

[54] **AUTOMATIC PISTOL**

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[58] Field of Search **42/71 R, 71 P, 72, 73;**
89/129 R, 129 B, 141

[56] **References Cited**

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[57] **ABSTRACT**

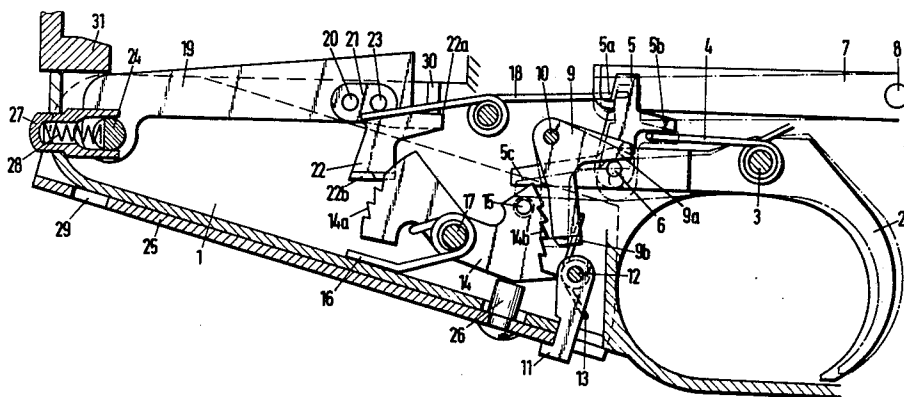
The invention relates to automatic pistols, and visualises the employment of a mechanism the purpose of which is to permit the mode of firing to be changed automatically i.e., from the firing of single rounds to firing a burst of rounds of a predetermined number (and vice-versa). The change in mode is effected through the agency of a lever-like handgrip which is pivotably fitted to the forestock and such that in a folded position the handgrip sets the mechanism to a mode of operation in which only the firing of a single

round is possible, and in this folded position the handgrip lies flush with the forestock such that in size and appearance the weapon is conventional. In the unfolded position of the handgrip the weapon has, through the unfolding operation, been set to permit the weapon to fire a burst of a predetermined number of rounds. Furthermore, in the unfolded position, the handgrip provides an auxiliary grip which, when grasped by the normally free hand of the marksman, steadies the aim and contributes to overcoming the inherent characteristic of "elevation creep" of the trajectory during the firing of bursts or continuous firing of such machine-pistols when employed in the role of a sub-machine gun.

The mechanism for determining the mode of firing functions in cooperation with the trigger sear and bolt. Actuation of the trigger in the unfolded position of the handgrip permits a segmentally toothed switching member to pivot step-by-step for each recoiling action of the bolt after the firing of a burst of a predetermined number of rounds, i.e., the stepping actions equalling the bolt recoil movements. Actuation of the trigger in the folded position of the handgrip permits one round only to be fired since the stepping of the toothed member is inhibited by a stop on the handgrip which is interposed in the path of the member in its pivoting action. In this mode of operation the trigger must be released for the mechanism to be reset to fire a following single round.

Removal of the detent in the mechanism, or displacement of the toothed member inhibits operation of the mechanism in the mode for firing bursts of rounds and permits a whole magazine to be fired off or as many rounds as permitted so long as the trigger remains in the pulled condition.

