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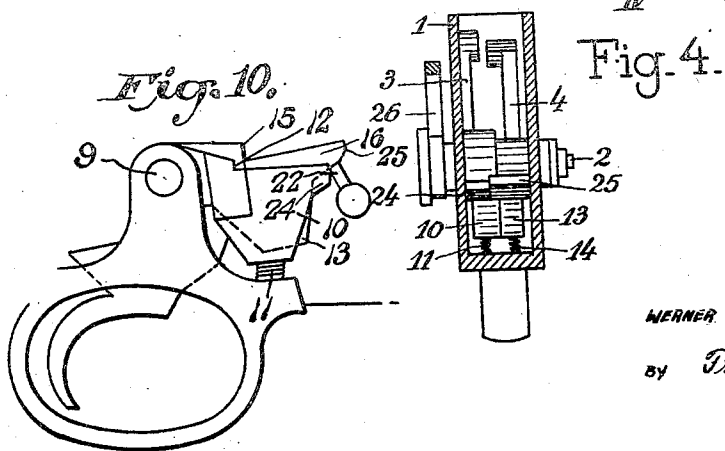
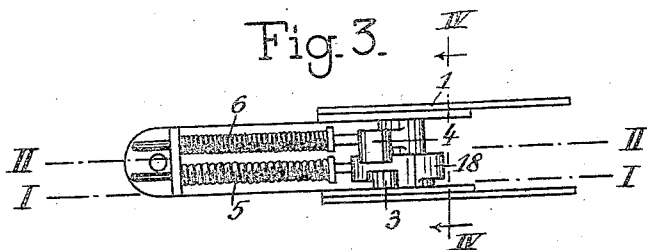
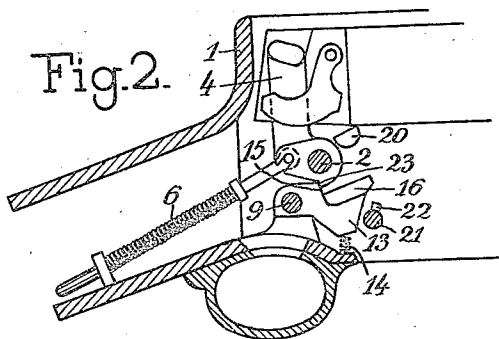
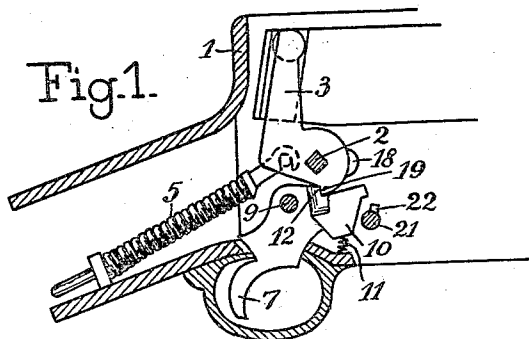
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TRIGGER MECHANISM FOR AUTOMATIC SMALL FIREARMS

