

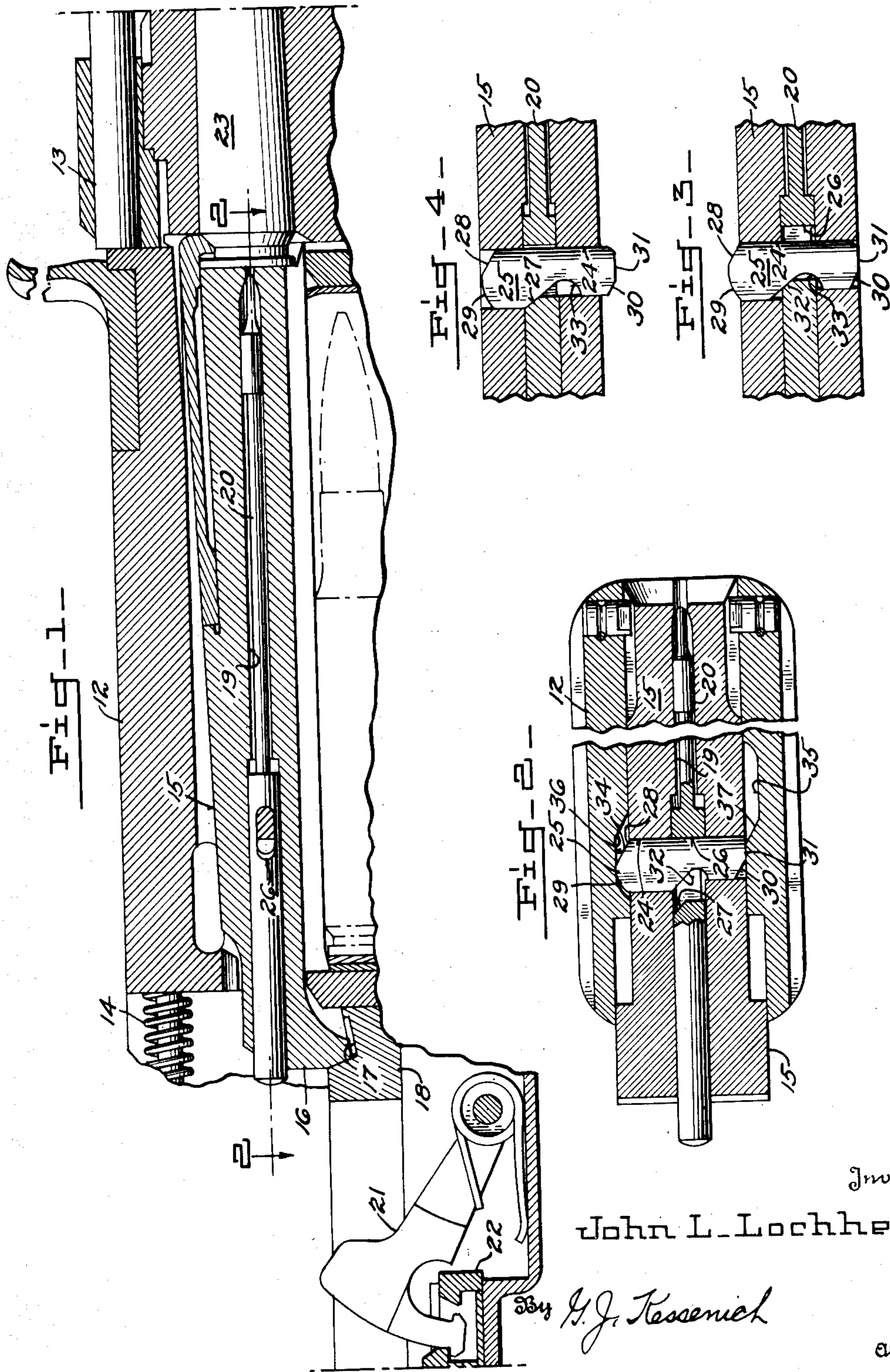
Jan. 27, 1953

J. L. LOCHHEAD

2,626,474

FIRING PIN RETRACTING MEANS FOR FIREARMS

Filed March 15, 1951



Inventor

John L. Lochhead

*G. J. Kessenich*

Attorney

## UNITED STATES PATENT OFFICE

2,626,474

## FIRING PIN RETRACTING MEANS FOR FIREARMS

John L. Lochhead, Springfield, Mass., assignor to  
the United States of America as represented  
by the Secretary of War

Application March 15, 1951, Serial No. 215,851

3 Claims. (Cl. 42—16)

(Granted under Title 35, U. S. Code (1952),  
sec. 266)

1

The invention described in the specification and claims may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to firing mechanism for firearms of the type wherein the firing pin is actuated by a hammer and relates more particularly to means for retracting the firing pin prior to initiating another cycle of firearm operation.

