Nov. 17, 1953 I. MURRAY 2,659,276

FIREARM COCKING MECHANISM

Filed Sept. 27, 1946

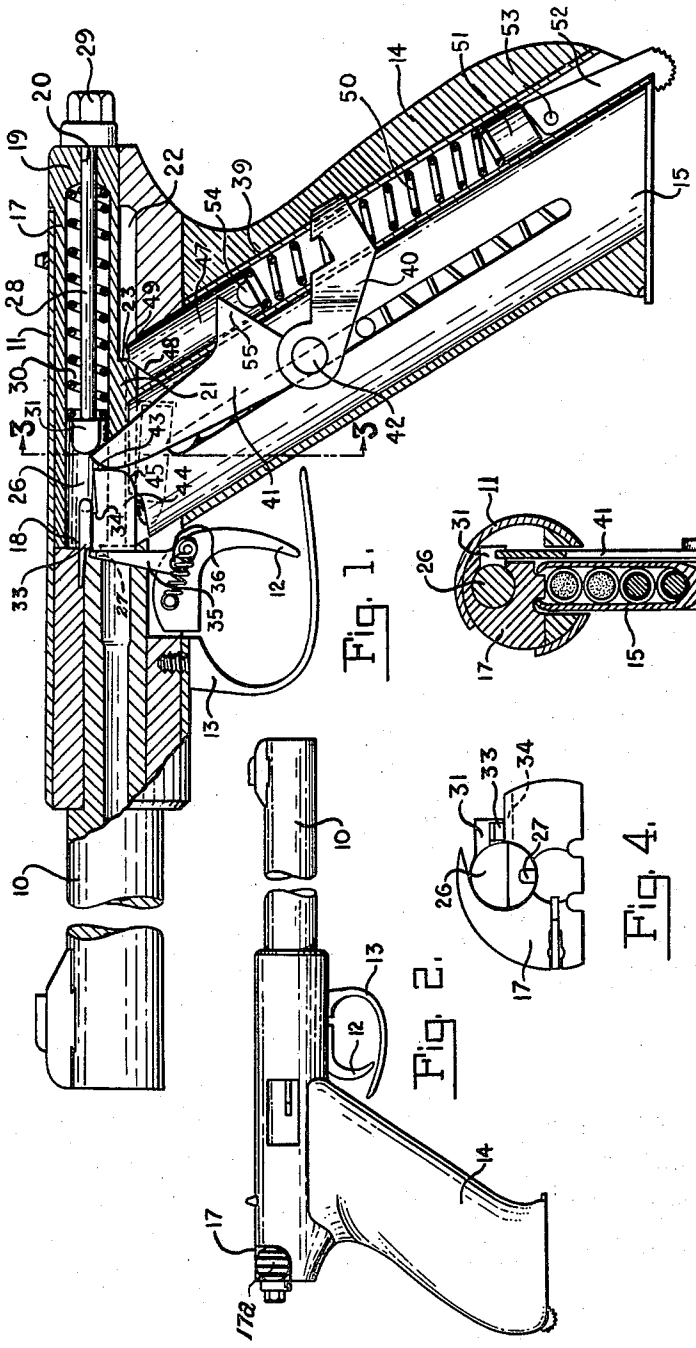


Fig. 1.

Fig. 3.

Fig. 4.

Fig. 2.

INVENTOR.
Ian Murray
BY Fetherstonhaugh & Co
ATTORNEYS.

Patented Nov. 17, 1953

2,659,276

UNITED STATES PATENT OFFICE

2,659,276

FIREARM COCKING MECHANISM

Ian Murray, Vancouver, British Columbia, Canada

Application September 27, 1946, Serial No. 699,810

6 Claims. (Cl. 89—195)

1

This invention relates to improvements in firearms of an automatic or semi-automatic nature.

An object of this invention is the provision of means for cocking high speed, powerful strikers in low powered automatic or semi-automatic firearms.

A further object is to increase the accuracy of all types of firearms.

The use of high speed firing pins in firearms is becoming more and more important and today every effort is being made to increase the speed of these firing pins in all types of firearms, including the low priced field. The importance of this is indicated by the fact that the amount of "human error" is directly proportional to the firing pin speed. High speed firing pins have been used successfully in single-shot guns and manually operated repeaters, but they have not been used in popular automatic arms and especially in target pistols where its benefits are very noticeable.

