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(54) **IMPROVED FIREARM**

VERBESSERTE FEUERWAFFE

ARME A FEU PERFECTIONNEE

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Description

Field of the Invention

[0001] This invention relates to an improved firearm, particularly to a new and improved trigger assembly that may be adjusted during assembly and during use to provide a sensitivity adjustment for a firearm, and more particularly to a new and improved trigger assembly for a convertible firearm.

Background of Invention

[0002] Firearms are mostly utilized by law enforcement, sport enthusiasts and private owners for target, game and also self-defence. In most of the prior arts, many of the firearms have its barrel slightly above the wrist of the user. This high placement of the barrel is normally due to the assembly of the trigger mechanism of the firearm. Since recoil force is applied on the gun barrel, a moment is created about the wrist that tends to rotate the gun barrel upward after firing and effort and time are required in re-aiming before firing the firearm again which can be undesirable especially during rapid shooting. This high barrel placement is one of the contributions to inaccuracy in aiming.

[0003] Also, in many of the prior arts for a semiautomatic firearm, the trigger travels beyond the point of firing and which requires additional time to allow the trigger to return to its firing position before the user can fire the next round. In situations where rapid firing is required, this additional trigger travel is undesirable as rapid firing can be difficult to achieve with such trigger mechanism. In addition, the excess distance travelled beyond the point of firing also causes a fulcrum effect wherein the barrel of the firearm travels downward and sideward path. When the user has managed to accurately aim at the target, the fulcrum effect may cause the aiming to run whereby the bullet usually does not hit the originally targeted area when the user pulls the trigger. This excess trigger travel is also another one of the contributions to inaccuracy when firing.

[0004] Although the sensitivity of many firearms is adjustable, due to the complex structural arrangement of these adjustable trigger mechanisms many movements are involved to discharge the firearm. Due to the many movements involved in these firearms, the distance travelled by the trigger to discharge the firearm is not proportional to the distance travelled by the sear to release the hammer from the cocked position and extra effort has to be put in to actuate the trigger to release the hammer from the cocked position and can be difficult for the user to make adjustments to the sensitivity on the field of action.

[0005] The main objective of this invention is to provide an improved firearm that has a low barrel placement, low trigger travel and proportional sensitivity adjustment. This objective is achieved by providing a trigger assembly in the area that is substantially in front of the trigger. Current firearms do not utilise this area for trigger assembly as most of the trigger assembly are conventionally provided behind the trigger, or the top front area of the trigger with a few of its components extending into the substantial area in front of the trigger. This area is preferred as it allows more space for the assembly as compared to the conventional areas used. In addition to overcoming the above problems of the prior arts, it is also desirable to provide a trigger mechanism that allows the user to reversibly adjust the sensitivity and trigger travel during use as desired according to the environmental condition at time of use. It is also desirable to provide a convertible firearm that overcomes the problems faced by the semi-automatic firearms and also provides a trigger mechanism that allows the user to reversibly adjust the trigger pull and travel when a semi-automatic firing mode is selected.

[0006] Document US-A-4664015 describes a trigger assembly according to the preamble of claim 1.

Summary of the Invention

[0007] The present invention relates to a trigger assembly that is provided substantially in front of the trigger. The trigger is also pivoted at its lower end to allow less effort to move the trigger discharge the firearm. One embodiment of the current invention comprises of a hammer means biased to discharge the firearm and latched from discharging by a sear assembly, a sear assembly comprising of a sear-cam block, a sear-link and a cross-bar that is serially engaged with one another at two engagement means to mutually latch said sear assembly from actuating said hammer means and a trigger means comprising of a trigger and a trigger link in operative contact with said sear assembly to actuate said hammer means.

[0008] The first end of said trigger link is pivoted to the second end of said trigger, said trigger is pivoted to the housing at its first end, and the second end of said trigger link is pivoted to the first end of said cross-bar. The second end of the cross-bar is biased upwardly. The first end of said sear-link is pivoted to the housing, second end in contact with the second end of the cross-bar to mutually form a first engagement means and is biased forwardly. A sear-cam block of substantially a triangular shape which first angle is pivoted to the housing and second angle in contact with the sear-link to mutually form a second engagement means. The first end of a hammer link is pivoted to the third angle of the sear cam block and the second end of said hammer link is pivoted to a hammer. Upon cocking of the hammer, the hammer link is biased towards the third angle of the sear cam block to urge said second angle of said sear cam block to swing upwardly, only to be restrained by the second engagement means. When the trigger is pulled, the cross-bar is pushed towards the sear-link to pivotally move the sear-link to unlatch the second engagement means between the sear-link and sear cam block, thus releasing biased

hammer link to throw the hammer to discharge the firearm.

[0009] The hammer is automatically re-cocked by the explosion of the bullet which forces the second angle of the sear-cam block to swing downwardly and engages with the cross-bar to disengage with the first engagement means and re-engaging the second engagement means, whereby the trigger has to be released to re-engage the first engagement means to discharge another round of firearm.

[0010] The preferred embodiment of the current invention further comprises of a cross-bar and a means of selecting either one of the cross-bar to be in contact with the second end of said sear-link to form a first engagement means. The additional cross-bar is pivoted at its first end to the second end of said trigger link and the second end of the additional cross-bar is biased upwardly. In this embodiment, the lower surface of the second angle of the sear-cam block is provided with different thickness such that when the cross-bar that is closest to the second angle of the sear-cam block is selected to be engageable with the second end of the sear-link to form the first engagement means, the second angle of the sear cam block engages with the selected cross-bar to disengage the first engagement means and re-engaging the second engagement means during the automatic re-cocking of the hammer, and the trigger has to be released to re-engage the first engagement means to discharge another round of the firearm, and when the cross-bar that is furthest to the second angle of the sear-cam block is selected to be engageable with the second end of the sear-link to form the first engagement means, the second angle of the sear-cam block does not engage with the selected cross-bar to disengage the first engagement means and the second engagement means is not re-engaged during the automatic re-cocking of the hammer, and the trigger does not need to be released to discharge another round of the firearm.

Brief Description of the Drawings

[0011] The present invention may be more readily described by reference to the accompanying drawings in which:

Figure 1 shows the side view of the first embodiment of the firearm of the current invention.

Figure 2 shows the simplified side view of the first embodiment of the firearm of the current invention before the trigger was pulled.

Figure 3 shows the simplified side view of the first embodiment of the firearm of the current invention when the trigger was pulled.

Figure 4 shows the simplified side view of the first embodiment of the firearm of the current invention when the hammer was re-cocked.

Figure 5 shows the side view of the preferred embodiment of the firearm of the current invention.

Figure 6 shows the simplified side view of the preferred embodiment of the firearm of the current invention.

Figure 7 shows the perspective view of the latch of the preferred embodiment.

Figure 8 shows the cross section of the lower surface of protrusion and both the levers, when both the levers are engaged with the sear.

Figure 9 shows the simplified side view of the preferred embodiment of the firearm of the current invention when the trigger is pulled.

Figure 10 shows the simplified side view of the preferred embodiment of the firearm of the current invention when the hammer is re-cocked.

Figure 11 shows the side view of the switch, illustrating the switch cap, spindle and shaft of the preferred embodiment.

Figure 12 illustrates the grooves on the shaft.

Figure 13 illustrates the safety switch with the hammer.

Detailed Description of the Invention

[0012] The terms "front", "rear", "forward", "rearward", "left", "right", "upper" and "lower" are used herein refer to any firearm when held in the normal firing position. The terms "clockwise" and "counter-clockwise" used herein refer to the direction of rotation as shown in the respective figures.

[0013] What follows is the detailed description of the assembly and operation of the first embodiment of the improved firearm in reference to the Figures 1 to 4, which also shows the trigger assembly located in the area that is substantially in front of the trigger. Figure 1 shows a semi-automatic firearm with the trigger system of the current invention in its armed position. A pivot pin (24) is used to pivot the lower end of trigger (18) to the housing (1) and the trigger (18) is forwardly biased. In Figure 1, a torsion spring (21) with a bend at its both ends is used to bias the trigger forwards. The torsion spring (21) is attached to the housing by coiling over the trigger pivot (24) and each of its bent ends placed against a pin (20) that is provided on the housing (1) and a pin (23) that is provided on the trigger (18) such that when the trigger (18) is pulled, the pin (23) on the trigger (18) extends the torsion spring (21) and once the trigger is released, the

extended torsion spring (21) will urge the trigger (18) back to its original firing position.

[0014] An adjustable screw as a trigger stop (22) is screwed through the trigger (18) and projects rearwardly out from the trigger (18). When the trigger (18) is pulled, the rear portion of trigger stop (22) will touch the wall of the housing (1) to stop the rearward movement of the trigger (18). This adjustable screw (22) allows the clearance between the trigger wall and the trigger stop (22) to be reversibly adjusted to either increase or decrease backward movement of trigger (18), hence, regulating the amount of fulcrum effect. A trigger link (9) has its first end pivoted with upper end of said trigger (18) and its second end placed in front of and lower than said first end of trigger link (9).

