Sept. 25, 1928.

1,685,148

H. S. CONANT

FIREARM

Filed April 18, 1925

2 Sheets-Sheet 1

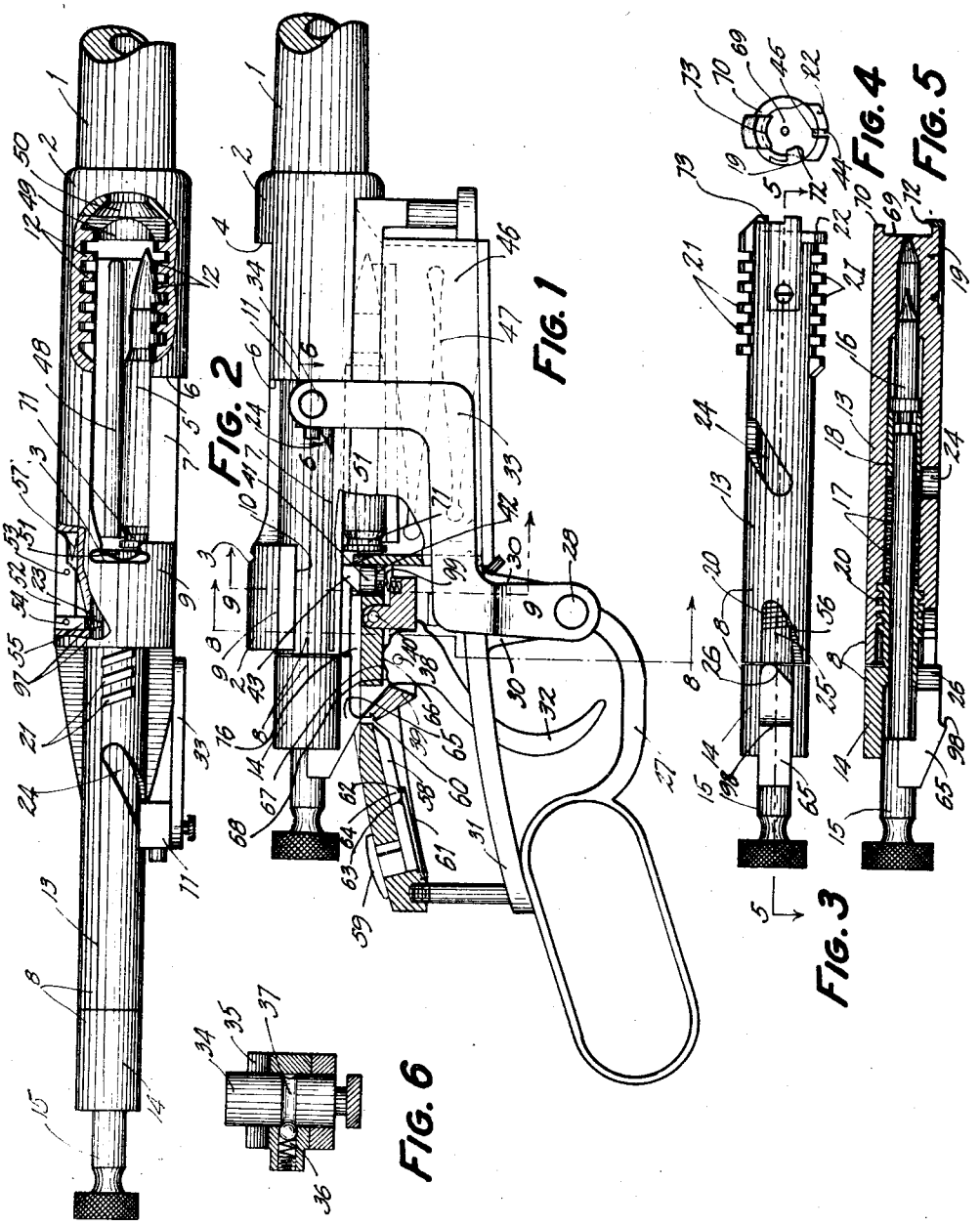


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

