and portions of the stock and barrel, the receiver being partly broken away to disclose a latch which forms one of the novel features of my present improvement. Fig. 6 is a transverse, sectional, view on the line 6—6 of Fig. 3 looking in the direction of the arrow. Fig. 7 is a side elevation, partly broken away, of the engaging portions of the receiver and barrel showing particularly the cut-off for preventing the undue escape of the cartridges from the magazine into the receiver, and also the means provided for operating the said cut-off. Fig. 8 is a transverse, sectional, view taken on the line 8—8 of Fig. 2, looking in the direction of the arrow. In Fig. 9 I have shown, in perspective, the trigger plate having the trigger and sear pivoted therein. Fig. 10 is a longitudinal, central, sectional view of the bolt, showing the firing-pin, extractor and ejector mounted therein and Fig. 11 is a view of said bolt taken from the side opposite to that of Fig. 10. Fig. 12 is a perspective view of the carrier by means of which the cartridges are raised from the level of the magazine to the level of the barrel. Fig. 13 is a perspective view of the extension rod 19 and Fig. 14 is a perspective view of the safety lever 33 which co-acts with the trigger.

In these drawings the reference numeral 10 indicates the stock of the arm, 11 the receiver, which serves as a housing for the lock and cartridge-handling mechanisms; 12 is the barrel and 13 the magazine tube; said magazine tube being located underneath the barrel and being supported at its front end portion in a ring 14 secured to the barrel; the magazine tube being free to slide in said ring whenever it becomes necessary or desirable to separate the barrel from the receiver. The barrel has fixed to its rear end portion a plate 15 conforming in outline to the cross section of the receiver, the lower portion of said plate having an opening adapted to receive a nut 16 loosely mounted on the rear end of the magazine tube, and the said nut being threaded exteriorly to screw into the receiver, as seen in Fig. 3 of the drawings. The said nut then serves as a support for the rear end of the tube 13 and also as a dowel to prevent the displacement of the plate 15, as well as the accidental unscrewing of the barrel from the receiver.

Mounted to move longitudinally upon the magazine tube 13 is a hand slide 17 having

secured thereto a bar 18 which latter extends rearwardly and has interlocked therewith an extension 19 which is covered and protected, when the arm is completely assembled, by a plate 20 slidably mounted in a dove-tail groove in the side of the receiver. By means of the hand slide 17 and the attached, two-part, bar 18—19, the lock-mechanism and other operative parts, may be readily actuated in order to eject a discharged shell and to transfer a fresh cartridge from the magazine to the barrel and, simultaneously, to cock the arm and set the trigger.

In the receiver portion, into which the barrel is screwed I have provided a fixed annulus 21 which forms one of the important features of my present improvement. This annulus is so located that it serves as a substantial abutment for the barrel end, when the barrel is screwed home in the receiver, and it also serves another, and perhaps more important, purpose which I will explain.

Ordinarily the rear end portion of the barrel has to be notched, or otherwise recessed, to receive the free end of the extractor hook, in order that the said hook may lie in front of the flanged cartridge head and, when the extractor is thus seated in the barrel notch, it effectually locks the barrel against rotation and it is therefore impossible to separate the barrel from the receiver until the arm has been cocked or, at all events, not until the extractor hook has first been withdrawn from the barrel notch. In my improved construction the notch for the reception of the extractor is made in the fixed annulus, as seen at 22 in Figs. 2 and 3, thus rendering it unnecessary to cut into the barrel end, and leaving the barrel end free to be rotated, or partially rotated, in order that it may be detached from the receiver.