[0015] The second end of the trigger link (9) has a cross-bar (11) attached via a pivot pin (10) and also has a means of guiding the cross-bar (11) attached. A preferred guiding means is a lever (3) that is pivoted to the housing (1) at its upper end via a pivot pin (4) and the lower end of the lever (3) is free to rotate about the pivot pin (4) and is attached to pivot pin (10). Another guiding means comprises of a guide pin which extends from the pivotal point of the trigger link (9) with lever (3) and cross-bar (11), and an oblong opening on the housing (1) through which said guide pin can extend through and guided to move rearwards and forwards therewithin. The upper rear end of the cross-bar (11) is provided with a stepped cut out to provide a corner and the rear end of the cross-bar (11) is upwardly biased.

[0016] Between the cross-bar (11) and the trigger (18) is a sear-link (15) that is rotatably pivoted to the housing (1) at its upper end with a pivot pin (13). The lower end of the sear-link (15) is free to rotate around the pivot pin (13) and is forwardly biased. The lower front end (41) of sear-link (15) can come into contact with the rear-end of the cross-bar (11) to mutually form a first engagement means. Preferably, the lower front end (41) of the sear-link (15) is in contact with the corner formed on the rear-end of the cross-bar (11) as shown in Figures 1 to 3. Alternatively, the lower front end of the sear-link (15) is provided with a stepped cut-out to form a corner, and the upper rear end of the cross-bar (11) is In contact with the corner to form the first engagement means. In this alternative, the cross-bar (11) does not need to be provided with a corner formed by the stepped cut-out.

[0017] The preferred method of biasing the rear end of cross-bar (11) upwardly and biasing the lower end of the sear-link (15) forwardly will be discussed in the preferred embodiment of the improved firearm. Another biasing means is illustrated in Figure 1 and the same means is used to describe the first embodiment of the improved firearm. In this figure, the cross-bar (11) is integrally provided with an extension extending downwardly from the pivotal connection with the trigger link (9) and lever (3). The lower end of the sear-link (15) is also provided with an extension extending from the lower front end (41). A stretched elastic link (12) like a spring as shown in Figure (1), is used to connect both the extensions.

[0018] In this arrangement, both the rear end of the cross-bar (11) and the sear-link (15) are simultaneously biased in their intended direction. With this biasing means, the extension the sear-link (15) is provided with a means of accommodating the rear end of said cross-bar (11). The accommodating means can be a perforation that extends from the front of the extension through which the rear end of the cross-bar (11) can be accommodated or preferably, the accommodating means is a groove provided on the side of the sear-link (14) such that the rear-end of the cross-bar (11) can be accommodated in the groove as illustrated in Figures 1 and 4. A stopping pin (14) is provided in front of the extension on the sear-link (15) and is attached to the firearm's housing (1) to prevent the forwardly biased sear-link (15) from rotating further. To allow sensitivity adjustments to the trigger, an adjustable screw (16) is provided through the back of the extension on the sear-link (15) such that the tip of the adjustable screw (16) abuts this stopping pin (14). Referring to Figure 1, when the lever (3) rotates counter-clockwise, the cutout corner of lever (11) will push against the lower front end (41) of sear-link (15), causing the sear-link (15) to rotate counter-clockwise about the pivot (13) thus moving the adjustable screw (16) away from the stopping pin (14). The adjustable screw (16) will be discussed in more detail later.

[0019] Another alternative method of biasing the rear end of said cross-bar (11) upwardly and biasing the lower end of the sear-link (15) forwardly is to utilize a torsion spring. A torsion spring is attached around each pivot pins (10) and (13) in a similar manner as that of the torsion spring (21) to bias the rear end of the cross-bar (11) and the lower end of the sear-link (15) in their intended direction. To prevent the sear-link (15) from rotating further, a stopping pin is provided in front of the sear-link (15). Alternatively, the sear-link (15) is provided with an extension extending downwardly from the lower front end (41), and a stopping pin (14) is placed in front of said extension. The extension is also provided with a means of accommodating the rear-end of the cross-bar (11). An adjustable screw (36) can also be provided on the extension to provide a means of adjusting the trigger sensitivity which will be discussed later.

[0020] A sear-cam block (6) is placed in front of the sear-link (15) and above the cross-bar (11), and is essentially triangular in shape whereby the first triangular side is pivoted to the housing (1) via a pivot pin (8). The second side of the triangular sear-cam block (6) is provided with a protrusion (45) that is engageable with the forwardly biased sear-link (15) to form a second notch means. Preferably, a notch (43) is provided on the forwardly biased sear-link (15), above the first engagement means, and is engageable with the protrusion (45) of the sear-cam block (6) such that when the second engagement means is engaged, the upper surface of the protrusion (45) is in contact with the lower surface of the notch

(43). The third side is pivoted to the front end of a hammer link (48) with a pivot pin (5). The rear end of the hammer link (48) is connected to the hammer (38) with a pivot pin (37). The hammer (38) is attached to the housing (1) via pivot pin (36) and is free to rotate about this pivot pin (36).

[0021] The hammer (38) in Figure 1 is shown in its cocked position. To cock the hammer (38), the hammer (38) is rotated clock-wise which simultaneously causes the hammer link (48) to be pulled rearwards and causes the hammer drive spring (34) on hammer drive (33) to be compressed. The hammer link (48) rotates the sear-cam block (6) clock-wise to engage the second engagement means which maintains the compression of the hammer drive spring (34) and the compressed drive spring (34) thereby biases the hammer link (48) towards the third side of the sear-cam block (6) which is locked from rotating around the pivot pin (8) due to the engagement of the second engagement means. Hammer drive (33) serves to push the hammer (38) out of its cocked position when the second engagement means is disengaged.

[0022] A simplified diagram of the first embodiment is shown in Figure 2 whereby the firearm is in the armed position. The hammer is shown in the cocked position, the first engagement means shown as engaged, and the second engagement means shown as engaged to prevent the sear-cam block (6) from rotating.

[0023] Referring now to Figure 3, when trigger (18) is actuated, it rotates clockwise around the pivot pin (24) and drags the trigger link (9) rearwards. The rearward movement of the trigger link (9) causes the lever (3) to rotate counter-clockwise around the pivot pin (4), which also causes the cross-bar (11) to move rearwards. The corner formed by step cutout of said cross-bar (11) pushes the lower front end (41) of sear-link (15) backwards. The resulting movement of sear-link (15) about pivot pin (13) causes the second notch (43) of sear-link (15) to slip from the protrusion (45) of sear-cam block (6) and disengaging the second engagement means, thereby freeing the hammer drive spring (34) from its compressed state as the sear-cam block (6) is now free to rotate counter-clockwise around the pivot pin (8). When the hammer drive (33) extends from its compression state, the hammer (38) is pushed to rotate counter-clockwise around the pivot pin (36) and slams against the firing pin (47) thereby igniting the primer to drive the bullet out of the barrel.

[0024] When the bullet fires, the reactive force forces the breechblock (52) rearwards which pushes the hammer (38) to rotate clockwise beyond its initial cocked position as shown in Figures 1 and 2 until the hammer (38) reaches its rearmost position as illustrated in Figure 4 and compressing the hammer drive spring (34). The hammer (38) rotation pulls the hammer link (48) rearwards, thereby causing the sear-cam block (6) to rotate clockwise beyond its initial starting position shown in Figures 1 and 2 and causing the lower surface of the protrusion (45) of sear-cam block (6) to push against the upper surface of the cross-bar (11) until the corner formed by the stepped cutout of the cross-bar (11) becomes disengaged with the lower front end (41) of sear-link (15) as shown in Figure 4. Immediately upon disengagement of the first engagement means, the stretched elastic link (12) pulls the extensions of sear-link (15) and cross-bar (11) closer, thereby rotating sear-link (15) clockwise. Once the reactive force from the explosion is dissipated, the recoil of the spring (51) on the breechblock (52) forces the breechblock forwards and releases the hammer drive spring (34) from its compressed state. The hammer drive spring (34) extends from its compressed state, causing the hammer drive (33) to push hammer (38) counter-clockwise, thereby reengaging the second engagement means; i.e. reengaging the protrusion (45) of sear-cam block (6) with notch (43) of sear-link (15).

[0025] To reengage the first notch mean, the user has to release the trigger (18) and the trigger spring (21) will push against pin (23) on trigger (18) to rotate the trigger (18) counter-clockwise around the pivot (24) to its initial firing position. This rotation will push the trigger link (9) forward, thereby causing the lever (3) to rotate clockwise around pivot pin (4) and moving the cross-bar (11) forwards and re-engaging the corner on its upper rear end with the lower front end (41) of sear-link (15), thus bringing the whole trigger system back to its original firing position as illustrated in Figures 1 and 2. The clockwise movement of the lever (3) is stopped by the adjustable screw (7).

