Sept. 25, 1962 P. C. MILLER 3,055,270

AUTOMATIC REVOLVER WITH RECOILING CYLINDER FRAME

Filed Aug. 2, 1960 3 Sheets-Sheet 1

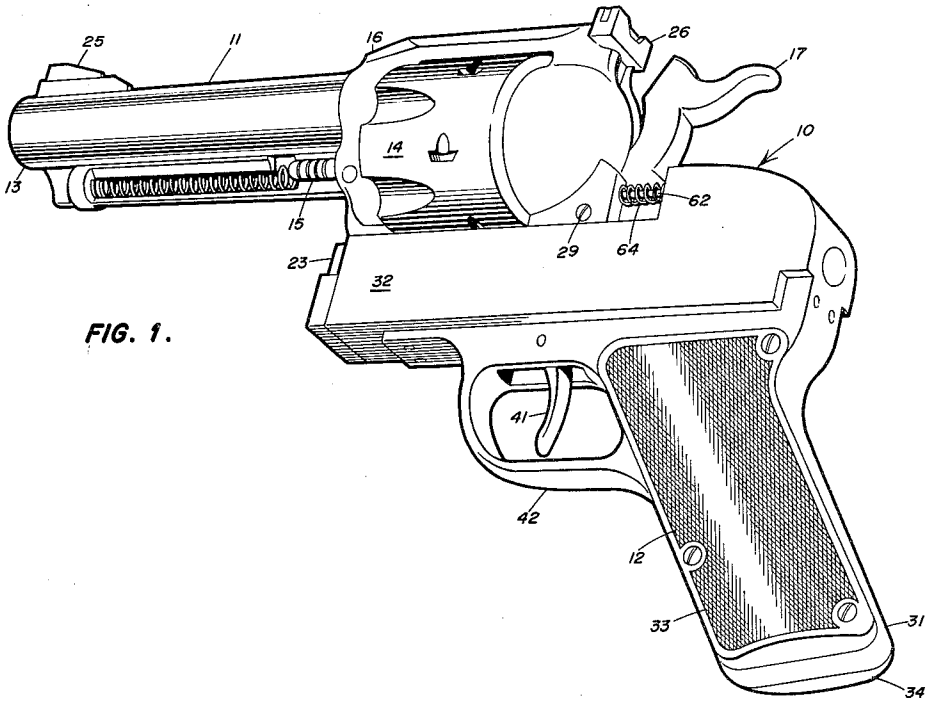


FIG. 1.

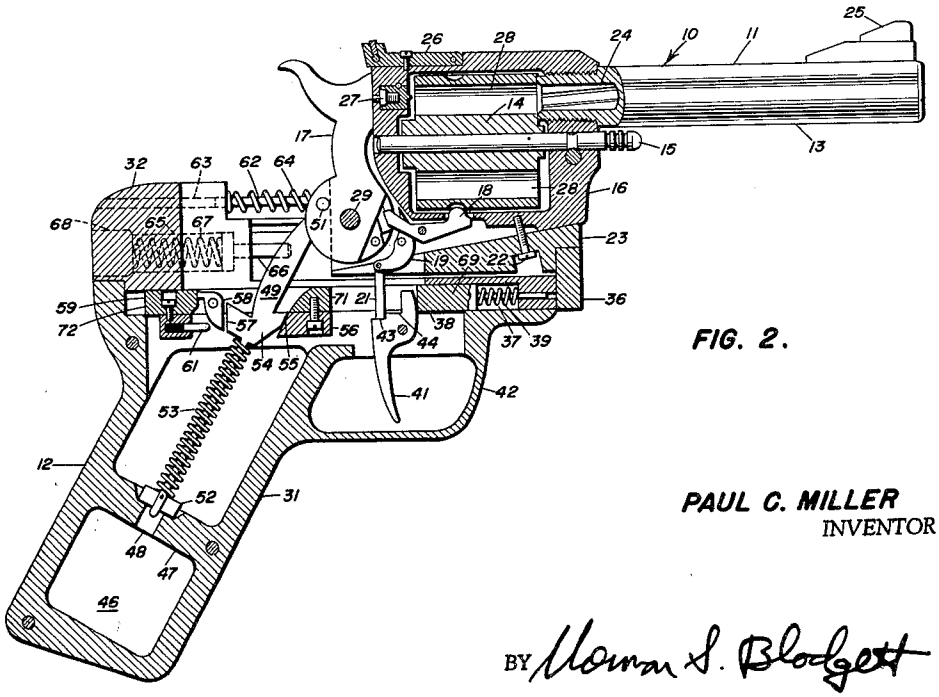


FIG. 2.

