April 12, 1955 L. L. KRAMER 2,705,847

PISTOL, INCLUDING IMPROVED OPERATING MECHANISM

Filed Sept. 24, 1951 3 Sheets-Sheet 1

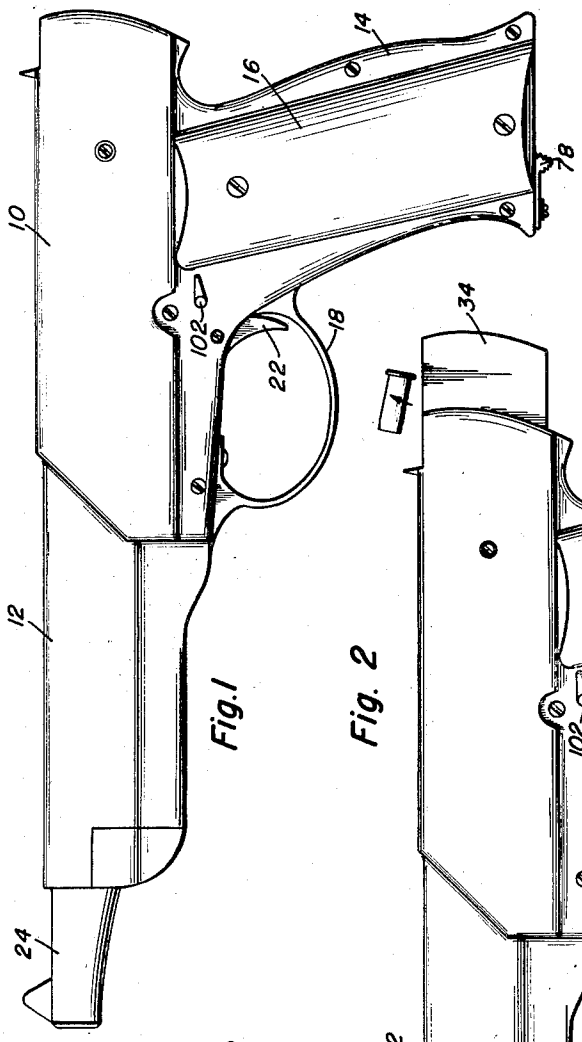


Fig. 1

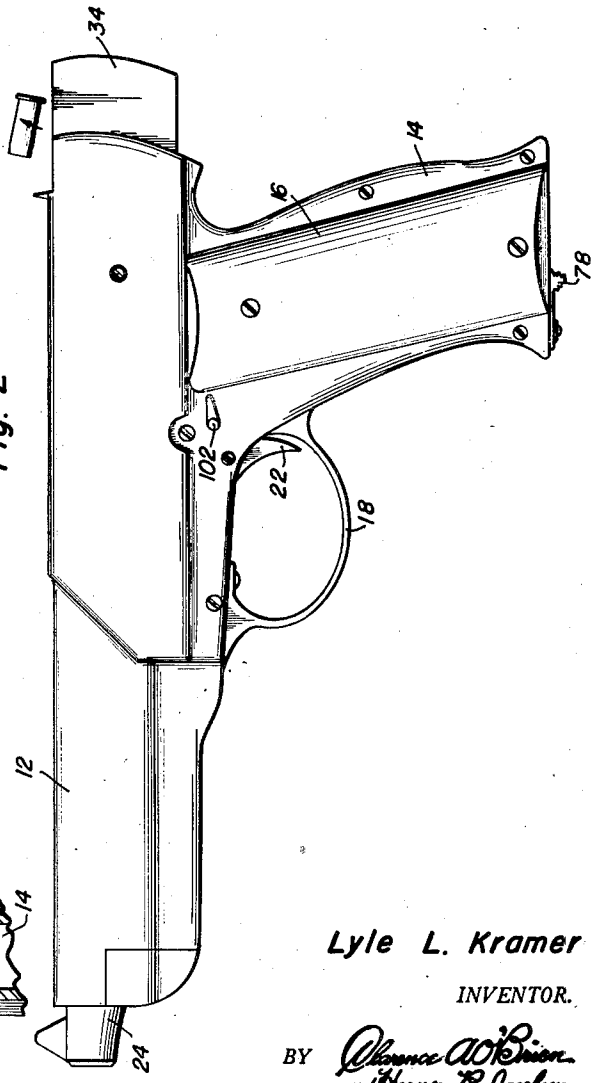


Fig. 2

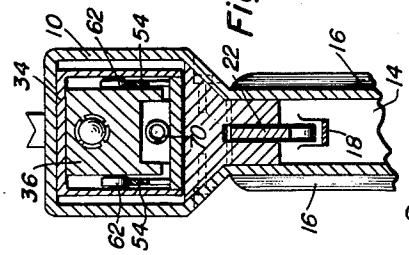


Fig. 8

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PISTOL, INCLUDING IMPROVED OPERATING MECHANISM

