

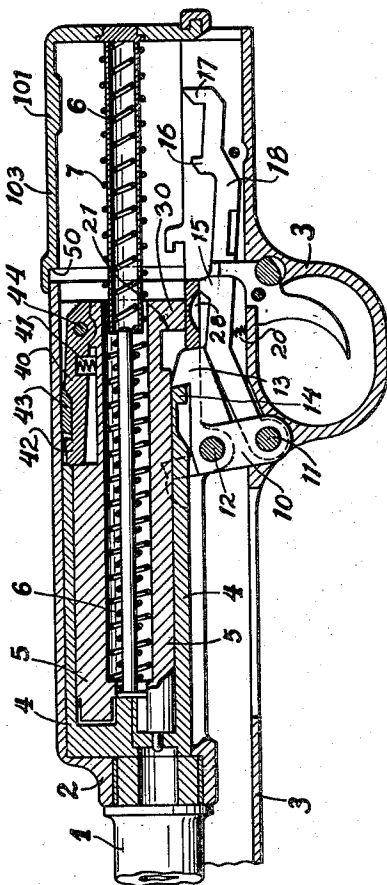
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AUTOMATIC SEAR FOR AUTOMATIC FIREARMS

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## UNITED STATES PATENT OFFICE

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AUTOMATIC SEAR FOR AUTOMATIC  
FIREARMS

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1 Claim. (Cl. 89-149)

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My application for United States Patent Serial No. 117,154, filed September 22, 1949, describes a relatively light breech-bolt and a relatively heavy hammer which perform together their backwards run within the casing, but perform separately, in two different phases, their forwards run.

The purpose of this construction was to lag the ignition of the cartridge brought into the gun by the breech-bolt, in order to reduce the speed of the shooting during an automatic series fire.

The experience shows that the weight of the hammer must be in some cases as great as the weight of the breech-bolt and in other cases greater, what constitutes a mass-ratio up to now unknown in the automatic and non-automatic arms.

This new distribution of the masses makes possible a good shooting speed with a light breech-bolt running backwards along a short run, as well as for arms with a gun which moves slightly back as for arms with a fixed gun.

The drawing shows by way of example, one form of execution of the object of the invention. The figure is an axial sectional view of the breech-mechanism.

In the drawing, 1 designates the barrel which is rigidly secured to a barrel extension 2 and which can perform a slight recoil movement about 0.15 inch in the frame 3. 4 designates the breech-bolt slidably arranged in the barrel extension 2, and 5 designates the striker which is slidably mounted within the breech-bolt. The breech-bolt 4 is a hollow cylinder in which slides the front part of the striker which is likewise cylindrical. 6 designates the recoil spring the front end of which bears directly on the breech-bolt. 7 is the firing spring the front end of which bears on the front wall of a boring provided in the striker.

The rear portion of the breech-bolt 4 is guided during the second phase of the recoil in the longitudinal inner straight wall of a rear casing 103 fastened to the frame 3, substantially in the prolongation of the straight guiding wall of the barrel extension 2.

The breech-bolt 4, as well as the barrel 1 and barrel extension 2 are adapted to be locked before firing, by a crank-lever like locking member 10-13 pivoted at 11 to the frame and linked by a bolt 12 to the barrel extension 2. The hook-shaped end 13 of this locking member engages a corresponding lower shoulder 14 of the breech-bolt.

A toothed sear 18 is pivoted about the pin 11

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and carries a rearmost tooth 17, a second tooth 16 and an upper protrusion 15. The spring 20 tends to lift the sear 18 into engagement either with the breech-bolt 4 or with the striker 5 or both.

A catch 40, 42 pivoted on pin 44 carried by the striker 5 is urged by the spring 41 in engagement with the abutment 43 provided in the breech-bolt 4 so as to connect said breech-bolt and striker to each other substantially during the recoil. The rear casing 103 is provided with an inner rib 101 adapted to tilt the catch 40-42 as will be hereinafter explained.

The striker 5 is provided at its rear end with a retaining shoulder 30 having a vertical wall 21 adapted to be engaged by the rearmost tooth 17 of the sear. The barrel extension 2 has a cam-shaped rear edge 28 on the path of which is located the protrusion 15.

