

G. HAMMOND.

GUN.

APPLICATION FILED FEB. 1, 1912.

1,044,780.

Patented Nov. 19, 1912.

5 SHEETS—SHEET 1.

Fig. 1.

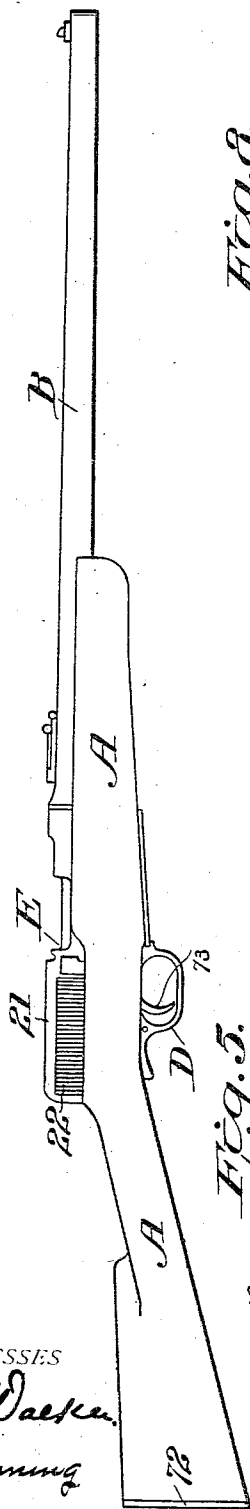


Fig. 8.

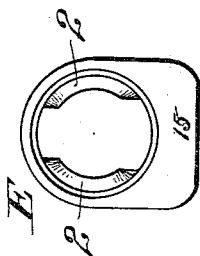


Fig. 9.

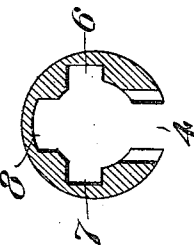


Fig. 5.

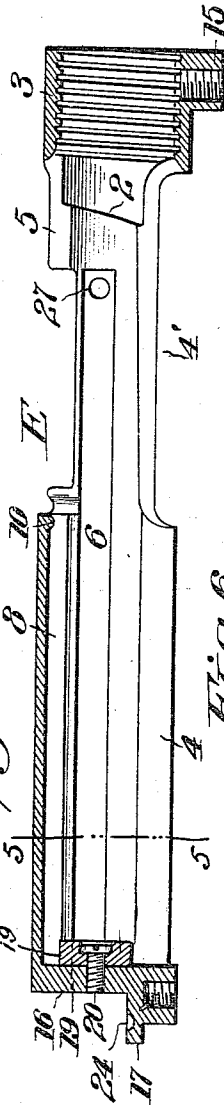


Fig. 6.

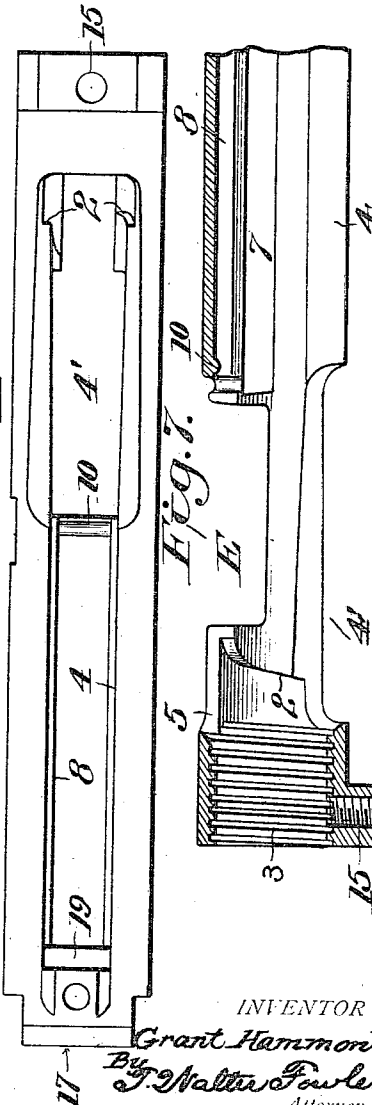
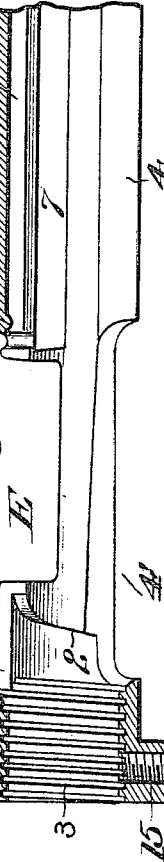


Fig. 7.



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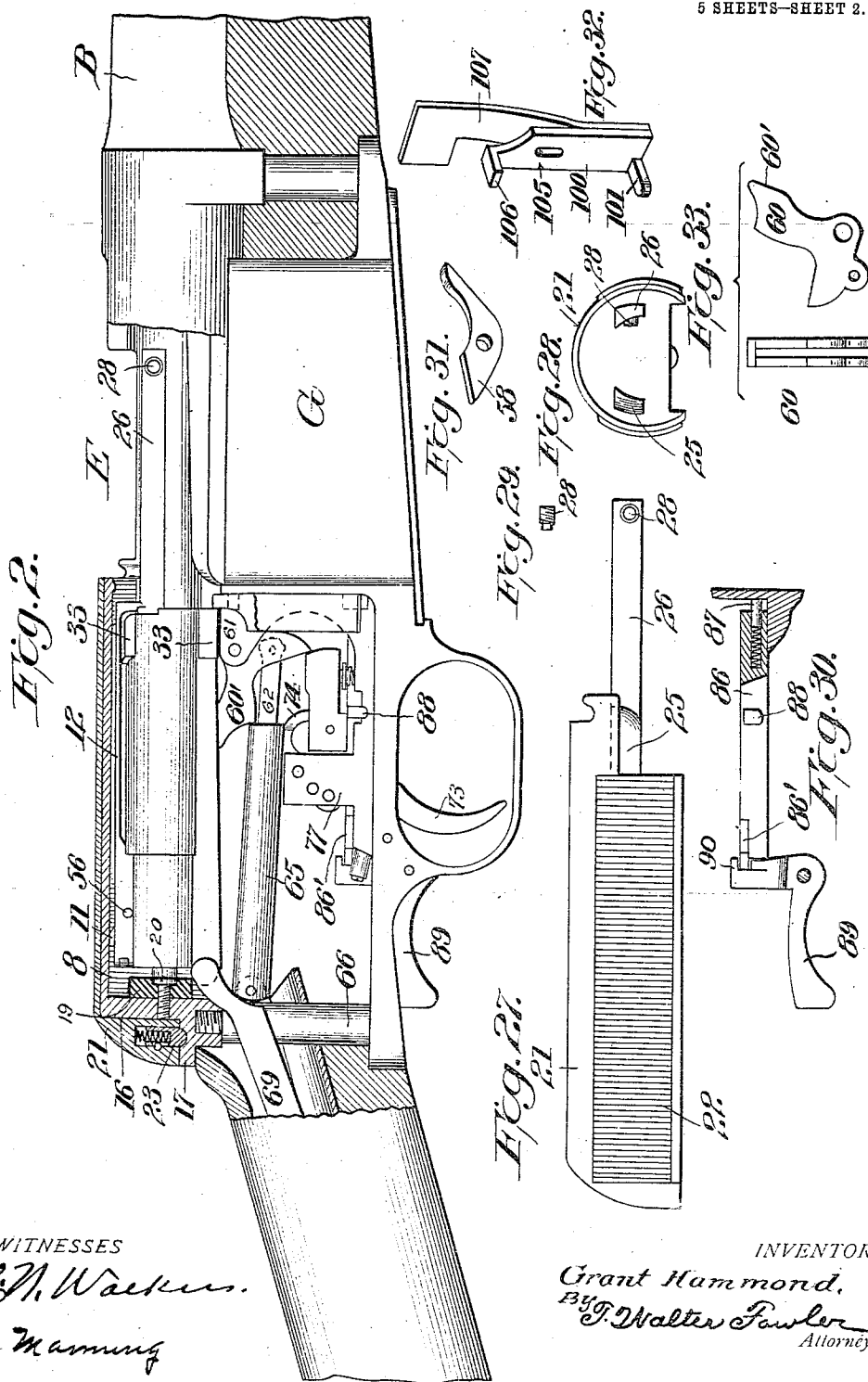
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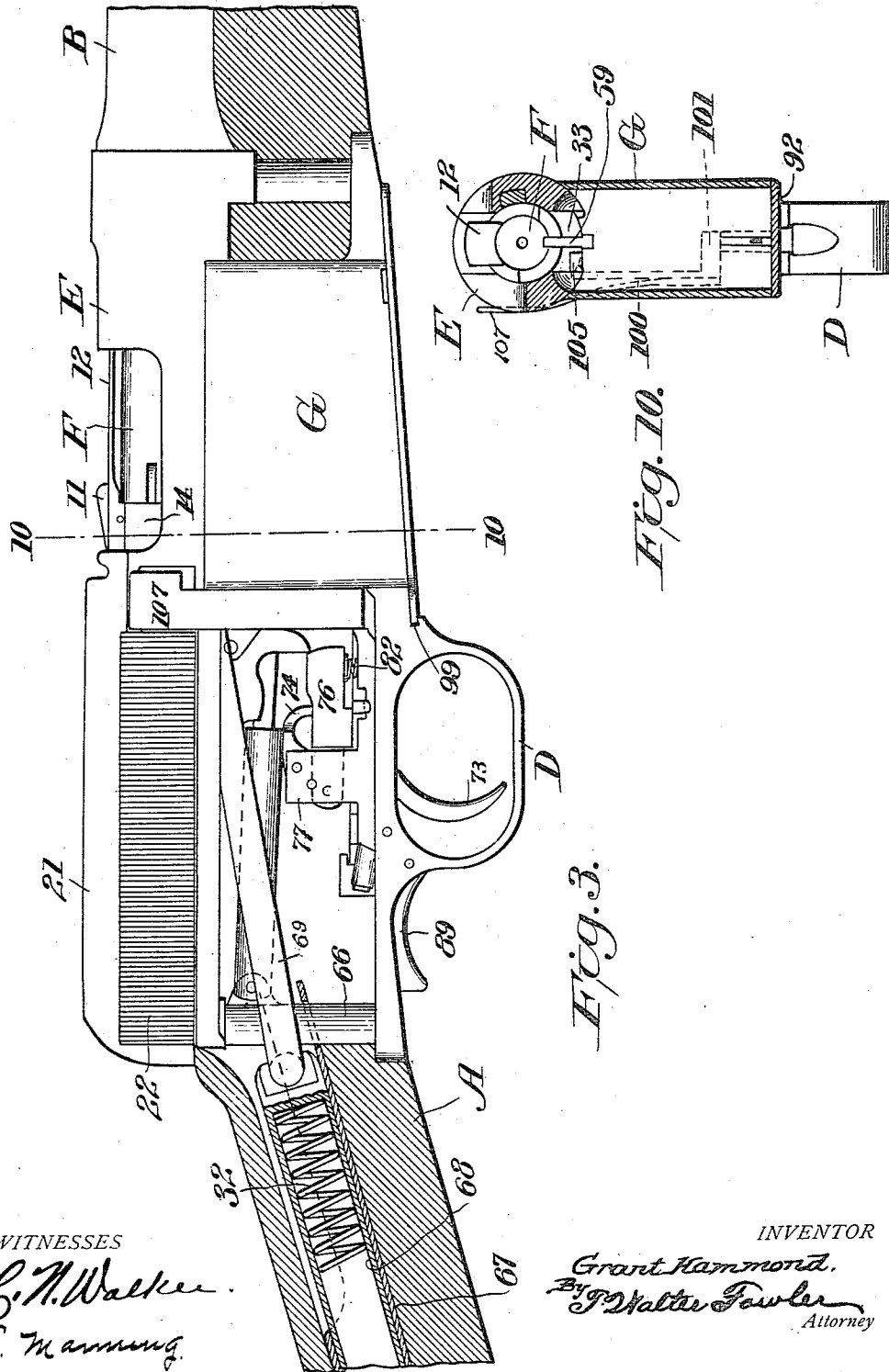


