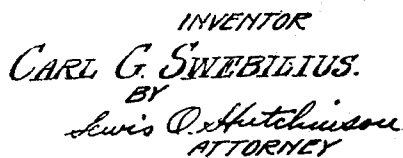


2 Sheets-Sheet 1



Aug. 25, 1925.

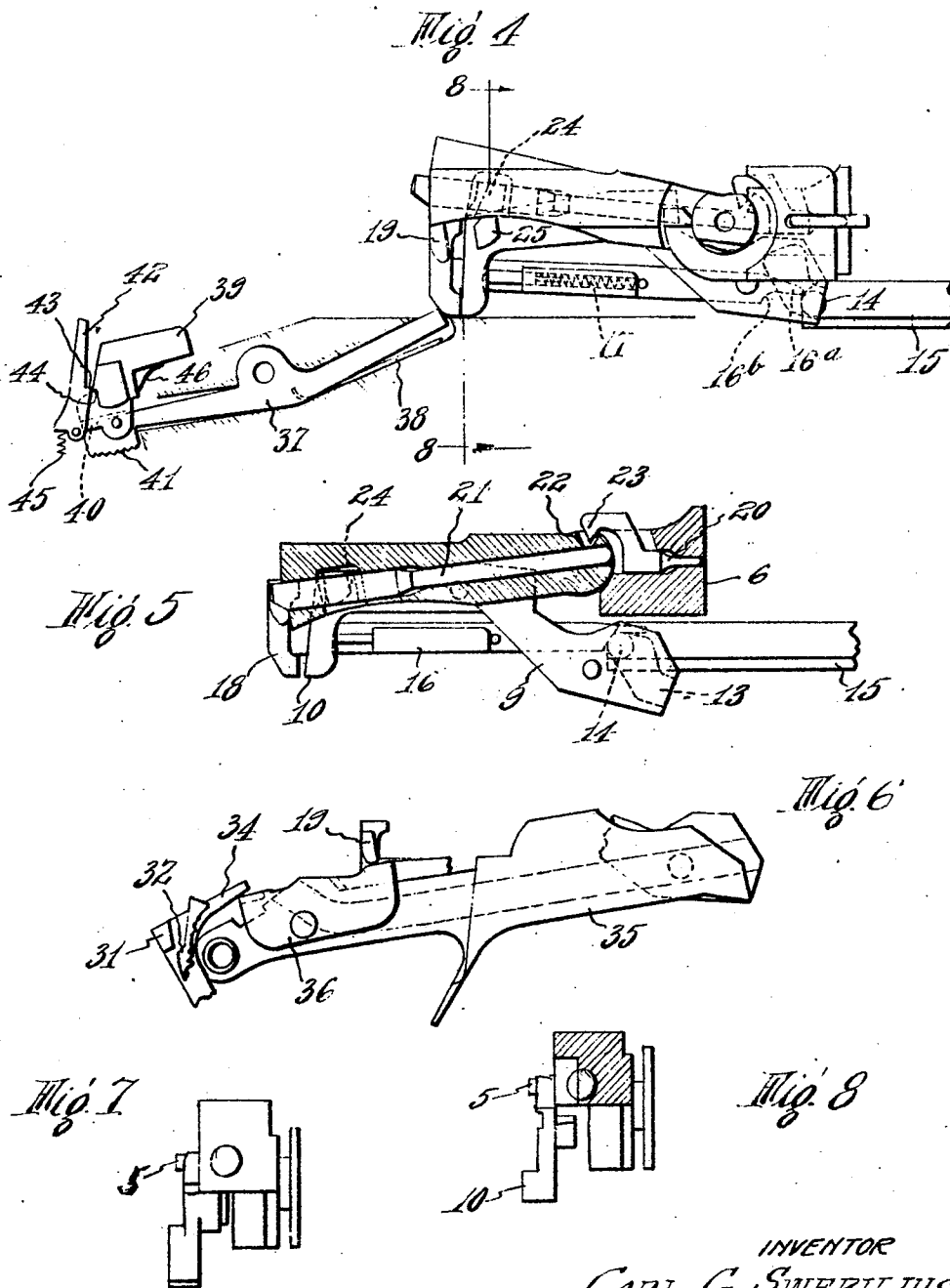
C. G. SWEBILIUS

1,550,757

FIREARM

Filed March 6, 1922

2 Sheets-Sheet 2



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Patented Aug. 25, 1925.