[0026] The sensitivity of the firearm is defined by the amount of engagement between the protrusion (45) of sear-cam block (6) and the notch (43) and the sensitivity, and specifically the sensitivity is defined by the amount of contact area between the upper surface of the protrusion (45) and the lower surface of the notch (43). When the adjustable screw (16) is screwed in through sear-link (15), the tip pushes the lower end of sear-link (15) away from the stopping pin (14), thus decreasing the amount of engagement between the notch (43) of sear-link (15) and the protrusion (45) of sear-cam block (6) and increasing the sensitivity of the firearm. When the adjustable screw (16) is screwed out through sear-link (15), the lower end of sear-link (15) is forced towards the support pin (14), thus increasing the amount of engagement between the notch (43) and protrusion (45) and decreasing the sensitivity of the firearm.

[0027] The distance travelled by the trigger to discharge the firearm is equal to the distance travelled by the sear-link (15) to release the sear-cam block (6), and such a 1:1 ratio is achieved with the trigger arrangement described above. This first embodiment is used to form the preferred embodiment of the firearm which is convertible from semi-automatic and fully automatic.

[0028] The preferred embodiment of the firearm is shown in Figure 5 which also shows the firearm in its armed position. In this preferred embodiment, the firearm is convertible between a semi-automatic and a fully automatic firearm. In addition to the trigger (18), trigger link

(9), lever (3), cross-bar (11), sear-link (15), sear-cam block (6), hammer link (48), hammer (38) and hammer drive (33) that forms the basic structure of the first embodiment, an additional cross-bar (11a) and a switch (19) are added to form the preferred embodiment. The preferred means of biasing the cross-bars (11, 11a) upwardly and the sear-link (15) forwardly is also shown in Figure 5. The assembly and the operation of the preferred embodiment of this invention are herein described.

[0029] Similarly with the cross-bar (11), the additional cross-bar (11a) is also pivoted to the lower end of lever (3) and the trigger link (9) at the pivot pin (10). The upper end of the lever (3) of the preferred embodiment is thicker on its upper end so that the trigger link (9) and two cross-bars (11) and (11a) can be accommodated and pivoted to the lower end of lever (3) by pivot pin (10). The upper end of the lever (3) is provided with a forward extending arm (3a) with two springs (2a, 2b) [only one shown in Figure 5] having their upper ends attached to the forward extending arm (3a).

[0030] A forward extending arm (11b) is provided on the front end of each levers (11, 11a) [only one shown in Figure 5] for attaching with the lower end of springs (2a, 2b), each arm attaching with only one end of a spring. The springs (2a, 2b) act in compression against cross-bars (11, 11a), and the rear end of the cross-bars (11, 11a) is upwardly biased. The levers (11) and (11a) are each provided with an upward extending arm that extends upwardly from the pivot pin (10) and abuts the pin (3b) that is fixed on the lever (3) which stops the cross-bars (11, 11a) from rotating during assembly. The adjustable screw (7) abuts the front end of the arm (11b).

[0031] The preferred means of biasing the sear-link (15) forwards is herein described. A spring (27) has its upper end attached to the housing (1) between the sear (15) and the trigger (38). The lower end of the spring (27) is provided with a cup (26) with its convex surface cupping the pin (15a) provided on sear (15). This spring (27) constantly exerts a force on the pin (15a) to push the sear (15) forward.

[0032] Only one of the two cross-bars (11) and (11a) can be engaged with the lower front end (41) of sear-link (15) and the semi-automatic or automatic mode of the firearm is determined by which of the two cross-bars (11) and (11a) is allowed to be engaged with the lower front end (41) of sear-link (15). The fiream is provided with a means of selecting which of the cross-bars (11) and (11a) is to be engaged with the lower front end (41) of the sear-link (15) and selecting means can also can also be used disengage both the cross-bars (11) and (11a) from the lower front end (41) of sear-link (15) which provides for the safety of the firearm.

[0033] Referring to Figure 11, the selecting means is provided by the switch (19) which consists of a shaft (60), a spindle (58), and switch cap (56). The switch shaft (60) is placed between the pendulum (3) and the sear (15) and directly above both the cross-bars (11) and (11a). A switch spindle (58) is provided at one end of the switch shaft (60) that extends into and out through the firearm's housing (1). A switch cap (56) is rotatably fixed onto the exterior of the firearm's housing (1) by having the switch spindle (58) extending into the switch cap (56). The lower side of the switch cap (56) is provided with dimples such that the cap (25a) comprising a head and a pin that is provided under the switch cap (56) with a spring (25) coiled around the pin can be received within any of the dimple when the switch cap (56) is rotated to provide different radial location of the switch shaft (60). Alternatively, the different location of the switch shaft (60) can be achieved by having serrations or teeths on the lower side of the switch cap (56) to engage with a pin.

[0034] The switch shaft (60) is provided with two parallel grooves (59a, 59b) that are both perpendicular to the axis with their ends not aligned to each other [Figure 12]. Each groove is wide enough to allow a cross-bar to be received therein such that when the shaft (60) is rotated by rotating switch cap (56), either one of the groove is positioned over a cross-bar and the cross-bar is pushed into the groove by the spring attached on the arm forward extending arm (11b) until the corner formed by the stepped cut-out portion of the cross-bar is engaged with the lower front end (41) of sear-link (15). The other cross-bar that does not have a groove positioned over its upper portion is forced to be disengaged with the lower front end (41) sear-link (15). Apart from rotating the switch (19) to change between cross-bar (11) and cross-bar (11a) to engage with sear-link (15), the switch (19) can also be rotated to disengage both the cross-bars (11) and (11a) with the sear-link (15).

[0035] The sear-cam block (6) of the preferred embodiment differs from the first embodiment by having different thickness at the lower surface of the protrusion (45). This difference in thickness is shown in Figure 7. The protrusion (45) can alternatively be either thinner at its lower left or lower right side. Due to the difference in the thickness, the distance from the lower surface of the protrusion (45) to the upper surface of the cross-bars (11) and (11a) when they are engaged with the lower front end (41) of sear-link (15) is different from one another, as illustrated in Figure 8.

[0036] According to Figure 8, when the cross-bar (11) that has the upper surface closer to the lower surface of the protrusion (45) of sear-cam block (6) is selected by switch (19) to be engaged with the sear-link (15), the firearm is converted into a semi-automatic firearm. Referring to Figure 9, whereby the broken lines denotes the original position of the trigger (18), when the trigger (18) is pulled until the distance 'B' is passed, the lever (3) rotates counter-clockwise and further movement of the trigger (18) is restricted by the adjustable screw (22) by abutting the firearm's housing (1). The rotation of the lever (3) causes the cross-bar (11) to push the sear-link (15) rearward, thereby releasing the sear-cam block (6) to allow the hammer drive spring (34) on hammer drive (33) to rotate the hammer (38) counter-clockwise to fire the bullet out.

[0037] The reactive force from the explosion will force the breech block (52) rearwards which pushes the hammer (38) to rotate clockwise beyond its initial cocked position and pushing the hammer (38) to its rearmost position, dragging the hammer link (48) rearward and rotating the sear-cam block (6) beyond its initial engaged position with second engagement means as shown in figures 5 and 6 and pushing the cross-bar (11) to be disengaged with the first engagement means. Immediately upon disengagement of the first engagement means, the spring (27) will push the sear-link (15) forward as shown in Figure 10. When the reactive force from the explosion dissipates, the recoil of spring (51) on the breechblock (52) forces the breechblock (52) forwards and releases the hammer drive spring (34) from its compressed state, thereby forcing the hammer (38) to rotate counter-clockwise and forcing the hammer link (48) to move forward, which in return rotates the sear-cam block (6) counter-clockwise and re-engaging the second engagement means. Therefore, similarly to the first embodiment, to fire another round of bullet, the user has to release the trigger (18), to allow the lever (3) to rotate back to its original state as shown in Figures 5 and 6. The spring (21) urges both the trigger (18) and lever (3) forwards, and the compressed spring (2) urges the lever (11) counter-clockwise until the rearward end of cross-bar (11) becomes engaged with the lower front end (41) of the sear-link (15).

[0038] When the cross-bar (11a) with the upper surface further from the lower surface of the protrusion (41) is selected and the trigger (18) is pulled rearward, the movements of the trigger (18), lever (3), cross-bar (11a), sear-link (15), sear-cam block (6), hammer link (48), hammer drive (33) and hammer (38) is the same as that for the semi-automatic for this preferred embodiment. Similarly, the reactive force from the explosion forces the hammer (38) to its rearmost position as shown in Figures 5 and 6. The rotation of the hammer (38) pulls the hammer link (48) rearward and rotating the sear-cam block (6) clockwise beyond its initial starting position of being engaged with the second notch means. Due to the decreased thickness of the lower surface of protrusion (41) of sear-cam block (6), the return of the sear-cam block (6) does not push the cross-bar (11a) out of engagement with the first engagement means as illustrated in Figure 10, thereby remaining the engagement between the cross-bar (11a) and lower front end (41) and remaining the sear-link (15) being pushed rearwards by the cross-bar (11a). When the reactive force of the explosion dissipates, the hammer drive spring (33) pushes the hammer (38) counter-clockwise which forces the hammer link (48) forwards, thereby rotating the sear-cam block (6) counter-clockwise. As the sear-link (15) is remained pushed, the protrusion (45) of sear-cam block (6) does not re-engage with the second engagement means and the hammer (38) is not held in the cocked position and continues to rotate counter-clockwise and fire another round of bullet, and the cycle continues. To stop firing, the user has to discontinue pulling the trigger (18) rearwards.