Filed Sept. 3, 1924

2 Sheets-Sheet 1



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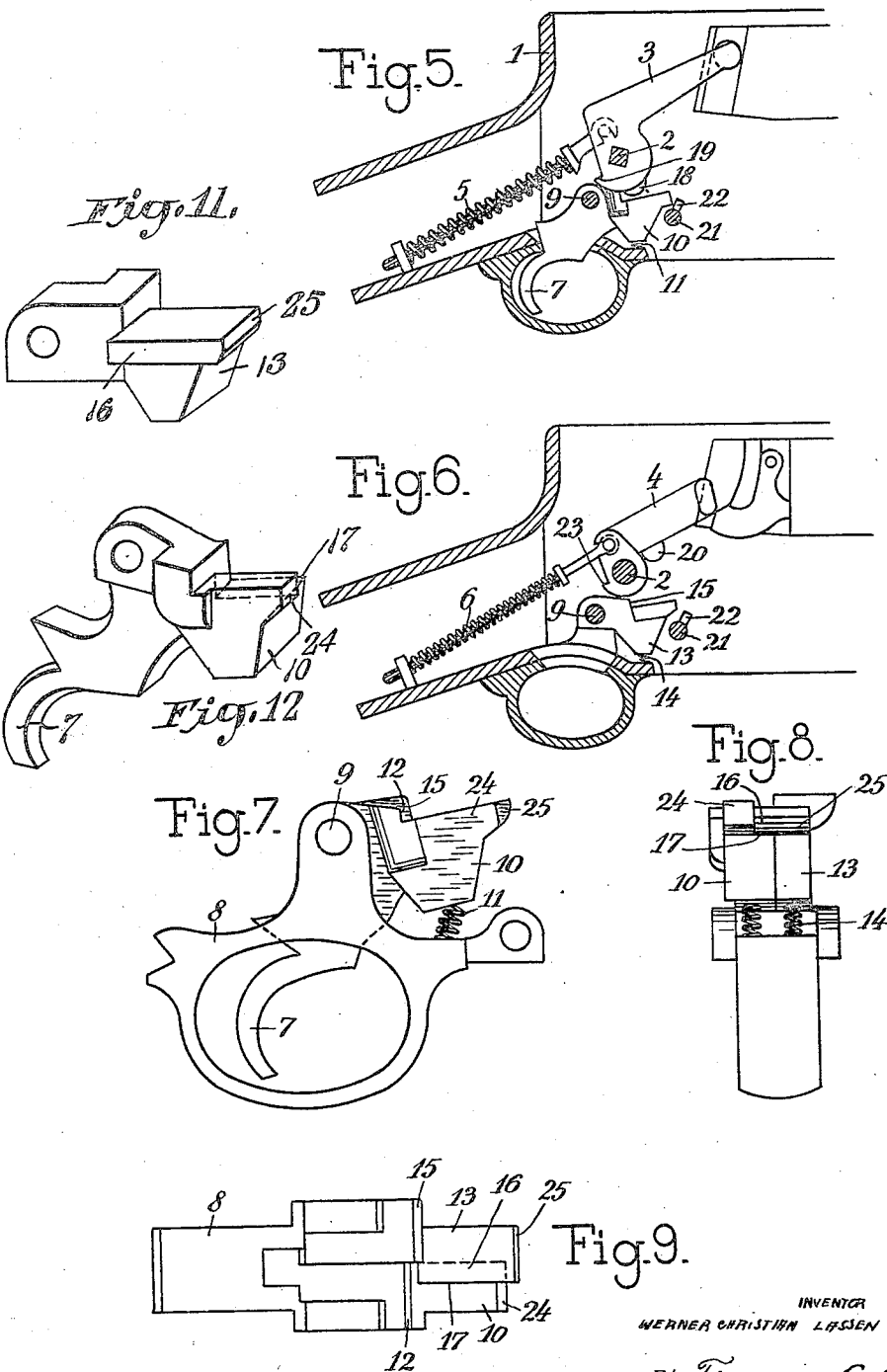
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TRIGGER MECHANISM FOR AUTOMATIC SMALL FIREARMS

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TRIGGER MECHANISM FOR AUTOMATIC SMALL FIREARMS.

Application filed September 3, 1924, Serial No. 735,545, and in France September 24, 1923.

The present invention relates to a trigger mechanism for automatic small fire arms of the kind by which there are provided a spring-actuated recoil lever adapted to move the barrel forward and a spring-actuated percussion lever adapted to fire the charge, both of the said levers being set by the recoil of the barrel and the breech block.

The trigger mechanism according to the present invention is arranged in such a manner—

That a cartridge inserted all the way into the chamber will always be fired when the barrel and the breech block have been moved forward into their foremost position.

That the barrel and the breech block will always remain in the withdrawn position, when the trigger is released,

That the barrel and the breech block, when the gun is secured, while these parts are in their rearmost position, cannot be moved forward into their foremost position, whereby the danger is removed that a cartridge may be moved into the chamber and, if the latter is sufficiently hot, may be fired by self-ignition,

That the barrel and the breech block are prevented from being moved home into their foremost position, when by a wrong operation the safety device is turned into an intermediate position.