1,550,757

UNITED STATES PATENT OFFICE.

CARL GUSTAF SWEBILIUS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE MARLIN FIREARMS CORPORATION, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF DELAWARE.

FIREARM.

Application filed March 6, 1922. Serial No. 541,432.

To all whom it may concern:

Be it known that I, CARL G. SWEBILIUS, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Firearms, of which the following is a full, clear, and exact description.

This invention relates to repeating firearms and more particularly to that type of hammerless repeating firearm disclosed in United States Letters Patent No. 943,828 to Louis L. Hepburn, dated December 21, 1909 and has for its objects the provision of various improvements of said type of firearm.

An object of the invention is the provision of an improved sear tripping means whereby the sear is released from the hammer only after the breech bolt is locked up.

Another object of the invention is an improved arrangement for retracting the firing pin during the reloading of the gun and maintaining it inoperative until the breech bolt is locked up.

A further object of the invention is an improved breech bolt locking means of such a character that the breech bolt is prevented from moving until after a cartridge has been discharged, thereby preventing possible injury from "hang fire" cartridges.

Other objects and features of the invention will be apparent from the following specification and accompanying drawings in which Fig. 1 is a side elevation, the side plate being removed, with the breech bolt in closed position; Fig. 2 is a similar view with the breech bolt unlocked but in the forward part of the receiver; Fig. 3 is a detail of a portion of the receiver, and action rod; Fig. 4 is a side elevation of the breech bolt in locked position; Fig. 5 is a longitudinal section therethrough in unlocked position; Fig. 6 is a detail of the carrier, sear trip lever, link and sear; Fig. 7, is an end elevation of the breech bolt in locked position and Fig. 8 is a section on line 8—8 of Fig. 4.

The receiver 1 carries the barrel 2 at its front end and at its rear end the stock 3. A longitudinal groove 4 extends along the side wall of one receiver in which groove is arranged the rib 5 projecting from the breech bolt 6. Pivottally attached to the rear part of the breech bolt 6 is the locking

bolt 7, the rear end of which is adapted to move into a notch 8 in the top wall of the receiver in the manner shown in Fig. 1 to lock the breech bolt 6 in its forward position.

A link 9 is provided with a stud which is received in a socket in one side of the locking bolt whereby the link is capable of a rocking movement relative to the locking bolt. At the rear end of the link 9 is a lateral projection 10 which rides along the lower edge of a groove 11 in the side wall of the receiver, part of said edge being horizontal as indicated at 12 and part being inclined downwardly to the rear as shown at 12^a. At the forward end of the groove 11 is a curved shoulder 11^a. In the forward end of the link is provided a cam groove 13 in which is received the stud 14 on the end of the action rod 15, the firearm being of the so-called "pump action" type. The projection 10 constitutes the fulcrum point for the link 9, the front end being elevated or depressed by the action of the stud 14 in the cam groove 13 in the front end of the link. In brief, the action of the link, the lock bolt and breech bolt is as follows: The rearward movement of the action rod 15 will first cause the forward end of the link to move down. This movement will simultaneously swing down the locking bolt 7, freeing its upper end from the notch 8 and thereby unlocking the breech bolt. A further rearward movement of the action rod will cause the breech bolt, locking bolt and link to move rearwardly, the projection 10 of the link sliding in the groove 11 on the supporting edge first along the part 12 and then down the incline 12^a.

