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## AUTOMATIC PISTOL

Fritz Walther and Fritz Barthelmes, Zella-Mehlis, Germany, assignors to Carl Walther, Waffen-Fabrik, Zella-Mehlis, Germany

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9 Claims. (Cl. 42—4)

This invention relates to automatic fire arms such as pistols, comprising a frame, a barrel, a breech mounted to slide on the frame, a bolt between the breech and the barrel, and return means.

A modern automatic pistol should have a triplock, a double acting safety device, an automatic locking device for the hammer, and a loading indicator for indicating the presence of a cartridge in the barrel. The pistol should have a pleasing appearance, must not be too heavy, and must rest securely in the hand.

It is an object of the invention to so design an automatic fire arm and particularly a pistol, in which the width of the bolt is substantially equal to the width of the frame, that the aforesaid conditions are fulfilled.

In a fire arm, and particularly in one for heavy ammunition, obviously all parts, and especially the bolt, must be strong in proportion to the heavy stress to which they are subjected. Therefore, the bolt is made as thick, or substantially as thick, as the frame. With such a thick bolt, it is obviously not practicable to arrange counter recoil springs at the sides of the bolt neither in the frame nor in the barrel, as the overall width of the arm would become excessive. Therefore, according to the invention the return means, normally a pair of return springs, is arranged in one of the bars either on the frame or on the barrel by which the breech is guided on the frame, and extends forwardly from the rear end of the fire arm. With this arrangement, the bolt and the return means do not interfere with each other and a space at the rear of the arm which hitherto was not utilized, is made available for arranging the return means.

The return means may be arranged in at least one of the guide bars of the frame, or in at least one of the guide bars of the breech.

In the first instance the return spring is arranged in at least one of the guide bars of the frame. Normally, a return spring is arranged in a recess in each bar of the frame.

In the second instance a similar arrangement is provided in at least one of the bars of the breech by which the breech is guided on the frame.

It has already been proposed in a pistol to house a pair of return springs in the frame below the barrel and to provide a pair of lugs extending downwardly from the barrel for cooperation with the springs. This solution is not satisfactory because the lugs extend far into the rear portion of the pistol and occupy considerable space, increasing the overall width of the pistol and spoiling its handiness and appearance.

By arranging the return means in the guide bar, or guide bars, of the frame or of the breech, the necessity of placing it below the barrel, and interference on the part of the bolt, are avoided, and the said extra lugs on the barrel are dispensed with.

The overall size of the arm is not increased, and neither its appearance nor its handiness are deteriorated.

An embodiment of the invention is illustrated by way of example in the accompanying drawings, in which show:—

Fig. 1 in side elevation the rear part of an automatic pistol in which the return means is housed in the frame and the locking arrangement partly in section,

Fig. 2 a section on line II—II of Fig. 1,

Fig. 3 the automatic pistol without handle plates, barrel and breech, seen from the opposite direction from Fig. 1,

Fig. 4 a section on line IV—IV of Fig. 1,

Fig. 5 a section on line V—V of Fig. 1,

Fig. 6 the corresponding vertical section, as that shown in Fig. 5, in an automatic pistol with return means located in the breech,

Fig. 7 a horizontal section through the form of construction shown in Fig. 6 at the height of the axes of the counter-recoil springs, viewed in the same direction as in Fig. 2.

The arm comprises three principal elements, i. e. the frame 1, the barrel 2, and the breech 3. The frame 1 carries the lock with the pull mechanism consisting of the trigger 4, the sear 5, the cocking piece 6, the hammer spring 7, the hammer rod 8 and the hammer 9 with hammer latch 10.

The frame 1 also carries the automatic locking device, consisting of the locking piece 11 and its spring 12. The releasing piece 13 acting from the safety mechanism upon the lock mechanism is also fixed on the frame 1. The frame carries further the cartridge magazine 14 and the cartridge ejector 15.

The breech 3 comprises the double acting safety mechanism consisting of safety roller 16 and of the lockable firing pin 17 with spring, and the device for indicating the presence of a cartridge in the barrel. The rear end of the indicator is visible at 18 in Fig. 1.

