Oct. 23, 1945. E. A. SHAFFNIT 2,387,413

BOLT ACTUATING MECHANISM FOR BOLT ACTION FIREARMS

Filed Sept. 18, 1943 2 Sheets-Sheet 1

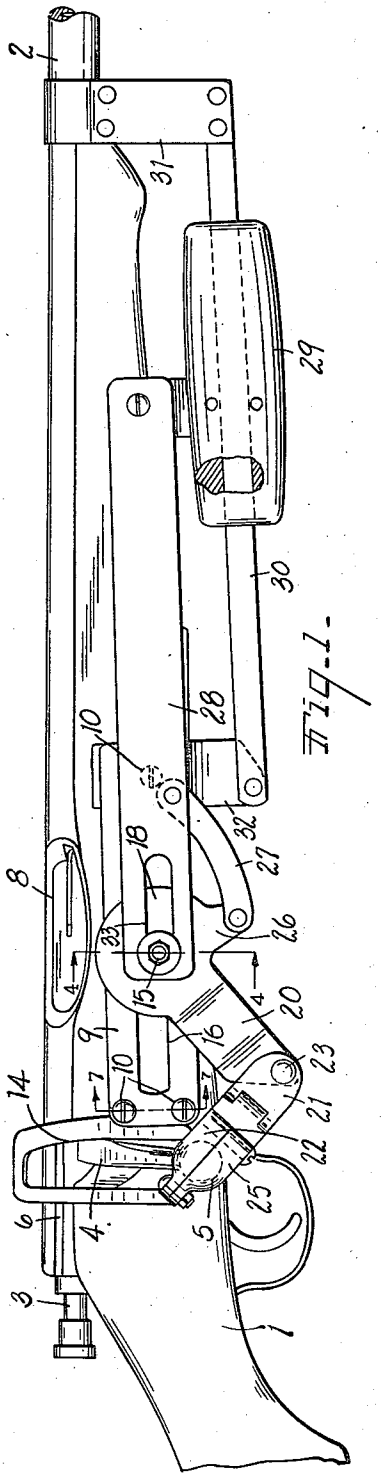


Fig. 1.

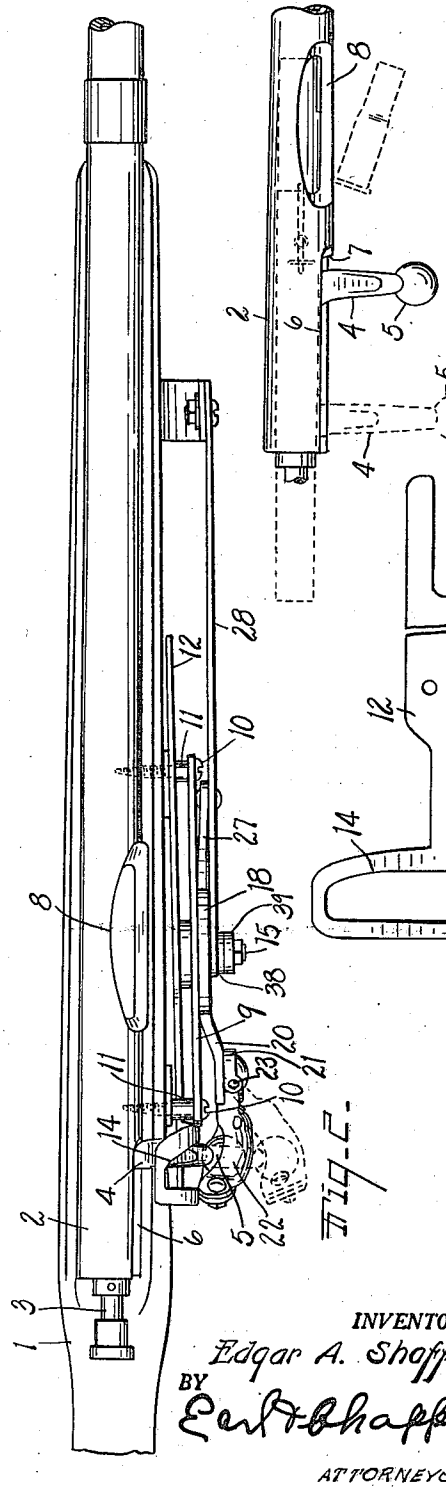


Fig. 2.