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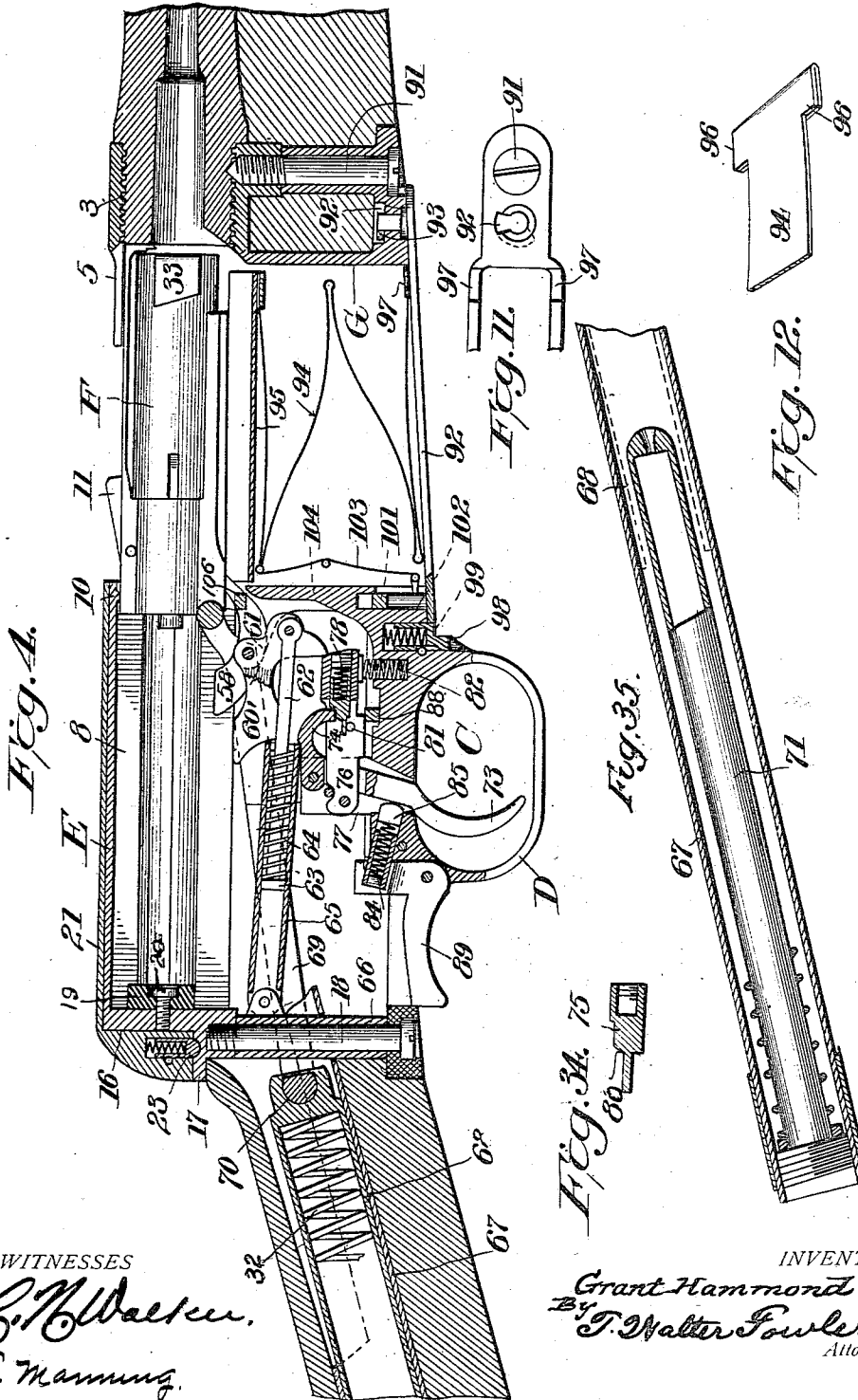
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WITNESSES

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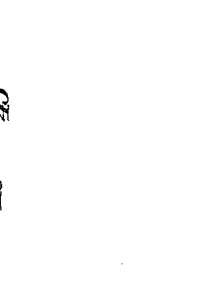
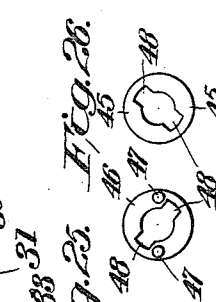
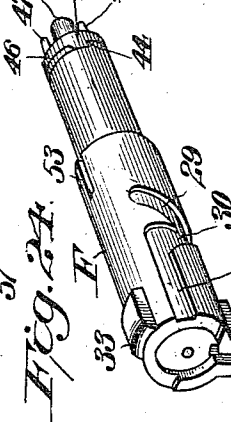
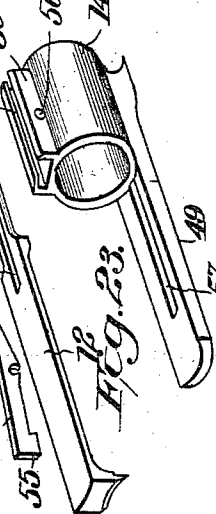
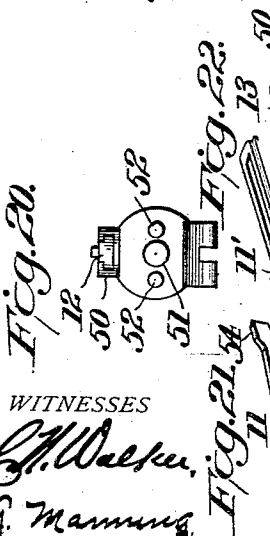
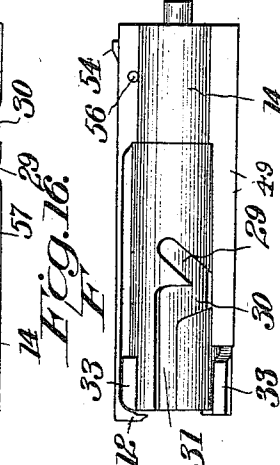
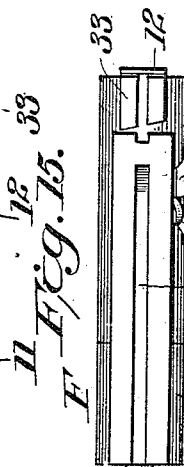
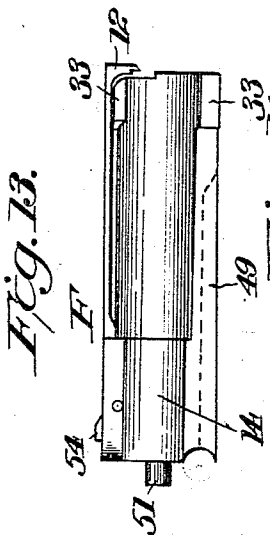
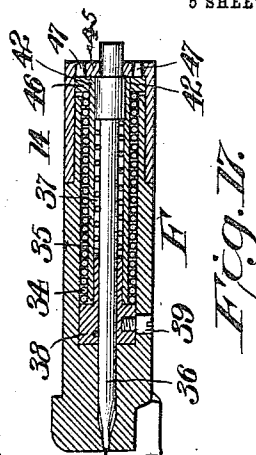
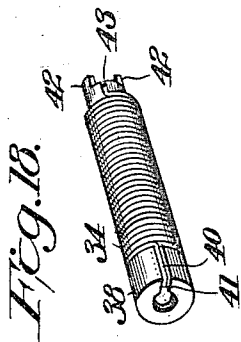
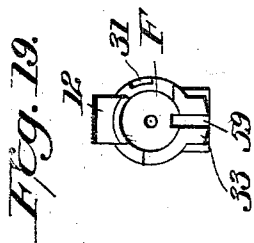
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5 SHEETS-SHEET 5.