In an automatic or semi-automatic firearm incorporating the present invention, very strong striker and recoil springs may be used even if it is a low powered weapon. A cocking lever is mounted in such a manner that considerable leverage is used for cocking the striker and compressing the recoil spring.

This invention is more or less diagrammatically illustrated in the accompanying drawings, in which

Figure 1 is a longitudinal section through a firearm incorporating this invention,

Figure 2 is a side elevation of this firearm,

Figure 3 is a section taken on the line 3—3 of Figure 1, and

Figure 4 is an enlarged end elevation of the bolt.

Referring more particularly to the drawings, the firearm shown is a semi-automatic pistol having a barrel 10, bolt housing 11, trigger 12, trigger guard 13, butt 14, and a cartridge magazine 15 removably positioned in the latter. The safety, extractor, and ejector have been omitted for the sake of clarity, as these are all of conventional construction and operation.

A substantially semi-cylindrical hollow bolt 17 having a flat bottom is slidable longitudinally of the housing 11 and is open at its inner end 18 which normally rests against the inner end of the barrel, while its outer end 19 is closed and has a passage 20 extending therethrough. The bolt has cocking grips 17a, see Figure 2, at its outer end. This bolt has a projection 21 on its lower surface which rides in a slot 22 in the bottom of the housing, said projection being

2

adapted to engage the outer end of the slot to limit the rearward movement of the bolt. The projection 21 is formed with a beveled shoulder 23 at the rearward end thereof.

A striker 26 is slidably mounted in the bolt 17 and has a striker pin 27 on its forward end adapted to strike the rim of a cartridge resting in the bore of the barrel to fire it in the usual manner. A rod 28 extends rearwardly from the striker through the passage 20 and has an adjusting nut 29 on the outer end thereof. A strong coil spring 30 surrounds this rod and lies between the striker and the end 19 of the bolt housing, said spring normally urging the striker towards and against the inner end of the barrel. A lug 31 projects laterally from the striker adjacent its rearward end.

A sear 33 is pivotally mounted at one end on the side of the striker 26 and spring means, not shown, urge the outer end of the sear downwardly. When the striker is moved rearwardly in relation to the bolt 17, the sear engages a shoulder 34 formed on said bolt to retain the striker in this position. At this time, the free end of the sear lies above a disconnector 35 which extends upwardly from the trigger 12, to which it is pivotally connected at 36. When the trigger is squeezed, the disconnector moves upwardly to raise the sear and disengage it from the shoulder 34, and then the spring 30 urges the striker forward to fire the cartridge.

A spring housing 39 is mounted in and extends the full length of the butt 14 behind the magazine 15, and a support 40 extends forwardly from said housing beside the magazine. A relatively long cocking lever 41 is pivotally mounted at 42 on the support 40 and extends upwardly beside the bolt and engages the lug 31 of the striker. This lever diverges from the upper towards the lower end thereof and it has a rounded surface 43 near its free end which bears against a shoulder 44 formed on the side of the bolt which also has a rounded surface 45 at its lowermost corner.

A retarding pin 47 rides in the upper end of the housing 39 and has a bevelled shoulder 48 adapted to cooperate with the bevelled projection 23 of the bolt. This pin has a flat upper surface 49, and it rests on a strong recoil spring 50 in the housing 39 which may be anchored at its lower end or it may rest on a bearing piece 51 which presses against the upper corner of a latch 52 pivoted at 53 for removably retaining the magazine 15 in its place in the butt. The retarding pin has a lug 54 on one side normally spaced from a lever arm 55 extending rearwardly from the cocking lever adjacent its pivot.

The gun is initially cocked manually by grasping the cocking grips 17a and retracting the bolt. This actuates the cocking and loading mechanism as hereinafter described relative to the semi-automatic cycle of operation. The striker 26 remains in the cocked position since the sear 33 now engages the shoulder 34 on the bolt.