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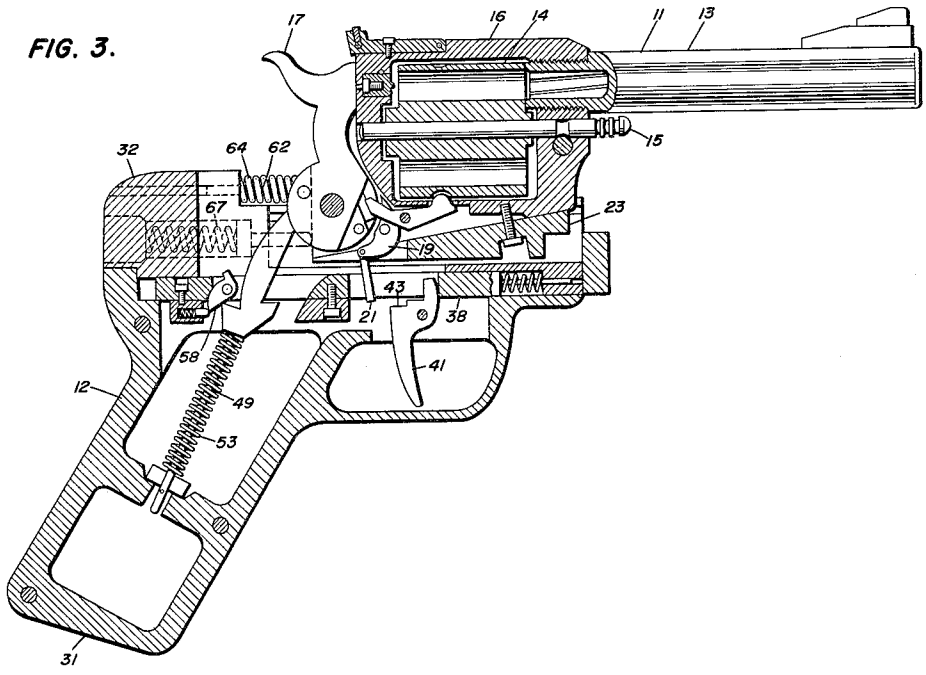
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FIG. 3.