[0039] Apart from disengaging both the cross-bars with the second engagement means with switch (19), an additional safety switch (29) is provided on the preferred embodiment of the firearm that stops the hammer (38) from slamming the firing pin (47) [Figure 5]. The safety switch (29) consist of a flange (31), spindle and switch cap, wherein the flange (31) is placed infront of the hammer. Similarly, the safety switch (29) has a switch cap that is rotatably fixed to the housing by a spindle that extends from the switch cap into and through the firearm's housing (1) and into the housing's inner surface. The upper surface of switch cap is serrated or teethed to be engageable with the vertex of a cap (30a) covering a spring (30) that has its upper end connected to the housing (1). The other end of the shaft is provided with a flange (31). Referring to Figure 13, the hammer (38) is provided with a groove (39) on the side of the hammer such that the groove (39) starts from the front and extends rearwards for receiving the flange (31). A notch (40) is provided on the mouth of the groove (39). The flange (31) can be rotated into two position whereby one position will engage the flange (31) with the notch (40), thereby blocking the hammer (38) from slamming the firing pin (47). When the flange (31) is rotated into the other position, the flange (31) is positioned over the mouth of the groove (39) such that when the hammer (38) is not blocked and flange (31) is slidably received within the groove (39) when the hammer (38) rotates to discharge the firearm.

[0040] Such trigger arrangement for the preferred embodiment also provides a 1:1 ratio between the distance travelled by trigger (18) to discharge the firearm and the distance travelled by sear (15) to release latch (6) as illustrated in Figures 9 and 6, where the distance travelled by the trigger (18) to discharge the firearm, labelled as 'B' [Figure 9] is the same as the distance travelled by the sear (15) to release the latch (6), labelled as 'A', such ratio of which is not achieved in many conventional firearms.

[0041] The reactive force is dampened by 2 springs (50a, 50b) that are placed beside each other [one shown in Figure 5]. The spring guide (51) of each spring has their front end fixed onto the housing (1) and extends into and through the breech block (52) with its rear end fixed onto the rear end of the breech block cover (1a). Each spring (50a, 50b) is coiled around a spring guide (51) and has its front end fixed onto the breech block (52) and its rear end fixed onto the breech block cover (1a) on the rear end of the firearm, such that when the reactive force of the explosion is transferred onto the breech block (52), the breech block moves rearwards, thereby squeezing the springs (50a, 50b). An additional spring (53) is provided above the springs and is embedded on the breech block (52). The rear end of the spring (53) is provided with a cap (54) that protrudes out of the breech block slightly. This further dampens the clashing of the breech block with the housing (1).

[0042] An additional handle (28) is provided in front of the whole trigger system to provide additional stability for the user during shooting. The handle (28) is preferably foldable to allow to the user to store the handle when the user does not wish to use the handle.

Claims

1. A trigger assembly for releasing a mechanism biased for discharging a firearm comprising

- a trigger (18) in operative contact with a
- trigger assembly which is latched against the firing of the biased mechanism;

wherein said trigger (18) is operable to release the latching of said trigger assembly to allow the discharge of the biased mechanism,
said trigger assembly is provided forward of said trigger (18); **characterised in that** said trigger assembly is accommodated in an extended trigger guard housing.

2. A trigger assembly according to Claim 1 comprising:

- a hammer means (38) biased to discharge the firearm and latched from discharging by a sear assembly;
- a sear assembly comprising three components serially engaging one another at two engagement means which mutually latch said sear assembly from actuating said hammer means (38);
- a trigger means (18) in operative contact with said sear assembly to actuate hammer means (38).

3. A trigger assembly according to Claim 2 wherein the sear assembly comprises:

- sear cam block (6);
- sear link (15); and
- cross-bar (11);

wherein said sear cam block (6) is biased against said hammer means (38) and pivoted to swing upwardly,
wherein said cross-bar (11) engages said sear link (15) at a first engagement means, said cross-bar (11) is biased against releasing said first engagement means with said sear link (15); and
wherein said sear link (15) engages said sear cam block (6) at a second engagement means provided on complementary contacting surfaces between said sear cam block (6) and sear link (15), said sear link is biased towards said sear cam block's (6) upward swing to mutually engage at said second engagement means.

4. A trigger assembly according to Claim 3 wherein the trigger means (18) moves the cross-bar (11) in line with the trigger movement so that the sear link (15) is moved to unlatch second engagement means.

5. A trigger assembly according to Claim 3 wherein the trigger means (18) comprises:

- a trigger guard housing for accommodating therein the following components;
- a trigger (18) which first end is pivoted to the housing;
- a trigger link (9) which first end is pivoted to second end of said trigger (18);
- a cross-bar (11) which first end is pivoted to said trigger link (19) and second end is biased upwardly;
- a sear link (15) which first end is pivoted to the housing (1), second end in contact with the second end of cross-bar (11) to mutually form a first engagement means and is biased forwardly;
- a sear cam block (6) of substantially a triangular shape which first angle is pivoted to the housing (1) and second angle in contact with sear link (15) to mutually form a second engagement means;
- a hammer link (48) which first end is pivoted to the third angle of the sear cam (6) block and second end pivoted to a hammer (38);

wherein said hammer link (48) is biased, upon the cocking of the hammer (38), towards said third angle of said sear cam block (6) to urge said second angle of said sear cam block (6) to swing upwardly, only to be retrained by second engagement means;
wherein the pulling of the trigger transmits movement to push the crossbar towards the sear link (15) to pivotally move the sear-link (15) to unlatch the second engagement means between the sear link (15) and sear cam block (6), thus releasing biased hammer link (48) to throw the hammer (38) to discharge the firearm.

6. A trigger assembly according to Claim 5 wherein the trigger's (18) first end pivoted to the housing (1) comprises the lower end and the second end is pivotally linked to the trigger link (9), and wherein the pressing of the trigger (18) transmit the trigger movement via the trigger link (19) to move the cross-bar to unlatch second engagement means.

7. A trigger assembly according to Claim 5 further comprises a lever (3) which first end is pivoted to said housing and second end is pivoted to the second end of said trigger link (9).

8. A trigger assembly according to Claim 7 wherein the sear-link (15) is integrally provided with an extension

extending downwardly beyond the first engagement means, said extension provided with a means of accommodating the cross-bar (11), and said extension provided with an adjustable screw (16) and a stopping pin (14), wherein the adjustable screw is provided through said extension, wherein stopping pin (14) is attached to said housing (1), wherein the tip of said adjustable screw (16) abuts said stopping pin (14) such that the amount of engagement of the second engagement means can be adjusted via said adjustable screw (16).

9. A trigger assembly according to Claim 8 wherein the cross-bar (11) is integrally provided with an extension extending downwardly from its pivotal connection with the lever (3) and is biased towards the sear-link (15).

10. A trigger assembly according to Claim 9 wherein said cross-bar (11) extension and sear-link (15) extension are held by spring means urging said extensions towards each other.

11. A trigger assembly according to Claim 8 further comprises of a spring with one end attached to the housing (1) and other end in operable contact with the sear-link (15) to urge the sear-link (15) towards.

12. A trigger assembly according to Claim 11 further comprises of a spring with one end in operable contact with the lever (3) and other end in operable contact with the cross-bar (11) to urge the second end of the cross-bar upwardly.

13. A trigger assembly according to Claim 5 wherein the hammer (38) is automatically re-cocked by the explosion of the bullet, said automatic re-cocking of the hammer (38) forces the second angle of the sear-cam block (16) to swing downwardly and engages with the cross-bar (11) to disengage the first engagement means and re-engaging the second engagement means, whereby the trigger (18) has to be released to re-engage the first engagement means.

14. A trigger assembly according to Claim 5 further comprising:

- a second cross-bar wherein the first end of said second cross-bar is pivoted to the second end said trigger link and second end biased upwardly and in contact with the second end of sear link (15) to mutually form a first engagement means; and
- a means of selecting either one of the cross-bar to in contact with the second end of said sear-link (15) to form a first engagement means;
- the lower surface of the second angle of the sear cam block (16) is provided with different thickness;

whereby when the cross-bar (11) that is closest to the second angle of the sear-cam block (6) is selected to be engageable with the second end of the sear-link (15) to form the first engagement means, the second angle of the sear-cam block (6) engages with the selected cross-bar (11) to disengage the first engagement means and re-engaging the second engagement means during the automatic re-cocking of the hammer (38), and the trigger (18) has to be released to re-engage the first engagement means; and

when the cross-bar (11) that is furthest to the second angle of the sear-cam block (6) is selected to be engageable with the second end of the sear-link (15) to form the first engagement means, the second angle of the sear-cam block (6) does not engage with the selected cross-bar (11) to disengage the first engagement means and the second engagement means is not re-engaged during the automatic re-cocking of the hammer (38), and the trigger (18) does not need to be released to discharge another round of the firearm.