19 and 20, Fig. 2 are a pair of spaced-apart hollow lugs projecting from the lower side of the barrel 2, each lug having at both sides guide bars

and grooves for the longitudinal shifting of the breech 3 on the barrel 2 and of both parts together on the frame 1. The rear end of the front lug 19 has a seat 21, Fig. 1, for the reception of the front end of a bolt 22 by which the barrel 2 and the breech 3 are temporarily connected. A spring 32, Fig. 2, resembling a hair pin, is inserted in the cavity of the front lug 19 with its shanks, and with its closed end engages below the seating portion of the bolt 22, for holding the bolt and the unlocking pivot 28 to the barrel when the pistol is taken to pieces. When the locking bolt is in its active position for connecting the barrel and the breech, two projections 23 at opposite sides of the bolt engage in indentations 24 made in the guide bars 25 of the breech 3 approximately at the level of the barrel axis. At its rear end the bolt 22 has an inclined surface 27 for cooperation with an unlocking pivot 28 axially shiftably mounted in the rear lug 20 of the barrel. The inclined surface is formed by a V-groove in the rear end of the bolt 22 in which the end of the unlocking pivot 28 engages in the retracted position of the barrel. In the normal position of the barrel, a locking nose 30 of the bolt 22 is supported by a rest 31 on the frame 1. In this position the shiftable distance of the unlocking pivot 28 between the inclined surface 27 and an abutment 29 on the frame 1 is slightly larger than the distance with which the locking nose 30 occupies the rest 31 on the frame 1 in the shifting direction.

When a cartridge has been fired the barrel and the breech 3 moves back together and the locking nose 30 leaves the rest 31; at the same time the unlocking pivot 28 comes to bear against the abutment 29 and presses the inclined surface 27 down for the purpose of unlocking. The projections 23 release the breech 3; the barrel 2 is stopped by the abutment 29, and the breech 3 now moves on alone unimpeded as in the case of an automatic pistol with inertia lock. A similar effect would be achieved if the unlocking pivot 28 were rigidly mounted on the frame 1 in the longitudinal direction. As soon as the breech 3 has attained the barrel 2 again, both parts move forward together. The locking nose 30, owing to the inclined surface, ascends on the transverse rest 31, whereby the locking of the barrel 2 with the breech 3 is effected.

Apart from the favorable mounting of the bolt 22 with respect to the other arrangements of the arm described above, the locking arrangement has further advantages. The bolt 22 which extends over the whole width of the frame has ample sectional areas of material for taking up the considerable recoil pressure, so that great security against breakage is attained. The locking is released softly, as the withdrawing of the projections 23 from the recesses 24 in the breech 3 takes place practically on the whole releasing travel. As the unlocking is effected when the inclined surface 27 strikes against pivot 28, the walls of the indentations 24 can extend vertically in the direction of movement of the breech; therefore, the dangerous, strong vertical pressures which cause a bending up of the guide bar 25 in breech 3 are avoided.

Owing to the pull mechanism, the arrangement of the locking pivot, the firing pin and the loading indicator, it is impossible to arrange the return spring within the breech 3, in the frame 1, or in any of the other parts at the level of or above the barrel axis, without making the firearm broader or higher. Nor is it possible to arrange the return springs at the sides of the bolt 22 in the frame or the barrel since the bolt, for the reason stated, occupies substantially the entire width of the frame 1.

There is, however, sufficient room at disposal on frame 1 and on breech 3 for the bars 33, 34 which effect the guiding of the breech on the frame. According to the invention, one of the bars is made with normal thickness, and the other is made so thick that it can be recessed for the reception of a return spring.

In the first instance as shown in Figs. 1 to 5, the guide bars 33 of frame 1 are made thicker than the bars 34 of the breech, as best seen in Fig. 4, and have recesses 35 for accommodating the return springs 36. These springs are placed over longitudinally movable guide rods 37 which at the same time serve to limit the recoil travel of the breech 3 by abutting against the rear ends 40 of recesses 35. Heads 38 of rods 37 bear against projections 39 in breech 3 (Fig. 2).

