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SAFETY UNIT FOR AUTOMATIC WEAPONS

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Fig. 1.

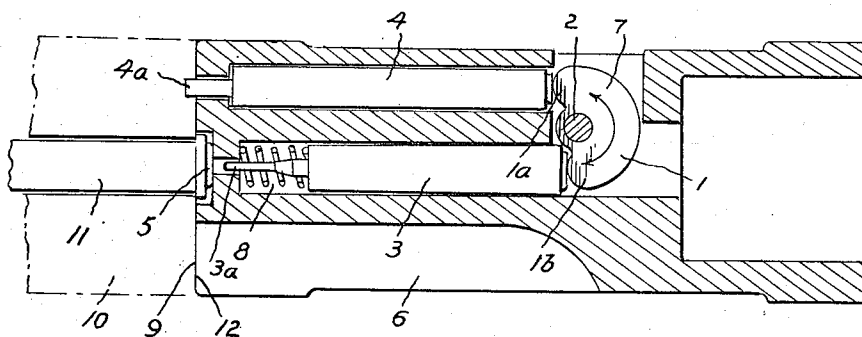
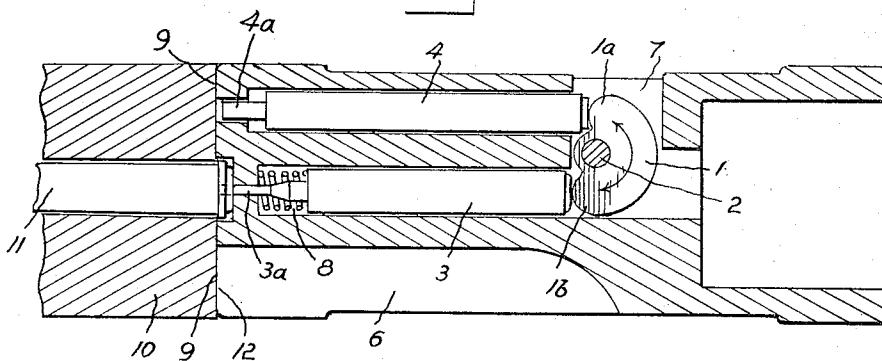


Fig. 2.



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SAFETY UNIT FOR AUTOMATIC WEAPONS

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2 Claims. (Cl. 89—151)

1

The invention outlined herein refers to a safety unit for sub-machine guns and other automatic weapons of a similar nature, and the purpose thereof is to ensure that percussion of a cartridge and the subsequent explosion will only occur when said cartridge has been wholly and perfectly introduced into the breech chamber, thus eliminating all risks of a premature and therefore dangerous explosion.

A cartridge which has been imperfectly introduced into the breech chamber (a fairly frequent occurrence due to several causes, such as defective cartridges, imperfect functioning of the loading mechanism due to particles of sand, dust, unburnt powder and similars, and careless handling, and so on) will result in a premature and outward explosion which will seriously affect the gunner and more specifically his eyesight, endanger the persons in his vicinity, plus the material disadvantage of partially disabling the weapon.

The mechanism dealt with herein eliminates these inconveniences and can be applied to practically every type of automatic arms in existence, facilitating the handling thereof and rendering them completely independent of the experience or care of the gunners, and consists in disposing inside the breech bolt an oscillating lever which, when in normal position (in repose), receives at one end the constant thrust of the rear face of the firing pin always subject to a rearward pressure from a spring, while, with the opposite end, this lever thrusts against the rear face of an auxiliary actuating rod holding it in its foremost position with the point projecting a little beyond the vertical front face of the breech bolt.

The exact working of this mechanism may be appreciated from the following description based on the attached drawings which merely outline a practical example of the way in which this invention may be applied, without in any way being restrictive provided that the essentials thereof be safeguarded;

Figure 1 illustrating a vertical longitudinal sectional view of a breech bolt fitted with the said mechanism in repose, that is to say, normal position, and

Figure 2 a similar sectional view with the mechanism in action, that is to say, with the cartridge during the instant of the explosion;

Same parts are always represented by the same numeral.

At 1, the half-moon shaped lever is shown with the end stops 1^a and 1^b, said lever oscillates

2

around the axis 2; 3 indicates the firing pin which ends at point 3^a, and 4 the auxiliary actuating rod with its frontal supplement 4^a, 5 represents the cartridge socket with the priming, 6 the body of the breech bolt with the pocket 7 where the oscillating lever is lodged; 8 the spring that presses constantly on the firing pin, 9 the vertical rear surface of the barrel 10 where the cartridge 11 is introduced. It will be readily appreciated that the mechanism involved is lodged within the body of the breech bolt 6, the vertical front-face of which is indicated by 12.

As illustrated in Figure 1 (normal position), the spring 8 maintains the firing pin 3 pressed back and the point 3^a is, therefore, hidden within the body of the bolt 6 and unable to enter in contact with the socket 5 of the cartridge shell 11. The rear end of this pin 3 being in contact with the stop 1^b of the lever 1, maintains this stop in its hindmost position, while the upper stop 1^a of lever 1 holds the auxiliary actuating rod 4 at its foremost position, with the nose 4^a projecting somewhat beyond the vertical front-face 12 of the bolt 6. As long as the component parts of the bolt remain in their normal position (say in repose), what they evidently do during the recoil movement and almost to the end of the advance stroke of the bolt, the priming of the cartridge socket 5 cannot be struck by the firing pin 3^a and, therefore, a premature explosion cannot take place.