Filed Sept. 24, 1951 3 Sheets-Sheet 2

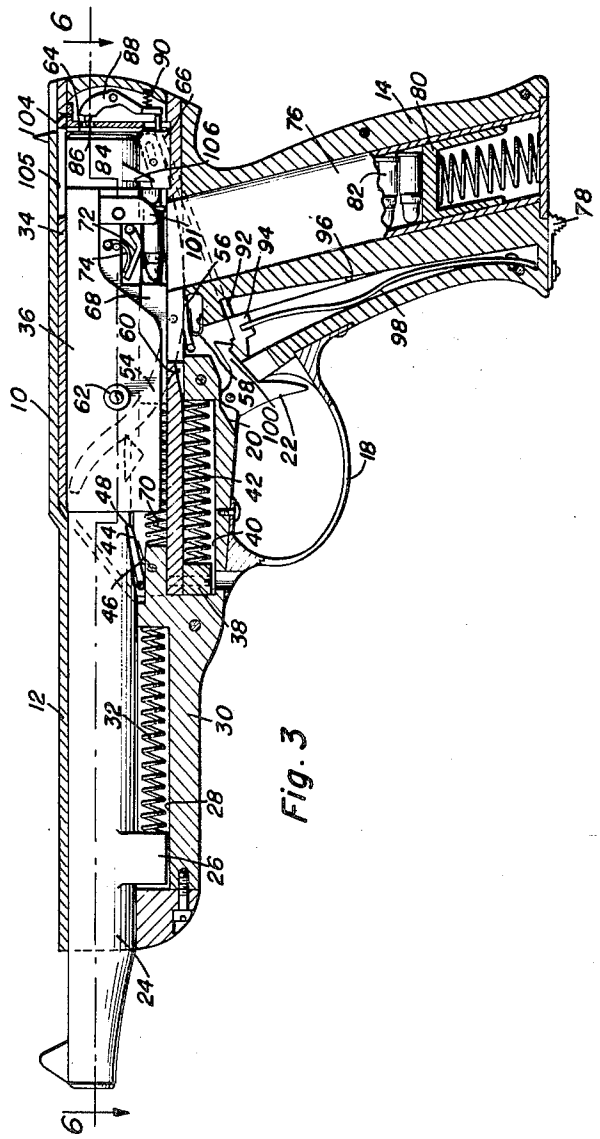


Fig. 3

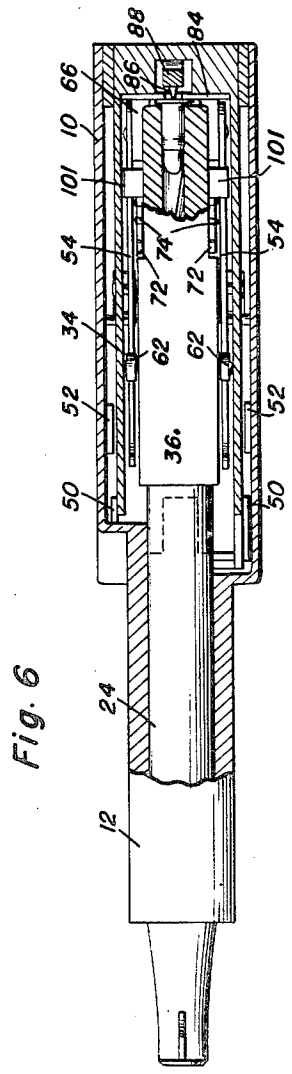


Fig. 6

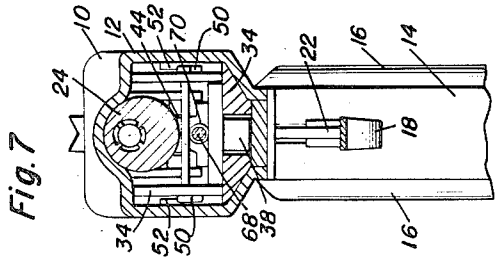


Fig. 7

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April 12, 1955 L. L. KRAMER 2,705,847

