Feb. 13, 1923. 1,444,890.

C. G. SWEBILIUS.

AUTOMATIC GUN.

FILED JUNE 11, 1918.

Fig. 1

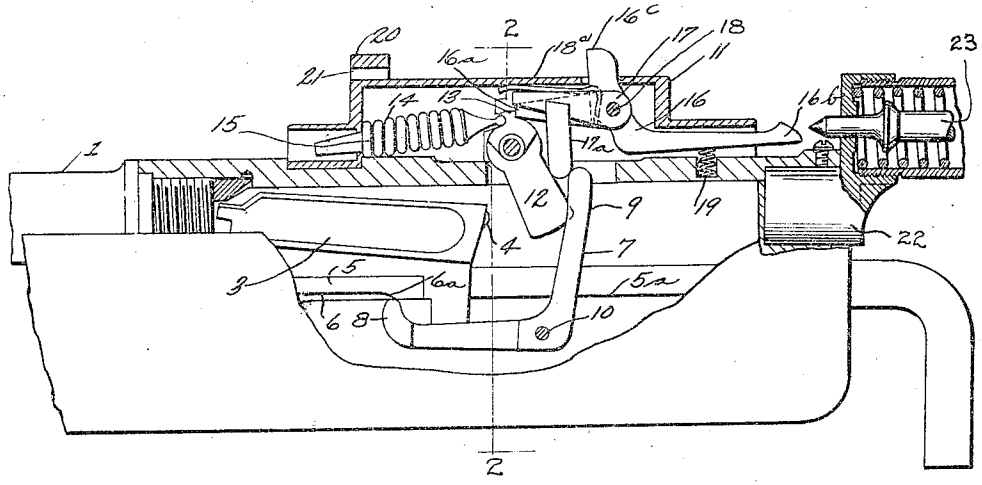


Fig. 2

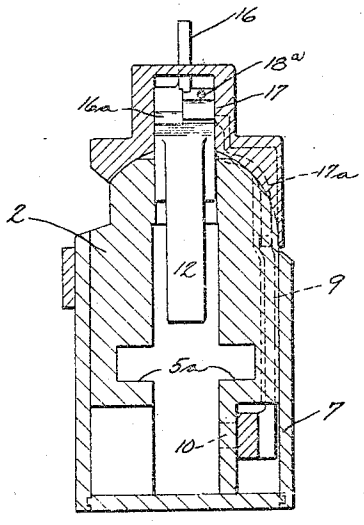
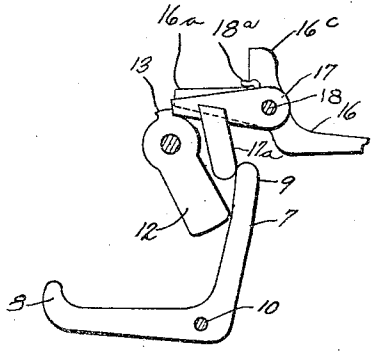


Fig. 3



INVENTOR.

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BY L. O. Hutchinson

ATTORNEYS.

Patented Feb. 13, 1923.

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UNITED STATES PATENT OFFICE.

CARL G. SWEBILIUS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE MARLIN FIREARMS CORPORATION, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF DELAWARE.

AUTOMATIC GUN.

Application filed June 11, 1918. Serial No. 239,359.

To all whom it may concern:

Be it known that I, CARL G. SWEBILIUS, a citizen of the United States, residing at New Haven, county of New Haven, State of Connecticut, have invented a certain new and useful Improvement in Automatic Guns, of which the following is a specification.

My invention relates to automatic firearms and pertains more especially to the firing mechanism of such guns.

The object of this invention is the provision of means whereby impulses or pulsations of a higher frequency than the rate of fire of the gun may be utilized to fire the gun whenever it is breeched.

An additional object of this invention is a firing mechanism such that an automatic gun equipped therewith may be used upon airplanes in conjunction with a synchronizer system.