A slide 16 mounted on the link 9 longitudinally thereof is arranged in the groove 11 and contacts with the upper edge thereof, the rear portion thereof resting on the lug 10. This slide is normally pressed toward the forward end of the link by the spring pressed plunger 17. At the rear end of the slide is a vertical member 18 which is adapted to contact with the projection 10 to limit the forward movement of the slide and which is arranged in the groove 11. Extending laterally from the member 18 toward the middle of the receiver is a stop shoulder or lug 19 which is adapted, when the locking bolt is in its upper position and

the slide 16 in its forward position, to underlie the locking bolt and hold it in its locking position. At the forward end of the slide 16 is provided a finger 16^a which
 5 engages a curved surface 15^a on the action rod, when the breech is closed, so that the first movement of the action rod rearwardly will be to move the slide back and move the
 10 lug 19 rearwardly from under the locking bolt 7. The under surface of the finger is curved at 16^b and is adapted to receive the end 15^a of the action rod in the manner to be later set forth.

The firing pin is composed of two sections, one section of which is a plunger 20 reciprocatively mounted in the breech bolt 6 and the other section of which is a rod or piston 21 slidably mounted in the locking bolt 7. These two members are so arranged
 15 that when the locking bolt is in its upper position they are in substantial alinement and when the rear section 21 is driven forward by the hammer its front end strikes the rear end of the forward section 20 driving it
 20 against the primer of a cartridge. The front end of the locking bolt is provided with a notch 22 and the rear end of the section 20 of the firing pin carries a hook 23 which is received in the notch. The arrangement
 25 of the notch and hook is such that after the section 20 has been driven forward, the downward movement of the locking bolt will draw it to its rear position, but the upper movement of the locking bolt will have no
 30 effect thereon when the section 20 is in its rear position. Near the rear end of the section 21 is a vertical slot 24 in which is adapted to be received the cam 25 carried by the link 9 and extending through a groove in the locking bolt 7. When, upon opening
 35 the breech of the gun, the link rotates relative to the locking bolt, the cam 25 enters the slot 24 and retracts the firing pin section 21. The lug 25 remains in the slot 24 during the reciprocation of the breech bolt incident to the reloading of the gun and prevents possible movement of the section 21 until the gun is fully breeched and the locking bolt is in the socket 8. The possibility of premature operation of the firing pin is thus prevented.

A hammer 26 is pivotally mounted on the trigger plate and is adapted to be engaged by the breech bolt on its rearward movement to be rotated into cocked position. On the under portion of the free end of the hammer is provided a hook 27 which is adapted to be engaged by the hook 28 on the trigger 29. A sear 30 is pivotally mounted on the trigger and has a lug 31 adapted to engage a shoulder 32 on the hammer. A spring pressed plunger 33 is mounted in the sear and bears against the trigger plate. This plunger normally maintains the sear in position to have the

lug 31 engage the shoulder 32, and also to maintain the trigger with the hook 28 in engagement with the hook 27 of the hammer. Extending forwardly from the sear is an arm 34. A carrier 35 is pivotally
 70 mounted in the receiver and is adapted to be operated in the usual manner by a stud on the link working in a cam groove in the carrier. On the carrier is pivotally mounted the sear trip lever 36, the rear
 75 end of which underlies the arm 34 of the sear. Near its forward end, the lever 36 is slightly concave and is adapted to be engaged by the lug 19 on the slide 16 as the latter moves forward to underlie the locking lever 7 at the closing of the breech.
 80 The engagement of the concave surface of the lever 36 by the lug 19 causes a rotation of the lever which results in the arm 34 of the sear being engaged by the rear end
 85 of the lever 36. The sear is thus rotated sufficiently to disengage the lug 31 from the shoulder 32. The hammer may now be released by pulling the trigger 29. The design of the concave portion of the lever
 90 36 is such that the sear is not released until after the locking bolt is in the notch 8 and the lug 19 underlies the locking bolt. This arrangement prevents the release of the hammer until the gun is fully breeched and locked.