15. A trigger assembly according to Claims 3 to 14 wherein the second end of the cross-bar (11) comprises a stepped cut-out for contacting with the second end of sear link (15) to mutually form a first engagement means and allowing slip-over unlatching of first engagement means.

16. A trigger assembly according to Claim 12 and 15 wherein said means of selecting comprises of a shaft (60) extending over both levers (3), said shaft (60) comprising two parallel grooves (59a, 59b) that are perpendicular to the axis of the shaft (60) with non-aligned ends; a spindle (58) connecting to one end of said shaft (60) and extending into said housing (1) and connecting a switch cap (56) to the exterior of said housing, said switch cap is dimpled; and a pin in close proximity to said switch cap (56), said pin is provided with a cap with a vertex that is engageable with said dimples on switch cap (56) such that different radial location of the shaft is provided when the switch cap is rotated so that either one or none of the grooves can be placed above to receive a lever (3).

17. A trigger assembly according to any one of Claims 5 to 14 further comprises a safety switch (29), said safety switch comprising a flange (31), said flange placed in front of hammer (18); a spindle connecting to one end of said shaft and extending into said housing and connecting a switch cap (56) to the exterior of said housing (1), said switch cap (56) is serrated; a spring in close proximity to said switch cap, said spring is provided with a cap with a vertex that is

engageable with said serrations on switch cap (56) to provide different radial position on said flange by rotating said switch cap (56); a groove provided on said hammer (38) such that said groove extends from the front of the hammer; and a notch provided on the mouth of said groove such that said flange can be rotated to be received within the groove or received in the notch by rotating the switch cap (56).

18. A trigger assembly as claimed in any preceding claim in which the hammer is located behind the trigger.

19. A firearm including a trigger assembly according to any of the preceding claims.

20. A firearm as claimed in Claim 19 which includes a magazine housing located behind the trigger.

21. A firearm as claimed in Claim 19 which includes a magazine housing which is part of a pistol grip for the trigger hand of the user.

Patentansprüche

1. Abzugseinheit für das Lösen eines Mechanismus, der für das Abfeuern einer Schusswaffe vorgespannt ist, wobei die Einheit aufweist:

- einen Abzug (18), der in operativen Kontakt ist mit einer
- Abzugseinheit, welche gegen das Abfeuern des vorgespannten Mechanismus gesperrt ist; wobei

der Abzug (18) betriebsfähig ist, die Sperrung der Abzugseinheit zu lösen, um das Auslösen des vorgespannten Mechanismus zu ermöglichen,
wobei die Abzugseinheit vor dem Abzug (18) vorgesehen ist; **dadurch gekennzeichnet, dass**
die Abzugseinheit in einem erweiterten Abzugs-Schutzgehäuse untergebracht ist.

2. Abzugseinheit nach Anspruch 1, welche aufweist:

- ein Hammermittel (38), welches vorgespannt ist, um die Schusswaffe abzufeuern und welches vom Abfeuern durch eine Auslösehebeleinheit gesperrt ist;
- eine Auslösehebeleinheit mit drei Komponenten, die hintereinander an zwei Einrastmitteln ineinander eingreifen, welche die Auslösehebeleinheit von einem Betätigen der Hammermittel (38) gegenseitig sperren;
- ein Abzugsmittel (18), welches mit der Auslösehebeleinheit in operativen Kontakt ist, um das Hammermittel (38) zu betätigen.

3. Abzugseinheit nach Anspruch 2, wobei die Auslösehebeleinheit aufweist:

- einen Auslösehebel-Nockenblock (6);
- ein Auslösehebel-Verbindungsstück (15); und
- eine Querstange (11);

wobei der Auslösehebel-Nockenblock (6) gegen besagtes Hammermittel (38) vorgespannt ist, und drehbar gelagert ist, um nach oben zu schwenken, wobei die Querstange (11) mit den Auslösehebel-Verbindungsstück (15) an einem ersten Einrastmittel im Eingriff ist, und die Querstange (11) gegen ein Lösen des ersten Einrastmittels mit den Auslösehebel-Verbindungsstück (15) vorgespannt ist; und
wobei das Auslösehebel-Verbindungsstück (15) mit dem Auslösehebel-Nockenblock (6) an einem zweiten Einrastmittel in Eingriff ist, welches an sich ergänzenden berührenden Flächen zwischen den Auslösehebel-Nokkenblock (6) und den Auslösehebel-Verbindungsstück (15) vorgesehen ist, wobei das Auslösehebel-Verbindungsstück gegenüber dem Aufwärtsschwenken des Auslösehebel-Nokkenblocks (6) vorgespannt ist, um gegenseitig an den zweiten Einrastmittel einzurasten.

4. Abzugseinheit nach Anspruch 3, wobei das Abzugsmittel (18) die Querstange (11) im Einklang mit der Bewegung des Abzuges bewegt, so dass das Auslösehebel-Verbindungsstück (15) bewegt wird, um das zweite Einrastmittel zu entsperren.

5. Abzugseinheit nach Anspruch 3, wobei das Abzugsmittel (18) aufweist:

- ein Abzugs-Schutzgehäuse, um darin die folgenden Komponenten unterzubringen;
- einen Abzug (18), dessen erstes Ende im Bezug auf das Gehäuse drehbar gelagert ist;
- ein Abzugs-Verbindungsstück (9), dessen erstes Ende im Bezug auf das zweite Ende des Abzuges (18) drehbar gelagert ist;
- eine Querstange (11), deren erstes Ende in Bezug auf das Abzugs-Verbindungsstück (19) drehbar gelagert ist, und dessen zweites Ende nach oben vorgespannt ist;
- ein Auslösehebel-Verbindungsstück (15) dessen erstes Ende im Bezug auf das Gehäuse (1) drehbar gelagert ist, dessen zweites Ende mit den zweiten Ende der Querstange (11) in Kontakt ist, um gegenseitig ein erstes Einrastmittel zu bilden, und welches nach vorne vorgespannt ist;
- einen Auslösehebel-Nockenblock (6) von im wesentlichen dreieckiger Form, dessen erster Winkelbereich in Bezug auf das Gehäuse (1) drehbar gelagert ist, und dessen zweiter Winkelbereich in Kontakt mit dem Auslösehebel-

Verbindungsstück (15) ist, um gegenseitig ein zweites Einrastmittel zu bilden;
- ein Hammer-Verbindungsstück (48), dessen erstes Ende in Bezug auf den dritten Winkelbereich des Auslösehebel-Nockenblocks (6) drehbar gelagert ist, und dessen zweites Ende in Bezug auf einen Hammer (38) drehbar gelagert ist;

wobei das Hammer-Verbindungsstück (48) in Folge des Spannens des Hammers (38) in Richtung des dritten Winkelbereichs des Auslösehebel-Nockenblocks (6) vorgespannt wird, um den zweiten Winkelbereich des Auslösehebel-Nockenblocks (6) zu drängen, so dass dieser nach oben schwenkt, und nur von dem zweiten Einrastmittel zurückgehalten wird;
wobei das Zeihen des Abzuges eine Bewegung überträgt, um die Querstange in Richtung des Auslösehebel-Verbindungsstücks (15) zu drücken, um das Auslösehebel-Verbindungsstück (15) zu schwenken, um das zweite Einrastmittel zwischen den Auslösehebel-Verbindungsstück (15) und dem Auslösehebel-Nockenblock (6) zu entsperren, wodurch das vorgespannte Hammer-Verbindungsstück (48) gelöst wird, um den Hammer (38) umzulegen und die Schusswaffe abzufeuern.

6. Abzugseinheit nach Anspruch 5, wobei das erste Ende des Abzuges (18), welches in Bezug auf das Gehäuse (1) drehbar gelagert ist, das untere Ende aufweist, und wobei das zweite Ende mit dem Abzugs-Verbindungsstück (9) drehbar verbunden ist, und wobei das Drücken des Abzuges (18) die Abzugsbewegung über das Abzugs-Verbindungsstück (9) übermittelt, um die Querstange zu bewegen, um das zweite Einrastmittel zu entsperren.

7. Abzugseinheit nach Anspruch 5, welche weiters einen Hebel (3) aufweist, dessen erstes Ende in Bezug auf das Gehäuse drehbar gelagert ist und dessen zweites Ende in Bezug auf das zweite Ende des Abzugs-Verbindungsstücks (9) drehbar gelagert ist.

8. Abzugseinheit nach Anspruch 7, wobei das Auslösehebel-Verbindungsstück (15) mit einer Erweiterung einteilig ausgebildet ist, welche sich über das erste Einrastmittel hinweg nach unten hin erstreckt, wobei die Erweiterung mit einem Mittel ausgestattet ist, um die Querstange (11) unterzubringen, und die Erweiterung mit einer justierbaren Schraube (16) und einem Anschlagstift (14) versehen ist, wobei die justierbare Schraube durch die Erweiterung hindurch vorgesehen ist, wobei der Anschlagstift (14) an dem Gehäuse (1) angebracht ist, wobei die Spitze der justierbaren Schraube (16) so an dem Anschlagstift (14) anliegt, dass der Anteil des Eingriffes des zweiten Einrastmittels über die justierbare Schraube (16) justiert werden kann.

