

Sept. 24, 1957

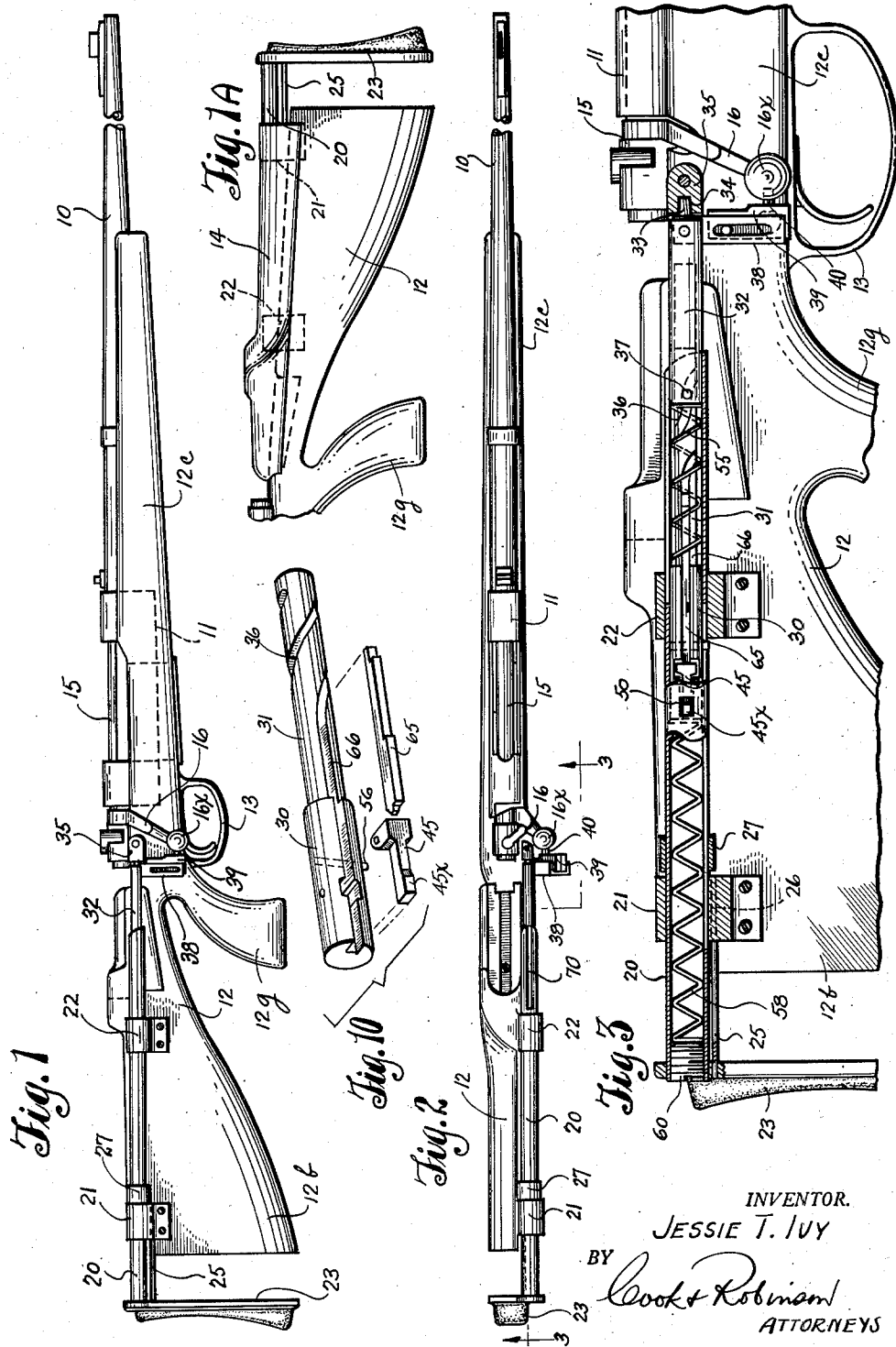
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2,807,113