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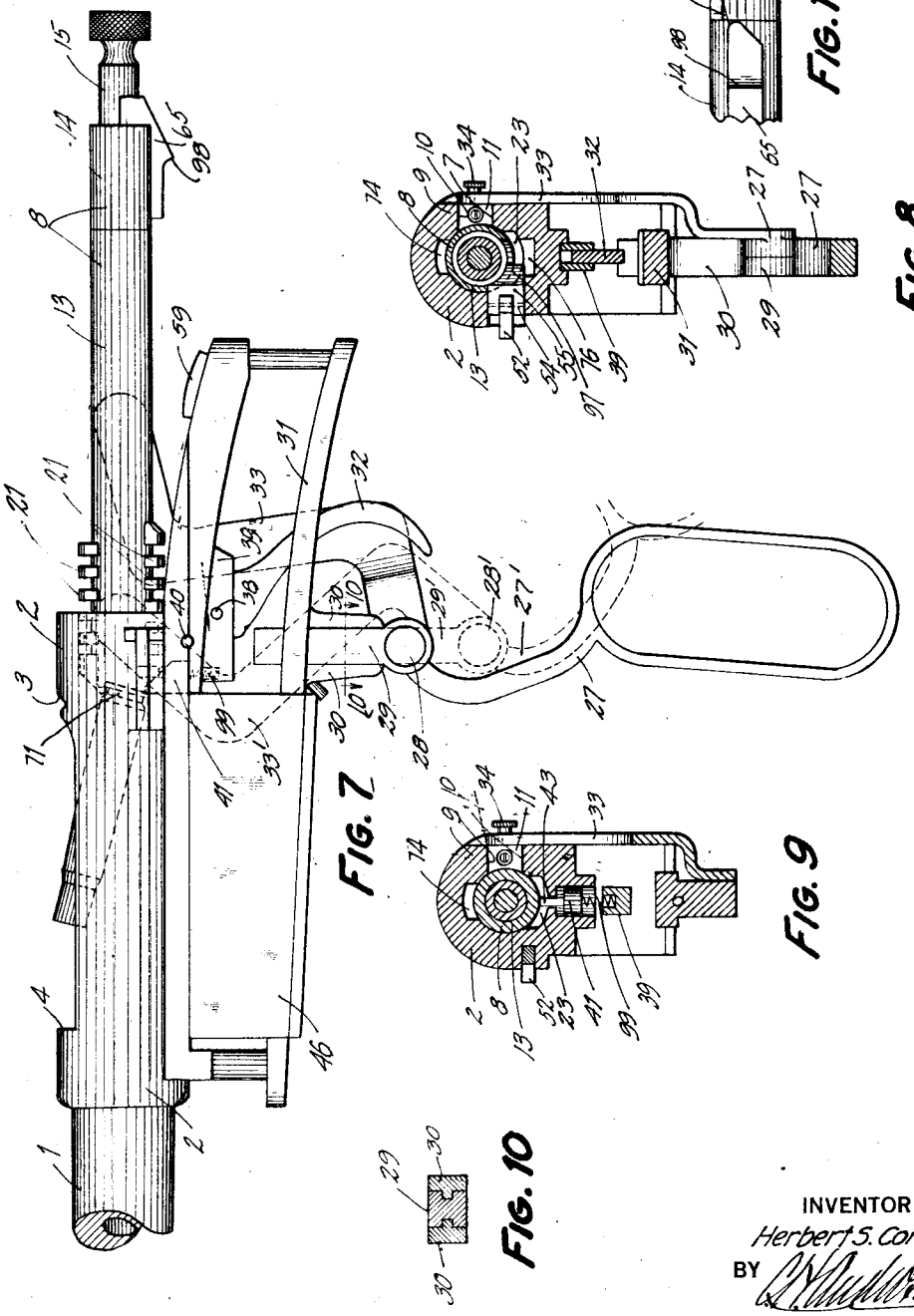


FIG. 7

FIG. 8

FIG. 9

FIG. 10

FIG. 11

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UNITED STATES PATENT OFFICE.