A step 42, Fig. 3 with a short incline is formed on each bar 33 on the bottom of its recess 41 so that when breech 3 has been removed, the return spring 36 remains under a certain initial tension since the head 38 of the guide rod 37 ascends on the incline or step 42 and is arrested. At the same time the moulded groove 41 prevents the return spring from bending. When re-inserting the return spring 36 and the guide rod 37 in the recess 35, the spring is first inserted through the open end, whereupon the spring 36 is pressed back towards the end face 40 with the aid of a small screw driver or the like, until spring 36 surrounds only the lower part of the guide rod 37 so that the head 38 of the same passes the inclined surface 42, to engage behind the same as soon as spring 35 is liberated. The removing of spring 36 and of guide rod 37 is effected in inverse order.

The accommodation of the return springs in the breech 3 according to Figs. 6 and 7 is similar to the arrangement of the return springs in the frame 1, as shown in Figs. 1 to 5. In this case, as best seen in Fig. 6, the guide bars 33 on the frame 1 are of normal thickness, and the bars 34 on the breech 3 are made thicker and recessed at 35 for the reception of the springs 36 and their rods 37. The heads of the rods abut against the front ends 44 of the recesses 35.

The mounting of the springs 36 in breech 3 offers the advantage that the whole length of the breech is at disposal for this purpose. The springs of the same strength as in the first form of construction may be made of wire of smaller cross-section and the spring may have a smaller diameter.

In both forms of construction a single spring may be arranged instead of the two springs 36.

We claim:—

1. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars, and a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel, for locking the barrel and the breech with respect to each other when the arm is closed.

2. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame,

bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars, a locking bolt whose width is substantially equal to that of the frame and which has an inclined surface, pivotally mounted at the rear end of the barrel, a pair of projections at opposite sides of the bolt for locking the barrel and the breech with respect to each other when the arm is closed, and an unlocking pivot for cooperation with the inclined surface on the bolt symmetrically to its projections.

3. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars, a locking bolt whose width is substantially equal to that of the frame and which has an inclined surface, pivotally mounted at the rear end of the barrel, a pair of projections at opposite sides of the bolt for locking the barrel and the breech with respect to each other when the arm is closed, a locking nose on the bolt having an inclined face and arranged symmetrically with respect to the two projections, a seat for the locking nose on the frame, and an unlocking pivot for cooperation with the inclined surface on the bolt symmetrically to its projections.

4. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars, a locking bolt whose width is substantially equal to that of the frame and which has an inclined surface, pivotally mounted at the rear end of the barrel for locking the barrel and the breech with respect to each other when the arm is closed, a locking nose on the bolt, a seat on the frame for the locking nose, an unlocking pivot mounted to slide on the barrel, with one end arranged for cooperation with the inclined surface on the bolt, and an abutment on the frame for the other end of the pivot.

5. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars, a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel, for locking the barrel and the breech with respect to each other when the arm is closed, and a spring supporting the bolt at its pivoted end with respect to the barrel.

6. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, a return spring extending forwardly from the rear end of the frame and inserted in at least one of the bars, the bar in which such spring is arranged, defining a recess, a step at the end of the recess, a rod in the spring, a head at the end of the rod for engaging the step when the arm is disassembled, and a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel, for locking the barrel and the breech with respect to each other when the arm is closed.

7. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars on the frame, and a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel, for locking the barrel and the breech with respect to each other when the arm is closed.

8. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame and inserted in at least one of the bars on the breech, and a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel, for locking the barrel and the breech with respect to each other when the arm is closed.

9. In an automatic firearm, a frame, a barrel mounted to slide on the frame, and a breech mounted to slide on the barrel and the frame, bars at the sides of the frame and the breech for guiding the breech on the frame, return means extending forwardly from the rear end of the frame for the entire length of the breech and inserted in at least one of the bars on the breech and a locking bolt whose width is substantially equal to that of the frame, pivotally mounted at the rear end of the barrel for locking the barrel and the breech with respect to each other when the arm is closed.

FRITZ WALTHER.
FRITZ BARTHELMES.

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Fig. 1.