WITNESSES

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GUN.

1,044,780.

Specification of Letters Patent.

Patented Nov. 19, 1912.

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To all whom it may concern:

Be it known that I, GRANT HAMMOND, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Guns, of which the following is a specification.

This invention relates to certain new and useful improvements in fire-arms; it is particularly adapted to firearms of the sporting-rifle type, although the salient features of the invention may be employed in connection with other designs of guns, the construction being such that the gun may be used as a single-firer, or it may be automatic in its action and have the cartridges supplied from a suitable magazine.

A leading object of the invention is to simplify the construction of a fire-arm of the type shown and described; to lessen the weight of the same to a minimum; to insure the safety of the fire-arm under working conditions; and to generally improve the fire-arm.

With the above and other objects in view the invention consists of the parts and the constructions, arrangements and combinations of parts which I will hereinafter describe and claim.

In the accompanying drawings forming part of this specification and in which similar reference numerals indicate like parts in the several views—Figure 1 is a side elevation of the gun embodying my invention. Fig. 2 is an enlarged side elevation, partially broken away, of a part of the gun, showing the breech-bolt in its retracted position and the gun ready for firing. Fig. 3, is a side elevation of a part of the gun partially broken away, showing the breech-bolt in its forward position. Fig. 4 is a longitudinal sectional view of the gun, showing the bolt in elevation in its forward position. Fig. 5 is a longitudinal sectional view of the receiver detached. Fig. 6 is a bottom plan view of Fig. 5. Fig. 7 is a longitudinal sectional view of the forward part of the receiver. Fig. 8 is a front end view of the receiver. Fig. 9 is a cross-sectional view of the receiver on the line 5—5 of Fig. 5. Fig. 10 is a cross-sectional view on the line 10—10 of Fig. 3. Fig. 11 is a detail showing in bottom plan a portion of the magazine bottom plate. Fig. 12 is a detail showing in perspective

one end of the lower leaf of the magazine spring. Fig. 13 is a side elevation of the breech-bolt assembled. Fig. 14 is a top plan view of the same. Fig. 15 is a bottom view of the breech-bolt. Fig. 16 is a side elevation of the breech-bolt looking at the opposite side of the bolt as shown in Fig. 13. Fig. 17 is a longitudinal sectional view of the assembled bolt. Fig. 18 is a perspective view of the bolt-sleeve showing the spirally coiled spring thereon. Fig. 19 is a front end view of the breech-bolt. Fig. 20 is a rear end view of the breech-bolt. Fig. 21 is a perspective view of the locking lever, 11. Fig. 22 is a perspective view of the extractor detached. Fig. 23 is a perspective view of the breech-bolt sleeve, 14. Fig. 24 is a perspective view of the bolt removed from its sleeve. Fig. 25 is a view of the outer face of the disk, 46. Fig. 26 is a view of the inner face of said disk. Fig. 27 is a side elevation of the slidable cap or sleeve, 21. Fig. 28 is an end view of the same. Fig. 29 is a detail of the screw, 28. Fig. 30 is a side elevation partially in section of the safety device. Fig. 31 is a perspective view of the ejector. Fig. 32 is a perspective view of the bolt-lock. Fig. 33 represents side and end views of the hammer. Fig. 34 is a sectional view of the spring-pressed pin, 75. Fig. 35 is a sectional view of the rear portion of the tube, 67.

In the accompanying drawing, A represents a stock composed of suitable material and having a conventional design and B represents the barrel, which barrel, except as modified as hereinafter described, may represent any of the standard rifle barrels, or any barrel of the construction suitable for cooperation with the remaining features of this gun, it being understood that the gun will be supplied with a suitable trigger mechanism shown generally at C, a trigger-guard, D, a receiver, E, a rotating and reciprocating breech-bolt, F, and a magazine, G, each of which parts will be hereinafter specifically described as to its various components and the operation of the same. Referring to Figs. 5 to 9 inclusive, the receiver, E, is composed of metal and has the general appearance of the receivers of rifles of this type, but this receiver has been modified to make it particularly adapted to the present gun.

By reference to Fig. 5, it will be seen that

the front end of the receiver is bored out to a diameter sufficiently large to insure the required strength of the cam shoulders 2 behind which lock the lugs on the reciprocating breech-bolt, as I will hereinafter disclose.

The front bored end of the receiver is internally threaded, at 3, to receive a corresponding threaded portion which is formed on the rear end of the barrel, this threaded portion extending for about one inch rearward on the front end of the receiver and said receiver being slotted on its underside clear to the rear end wall, as shown at 4, to provide a necessary guide or slot for the operation of the compression link hereinafter mentioned, said slot being widened at 4', at the front end immediately over the magazine chamber to enable cartridges to be fed from the magazine into the receiver in line with the barrel and reciprocating bolt. The receiver is also provided with a slot, 5, in the upper side of the front portion and just in rear of the threaded part above mentioned, the front end of said slot extending slightly forward of the corresponding end of the lower slot, 4, and adapted to permit the proper working of the cartridge extractor which I will hereinafter refer to.

In addition to the foregoing construction, the receiver is milled down to approximately its center line on the right hand side, and is milled down to about 5/16 of an inch above the center of the left-hand side and back sufficiently far so that when the cartridge clip is in its place, the bolt end thereof will have sufficient clearance to enable the cartridge to be pushed downward into the underlying magazine. By this construction of the head end of the receiver, the space occupied by the bolt locking lugs and the cam shoulders, 2, of the receiver, which in guns of this type usually amounts to nearly one inch, is utilized; in other guns of this type, as far as I am advised, the head of the breech-bolt has to move back about one inch before it has cleared the rear portion of this end of the receiver, and this necessitates the placing of the magazine about one inch farther back and makes a difference of nearly two inches in the length of the action.

By reason of the foregoing construction the bolt and the mechanism for operating the same can be made nearly one inch shorter and accordingly they are correspondingly lighter, and more compact.

The receiver also has milled in its upper part a channel or groove, 8, which groove extends from the rear end wall to a point approximate to where the clip enters and at a point about 1/16 of an inch back of this place is a cam projection or bridge, 10, which extends transversely across this portion of the channel. If desired, the channel may be milled out to the same depth from

end to end in which case a pin may be employed in lieu of the bridge, which may be done by drilling a transverse hole through the receiver at a point corresponding with the bridge shown in Fig. 5, said bridge or its equivalent pin having for its object to provide a projection which will operate a locking lever, 11, which is pivoted in a slot, 11', made through the extractor, 12, which is located in a groove, 13, in the top part of a bolt sleeve, 14, as shown in Fig. 22, and as I will hereinafter more fully describe. The receiver is also provided with a retaining lug, 15, on the underside of its forward end adapted to prevent the action from kicking backward in the stock, and from this lug to the rear end the receiver is substantially cylindrical in cross section.

As shown in Fig. 9, the inner sides of the receiver are provided with two grooves or channels, one, 6, on the left-hand side and another, 7, on the right-hand side. The channel, 7, extends from the rear end of the receiver to a point slightly back of the forward end of the chamber in which the cartridges are received from a clip or otherwise; the channel, 6, on the right-hand side extends from the rear end of the receiver to the front part thereof just back of the cam shoulders, 2. The receiver is also cut down from the top at the rear leaving a vertical wall, 16, and it has a bottom lug, 17, which extends backward for about 1/2 of an inch, said lug being flattened at its underside and extending slightly backward over the wood of the stock to prevent the wood from splitting, and to make a solid bearing when the rear screw, 18, which fastens the magazine to the receiver is inserted and tightened, said receiver having secured to the inner surface at its rear end, a washer, 19, or like part and preferably composed of fiber, or other suitable material and adapted to absorb the shock of the bolt during its rear reciprocation, said washer being appropriately held to the vertical rear wall of the receiver by a suitable screw, 20, the head of which may be slightly countersunk below the plane of the inner face of the washer.

Over the rear end of the receiver is fitted a slidable cap or sleeve, 21, (Fig. 27), said cap extending forward to the milled-out portion of the receiver where the cartridges are fed into the magazine. This sleeve has its upper part at the forward end cut away to conform to the clip hole in the magazine, said sleeve having its outer sides milled or otherwise roughened as shown at 22, to form an appropriate grip for the fingers in pulling the sleeve backward in the operation of the gun, and as I will presently fully state.