This position is selected in such a manner that the breech may be closed over the cartridge which is introduced into the chamber after the error of operation has been remedied. Before firing is resumed, the cartridge is ejected from the chamber by a loading manipulation, and the safety device is then turned into free position, whereafter the gun is once more ready to be fired.

The following description will explain how these advantages are attained.

The invention is illustrated on the drawing,

Figs. 1 and 2 showing sections along the lines I—I and II—II, respectively, in Fig. 3,

Fig. 3 the trigger mechanism in top view, Fig. 4 a section along the line IV—IV of Fig. 3,

Figs. 5 and 6 showing sections corresponding to those shown in Figs. 1 and 2, but with the parts in a different position,

Figs. 7, 8 and 9, on a larger scale, the trigger mechanism proper in side elevation,

front elevation and in top view, respectively,

Fig. 10 the trigger mechanism in side elevation with the parts in another position than the one shown in Fig. 7, and

Figs. 11 and 12 some details in perspective view.

1 is the lock frame and 2 a bolt journaled in the same, the recoil lever 3 being rigidly attached to the said bolt, while the percussion lever 4 is free to rotate about the bolt. 5 is the recoil spring and 6 the percussion spring, co-operating with the recoil lever 3 and the percussion lever 4, respectively, the said springs becoming tightened, when the levers 3 and 4 by the return motion of the barrel and the breech block are turned from the position shown in Figs. 5 and 6 into those shown in Figs. 1 and 2.

The trigger is pivoted about a bolt 9 journaled in the trigger plate 8, and is shaped as a two-armed lever, one arm 7 of which forms the trigger proper, while its other forwardly directed arm 10 is actuated by a helical spring 11, and has a fixed stopping hook 12. On the bolt 9 is further hung the sear 13, which is a single-armed lever provided alongside the trigger and actuated by a helical spring 14. The sear has a fixed stopping hook 15 and, on the side facing the trigger arm 10, a projection 16, Figs. 8, 9 and 11, which fits into a notch 17, Figs. 8 and 12 in the upper face of the trigger arm 10. The trigger arm 10 is fitted, at its front end, with a beak 24 and the sear similarly with a beak 25. The latter is, as it appears from Figs. 7 and 9, slightly longer than the beak 24.

On the hub of the recoil lever 3 there is provided a lug 18 above the trigger arm 10 and also above the projection 16 on the side of the sear. The hub of the recoil lever is further fitted with a stop 19 adapted to co-operate with the stopping hook 12 of the trigger arm 10, and the hub of the percussion lever is fitted with a stop 23 adapted to co-operate with the stopping hook 15 of the sear 13.

20 is a tappet provided in the lock frame and adapted to limit the forward motion of the percussion lever, and the percussion lever rests against this tappet, when the lock mechanism is to be put together after having been taken apart. 21 is the safety bolt with a projecting lug 22.

By the recoil of the barrel and the breech

block the recoil lever 3 and the percussion lever 4 are returned in known manner from the positions shown in Figs. 5 and 6 into those shown in Figs. 1 and 2. When the trigger is free, its stopping hook 12 will catch the stop 19 of the recoil lever, whereby the recoil lever is arrested, so that the recoil spring 5 cannot then move the barrel and the breech block forward. At the same time the percussion lever is arrested by the stopping hook 15 of the sear 13 engaging the stop 23 of the percussion lever.