9. Abzugseinheit nach Anspruch 8, wobei die Querstange (11) mit einer Erweiterung einteilig ausgebildet ist, welche sich von ihrer drehbar gelagerten Verbindung mit dem Hebel (3) nach unten erstreckt, und in Richtung des Auslösehebel-Verbindungsstücks (15) vorgespannt ist.

10. Abzugseinheit nach Anspruch 9, wobei die Erweiterung der Querstange (11), sowie die Erweiterung des Auslösehebel-Verbindungsstück (15) durch Federmittel gehalten sind, welche die Erweiterungen in Richtung zueinander drängen.

11. Abzugseinheit nach Anspruch 8, welche weiters eine Feder aufweist, deren ein Ende an dem Gehäuse (1) angebracht ist, und dessen anderes Ende in operativem Kontakt mit dem Auslösehebel-Verbindungsstück (15) ist, um das Auslösehebel-Verbindungsstück (15) nach vorne zu drängen.

12. Abzugseinheit nach Anspruch 11, welche weiters eine Feder aufweist, deren ein Ende in operativem Kontakt mit dem Hebel (3) ist, und deren anderes Ende in operativem Kontakt mit der Querstange (11) ist, um das zweite Ende der Querstange nach oben zu drängen.

13. Abzugseinheit nach Anspruch 5, wobei der Hammer (38) durch die Explosion des Projektils automatisch wiedergespannt wird, wobei das automatische Wiederspannen des Hammers (38) erzwingt, dass der zweite Winkelbereich des Auslösehebel-Nockenblocks (16) nach unten schwenkt, und in Eingriff mit der Querstange (11) gelangt, um das erste Einrastmittel zu lösen, und das zweite Einrastmittel wieder einzurasten, wobei der Abzug (18) gelöst werden muss, um das erste Einrastmittel wieder einzurasten.

14. Abzugseinheit nach Anspruch 5, welche weiters aufweist:

- eine zweite Querstange, wobei das erste Ende der zweiten Querstange im Bezug auf das zweite Ende des Abzuges-Verbindungsstücks drehbar gelagert ist, und das zweite Ende nach oben vorgespannt ist, und in Kontakt mit dem zweiten Ende des Auslösehebel-Verbindungsstücks (15) ist, um gemeinsam ein erstes Einrastmittel zu bilden; und
- ein Mittel, um eine der Querstangen auszuwählen, um in Kontakt mit dem zweiten Ende des Auslösehebel-Verbindungsstücks (15) zu sein, um ein erstes Einrastmittel zu bilden;
- wobei die untere Oberfläche des zweiten Winkelbereichs des Auslösehebel-Nockenblocks (16) mit unterschiedlicher Dicke versehen ist;

wobei die Querstange (11) die dem zweiten Winkelbereich des Auslösehebel-Nockenblocks (6) am nächsten ist, ausgewählt ist, um mit dem zweiten Ende des Auslösehebel-Verbindungsstücks (15) einrastbar zu sein, um das erste Einrastmittel zu bilden, wobei der zweite Winkelbereich des Auslösehebel-Nockenblocks (6) mit der ausgewählten Querstange (11) in Eingriff ist, um das erste Einrastmittel zu lösen, und um das zweite Einrastmittel wiedereinzurasten während der Hammer (38) automatisch wiedergespannt wird, und wobei der Abzug (18) gelöste werden muss, um das erste Einrastmittel wieder einzurasten; und
wenn die Querstange (11), welche am weitesten von dem zweiten Winkelbereich des Auslösehebel-Nokkenblocks (6) entfernt ist, ausgewählt ist, um mit dem zweiten Ende des Auslösehebel-Verbindungsstücks (15) einrastbar zu sein, um das erste Einrastmittel zu bilden, dann gelangt der zweite Winkelbereich des Auslösehebel-Nockenblocks (6) nicht mit der ausgewählten Querstange (11) in Eingriff, um das erste Einrastmittel zu lösen, und das zweite Einrastmittel wird während des automatischen Wiederspannens des Hammers (38) nicht wieder eingerastet, und der Abzug (18) muss nicht gelöst werden, um eine weitere Patrone der Schusswaffe abzufeuern.

15. Abzugseinheit nach einem der Ansprüche 3 bis 14, wobei das zweite Ende der Querstange (11) eine abgestufte Aussparung für den Kontakt mit dem zweiten Ende des Auslösehebel-Verbindungsstücks (15) aufweist, um gemeinsam ein erstes Einrastmittel zu bilden, und um ein überstreifendes Entriegeln des ersten Einrastmittels zu ermöglichen.

16. Abzugseinheit nach Anspruch 12 und 15, wobei das Auswählmittel eine Welle (60) aufweist, die sich über beide Hebel (3) erstreckt, wobei die Welle (60) zwei parallele Nuten (59a, 59b) aufweist, welche im rechten Winkel auf die Achse der Welle (60) ausgerichtet sind, mit nicht aufeinander ausgerichteten Enden; eine Spindel (58), welche an einem Ende der Welle (60) anschließt und sich in das Gehäuse (1) erstreckt und eine Verbindung mit einem Schaltaufsatz (56) an der Außenseite des Gehäuses herstellt, wobei der Schaltaufsatz mit Vertiefungen versehen ist; und einen Zapfen in nächster Nähe zu dem Schaltaufsatz (56), wobei der Zapfen mit einem Aufsatz mit einer Erhebung versehen ist, die mit den Vertiefungen auf dem Schaltaufsatz (56) in Eingriff bringbar ist, so dass verschiedene radiale Anordnungen der Welle vorgesehen sind, wenn der Schaltaufsatz gedreht wird, so dass entweder eine oder keine der Nuten oberhalb eines Hebels (3) angeordnet werden können, um diesen aufzunehmen.

17. Abzugseinheit nach einem der Ansprüche 5 bis 14, welche weiters einen Sicherheitsschalter (29) aufweist, wobei der Sicherheitsschalter einen Flansch (31) aufweist, wobei der Flansch vor dem Hammer (18) angeordnet ist; eine Spindel, welche an einem Ende der Welle anschließt, und sich in das Gehäuse erstreckt, und die Verbindung zu einem Schaltaufsatz (56) an der Außenseite des Gehäuses (1) herstellt, wobei der Schaltaufsatz (56) gezackt ist; eine Feder in nächster Nähe zu dem Schaltaufsatz, wobei die Feder mit einem Aufsatz versehen ist, der eine Erhebung aufweist, die mit den Zacken auf den Schaltaufsatz (56) in Eingriff bringbar ist, um verschiedene radiale Positionen auf dem Flansch vorzusehen, indem der Schaltaufsatz (56) gedreht wird; eine Nut, die auf dem Hammer (38) vorgesehen ist, so dass sich die Nut von der Vorderseite des Hammers erstreckt; und eine Aussparung, die an der Öffnung der Nut vorgesehen ist, so dass der Flansch gedreht werden kann, um innerhalb der Nut aufgenommen zu werden oder in der Aussparung aufgenommen zu werden, indem der Schaltaufsatz (56) gedreht wird.

18. Abzugseinheit nach einem der vorhergehenden Ansprüche, wobei der Hammer hinter dem Abzug angeordnet ist.

19. Schusswaffe, welche eine Abzugseinheit nach einem der vorhergehenden Ansprüche enthält.

20. Schusswaffe nach Anspruch 19, welche ein hinter dem Abzug angeordnetes Magazingehäuse enthält.

21. Schusswaffe nach Anspruch 19, welche ein Magazingehäuse aufweist, welches Teil eines Pistolengriffes für die Abzugshand des Benutzers ist.

Revendications

1. Assemblage de déclenchement destiné à libérer un mécanisme précontraint pour décharger une arme à feu, comprenant :

- une gâchette (18) en contact opérationnel avec
- un assemblage de déclenchement qui est bloqué contre la mise à feu du mécanisme précontraint, ladite gâchette (18) pouvant fonctionner pour libérer le blocage dudit assemblage de déclenchement afin de détendre le mécanisme précontraint, ledit assemblage de déclenchement étant prévu à l'avant de ladite gâchette (18), **caractérisé en ce que** ledit assemblage de déclenchement est contenu dans un logement prolongé de la garde de la gâchette.

2. Assemblage de déclenchement selon la revendication 1 comprenant :

- un moyen formant percuteur (38) précontraint destiné à décharger l'arme à feu et bloqué contre la décharge par un assemblage formant levier d'armement
- un assemblage formant levier d'armement comprenant trois composants en prise les uns avec les autres en série à deux moyens de mise en prise qui bloquent mutuellement ledit assemblage formant levier d'armement contre l'actionnement dudit moyen formant percuteur (38) ;
- un moyen de déclenchement (18) en contact opérationnel avec ledit moyen formant levier d'armement afin d'actionner le moyen formant percuteur (38).