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FIREARM.

Application filed April 18, 1925. Serial No. 24,254.

My invention relates both to bolt action and lever action weapons.

The object of my invention is to provide a rifle or other firearm having the speed and handiness of a lever action gun combined with the strength and simplicity of a bolt action.

It is well known that the breech mechanism of all lever action guns now in use, "springs" when used with heavy charges of dense nitro powders. This defect soon results in a permanent set or deformation of the breech mechanism in high power rifles which prevents the mechanism from closing tightly and results in shells which are expanded, split, and otherwise distorted. It may progress to the point where it is absolutely unsafe to fire the gun. This defect is inherent to the design of the breech block locking mechanism in this type of action. For sporting use however, a lever action rifle is far superior to a bolt action rifle, and because of the speed with which it may be fired without removing from the shoulder it is the accepted type of action in this country for that use.

On the other hand, the bolt action type is the accepted standard for army purposes throughout the civilized world. The breech mechanism of this type is absolutely rigid when closed, and is permanently so. All parts of the action are rendered accessible for cleaning purposes and may be assembled and disassembled without the use of any tools. While there has been some effort to popularize, for sporting use, guns having this type of action, they cannot generally be reloaded without removing from the shoulder and hence, cannot be fired as rapidly as the lever action gun.

The objects of my invention, therefore, are to provide a bolt action mechanism which may be opened and closed by means of the conventional finger lever, thereby combining all the good features of both types of action.

With this object in view my invention comprises the novel elements and combinations thereof described in the following specification and illustrated in the accompanying drawings in which—

Fig. 1 is a right side view of my action in partial section on the center line to show the interior construction;

Fig. 2 is a top view showing the breech bolt in open position and having certain portions of the receiver broken away to show the interior construction;

Fig. 3 is a bottom outside view of my bolt showing the relative position of the parts when the gun is cocked and ready to fire;

Fig. 4 is a front end view of the bolt;

Fig. 5 is a section of Fig. 3 on the line 5—5;

Fig. 6 is a section on the line 6—6 of Fig. 1;

Fig. 7 is a left side view of my action showing the bolt in open position;

Fig. 8 is a section on the line 8—8 of Fig. 1;

Fig. 9 is a section on the line 9—9 of Fig. 1;

Fig. 10 is a section on the line 10—10 of Fig. 7;

Fig. 11 is a fragmentary outside view of my bolt assembly in cocked position when outside the gun.

In the drawings, 1, represents a fragmentary portion of the barrel which is threaded or otherwise secured to the receiver, 2. The receiver between the points, 3 and 4, on the top, is open to permit the insertion and ejection of the cartridges, 5, and the shells. On the right hand side and rearwardly from the surface, 6, the receiver is open from the top down to the plane surface, 7. At the rear end, the receiver is bridged over the bolt, 8, as shown at, 9. This bridge does not extend entirely around the bolt but has a cut out portion extending vertically from the surface, 7, to the parallel plane surface, 10, to provide a passageway for the block, 11, as the bolt is retracted. The interior of the forward end of the receiver is provided, at the sides thereof, with several interrupted, female threads, 12, as shown in Fig. 2.

The bolt assembly illustrated in Figs. 3, 4 and 5 comprises the hollow bolt shell, 13, the bolt sleeve, 14, the cocking piece 15, the firing-pin, 16, the firing-pin spring, 17, the firing-pin sleeve 18, and the extractor spring, 19. The bolt sleeve, 14, is threaded into the bolt, 13, by means of the square thread, 20, in substantially the same manner as the Springfield Army rifle. Likewise, the cocking piece, the firing-pin, the firing-pin sleeve and the firing-pin spring may be substantially the same as those parts in the Springfield Army rifle and may be assembled in substantially the same manner, all of which is well known in the art. The