AUTOMATIC RELOADING MECHANISM FOR BOLT ACTION RIFLE

Filed May 18, 1956

2 Sheets-Sheet 1



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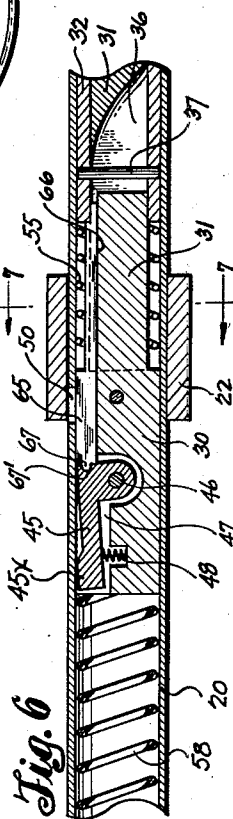
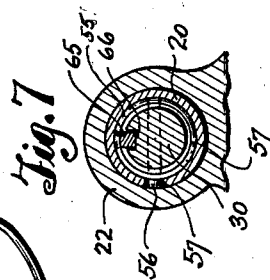
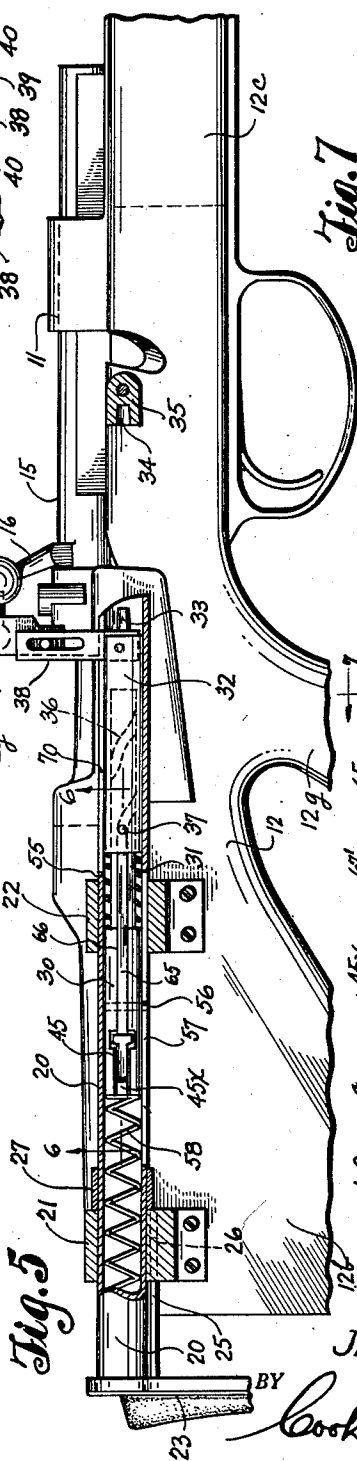
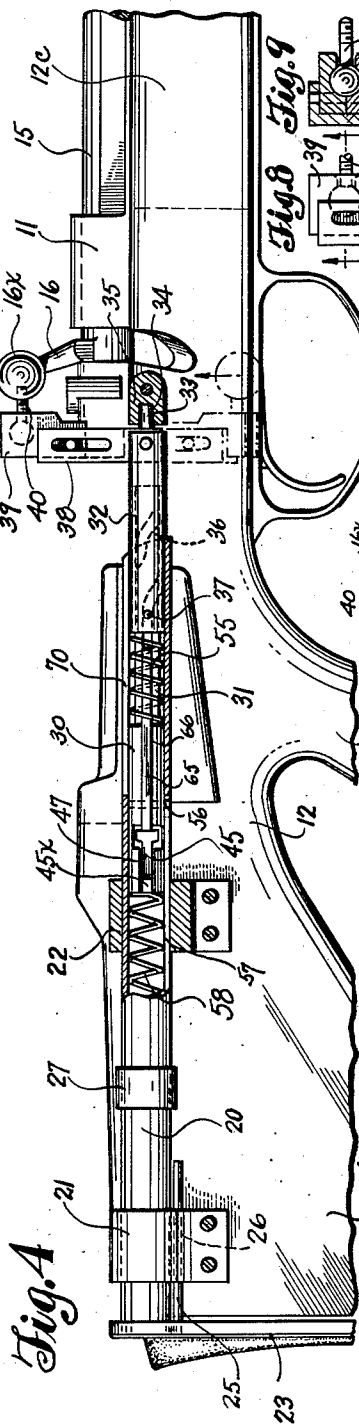
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AUTOMATIC RELOADING MECHANISM FOR BOLT ACTION RIFLE