The sleeve is made with a solid rear end which may be fashioned in any desired shape, and the underside of the sleeve which

slides over the rear end of the receiver is milled away, its sides projecting slightly below the plane of the rear wall of the cap, said rear wall being bored with a hole to receive a spring-pressed detent, 23, having preferably a rounded head adapted to register with a corresponding hole, 24, formed in the top face of the lug, 17, which projects horizontally from the rear end of the receiver, and over which lug the rear end of the sleeve fits to form a flush joint, said detent adapted to spring into engagement with said hole when the detent and hole are in register whereby the sleeve is held in position when it has been forced home or to the limit of its forward movement, but the detent is so arranged that it will yield in response to a backward pull on the sleeve to unlock the sleeve from the receiver and allow said sleeve to be reciprocated. It will be noted, also, that the sleeve has pinned into the rear wall thereof two parallel longitudinally extending bars, one of which, 25, is arranged along the right-hand side and the other, 26, along the left-hand side, one of these bars being a guide bar and adapted to operate in the groove, 6, formed in the corresponding side of the receiver, and the other bar being a draw-bar and adapted to operate in a groove, 7, in the left-hand side of the receiver. These bars, therefore, operate in the grooves or channels, 6 and 7, in the inner walls of the receiver and accurately guide the sleeve in its reciprocating movement, said receiver having, also, a hole, 27, formed in the left-hand wall near the forward end adapted to register with a corresponding threaded hole formed in the draw-bar near the forward end of the same, when the sleeve is forced to the limit of its forward movement.

A screw, 28, having a threaded head, and a smooth smaller point is designed to be inserted through the hole, 27, in the left side of the forward part of the receiver and is threaded into the corresponding hole in the draw-bar when said holes are in register, whereby the screw is fixedly held to the draw-bar. The smooth point of the aforesaid screw, 28, is adapted to project into the cam-groove in the side of the bolt, and when the receiver sleeve is pulled backward by hand, the point of this screw engages with the rear wall of the spiral portion, 29, of the groove, in the bolt and the bolt is initially turned thereby to its unlocked position.

The reciprocating breech-bolt is shown in detail in Figs. 13 to 26 inclusive. In the left side of the bolt is milled a grooved forming a cam, one portion, 29, of the groove being of spiral form, as before mentioned, one end of which is widened by being milled vertically around the bolt for about 90° of its

circumference, as at 30, and another portion of the groove being somewhat narrower and straight and extending parallel with the axis of said bolt, as at 31, and leading from the wider vertical connecting portion, 30, to the head of the bolt. The bolt is adapted to be retracted by a backward pull upon the sleeve and in so doing it compresses the return spring, 32, which is located in the stock in rear of the receiver, the power of which spring is utilized to return the bolt to the front end of the receiver and to force the cartridge to its seat in the breech of the barrel.

At its front end the bolt has suitable lugs, 33, with sloping or spiral faces adapted to conform to and co-act with the shoulders, 2, in the forward end of the receiver, said bolt being contained within the sleeve, 14, and the bolt being provided with an internal spring, 34, of a closely wound spiral type, something on the order of the curtain roller spring, for the purpose of turning the bolt in the receiver. This spring surrounds a sleeve, 35, containing the firing-pin, 36, the sleeve containing a second spring, 37, which operates on the firing-pin, to withdraw the same after it has been forced forward by the hammer of the gun, and the cartridge exploded. The sleeve, 35, carries at its forward end an enlarged detachable disk or head, 38, the rear part of which is turned down to a diameter sufficiently small to enable it to fit inside the forward end of the sleeve, this projecting portion forming a bearing about which the sleeve is freely turnable. The larger part of this head is adapted to fit the bore of the breech-bolt and is fastened to the bolt by a screw, 39, which passes through the wall of the bolt, as shown in Fig. 17.

The spirally wound spring, 34, which encircles the outside of the sleeve, 35, and is contained in the bore of the breech-bolt, is clearly shown in Fig. 18, as having an extended portion, 40, at its front end and adapted to lie in a slot formed longitudinally in the head, 38, the extremity of this extended portion of the spring being of hook-form and adapted to lock in engagement with a recess or notch, 41, formed in the front vertical wall of the said head, thus holding this end of the spring stationary.

The rear end of the sleeve is provided with two projecting lugs, 42, and a notch, 43, in which a bent end of the bolt spring, 34, fits. The rear end of the bolt is turned down to a smaller diameter than the front portion and has two ratchet lugs, 44, adapted to be engaged by corresponding lugs, 45, on the front face of a washer or disk, 46, said washer or disk having two short pins, 47, projecting from its rear face and having openings, 48, through which the two lugs on

the end of the sleeve, 35, pass to lock the washer to the sleeve as hereinafter explained.

The rear end of the bolt is turned down or made of smaller diameter as shown in Fig. 17, to receive the sleeve, 14, said sleeve having a wide forwardly projecting part, 49, which lies normally on the underside of the bolt, and extends up to the rear of the locking lugs, 33. This bolt sleeve, 14, also, has a lug, 50, on its upper face and this lug is longitudinally slotted and undercut and is adapted to receive and secure the extractor, 12, the forward end of which is turned down as is customary, to engage the rim of the cartridge and withdraw said cartridge from the breech in the well known manner.

The rear wall of the bolt sleeve is provided with a central hole, 51, for the proper operation of the firing-pin, and two other small holes, 52, one on each side of the central hole, as shown in Fig. 20, are provided for the reception of the rearwardly projecting pins, 47, of the locking disk, or washer, 46, before mentioned, whereby the washer may be locked to the bolt sleeve so that the bolt spring, 34, may exert its tension to return the bolt to its locked position.

That portion of the breech-bolt which lies immediately in front of the bolt sleeve is also provided with the longitudinally extending slot, 53, in its periphery into engagement with which the cam-actuated locking lever, 11, which is carried by and fits in the slot, 11', in that part of the extractor which fits in the top projecting lug, 50, of the bolt-sleeve, is forced when the bolt is turned upon its axis against the tension of its torsional spring, 34, this movement of the locking lever being effected by the projection, 10, at the top of the receiver, just back of the cartridge-clip hole, and when the locking lever is thus forced into the groove slot, 53, after the bolt has been turned approximately 90° and has unlocked its lugs, 33, from behind the shoulders, 2, at the front end of the receiver, locks the bolt to its exterior sleeve, 14, and thereby makes the bolt and sleeve a unit which is freely slidable in the receiver, and without being subject to any torsional strain due to the presence of cam-grooves, or like parts with which guns of this character have usually been supplied.

From this description it will be understood that when the bolt is shoved home by the return spring said bolt rides freely through the receiver with its shoulders vertical and it remains in this position until the lugs pass to the front of the receiver shoulders. At this time the locking lever, 11, has its heel, 54, engaged by the projection, 10, and the lever is rocked upon its pivot to withdraw the toe or front end, 55, of the lever out of the slot, 53, in the periphery of the bolt. Instantly the spirally wound

spring reacts relatively to the fixed washer and rotates the bolt through an arc of about 90° which results in the bolt lugs being turned into locking engagement behind the receiver shoulders. When the gun is fired, the force of the explosion reacts on the bolt and consequently the cam shoulders on the bolt and receiver ride past each other thereby turning the bolt about a quarter turn and against the tension of the spring, 34, and unlocking the bolt from the receiver, and allowing the force of the explosion to freely drive the bolt to the rear and compress the return spring, 32.

A cross-pin, 56, serves to hold the extractor and cam-actuated locking lever, 11, in position and also fastens the bolt to the sleeve to prevent their separation as by pulling apart.

By reference to Fig. 23, it will be seen that the bolt sleeve has its extended portion, 48, longitudinally slotted, as at 57, to a point about $\frac{1}{2}$ an inch from the extreme forward end, and in this slot the heel end of the ejector, 58, rides until just before the bolt has completed its rearward stroke. As the bolt reaches this position the heel of the ejector rides down out of the slot which results in tipping the forward end of the ejector upward into the slot, 59, formed in the bottom lug, 33, of the head of the bolt, Fig. 24, the slot being sufficiently deep to allow a point of the ejector to contact with the base or rim of the cartridge and to eject the cartridge from the gun. When the bolt is moved forward the ejector performs the reverse motion and is returned to its normal position.

The means for exploding the cartridge comprise a hammer, 60, which is slotted in its central portion and into said slot the ejector enters, the hammer and ejector being pivoted to the upper part of the lug, 61, which is formed on the rear of the magazine and which is just below the line of travel of the bolt, said lug being located central to the receiver.

The hammer is actuated by the main spring, 64, which is coupled to the hammer at one side of its pivot by means of a connecting rod, 62, said rod extending rearwardly and has its rear end provided with an enlarged head, 63. The connecting rod passes through the main spring, 64, one end of which bears against said head and the other end against the front end of a cylinder or tube, 65, in which the connecting rod and its head slidably operate, the forward end of the rod being fastened to the hammer by means of a pin which passes through the walls of the hammer and through a hole formed in the end of the connecting rod. The tube, 65, has its rear end pivotally connected to a rear post, 66, as shown in Figs. 2, 3 and 4.

Suitably positioned in the stock, A, is a tube, 67, within which slides the tube, 68, these tubes containing the return spring, 32. The front end of the tube, 67, has an opening in the front end of its bottom wall and through this opening the post, 66, passes, the parts being secured by the rear screw bolt, 18, before mentioned.