5 Claims, 2 Drawing Figures



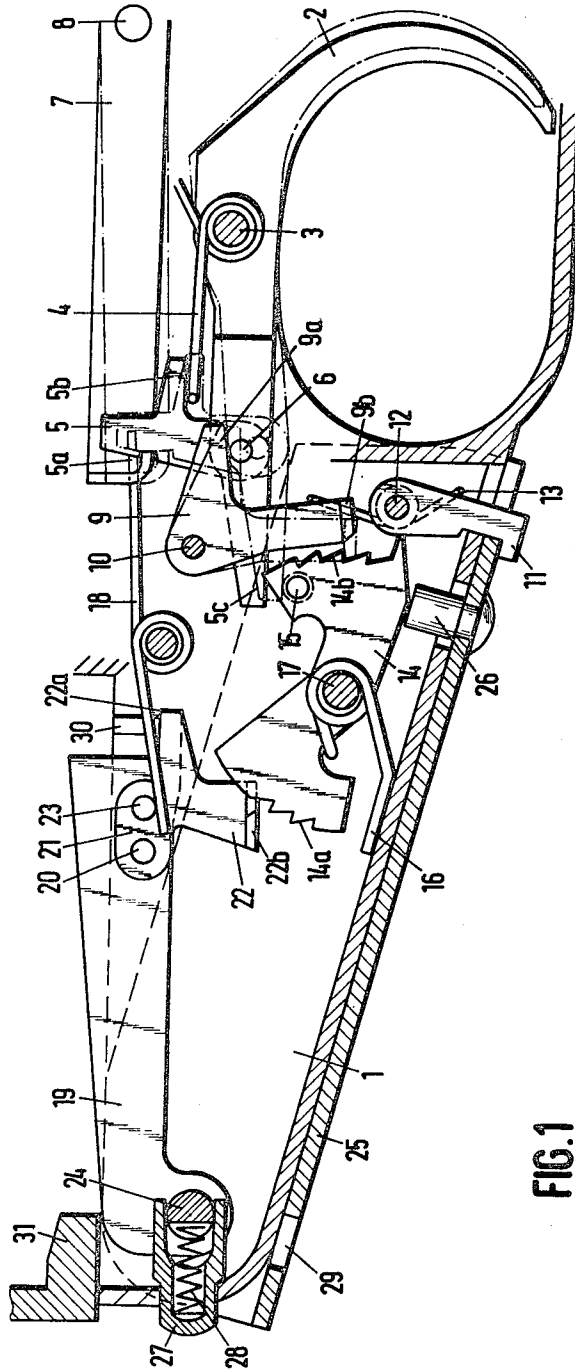


FIG. 1

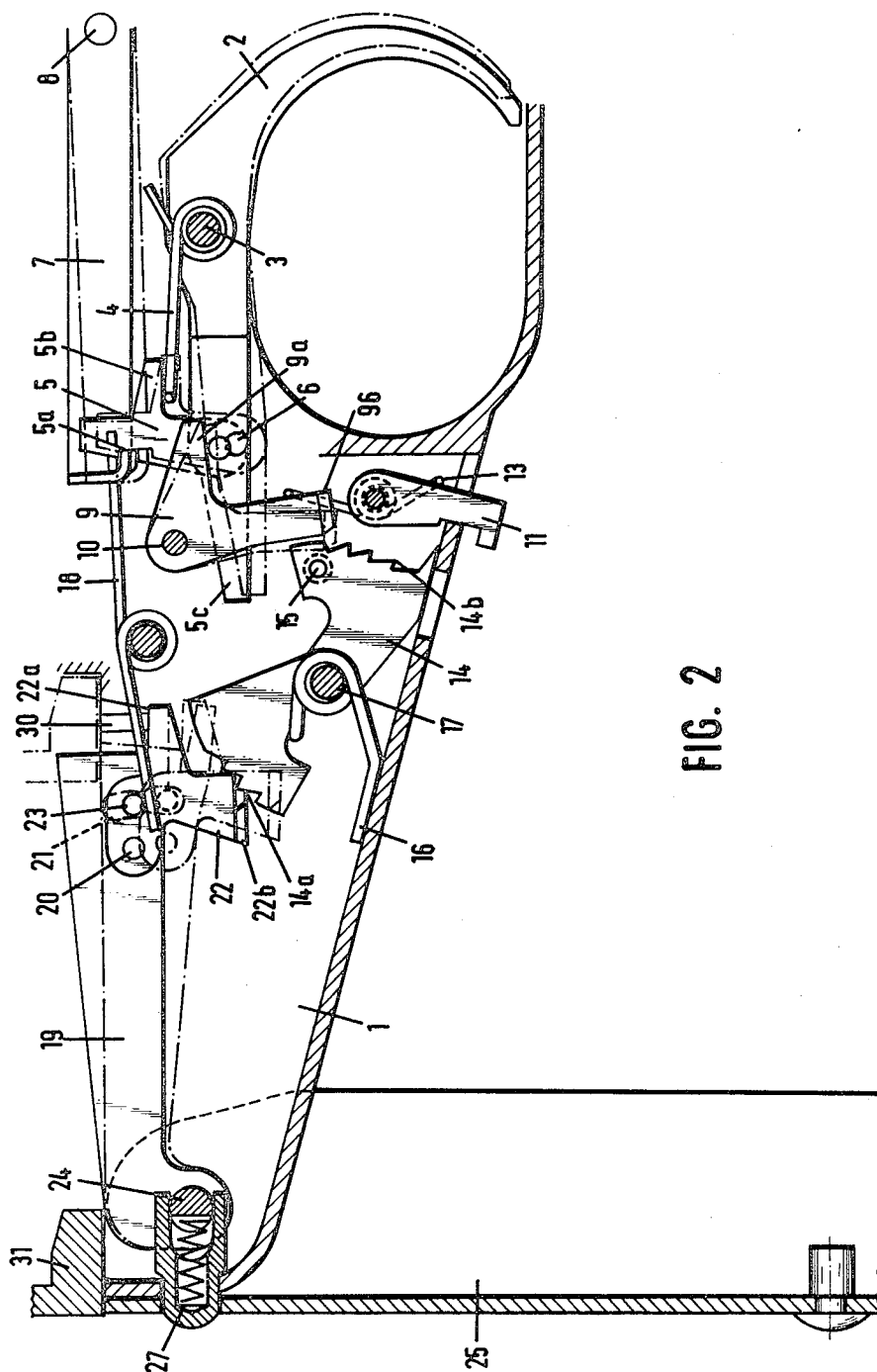


FIG. 2

AUTOMATIC PISTOL

This invention relates to improvements in automatic pistols.

U.S. Pat. No. 2,058,746 (K. Westinger) describes an automatic pistol, which employs a changeover mechanism for effecting continuous fire. Such pistols have the disadvantage of a relatively high rate of fire since, through their nature of operation, there is insufficient room to permit the bolt to recoil over a longer distance which would result in a slower rate of fire. Through this high rate of fire and the general lightness in weight of such weapons, delivery of effective bursts of fire is only possible with the support of a pistol-butt. However with such a pistol-butt, the weapon assumes the proportions of a sub-machine gun. Besides this the fitting of the butt requires more time to accomplish than the unfolding or withdrawal of the butt of a modern sub-machine gun to its operative position. In the majority of cases the magazine capacity is too small or too large for the weapon to be considered as a substitute for a sub-machine gun.

Solutions are also known in which the high rate of fire is compensated for by retardation of the breach mechanism velocity or operation of the firing mechanism. Such solutions are, however, complicated and their realisation in terms of manufacturing costs is high. Furthermore complicated mechanisms lead to higher incidences of stoppages.