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2 Sheets-Sheet 2



INVENTOR
JESSIE T. IVY

BY

Cook & Robinson
ATTORNEYS

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AUTOMATIC RELOADING MECHANISM FOR
BOLT ACTION RIFLE

Jessie T. Ivy, Seattle, Wash.

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4 Claims. (Cl. 42—16)

This invention relates to rifles and has reference more particularly to a means designed especially for use with repeating rifles of bolt action types for the automatic ejection of the empty shell and a reloading operation after firing.

It is the primary object of this invention to provide a simple, practical and relatively inexpensive mechanism, that may be made as an attachment for already existing bolt action rifles, or which might be embodied as original equipment in rifles as being manufactured, and which mechanism is operable by the recoil forces in the rifle upon firing, to effect the unlocking and throwing of the bolt for ejection of the shell, and the compressing of spring means which effect its return for reloading and for locking it in place.

Further objects and advantages of the invention reside in the details of construction and combination of parts embodied in the present mechanism, and in their mode of operation in combination with parts of the rifle as will hereinafter be fully described.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a right hand side view of a bolt action repeating rifle equipped with an automatic reloading mechanism embodied by the present invention.

Fig. 1A is a left hand side view of the stock portion of the rifle, showing a face protecting attachment piece as applied thereto.

Fig. 2 is a top view of the rifle as equipped with the present mechanism with the parts thereof in positions as shown in Fig. 1.

Fig. 3 is an enlarged longitudinal sectional detail of the mechanism taken on line 3—3 in Fig. 2, with the bolt closed and its actuating lever in bolt locking position.

Fig. 4 is a view similar to that of Fig. 3 but showing the bolt lever as swung upwardly to bolt unlocking position, as the initial step required after firing for ejection of the empty shell.

Fig. 5 is a sectional view, similar to that of Fig. 4 but showing the bolt partly drawn as for ejection of the empty shell.

Fig. 6 is a horizontal sectional detail, taken on line 6—6 in Fig. 5.

Fig. 7 is a cross-section taken on line 7—7 in Fig. 6.

Fig. 8 is a side view of a portion of the bolt lever actuating means.

Fig. 9 is a horizontal section on line 9—9 in Fig. 8.

Fig. 10 is a perspective view of the plunger and latch mechanism removed from the tubular slide.

Referring more in detail to the drawings:

The present invention applies to the common types of bolt action rifles of the general character of that shown best in Fig. 1. In the several views, the rifle is shown to comprise a barrel 10, secured to the metal frame 11 to which the gun stock 12 is fixed in the usual manner. The design of the stock, preferably, is as shown in Figs.

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1 and 1A wherein it is seen to comprise the usual base portion 12b and an elongated forward portion 12c in which the barrel 10 and frame 11 are cradled. Because of the use of the mechanism of the present invention, it is desirable to provide the stock with a pistol grip attachment portion 12g which is fixed thereto just back of the trigger guard 13.

It is also desirable that a face guard 14 be applied to the stock as shown in Fig. 1A.

The barrel is also equipped with the usual type of breech bolt 15 that is rotatably and reciprocally contained in the frame and which is adapted to be operated manually by a hand lever 16 to effect the ejecting of the shell, the loading and finally closing and locking of the breech. This lever is fixed to the rear end of the bolt and extends to the right hand side of the stock.