69 is a compression link, which straddles the return spring tube, 67, screw post, 66, and hammer, 60, when the action is inclosed and the hammer is down. The head of the compression link lies in a transverse half round cavity in the rear lower face of the bolt sleeve, and when the hammer is down this forward or head end of the compression link lies forward of and below the striking face, 60', of the hammer. The other or rear end of the compression link is likewise rounded and fits into a transverse slot, 70, in the front end of the compression tube, 68, which operates in the tube, 67. The front end of the compression tube, 68, lies just back of and against the hollow screw post through which the screw, 18, passes, and which screw serves to fasten the rear end extension of the magazine to the rear end of the receiver, when the gun action is in its most forward closed position.

The rear hollow screw post also passes through the lower wall of the tube, 67, thereby holding this tube against the backward thrust of the return spring at all times; the rear end of the tube, 67, is threaded and into this threaded end is screwed a spring guide, 71, Fig. 35, the threaded head of this guide being flush with the wood at the butt of the stock and the end of the tube being covered by a suitable butt plate, 72, Fig. 1. The return spring is of suitable character and the guide, 71, which it encircles is made sufficiently long so that the forward end projects slightly beyond the rear end of the tube, 68, when the gun action is closed, thus holding the return spring in proper alinement during the reciprocating movement of the tube, 68, when the gun is being operated.

Referring to Figs. 2, 3 and 4, 73 represents the trigger having a forwardly extending down-turned end, 74, adapted to engage a sear in the form of a spring-pressed pin, 75, mounted in a suitable sear-bar, 76, the trigger and the sear-bar being pivoted to and between a pair of vertical lugs, 77, projecting upwardly from the tail-strap of the magazine. The rear end of the sear-bar is thinned down and passes through a slot in the body of the trigger, as shown in Fig. 4, and a hole is bored in the forward end of the sear-bar, slightly below the center so as to leave more stock on the top part where the tang or pawl end of the hammer contacts, said hole receiving the spring-pressed pin, 75, and the forward end

of the hole being threaded to receive a screw, 78, for retaining the spring-pressed pin in position.

The sear-bar is shown as having an opening made in its upper surface and which opening connects with and below the rear end of the spring-pressed pin, 75, said rear end of the pin being slightly flattened on its top part, for a short distance, and ending in a notch or step, 80, which extends downwardly and is provided with a slanting or cam face. The under part of the spring-pressed pin, 75, is likewise slightly flattened and a transverse pin, 81, passes through the sear-bar and below said flattened portion and lies in sliding contact therewith, to prevent the spring-pressed pin from turning.

Beneath the sear-bar and lying in a hole bored in the trigger guard, is a spiral spring, 82, adapted to bear under the sear-bar, and hold it upwardly against the pressure of the trigger and in contact with the tang or pawl end of the hammer, the front end of the sear-bar being cut at a slight angle at this point for the purpose hereinafter stated.

As before mentioned, the trigger has a forwardly projecting curved part, 74, the front lower point of which rests against the flattened upper surface of the spring-pressed pin, 75, in the sear-bar and just forward of the cam faced step, 80, formed on this pin, and when the trigger is pulled backward its forward point depresses the sear-bar until the forward face of the point of the trigger reaches the cam face of the step, 80, when the spring-pressed pin, 75, is forced forwardly, due to the cam-action of the point of the trigger on the cam-face of the pin, and the sear-bar is at the same time raised by the spring, 82, acting under its lower front portion. The sear-bar is now in position to intercept the tang or pawl-end of the hammer when the latter is cocked by the backward movement of the bolt and the mechanism connecting therewith, thereby leaving the hammer in position to again be released when the trigger is forced forward by its spring bringing the contact point of the trigger in engagement with the corresponding contact part of the spring-pressed pin, 75. The peculiar construction of this trigger mechanism as heretofore described, permits of any desired pull for releasing the hammer. The slanting end of the sear-bar where it contacts with the tang or pawl-end of the hammer, makes the pull extremely smooth and easy, and this pull may be varied from six pounds to four ounces and still retain a safe locking contact.

In the tail of the trigger-guard and just back of the trigger and immediately above the curved lower portion thereof, a hole is bored and in this hole is fixed a small tube, 84, containing at its front end a spring-pressed pin, 85, the end of which is adapted

to contact with the back of the trigger to force the trigger forward after it has been pulled to the rear.

In addition to the foregoing features and in order to give increased safety to the gun, I provide a flat sided safety bar, 86, with a spring-pressed pin, 87, in its forward end, said bar lying alongside of the sear-bar and extending backward to about the beginning of the guard-strap, said safety bar carrying a flattened cross-pin, 88, which projects to the right and lies on top of the metal below the sear-bar and situated at about the middle of the sear-bar, the forward part of the sear-bar being milled off smaller than the rear portion so as to leave a vertical stop of about 1/16 of an inch in height. The rear end of this safety-bar, 86, projects inwardly to the right a short distance, as shown at 86'.

Referring to Fig. 4, it will be seen that the rear portion of the trigger guard strap is slotted and in said slot is pivoted a lever, 89, which has a projecting stud, 90, adapted to rest against the projection, 86', on the rear end of the safety-bar, 86, the spring-pressed pin at the head of the safety-bar being adapted to force the bar backward and bring the cross-pin, 88, which lies underneath the sear-bar beneath the square-faced larger part of the sear-bar thereby locking the firing mechanism and at the same time rocking the lever, 89, which is pivoted to the guard-strap, and holding it with its rear end projecting below the under surface of the tail-strap. This construction forms a positive automatic safety device and it is impossible to accidentally fire the gun by a jar or shock from any known position.

When the gun is raised to the shoulder in the firing position, the finger which naturally comes back of the guard, brings the safety lever, 89, up and forces the safety bar forward against the tension of the spring-pressed pin, 87, carrying that portion of the safety-bar which lies under the sear-bar forward past the larger part of the sear-bar and leaving the sear-bar free to be depressed by a backward pull upon the trigger.

In the present instance the magazine, G, is adapted to carry the trigger mechanism and locking devices before mentioned, and it is fastened to the receiver by the two screw bolts, 18 and 91, one at the front end and the other at the rear. At the forward end of the magazine and between the screw, 91, and the front wall of the magazine chamber, a key-hole, 92, is made through the strap of the trigger guard which hole is counter-bored from the upper side and also from below. The magazine bottom plate, 92, is removable and has a key shaped lug, 93, at its front end and the upper portion of this lug, 93 or its base, is made round, or otherwise

adapted to fit the counterbore, in the under-side of the strap. The magazine has the usual shaped spring, 94, for supporting the floor, 95, and feeding the cartridges into the receiver, except that the bottom leaf at the front portion is doubled over, Fig. 12, and is provided with a projecting lug, 96, on each side thereof. The magazine casing has a depression, 97, in the bottom of each side wall near its forward end and the lugs, 96, just referred to are designed to fit these depressions when the bottom of the magazine is turned into its normal locked position. In assembling these parts, the magazine bottom plate, 92, is placed at about right-angles to the magazine and the key-shaped lug, 93, is inserted into the corresponding hole, 92, when the bottom plate is turned until it lies parallel with the magazine. In this latter position a spring-pressed pin, 98, located at the rear of the magazine and just forward of the trigger-guard, snaps into engagement with a notch, 99, located in the rear central part of the bottom, the guard being undercut at the point where this spring-pressed pin is located, and the under edge of the bottom of the magazine being beveled to form a cam surface, adapted to depress the pin in turning the bottom to its normal locked position. The bottom plate locks the magazine spring in position by its lugs locking with the notches or depressions in the bottom of the side walls of the magazine. After the last cartridge is forced from the magazine the breech-bolt is held in its rearmost position by a suitable bolt stop, 100, Figs. 3 and 32. This stop has a projecting lug, 101, on its lower portion resting on top of a vertically sliding pin, 102, which is connected to the floor of the magazine by suitable links, 103, or like parts, or some other flexible connection, whereby the bolt stop is raised by the power of the magazine-spring after the final cartridge has been forced by the floor of the magazine into the receiver. Any connection between the pin, 102, and the floor of the magazine will be sufficient to cause the bolt-stop to be lifted when the floor of the magazine has about reached the limit of its upward movement. The top part of the lifting pin, 102, rests in contact with the lug, 101, on the vertical sliding part, 105, of the bolt stop, said stop being located on the side of the vertical part of the magazine lug, 104, immediately at the rear of the magazine, and the said rear magazine lug has a slot, in its side face near the bottom, said slot connecting with a hole bored in the bottom of the magazine and into which the before-mentioned lifting pin, 102, fits. The vertical sliding part, 105, of the bolt stop is also provided with a projection, 106, at its top which, when the member is raised by the forward movement of the magazine floor, after the last cartridge has been removed from the

magazine, projects into the path of the returning breech-bolt and retains this bolt in its rearward position so as to leave the floor of the magazine free to permit of inserting a cartridge clip through the top of the receiver and forcing loaded cartridges into the magazine.

The vertical sliding part, 105, carries a part, 107, which is fastened to its side and which projects up through the stock at the side of the receiver, the projection of this part above the receiver being sufficient so that said part may be forced down with the thumb, thus releasing the bolt and feeding a cartridge into the breech chamber and leaving the gun ready to fire.