Fig. 3.



Fig. 4.

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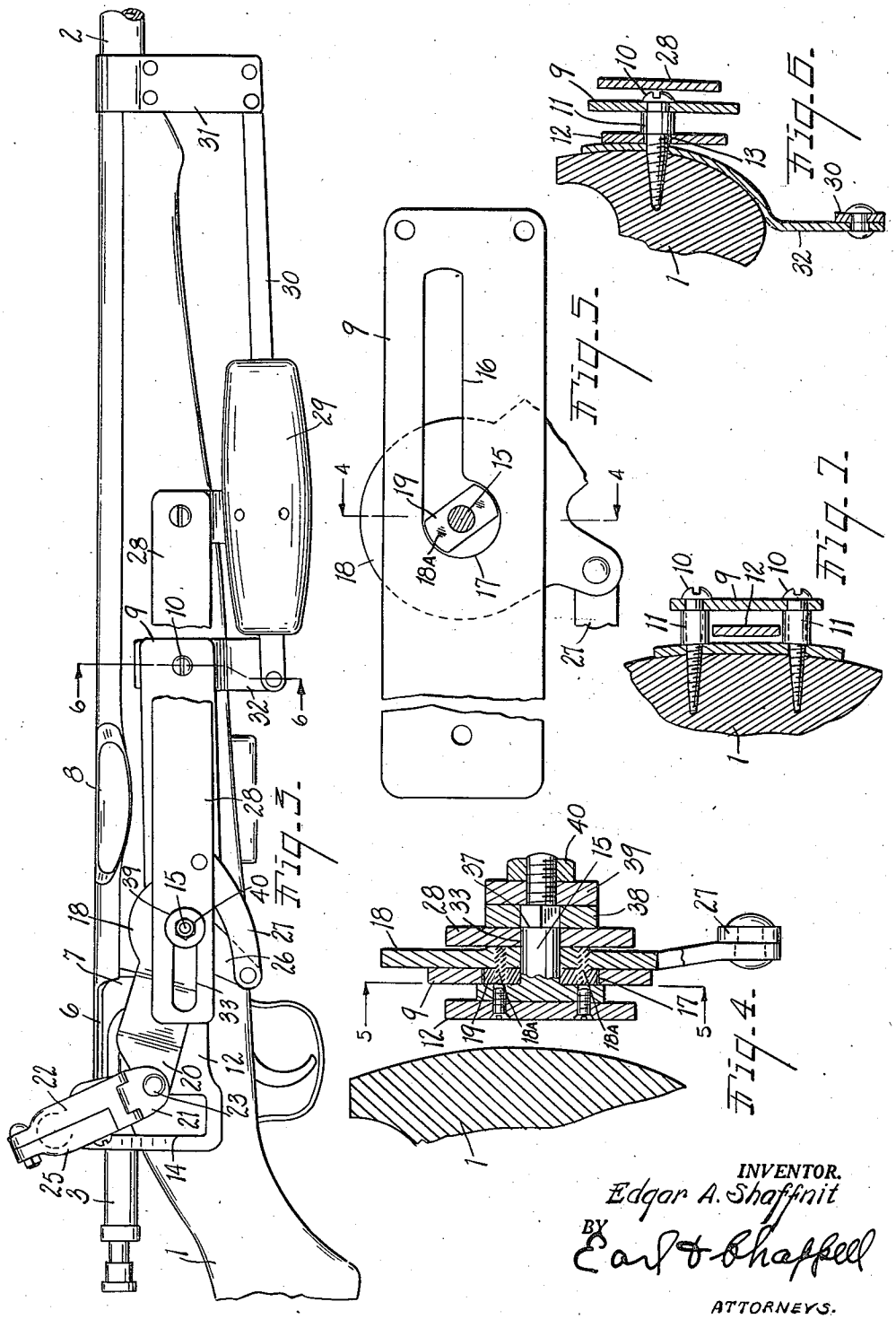


FIG. 3.



FIG. 6.



FIG. 5.



FIG. 7.



FIG. 4.