Rifles of this type have the stock chambered at the underside, just forward of the trigger guard, and fitted with means to receive a cartridge holding clip, details of which have not been illustrated herein, since this means, per se, forms no part of the present invention.

Without use of the present invention, the normal operation for this type of rifle for reloading after firing is, first, to swing the bolt hand lever 16 upwardly from position of Fig. 1, thus to unlock the bolt; then, by means of the lever, to pull the bolt rearwardly to effect the ejection of the empty shell; then by means of the lever 16, to push the bolt forwardly to effect the loading of a cartridge from the clip into the breech of the barrel; then to swing the lever 16 downwardly to lock the bolt in place.

With the present invention properly applied to the rifle, the recoil forces of each fired cartridge operate to effect all the above ejection and reloading movements and leave the gun loaded and ready for firing at the will of the user.

The present mechanism, illustrated as an attachment, comprises a rather elongated tubular slide 20, mounted for limited longitudinal movement lengthwise of the gun stock, parallel to the axial line of the gun barrel slightly below and to the right thereof; this slide being mounted in guide bearings 21 and 22 that are fixed in spaced relationship to the rifle stock 12. The slide 20 terminates, at its forward end, short of the breech end of the barrel, and at its rear end extends slightly beyond the butt end of the stock, and is there equipped with a pad 23 adapted to be rested against the gun user's shoulder when firing the rifle; this pad normally being spaced from the end of the stock as shown in Fig. 1. A rod 25 is fixed in the pad, below and parallel with the slide, and this rod is fitted in and movable endwise through a hole 26 bored through the bearing 21. Its purpose is to hold the slide from axial rotation without interfering with its longitudinal movement. Forward movement of the slide 20 is limited by the pad 23 engaging against the butt end of the gun stock. Its rearward movement is limited by a collar 27 that is fixed to the slide in position to engage with the front end surface of the bearing 21.

Reciprocally fitted in the medial portion of the tubular slide, as seen in Fig. 3, is a plunger 30. At its forward end, the plunger has an integrally formed, coaxial stem 31, of reduced diameter. Fitted in the forward end portion of the slide 20 for rotary and also for longitudinal movement, is a sleeve 32, closed at its forward end but adapted to telescopically receive the stem 31 therein to a substantial distance. The sleeve 32 normally extends from the forward end of the slide 20, and at its forward end has a bearing portion 33, of reduced diameter, rotatably seated in a rocket 34 formed in a bearing block 35 which is fixed to the rear end of the gun frame 11.

It is shown best in Figs. 4 and 5, that the forward end portion of the stem 31 is formed lengthwise thereof and diametrically therethrough with a spirally directed slot

or channel 36, and that a pin 37, fixed in and extending diametrically through the rearward end of the sleeve 32, is contained in and is movable along this channel. Therefore, with the bearing tip 33 of stem 31 seated in the block 34, as in Fig. 1, it will be understood that a telescopic movement of sleeve 32 and the plunger stem while the stem is held against rotation in the tubular slide 10 will effect axial rotation of the sleeve 32 in accordance with the pitch of the spiral channel 36 and extent of forward movement of the plunger and stem. It is this rotative action of the sleeve that causes unlocking and locking action of the bolt, as will now be described.

At its forward end the sleeve 32 has a radial arm 38 fixed thereto and at its outer end this arm has a block 39 that has limited longitudinally movement therein. The block 39 pivotally mounts one end of a stud 40 therein. The outer end of the stud is mounted in the knob shaped end member 16x of the bolt hand lever 16. Thus, it will be understood that rotation of the sleeve 32, as effected by the relative forward and rearward reciprocal action of the plunger stem therein, will cause the lever arm 16 to be swung upwardly and downwardly between bolt locking and unlocking positions.