In firearms of the type herewith concerned, a coil spring is commonly employed to bias the firing pin rearwardly to a retracted position. Obviously, such spring necessarily resists the forward movement of the firing pin and is therefore customarily designed to provide no greater bias than that normally required to move the relatively small mass of the pin. Thus, it is quite likely that in the event dirt or other foreign material should accumulate in the path of firing pin travel, the bias of the retracting spring may not be strong enough to move the pin past such obstruction.

Various attempts, therefore, have been made in the art to provide suitable mechanical means for the retraction of firing pins. However, such prior art devices have heretofore required relatively complicated mechanism for preventing subsequent interference with the firing movement of the pins.

Accordingly, it is an object of this invention to provide improved means in a firearm for retracting a firing pin from its fired position.

It is a further object of this invention to provide mechanical firing pin retracting means for a firearm wherein such means serves to positively block accidental firing movement of the pin until the bolt of the firearm reaches a fully locked battery position.

It is a specific object of this invention to provide a simple and positive cam means for retracting a firing pin from its fired position in a firearm wherein such cam means will not interfere with the subsequent firing movement of the pin.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from the following description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 is a fragmentary longitudinal cross-sectional view of a firearm showing a firing mechanism wherein the present invention is employed;

Fig. 2 is a cross-sectional view taken along the lines 2—2 in Fig. 1 showing the firing pin re-

2

tractor in position to permit the firing movement of the firing pin;

Fig. 3 is a fragmentary view of Fig. 2 but showing the firing pin in the fired position; and

Fig. 4 is a view similar to Fig. 3 but showing the firing pin locked in the retracted position by the retractor of the present invention.

There is illustrated in Fig. 1 one example of a typical firearm wherein the firing pin retracting means of the present invention is employed. Such firearm includes a reciprocable slide 12 arranged to be actuated in recoil by a gas-operated piston 13 and in counter-recoil by a driving spring 14. Slide 12 in turn reciprocates a bolt 15 between a battery and a recoiled position. Bolt 15 is locked in battery position by an extension 16 on the rear end thereof which engages in a recess 17 formed into the receiver 18 of the firearm. A firing pin tunnel 19 extends longitudinally through bolt 15 and a firing pin 20 is slidably mounted therein for reciprocable sliding movement between a fired and a retracted position. A spring-biased pivotal hammer 21 is retained in a cocked position by a sear 22 and upon release therefrom is arranged to strike the rear end of firing pin 20 and discharge a chambered cartridge 23 in a manner conventional to the art.

Bolt 15 is provided with a transverse slot 24 in which a firing pin retractor 25 is slidably mounted. Bolt slot 24 intersects firing pin tunnel 19. An elongated slot 26 extends transversely through firing pin 20 and is arranged to permit free passage of retractor 25 therethrough. The rear wall of slot 26 is cut away at one end to provide an angular cam surface 27 inclined relative to the path of movement of retractor 25 for a purpose to be later explained. One end of retractor 25 is provided with a forwardly facing angular cam surface 28 blending into an arcuate surface 29. The opposite end of retractor 25 is provided with a rearwardly facing angular cam surface 30 terminating in a substantially flat surface as best indicated at 31 in Fig. 4. The rear side of retractor 25 is centrally notched to form an inclined cam surface 32 terminating in an arcuate clearance cut 33. The length of retractor 25 is such that when one end thereof is flush with the sidewall of bolt 15, the opposite end projects therefrom as best shown in Figs. 3 and 4. It will also be noted that the width of retractor 25 is appreciably greater across one end portion than across the other and that bolt slot 24 is arranged to conform to the two different widths. As a result, retractor 25 can be inserted

into bolt 15 from one side only thereby preventing any errors in assembly.

Slide 12 is substantially U-shaped in cross-section and is arranged to be slidably mounted on bolt 15. The sides of slide 12 extend downwardly and as best shown in Fig. 2 straddle the sidewalls of bolt 15. The interior walls of the downwardly projecting sides of slide 12 are provided with a pair of cam grooves 34 and 35 arranged in opposite but staggered relationship. Grooves 34 and 35 are vertically located in slide 12 so as to coincide with bolt slot 24. The forward wall of groove 34 is provided with an angular cam surface 36 arranged to mate with the similar surface 28 on retractor 25. Similarly, the rearward wall of groove 35 is provided with an angular cam surface 37 arranged to mate with cam surface 30 on retractor 25.