In order to prevent the breech from being opened after the gun is ready for firing a lever 37 is pivotally mounted in the receiver in such a way that in one position its forward end contacts with the rear end
 100 18 of the slide 16 and prevents said slide from being moved by pressure applied thereto through the action rod 15. A spring 38 is provided to press the forward end of the lever into its locking position.
 105 At the rear end of the receiver is pivoted an inertia block 39 which is arranged to swing longitudinally of the receiver. A lug 40 projects from the block 39 and underlies the rear end of the lever. Thus,
 110 when the block 39 swings forward, the lug lifts the rear end of the lever 37 and disengages the forward end thereof from the slide 16 and allows the breech to be opened. This lever may be operated manually by the finger piece 41, if it is desired to open the breech after the gun has been
 115 cocked. The inertia block 39 is moved forward automatically by the recoil of the gun and operates the lever to release the
 120 slide 16. This arrangement acts as a safety device to prevent the premature unlocking of the gun in the event of a "hang fire" since the breech bolt is not unlocked until after the cartridge is fired. This lever also performs the additional function of preventing any loose play fore and aft of the action rod 15, there being in many
 125 guns of the pump action type a limited amount of play when the gun is locked up.
 130

42 is a latch for the inertia block 39. This latch is pivoted at its lower end and is provided with a latch shoulder 43 which is arranged to engage a shoulder 44 on the inertia block when the inertia block is in its forward position and hold the latter in this position until it is released in the manner hereinafter described. A suitable spring 45 is provided to move the latch 42 in a direction to engage the shoulder 43 with the shoulder 44. The inertia block is normally maintained in its rear position by the spring 46. When the breech is fully opened, the rear end of the locking bolt 7 will strike the upper end of the latch 42 thus releasing the inertia block to allow it to swing back into normal position releasing the lever 37 to permit it to engage the member 18 when the breech block is again in its forward position.

The gun is, of course, equipped with the usual cartridge extracting and ejecting means and is provided with a magazine and appropriate cut off mechanism for releasing the cartridges from the magazine at the proper time. As to these devices, no claim of novelty is made herein, and since the same are well understood, it will be unnecessary to describe the construction or mode of operation of such devices.

The operation of this gun is as follows: Starting with the parts in the position shown in Fig. 1, it will be seen that the gun is ready to be fired. When the trigger is pulled, the hammer advances and strikes the rear section 21 of the firing pin driving it against the forward section 20 which strikes the primer of a cartridge in the barrel chamber causing the explosion of the cartridge. Even though the operator is pulling back upon the action rod 15, this rearward pressure does not disturb the position of the parts until after the cartridge is fired because the stop lever 37 is blocking the slide 16 and therefore the lug 19 is maintained under the locking lever 7 to hold it in the notch 8. When, however, the cartridge is discharged, the recoil causes the inertia block 39 to rotate sufficiently to shift the stop lever 37 to disengage its forward end from the slide 16, whereupon the action rod 15 may be moved rearwardly. The first movement of the action rod moves the slide 16 rearwardly the block 39 being held by the latch 42 to disengage the lug 19 from the locking bolt 7. As the slide moves rearwardly the slide 16 rides up the curved shoulder 11^a allowing the end of the action rod to slide under it and engage the surface 16^a. The continued rearward movement of the action rod causes the forward end of the link 9 to swing downwardly, the projection 10 acting as the fulcrum, so as to draw down the locking bolt 7 through the medium of the pivotal connection between the link