As each cartridge passes rearwardly from the magazine tube 13 into the receiver it is deposited upon a carrier 23 which is fulcrumed at 24 in the said receiver; the said carrier being then elevated, as seen in Fig. 3 to raise the cartridge into alinement with the barrel and so that it (the cartridge) may be forced forward, and seated in the barrel, by the forward movement of the bolt. The rear end portion of said carrier is formed with two projections 23^a 23^b the former of which is located at the rear of the carrier fulcrum and the latter at the front of said fulcrum, said projections being adapted to be engaged alternately by a bracket 25 carried by the sliding bar 19, that is to say when the said bar is slid rearwardly, the attached bracket 25 engages the projection 23^a and forces the rear end of the carrier downward and thus elevates the free front end of said carrier and, *per contra*, when the bracket 25 is moved forward again, to return it to its normal position, it (the bracket) engages the projection 23^b and thus rocks the carrier downward to its initial position, ready to receive the next cartridge from the magazine tube. In order to prevent the premature return of the carrier from its elevated position to its initial position, I have provided in the side wall of the receiver a spring-pressed plug 26 whose rounded end enters a depression in the carrier, when the latter is in its elevated position (see Fig. 8) and thus serves frictionally and temporarily to prevent the premature downward movement of the carrier.

The trigger 27 is pivoted in a plate 28 that is secured to the receiver by a pin 29 at one end and by a screw 30 at its other end and the sear 31 is pivoted in a stand 31^a formed on the said plate 28, as will be best understood by reference to Fig. 9 of the drawings. The sear 31 has two rearwardly projecting arms the lower of which is adapted to be engaged by the trigger and the upper of which is so located that it may be engaged by the head 45^a of the firing pin when the bolt is slid rearwardly to cock the arm (see particularly Fig. 4). When the trigger is pulled, to discharge the arm, the sear is rocked downward until its upper arm is released from engagement with the firing-pin head when said firing-pin is snapped forward as I shall explain more fully later.

I desire to call particular attention to two forms of safety devices which I have provided in connection with the trigger in order to prevent the accidental discharge of the arm before the new cartridge is completely seated in the barrel, and the bolt is securely locked in its home position in the receiver. One of said safety devices consists of a lever 33 that is pivoted on a screw 34 in the side wall of the receiver at, or about, the same point where the sear is pivoted. The rear end of the lever 33 is adapted to be moved into the path of a stud 27^a on the trigger and the front ends of said lever bears a stud 33^a that lies in the path of a rib 19^a on the sliding bar 19. When the said bar is in its forward, or normal position, as seen in Fig. 2, the rib 19^a holds the safety lever out of locking engagement with the trigger stud 27^a but so soon as bar 19 is moved rearward the rib 19^a passes away from the lever stud 33^a and the said lever is permitted to rock on its fulcrum so as to move its rear end into locking engagement with the trigger stud. The trigger is thus prevented from being pulled off until the bar 19 returns to its normal position and the bolt has been safely locked in its home position in the receiver. I have also provided another safety feature in the form of an upward extension 27^b on the trigger that lies in the rearward path of the bracket 25 which I have already referred to. When the said

bracket is moved rearward, in the operation of unloading and cocking the arm, the bracket engages the said trigger extension and positively rocks the trigger into position to receive the safety lever 33. If this were not so the trigger proper might be held rearward by the finger of the gunner in which case the sear would be held out of engagement with the firing-pin and the latter would return with the bolt instead of being retained by the sear.

The cartridge cut-off, which I have already briefly mentioned, is best seen in Figs. 6 and 7 and consists essentially of a bolt 35 mounted to slide vertically in a hole in the side of the receiver, said bolt being held normally in its elevated position by a spring 36. The bolt 35 is formed with a lateral fin 35^a that extends into the path traversed by the cartridges as the latter pass from the magazine tube into the receiver, as is clearly illustrated in Fig. 6. The sliding bar 19 is located immediately over the upper end of the said bolt 35 and said bar has pivoted thereto a pawl 37 whose free end engages the said bolt, and forces it downward, when the bar 19 is moved rearwardly (see Fig. 7). This downward movement of the cut-off 35^a occurs at the first rearward movement of the bar 19 and said gate is held open just long enough to allow the passage of the head of the cartridge then seeking to pass into the receiver. As said head passes the cut-off the pawl 37 passes out of engagement with bolt 35 and the spring 36 forces said bolt upward again, thus moving the cut-off fin into position to check the rearward movement of the next cartridge in the magazine. When the bar 19 is slid forward again the pawl 37 yields and passes over the end of bolt 35 without disturbing the latter.