forward end of the bolt, 8, is provided with several interrupted, male threads, 21, which are adapted to coact with the female threads, 12, in the receiver to lock the bolt in its closed position. The thread, 22, at the extreme end of the bolt is somewhat longer than the other threads and is designed to coact with a groove, 23, in the lower part of the receiver to prevent the bolt, 8, after it has been unlocked, from turning as it is retracted. The bolt, 13, is provided at a point intermediate the ends thereof with a helical cam slot, 24, which extends about one-quarter way around the bolt, 13. The rear end of the bolt, 13, at the bottom thereof is provided with the cocking cam slot, 25, which is best shown in Fig. 3. The lower part of the bolt sleeve is cut away to provide a passage for the cocking cam, 26, which is an integral part of the cocking piece, 15.

The finger lever, 27, is pivoted at, 28, to a vertically sliding piece, 29, which is adapted to reciprocate vertically between the members, 30. These members are integral with and depend below the lower tang, 31, in front of the trigger, 32. Integral with and offset from the finger lever, 27, is the bolt operating crank, 33. Pivoted to the upper end of this crank, by means of pin, 34, is block, 11, which is concaved as shown at, 35, to fit the outer surface of the bolt, 13. The pin, 34, extends through the crank, 33, and the block, 11, and projects into the cam slot, 24, with which it coacts to unlock and retract the bolt. The outer end of the pin, 34, is provided with a knurled head by means of which it may be withdrawn. The pin, 34, is retained in position in the assembly by means of the spring, ball catch, 36, shown in Fig. 6, which coacts with a circumferential groove, 37, in pin, 34.

The trigger, 32, is pivoted as at, 38, to the sear, 39, which in turn, is pivoted to the frame, as at, 40, (see Fig. 1). The rear part of the sear, 39, is slotted as shown in Fig. 8 to permit the trigger to be mounted therein. The forward part of the sear, 39, is recessed to receive the sear spring, 44, which is compressed between the bottom of this recess and ejector, 41. The ejector, 41, is adapted to move vertically in a recess, 42, which is provided in the frame. The base of the ejector fits the recess, 42, in the frame and the upper part, 43, of the ejector projects through a narrow slot in the frame and normally rides upon the lower part of the bolt. The interrupted threads upon the left side of the bolt assembly, as shown at the bottom of Fig. 4 are slotted as shown at, 44, (Fig. 4) to permit the ejector to pass therethrough. The bolt shell, 13, within the limits of the interrupted threads is also slotted as shown at 45, (Fig. 4) so that the part, 43, of the ejector may snap up when the bolt is fully retracted to strike the rear end of the empty shell and knock it up as shown in Fig. 7.

The magazine, 46, may be substantially similar to the magazine in the Springfield Army rifle and have a magazine spring, 47, and a follower, 48, substantially identical with these parts in the Springfield rifle. To facilitate the passage of the cartridges from the mechanism into the chamber of the barrel the forepart of the receiver and the rear part of the barrel are chamfered as shown at, 49 and 50, respectively. The rear end of the magazine is also chamfered as shown at, 51, to facilitate the insertion of the cartridges in the gun.

To lock the mechanism when the gun is cocked and the bolt is closed, I provide a safety device upon the rear part of the receiver as shown in Figs. 2, 7, 8 and 9. Referring to these figures, my safety device comprises a lever, 52, which is pivoted in the receiver by means of pin, 53. To the rear end of the lever, 52, is pivoted, by pin, 54, a catch, 55, which is adapted to engage notch, 56, (see Fig. 3) provided in the curved side of the cocking cam slot. This locking mechanism is held in positive engagement with the slot, 56, by means of the V spring, 57, (see Fig. 2). To facilitate the removal and insertion of the bolt, 8, the catch, 55, is beveled, as at, 97, where it projects into slot, 23.

For the purpose of locking the trigger mechanism when the gun is cocked I provide the sliding safety, 58, which is operated by a button, 59, projecting through the rear part of the upper tang. The forward end of the safety, 58, is beveled and adapted to engage the notch, 60, in the sear when the gun is cocked. To prevent this safety device from being moved except at the will of the operator, I provide the flat spring, 61, having a projection, 62, on the forward end thereof which is adapted to engage notches, 63 and 64, provided in the lower part of the safety, 58.