Figure 2 illustrates the relative position of the component parts of this mechanism during the instant the regular explosion of the cartridge is going on, that is to say, the position guaranteed by fitting this mechanism to the weapon in question.

The safety unit works in the following manner: When the cartridge explodes (see Figure 2), the breech bolt is thrust violently to the rear, breaking the contact between its front-face 12 and the opposite back-face 9 of the barrel 10, and the pressure of the spring 8 coming immediately into play, thrusts back the firing pin 3 the point 3^a of which disappears inside the body of the breech bolt 6, while its rear end pushes back the stop 1^b of lever 1 and causes the latter to oscillate around its axis 2 in the direction shown by the black arrow (Figure 1) and, through its stop 1^a in contact with the rear face of the auxiliary actuating rod 4, thrusts the latter to its foremost position and causes the nose 4^a to protrude a little beyond the vertical plane 12 of the breech bolt 6. The relative position of all these component parts is maintained to almost

3

the whole progressive stroke of the bolt. During the recoil, the bolt ejects the empty shell, and when it has reached its hindmost position it is retained there by the retention catch, except in the case of firing the shots in series, when it is immediately moved forward once more. The breech is now empty and ready for receiving another cartridge. By pulling the trigger (or keeping it pressed down in the case of shooting in series), the pressure exerted by the recuperating spring pushes the bolt forward, picking up a new cartridge from the magazine and introducing it into the breech chamber with the certainty that the firing pin 3 is always thrust back and that its point 3^a is unable to contact the priming in the socket 5 of the cartridge. When the cartridge 11 has been wholly introduced into the breech chamber, the front face of the nozzle 4^a of the auxiliary actuating rod 4 enters in contact with the vertical rear face 9 of the barrel 10 or another similar stop adequately disposed, which obliges the auxiliary actuating rod to retract a little and its rear face gyrating the oscillating lever 1 around axis 2 in the direction shown by the dotted arrow (Figure 1), causes the stop 1^b to push forward the firing pin 3 whereby its point 3^a projects beyond the front-face 12 of the bolt 6 and strikes the priming in the cartridge socket 5, producing the most perfect and safe explosion which can be possibly devised in percussion systems applied to automatic arms. The cycles are then repeated in the manner already described.

By virtue of its configuration, the half-moon shaped lever 3, when rotating on its axis 2, can move its circular rear side freely, irrespective of the presence of products of combustion, dust, rust, sand unburnt powder grains, and other impurities, which have a tendency to collect at the bottom of the pocket 7. Such impurities cannot lie in the path of rotation of the lever 3, and hence they cannot impede operation of the safety device.

I claim:

1. For use in an automatic weapon having a gun body and a breech bolt axially slidable with said gun body, the gun body having at its forward part an abutment constituting a breech bolt stop and the breech bolt having at its front end a stop face co-operating with the abutment; a firing pin mounted for axial rectilinear sliding movement in the forward portion of the breech bolt, spring means urging said firing pin in a rearward direction, a half-moon-shaped lever having its half-moon horn ends rounded, said half-

4

moon-shaped lever being rotatably mounted at its axial center, one of said rounded ends freely engaging with the rear end of said firing pin, an actuating rod mounted in a bore in the front upper portion of the breech bolt for rectilinear sliding movement in a direction parallel to the movement of said firing pin and having its rear end in engagement with the second rounded end of said half-moon-shaped lever, and having its front end of reduced diameter arranged to project normally forwardly through a reduced counter-bore a limited amount beyond the said stop face of the breech bolt and to engage the said abutment on the gun body as the breech bolt approaches its final forward position to slide said actuating rod rearwardly in the breech bolt for rotating said half-moon-shaped lever about its axis to thereby actuate said firing pin.

2. For use in an automatic weapon having a gun body and a breech bolt axially slidable within said gun body, the gun body having at its forward part an abutment constituting a breech bolt stop and the breech bolt having at its front end a stop face co-operating with the abutment; a firing pin mounted for axial rectilinear sliding movement in the forward portion of the breech bolt, spring means urging said firing pin in a rearward direction, a half-moon-shaped lever having its half-moon horn ends rounded, said half-moon-shaped lever being rotatably mounted at its axial center, one of said rounded ends freely engaging with the rear end of said firing pin, an actuating rod mounted in a bore in the front upper portion of the breech bolt for rectilinear sliding movement in a direction parallel to the movement of said firing pin and having its rear end in engagement with the second rounded end of said half-moon-shaped lever, and having its front end arranged to project normally forwardly a limited amount beyond the said stop face of the breech bolt and to engage the said abutment on the gun body as the breech bolt approaches its final forward position to slide said actuating rod rearwardly in the breech bolt for rotating said half-moon-shaped lever about its axial center to thereby actuate said firing pin.

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REFERENCES CITED

The following references are of record in the file of this patent:

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