When the trigger is squeezed, the disconnector 35 lifts the sear from the shoulder 34, and the spring 30 drives the striker forwardly. The striker pin fires the cartridge in the barrel, and the force of the explosion forces the cartridge case back against the bolt 17, thus moving it rearwardly. The bevelled shoulder 23 bearing against the bevelled shoulder 48 of the retarding pin 47 presses the latter downwardly. At the same time, the shoulder 44 of the bolt moves the cocking lever 41 rearwardly around its pivot 42. By the time the retarding pin has completely disengaged the shoulder 23, the lever arm 55 presses against the lug 54 to compress the recoil spring 50. The length of the arm 55 provides considerable leverage for this purpose. While the cocking lever is pivoting back with the bolt, the upper end of said lever moves the lug 31 and the striker rearwardly in relation to the bolt against the tension of the spring 30. By the time the bolt has reached its outermost position (when the projection 21 strikes the end of the slot 22) the cartridge case has been ejected in the usual manner through an opening in the bolt housing 11. At this time, the springs 30 and 50 recessed themselves. The recoil spring causes the bolt to move forward until it engages the gun barrel and the pin 47 retains it in place, while the striker spring moves the striker forward only until the sear 33 engages the shoulder 34. As the bolt moves, it strips a cartridge in the well-known manner from the magazine 15 and presses it into the barrel. The pin 47 wedges and retains the bolt in this position. Since the trigger is still squeezed, the disconnector 35 is in its upward position and is pressed forward by the end of the sear. The trigger must then be released to permit the disconnector to drop to its normal position beneath the sear ready for the next shot. The pistol is now cocked and ready for firing. This disconnecting action prevents the gun from acting in a fully automatic manner.

The leverage afforded by the cocking lever 41 permits very strong recoil and striker springs to be used. Actually this lever functions in two completely different ways. First, its pivot 42 retains the lower end thereof from moving rearwardly while pressure is applied to its rounded surface 43 by the shoulder 44. The latter actually acts as a fulcrum point and this pressure is greatly magnified at the upper end of the lever, said magnified pressure being utilized to compress the strong striker spring. Secondly, the pivot 42 acts as a fulcrum about which the lever and its arm 55 pivot so that the pressure applied to the upper end of the lever is greatly magnified at the outer end of the lever arm. This magnified pressure compresses the strong recoil spring. This provides for a very rapid movement of the bolt and the striker. Furthermore, as the cocking lever diverges from its upper or free end, a wider portion of it separates the shoulder 44 and lug 31 at the outer position of the bolt than when the latter is in its inner position. Thus, the striker moves rearwardly during the bolt action farther than it would otherwise do, so that a shorter cocking lever may be used to obtain a certain degree of striker movement. It will be seen that the striker has a very short distance to travel before firing the cartridge and as the striker spring is quite powerful, the time for this movement is very small, thus reducing the time for the "human error" to creep in.

What I claim as my invention is:

1. A firearm including a movable bolt, a shoulder on the side of the bolt, a bevelled projection on the bolt, a striker slidably mounted in the bolt, a lug projecting laterally from the striker near the bolt shoulder, a retarding pin having a bevelled shoulder extending towards the bolt, a projection extending from the pin, a recoil spring normally urging the pin shoulder into engagement with the bevelled bolt projection, said pin retaining the bolt in the normal position thereof and being depressed by the bolt projection on the rearward movement of said bolt, a cocking lever pivoted at its lower end and having its upper end extending between the bolt shoulder and the striker lug, said lever slidably engaging the bolt shoulder adjacent the upper end of the lever and the lug at said upper end, and an arm projecting outwardly from the lever adjacent the pivot thereof and normally spaced from the retarding pin projection, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the striker rearwardly relative to the bolt and to move the lever arm to compress the recoil spring after the retarding pin has been depressed by the bolt, and said compressed spring returning the bolt to the forward position through the lever and the pin.

2. A firearm including a movable bolt, a bevelled projection formed on the bolt, a retarding pin lying at an angle to the bolt and having one end in line with the projection thereof, said pin having a bevelled shoulder engaging the projection bevel when the bolt is in its normal forward position, a recoil spring normally pressing the pin towards the bolt to retain the pin shoulder against the bolt projection removably to retain the bolt in its forward position, the projection and shoulder bevels causing the pin to be depressed against the spring pressure upon rearward movement of the bolt when a cartridge is fired, a cocking lever pivoted at its lower end and continuously and slidably engaging the bolt at the upper end of said lever, an arm projecting outwardly from the lever adjacent the pivot thereof, and means adapted to connect the lever arm to an end of the spring, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the lever arm to compress the recoil spring, and said compressed spring returning the bolt to the forward position through the lever.