A further object of the invention is the arrangement of the elements of the firing mechanism of a gun whereby a reciprocating member is caused to oscillate the trigger.

In the drawings, only the elements of the firing mechanism and such elements of the actuating mechanism as are modified are shown. This is merely for the sake of clearness.

Fig. 1 is a sectional view of the breech of the gun.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a detail of the firing mechanism the parts being positioned differently from that of Fig. 1.

Referring now to the drawings, 1 represents the barrel of the gun and 2 denotes the receiver. The breech bolt is designated 3 and the firing pin 4. The sliding action rod, which is numbered 5 and cut away at its lower edge to provide a shoulder 6, one end of which is curved as at 6^a, reciprocates in the well known manner on the guides 5^a and carries the breech bolt 3. A bell crank trip lever 7 having the arms 8 and 9 is pivoted at 10. The end 8 of this lever engages with the shoulder 6 and is caused to rotate slightly by the curved shoulder 6^a. The other end 9 of this lever extends upwardly at right angles to the longitudinal axis of the gun.

Carried on the top of the gun, directly over the receiver is the lock container 11. Pivotally mounted in the lock container and extending into the receiver is the hammer 12 which is provided with the shoulder 13. 14 is the hammer spring and 15 the hammer spring guide. The trigger or detent 16 and the sear 17 are pivotally mounted on the pin 18. The trigger is provided with a forward extension 16^a and also with a rearward extension having a cam surface 16^b thereon. 16^c is an upstanding part of the trigger which extends through the top of the lock container. The sear 17 is provided with a laterally offset downwardly projecting arm 17^a which contacts with the arm 9 of the trip lever. Carried by the sear is the spring 18^a which bears against the top of the lock container and tends to hold the sear down. A spring 19 coacts with the rear end of the trigger 16 to force the rear end thereof upwardly.

The bracket 22 is attached to the gun in any suitable manner and acts as a support for the trigger motor of a synchronizer system, the piston 23 of which is continuously operated during the operation of the gun, and strikes the cam surface 16^b of the trigger, causing the trigger to be operated against the action of its spring 19.

When a gun provided with this firing mechanism is used in connection with a synchronizing system, the trigger 16 is constantly oscillated in a suitable manner, for example, by the reciprocating piston 23 of a synchronizing system striking against the cam surface 16^b or against the extension 16^c. The sliding action rod reciprocates the breech bolt in the well known manner. As soon as the breech bolt is in its locked position the sear is raised due to the fact that the engagement of the arm 8 with the curved surface 6^a on the sliding action rod 5 has caused a slight rotation of the trip lever 7 which results in a slight rotation of the sear due to the engagement of the arm 9 with the arm 17^a of the sear. If it so happens that the trigger is raised at this instant, as shown in Fig. 3, the hammer will be re-

leased upon the disengagement of the sear from the shoulder 13, and will strike against the firing pin 4 causing the firing of the gun. But if the trigger is in the position shown in Fig. 1 at this instant the shoulder 13 will engage with the projection 16^a upon the raising of the sear. At the next oscillation of the trigger, however, this engagement will be broken, and the gun fired.

The sliding action rod will then be forced rearwardly carrying therewith the breech bolt 3. The bolt will contact with the hammer and force the same into position so that the sear under the influence of the spring 18^a will return into engagement with the shoulder 13. This is possible due to the fact that upon the rearward movement of the action rod the cam surface 6^a is no longer in engagement with the arm 8 and the lever 7 is free to rotate slightly in a clockwise direction.

A gun provided with this arrangement of trigger, sear and trip lever can also be used separately from any synchronizing system. By holding down the rear end of the trigger the gun will fire off the sear and will operate automatically to fire as soon as the breach bolt is in position. This is due to the fact that as soon as the breach bolt is in this position, the sear is raised due to the placing of the cam surface 6^a.

By means of this type of firing mechanism, impulses set up by the generator of a synchronizing system may be utilized to cause the firing of the gun at such times that the bullets will always pass between the blades of the propeller of the airplane.