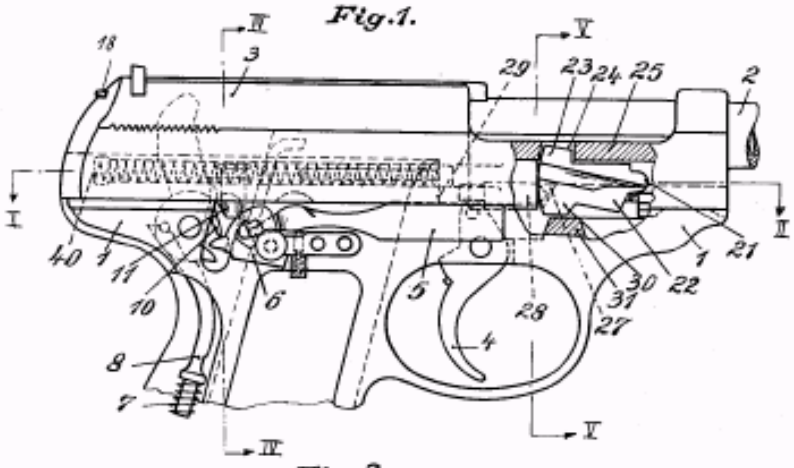



Fig. 2.

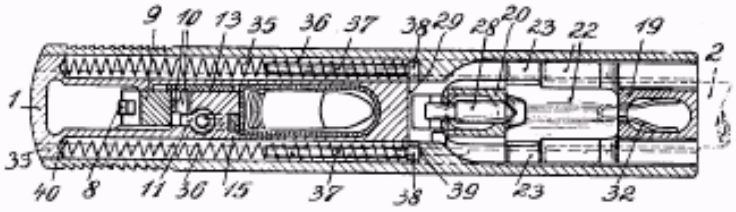
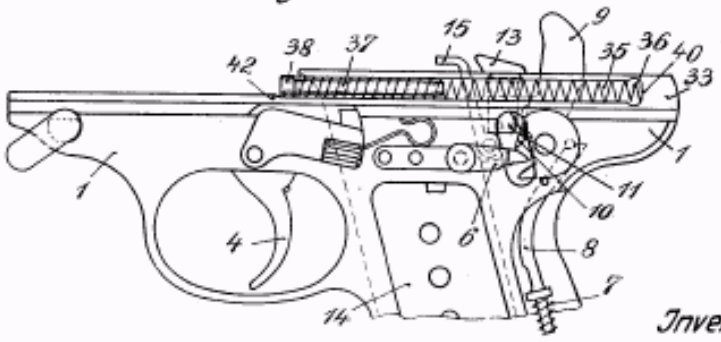



Fig. 3.




Inventors:

Fritz Walther

and

Fritz Barthelmes

by [illegible]

Their Attorney

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Fig. 4.

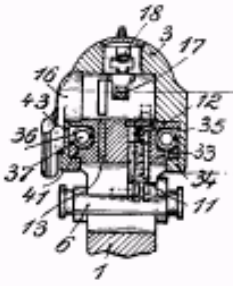



Fig. 5

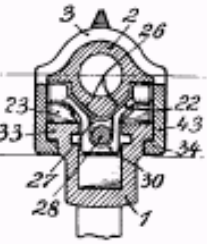



Fig. 6

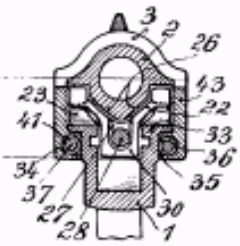
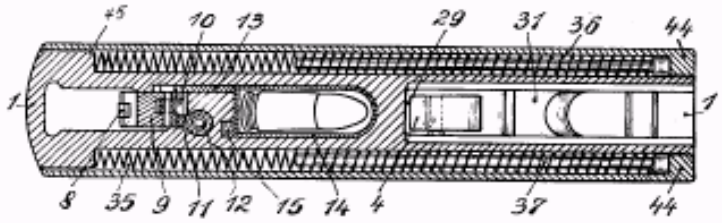



Fig. 7




Inventors:
Fritz Walther
and
Fritz Barthelmes
by
their attorney