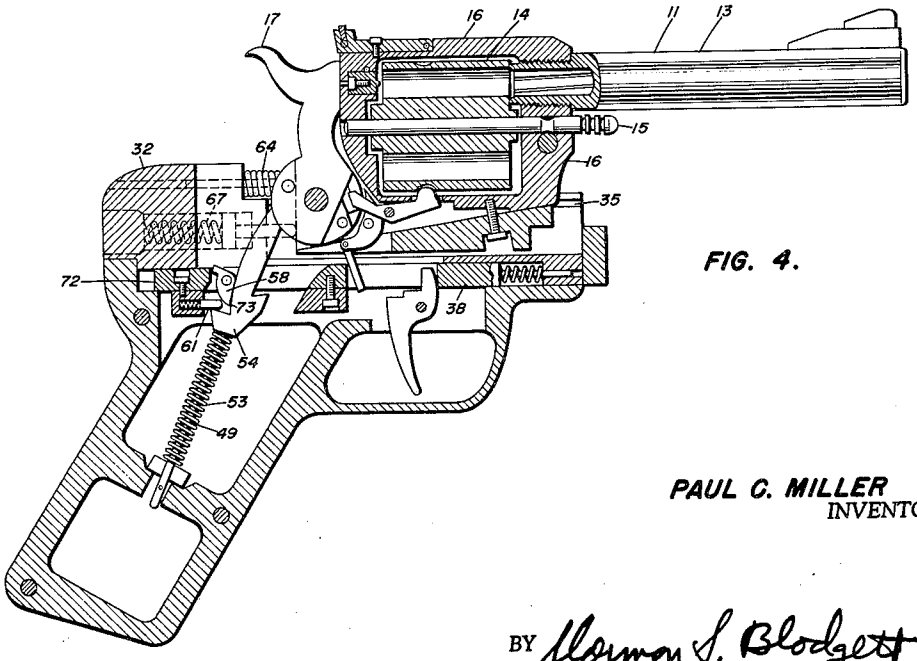


FIG. 4.

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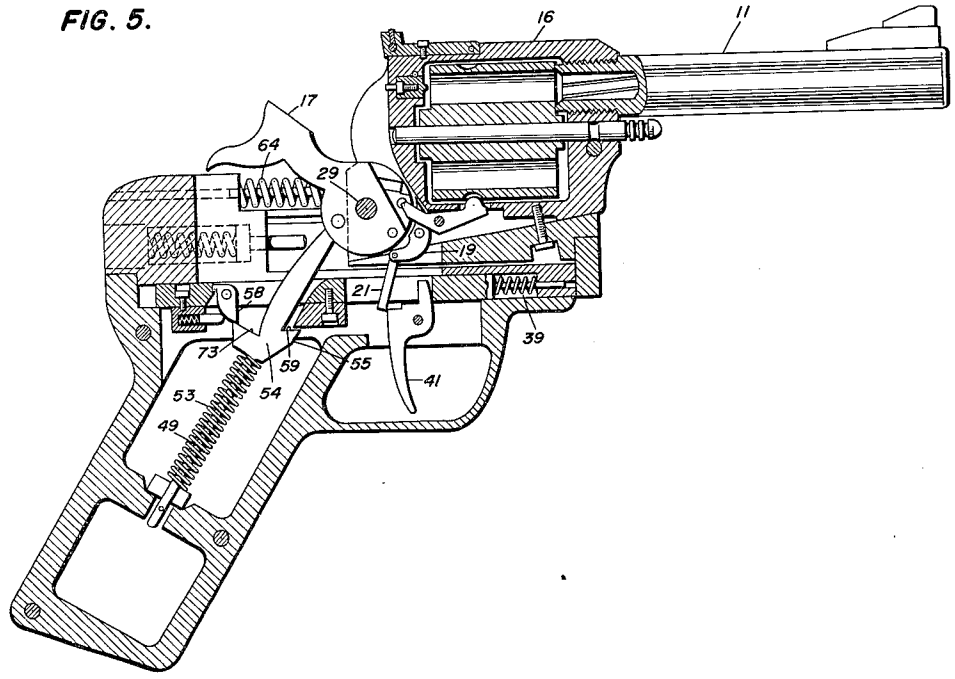
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FIG. 5.



