Jan. 28, 1964 J. BUMILLER 3,119,113

PERCUSSION MECHANISM FOR FIXING GUN

Filed Nov. 21, 1960 2 Sheets-Sheet 1

Fig. 1

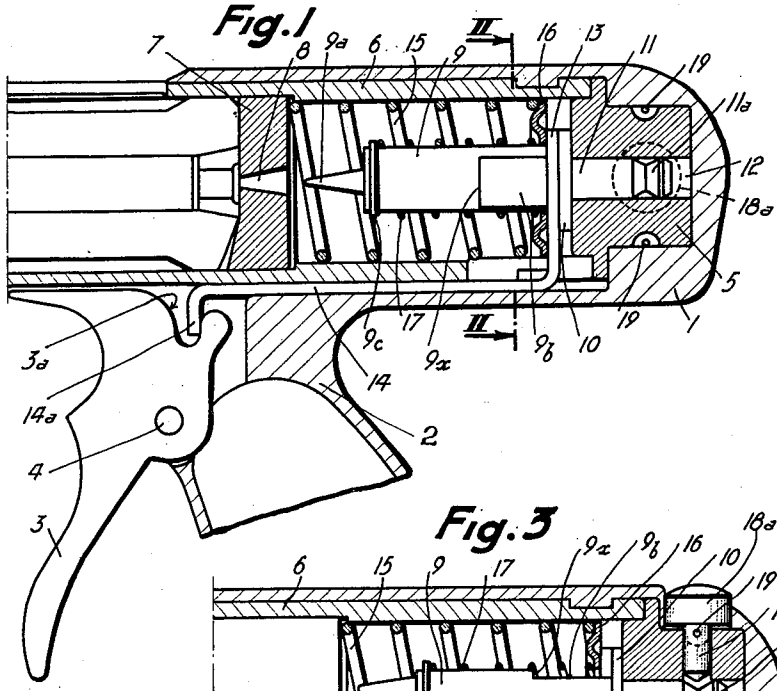


Fig. 3

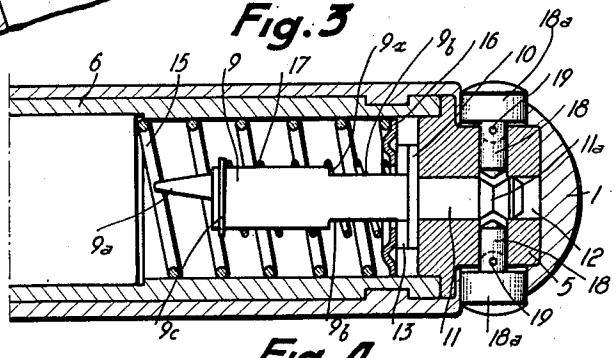


Fig. 2

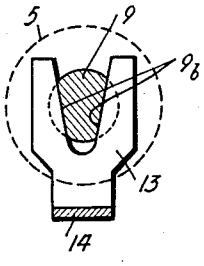


Fig. 4

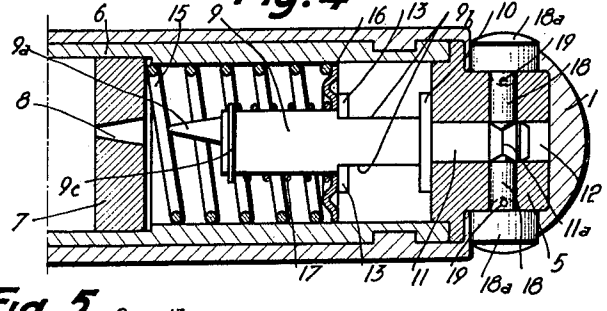
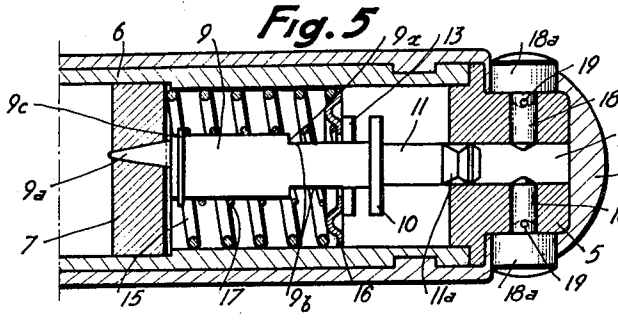