A pistol has been developed as recently as 1970 by the Firm of Heckler & Koch, Oberndorf-on-Neckar, Germany. This pistol employs a firing system such that the firing of short bursts of a determined number of rounds (or shots as they are sometimes called) is possible. Since the mechanism for achieving this mode of fire is accommodated in the butt, the changeover from firing single rounds to bursts of rounds (and vice-versa) with this weapon is only possible with the butt in the operative position and such that the previously stated disadvantages still arise.

The present invention seeks to remove the objections arising from these known disadvantages in machine-pistols, and in a simple manner such that as well as firing single rounds the pistol may be employed as a machine-pistol for firing bursts of a determined number of rounds. In pursuance of the objects of the present invention, the pistol to be described herein is provided with a lever-like handgrip which is pivotably mounted on a leading portion of the forestock. This handgrip is coupled in operative relationship with the trigger mechanism. It is pivotable from one to the other (and vice-versa) of two operative positions; in the unfolded (open) position it acts to permit automatic firing of a determined number of rounds i.e., a burst of rounds instead of the firing of single rounds such as occurs in the folded (closed) position. This arrangement obviates the necessity for providing a changeover switch for determining the mode of firing. In the folded position, the handgrip lies flush with the underside of the foregrip so that, in appearance, it is substantially indistinguishable from a conventional pistol; and again in its unfolded position the handgrip acts as a second handgrip thus making an attachable handgrip unnecessary.