The general operation of this gun is in brief substantially as follows: When the primer is struck by the firing-pin, the powder charge is ignited and the pressure exerted on the cartridge by the expanding gases causes the breech-bolt, the head of which rests against the base, or flange of the cartridge, to turn against the tension of its spring, 34, and unlock from behind the backwardly sloping spiral shoulders, 2, of the receiver; the continued pressure now forces the bolt backward, compressing the return spring, 32, in the stock back of the rear end of the receiver, ejecting the empty cartridge by the action of the ejector, 58, and forcing a loaded cartridge out of the magazine and into the breech chamber of the barrel. The bolt is returned by the spring, 32, into its most forward position and is then unlocked by the tripping of the locking lever, 11, to allow the spiral spring, 34, to react to return the bolt to its locked position in the receiver, leaving the gun action in position to be fired by a backward pull on the trigger. The hammer is cocked in the opening movement by the rear movement of the breech-bolt and its complementary mechanism forcing the hammer to turn about its pivot until its striking face, 60', is immediately below the end face of the bolt sleeve, 14, in which position it is held by the sear-bar, 76. After the last cartridge is fired from the magazine, the bolt is held in its rearward position by the lug, 106, of the bolt stop, 100, and which stop is lifted into the path of the movement of the front of the breech-bolt by the power exerted by the magazine spring, 94, through the lifting pin, 102, and connections before described, this pin actuating the vertical member, 105, which is slidably fixed to the vertical part of the magazine lug, 61, immediately at the rear of the magazine and which slidable member carries the inwardly projecting lug, 106, at its top adapted to project into the path of the returning breech-bolt and to retain it in the rearward position, leaving the floor of the magazine free to permit of the insertion of a cartridge clip through the top of the receiver

and forcing the loaded cartridges into the magazine. The bolt stop is operated to release the bolt by the pressure of the thumb on the piece, 107, as before described, and at the same time that the breech-bolt is released it feeds a cartridge into the breech-chamber and places the gun in condition for firing. As that part of the breech-bolt which lies immediately in front of the bolt sleeve, 14, is provided with the longitudinal slot, 53, in its periphery, it is quite clear that the cam-actuated locking lever, 11, which fits in a slot in that part of the extractor which is fitted to the bolt-sleeve, 14, will be forced into said slot when the bolt is turned upon its axis against the tension of the helical spring, 34, and which spring serves as a motor for turning the bolt from its unlocked position through an arc of approximately 90° so as to lock the lugs of the bolt behind the shoulders, 2, at the front end of the receiver. When the bolt is locked in the receiver, the slot, 53, is upon the side of the bolt, but when the bolt is turned through approximately a quarter of a circle, in unlocking from the receiver, the slot is brought on top of the bolt and immediately below the locking lever, 11, and hence when this lever is actuated by the projection, 10, at the top of the receiver and just back of the cartridge clip hole, the lever will be forced into intimate engagement with the slot, 53, thus locking the bolt to its sleeve, and as the lugs, 33, on the front end of the bolt are detached from the corresponding shoulders, 2, at the front of the receiver, it leaves the bolt and its sleeve as a freely sliding unit; that is, the bolt and sleeve are now in condition where they may be moved freely back and forth in the receiver without undue friction and without torsional movement, since there is no cam, spring or other part acting upon the bolt with any tendency to further rotate the same. On the return movement of the bolt, the locking lever, 11, is released by the projection, 10, and the spring, 34, reacts to lock the front lugs of the bolt behind the corresponding shoulders at the front of the receiver. Upon the gun being fired, the powder charge acts on the breech-bolt and the lugs, 33, ride along the inclined faces of the shoulders, 2; the washer, 46, being held stationary in the bolt sleeve; the turning of the bolt results in the winding of the helical spring, 34, and the placing of the same under tension.

When the gun is raised to the shoulder in the firing position, the finger which naturally comes back of the guard, actuates the safety-piece, 89, and forces the safety bar, 86, forward against the tension of its spring-pressed pin, 87, bringing that part which lies under the sear bar forward past the larger part of the sear and leaving the sear-bar, 76, to be depressed by pulling the

trigger backward, it being understood from the foregoing description that the trigger mechanism permits of any desired pull for releasing the hammer as the slanting end of the sear, where it contacts with the hammer, makes the pull extremely smooth and easy and this pull may be varied from six pounds to four ounces and still retain a safe locking contact.

By constructing the receiver in the manner hereinbefore described, and providing the bolt with its own motor, or spring for turning it to lock the lugs on the bolt behind the shoulders in the receiver, I am permitted to materially reduce the length of the gun action and to utilize the space ordinarily occupied by the locking lugs of the bolt and the shoulders of the receiver and which in guns of this type usually amount to nearly one inch, as the bolt head has to move back about one inch before it has cleared the rear end of that part of the receiver; this would necessitate the magazine being placed about one inch farther back which would make a difference of nearly two inches in favor of my gun in the length of action.

The magazine casing carries all of the trigger mechanism and the locking devices and consequently these parts are readily removed with this casing, and may be assembled and restored in the stock as the magazine casing is placed in position.

The sliding cap or sleeve, 21, which fits over the rear end of the receiver is so fashioned that it forms a convenient grip for manipulating this piece and actuating the breech-bolt manually, and when this cap or sleeve is forward to its normal position, it is latched to the rear end of the receiver by the action of the spring detent, 23; when the cap or sleeve is pulled backward, by hand, the point of the screw, 28, engages and rides along the rear wall of the spiral portion, 29, of the slot in the bolt whereby the bolt is first turned to its unlocked position relative to the receiver and then retracted in the receiver by the continued backward pull on the cap or sleeve, thereby compressing the return spring, 32, located in the stock.

If the magazine has cartridges in it when the sleeve is thus retracted, a loaded cartridge is fed into the breech chamber automatically; if the magazine is empty, the breech-bolt will be held open by the bolt-stop lug, 106, with the cap or sleeve, 21, projecting in rear of the back end of the receiver, and consequently it will be necessary to push down the bolt-stop before the cap or sleeve can be returned to its normal position. This is descriptive of the hand operation of the gun.

In the automatic operation, the sleeve is not moved by the bolt action, as the point of

the screw, 28, in the draw-bar, 26, is not engaged by the bolt either in its turning motion or its reciprocating action; as the bolt turns, the screw point rides between the walls of the vertical portion, 30, of the bolt groove, and as the bolt reciprocates, the pin rides between the walls of the straight longitudinal portion, 31, of the groove, until the bolt-head, is past the screw point. After that the bolt reciprocates freely in that part of the receiver to the rear.

To take out the barrel of the gun for packing purposes, the front magazine screw, 91, is unscrewed for about $\frac{1}{2}$ of an inch and the rear screw, 18, given a couple of turns, when the barrel may be unscrewed from the receiver. The point of the forward magazine screw, 91, is turned cone-shape and when seated projects slightly past the thread on the inside of the receiver head; the barrel has a slight indentation which when screwed home is in register with the point of the magazine screw, 91, and when this screw is tightened the barrel is held from unscrewing from the receiver.

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

1. In a gun of the character described, the combination with the receiver having internal cam-face locking shoulders at its front portion, of a longitudinally and rotarily movable breech-bolt having cam-faced lugs to coact with the said shoulders, said bolt having an internal spring placed under tension by the disengagement of the said lugs and shoulders, means maintaining the spring under tension during the reciprocation of the bolt, and means for automatically releasing the spring when the bolt is returned to locking position to enable said spring to react and turn the bolt to carry its lugs in locking engagement with the receiver shoulders.

2. In a gun of the character described, the combination of a receiver and a reciprocable and turnable breech-bolt operable therein, said receiver and bolt having engaging cam-faced lugs and shoulders, a torsional spring within the bolt adapted to be placed under tension by said lugs and shoulders as they ride past each other in unlocking the bolt from the receiver, means holding the bolt against rotation during its reciprocation, whereby the spring is maintained under tension, and means automatically releasing the spring at the conclusion of its forward reciprocation to enable said spring to react on and turn the bolt into locking engagement with the receiver.

3. A gun having a receiver and a breech-bolt reciprocable therein, said receiver and bolt having coacting cam-faced lugs and shoulders for locking the bolt to the receiver, a sleeve within the bolt, a torsional

spring surrounding the sleeve, means for holding the sleeve against rotation relative to the bolt proper, said spring being connected to the sleeve and bolt proper whereby the spring is placed under tension when the bolt is partially rotated by the action of the said cam-faced lugs and shoulders in unlocking the bolt from the receiver, and means engaging the partially rotated bolt for holding the same against return rotation whereby the spring is maintained under tension, said receiver having longitudinal grooves in which the bolt is guided in its reciprocation.

4. A gun having a receiver and a breech-bolt reciprocable therein, said receiver and bolt having coacting cam-faced lugs and shoulders for locking the bolt to the receiver, a sleeve within the bolt, a torsional spring surrounding the sleeve, means for holding the sleeve against rotation relative to the rotatable part of the bolt, said spring being connected to the sleeve and rotatable part of the bolt whereby the spring is placed under tension when the rotatable part of the bolt is partially rotated by the action of said cam-faced lugs and shoulders in unlocking the bolt from the receiver, and means carried by the bolt and engaging the partially rotated portion thereof for holding the same against return rotation whereby the spring is maintained under tension, said receiver having longitudinal grooves in which the bolt is guided in its reciprocation.