PISTOL, INCLUDING IMPROVED OPERATING MECHANISM

Filed Sept. 24, 1951 3 Sheets-Sheet 3

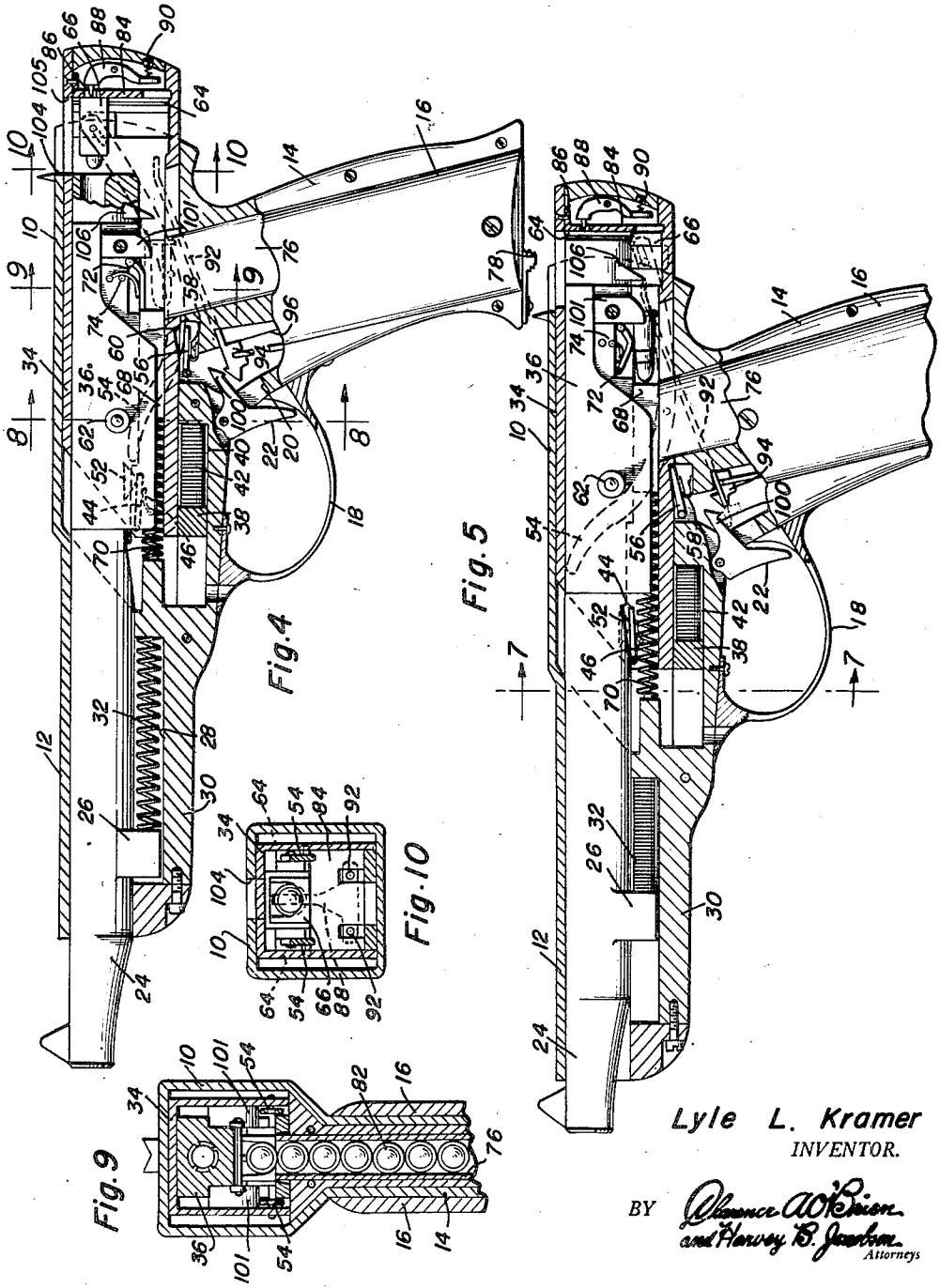


Fig. 4

Fig. 5

Fig. 10

Fig. 9

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2,705,847

PISTOL, INCLUDING IMPROVED OPERATING MECHANISM

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Application September 24, 1951, Serial No. 248,015

7 Claims. (Cl. 42—7)

This invention relates to new and useful improvements in firearms and the primary object of the present invention is to provide a pistol so constructed as to permit the use of a longer barrel, than heretofore was possible, without requiring a corresponding increase in the length of the pistol, and thereby obtaining better accuracy, more striking power and higher velocity.

Another important object of the present invention is to provide a pistol including a slidable barrel and slide that are releasably connected together to permit rearward movement of the slide and barrel as a unit and forward movement of the barrel in advance of the slide, the slide being released from a retracted position by the barrel as the latter moves forwardly, said barrel also actuating a means for feeding cartridges to a position for firing.

A further object of the present invention is to provide a pistol of the aforementioned character involving a means for releasing the means retaining the slide retracted, and which means will also eject the shell of a fired cartridge and move a new cartridge to a position for firing.

A still further aim of the present invention is to provide a pistol that is simple and practical in construction, strong and reliable in use, small and compact in structure, easily assembled or disassembled for repair and cleaning, inexpensive to manufacture and service, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the present invention showing the barrel moved to its forward position for firing;

Figure 2 is a view similar to Figure 1 but showing the barrel retracted after firing and a shell being ejected from the piston;

Figure 3 is a longitudinal sectional view through the center of Figure 1 to show the barrel and slide locked together and the cartridge feeder actuated in order to feed a cartridge into the cartridge guides;