Fig. 5



Inventor
JACQUES BUMILLER
By Toulmin & Toulmin
Attorneys

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Fig. 6

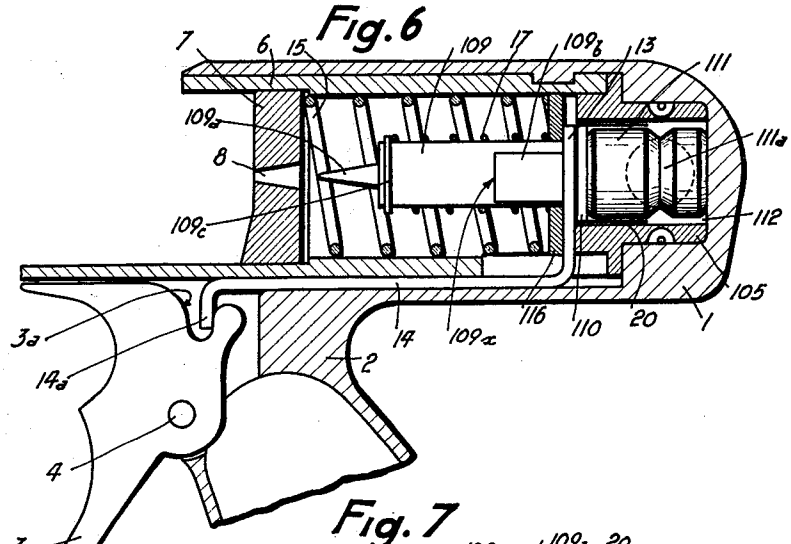


Fig. 7

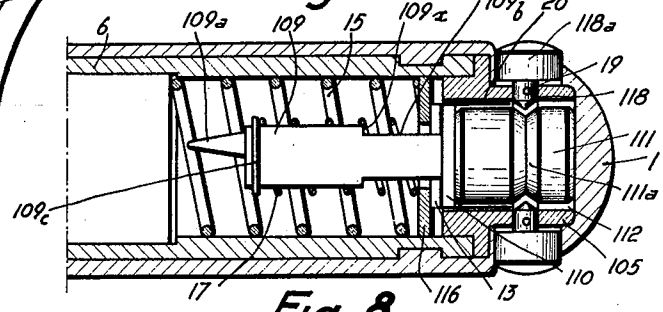


Fig. 8

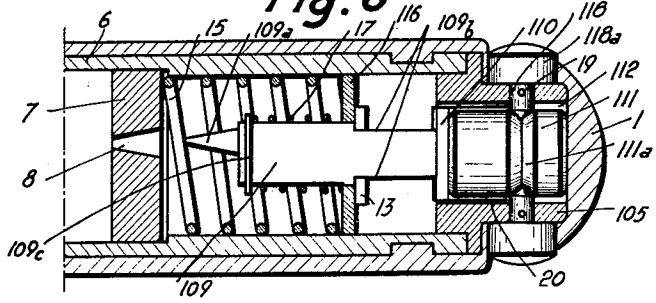
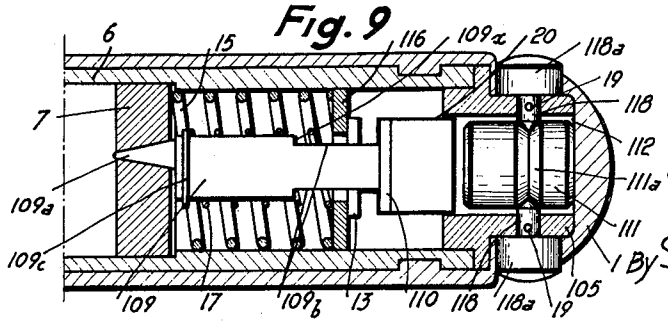


Fig. 9



Inventor
JACQUES BUMILLER

By Toulmin & Toulmin
Attorneys

United States Patent Office

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PERCUSSION MECHANISM FOR FIXING GUN

Jacques Bumiller, Valence, France, assignor to Sarmi S.A., Societe d'Applications de Recherches Minieres et Industrielles, Lenzerheide, Switzerland, a Swiss company

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Claims priority, application France Dec. 3, 1959
12 Claims. (Cl. 1—44.5)

The present invention relates to percussion mechanisms, in particular (but not exclusively) for fixing or sealing guns, and the object of the invention is to allow the ignition of the explosive propelling charge only when the operator holds the applicance with both hands, one hand holding the grip of the gun, so as to apply the latter against the wall receiving the pin (or the like) driven in by the gun and capable of actuating the trigger, and the other hand, acting on the safety means adapted to permit operation of the striker.