3. Assemblage de déclenchement selon la revendication 2, dans lequel l'assemblage formant levier d'armement comprend :

- un bloc à came de levier d'armement (6) ;
- une liaison de levier d'armement (15) ; et
- une barre transversale (11) ;

ledit bloc à came de levier d'armement (16) étant précontraint contre ledit moyen formant percuteur (38) et pivote pour se balancer vers le haut,
ladite barre transversale (11) étant en prise avec ladite liaison de levier de d'armement (15) à un premier moyen de mise en prise, ladite barre transversale (11) étant précontrainte contre la libération audit premier moyen de mise en prise avec ladite liaison de levier d'armement (15) ; et
ladite liaison de levier d'armement (15) étant en prise avec ledit bloc à came de levier d'armement (6) à un second moyen de mise en prise prévu sur des surfaces complémentaires en contact entre lesdits bloc à came de levier d'armement (6) et liaison de levier d'armement (15), ladite liaison de levier d'armement est précontrainte vers le pivotement vers le haut dudit bloc à came de levier d'armement (6) afin de se mettre en prise mutuellement audit second moyen de mise en prise.

4. Assemblage de déclenchement selon la revendication 3, dans lequel le moyen formant gâchette (18) déplace la barre transversale (11) dans le sens du mouvement de la gâchette de sorte que la liaison de levier d'armement (15) soit déplacée afin de débloquer le second moyen de mise en prise.

5. Assemblage de déclenchement selon la revendication 3, dans lequel le moyen formant gâchette (18) comprend :

- un logement de garde de gâchette afin d'y contenir les composants suivants ;
- une gâchette (18) dont la première extrémité pivote par rapport au logement ;
- une liaison à la gâchette (9) dont la première extrémité pivote par rapport à la seconde extrémité de ladite gâchette (18) ;
- une barre transversale (11) dont la première extrémité pivote par rapport à ladite liaison à la gâchette (19) et dont la seconde extrémité est précontrainte vers le haut ;
- une liaison de levier d'armement (15) dont la première extrémité pivote par rapport au logement (1), dont la seconde extrémité est en contact avec la seconde extrémité de la barre transversale (11) pour former mutuellement un premier moyen de mise en prise et est précontrainte vers l'avant ;
- un bloc à came de levier d'armement (6) de forme sensiblement triangulaire dont le premier angle pivote par rapport au logement (1) et dont le second angle est en contact avec la liaison de levier d'armement (15) pour former mutuellement un second moyen de mise en prise ;
- une liaison (48) à un percuteur dont la première extrémité pivote par rapport au troisième angle du bloc à came de levier d'armement (6) et dont la seconde extrémité pivote par rapport au percuteur (38) ;

ladite liaison (48) au percuteur étant précontrainte, lors de l'armement du percuteur (38), vers ledit troisième angle dudit bloc à came de levier d'armement (6) afin de pousser ledit deuxième angle dudit bloc à came de levier d'armement (15) à pivoter ver le haut en étant seulement retenu par le second moyen de mise en prise ;
la traction sur la gâchette transmettant un mouvement afin de pousser la barre transversale vers la liaison de levier d'armement (15) afin de déplacer par pivotement la liaison de levier d'armement afin de débloquer le second moyen de mise en prise entre la liaison de levier d'armement (15) et le bloc à came de levier d'armement (6), ce qui libère la liaison (48) précontrainte au percuteur pour lancer le percuteur (38) afin de décharger l'arme à feu.

6. Assemblage de déclenchement selon la revendication 5, dans lequel la première extrémité de la gâchette (18) pivotant par rapport au logement (1) comprend l'extrémité inférieure et la seconde extrémité est liée par pivotement à la liaison (9) à la gâchette, et dans lequel la pression sur la gâchette (18) transmet le mouvement de la gâchette via la liaison (9) à la gâchette pour déplacer la barre transversale afin de débloquer le second moyen de mise en prise.

7. Assemblage de déclenchement selon la revendication 5, comprenant en outre un levier (3) dont la première extrémité pivote par rapport audit logement et dont la seconde extrémité pivote par rapport à la seconde extrémité de ladite liaison (9) à la gâchette.

8. Assemblage de déclenchement selon la revendication 7, dans lequel la liaison de levier d'armement (15) est pourvue, en une seule pièce, d'une extension s'étendant vers le bas en dehors du premier moyen de mise en prise, ladite extension étant pourvue d'un moyen pour loger la barre transversale (11) et ladite extension étant pourvue d'une vis ajustable (16) et d'un goupille d'arrêt (14), où la vis ajustable (16) est prévue à travers ladite extension, où la goupille d'arrêt (14) est fixée audit logement (1), où le bout de ladite vis ajustable (16) bute contre ladite goupille d'arrêt (14) de sorte que la mesure de mise en prise du second moyen de mise en prise peut être ajustée par l'intermédiaire de ladite vis ajustable (16).

9. Assemblage de déclenchement selon la revendication 8, dans lequel la barre transversale (11) est pourvue, en une seule pièce, d'une extension s'étendant vers le bas depuis son raccordement à pivot au levier (3) et est précontrainte vers la liaison de levier d'armement (15).

10. Assemblage de déclenchement selon la revendication 9, dans lequel ladite extension de la barre transversale (11) et ladite extension de la liaison de levier d'armement (15) sont maintenues par des moyens à ressort poussant lesdites extensions l'une vers l'autre.

11. Assemblage de déclenchement selon la revendication 8, comprenant en outre un ressort ayant une extrémité fixée au logement (1) et l'autre extrémité en contact opérationnel avec la liaison de levier d'armement (15) afin de pousser la liaison de levier d'armement (15) vers l'avant.

12. Assemblage de déclenchement selon la revendication 11, comprenant en outre un ressort ayant une extrémité en contact opérationnel avec le levier (3) et l'autre extrémité en contact opérationnel avec la barre transversale (11) afin de pousser la seconde extrémité de la barre transversale (11) vers le haut.

13. Assemblage de déclenchement selon la revendication 5, dans lequel le percuteur est réarmé automatiquement par l'explosion de la balle, ledit réarmement automatique du percuteur (38) force le deuxième angle du bloc à came de levier d'armement (16) de pivoter vers le bas et se met en prise avec la barre transversale (11) pour découpler le second moyen de mise en prise et remettre en prise le second moyen de mise en prise, la gâchette (18) devant être relâchée pour remettre en prise le premier moyen de mise en prise.

14. Assemblage de déclenchement selon la revendication 5, comprenant en outre :

- une seconde barre transversale dont la première extrémité pivote par rapport à la seconde extrémité de ladite liaison à la gâchette et dont la seconde extrémité est précontrainte vers le haut et en contact avec la seconde extrémité de la liaison de levier d'armement (15) afin de former mutuellement un premier moyen de mise en prise; et
- un moyen pour sélectionner l'une ou l'autre barre transversale afin de former au contact avec la seconde extrémité de ladite liaison de levier d'armement (15) un premier moyen de mise en prise ;
- la surface inférieure du deuxième angle du bloc à came de levier d'armement (6) étant pourvue d'une épaisseur différente;

ce par quoi lorsque la barre transversale (11) qui est la plus proche du deuxième angle du bloc à came de levier d'armement (6) est sélectionnée pour pouvoir être mise en prise avec la seconde extrémité de la liaison de levier d'armement (15) afin de former le premier moyen de mise en prise, le second angle du bloc à came de levier d'armement (6) se met en prise avec la barre transversale sélectionnée (11) pour découpler le premier moyen de mise en prise et remettre en prise le second moyen de mise en prise pendant le réarmement automatique du percuteur (38), et la gâchette (18) doit être relâchée afin de remettre en prise le premier moyen de mise en prise et

lorsque la barre transversale (11) qui est la plus éloignée du deuxième angle du bloc à came de levier d'armement (6) est sélectionnée pour pouvoir être mise en prise avec la seconde extrémité de la liaison de levier d'armement (15) afin de former le premier moyen de mise en prise, le second angle du bloc à came de levier d'armement se met en prise avec la barre transversale sélectionnée (11) pour découpler le premier moyen de mise en prise et le second moyen de mise en prise n'est pas remis en prise pendant le réarmement automatique du percuteur (38), et la gâchette (18) ne doit pas être relâchée pour tirer un coup.

15. Assemblage de déclenchement selon les revendications 3 à 14, dans lequel la seconde extrémité de la barre transversale (11) comprend une découpe en gradin pour la mise en contact avec la seconde extrémité de la de la liaison de levier d'armement (15) pour former mutuellement un premier moyen de mise en prise et pour permettre un déblocage par glissement du premier moyen de mise en prise.

16. Assemblage de déclenchement selon la revendication 12 et la revendication 15, dans lequel ledit moyen de sélection comprend un arbre (60) s'étendant sur les deux leviers (3), ledit arbre (60) com-

prenant deux rainures parallèles (59a, 59b) qui sont perpendiculaires à l'axe de l'arbre (60) avec des extrémités non alignées ; un axe (58) se raccordant à une extrémité dudit arbre (60) et s'étendant dans ledit logement (1) et raccordant une coiffe commutatrice (56) à l'extérieur dudit logement, ladite coiffe commutatrice étant ondulée ; et une goupille située à étroite proximité de ladite coiffe commutatrice (56), ladite goupille étant pourvue d'une coiffe avec un sommet qui peut se mettre en prise avec lesdites ondulations sur la coiffe commutatrice (56) de sorte qu'un emplacement radial différent de l'arbre soit fourni lorsque la coiffe commutatrice est mise en rotation de sorte que soit une rainure soit placée, soit aucune rainure ne soit placée au-dessus pour recevoir un levier (3).