A major portion of the control mechanism for determining the mode of operation lies forward of the trigger guard, and is accommodated within the forestock. Only this portion of the mechanism is more voluminous

than with conventional types of pistol, and that much heavier by the sum of the weights of the extra components.

When the pistol assumes the role of a sub-machine gun, the extra weight forward of the trigger guard has an advantage inasmuch that the inherent tendency for the trajectory to increase in elevation i.e., ("elevation creep") is lessened when the weapon is firing automatically, this advantage accrues through a better distribution of weight effecting the balance of the weapon.

According to the present invention therefor there is provided:

An automatic pistol comprising a barrel with a cartridge feed mechanism, a forestock including a butt, and a firing mechanism, which is arranged for the firing of single shots and for firing bursts, characterized in that there is provided a pivotable handgrip operable between two fixed positions whereby the firing mechanism can be automatically changed over from the firing of single shots to the firing of bursts or continuous fire.

The foregoing aspect and other aspects of the invention will be better understood from the following description read with reference to the accompanying drawings in which:

FIG. 1 shows, in cross-section, a side elevation of the forestock revealing the components accommodated therein and,

FIG. 2 shows, in cross-section, a side elevation of the forestock revealing the components accommodated therein when the handgrip is in the unfolded (open) position.

FIG. 1 shows a trigger 2 pivotably mounted, within the forestock 1, on a pin 3. A forwardly placed portion of the trigger 2 pivotably mounts, via a pin 6 extending therefrom a carrier 5. A vertically extending member of the carrier 5 is machined with a recessed portion 5a, which is arranged to be engaged by a bent portion at the forward (lefthand) end of a sear 7. Extending from the rear (right-hand) end of the carrier 5 is a member 5b which is arranged to engage with and act under the influence of a spring 4 carried on the pin 3 mounting the trigger. Yet another member 5c extends forward (left) from the carrier 5. The previously referred to sear 7 is arranged to pivot on the pin 8 such that it is biased by the spring 18 to turn in a clockwise direction i.e., the left hand end is biased to move upward. The detent 9 is also pivotably accommodated on the pin 10 within the forestock 1. This detent 9 has an arm 9a extending rearwards therefrom and a pawl 9b extending laterally from a vertically depending arm thereof. The detent 9 is biased to pivot in a clockwise direction about pin 10 under the influence of the spring 13 accommodated on the pin 12, and also engaging a catch 11. The toothed switching member 14, which functions in the changeover of the mode of operation, is pivotably mounted on a pin 17 within the forestock 1 and is biased to pivot in the clockwise direction under the influence of the spring 16 carried by the same pin. On the remote side of the toothed switching member 14 there extends therefrom an interrupter 15, and arcuate toothed portions 14a and 14b are arranged on either side of the pivot pin 17 supporting the toothed switching member. A changeover lever 19 is pivotably mounted on a spindle 24 and is also biased to pivot in an anti-clockwise direction such that the rear (right-hand) free end can move upward. A changeover link

22 is pivotably mounted on a pin 20 affixed to, and extending from, the free end of the changeover lever 19. This changeover lever incorporates therein an arcuate slot 21 which is engaged by a pin 23 extending from the changeover link 22; this arrangement permits the changeover link 22 to pivot about the pin 20 over an arc defined by the arcuate limits of the slot 21 (FIG. 2).

The previously mentioned catch 11 is accommodated within the forestock 1, this catch 11 is engaged by and subjected to the influence of the spring 13 so as to cause it to pivot in the clockwise direction about the pin 12. At the forward end of the forestock, and accommodated therein, is a locking pin 27 which is urged in the forward direction under the influence of a compression spring 28, which is accommodated within the locking pin and impinges against the spindle 24. The handgrip 25, pivotably mounted in common with the changeover lever 19 on the spindle 24 has a hole 29 therein at its fore end and is fitted with a stop pin 26 at its rear end.