Figure 4 is a view similar to Figure 3 but showing the slide still retracted as the barrel moves forwardly after being retracted following firing;

Figure 5 is a longitudinal sectional view through the center of Figure 2 and showing the barrel and slide retracted following firing;

Figure 6 is a longitudinal sectional view taken substantially on the plane of section line 6—6 of Figure 3;

Figure 7 is a transverse vertical sectional view taken substantially on the plane of section line 7—7 of Figure 5;

Figure 8 is a transverse vertical sectional view taken substantially on the plane of section line 8—8 of Figure 4;

Figure 9 is a transverse vertical sectional view taken substantially on the plane of section line 9—9 of Figure 4; and,

Figure 10 is a transverse vertical sectional view taken substantially on the plane of section line 10—10 of Figure 4.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred

embodiment of the present invention, the numeral 10 represents the receiver of the present pistol that is integrally formed with a forwardly extending tube 12 and a depending hollow hand grip 14 having the usual open sides that are closed by cover plates 16. The receiver 10 and hand grip 14 are joined by a trigger guard 18 and the juncture between the hand grip and receiver is formed with a slot 20 in which there is pivotally mounted a trigger 22 that extends toward the guard 18.

A barrel 24 is longitudinally slidably received in the receiver 10 and tube 12 and includes a depending laterally projecting lug 26 at its forward end portion that is slidably received in a groove 28 in the bottom wall section 30 of the tube 12. A coil spring 32 positioned in the groove 28, behind the lug 26, is biased between the lug and the rear end wall of the groove to urge the barrel forwardly.

An elongated, hollow, open ended slide 34 is slidably received in the receiver 10 and the bore extending throughout the length of the slide accommodates the rear multi-sided end portion 36 of the barrel 24. A lug 38 depends from the forward portion of the slide 34 and slidably enters a rear longitudinal groove 40 in the bottom wall section 30. A coil spring 42 in the groove 40, behind the lug 38, is biased between the lug 38 and the rear end wall of the groove 40 to yieldingly urge the slide forwardly.