5. A gun having a receiver and a breech-bolt reciprocable therein, said receiver and bolt having coacting cam-faced lugs and shoulders for locking the bolt to the receiver, a sleeve within the bolt, a torsional spring surrounding the sleeve, means for holding the sleeve against rotation relative to the rotatable part of the bolt, said spring being connected to the sleeve and rotatable part of the bolt whereby the spring is placed under tension when said part of the bolt is partially rotated by the action of said cam-faced lugs and shoulders in unlocking the bolt from the receiver, and a pivoted locking lever carried by the bolt, said bolt having a slot alinable with said lever and engaged by the same when the bolt is turned to place the spring under tension whereby the spring is held under restraint during the reciprocation of the bolt, said receiver having longitudinal guides for the bolt lugs.

6. A gun having a receiver and a breech-bolt reciprocable therein, said receiver and bolt having coacting cam-faced lugs and shoulders for locking the bolt to the receiver, a sleeve within the bolt, a torsional spring surrounding the sleeve, means for holding the sleeve against rotation relative to the rotatable part of the bolt, said spring being connected to the sleeve and said rota-

table part of the bolt whereby the spring is placed under tension when the bolt is partially rotated by the action of said cam-faced lugs and shoulders in unlocking the bolt from the receiver, and a pivoted locking lever carried by one part of the bolt, the other part of said bolt having a slot alinable with said lever and engaged by the same when the bolt is turned to place the spring under tension, whereby the spring is held under restraint during the reciprocation of the bolt, said receiver having longitudinal guides for the bolt lugs, and means for tripping said lever and releasing the spring from restraint when the bolt is returned to locking position, whereby the spring reacts to turn the bolt and carry the lugs thereof into locking engagement with the lugs on the receiver.

7. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs to engage the receiver shoulders and to ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, and a spring motor carried within the bolt and adapted to be placed under tension by the rotation thereof, said receiver having guides in which the bolt is freely reciprocable, and means engaging the bolt and restraining the return rotation thereof and thereby maintaining the spring motor under tension during its backward and forward reciprocal movements.

8. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs to engage the receiving shoulders and to ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, and a spring motor carried within the bolt and adapted to be placed under tension by the rotation thereof, said receiver having guides in which the bolt is freely reciprocable, and means engaging the bolt and restraining the return rotation thereof, and thereby maintaining the spring motor under tension during its backward and forward reciprocal movements, and means for releasing the bolt engaging means to allow the spring motor to react and rotate the bolt to carry its cam-faced lugs into locking engagement with the shoulders on the receiver.

9. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable

breech-bolt, said bolt having cam-faced lugs to engage the receiver shoulders and to ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, and a spring motor carried within the bolt and adapted to be placed under tension by the rotation thereof, said receiver having guides in which the bolt is freely reciprocable, and means engaging the bolt and restraining the return rotation thereof and thereby maintaining the spring motor under tension during its backward and forward reciprocal movements, said means including a pivoted locking lever carried by one part of the bolt, the other part of said bolt having a peripheral groove normally out of register with the lever and adapted to be engaged thereby when brought into register therewith by the rotation of said bolt.

10. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs to engage the receiver shoulders and to ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, and a spring motor carried within the bolt and adapted to be placed under tension by the rotation thereof, said receiver having guides in which the bolt is freely reciprocable, and means engaging the bolt and restraining the return rotation thereof and thereby maintaining the spring motor under tension during its backward and forward reciprocal movements, said means including a pivoted locking lever carried by one part of the bolt, another part of said bolt having a peripheral groove normally out of register with the lever and adapted to be engaged thereby when brought into register therewith by the rotation of said bolt, and means for tripping said lever to cause it to release the bolt whereby the spring motor reacts to turn the bolt back to normal position and to lock its lugs with the shoulders in the receiver.

11. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs to engage the receiver shoulders and to ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, and a spring motor carried within the bolt and adapted to be placed under tension by the rotation thereof, said receiver having guides in which the bolt is freely reciprocable, means engaging the bolt and restraining the return rotation thereof and thereby maintaining the spring motor

under tension during its backward and forward reciprocal movements, said means including a pivoted locking lever carried by one part of the bolt, another part of said bolt having a peripheral groove normally out of register with the lever and adapted to be engaged thereby when brought into register therewith by the rotation of said bolt, and a fixed stop disposed in the range of action of the locking lever and adapted to lift the same out of its engagement with said groove.

12. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs at one end to coact with the receiver shoulders in locking the bolt to and unlocking it from the receiver, said bolt having a bore in one end, and provided with a firing-pin; a non-rotatable sleeve in said bore and surrounding said pin, a torsional spring surrounding the sleeve, and fixed to a rigid part of the bolt, said sleeve having spaced lugs projecting from its rear end, a loose washer at the rear end of the bolt having openings to receive said spaced lugs, said bolt and washer having engaging ratchet lugs on their adjoining faces, means for holding the washer stationary relative to the bolt to enable the spring to be placed under tension during a partial rotation of the bolt in one direction, means for holding the bolt with the spring under restraint during the reciprocation of the bolt, and means for releasing the bolt-holding means to enable the spring to react and lock the bolt to the receiver.

13. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs at one end to contact with the receiver shoulders in locking the bolt to and unlocking it from the receiver, said bolt having a bore in one end, a firing-pin carried by the bolt, a non-rotatable sleeve within the bolt surrounding the firing-pin, a head at the front end of the sleeve and means for fixing said head to the bolt, the other end of the sleeve being provided with rearwardly extending lugs, a spring surrounding the sleeve inside the bolt having one end fixed to said head and having the opposite end secured to the sleeve, a loose washer at the rear end of the sleeve inside the bolt having openings to receive the lugs of said sleeve, the rear end of the bolt and the adjacent face of the washer having coacting ratchet lugs, means for holding the washer stationary relative

to the bolt, to enable the spring to be placed under tension during a partial rotation of the bolt in one direction, means for holding the bolt with the spring under restraint, 5 during the reciprocation of said bolt, and means for releasing the bolt-holding means to enable the spring to react and lock the bolt to the receiver.

14. In a gun of the character described, 10 the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam- 15 faced lugs to engage the receiver shoulders and ride past the same in unlocking the bolt from the receiver, whereby the bolt is partially rotated, a spring carried within the bolt having one end fixed thereto, a washer at 20 the rear end of the bolt having rearwardly projecting lugs, a non-rotatable sleeve within the bolt inside of said spring having lugs with openings in said washer, and a sleeve surrounding the rear end of the bolt having 25 a rear wall provided with openings to receive the lugs projecting from the washer, to hold said washer relatively to the bolt, said bolt surrounding sleeve having a portion projecting forwardly beneath the bolt and 30 longitudinally slotted.

15. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, said receiver having internal cam-faced shoulders 35 at its front portion, of a rotatable and reciprocable breech-bolt, said bolt having cam-faced lugs to engage the receiver shoulders and ride past the same in unlocking the bolt from the receiver whereby the bolt is partially rotated, a spring carried within the bolt 40 having one end fixed thereto, a washer at the rear end of the bolt having rearwardly projecting lugs, a non-rotatable sleeve within the bolt inside of said spring having lugs 45 to enter openings in said washer, and a sleeve surrounding the rear end of the bolt having a rear wall provided with openings to receive the lugs projecting from the washer, to hold said washer relatively to the 50 bolt, said bolt surrounding sleeve having a portion projecting forwardly beneath the bolt and longitudinally slotted, said bolt-sleeve having, also, a slotted lug on its upper surface, and an extractor fitting said lug.

55 16. In a gun of the character described; the combination with a barrel, a hammer, a trigger mechanism, and a receiver, of a rotatable and reciprocable breech-bolt, locking 60 means between the bolt and receiver, a torsional spring within the bolt, means for placing the spring under tension when the bolt is normally rotated in one direction, means for engaging the partially rotated bolt for holding the same against return

rotation, whereby the spring is maintained 65 under tension, a bolt-sleeve surrounding the rear end of the bolt, said end of the bolt being of reduced diameter to receive the sleeve, and said sleeve having a forwardly extending bottom portion projecting under 70 the bolt and longitudinally slotted, and an ejector, said ejector having a rear end adapted to ride in said slot, and said slot having an inclined wall for tipping the ejector, and causing its forward end to en- 75 gage the base or rim of the cartridge and eject the cartridge from the receiver.

17. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, of a ro- 80 tatable and reciprocable breech-bolt, locking means between the bolt and receiver, a torsional spring within the bolt, means for placing the spring under tension when the bolt is partially rotated in one direction, a 85 locking lever for engaging the partially rotated bolt for holding the same against return rotation, whereby the spring is maintained under tension, a bolt-sleeve surround- 90 ing the rear end of the bolt, said end of the bolt being of reduced diameter to receive the sleeve, and said sleeve having a forwardly extending bottom portion projecting under the bolt and longitudinally slotted, an ex- 95 tractor fitted to the bolt-sleeve and projecting forwardly over the bolt, and longitudinally slotted, to receive the locking lever, said locking lever having a toe-portion to lock in engagement with the bolt when the latter is partially rotated and the spring is 100 under tension, and a fixed stop disposed in the path of the locking lever adapted to actuate the same on the forward movement of the bolt, to release the bolt and allow the spring to react to lock the bolt in the re- 105 ceiver.