FIG. 1 shows the relative positions of the components in their operative condition for firing of single shots. It will be seen that the handgrip 25 is in the folded position thereof such that it lies substantially flush with the forestock 1, and is locked in position by engagement of the catch 11 with a portion of the handgrip 25 at its rear end. The mechanism just described operates in the following manner:

For the firing of single shots, the trigger 2 is pulled in the conventional manner, thus it is caused to pivot on the pin 3, whereupon the member 5a of the carrier 5 is urged into engagement with the sear 7 under the action of the spring 4 on the member 5b of the carrier 5; and since the sear 7 and the carrier 5 are coupled by the engagement of the bent portion at the end of the former engaging with the recess 5a in the latter, the sear 7 is caused to pivot, simultaneously with the pulling of the trigger 2, on the pin 8.

On the pulling of the trigger 2 other actions take place; the upwardly acting force of the pin 6 of the trigger 2 on the underside 9a of the arm of the detent 9 pivots said detent on the pin 10 in an anti-clockwise direction to cause the pawl 9b extending from the lower end thereof to come into engagement with the arcuate rack of teeth 14b of the toothed member 14 under the action of the spring 13. Through the action of the sear 7 in its pivoting movement, the bolt 31 is released in a well-known manner to make a forward excursion to effect firing of a single shot. Under the pressure of gases, built up by the burning of propellant on detonation of the cartridge, the bolt 31 recoils rearward in a well-known manner in the breach (not shown), and whereby the change-over lever 19 pivots on the spindle 24, under the action of the spring 18, in the clockwise direction and so that it causes the changeover link 22 thereon to descend. Since the changeover link 22 is mounted on the changeover lever 19, via pin 20, this changeover link is biased into engagement with the forward end of the toothed arcuate rack 14a of the toothed switching member 14 under the influence of the spring 18, and its descent the pawl portion 22b engages with the teeth of the rack. Further descent causes pivoting of the toothed switching member 14 over an arc, subtended by the pitch subtended by one tooth of the rack of teeth, in the anticlockwise direction. The pivoting of the toothed switching member 14, against the influence

of the spring 16, causes the interrupter thereon designated 15 to move upward into engagement with the arm 5c of the carrier 5. Through this engagement, and against the influence of the spring 4, the carrier 5 pivots in the clockwise direction such that the recess 5a therein comes out of engagement with the bent end portion of the sear 7 which then pivots on the pin 8 in a clockwise direction, under the influence of the spring 18, to its original position.

When, in a well-known manner, the bolt 31 is again driven forward under the action of the breach spring (not shown), the changeover lever 19 (and thus the changeover link 22) return to their original positions under the influence of the spring 18. This return movement continues until an extending stop portion of the changeover link 22 comes into engagement with a stop 30 affixed to the forestock 1, and further through this movement the pawl portion 22b of the changeover link 22 is pivoted out of engagement with the tooth in the arcuate rack of teeth 14b in the toothed changeover member 14.

To fire the following single shot, the trigger must first be released and pulled again. By releasing the trigger 2, the pin 6 extending therefrom causes the detent 9, via the arm 9a thereon, to move upward due to the anti-clockwise movement on pin 10 against the influence of the spring 13; this results in the pawl 9b being withdrawn from engagement with a tooth of the arcuate rack of teeth 14b whereupon the toothed switching member 14 returns to its original position, under the influence of the spring 16, by its pivoting movement on the pin 17.

Referring now to FIG. 2, there is shown the condition of the mechanism components for the firing of bursts. The handgrip 25 is shown in the unfolded position, and is fixed vertically with respect to the barrel by engagement of the locking pin 27 in the hole 29 in the handgrip 25 and under the influence of the spring 28. Through the action of unfolding the handgrip 25, the stop pin 26 affixed thereto is withdrawn from engagement with the underside of the rear (righthand) portion of the toothed switching member 14; whereupon this member rotates about pin 17 in an anti-clockwise direction under the influence of the spring 16 and until the underside of the member lies flush against an adjacent portion of the forestock 1 as illustrated.