The improved percussion mechanism according to the invention is characterised in that, on the one hand, a movable unit receiving the thrust of the percussion spring and carrying the striker is, so long as it is not immobilized, capable of being shifted by the actuation of the cocking mechanism which is thus rendered incapable of putting the percussion spring under stress and, on the other hand, immobilizing means are provided for immobilizing said unit, said immobilizing means being actuatable from outside the gun toward the immobilizing position, in opposition to a permanent opposing force, and disposed on the appliance provided with the mechanism in such manner that, when the appliance is held in the hand, the actuation of the immobilizing means for bringing the latter to the position for immobilizing said unit and the holding of them in this position (permitting the cocking of the mechanism) requires permanent action of the hand other than that holding the appliance.

Preferably, the immobilizing means project from two opposed sides of the appliance and comprise push-buttons adapted to be depressed by two fingers of the hand pertaining to actuation of said means.

The improvements of the invention can be appiled to percussion mechanisms of both the mechanical type and permanent magnet type (such as those described in the Patent Application No. 5,187 filed January 28, 1960 and issued as U.S. Patent 3,049,714 on August 21, 1962 and in the Patent Application No. 11,628 filed February 29, 1960 and issued as U.S. Patent 3,065,560 on November 27, 1962.

In these preferred embodiments, the improved percussion mechanism according to the invention also comprises the following features and combinations thereof:

The movable unit receiving the thrust of the percussion spring comprises a rear part slidable in a rear cavity of the breech;

The cavity for the rear part of the movable unit receiving the thrust of the spring is provided in a block connected to the breech;

The rear part of the movable unit receiving the thrust of the percussion spring comprises an annular groove which has advantageously a V-shaped cross-section and co-operates with the inner ends of the push-buttons each of which advantageously terminates in an obtuse angle point engageable in the V-shaped section of the annular groove;

The movable unit receiving the thrust of the percussion spring is controlled by cocking or loading means comprising a fork slidable relative to said unit, connected to the trigger and capable, after effecting a given travel in the course of which it compresses the percussion spring, of positively and forwardly driving said unit;

The percussion spring, which is helical, surrounds the unit receiving its thrust and bears respectively against the fork and against a flange provided at the forward part of said unit.

Further features and advantages of the invention will be apparent from the ensuing description of two embodiments of an improved percussion mechanism according to the invention, which have been given merely by way of examples and are shown diagrammatically in the accompanying drawings, in which:

FIG. 1 is a vertical longitudinal sectional view of the percussion mechanism (at rest) of the mechanical type applied to a sealing gun;

FIG. 2 is a cross-sectional view taken along line II—II of FIG. 1;

FIG. 3 is a horizontal longitudinal section view of the mechanism shown in FIG. 1;

FIGS. 4 and 5 are views, similar to FIG. 3, the mechanism being in its cocked position and its percussion position respectively;

FIG. 6 is a vertical longitudinal sectional view of the percussion mechanism (at rest) of the permanent magnet type applied to a sealing gun;

FIG. 7 is a horizontal longitudinal sectional view of the mechanism shown in FIG. 6, and

FIGS. 8 and 9 are views similar to FIG. 7, the mechanism being in its cocked position and its percussion position respectively.

In FIGS. 1 to 5, showing a mechanism of the mechanical type, 1 designates the breech of the gun, 2 the grip or butt, 3 the trigger pivotably mounted at 4, and 5 a block immobilized in the rear part of the breech by a sleeve 6. Provided in the latter is a transverse wall 7 adapted to constitute the rear closing member of the loading chamber, said wall comprising an aperture 8 for the passage of the percussion point or striker 9*a*.

Disposed in the cylindrical cavity defined by the elements 5 and 7 is the element or unit subjected to the action of the percussion spring, which is, in the presently-described embodiment, a percussion pin 9 provided with the striker 9*a*, an annular flange or ring 10 and a tail portion 11 slidable in a cavity 12 provided in the block 5. The pin 9 has on opposed sides two flat portions 9*b* terminating in shoulders 9*x* and along which are slidable the two branches of a fork 13 rigid with a slidable rod 14 whose forward end is bent in the form of a hook 14*a* which co-operates with a notch 3*a* of the trigger 3.