I claim as my invention:

1. In an automatic gun, a receiver having a slot in one wall, a breech mechanism therein, a housing carried by the receiver, a hammer pivotally mounted in said housing and adapted to swing in said slot, a shoulder on said hammer, a sear and a trigger pivotally mounted in said housing and adapted to engage said shoulder, and means to operate said trigger.

2. In an automatic gun, a receiver having a slot in one wall, a breech mechanism therein, a housing carried by the receiver, a hammer pivotally mounted in said housing and adapted to swing in said slot, a shoulder on said hammer, a sear and a trigger pivotally mounted in said housing and adapted to engage said shoulder, and a piston arranged to oscillate said trigger upon reciprocation of the piston.

3. In an automatic gun, a receiver having a slot in one wall, a breech mechanism therein, a housing carried by the receiver, a hammer pivotally mounted in said housing and adapted to swing in said slot, a shoulder on said hammer, a sear and a trigger pivotally mounted in said housing and adapted to engage said shoulder, an action rod operatively associated with the breech mechanism, an offset downwardly-extending arm on said sear, and a lever pivotally mounted on the receiver to engage said arm and adapted to be actuated upon reciprocation of the action rod.

4. In an automatic gun, a receiver having a slot in one wall thereof, a breech mechanism therein, a housing carried by the receiver, a hammer pivotally mounted in said housing and adapted to extend through said slot, a shoulder on said hammer, a sear and a trigger coaxially mounted in said housing and adapted to engage said shoulder, an arm on said trigger having a cam surface and a piston adapted to engage said cam surface.

5. In an automatic gun, a receiver having a slot in one wall thereof, a breech mechanism movably mounted in said receiver, a housing carried by said wall, a hammer mounted in said housing and arranged to cooperate with said breech mechanism through said slot, a trigger and a sear in said housing adapted to engage said hammer, and a common pivot pin for said sear and trigger.

6. In an automatic gun, a receiver having a slot in one wall thereof, a breech mechanism movably mounted in said receiver, a housing carried by said wall, a hammer mounted in said housing and arranged to cooperate with said breech mechanism through said slot, a trigger and a sear coaxially mounted in said housing and arranged to engage said hammer, and means to disengage said sear from said hammer.

7. In an automatic gun, a receiver having a slot in one wall thereof, a breech mechanism movably mounted in said receiver, a housing carried by said wall, a hammer mounted in said housing and arranged to cooperate with said breech mechanism through said slot, a trigger and a sear coaxially mounted in said housing and adapted to engage said hammer, and means mounted on the gun independently of the sear for actuating the sear at the breaching of the gun.

8. In an automatic gun, a receiver having a slot in one wall thereof, a breech mechanism movably mounted in said receiver, a housing carried by said wall, a hammer pivotally mounted in said housing and adapted to swing in said slot to cooperate with said breech mechanism, a trigger and a sear pivotally mounted on a common pin in said housing and adapted to engage said hammer.

9. In an automatic gun, a receiver, a breech mechanism therein, a housing attached to the exterior of the receiver, a hammer mounted in said housing and operatively associated with said breech mechanism, a sear and a trigger mounted in said housing and arranged to engage said hammer, a common pivot pin for said sear and

trigger means to disengage said sear from said hammer, and means to disengage the trigger from said hammer.

10. In an automatic gun, a receiver having a slot, a breech mechanism therein, a housing carried by the receiver, a hammer pivotally mounted in said housing and adapted to swing in said slot, a sear and a trigger pivotally mounted in said housing and adapted to engage said shoulder, and means to actuate said sear and trigger.

11. In an automatic gun, a receiver, a breech mechanism therein, a hammer supported exterior of said receiver and operatively associated with said breech mechanism, a trigger to engage said hammer, and reciprocable means for disengaging said trigger from said hammer.