The other details of my device will be understood as the operation thereof is explained as follows: Assuming the gun to be loaded and cocked, in which condition the parts will be in the relative position shown in Figs. 1, 3, 5, 8 and 9, the point of the sear will then be in engagement with the edge of the member, 65, attached to the cocking piece (see Fig. 1). As the trigger is pulled it will turn about the pin, 38, and the curved surface, 66, on the upper part of the trigger will rotate against the lower surface, 67, of the frame as shown in Fig. 1. The curved portion, 66, of the upper part of the trigger is concentric with the pin, 38, so that for a short distance the movement of the trigger does not effect a movement of the sear. As the trigger is drawn back, the

portion, 68, is brought into contact with the surface, 67, and acting as a cam, will depress the sear and release it from its engagement with the member, 65, which will release the firing-pin spring and explode the shell in the chamber of the gun. To reload the gun the finger lever, 27, is drawn down as shown in Fig. 7. When this is done the parts coact as follows: The base of the shell which is in the chamber of the rifle rests against the forward end surface, 69, (see Figs. 5 and 6) of the bolt. A rim, 70, extends partially around the end of the bolt as shown in Fig. 4 and the interior edge of this rim is adapted to fit the circumference of the rear of the shell. The notch, 71, about the base of the shell is engaged by the beveled edge, 72, of the extractor spring, 19, and by the edge, 73, of the extension on the extreme locking thread, 21, on the right side of the bolt which acts as an extractor. When the bolt is in locked position the end view thereof shown in Fig. 4 is rotated 90 degrees from the position as shown so that the extractor spring, 19, is upon the bottom of the bolt. As the finger lever is depressed the pin, 34, coacts with the cam slot, 24, to turn the bolt 90 degrees in a counter-clockwise direction looking from the rear of the gun. During this turning movement the bolt moves rearwardly, the pitch of the interrupted thread segments thereby exerted a relatively great pull upon the exploded shell in the chamber. However, when the bolt has been rotated 90 degrees the locking threads are disengaged, and the bolt is in the position shown in Fig. 4 so that the narrow thread segments, 21, are in registration with slot, 74, and the wide thread segment, 22, is in registration with slot 23, (see Figs. 8 and 9). The slot, 74, extends longitudinally of the receiver so that as the finger lever is further depressed the bolt, 8, is retracted and is prevented from turning by the engagement of the thread segment, 22, with the sides of the slot, 23. The slot, 74, extends through the bridge, 9, to permit the passage of the threads, 21. It will be obvious that when the gun has been fired, the member, 65, (see Fig. 3) will be within the cam slot, 25. In this position the sides of the member, 65, are in engagement with the sides of the slot, 76, which is provided in the frame, and the bolt sleeve, 14, and the member, 65, are therefore prevented from rotating as the bolt shell, 13, is turned. This effects the cocking of the piece in substantially the same manner that a Springfield rifle is cocked by the coaction of the slot, 25, with the end of the member, 65. The bolt sleeve, 14, and the bolt shell, 13, can turn relative to each other by means of threads, 20. In turning the bolt shell 90 degrees, the member 65, is carried entirely out of and beyond the open end of the cam slot so that the firing spring is held in a compressed condition by the contact between the end of the member, 65, and the end of the bolt shell, 13. The relative position of these parts will then be as shown in Fig. 11. As the bolt is retracted the empty shell is withdrawn from the chamber by means of the engagement of the notch therein with the extractor lip, 73. When the bolt is completely retracted the ejector, 41, snaps up into the slot, 45, strikes the rear end of the shell near the bottom thereof, tips it up, and ejects it as shown in Fig. 7. To facilitate the ejection of the shell, the spring, 19, is made very light, and its edge, which engages the shell is beveled as shown at, 72. The principal function of this spring is to prevent the base of the shell from dropping as it is being withdrawn from the chamber. The loaded cartridges are pressed up slightly by the follower spring, 47, so that the rear end of the top cartridge is struck and carried forward and upward into the chamber by the front end of the bolt. As the bolt is carried forward the ejector is depressed and the sear spring is compressed to force the rear end of the sear up to a position where it will engage the projection, 98, on member, 65. When the bolt is completely in, the further closing of the lever will turn it 90 degrees in a clockwise direction and effect a locking of the mechanism by means of the engagement of the female and male threads, 12 and 21, respectively. When this turning operation is completed and the bolt is tightly locked, the notch, 56, in the cocking cam slot will be in registration with the catch, 55, which will be forced therein by the spring, 57, as shown in Fig. 8. Should it be desired to unload the gun without firing it, the action may be unlocked by pressing upon the forward end of the lever, 52, which will withdraw the catch, 55, from its engagement with the notch, 56, in the cocking cam slot, and thus permit the bolt to turn. When the gun is fired, the member, 65, moving into the cocking cam slot, 25, will automatically drive the catch, 55, out of engagement with the notch, 56, thus permitting the bolt to be turned by the finger lever, 27.