Disposed forward of the fork 13 and held against the latter by one end of a return spring 15, whose other end rests against the closing member or wall 7, is a ribbed washer 16. The latter acts as a support for one end of the percussion spring 17 whose other end rests against a flange 9*c* formed on the pin 9.

The tail end 11 of the pin 9 has an annular groove 11*a* having a V-shaped cross-section with which are engageable (FIGS. 1, 3 and 4) the obtuse-angle points of two immobilizing push-buttons 18 diametrally opposed relative to the pin 9 and subjected to the action of a spring clip or ring 19 which tends to separate them from the groove 11*a* (FIG. 3) to define a safety means. These push-buttons are provided with knobs 18*a* which extend out of the breech on opposite sides of the gun.

The percussion mechanism just described operates in the following manner:

When the trigger 3 is actuated without touching the push-buttons 18, the assembly comprising the fork 13, the pin 9, the spring 17, the ring 10 and the washer 16, is free to move forwardly in compressing the spring 15, the percussion spring 17 remaining uncompressed. Percussion of the explosive charge is therefore impossible. When the trigger is released, the assembly returns to the position of rest shown in FIGS. 1 and 3.

To obtain percussion (and consequently ignition of the explosive charge of the gun) it is necessary to depress, with one hand, the push-buttons 18 and to hold them in temporarily so that their points engage the groove 11*a* in the tail portion 11 of the pin 9 and then to actuate with the other hand, the trigger 3. As the pin 9 is temporarily immobilized, actuation of the trigger 3 first causes a forward displacement of the washer 16 and compression of the return spring 15 and of the percussion spring 17 (FIG. 4). At the end of the cocking travel (when the fork 13 comes into contact witht he shoulders 9*x*) the thrust exerted on the pin 9 by the trigger 3 is increased sufficiently to overcome the manual force exerted on the push-buttons 18. At this moment, the pin 9 moves forward and, under the cam or ramp effect of the V-shaped groove 11*a* on the obtuse-angle points of the push-buttons, the latter are urged out of the recess; thus released, the pin 9 is then violently thrown forward by the expansion of the of the percussion spring 17 and the striker 9*a* is caused to protrude into the loading chamber by way of the aperture 8 (FIG. 5).

Thus it is clear that the percussion mechanism can only operate if the user holds the gun in one hand and actuates the trigger 3 and depresses the push-buttons 18 with the other hand.

FIGS. 6 to 9 relate to a mechanism of the permanent magnet type and like reference characters indicate like elements already described and shown in FIGS. 1 to 5.

As can be seen in FIGS. 6 to 9, this embodiment differs from the previous embodiment in that the unit receiving the thrust of the percussion spring 17 (bearing against a flange 109*c*) consists of two elements. One element is in the form of a pin 109 carrying the striker 109*a* and having two opposed flat faces 109*b* and provided at the rear with an abutment flange 110 acting as a rear support for the fork 13 in front of which is disposed the washer 116 co-operating with the return spring 15.

The pin 109 co-operates with a bar magnet 111 constituting the other element of the unit receiving the thrust of the percussion spring, which magnet is provided with a V-shaped section groove 111*a* and is slidable in a cavity 112 in a block 105 fixed in the breech 1.

Engageable in the groove 111*a* are the conical ends of two push-buttons 118 each of which is provided with a control knob 118*a* and is subjected to the action of a return spring ring 19.

The pin 109 is guided and held coaxial relative to the magnet 111 by a sleeve 20 which is composed of non-magnetic material rigid with the pin 109 and slidable in the annular space between the cylindrical surface of the magnet 111 and the wall of the cylindrical cavity 112.

In this embodiment, in the absence of pressure exerted on the push-bottons 118*a*, the elements 109 and 111 behave in the same way as the assembly consisting of the pin 9 and the tail portion 11 of the previous embodiment and are capable of sliding in one piece when the trigger 3 is actuated. No cocking or loading of the gun occurs and there is no possibility of percussion.