and the locking bolt, thus unlocking the breech bolt and its associated parts. The rocking of the link 9 relative to locking bolt 7 causes the forward wall of the notch 22 to engage the hook 23 on the forward section 20 to retract it and also causes the lug 25 to enter the slot 24 on the rear section 21 to retract it. During the subsequent rearward and return movement of the breech mechanism the lug 25 remains in the slot and maintains the section 21 in its retracted position until the breech mechanism again assumes its locked position. This arrangement effectively prevents a premature discharge of the cartridge should the hammer in some way be released before the gun is completely breeched. The further rearward movement of the action rod 15 causes the breech bolt, locking bolt and link to move rearwardly bodily, the ribs 5 on the breech bolt following the grooves 4 in the receiver and the lug 10 on the link following the edge 12—12^a. The rearward movement of these parts depresses the carrier through the medium of the stud on the link. Incidental to this movement of the various parts of the breech mechanism, the extractor, ejector and magazine cut off, operate in the usual manner to cause the ejection of the empty shell and the release of a single cartridge from the magazine. Also during its rearward movement, the breech bolt engages the hammer and rotates it into cocked position where the hook 27 is engaged by the hook 28 of the trigger and the shoulder 31 of the sear engages the shoulder 32 on the hammer to hold it in its cocked position. When the breech bolt approaches the rear wall of the receiver, it engages the inertia block latch 42 and disengages it from the inertia block allowing the spring 46 to return the inertia block to its rear position thereby releasing the blocking lever 37. The forward movement of the action rod carries forward the several parts of the breech mechanism bodily, lifts the carrier simultaneously so that the cartridge carried thereby will be raised to its proper position in front of the breech bolt and forced into the chamber of the barrel. The breech bolt engages the end of the barrel to limit the forward movement of the breech mechanism. Further forward movement of the action rod causes the link 9 to tilt in a direction to lift the locking bolt 7 into locking position. Coincident with this tilting of the locking bolt 7, the slide 16 moves forward under the action of its spring 17 following the action slide until the member 18 engages the projection 10 and the lug 19 underlies the locking bolt 7 to maintain it in the notch 8. As the slide 16 advances the lower end of the lug 19 engages the curved portion of the lever 36 which has been brought into position by the upward movement of the carrier

and forces the forward end of the lever 36 downward. The rocking of this lever brings its rear end into engagement with the arm 34 of the sear and rotates the sear against the action of its spring sufficiently to disengage the lug 31 of the sear from the shoulder 32 of the hammer. The lever 36 is not rocked sufficiently to disengage the sear from the hammer until after the lug 19 partially underlies the bolt 7. At the same time the rocking movement of the link relative to the locking bolt moves the lug 25 out of the slot 24 in the section 21 of the firing pin. Simultaneously with these movements, the blocking lever 37 swings up into engagement with the rear end of the slide 16 to hold the latter against movement and prevent a rearward pull on the action rod from unlocking the breech bolt. The gun is now ready to be fired again.

The arrangement of the sear operating lever on the carrier and the provision of the lug on the slide to engage the curved surface on the lever allows a very fine adjustment of the release of the sear. The sear operating lever is not in position to be engaged by the lug until the gun is almost breeched. This is due to the fact that it is mounted on the carrier. Furthermore, the lug does not reach the end of the curved surface until after it underlies the locking bolt, so that the sear is not tripped until after the gun is fully breeched. The maximum safety is thus provided for the operation of this gun.

It is, of course, understood that various modifications may be made in the structure of this device without in any way departing from the spirit of the invention as set forth in the appended claims.

What is claimed is:

1. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a sear adapted to engage said hammer to maintain it in cocked position, a carrier, a lever mounted on said carrier, said lever being adapted to operate said sear to disengage it from said hammer, and means on said breech mechanism to actuate said lever at the closing of the breech.

2. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a sear adapted to engage said hammer to maintain it in cocked position, a cartridge carrier, a lever pivoted to said cartridge carrier adapted to operate said sear to disengage it from the hammer, and means on said breech mechanism to actuate said sear operating lever.

3. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a trigger, a sear pivotally mounted on said trigger and adapted to engage said hammer to maintain it in cocked position, a cartridge carrier, and means mounted on

said carrier to disengage said sear from said hammer, said means being operated by said breech mechanism.

4. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a trigger, a sear pivotally mounted on said trigger and adapted to engage said hammer to maintain it in cocked position, a cartridge carrier a lever mounted on said carrier adapted to operate said sear to disengage it from said hammer, and means on said breech mechanism to actuate said sear operating lever.

5. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a pivotally mounted sear adapted to engage said hammer to maintain it in cocked position, a cartridge carrier, a lever on said cartridge carrier adapted to operate said sear to disengage it from said hammer, said lever having a curved surface, and means on said breech mechanism to engage said surface to rock said lever.

6. In a firearm, a receiver, a breech mechanism reciprocally mounted thereon, an action rod, a link pivotally carried by said breech mechanism and operatively connected to said action rod, a hammer, a cartridge carrier a sear mounted on said cartridge carrier adapted to engage said hammer to maintain it in cocked position, a lever adapted to operate said sear to disengage it from said hammer, and means on said link to actuate said lever.

7. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, a hammer, a sear adapted to engage said hammer to maintain it in cocked position, a carrier, means to actuate said carrier upon reciprocation of said breech mechanism, a lever having a curved surface mounted on said carrier and adapted to operate said lever, and means on said breech mechanism to engage said surface to rock said lever.

8. In a firearm, a receiver, a breech mechanism reciprocally mounted therein, an action rod, a link pivotally carried by said breech mechanism and operatively connected to said action rod, a hammer, a sear adapted to engage said hammer to maintain it in cocked position, a lever adapted to operate said sear to disengage it from said hammer, a member on said link adapted to slide as the breech mechanism is locked, and means on said member to engage said lever whereby movement of said member is effective to actuate said lever.

9. In a fire arm, a receiver, a breech bolt reciprocally mounted therein, a locking bolt pivotally mounted on said breech bolt, an action rod, a link pivotally connected to said locking bolt and operatively connected to said action rod, means on said link adapted to underlie said locking bolt when in locking position, a hammer, a sear adapted

to engage said hammer to maintain it in cocked position, and a lever to actuate said sear to disengage it from said hammer, said means on the link being adapted to actuate said lever.

10. In a firearm, a receiver, a breech bolt reciprocally mounted therein, a locking bolt pivotally mounted on said breech bolt, an action rod, a link pivotally connected to said action rod, reciprocable means on said link adapted to underlie said locking bolt, said means being adapted to be engaged by said action rod when locked up, to maintain it in locking position, a hammer, a sear adapted to engage said hammer to maintain it in cocked position, and a lever to actuate said sear to disengage it from said hammer, said reciprocable means being adapted to actuate said lever.

11. In a firearm, a receiver, a breech bolt reciprocally mounted therein, a locking bolt pivotally mounted on said breech bolt, an action rod, a link pivotally connected to said locking bolt and operatively connected to said action rod, reciprocable means on said link adapted to be actuated by said action rod, a lug on said reciprocable means adapted to underlie said locking lever when it is in its locked up position, a hammer, a trigger, a sear pivotally mounted on said trigger and adapted to engage said hammer to maintain it in cocked position, a lever adapted to actuate said sear to disengage it from said hammer, said lever having a curved surface to be engaged by said lug on said reciprocable means to operate said lever, and means to maintain said reciprocable means with said lug under said locking bolt.

12. In a firearm, a breech bolt, a locking bolt pivotally attached thereto, said locking bolt having a socket, a firing pin in said breech bolt, and a hook on said firing pin,

the point of said hook being arranged in said socket, the arrangement of said hook and socket being such that rotation of the locking bolt in one direction is effective to retract said firing pin but rotation thereof in the other direction does not affect said firing pin.

13. In a firearm, a breech bolt, a locking bolt pivotally mounted thereon, a firing pin comprising reciprocable members in said breech bolt and locking bolt, and means whereby rotation of said locking bolt relative to said breech bolt is effective to retract said members.

14. In a firearm, a breech bolt, a locking bolt pivotally mounted thereon, a link pivotally connected to said locking bolt, a firing pin comprising reciprocable members in said breech bolt and locking bolt, and inter-engaging means on one of said members and locking bolt and on said link and other of said members whereby relative rotation of said breech bolt, locking bolt and link is effective to retract said members.

15. In a firearm, a breech bolt, a locking bolt pivotally mounted thereon, said locking bolt having a socket, a link pivotally connected to said locking bolt, a firing pin comprising reciprocable members in said breech bolt and locking bolt, a hook on said breech bolt member having its point arranged in said socket, said locking bolt member having a groove, a lug on said link adapted to enter said groove, said lug having an oblique surface adapted to engage a wall of said groove, the arrangement of said named elements being such that relative rocking of said breech bolt, locking bolt and link is effective to retract said members.

In witness whereof, I hereunto affix my signature this 13th day of February, 1922.

CARL GUSTAF SWEBILIUS.