When bolt 15 is in the locked battery position illustrated in Fig. 1, retractor 25 projects out of slot 24 into cam groove 34. Firing pin 20 is in its retracted position. Upon release by sear 22, hammer 21 is actuated to strike the rear end of firing pin 20 and drive such pin forwardly to the position shown in Fig. 3 thereby effecting discharge of cartridge 23. The resulting recoil gases drive piston 13 rearwardly against the front end of slide 12 and thereby impart recoil movement thereto.

As slide 12 recoils, cam surface 36 in groove 34 contacts cam surface 28 and thereby cams retractor 25 transversely in bolt 15 so that the flat end 31 thereof projects into cam groove 35 which has by then moved into position to uncover the smaller end of bolt slot 24. During this transverse movement of retractor 25, cam surface 32 thereon contacts cam surface 27 in firing pin slot 26 and moves the firing pin 20 rearwardly to the retracted position shown in Fig. 4. During this movement of slide 12, bolt 15 is unlocked by appropriate means (not shown) and is driven rearwardly by slide 12 to pivot hammer 21 into engagement with sear 22.

During the return movement of bolt 15 and slide 12 which counter-recoil as a unit, bolt 15 is cammed into locked battery position whereupon slide 12 continues to move forwardly. Cam surface 37 of groove 35 then contacts the mating surface 30 on the projecting flat end 31 of retractor 25. Thus retractor 25 is moved transversely so that the larger end thereof projects into cam groove 34. In this position, cam surface 32 is moved out of the path of travel of firing pin 20. Upon subsequent release of hammer 21, another cycle of operation takes place in the manner previously described.

Thus there is here provided a simple and reliable device for retracting a firing pin from its fired position. Such device is arranged to be directly actuated by a reciprocable slide and thereby eliminates the relatively complicated linkages and separate camming mechanisms of the prior art. Furthermore, the retracting device serves to positively block any accidental forward movement of the firing pin since the actuating slide does not move relative to the bolt until positive locking thereof in battery has been accomplished. The continued movement of the slide then cams the retracting device out of the path of firing pin travel thereby placing the firearm in readiness to initiate another cycle of operation. The elimination of the conventional spring as the moving power for a firing pin assures uninterrupted operation of the firearm even

though dirt or other foreign matter should accumulate in the firing pin tunnel of the bolt.

I claim:

1. In a firearm having a slide reciprocable between a recoil and a counter-recoil position and means on the slide for actuating a bolt between a battery and a recoil position, the combination of, a firing pin slidably mounted in the bolt for longitudinal movement between a fired and a retracted position, said firing pin having an elongated transverse slot therethrough, a slidable firing pin retractor transversely mounted in the bolt so as to extend through said firing pin slot, first cam means in the slide for actuating said retractor in one direction during recoil and in the opposite direction during counter-recoil, and second cam means located on said retractor for moving said firing pin rearwardly to the retracted position during recoil of the slide.

2. In a firearm having a slide reciprocable between a recoil and a counter-recoil position and means on the slide for actuating a bolt between a battery and a recoil position, the combination of, a firing pin slidably mounted in the bolt for longitudinal movement between a fired and a retracted position, said firing pin having a transverse elongated slot therethrough, the bolt having a transverse slot therethrough coinciding with said firing pin slot, a retractor slidably mounted in said bolt slot and passing through said firing pin slot, an inclined cam surface located at one end of the rear wall of said firing pin slot, a similarly inclined cam surface on said retractor arranged to slidably mate with said cam surface in said firing pin, and cam means in the slide operative on one end of said retractor during recoil and on the opposite end thereof during counter-recoil whereby said retractor actuates said firing pin rearwardly to the retracted position in one direction of transverse movement and moves out of the path of travel of said firing pin in the opposite direction of movement.

3. In a firearm having a channel-shaped slide reciprocable between a recoil and a counter-recoil position and means on the slide for actuating a bolt between a locked battery and a recoil position, the combination of, a firing pin slidably mounted in the bolt for longitudinal movement between a fired and a retracted position, a firing pin retractor transversely slidable in the bolt, cam means on said retractor for actuating said firing pin rearwardly to the retracted position, the slide having a first cam groove located in the interior wall on one side thereof and a second cam groove located in the opposite side, said second cam groove being displaced forwardly of said first cam groove, and an inclined cam surface in each of said cam grooves operative on the respective end of said retractor whereby recoil movement of the slide actuates said retractor to cam said firing pin rearwardly and counter-recoil movement of the slide actuates said retractor to unblock the path of forward movement of said firing pin after the bolt is locked in battery position.

JOHN L. LOCHHEAD.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

Number	Name	Date
1,628,548	Loomis	May 10, 1927
2,480,017	Green	Aug. 23, 1949
2,539,644	Turner	Jan. 30, 1951