12. In an automatic gun, a receiver, a breech mechanism therein, a hammer supported exterior of said receiver and operatively associated with said breech mechanism, a sear and a trigger adapted to engage said hammer, a common pivot pin for said sear and trigger, means for disengaging said sear from said hammer, and means for disengaging said trigger from said hammer.

13. In an automatic gun, a receiver, a breech mechanism therein, a housing attached to the exterior of said receiver, a hammer in said housing and operatively associated with said breech mechanism, a trigger and a sear mounted on a common pin in said housing and adapted to engage said hammer, means for disengaging said sear from said hammer and means for disengaging said trigger from said hammer.

14. In an automatic gun, a receiver, a breech mechanism therein, a housing attached to the exterior of said receiver, a hammer having a shoulder pivotally mounted in said housing and operatively associated with said breech mechanism, a sear and a trigger pivotally mounted in said housing and adapted to engage said shoulder, and reciprocable means for operating said trigger.

15. In an automatic gun, a receiver, a breech mechanism therein, a striking mechanism supported exterior of said receiver and operatively associated with said breech mechanism, a pair of members to engage said striking mechanism to hold it in one position, a common pivot pin for said members and means to disengage said members from said striking mechanism.

16. In an automatic gun, a receiver, a breech mechanism therein, a housing exterior of said receiver, a striking mechanism in said housing and operatively associated with said breech mechanism, a plurality of detents for said striking mechanism, a common pivot pin for said detents and means to disengage said detents from said striking mechanism.

17. In an automatic gun, a receiver, a breech mechanism therein, a housing exterior of said receiver, striking mechanism in said housing and operatively associated with said breech mechanism, a detent for said striking mechanism, and means comprising a reciprocating member and a cam surface for releasing said detent from said striking mechanism.

18. In an automatic gun, a receiver having a slot, a breech mechanism therein, a housing carried by said receiver, a hammer mounted in said housing and adapted to extend through said slot to cooperate with said breech mechanism, a detent for said hammer, and means comprising a reciprocating member and a cam surface for releasing said detent from said hammer.

19. In an automatic gun, a receiver having a slot in its top wall, a breech mechanism therein, a housing carried by said receiver, a hammer pivotally mounted in said receiver and adapted to swing through said slot to cooperate with said breech mechanism, a detent for said hammer pivotally mounted in said housing and means comprising a reciprocating member for releasing said detent from said hammer.

20. In an automatic gun, a receiver having a slot in its top wall, a breech mechanism therein, a housing carried by said receiver, a hammer pivotally mounted in said receiver and adapted to cooperate with said breech mechanism through said slot, a sear to engage said hammer, means to disengage said sear from said hammer, a detent for said hammer, and means comprising a vibratory member for releasing said detent.

21. In an automatic gun, a receiver, a breech mechanism therein, a housing carried by an exterior wall of said receiver, a hammer pivotally mounted in said housing and adapted to cooperate with said breech mechanism, a pin carried by said housing, and a plurality of detents for said hammer pivotally mounted on said pin.

22. In an automatic gun, a receiver, a breech mechanism therein, a hammer having a shoulder supported exterior said receiver and operatively associated with said breech mechanism, a plurality of detents for engaging said shoulder, and means for tripping said detents.

23. In an automatic gun, a receiver, a breech mechanism therein, a hammer supported exterior of said receiver and operatively associated with said breech mechanism, a hammer engaging member, and reciprocable means for actuating said hammer engaging member.

24. In an automatic gun, a receiver, a breech mechanism therein, a striking member supported exterior of said receiver and operatively associated with said breech mechanism, a detent for said striking mem-

ber, a cam on said detent, and a reciprocable member adapted to engage said cam.

25. In an automatic gun, a receiver, a breech mechanism therein, a striking member supported exterior of said receiver and operatively associated with said breech mechanism, a detent for said striking member pivotally mounted exterior of said receiver, an oblique surface on said detent, and a reciprocable rod arranged to engage said oblique surface.

In testimony whereof, I hereunto affix my signature.

CARL G. SWEBILIUS.