3. A firearm including a movable bolt, a striker slidable in relation to said bolt, spring means normally urging the striker towards the forward end of the bolt, a bevelled projection formed on the bolt, a retarding pin lying at an angle to the bolt and having one end in line with the projection thereof, said pin having a bevelled shoulder engaging the projection bevel when the bolt is in its normal forward position, a recoil spring normally pressing the pin towards the bolt to retain the pin shoulder against the bolt projection removably to retain the bolt in its forward position, the projection and shoulder bevels causing the pin to be depressed against the spring pressure upon rearward movement of the bolt when a cartridge is fired, a cocking lever continuously and slidably engaging the bolt and the striker adapted to be moved by said bolt during rearward movement of the latter to cock the striker, and means adapted to connect the lever to an end of

the spring, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the striker rearwardly relative to the bolt and to compress the recoil spring, and said compressed spring returning the bolt to the forward position through the lever.

4. A firearm including a movable bolt, a striker slidable in relation to said bolt, spring means normally urging the striker towards the forward end of the bolt, sear means for removably retaining the striker in a rearward position relative to the bolt, a bevelled projection formed on the bolt, a retarding pin lying at an angle to the bolt and having one end in line with the projection thereof, said pin having a bevelled shoulder engaging the projection bevel when the bolt is in its normal forward position, a recoil spring normally pressing the pin towards the bolt to retain the pin shoulder against the bolt projection removably to retain the bolt in its forward position, the projection and shoulder bevels causing the pin to be depressed against the spring pressure upon rearward movement of the bolt when a cartridge is fired, a cocking lever pivoted at its lower end, said lever slidably engaging the bolt continuously adjacent the upper end of the lever and the striker at said upper end, said lever being moved by the bolt during rearward movement of the latter to cock the striker, an arm projecting outwardly from the lever adjacent the pivot thereof, and means adapted to connect the lever arm to an end of the spring, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the striker rearwardly relative to the bolt and to compress the recoil spring, and said compressed spring returning the bolt to the forward position through the lever.

5. A firearm including a movable bolt, a striker slidable in relation to said bolt, spring means normally urging the striker towards the forward end of the bolt, a bevelled projection formed on the bolt, a retarding pin lying at an angle to the bolt and having one end in line with the projection thereof, said pin having a bevelled shoulder engaging the projection bevel when the bolt is in its normal forward position, a recoil spring normally pressing the pin towards the bolt to retain the pin shoulder against the bolt projection removably to retain the bolt in its forward position, the projection and shoulder bevels causing the pin to be depressed against the spring pressure upon rearward movement of the bolt when a cartridge is fired, a projection extending outwardly from the retarding pin, a cocking lever pivoted at its lower end, said lever slidably engaging the bolt continuously adjacent the upper end of the lever and the striker at said upper end, said lever being moved by the bolt during rearward movement of the latter to cock the striker, and an arm projecting outwardly from the lever adjacent the pivot thereof and normally spaced from the pin projection, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the striker rearwardly relative to the bolt and to move the lever arm to compress the recoil spring after the retarding pin has been depressed by the bolt, and said compressed spring returning the bolt to the forward position through the lever and the pin.

6. A firearm including a movable bolt, a striker carried by and slidable in relation to said bolt, spring means normally urging the striker towards the forward end of the bolt, sear means for removably retaining the striker in a rearward position relative to the bolt, a recoil spring, a pivotally-mounted cocking lever with the pivot thereof at its lower end, said lever slidably engaging the bolt adjacent the upper end of the lever and the striker at said upper end, and a lever arm fixed to and projecting from the cocking lever adjacent the pivot thereof and engaging the recoil spring, said cocking lever being rotated about its pivot by rearward movement of the bolt to move the striker rearwardly relative to the bolt and to move the lever arm to compress the recoil spring, and said compressed spring returning the bolt to the forward position through the lever.

IAN MURRAY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
317,162	Maxim	May 5, 1885
571,260	Borchardt	Nov. 10, 1896
642,018	Ternstrom	Jan. 23, 1900
863,770	Whiting	Aug. 20, 1907
1,387,938	Pedersen	Aug. 16, 1921
1,391,498	Pedersen	Sept. 20, 1921
1,450,653	Swebilius	Apr. 3, 1923
2,351,976	Koucky	June 20, 1944

FOREIGN PATENTS

Number	Country	Date
603,705	France	Jan. 12, 1926