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Patented Oct. 23, 1945 2,387,413

# UNITED STATES PATENT OFFICE

2,387,413

## BOLT ACTUATING MECHANISM FOR BOLT ACTION FIREARMS

Edgar A. Shaffnit, Otsego, Mich.

Application September 18, 1943, Serial No. 502,854

10 Claims. (Cl. 42—16)

The main objects of this invention are:

First, to provide an actuating mechanism for bolt action firearms which may be readily applied to bolt action firearms in which the bolt is directly manipulated by the operator to adapt the same for a so-called "pump" gun operation.

Second, to provide an actuating mechanism for bolt action firearms which may be readily adapted to various firearm structures now in extensive use and greatly increases the speed of operation and facilitates the operation thereof.

Third, to provide a structure having these advantages in which the parts are simple and economical to produce and assemble.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevation of a bolt action firearm having my improvements embodied therein.

Fig. 2 is a fragmentary top plan view, the bolt arm being shown in one position by full lines and in another position by dotted lines.

Fig. 3 is a fragmentary side view corresponding to that of Fig. 1 with the parts in bolt retracting position.

Fig. 4 is an enlarged fragmentary view, mainly in section, on line 4—4 of Figs. 1 and 5 illustrating several of the parts in their associated relation.

Fig. 5 is a fragmentary view in section on line 5—5 of Fig. 4.

Fig. 6 is an enlarged fragmentary view mainly in section on line 6—6 of Fig. 3.

Fig. 7 is an enlarged fragmentary view mainly in section on a line corresponding to line 7—7 of Fig. 1.

Fig. 8 is a fragmentary side elevation of the bolt actuating or control member.

Fig. 9 is a fragmentary plan view showing the relation of the bolt to other parts of the gun, the bolt being shown in retracted position by dotted lines.

In the accompanying drawings, 1 represents the gun stock and 2 the barrel. The bolt 3 has a combined sliding and rotating movement, the bolt being provided with a laterally projecting arm 4 terminating in the spherical knob 5 which constitutes a hand piece when the bolt is directly manipulated manually.

The slot 6 is angled, the vertical portion 7 thereof receiving the arm and coacting with the arm to lock the bolt in its advanced position. The shell ejecting opening is shown at 8.

The bolt actuating mechanism illustrated comprises a supporting bracket 9 which is mounted on the side of the gun stock in spaced relation thereto by means of the screws 10, there being a pair of screws in the rear end of the bracket and a single screw in the front end of the bracket. Spacing collars 11 are provided for these screws.

The bolt control or actuating member 12 is slidably or reciprocatingly mounted on the inner side of the bracket 9, in the embodiment illustrated being disposed between the pair of screws 10, see Fig. 7, and being longitudinally slotted at 13 to engage the single screw. This member 12 is provided with a vertical slot 14 at its rear end and adapted to receive the arm 4 permitting the swinging thereof. A post or stud 15 is fixedly secured to the member 12, as shown in Fig. 4. This post or stud projects laterally through the slot 16 in the supporting bracket 9. This slot has a curved enlargement 17 at its forward end.

I provide a bell crank lever 18 which has a slide block 19 electrically spot welded to the rear side thereof, as shown at 18A in Figs. 4 and 5, to slidingly engage the slot 16 and be rotatably received in the enlargement 17 thereof. The arm 20 of the lever 18 is connected to the arm 4 of the bolt, the connection in the embodiment illustrated comprising a link made up of pivotally connected sections 21 and 22, the section 21 being pivoted at 23 to the arm of the lever, the section 22 being provided with a socket receiving the spherical head 5 of the bolt arm.

The link element or section 22 is provided with a detachable section 25 to permit engagement of the link with the spherical head. The other arm 26 of the bell crank lever 18 is connected by the link 27 to the connecting rod 28 which is pivotally connected to the hand piece 29. This hand piece 29 is slidably mounted on the slide bar 30 suspended at its front end by the hanger 31 carried by the barrel in the front end of the stock and by the hanger 32 which is secured to the side of the stock by means of the forward bracket supporting screw, see Fig. 6. These hangers support the slide bar 30 directly under the stock.

The connecting rod 28 is longitudinally slotted at 33 to receive the stud 15, thus providing a lost motion connection for the connecting rod to the bolt actuating or control member 12 through its stud 15 and also a lost motion connection to the lever.