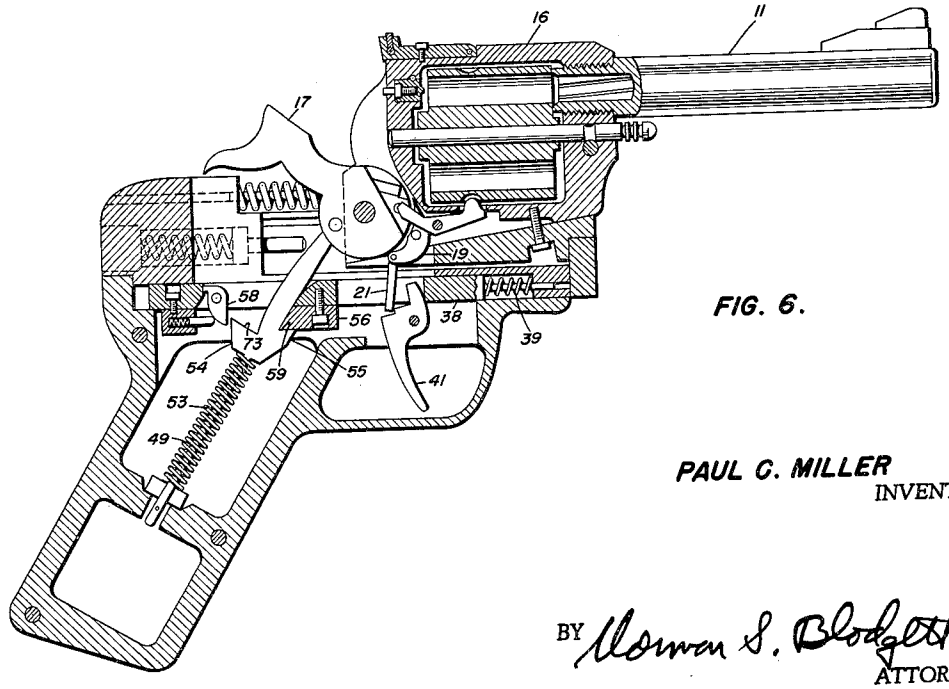


FIG. 6.

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AUTOMATIC REVOLVER WITH RECOILING CYLINDER FRAME

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9 Claims. (Cl. 89—157)

This invention relates to a gun and more particularly to apparatus arranged to perform the functions of a long recoil automatic revolver.

In the use of pistols for target shooting and the like it is common practice to make use of a revolver-type pistol. Such a revolver may consist of a single-action revolver, in which the hammer must be drawn back before every shot, or a double-action revolver in which the trigger mechanism operates in the first part of its motion to cock the hammer, and in the second part to release the hammer to strike the cartridge. In target shooting and where rapid fire is desirable, such as in hunting vermin, the single-action revolver is troublesome because of its slow firing rate and the fact that the gunner must move his hand on the grip to pull back the hammer between successive shots, thus destroying his hold on the gun. In the case of the double-action revolver, however, the fact that the trigger must be moved through a long stroke to actuate all the mechanism and also requires considerable force is a handicap in accurate shooting with a pistol. Most automatic and semi-automatic pistols eject the shell after firing. A revolver, incidentally, is desirable for target shooting because of the fact that the cartridge shells are not ejected after the bullet is fired, but are retained in the cylinder. Since cartridge shells are quite expensive and furthermore, since the marksman quite often wishes to load his own cartridges, it is convenient to use a pistol in which the empty shells are retained within the gun. These and other difficulties experienced with the prior art devices have been obviated in a novel manner by the present invention.

It is, therefore, an outstanding object of the invention to provide a revolver of the long recoil automatic type.

Another object of this invention is the provision of a gun which is of the revolver type and yet fires with the ease of a single-action revolver and is automatic in the sense that it is not necessary to cock the hammer before each shot.

A further object of the present invention is the provision of an apparatus for converting a conventional single-action revolver into a long recoil automatic revolver.

It is another object of the instant invention to provide a gun permitting semi-automatic fire from a revolver type gun.

It is another object of the instant invention to provide a gun of the revolver type in which the recoil of the firing cocks the hammer.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

The character of the invention, however, may be best understood by reference to one of its structural forms as illustrated by the accompanying drawings in which:

FIG. 1 is a perspective view of a gun embodying the principles of the present invention;

FIG. 2 is a longitudinal sectional view through the gun in ignition condition;

FIG. 3 is a longitudinal sectional view of the gun in recoiling condition;

FIG. 4 is a longitudinal sectional view of the gun in hesitation condition;

FIG. 5 is a longitudinal sectional view of the gun in return condition; and

FIG. 6 is a longitudinal sectional view of the gun in trigger-released condition.