Means has been shown in Fig. 3 whereby the plunger 30 is normally held against longitudinal movement in the tubular slide 20. This means comprises a latch member 45 that is pivotally mounted on a transverse pivot pin 46, directed transversely through the forward end portion of the latch and diametrically through the rear end portion of the plunger. The latch member, as noted in Fig. 6, is contained in a slot 47 formed longitudinally in the plunger, and it is yieldingly urged outwardly at its free end to latching position by pressure of a small coil spring 48 contained in a seat in the base of the slot 47 and pressing against the latch. At the top side of its swinging end, the latch 45 has an upwardly extended boss 45x formed thereon. This is normally seated in a slot 50 formed in the sidewall of the tubular slide 20, as shown in Fig. 3, thus to normally hold the plunger against relative longitudinal movement in the slide.

It is also shown in Figs. 3, 4 and 5, that a coil spring 55 surrounds the plunger stem between the end surfaces of the plunger and sleeve. This spring urges the sleeve toward its forward extended position, as seen in Fig. 3, at all times.

When the boss 45x of the latch member is disengaged from the slot 50, the plunger 30 is then free to move rearwardly in the tubular slide 20. However, this plunger 30 is at all times held against axial turning in the slide by means of a stud 56 extended outwardly therefrom into a slot 57 that is formed lengthwise in a sidewall of the slide. A heavy coil spring 58 is contained under compression in the rearward end portion of the slide, between the rear end of plunger 30 and a plug 60 that is threaded into the rear end of the slide and adjustable to regulate the spring pressure.

The means provided for releasing the latch 45 as required for reloading operation comprises a push rod 65, best shown in Fig. 6, that is contained for endwise movement in a channel 66 that is formed lengthwise of the plunger 30, and is extended into the stem portion thereof. At its rear end, the rod 65 terminates in a pointed tip 67 that seats pivotally in a socket 67' formed in the forward end surface of the latch 45 at a point above the level of the pivot pin 46 as shown in Fig. 6. At its forward end, the rod 65 as contained in channel 66 projects slightly above the surface of the stem. This provides that when the sleeve 32 is actuated rearwardly along the stem as presently explained, it will engage at its rear end against the forward end of the rod 65 and force the rod rearwardly, and thus cause it to act against the latch 45 to release the latch lug 45x from the tube slot 50 thus to free the plunger for rearward movement in the slide.

Assuming that the various parts of the mechanism are

so constructed, and that they are assembled and applied to a rifle as described, and that after the cartridge clip has been applied to the magazine and a first shell is loaded into the barrel by hand operation as usual, after that, the automatic unloading and loading operation is as follows:

With all parts in the relative positions shown in Fig. 1, and the pad 23 rested against the hunter's shoulder, the gun is fired in the usual way. The recoil of the gun, under the force of the fired cartridge, drives the gun rearwardly. This causes a forward movement of the slide 20 relative to the gun stock 12 and barrel. The plunger 30, being locked to the sleeve 20 by latch 45 at that time, moves with the slide, causing the plunger stem 31 to move forwardly into the sleeve 32 against the resistance of spring 55. By reason of the pin 37, which is fixed in the rear end of the sleeve, extending through the spiral groove 36 formed along the stem, this relative longitudinal movement of stem and sleeve effects the rotation of the sleeve and an incident upward swinging of the bolt operating lever 16, as from the locked position in Fig. 1 to that of Fig. 4, to thus unlock the bolt. This action also causes the sleeve 32 to engage the forward end of push rod 65 to push it rearwardly and cause it to release the latch 45 from the slide and free the plunger 30 for rearward movement. Then, the force of the expanding gases in the gun barrel, acting against the unlocked bolt 15 drives it rearwardly; the plunger 30 being forced rearwardly with the rearward travel of the bolt 15. As the bolt moves rearwardly, the arm 38 at the forward end of the sleeve 32, enters a longitudinal slot 70 that is formed in the top wall of the tubular slide as shown in Figs. 1 and 2. The rearward action of the bolt 15 effects the ejection of the empty shell preparatory to a reloading operation, and the rearward travel of the plunger 30 causes the coiled spring 58 to be further compressed. Then, with the force of the explosion expended, the coil spring 58 expands and forces the plunger 30 forwardly, moving the same back to normal position and thereby returning the bolt to a closed position, and with this action, the latch 45 carried in the plunger reseats itself in the slide slot 50. The coiled spring 55 which is still compressed at this time then expands and forces the sleeve 32 forwardly along the spirally channeled stem 31 and, by the pin and slot connection previously explained, the sleeve is caused to rotate and swing the lever 16 back to bolt locking position. Thus, a shell has been ejected, and a new cartridge has been loaded into the barrel and the bolt locked.