When now the grip 7 of the trigger is pulled back, then the stopping hook 12 of the trigger will be withdrawn from the stop 19 on the recoil lever, which is hereby turned forward by the recoil spring 5, and moves the breech block and the barrel forward into their forward position. During this rotation of the recoil lever, the projection 18 on the hub of the recoil lever will exert a downward pressure on the projection 16 on the sear 13, whereby the latter is forced downward alongside the forwardly directed arm 10 of the trigger, whereby the stopping hook 15 of the sear is removed from the stop 23 of the percussion lever, so that the said lever may be moved forward by the percussion spring 6 for firing the charge. By the recoil the barrel and the breech block are again withdrawn, whereby the recoil lever and the percussion lever are turned from the positions shown in Figs. 5 and 6 into those shown in Figs. 1 and 2. During firing the trigger grip 7 is constantly maintained in the withdrawn position, so that the trigger lever 10 is moved down so far that its stopping hook 12 cannot catch the stop 19 of the recoil lever and, consequently, the recoil lever will not be arrested. By the rearward rotation of the recoil lever the lug on this lever releases the sear 13, whereby the latter while actuated by the spring 14 is moved upward, so that the stopping hook 15, when the percussion lever is turned into the position shown in Fig. 2 enters up behind the stop 23 of the said lever and, thereby maintains the percussion lever in the arrested position. The recoil lever as mentioned above being not arrested during the return motion, it will immediately thereafter be turned forward again by action of the recoil spring. During the last portion of this forward rotation the projection 18 of the recoil lever releases again the sear 13, so that the percussion lever, after the forward motion has been finished, is again turned forward by the percussion lever, and fires a new shot. The same operation is repeated during the subsequent recoils and forward motions, as long as the trigger grip 7 is maintained in its rear position.

If the trigger grip is released, when firing is to cease, then the trigger spring 11 will tend to force the trigger arm 10 upward.

If the trigger grip happens to be released during the forward motion, then the projection 18 of the recoil lever will depress the sear at the end of the forward motion, and the cartridge which is inserted in the chamber will therefore be fired in normal manner. During the recoil, on the contrary, the trigger lever 10 is released by the rotation of the recoil lever into the position shown in Fig. 1, and the stopping hook 12 of the trigger lever 10 will therefore enter into engagement with the stop 19 of the recoil lever, when the return motion is finished, whereby the recoil lever is arrested in such a manner that the forward motion will be prevented. The percussion lever is arrested in the above described manner by the stopping hook 15 of the sear. If the trigger grip is released during the recoil, then the stopping hook 23 of the trigger arm 10 will arrest the recoil lever, in the same manner as described, above after the recoil is finished.

From the above it appears that a cartridge which when firing is stopped has been inserted into the chamber or is inserted therein will always be fired, and that the mechanism, after the cartridge has been fired, is locked in the withdrawn position, so that no fresh cartridge can be inserted into the chamber before the mechanism is again released by the trigger grip being pulled back. Hereby the danger of chance shots in consequence of the weapon being loaded during its removal from one place to another will be avoided.

As a security against the weapon being loaded and fired by an accidental pull on the trigger grip, the safety bolt 21 is provided with the lug 22, which when the bolt is rotated will be swung in below the beaks 24 and 25 of the trigger lever and the sear, respectively, the said lug being of such a length that it may arrest both of these beaks. For this reason a cartridge cannot casually, for instance when firing is stopped, be inserted into the chamber and fired by self-ignition, if the barrel has become overheated by a long series of shots.

If during firing the mechanism fails to operate, so that a cartridge cannot be moved home in the chamber, and the breech consequently cannot be fully closed, then the forward motion will be prevented thereby. When now in order to remove the cause of this failure of the mechanism the trigger grip is released, the safety bolt 21 should first be turned. The projection 22 of this bolt will then slide below the front portion of the beak 25 of the sear 13, until the said projection reaches the front end of the beak 24 of the trigger arm 10. The projection 22 cannot enter below this beak, as the trigger arm 10 is maintained depressed by the hub of the recoil lever, see Fig. 5. When the cause of the failure of the mechanism

has been removed and the forward motion is continued by action of the recoil spring, the cartridge will nevertheless not be fired, as the sear 13 is arrested by the projection 22 of the safety bolt engaging the bottom side of the beak 25. While the safety bolt is left in this locking position, the breech block and the barrel are returned by means of a handle 26 on the bolt 2, whereby the cartridge inserted in the chamber is ejected in the same manner as the empty cartridge case, and the recoil lever is locked by the stopping hook 12 of the trigger lever 10 engaging the rear face of the stop 19 of the recoil lever. The projection 22 of the safety bolt is now turned away from the beak 25 of the sear, and firing may then be continued by a pull on the trigger grip 7. By the above described locking arrangement, untimely firing of the cartridge about to be moved forward, when the failure of the mechanism occurred will be prevented.