Referring first to FIGS. 1 and 2, wherein are best shown the general features of the invention, the gun, indicated generally by the reference numeral 10, is shown as consisting of a conventional portion 11 and a grip portion 12. The conventional portion 11 consists of a barrel 13, a cylinder 14, a base pin 15, a cylinder frame 16, and a hammer 17. The conventional portion 11 also contains a cylinder latch 18 and a safety sear 19 as well as a safety sear disconnector 21. Fastened to the cylinder frame by means of a screw 22 is a guide rail adaptor 23. The barrel is provided in the usual manner with a rifle bore 24 and a sight 25. The cylinder frame 16 is provided with a rear sight 26 and with a firing pin 27. The cylinder 14 is provided with six chambers 28 adapted to carry cartridges. The hammer 17 is pivotally mounted to the cylinder frame 16 by means of a pivot pin 29. The cylinder latch 18 and the safety sear 19 are pivotally hinged to the cylinder frame 16.

The grip portion 12 consists in general of a grip frame 31 at the upper end of which is mounted a housing 32, the grip frame being provided with wooden or similar grips 33 and 34 in the usual manner. The housing is formed with rails 35 which engage the guide rail adaptor 23 on either side (see FIG. 4). The connection between the rails 35 of the housing 32 and the guide rail adaptor 23 is such as to permit sliding action of the conventional portion 11 relative to the grip portion 12. At the outer end a return motion stop 36 limits the forward motion between these members. A slot or groove 37 is formed in the housing 32 and carries a trigger bar 38 which is biased rearwardly by a coil spring 39. A rearwardly-facing surface of the trigger bar 38 presses against the upper end of a trigger 41 which is pivotally mounted on the grip frame 31 and has its lower end residing within the trigger guard 42 which forms part of the grip frame. The upper end of the trigger 41 is provided with two steps 43 and 44, the lower end of the safety sear disconnect 21 resting on the step 43.

The grip frame 31 is provided with two openings 45 and 46 in order to lgihten it; an intermediate wall 47 separates the two openings and is itself provided with an aperture 48. Extending from the aperture upwardly to the hammer 17 is a hammer strut 49 which is connected to the hammer by a pivot pin 51 which pin is spaced from the pivot pin 29 and is located somewhat rearwardly and upwardly thereof when the hammer is in the position shown in FIG. 2. At its lower end the strut is provided with a spring seat 52 which is larger than the aperture 48 and a coiled main spring 53 extends from the seat 52 upwardly to an enlarged central portion 54 of the strut. The central portion 54 is provided with flat forward surface 55 adapted to slide along a similar surface on a firing sear 56 which is fastened to the under surface of the trigger bar 38. The central portion 54 is also provided with a flat rearward surface 57 which is adapted to engage a cocking sear 58 which is pivotally mounted on the trigger bar 38 and which has a flat surface adapted to engage the surface 57. The trigger bar 38 is mounted on the under side of the housing 32 and contains in its lower point a cocking sear plunger 61 which is spring-biased toward the lower end of the cocking sear 58. Extending rearwardly from the cylinder frame 16 is a recoil spring guide 62 there being one such guide on each side of the hammer 17. Each guide extends rearwardly and slides in bores 63 in the housing 32; each bar is provided with a coil spring 64. Extending into the rearward end of the housing 32 is a bore 65 in which resides an oil buffer spring loaded plunger 66 which is biased forwardly by a coil spring 67 which is held within the bore by a plug

68. It should be noted that the trigger bar 38 is a member having a ladder-like configuration with one cross bar 69 engaging the upper end of the trigger 41, an intermediate cross bar 71 on which the firing sear 56 is mounted and a rearward cross bar 72 on which the cocking sear plunger 61 is mounted. It should also be noted that the cocking sear 58 is pivotally mounted on this trigger bar 38 and is movable with it. The trigger bar is slidably mounted between the grip frame 31 and the housing 32 and, of course, is spring biased by the coil spring 39.

The operation of the invention will now be readily understood in view of the above description. In FIG. 2 the gun is shown in "ignition" condition. The trigger 41 has been completely pulled back by the operator and the hammer 17 has fallen to strike the firing pin 27. The firing pin has indented the primer (not shown) so that the bullet (not shown) is about to move down the bore 24 and the barrel 11.