When the push-buttons 118*a* are depressed, the magnet 111 and the pin 109 are first held immobilized when the trigger 3 is actuated and the fork 13 causes the percussion spring 117 to be compressed. The pin 109 is held immobilized by the magnet 111 since the pin acts as an armature which is attracted by the magnet. The percussion pin 109 can be caused to be suddenly thrown forward when the fork 13 comes into contact with the shoulders 109*x* (FIG. 8) or when the pin 109 comes away from the magnet 111 which latter remains in the position in which it is held by the push-buttons 118. It will be observed that the groove 111*a* has no need to have a V-shaped section; a rectangular section would also be suitable. The ends of the push-buttons 118 need not then have a conical shape and could be cylindrical.

In this embodiment too, the percussion mechanism can only operate if the user holds the gun in one hand and actuates the trigger 3 and depresses the push-buttons 118 with the other hand.

The two embodiments of the improved percussion mechanism according to the invention can of course each be associated with other safety arrangements, such as the necessity of forcing the barrel into the breech so as to permit ignition of the explosive charge and the necessity of mounting a splinter guard to permit penetration of the barrel into the breech.

It must be understood that the embodiments of the improved percussion mechanism described and shown in the accompanying drawings have been given merely by way of example and any modification can be made therein without departing from the spirit or scope of the invention, which also embraces the new industrial product constituted by a sealing gun or the like including application of said improved percussion mechanism.

What I claim is:

1. Percussion mechanism for a firing appliance having a breech member with a longitudinally extending cavity therein, comprising: a unit movable in the longitudinal direction within said breech member cavity; a percussion spring, one end of which bears against said unit to exert a thrust thereon; a striker integral with said unit; cocking means coacting with the other end of said percussion spring for stressing the latter; a return spring coacting with said cocking means and tending to maintain the latter in an inoperative position; manually operable safety means located in said breech member and operable externally of said appliance so as to engage in an immobilizing position said movable unit whereby said unit is locked in opposition to said action of the percussion spring; and elastically yieldable means connected to said safety means and tending to prevent said safety means from assuming its immobilizing position.

2. Percussion mechanism as claimed in claim 13, wherein said safety means comprises a push-button on said breech member and transversely slidable relative to the movement of said movable unit and engageable with said movable unit; and said elastically yieldable means comprises a return spring connected to said push-button and to the breech member so as to bias the push-button away from said movable unit.

3. Percussion mechanism as claimed in claim 2, further comprising a block rigid with the rear part of the breech member and provided with a longitudinal cavity.

4. Percussion mechanism as claimed in claim 3, wherein said movable unit comprises a tail portion slidably mounted in said block longitudinal cavity at the rear of the breech member.

5. Percussion mechanism as claimed in claim 4, wherein the tail portion is provided with an annular groove adapted to be engaged by said push-button.

6. Percussion mechanism as claimed in claim 1, wherein the cocking means comprise a trigger and a fork connected to said trigger and adapted, to slide with respect to said movable unit to compress the percussion spring, and upon continued sliding movement to exert a positive forward thrust on said movable unit.

7. Percussion mechanism as claimed in claim 6, wherein said movable unit is provided at its forward part with a flange and the percussion spring is a coil spring which encompasses the movable unit and coacts between said fork and said flange, respectively.

8. Percussion mechanism as claimed in claim 6, wherein the movable unit carries a rear abutment which limits the rearward movement of said unit and acts as a rear stop for the fork.

9. Percussion mechanism as claimed in claim 6, further comprising a washed disposed between the fork and the percussion spring, and slidable in the breech and acting as a support for one end of the return spring, the other end of the latter bearing against a fixed part of the firing appliance.

10. Percussion mechanism as claimed in claim 1,

wherein the movable unit is constituted by an assembly comprising an armature and a bar magnet cooperating with said armature, one of said armature and bar magnet being provided with said striker whereas the other of said armature and bar magnet is engageable with the safety means.

11. Percussion mechanism as claimed in claim 10, further comprising centering means for maintaining the bar magnet and the armature in coaxial relation to one another.

12. Percussion mechanism for a firing appliance having a breech member with a longitudinally extending cavity therein, comprising: a unit movable in the longitudinal direction within said breech member cavity; a percussion spring one end of which bears against said unit to exert a thrust thereon; a striker integral with said

unit; cocking means coacting with the other end of said percussion spring for stressing the latter; a return spring coacting with said cocking means and tending to maintain the latter in an inoperative position; manually operable safety means located in said breech member and operable externally of said appliance so as to engage in an immobilizing position said movable unit whereby said unit is locked in opposition to the action of said percussion spring.

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