18. In a gun of the character described, the combination with a barrel, a hammer, a trigger mechanism, and a receiver, of a ro- 110 tatable and reciprocable breech-bolt, locking means between the bolt and receiver, a torsional spring within the bolt, means for placing the spring under tension when the bolt is normally rotated in one direction, a 115 locking lever for engaging the partially rotated bolt for holding the same against return rotation, whereby the spring is maintained under tension, a bolt-sleeve surrounding the rear end of the bolt, said end of the bolt being of reduced diameter to receive the 120 sleeve, and said sleeve having a forwardly extending bottom portion projecting under the bolt and longitudinally slotted, an extractor fitted to the bolt-sleeve and projecting forwardly over the bolt, and longitudi- 125 nally slotted to receive the locking lever, said locking lever having a toe-portion to lock in engagement with the bolt when the

latter is partially rotated and the spring is under tension, and a fixed stop disposed in the path of the locking lever adapted to actuate the same on the forward movement of the bolt, to release the bolt and allow the spring to react to lock the bolt in the receiver, said bolt having a groove in its periphery, a portion of which groove is slightly spiral and another portion extends parallel with the axis of the bolt, and connecting with the spiral-portion through a circumferentially extending portion of the slot, a cap or sleeve mounted on the rear end of the receiver, and a forwardly extending draw-bar fixed to the cap or sleeve and guided in the receiver and having a projection extending into engagement with said bolt-groove.

19. In a gun of the character described, the combination with a barrel, a hammer, a trigger-mechanism, a receiver, and a rotatable and reciprocable breech-bolt, said breech-bolt having a groove formed in its periphery with a portion of said groove extending parallel with the axis of the bolt and another connecting portion substantially spiral, a sleeve mounted on the rear end of the receiver and adapted to be reciprocated thereon, said sleeve having a forwardly projecting draw-bar which is guided on the inner wall of the receiver, a pin on the forward portion of the draw-bar extending into engagement with said groove, means for temporarily holding the sleeve in fixed relation to the rotatable and reciprocable bolt, said sleeve adapted to be reciprocated relatively to the receiver and cap or sleeve to cause the pin to ride in the cam-groove in the bolt and to thereby unlock the bolt from the receiver.

20. In a gun of the character described, the combination with a barrel, a hammer, a trigger-mechanism, a receiver, and a rotatable and reciprocable breech-bolt, said breech-bolt having a groove formed in its periphery with a portion of said groove extending parallel with the axis of the bolt, and another connecting portion substantially spiral, a sleeve mounted on the rear end of the receiver and adapted to be reciprocated thereon, said sleeve having a forwardly projecting draw-bar and a guide bar extending along the inner wall of the receiver, a pin on the forward portion of the draw-bar extending into engagement with said groove, means for temporarily holding the sleeve in fixed relation to the rotatable and reciprocable bolt, said sleeve adapted to be reciprocated relatively to the receiver to cause the pin to ride in the groove in the bolt and to thereby unlock the bolt from the receiver, and a spring-detent between the rear end of the sleeve and a corresponding portion of the receiver for immovably hold-

ing the sleeve relatively to the receiver, when the bolt is operated automatically.

21. In a gun of the character described, the combination of a barrel, a stock, a receiver, a hammer, and a trigger mechanism, said receiver having a slot in its bottom and having internal guides, a rotatable and reciprocable breech-bolt mounted in the receiver, means whereby the bolt may be locked to and unlocked from the receiver, a return spring mounted in the stock in rear of the receiver, a casing for the spring, a link connected to said spring and extending forwardly and connected to the bolt, said link operable in the slot formed in the bottom of said receiver, and a post passing through the front end of the casing and engaging the receiver.

22. In a gun of the character described, the combination of a barrel, a hammer, a trigger mechanism, a receiver, and a breech-bolt, said breech-bolt being rotatable and reciprocable in the receiver, an extractor and an ejector, said hammer having a slotted central portion adapted to receive the ejector, a pivot pin for the hammer and upon which pin the ejector is also pivotally mounted, a rod connecting with the hammer at one side of its pivot and extending rearwardly, a tube in which the rod operates, and a spring in the tube between the end of the rod and the wall of the tube and adapted to actuate the hammer.

23. In a gun of the character described, the combination with a barrel, a hammer, a receiver, a rotatable and reciprocable breech-bolt mounted in the receiver, said hammer being pivoted between its ends and having a downwardly extending tang, of a trigger mechanism, said mechanism comprising a trigger having a forwardly extending down-turned upper end, a pivoted sear-bar having its front end provided with a cam face, and a spring-pressed sear mounted horizontally in the sear-bar and having a notched upper surface to be engaged by the forwardly projecting portion of the trigger.

24. In a gun of the character described, the combination with a barrel, a hammer, a receiver, a rotatable and reciprocable breech-bolt mounted in the receiver, said hammer being pivoted between its ends and having a downwardly extending tang, of a trigger mechanism, said mechanism comprising a trigger having a forwardly extending down-turned upper end, a pivoted sear-bar having its front end provided with a cam-face, a spring-pressed sear mounted horizontally in the sear-bar and having a notched upper surface to be engaged by the forwardly projecting portion of the trigger, a trigger-guard and a spring mounted therein bearing upwardly under the free

end of the sear-bar adapted to hold said bar against the tang of the hammer and intercepting the tang when the hammer is cocked by the backward movement of the bolt thereby leaving the hammer in position to be again released when the trigger is pulled, and a spring acting against the trigger to return it to normal position after it has been pulled rearwardly.

25. In a gun of the character described, the combination of a barrel, a stock, a hammer, a receiver, a breech-bolt reciprocal and turnable therein, a trigger mechanism for releasing the hammer, a magazine, means for actuating the hammer after it is released by the trigger mechanism, and a safety mechanism comprising: a pivoted finger-piece mounted in rear of the trigger, a safety-bar extending forwardly from the finger-piece and below the sear-bar, a cross-pin projecting from the safety-bar and positioned centrally under the sear-bar, said sear-bar having a stop to be engaged by said cross-pin whereby the sear is locked against movement, and a spring-pressed pin in its forward end to engage a wall of the magazine, said pin acting to press the safety-bar backwardly to lock the sear-bar.

26. In a gun of the character described, the combination with a barrel, a stock, a hammer, a trigger mechanism, a receiver, and a rotatable and reciprocable breech-bolt operable in the receiver, of a magazine having a spring-pressed floor, a bolt-stop, a lifting pin on the magazine, means flexibly connecting said pin to the magazine floor whereby the stop is raised by the magazine spring after the final cartridge has been forced out of the magazine by the bolt, said bolt stop having a vertically guided member located on the side of the magazine immediately at the rear thereof, said sliding member having a projection on its lower end adapted to normally lie in contact with the top of the lifting pin, and having an inwardly projecting lug at its top adapted to project into the path of the returning breech-bolt to retain this bolt in its rear position and leave the floor of the magazine free to permit of the inserting of cartridges in the magazine from the clip in the top of the receiver, said bolt-stop having, also, a part which projects up through the stock at the side of the receiver and serving as a thumb piece for releasing the bolt and feeding a cartridge into the breech-chamber of the barrel.

27. In a gun of the character described, the combination of a barrel; a hammer; a trigger mechanism; a receiver; a breech-bolt reciprocal therein; a trigger-guard and a magazine; said magazine and trigger-guard being rigidly connected and forming a unitary housing for the trigger-mechanism,

the hammer and complementary parts; and securing screws at both ends of the trigger-guard extension for securing said housing to the receiver.

28. In a gun of the character described, a magazine casing having the bottom side edges recessed, and a cartridge feeding spring having its bottom leaf provided with laterally extending side flanges to seat in said recesses.

29. In a gun of the character described, a magazine casing having the bottom side edges recessed, and a cartridge feeding spring having its bottom leaf provided with laterally extending side flanges to seat in said recesses, a bottom plate for the magazine, said magazine having a forwardly extending lug provided with a transverse key-hole slot, said plate having a corresponding stud to enter said slot when the bottom plate is at about right angles to the magazine when attaching said plate, a detent at the rear of the magazine adapted to lock into engagement with the free end of the bottom plate when the latter is turned into place beneath the bottom leaf of the magazine spring and a trigger guard having an undercut groove or channel for receiving the free end of the bottom plate.

30. In a gun of the character described, the combination of a magazine casing having the bottom of its side edges recessed, a cartridge feeding spring having a bottom leaf to fit the bottom opening of the casing and having laterally extending flanges on opposite sides adapted to fit said recesses, a movable bottom plate for the magazine, said magazine having a forwardly extending lug provided with a key-hole slot and said bottom plate having a corresponding lug to enter said slot when the bottom plate is turned crosswise of the bottom of the magazine casing, a trigger guard having an undercut notch into which the free end of the bottom plate of the magazine may be edgewise turned, and a spring-pressed detent in the trigger guard adapted to be depressed when the magazine is closed.

31. In a gun of the character described, the combination with a barrel, a receiver, a reciprocable and rotatable breech-bolt, a trigger-guard having a rearward extension and the pivoted hammer, of the post extending from the rear part of the trigger-guard to the receiver, a bolt passing through said post and threaded into the rear end of the receiver, a tube pivotally connected to the post, and a spring-actuated rod operating in the post and connected to the hammer at a point below the pivot thereof.

32. The combination with a stock, a barrel, a receiver, a breech-bolt operable therein, a trigger-guard having a rear extension, a hollow vertical post connecting said exten-

sion with the rear end of the receiver, a bolt passing through said post and screwing into the receiver, a hammer mechanism, a casing, a tubular member operating therein, a spring between the said member and casing, and a link connecting said member to the bolt, said casing having a bottom wall with an opening therethrough through which

said post passes whereby the casing is held against the backward thrust of said spring. 10

In testimony whereof I affix my signature in presence of two witnesses.

GRANT HAMMOND.

Witnesses:

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