I will now describe the lock-mechanism bolt and the parts immediately connected therewith. The said bolt indicated by the reference numeral 38, is of the usual cylindrical form and is adapted to slide longitudinally in the chambered upper portion of the receiver. Loosely mounted on bolt 38 is a tubular section 39 which is formed with longitudinal ribs 39^a—39^b that project radially from the circumference of said section 39, the said ribs being so located that they may be rocked into engagement with solid portions of the receiver when the bolt 38 is in its normal or closed position, in order to lock the said bolt against endwise deflection. The rib 39^a thus locks against the upper wall of the receiver (see Figs. 1, 4 and 5) and the rib 39^b thus locks against the lower wall of the bolt chamber (see Fig. 4). When it is desired to slide bolt 38 rearward, as in the act of extracting an empty shell and cocking the arm, the tubular section 39 is first rocked sufficiently to move the ribs 39^a 39^b out of abutting engagement with the solid portions of the receiver, and such rocking movement is produced by a stud 19^b on the sliding bar 19; said stud lying in a spiral groove or channel cut in the lower circumferential wall of the section 39 as is plainly seen in Fig. 3 of the drawings. The first rearward movement of bar 19 causes the tubular section 39 to rock on bolt 38 sufficiently to move the ribs 39^a—39^b out of locking engagement with the receiver, and continued movement of said bar 19 and its stud 19^b operates to slide the bolt 38 and its attached parts rearward; the rib 39^a meanwhile sliding in an internal channel in the top of the receiver (see Fig. 3).

Secured to the front end portion of the bolt 38 is a spring extractor hook 40 of ordinary construction, and mounted to slide a limited distance in the lower front portion of said bolt is an ejector 41. The firing-pin is denoted by the reference numeral 42. The mainspring is confined between a shoulder 42^a on the firing-pin head and a nut 44 screwed into the rear end of bolt 38. Upon the extreme rear end portion of the firing-pin is fixedly mounted a head 45 which has a downwardly projecting spur 45^a that is adapted to engage the sear, as seen in Fig. 4, to hold the firing-pin rearward when the bolt 38 returns to its home position after reloading the arm.

I have found it desirable to lock the tubular section 39 in the receiver after the arm has been reloaded, in order that the loaded cartridge in the barrel may not, by oversight, be thrown out, and this I have accomplished by pivoting in the side of the receiver a spring latch 47 whose front end is formed with a projecting nose adapted to enter a slot 39^a in the tubular section 39 when the bolt is in its home or forward position in the receiver, thus effectually preventing the rotation of section 39 until the arm is discharged, when the firing-pin head engages a projection 47^a on the inner side of latch 47 and forces the nose of the latch out of locking engagement with the slot 39^c (see Fig. 5). If, however, it should be desired to unlock section 39 without first discharging the arm it may be accomplished by means of a thumb-piece 47^b extending outwardly through a hole in the side wall of the receiver.

I wish to direct particular attention to the fact that the operative parts of my improved arm, as herein described, are completely inclosed and protected from the action of the elements, also that the various elementary parts are of strong construction and they are mainly positive in their operations.

Having thus described my invention I claim as new and wish to secure by Letters Patent:—

1. In a fire-arm, the combination of a re-

ceiver, a bolt slidably mounted in said receiver, a spirally grooved collar rotatably mounted on said bolt and formed with abutment lugs, and means for moving the bolt longitudinally in the receiver consisting of a bar having a stud engaging the said spiral groove.

2. In a fire-arm, the combination of a receiver, a bolt slidably mounted in said receiver, means for moving said bolt longitudinally in the receiver and a trigger; an action bar said trigger being formed with an extension that is engaged by the action bar during the rearward movement of the bolt to temporarily lock the trigger.

3. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, means consisting of a sliding bar for moving said bolt longitudinally, a trigger formed with an extension located in the rearward path of the action bar, a sear adapted to co-act with the said trigger and also located in the rearward path of the said bolt.

4. In a fire-arm the combination with a receiver, of a bolt slidably mounted therein, a collar rotatably mounted on said bolt and formed with abutment lugs adapted to engage the receiver when the bolt is in its closed or firing position, means for partially rotating said collar, a sear having an extension located in the rearward path of the action bar and a trigger adapted to co-act with the sear; said sear being also formed with a projection that lies in the rearward path of the bolt.