When the parts are in fully retracted position, the slide block 19 is within the enlargement of

the slot in the bracket, see Fig. 5, so that neither the lever nor the control member can be advanced until the lever is rotated. This position of the parts is further illustrated in Fig. 1. On the initial movement of the hand piece, the lever is actuated or swung on its pivot to swing the arm 4 upwardly, this being effected through the link 27 connecting the connecting rod to the lever, and during this swinging movement of the lever the block 19 is brought into sliding or reciprocating position relative to the slot 16. This lost motion connection for the connecting rod insures the swinging of the bolt arm upwardly during the initial movement of the hand piece, continued movement imparting a sliding or reciprocating motion to the control member and through it, sliding the bolt. The movement of these parts is reversed on the return movement of the hand piece.

Viewed in Fig. 4, it will be noted that the stud or post 15 is shouldered at 37 to receive the spacer 38, a washer 39 being arranged on the outer side of the spacer, the parts being retained by the nut 40 threaded upon the post or stud. This provides an arrangement of parts that can be quite quickly assembled.

The mechanism is, as stated, readily adapted for use on various makes of bolt action firearms now in extensive use, converting the same into a quick acting repeater or "pump" gun.

I have illustrated and described my improvements in an embodiment which I have found highly satisfactory. I have not attempted to illustrate or describe other modifications or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. The combination with a bolt action firearm comprising a stock, barrel, and a slidable and rotatable bolt provided with an actuating arm terminating in a spherical head, of a supporting bracket mounted on the side of said stock in spaced relation thereto, said bracket having a longitudinal slot with an enlargement at the front end thereof, a slide bar, hangers therefor depending from said stock and barrel, a hand piece slidable on said slide bar, a bolt control member slidably mounted on the inner side of said supporting bracket and having a vertical slot receiving said bolt arm, a stud mounted on said control member and projecting through said slot in said bracket, a bell crank lever having an elongated slide block pivotally mounted on said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a jointed link connecting one arm of said lever to said bolt arm, one member of said link being pivoted to the lever and the other having a socket receiving said spherical head on said bolt arm, a connecting rod pivotally connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to the other arm of said lever, in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt.

2. The combination with a bolt action firearm comprising a stock, barrel, and a slidable and rotatable bolt provided with an actuating arm, of a supporting bracket mounted on the side of said stock in spaced relation thereto, said bracket having a longitudinal slot with an enlargement at the front end thereof, a slide bar, hangers therefor depending from the stock and barrel, a hand piece slidable on said slide bar, a bolt control member slidably mounted on the inner side of said supporting bracket and having a vertical slot receiving said bolt arm, a stud mounted on said control member and projecting through said slot in said bracket, a bell crank lever having an elongated slide block pivotally mounted on said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a link connecting one arm of said lever to said bolt arm, a connecting rod pivotally connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to the other arm of said lever, in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt.

3. The combination with a bolt action firearm comprising a slidable and rotatable bolt provided with an actuating arm terminating in a spherical head, of a supporting bracket mounted on the firearm and having a longitudinal slot with an enlargement at the front end thereof, a slide bar, a hand piece slidable on said slide bar, a bolt control member slidably mounted on the inner side of said supporting bracket and having a vertical slot receiving said bolt arm, a stud on said control member projecting through said slot in said bracket, a lever having an elongated slide block pivotally mounted on said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a jointed link connecting said lever to said bolt arm, one member of said link being pivoted to the lever and the other having a socket receiving said spherical head on said bolt arm, a connecting rod connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to said lever, in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

4. The combination with a bolt action firearm comprising a slidable and rotatable bolt provided with an actuating arm, of a supporting bracket mounted on the firearm and having a longitudinal slot with an enlargement at the front end thereof, a slide bar, a hand piece slidable on said slide bar, a bolt control member slidably mounted on the inner side of said supporting bracket and having a vertical slot receiving said bolt arm, a stud on said control member projecting through said slot in said bracket, a lever having an elongated slide block pivotally mounted on said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a link connecting said lever to said bolt arm, a connecting rod connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to said lever, in such manner that on the initial actuating move-

ment of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

5. The combination with a bolt action firearm comprising a slidable and rotatable bolt provided with an actuating arm, of a supporting bracket mounted on the firearm and having a longitudinal slot with an enlargement at the front end thereof, a reciprocable hand piece, a slidably mounted bolt control member engaged with said bolt arm to permit swinging movement thereof, a stud on said control member projecting through said slot in said bracket, a lever having an elongated slide block pivotally mounted on said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a link connecting said lever to said bolt arm, a connecting rod connected to said hand piece and having a lost motion connection to said stud, and a link connecting said connecting rod to said lever, in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