Referring to Fig. 7 it will be observed that the pin, 34, which coacts with the cam slot, 24, moves in a straight line. The straight line movement is obtained by providing the reciprocating pivotal mounting, 29, for the finger lever, 27. In designing this movement the member, 29, should reach the limit of its upward vertical movement when the action is open to provide a stop therefor. When the pin, 34, has reached an intermediate point in its movement, the pivotal mounting and the finger lever are in the position shown by, 28′ and 27′, respectively.

While I have illustrated a finger lever for operating my bolt action rifle, it will be

clear that a fore end or pump action may be conveniently used for moving the pin, 34, and thus turning and opening the bolt.

It is to be understood that many changes and modifications may be made in the details of my mechanism without departing from the true spirit of the invention herein described and illustrated. I therefore do not wish to limit myself to the precise details as herein set forth, and it is to be expressly understood that the words which I have used in describing my invention are words of description and not of limitation.

What I claim is—

1. A firearm comprising a receiver, a retractable bolt, lugs on said bolt rotatably engaging with recesses provided in the receiver to prevent direct retraction of the bolt, a finger lever provided with means engaging a helical slot in said bolt for turning and retracting said bolt, a pivotal bearing for said lever reciprocatingly mounted on said receiver, means on said bolt coacting with a recess in said receiver to prevent rotation of said bolt as it is being retracted after disengagement of said lugs, a cocking piece in said bolt provided with a cam rotatably coacting with a cam slot provided in the bolt shell, a sear adapted to engage said cocking piece, an ejector, a spring coacting with said sear and ejector to operate both, and a releasable safety catch mounted in said receiver and coacting with a recess in said bolt to prevent rotation thereof when the mechanism is in firing position; said catch being automatically released by the firing of the gun.

2. A firearm comprising a receiver, a retractable bolt, means rotatably coacting between said bolt and receiver to prevent direct retraction thereof when the mechanism is closed, a finger lever coacting with said bolt to turn and retract the same, said lever being reciprocatingly and pivotally mounted on said receiver to provide a straight line action on said bolt, a cocking piece in said bolt coacting with the shell thereof to cock the gun, a sear, an ejector, a spring coacting with said sear and ejector to operate both, and releasable means locking said bolt when in firing position.

3. A firearm comprising a receiver, a retractable bolt, means rotatably coacting between said bolt and receiver to prevent direct retraction thereof, a finger lever coacting with means engaging a cam provided on said bolt for turning and retracting the same, a pivotal bearing for said lever reciprocatingly mounted on said receiver, and means for locking said bolt in closed position; said means being released by the firing of the gun.

4. In a firearm, the combination with a sear and an ejector, of a common spring for operating both.

5. In a bolt action firearm, the combination with a rotatable bolt having a cocking cam slot therein, of a safety catch for locking said bolt in closed position; said safety catch projecting into said slot and coacting with the cocking piece to effect an automatic release thereof when said gun is fired.