5. In a fire-arm, the combination of a receiver, a carrier in said receiver, a tubular magazine, a cut-off between the magazine and carrier consisting of a gate movable transversely to the movement of the cartridge, and means consisting of a sliding bar and a yielding pawl carried by said bar for opening the said gate.

6. In a fire-arm, the combination of a receiver, a bolt slidably movable therein, a trigger formed with an extension that is engaged by the action bar as the latter is moved rearward, a safety lever adapted to be moved into engagement with the trigger to lock the latter, and means for moving said safety lever into engagement with the trigger.

7. In a fire-arm, the combination of a receiver, a bolt slidably and non-rotatably mounted therein, a collar rotatably mounted on said bolt and means consisting of a spring-actuated latch hung in the receiver for preventing the rotation and unlocking of the collar.

8. In a fire-arm, the combination of a receiver, a bolt slidably mounted in said receiver, a collar rotatably mounted on said bolt, means consisting of a spring-actuated latch hung in the receiver for preventing the rotation of the said collar, and means for releasing said latch during the operation of discharging the arm.

9. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, a collar rotatably mounted on said bolt and provided with an abutment lug adapted to engage the receiver, and a spring-actuated latch hung in the receiver and operating normally to prevent the rotation of said collar.

10. In a fire-arm, the combination of a receiver, a barrel connected with said receiver, an annulus fixed in the receiver and serving as a thrust abutment for the barrel, a bolt slidably mounted in the receiver, an abutment lug rotatably mounted on said bolt, and means for normally retaining said abutment lug in its locking position.

11. In a fire-arm, the combination of a receiver, a barrel connected with said receiver, an annulus fixed in said receiver and serving as a thrust abutment for the barrel, a bolt slidably mounted in the receiver, an abutment lug rotatably mounted on said bolt, and means, consisting of a spring-actuated latch, for normally retaining said abutment lug in its locking position.

12. In a fire-arm, the combination of a receiver, a bolt slidably mounted in said receiver, an abutment lug rotatably mounted on said bolt, means for partially rotating the said abutment lug, and means for locking the said abutment lug against rotation during the operation of discharging the arm.

13. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, an abutment lug rotatably mounted on said bolt, means consisting of a spiral channel and a slidable lug co-acting with said channel for partially rotating the said abutment lug, and means consisting of a spring-actuated latch hung in the receiver for locking the said abutment lug against accidental rotation.

14. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, an abutment lug rotatably mounted on said bolt, means consisting of a spiral channel and a slidable lug co-acting with said channel for partially rotating the said abutment lug, and for sliding the bolt longitudinally and means in the receiver for locking said abutment lug against accidental rotation.

15. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, an abutment lug rotatably mounted on said bolt, means consisting of a spiral channel and co-acting slidable lug, for moving the bolt longitudinally and for partially rotating the said abutment lug, and means consisting of a spring-actuated latch hung in the receiver for locking the said abutment lug against accidental rotation.

16. In a fire-arm, the combination of a

receiver, a bolt slidably mounted therein, a spring-actuated firing-pin slidably mounted in said bolt, a sear lying in the rearward path of the firing-pin, an abutment lug rotatably mounted on said bolt, and means for partially rotating said abutment lug and spring-actuated means in the receiver for locking said abutment lug.

17. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, a spring-actuated firing-pin slidably mounted in said bolt, a sear located in the rearward path of the firing-pin, an abutment lug rotatably mounted on said bolt, means for partially rotating the said abutment lug, and means for moving said bolt rearwardly in the receiver and spring-actuated means in the receiver for locking said abutment lug.

18. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, a spring-actuated firing-pin slidably mounted in said bolt, a sear located in the rearward path of the firing-pin, an abutment lug rotatably mounted on the said bolt, means for partially rotating said abutment lug, and means for locking said lug against rotation.

19. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, a spring-actuated firing-pin slidably mounted in said bolt, a sear located in the rearward path of the firing-pin, an abutment lug rotatably mounted on the said bolt, means for partially rotating the said lug, means for locking the said lug against rotation, and means for moving the bolt rearwardly in the receiver.

20. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, an abutment lug rotatably mounted on said bolt, means for partially rotating said abutment lug, means for locking said lug against rotation, a cartridge carrier vertically movable in said receiver, means for elevating and for lowering the said carrier in the receiver, and means for temporarily retaining said carrier in its elevated position.

21. In a fire-arm, the combination of a receiver, a bolt slidably movable therein, means for moving said bolt longitudinally in the receiver, a cartridge carrier vertically movable in said receiver, means for elevating and lowering said carrier, a tubular magazine adapted to deliver cartridges onto said carrier, a cut-off between the magazine and carrier consisting of a gate movable transversely to the movement of the cartridges, and means consisting of a sliding bar and a pawl carried by the said bar for opening the said gate.

22. In a fire-arm, the combination of a receiver, a bolt slidably mounted therein, an extractor hook carried by said bolt, an abutment lug rotatably mounted on said bolt, means for partially rotating said abutment lug, means for moving the bolt longitudinally in the receiver, means consisting of a spring-actuated latch for locking the said abutment lug against rotation, and an ejector mounted in said bolt.

23. In a fire-arm, the combination of a receiver, a magazine tube secured to said receiver, a safety lever hung in the receiver, a cartridge carrier fulcrumed in said receiver and formed with a rearwardly extending portion, a trigger located between the said carrier extension and the said safety lever, said trigger being provided with a laterally projecting stud, and means for moving said safety lever into engagement with the said stud.

24. In a fire-arm, the combination of a receiver, a magazine tube secured to said receiver, a cartridge carrier fulcrumed in said receiver and formed with a rearwardly extending portion, a safety lever hung in the receiver, a trigger and co-acting sear located between the said carrier extension and safety lever, means for moving said safety lever into locking engagement with the trigger during the operation of unloading and reloading the arm, and means for releasing said safety upon the reloading of the arm.

25. In a fire-arm, the combination of a receiver having an internal channel in its upper portion, a bolt slidably mounted in said receiver, an abutment lug mounted upon said bolt and adapted to be rocked into coincidence with said channel, a spirally grooved collar on the bolt for rocking said lug, and means for preventing the engagement of the said lug and channel.

26. In a fire-arm, the combination of a receiver having an opening in its upper portion and a channel leading rearwardly from said opening, a bolt slidably mounted in the receiver, an abutment lug mounted upon said bolt and adapted to be rocked into coincidence with the said channel, a spirally grooved collar on the bolt for rocking said lug, means for preventing the engagement of the said lug and channel, and for moving the bolt longitudinally in the receiver.

27. In a fire-arm the combination of a receiver having an opening in its upper portion and a channel leading rearwardly from said opening, a bolt slidably mounted in the receiver, an abutment lug mounted on said bolt and adapted to be rocked into coincidence with said channel and means consisting of a spiral groove and a co-acting stud for rocking the said lug into coincidence with the said channel and means within the receiver for locking said lug against accidental rotation.

28. In a fire-arm, the combination of a receiver having an opening in its upper portion and an internal channel leading rearwardly from said opening, a bolt slidably mounted in the receiver, an abutment lug mounted on said bolt and adapted to be

rocked into coincidence with said channel, means for thus rocking said lug on the bolt, and for moving the bolt longitudinally in the frame, and means for latching the said abutment lug against rotation.

29. In a fire arm, the combination of a receiver, a magazine tube secured to said receiver, a safety lever hung in the receiver, a cartridge carrier fulcrumed in said receiver and formed with a rearwardly extending integral portion, a trigger located between the said carrier extension and said safety lever, said trigger having a lateral projection, and means for moving said safety lever into engagement with said projection.

30. In a fire arm, the combination of a receiver, a magazine tube, secured to said receiver, a cartridge carrier fulcrumed in said receiver and formed with a rearwardly extending integral portion, a safety lever hung in the receiver, a trigger and coacting sear located between the said carrier extension and safety lever, means for moving said safety lever into locking engagement with the trigger during the operation of unloading and reloading the arm, and automatic means for releasing said safety lever upon the reloading of the arm.

WILLIAM H. GATES.

Witnesses:
FRANK H. ALLEN,
MADELINE D. RITCHIE.