The above described trigger mechanism offers not only security against the weapon being loaded when firing stops, but an essential advantage of the mechanism is that it consists of extremely few parts co-operating with each other and with the recoil lever and the percussion lever in a most simple and reliable manner. In consequence of the simple construction the parts may be made very solid, because owing to their small number there will be more room in the lock frame than in case of the heretofore used more complicated mechanisms, so that the mechanism becomes far more durable.

Having thus described my invention, what I claim is:—

1. An automatic firearm comprising, in combination, a reciprocable barrel and breech block, a spring-actuated recoil lever for imparting forward motion to said barrel and breech block, a spring-actuated percussion lever, means actuated by the recoil of the barrel and breech block for setting both of said levers, a pivoted trigger for retaining the recoil lever in set position, a pivoted sear for retaining the percussion lever in set position, a trigger grip for manually rocking said trigger on its pivot thereby to release said recoil lever, said trigger having a depression and the sear having a projecting portion adapted to be seated in said depression, a projection carried by the recoil lever and adapted to engage said projecting portion thereby to rock the sear on its pivot and release the percussion lever during the forward motion of the recoil lever, the organization being such that when the trigger grip is held so as to maintain the trigger in its rocked position the recoil and percussion levers will be automatically reciprocated and if said grip is released during the forward motion said reciprocating motion will con-

tinue until the levers arrive at the limit of their recoil motion, said trigger and sear being actuated during said recoil motion to lock said levers.

2. An automatic firearm comprising, in combination, a reciprocable barrel and breech block, a spring-actuated recoil lever for imparting forward motion to said barrel and breech block, a spring-actuated percussion lever, means actuated by the recoil of the barrel and breech block for setting both of said levers, a pivoted trigger for retaining the recoil lever in set position, a pivoted sear for retaining the percussion lever in set position, a trigger grip for manually rocking said trigger on its pivot thereby to release said recoil lever, said trigger having a depression and the sear having a projecting portion adapted to be seated in said depression, a projection carried by the recoil lever and adapted to engage said projecting portion thereby to rock the sear on its pivot and release the percussion lever during the forward motion of the recoil lever, the organization being such that when the trigger grip is held so as to maintain the trigger in its rocked position the recoil and percussion levers will be automatically reciprocated and if said grip is released during the forward motion said reciprocating motion will continue until the levers arrive at the limit of their recoil motion, said trigger and sear being actuated during said recoil motion to lock said levers, said trigger and sear each having at its forward end a projecting portion, and a rotatable bolt having a projection adapted to engage the projections of the trigger and sear thereby to prevent actuation of the trigger grip.

3. An automatic firearm comprising, in combination, a reciprocable barrel and breech block, a spring-actuated recoil lever for imparting forward motion to said barrel and breech block, a spring-actuated percussion lever, means actuated by the recoil of the barrel and breech block for setting both of said levers, a pivoted trigger for retaining the recoil lever in set position, a pivoted sear for retaining the percussion lever in set position, a trigger grip for manually rocking said trigger on its pivot thereby to release said recoil lever, said trigger having a depression and the sear having a projecting portion adapted to be seated in said depression, a projection carried by the recoil lever and adapted to engage said projecting portion thereby to rock the sear on its pivot and release the percussion lever during the forward motion of the recoil lever, the organization being such that when the trigger grip is held so as to maintain the trigger in its rocked position the recoil and percussion levers will be automatically reciprocated and if said grip is released during the forward

motion said reciprocating motion will continue until the levers arrive at the limit of their recoil motion, said trigger and sear being actuated during said recoil motion to lock said levers, said trigger and sear each having at its forward end a projecting portion, and a rotatable bolt having a projection adapted to engage the projections of the trigger and sear thereby to prevent actuation of the trigger grip, said projections being so disposed that said bolt projection may engage the sear projection independently of the trigger projection.

In testimony whereof I have signed my name to this specification.

WERNER CHRISTIAN LASSEN HAUBROE.