Referring now to FIG. 3, which shows the gun in "recoil" condition, the conventional portion 11 (which includes the barrel 13, the cylinder 14, the base pin 15, the cylinder frame 16, and the hammer 17, as well as the guide rail adaptor 23 and the recoil spring guides 62) is moving rearwardly with respect to the grip portion 12. This recoil acts to compress the main spring 53 and the recoil spring 64. It also disconnects the safety sear 19 from the trigger 41 by moving the safety sear disconnector 21 from the step 43 of the trigger.

Referring now to FIG. 4, which is the "hesitation" position of the gun, the cylinder frame 16 has been brought to rest by the springs 64 and 67 as well as the compression of the main spring 53 on the hammer strut 49, and has just previously been slowed down by the damping action of oil being squeezed by the oil buffer piston 66. In FIG. 3 the hammer strut 49 was moved backward and downwardly relative to the cocking sear 58 so that, by the time the apparatus reaches the condition shown in FIG. 4, the cocking sear 58 has snapped over the top of the central portion 54 of the hammer strut 49 under the action of the cocking sear plunger 61 and resides in a notch 73. The cocking sear plunger 61 is, of course, spring-biased and serves resiliently to bias the cocking sear 58 forwardly at all times. The cocking sear rotation, however, is limited by the engagement of a small arm portion with a forward surface of the cross bar 72 of the trigger bar 38.

Referring now to FIG. 5, which shows the "return" position of the gun, the recoil spring 64 throws the conventional portion 11 of the gun back to the forward position. During this forward motion, the cocking sear 58 by its engagement with the notch 73 has prevented forward axial motion of the hammer strut 49. This causes the hammer 17 to rotate about its pivot pin 29 so that it is brought to "full cock" position. When the hammer reaches the full cock position, the safety sear 19, which is now disconnected from the trigger and is acted upon only by its own torsion spring, engages a notch in the hammer, thus preventing its fall if the hammer is prematurely released by defective cocking sear 58. This prevents a broken sear from causing "full automatic" firing of the gun.

FIG. 6 shows the condition of the gun after the trigger has been released by the operator. Releasing the trigger allows the trigger bar 38 to move rearwardly under the action of its spring 39; the movement of the trigger bar 38 in this manner carries the cocking sear 58 rearwardly and causes it to dis-engage the notch 73 in the hammer strut 49. The release of the hammer strut permits the hammer to fall slightly but only until the firing sear 56 engages a notch 59 on the hammer strut just above the surface 55 on the enlarged central portion 54. Releasing the trigger 41 also allows the safety sear disconnector 21 to move into place once more to connect the safety sear 19 to the trigger. The gun is then in cocked position,

ready to fire. Pulling the trigger 41 carries the trigger bar 38 forwardly and releases the firing sear 56 from the notch 59 and permits the hammer 17 to fall so that the gun is again in a condition shown in FIG. 2.

It can be seen that the above invention makes use of the principle of long recoil actuation to provide semi-automatic fire from a revolver-type gun. As a result of the discharge of the bullet, the recoil carries the cylinder, base pin, cylinder frame, hammer, safety sear, pawl, cylinder latch, fasteners and spring rearwardly while they remain in a locked condition relative to one another. That is to say, during this movement cylinder rotation is prevented. The recoil compresses the main spring and recoil springs and, then the recoil springs cause return motion, but at that time the hammer is constrained in such a way as to cause it to rotate bringing the revolver mechanism to the full cock provision. When the hammer is brought to the full cock the cylinder is unlocked, indexed to the next chamber, and relocked, as in standard commercial revolvers.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, however, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

The invention having been thus described, what is claimed as new and desired to secure by Letters Patent is:

1. An assembly for converting to semi-automatic operation a revolver having a cylinder, a cylinder frame, and a hammer pivotally attached to the cylinder frame, comprising a housing in which the frame is carried for sliding movement due to recoil, a spring resisting such sliding movement in the rearward direction, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a hammer strut pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, a firing sear engaging the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear engaging the strut to rotate the hammer in cocked position with forward movement of the cylinder frame relative to the housing after recoil.

2. An automatic revolver, comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylinder frame, a housing in which the frame is carried for sliding movement therebetween due to recoil, a spring resisting rearward sliding movement, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a hammer strut pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, a firing sear engaging the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear engaging the strut to rotate the hammer to cocked position upon forward movement of the cylinder frame relative to the housing after recoil.