The operation for the firing of bursts is the same as for firing single shots with the followingly described differences however. Firing is only interrupted when the number of recoil excursions of the bolt is equal to the number of teeth in the arcuate racks of teeth of the toothed switching member 14. During the firing of bursts, and in a well-known manner through the provision of a second catch arrangement, (not shown) the firing mechanisms is acted on by the forward movement of the bolt 31. When the trigger 2 is released after firing of a burst, or when the magazine is empty, all components return to their original positions as previously described.

Without modification to the mechanism it is possible, as well as firing bursts, to deliver continuous fire. To this end therefor it is only necessary to interrupt the rotation (pivoting) of the toothed switching member 14, which takes place under the action of the bolt 31. This interruption may be achieved by mounting the toothed switching member 14 in a laterally displaceable manner on the pin 17, whereby with the employment of any

well-known means the switching member can be set to assume any one or the other of two positions. In one of said fixed positions it functions normally to effect bursts of firing, and in the other one of said fixed positions the teeth thereon cannot be engaged by the pawls 22b and 9b of the link member 22 and the detent 19 respectively.

It is also possible with the unfolding of the handgrip 25, to effect continuous firing, instead of the firing of bursts, by removal of the detent 9.

In the unfolded position of the handgrip 25, it serves as a second handgrip so that, when gripped by the free hand of the marksman, the aim is steadied and thus an extra fixed handgrip is unnecessary.

It is to be understood that the invention is not confined to the embodiment illustrated herein and described, but may be modified in a variety of ways. Preferably however the sear 7 should be mounted above the trigger 2 rather than below it since the former arrangement makes it simpler to apply a magazine accommodating two rows of cartridges.

I claim:

1. Automatic pistol comprising a forestock, a firing mechanism adapted for the firing of single shots and for firing bursts or continuous fire and a pivotable handgrip operable between two fixed positions on said forestock and adapted to change said firing mechanism over from the firing of single shots to the firing of bursts or continuous fire upon pivoting said handgrip from one fixed position to the other.

2. Automatic pistol comprising a forestock, a firing mechanism adapted for the firing of single shots and for the firing of bursts and a pivotable handgrip operable between two fixed positions on said forestock and adapted to change said firing mechanism over from the firing of single shots to the firing of bursts upon pivoting said handgrip from one fixed position to the other, said handgrip having a stop which, when said handgrip is flush with said forestock, engages a spring based

toothed switching member of said firing mechanism in a position to effect firing of single shots.

3. Automatic pistol comprising a forestock, a firing mechanism adapted for the firing of single shots and for firing bursts, a pivotable handgrip operable between two fixed positions on said forestock adapted to change said firing mechanism over from the firing of single shots to the firing of bursts, one of said fixed positions being substantially perpendicular to the barrel thereby allowing a spring biased toothed switching member of said firing mechanism to pivot to effect said firing of bursts.

4. Automatic pistol comprising a forestock, a firing mechanism adapted for the firing of single shots and for firing bursts, a pivotable handgrip operable between two fixed positions on said forestock adapted to change said firing mechanism over from the firing of single shots to the firing of bursts, one of said fixed positions being substantially perpendicular to the barrel thereby allowing a spring biased toothed switching member of said firing mechanism to pivot to effect said firing of bursts, said handgrip in said perpendicular position serving when grasped by a free hand, to steady the aim during the firing of bursts, and the pistol assumes the role of a sub-machine gun.

5. Automatic pistol comprising a forestock, a firing mechanism adapted for the firing of single shots and for firing bursts, a pivotable handgrip operable between two fixed positions on said forestock adapted to change said firing mechanism over from the firing of single shots to the firing of bursts, one of said fixed positions being substantially perpendicular to the barrel thereby allowing a spring biased toothed switching member of said firing mechanism to pivot to effect said firing of bursts, the total number of rounds fired in a burst being determined by the configuration of the said toothed switching member.

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