6. A firearm comprising a receiver, a bolt, means rotatably coacting between said bolt and receiver to lock the mechanism in closed position, a finger lever provided with means coacting with a slot in said bolt, a pivotal bearing for said lever, a reciprocating mounting for said bearing whereby the point of coaction between said lever and said bolt moves in a straight line, and means in said receiver coacting with said bolt to lock the same in closed position and to automatically release the bolt when the gun is fired.

7. In a firearm, a breech bolt provided with a cam slot therein, and a finger lever coacting with said cam slot to effect both a rotation and retraction of said bolt.

8. In a firearm, the combination with a rotatable bolt of a finger lever coacting therewith to effect the opening and closing of the breech mechanism and means, automatically released by the firing of the gun for locking said mechanism in closed position.

9. A firearm comprising a rotatable and retractable bolt, a slidably mounted finger lever for operating said bolt, a cocking piece associated with said bolt, a sear adapted to engage said cocking piece, an ejector, and a spring coacting between said sear and ejector to effect the operation of both.

10. In a firearm, the combination with a rotatable and retractable bolt of a finger lever effecting by direct coaction with said bolt both a rotation and retraction thereof; said lever being both pivotally and slidably mounted to coact in a straight line with said bolt.

11. A firearm comprising a bolt, a finger lever, means on said lever coacting with a slot provided in said bolt, a pivotal bearing for said lever, and a slidable mounting for said bearing whereby said lever and bolt coact in a straight line.

12. A firearm comprising a receiver, a bolt, threads on said bolt rotatably coacting with threads provided in said receiver for securing the bolt in closed position, a finger lever, and means on said lever coacting with a cam slot provided in said bolt to effect a disengagement of said threads.

13. A firearm comprising a receiver, a bolt therein, means on said bolt rotatably cooperating with means provided in said receiver to effect a positive locking of the same, a finger lever, and a slidable pivotal bearing for said lever whereby said lever and bolt coact in a straight line.

14. In a lever action firearm, the combina-

tion with a rotatable and retractable bolt of a pivotally mounted finger lever coacting in a straight line with said bolt, and directly effecting by such coaction both a rotation and retraction thereof.

15. A firearm comprising a bolt, a finger lever for rotating and retracting said bolt, a pivotal bearing for said lever, a slidable mounting for said bearing, a cocking piece in said bolt, a sear adapted to engage said cocking piece, an ejector, and a spring compressed between said sear and said ejector for operating both.

16. In a bolt action firearm, a finger lever having a slidably mounted pivotal bearing for effecting the opening and closing of the breech mechanism.

17. In a lever action firearm having a rotatable and retractable bolt, a finger lever provided with means slidably coacting therewith to rotate and retract said bolt, and a safety catch automatically engaging said bolt in a closed position to lock said mechanism.

18. A firearm comprising a rotatable and retractable bolt, a reciprocatingly mounted finger lever for effecting a rotation and retraction of said bolt, and a safety catch automatically coacting with said bolt to lock the mechanism in closed position.

19. A firearm comprising a rotatable and retractable bolt, a cocking piece, a finger lever for rotating and retracting said bolt, a pivotal bearing for said lever and a safety catch automatically coacting with said bolt to lock said mechanism in closed position, and automatically coacting with said cocking piece to unlock said mechanism when the gun is fired.

20. A firearm comprising a rotatable and retractable bolt, a finger lever coacting therewith to effect a rotation and retraction thereof, a pivotal bearing for said lever, a reciprocating mounting for said bearing, a cocking piece in said bolt, a sear adapted to engage said cocking piece, an ejector, a spring coacting with said sear and ejector to effect an operation of both, and a safety catch, for locking said mechanism in firing position; said safety automatically coacting with the cocking piece to release said mechanism when the gun is fired.

21. In a firearm, the combination with a rotatable bolt of a finger lever coacting therewith to effect the opening and closing of the breech mechanism and manually releasable means automatically released by the firing of the gun for locking said mechanism in closed position.

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