3. An automatic revolver, comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylinder frame, a housing in which the frame is carried for sliding movement therebetween due to recoil, a spring resisting rearward sliding movement, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a hammer strut pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, a spring biasing the strut to cause the hammer to move toward firing position, a firing sear engaging a notch in the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear engaging another notch on the strut to rotate the hammer to cocked position with forward movement of the cylinder frame relative to the housing after recoil.

4. An automatic revolver, comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylin-

der frame, a housing in which the frame is carried for sliding movement therebetween due to recoil, a spring resisting rearward sliding movement, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a trigger bar slidable within the housing and contacting the trigger for actuation thereby, a hammer strut which extends through an aperture in the trigger bar and which is pivotally attached at one end to the hammer at its position substantially removed from the point of attachment of the hammer to the cylinder frame, a firing sear mounted on the trigger bar engaging the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear mounted on the trigger bar engaging the strut to rotate the hammer to cocked position with forward movement of the cylinder frame relative to the housing after recoil.

5. An automatic revolver, comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylinder frame, a housing in which the frame is carried for sliding movement therebetween due to recoil, a spring resisting rearward sliding movement, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a trigger bar slidable within the housing and contacting the trigger for actuation thereby, a hammer strut which extends through an aperture in the trigger bar pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, a spring biasing the strut to cause the hammer to move for firing position, a firing sear mounted on the trigger bar engaging a notch in the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear mounted on the trigger bar engaging another notch on the strut to rotate the hammer to a cocked position with forward movement of the cylinder frame relative to the housing after recoil.

6. An assembly for converting to semi-automatic operation a revolver having a cylinder, a cylinder frame, and a hammer pivotally attached to the cylinder frame, comprising a housing in which the frame is carried for sliding movement therebetween due to recoil, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a hammer strut pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, the strut having two notches in its intermediate portion in opposed relation, a firing sear engaging one notch of the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear engaging the other notch of the strut to rotate the hammer to a cocked position with forward movement of the cylinder frame relative to the housing after recoil.

7. An assembly for converting to semi-automatic operation a revolver having a cylinder, a cylinder frame, and a hammer pivotally attached to the cylinder frame, comprising a housing in which the frame is carried for sliding movement therebetween due to recoil, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a trigger bar slidable within the housing and contacting the trigger for actuation thereby, a hammer strut which extends through an aperture in the trigger bar and which is pivotally attached at one end to the hammer at a position substantially removed from the point of attachment of the hammer to the cylinder frame, the strut having two notches in its intermediate portion in opposed relation, a spring biasing the strut to cause the hammer to move toward firing position, a firing sear mounted on the trigger bar engaging one notch of the strut to hold the hammer in cocked position when the trigger is released, and a cocking sear mounted on the trigger bar engaging the other notch of the strut to rotate the hammer to cocked position with forward movement of the cylinder frame relative to the housing after recoil.

8. A semi-automatic revolver comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylinder frame, a housing in which the frame is carried for sliding movement therebetween due to recoil, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a main spring means serving to bias the hammer toward firing position, a firing sear to hold the hammer in cocked position when the trigger is released, and a cocking sear serving to rotate the hammer to a cocked position with forward movement of the cylinder frame relative to the housing after recoil.

9. A semi-automatic revolver, comprising a cylinder, a cylinder frame, a hammer pivotally attached to the cylinder frame, a housing in which the frame is carried for movement therebetween due to recoil, a grip frame attached to the housing, a trigger pivotally mounted in the grip frame, a main spring means serving to bias the hammer toward firing position, a firing sear to hold the hammer in cocked position when the trigger is released, and a cocking sear serving to rotate the hammer to a cocked position with return movement of the cylinder frame relative to the housing after recoil.

References Cited in the file of this patent

UNITED STATES PATENTS

584,631 Fosbery ---------- June 15, 1897
747,073 Huntley ---------- Dec. 15, 1903