Where guns are being manufactured, the bearings 21—22, pistol grip portion and face plate might be made integral with the stock.

What I claim as new is:

1. In combination with a rifle of the character described; an automatic reloading mechanism comprising a tubular slide mounted on the rifle stock and forwardly yieldable relative thereto, and extended to the rear thereof, and equipped at its rear end with a shoulder engaging pad, a plunger slidably keyed in the slide, a sleeve telescopically fitted to the forward end of the plunger and extending from the forward end of the slide into abutting contact with the rifle frame, a recoil absorbing spring contained in the slide and acting against the plunger to urge it forwardly after recoil forces have been dissipated, a recoil absorbing spring acting against the sleeve and plunger to urge the sleeve forwardly along the plunger as recoil forces are dissipated, means whereby relative telescopic movements of the sleeve effect its rotation in opposite directions accordingly, and means operatively connecting the sleeve with the actuating arm of the rifle bolt whereby its rotative movements in opposite directions effect the unlocking and locking of the bolt.

2. The combination of claim 1 wherein the slide is automatically returned to its normal recoil receiving position by the pressure of said springs.

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3. In combination with a rifle of the character described, an automatic reloading mechanism therefor comprising a tubular slide mounted on the rifle stock and extended to the rear thereof and equipped with a shoulder pad, and adapted to yield for relative forward movement incident to recoil of the rifle when fired, a plunger slidably keyed in the slide, a recoil absorbing spring acting against the plunger to urge it forwardly, a sleeve telescopically applied to the forward end of the plunger and extended therefrom into abutment with the rifle frame, a second recoil spring acting against the sleeve to urge it forwardly along the plunger, a releasable latch means locking the plunger against recoil movement in the slide; said sleeve having operative connection with the actuating arm of the rifle bolt for unlocking and locking it with turning of the sleeve in opposite directions, coacting means on sleeve and plunger whereby relative forward movement of the plunger in the sleeve rotates the sleeve for unlocking the bolt, and then effects the release of said latch for rearward movement of the plunger and sleeve under recoil forces for shell ejection; said parts being returned to initial position by said springs after recoil forces have been dissipated.

4. In combination, with a bolt action repeating rifle of the character described; an automatic reloading mechanism comprising a tubular slide mounted on and extending along the rifle stock and to the rear thereof, and equipped at its rear end with a shoulder engaging pad, and adapted for relative forward movement under recoil action of the

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gun when fired, a plunger slidably keyed in the slide, a recoil absorbing spring means confined in the slide and acting against the plunger to return it to its forward position after recoil, a latch normally retaining the plunger against rearward movement in the slide, a sleeve telescopically applied to the forward end portion of the plunger and extended therefrom into abutting contact with the gun frame, a spring contained in the slide and acting against the sleeve to urge it from a retracted to its forward position after recoil; said plunger having a slot formed spirally therealong and said sleeve being formed with a slot follower whereby relative telescopic movements of the plunger and sleeve effect axial rotation of the sleeve in opposite directions, an arm extended from the sleeve and operatively connected with the actuating arm of the rifle bolt for effecting its functional operation, means operable by the sleeve when moved to its limit rearwardly along the plunger to release said latch for rearward travel of the plunger in the slide and the compression thereby of said recoil absorbing spring means; said plunger being returned to normal position by said recoil absorbing spring means after recoil forces are expended, thus to move said plunger forwardly for closing the bolt, and said sleeve being returned forwardly along the plunger under expanding force of the second mentioned spring to effect the locking action of the bolt.

No references cited.