Means is provided for releasably securing the barrel and the slide together, whereby the same may be retracted as a unit upon firing of a cartridge. The releasable interconnecting means between the slide and barrel comprises a vertically swingable latch member 44 pivotally secured to the slide and a spring 46 that urges member 44 upwardly where the same will enter a notch 48 in the underside of barrel 24.

Member 44 is provided with laterally projecting arms 50 disposed within and along side of the inner side walls of the receiver that are adapted to engage cams 52 fixed to the inner side walls of the receiver in order to lower the latch member out of engagement in notch 48, against action of spring 46, in response to rearward movement of the slide and barrel.

Means is provided for retaining the slide retracted after the slide and barrel have moved rearwardly as a unit. A pair of bell cranks 54 are pivoted to the inner faces of the side walls of the slide and extend longitudinally of the receiver along the inside of the slide. A pivoted catch 56 is mounted in the receiver under the slide and is urged upwardly toward the slide by a leaf spring 58, whereby the catch 56 may enter a notch 60 in the slide when the slide is moved to its rear position thereby retaining the slide in its rear position. The catch 56 is provided with end portions that underlie the bell cranks so that the latter may release the catch as the bell cranks are swung in a manner now to be described.

Rollers 62 are supported on the outer faces of the barrel at its rear end. These rollers are so located as to engage the forward ends of the bell cranks to lower the same and cause the catch 56 to be pressed out of the notch 60, whereby spring 42 will urge the slide forwardly.

The rear end of the slide is formed, within its hollow interior, with a vertical guide or guide tracks 64 that slidably receive a travelling member or cartridge lifter 66. The member 66 is slidably and pivotally secured to the rear ends of the bell cranks so that as the rear ends of the bell cranks are raised, by rollers 62 engaging the forward ends of the bell cranks during forward movement of the barrel, the member 66 will be raised to bring a cartridge into position for firing and in alignment with the bore in the barrel.

A longitudinal plunger 68 is slidably received in an elongated bore or guide in the lower portion of the slide and a coil spring 70 is attached to the plunger and receiver and first urges the plunger rearwardly toward the member 66 and then retracts the same. A latch 72 pivotally mounted in a side recess in the barrel is urged by a spring 74 into engagement with the plunger 68 after reciprocation thereof, whereby the

plunger will be moved forwardly with the barrel against action of spring **70**.

A magazine or clip **76** is releasably held in the hand grip by a slidable clip holder **78** and includes a spring urged follower **80**. A stack of cartridges **82** in the clip **76** will be urged upwardly with the uppermost cartridge engaging and releasing latch or dog **72** after the barrel has been moved to its forward position. Then, the plunger **68** will move the uppermost of the cartridges rearwardly into the cartridge seat in member **66**.

The false end wall **84** in the slide is formed with an aperture that will receive the pin **86** of a hammer **88** pivotally mounted in the rear end of the slide behind the wall **84**. A spring **90** acts on the hammer **88** to urge the pin **86** rearwardly from the aperture in the wall **84**.

A pair of actuating rods **92** are slidably carried by the hand grip and include rear end portions that extend upwardly into the rear end of the slide through slots in end wall **84** for engaging the lower end of the hammer **88**. The forward ends of the rods **92** carry hook elements **94** that enter a passage **96** in the hand grip.

Leaf springs **98** in the passage **96** are anchored at their lower ends in the passage and their upper ends are attached to the hook elements **94** to urge the hook elements and rods rearwardly away from a companion hook **100** forming the rear part of the trigger **22**, when the trigger is manually pulled rearwardly after its conventional safety **102** is released.

In practical use of the present invention, when the barrel is moved to its forward position for firing of a cartridge, the slide will also be in its forward position with the member **66** lowered and with a cartridge disposed behind the rear end of the barrel and in alignment with the barrel.