6. In an actuating mechanism for bolt action firearms including a rotatable and slidable bolt provided with an actuating arm terminating in a spherical head, the combination of a supporting bracket adapted for attachment to the firearm, said bracket having a longitudinal slot with an enlargement at the front end thereof, a bolt control member slidably associated with said bracket and having a vertical bolt arm receiving slot, a stud on said control member projecting through said slot in said bracket, a bell crank lever having an elongated slide block pivotally engaging said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a jointed link for connecting one arm of said lever to the bolt arm, one member of said link being pivoted to the lever and the other having a socket adapted to receive the spherical head on the bolt arm, an actuating hand piece, a connecting rod connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to the arm of said lever in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

7. In an actuating mechanism for bolt action firearms including a rotatable and slidable bolt provided with an actuating arm terminating in a spherical head, the combination of a supporting bracket adapted for attachment to the firearm, said bracket having a longitudinal slot with an enlargement at the front end thereof, a bolt control member slidably associated with said bracket and having a vertical bolt arm receiving slot, a stud on said control member projecting through said slot in said bracket, a bell crank lever having an elongated slide block pivotally engaging said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a link for connecting one arm of said lever to the bolt arm, an actuating hand piece, a connecting rod connected to said hand piece and having a longitudinal slot receiving said stud providing a lost motion connection for the connecting rod to said stud, and a link connecting said connecting rod to the arm of said lever in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

8. In an actuating mechanism for bolt action firearms including a rotatable and slidable bolt provided with an actuating arm, the combination of a supporting bracket adapted for attachment to a firearm, said bracket having a longitudinal slot with an enlargement at the front end thereof, a slidably mounted bolt control member engaged with said bolt arm to permit swinging movement thereof, a stud on said control member projecting through said slot in said bracket, a lever having an elongated slide block pivotally engaging said stud and slidable in said slot in said bracket and rotatable in the enlargement thereof, a link connecting said lever to the bolt arm, an actuating hand piece, a connecting rod connected to said hand piece and having a lost motion connection to said stud, and a link connecting said connecting rod to said lever in such manner that on the initial actuating movement of said hand piece the lever is actuated to swing the bolt arm and continued actuation actuates the control member to longitudinally actuate the bolt and the actuation of the bolt is reversed on the return movement of the hand piece.

9. In an actuating mechanism for bolt action firearms including a rotatable and slidable bolt provided with an actuating arm, the combination of a supporting bracket adapted for attachment to a firearm, a reciprocable hand piece, a reciprocatingly mounted bolt control member engaged with said bolt arm to permit swinging movement thereof, a lever mounted on said bracket for rotative and reciprocating movement and connected to said control member for reciprocating movement therewith, a link connecting said lever to said bolt arm, and means including a lost motion connection operatively connecting said hand piece to said lever and control member for imparting reciprocating movement thereto, said means also operatively connecting said hand piece to said lever in such manner that the lever is actuated during the initial movement of the hand piece to swing the bolt arm.

10. An actuating mechanism for bolt action firearms including a rotatable and slidable bolt provided with an actuating arm, comprising a supporting bracket adapted for attachment to a firearm, a reciprocable hand piece, a slidably mounted bolt control member engaged with said bolt arm to permit swinging movement thereof, a lever connected to said control member for reciprocating movement therewith and mounted on said bracket for rotative and reciprocating movement and connected to said bolt arm to impart swinging movement thereto, and means including a lost motion connection operatively connecting said hand piece to said lever and control member for imparting reciprocatory movement thereto, said means also operatively connecting said hand piece to said lever in such manner that the lever is swingingly actuated during the initial movement of the hand piece to swing the bolt arm.

EDGAR A. SHAFFNIT.