The sear 18 is adapted to catch, in their near rearmost positions, in single fire the breech-bolt and the striker, in automatic fire, the striker alone. It is this latter case in which the new disposition of weight and movement of firing of the striker proves useful.

At a shot the barrel with barrel-extension, breech-bolt and striker recoil, first a short distance, within which the breech-bolt is unlocked and, subsequently, barrel and barrel-extension stopped by the flange 50 of the rear casing 103. The breech-bolt 4 and the striker 5 continue, under the effect of the required momentum and of the residual pressure in the barrel, their rearward travel, during which the striker is connected to the bolt by the catch 40, 42. Toward the end of their common rearward movement this catch is depressed by the rib 101 of the rear casing 103, so that the striker 5 is disjoined from the breech-bolt 4.

In automatic fire, the breech-bolt 4 is now free to run forward under the effect of the recoil spring 6. The striker 5 remains, in the meantime, caught on the tooth 17 of the sear 18.

When the breech-bolt arrives into its foremost position in the barrel-extension 2, breech-bolt, barrel-extension and barrel made an additional movement forward, the movement of locking. During this movement the rear edge or cam 28 of the barrel extension 2 glides over the protrusion 15 on the back of the sear 18 and depresses this into lowest position. By this movement the striker 5 is released from the tooth 17 of the sear and now, when the breech-bolt has already been fully closed and locked, the striker moves for-

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ward freely, until its point hits and ignites the cap of the cartridge in the barrel.

This movement of firing of the striker being only slightly, some  $\frac{1}{3}$ - $\frac{1}{2}$  of an inch, shorter than the total recoil of the breech-bolt and striker, a comparatively weak firing spring is able to impart to the striker the required impact. Under the effect of a comparatively weak force the forward movement of the comparatively heavy striker will be slow, so that the firing of the cartridge in the barrel will sensibly be delayed. This fact makes itself especially felt in full automatic fire, the rate of which is thus conveniently slowed down.

The catch 40, 42 reestablishes the connection between striker 5 and breech-bolt 4 shortly before the point of the striker touches the cap of the cartridge in the barrel. The forward movement, the functioning of the striker in general is hereby not affected, not influenced.

The weight of the striker 5 is here of about 1.3 times greater than the weight of the breech-bolt 4, but in other arms it could be up to twice as great. In order to increase the ratio of the masses between the striker and the breech-bolt, the striker can be made of an especially heavy metallic alloy and/or the breech-bolt can be made of a light alloy.

What I claim is:

In a light automatic fire arm comprising a frame; a breech-bolt and striker mechanism, the recoil of which is controlled by the pressure of the firing gases, in combination: a barrel having a hollow rear extension movably supported by said frame for a short recoil movement therein; said barrel extension comprising a longitudinal straight guiding wall and a cam-shaped rear edge; a rear casing fastened to the frame and having a longitudinal inner straight wall substantially in the prolongation of said guiding wall of the barrel extension; an elongated recessed straight breech-bolt slidably located within said barrel extension; a striker in the form of an elongated straight body carrying a firing pin, the fore part of said

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striker being adapted to slide in said recessed breech-bolt and the rear part adapted to slide along said inner straight wall of the rear casing, said striker being provided with a retaining shoulder; means for connecting said breech-bolt and striker to each other substantially during the recoil; means for releasing said breech-bolt from said striker substantially at the end of said recoil; a recoil spring inserted between said rear casing and said breech-bolt; a firing spring inserted between said casing and striker; a toothed gear pivoted to the frame and comprising at least a rearmost tooth and a protrusion, said protrusion being located in the path of said cam-shaped edge; said rearmost tooth being adapted to contact said retaining shoulder of the striker in order to catch the latter at the beginning of the counter-recoil movement, so that the breech-bolt alone is able to move forwardly under the action of said recoil spring, until said cam-shaped rear edge of the barrel extension strikes said protrusion, thus freeing the striker itself for the firing forward movement, the main effective cross sections and relative longitudinal dimensions of said breech-bolt and said striker being so determined that the weight of this latter be at least equal to, up to a multiple of, the weight of the breech-bolt.

PAUL DE KIRALY.

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