As the trigger **22** is pulled rearwardly, the hook **100** will disengage the hook elements **94** and springs **98** will move rods **92** rearwardly where they will engage the hammer **88** to force the pin **86** against the base of the cartridge to fire the primer of the cartridge and cause the head of the cartridge to pass through and from the barrel in a spiral motion due to the rifling on the walls of the bore in the barrel.

As a result of firing the cartridge, the barrel will recoil and since the slide is releasably secured to the barrel it will also recoil to move rearwardly with the barrel. During this rearward movement or recoil of the barrel and slide, the latch **56** will enter notch **60** to retain the slide retracted and the cams **52** will engage and release latch **44** and spring **32** will urge the barrel forwardly whereupon the rollers **62** will engage the bell cranks **54** and cause the bell cranks to depress catch **56** so that the slide may move forwardly to be again coupled to the barrel.

When the barrel moves forwardly to release the slide retaining means, the rear ends of the bell cranks **54** will be raised sufficiently to force the shell of the fired cartridge outwardly through then registering slots **104** and **105** in the rear ends of the receiver and slide, the details of which are not shown as the ejecting means forms no part of the present invention, and cams **106** on the slide will engage the rear ends of the rods **92** to move the rods **92** forwardly where hook elements **94** reengage hook **100**.

The plunger **68** is engaged by the downwardly urged latch **72** as the barrel moves forwardly, but the uppermost of the cartridges in the clip **76** will raise the catch **72**, holding the plunger forwardly, so that the plunger will be released and the plunger will then move rearwardly to feed the uppermost cartridge to member **66** since member **66** will slide downwardly past the slide as cams **101** ride rearwardly against the bell cranks **54**.

It should here be noted that the member **66** is raised by bell crank **54** to raise a cartridge for alignment with the barrel as the barrel moves forwardly so that the cartridge will enter the rear end of the barrel when the slide moves forwardly after release of catch **56**. The means for holding the cartridge in elevated position during forward movement of the slide when member **66** is lowered by cams **101** engaging bell crank **54** are not shown. Cams **101** on the barrel will engage and lower the rear ends of the bell cranks to permit member **66** to receive the cartridge urged rearwardly by the plunger for the next cycle of operation.

Figure 3 shows the barrel and slide coupled together and disposed in their forward position for firing with the member **66** lowered. This figure also illustrates the uppermost of the cartridges in the clip releasing catch **72** to allow plunger **68** to push the uppermost cartridge into member **66**.

Viewing Figure 4, it will be seen that the cartridge in the rear of the barrel has been fired and that the slide is held in retracted position as the barrel moves forwardly until the bell cranks **54** depress the catch **56**. The catch **72** is engaged with plunger **68** to retract the plunger to allow another cartridge to rise in alignment with the plunger.

Figure 5 shows the fired position with both the barrel and slide retracted and with the coupling between the barrel and slide released. A new cartridge is ready to be pushed upward by the member **66** and bell cranks **54** and eject empty shell and position new shell at rear end of the barrel.

Obviously, the catch **72** could be carried by the slide as well as the barrel to function as disclosed. Also, the number of bell cranks **54** and rods **92** could be reduced although a more favorable mechanical advantage is accomplished from the structure and arrangement shown.

Having described the invention, what is claimed as new is:

1. In a pistol including a receiver and a tube extending forwardly from the receiver, a barrel slidably received in the tube and the receiver, means yieldingly urging the barrel forwardly of the receiver, a slide in the receiver and having a bore extending throughout its length and accommodating the rear end portion of the barrel, releasable interconnecting means between the barrel and the slide, whereby the barrel and slide may move rearwardly as a unit, means yieldingly urging the slide forwardly of the receiver, means disposed within the receiver for releasing said interconnecting means as the slide and barrel move rearwardly during recoil of the barrel, means in the receiver for retaining the slide retracted as the slide moves rearwardly with the barrel, a pair of side by side bell cranks pivotally mounted on the slide and including forward and rear ends, said slide having a notch to receive the retaining means as the slide moves rearwardly, means urging the front ends of said bell cranks toward said retaining means comprising rollers carried by the barrel engageable with the forward ends of said bell cranks as the barrel moves forwardly to force the front ends of said bell cranks against the retaining means and the retaining means out of the notches and thereby permit forward movement of the slide by the urging means acting on the slide.

2. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug extending laterally from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug to urge the barrel forwardly of the receiver, a channel shaped slide engaged over the rear end of the barrel and slidably received in the receiver, releasable interconnecting means between the slide and the barrel, means within the receiver engageable with said interconnecting means as the barrel and slide move rearwardly for releasing said interconnecting means, thereby allowing said barrel to move forwardly independently of said slide, means in the receiver engageable with the slide to retain the latter retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means.

3. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug projecting downwardly from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug for yieldingly urging the barrel forwardly of the receiver, a channel shaped slide slidably engaged over the rear end of the barrel and slidably received in the receiver, releasable interconnecting latch means between the slide and the barrel, cam means within the receiver engageable with said interconnecting latch means as the barrel and slide move rearwardly for releas-

ing said interconnecting latch means, thereby permitting said barrel to move forwardly independently of the slide, means in the receiver engageable with the slide to retain the slide retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means.

4. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug projecting downwardly from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug for yieldingly urging the barrel forwardly of the receiver, a channel shaped slide slidably engaged over the rear end of the barrel and slidably received in the receiver, releasable interconnecting latch means between the slide and the barrel, cam means within the receiver engageable with said interconnecting latch means as the barrel and slide move rearwardly for releasing said interconnecting latch means, thereby permitting said barrel to move forwardly independently of the slide, means in the receiver engageable with the slide to retain the slide retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means, said latch means including a notch on the underside of said barrel, and a spring urged latch pivotally mounted on said slide for selective engagement with said notch.

5. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug projecting downwardly from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug for yieldingly urging the barrel forwardly of the receiver, a channel shaped slide slidably engaged over the rear end of the barrel and slidably received in the receiver, releasable interconecting latch means between the slide and the barrel, cam means within the receiver engageable with said interconnecting latch means as the barrel and slide move rearwardly for releasing said interconnecting latch means, thereby permitting said barrel to move forwardly independently of the slide, means in the receiver engageable with the slide to retain the slide retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means, said cam means including a tapered abutment secured to said receiver and positioned in the path of movement of said interconnecting latch means wherein said latch means is released when said barrel and slide move rearwardly.

6. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug projecting downwardly from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug for yieldingly urging the barrel forwardly of the receiver, a channel shaped slide slidably engaged over the rear end of the barrel and slidably received in the receiver, releasable interconecting latch means between the slide and the barrel, cam means within the receiver engageable with said interconnecting latch means as the barrel and slide move rearwardly for releasing said interconnecting latch means, thereby permitting said barrel to move forwardly independently of the slide, means in the receiver engageable with the slide to retain the slide retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means, said slide retaining means including a notch in the underside of said slide, and a spring urged catch pivotally mounted on said receiver for engaging said notch when said slide moves to its rearmost position and releasably retaining said slide in its retracted position.

7. In a pistol including a receiver and a tube extending forwardly from the receiver and having a bottom wall section provided with a longitudinal groove opening into the interior of the tube, a barrel slidably received in the receiver and the tube and having forward and rear ends, a lug projecting downwardly from the forward end of the barrel and positioned in said groove, said groove having a rear end wall, a coil spring disposed in the groove in parallel relation with the barrel and biased between said end wall and said lug for yieldingly urging the barrel forwardly of the receiver, a channel shaped slide slidably engaged over the rear end of the barrel and slidably received in the receiver, releasable interconnecting latch means between the slide and the barrel, cam means within the receiver engageable with said interconnecting latch means as the barrel and slide move rearwardly for releasing said interconnecting latch means, thereby permitting said barrel to move forwardly independently of the slide, means in the receiver engageable with the slide to retain the slide retracted, and means carried by said slide and actuated by said barrel for releasing said slide retaining means, said releasing means for said slide retaining means including a pair of bell crank members with edges thereof forming camming surfaces pivotally mounted on said slide, and a pair of rollers on said barrel engageable with said bell cranks when said barrel moves forwardly, said bell cranks actuating said retaining means thereby permitting said slide to move forwardly.

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