17. Assemblage de déclenchement selon l'une quelconque des revendications 5 à 14, comprenant en outre un commutateur de sécurité (29), ledit commutateur de sécurité comprenant un épaulement (31) qui est placé devant le percuteur (18); un axe se raccordant à une extrémité dudit arbre (60) et s'étendant dans ledit logement (1) et raccordant une coiffe commutatrice (56) à l'extérieur dudit logement (1), ladite coiffe commutatrice (56) étant dentelée ; un ressort à étroite proximité de ladite coiffe commutatrice, ledit ressort étant pourvu d'une coiffe avec un sommet qui peut être mis en prise avec lesdites dentelures sur la coiffe commutatrice (56) afin de procurer une position radiale différente sur ledit épaulement en tournant ladite coiffe commutatrice (56) ; une rainure prévue sur ledit percuteur (38) de façon à ce que la rainure s'étende depuis l'avant du percuteur ; et une encoche prévue sur l'embouchure de ladite rainure de sorte que ledit épaulement puisse être tourné de façon à être reçu dans la rainure ou à être reçu dans l'encoche en tournant la coiffe commutatrice (56).

18. Assemblage de déclenchement selon l'une quelconque revendication précédente, dans lequel le percuteur est localisé derrière la gâchette.

19. Arme à feu incluant un assemblage de déclenchement selon l'une quelconque des revendications précédentes.

20. Arme à feu selon la revendication 19, qui comprend un logement pour magasin situé derrière la gâchette.

21. Arme à feu selon la revendication 19, qui comprend un logement pour magasin qui est une partie d'une poignée de pistolet pour la main déclenchante de l'utilisateur.

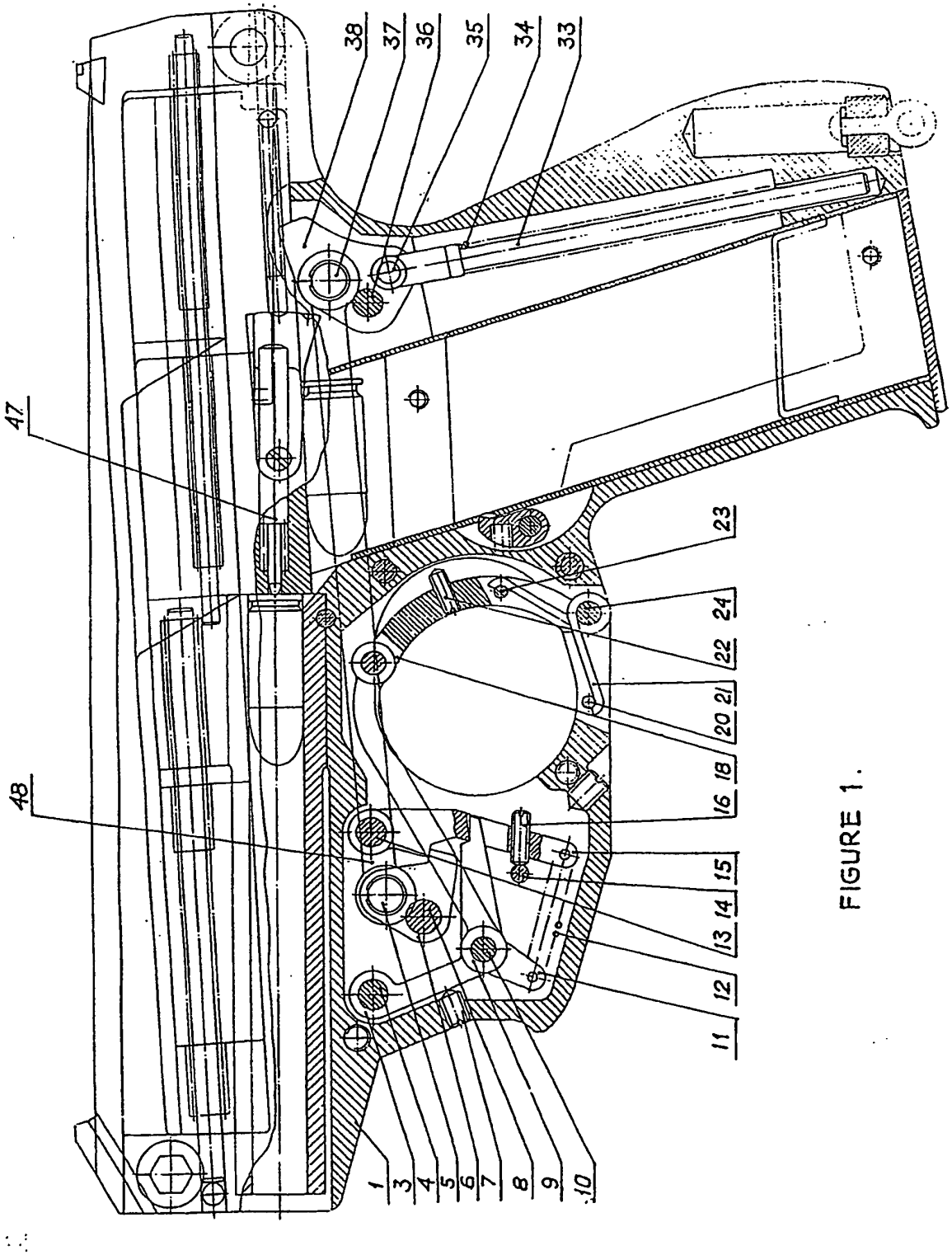

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FIGURE 1.

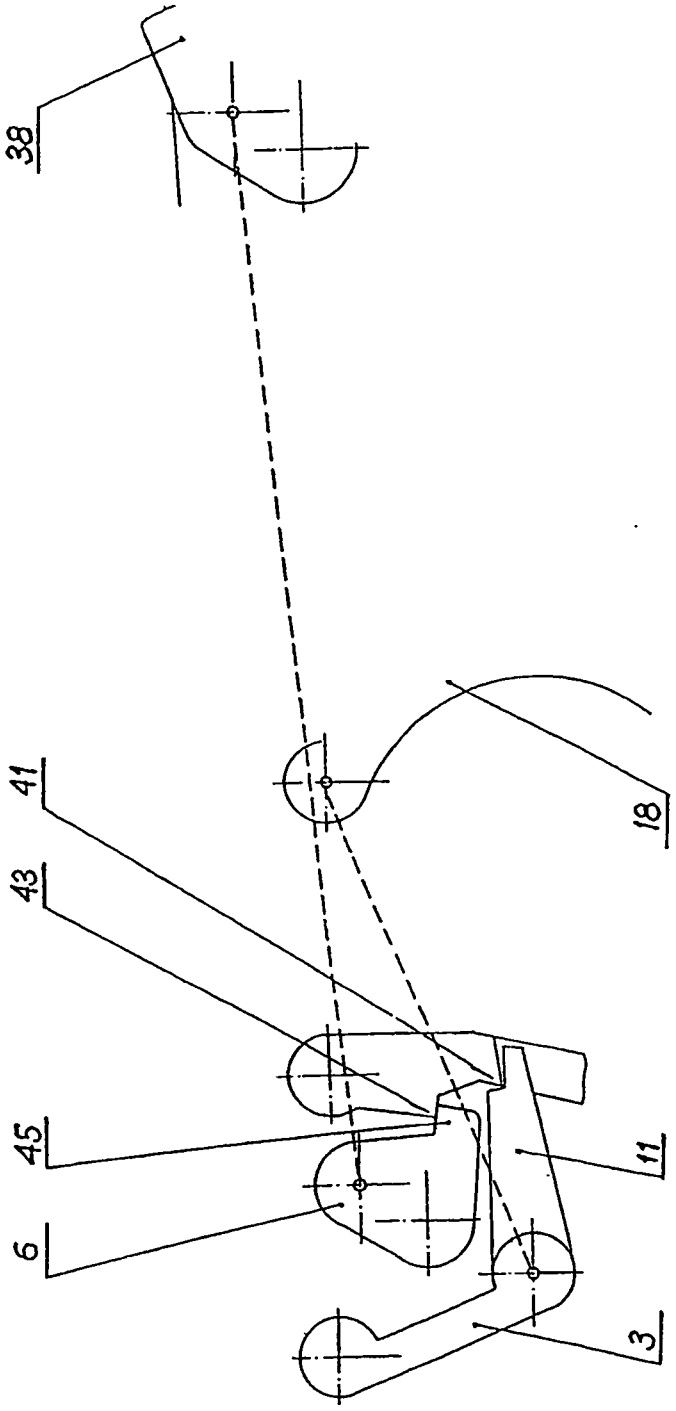


FIGURE 2.

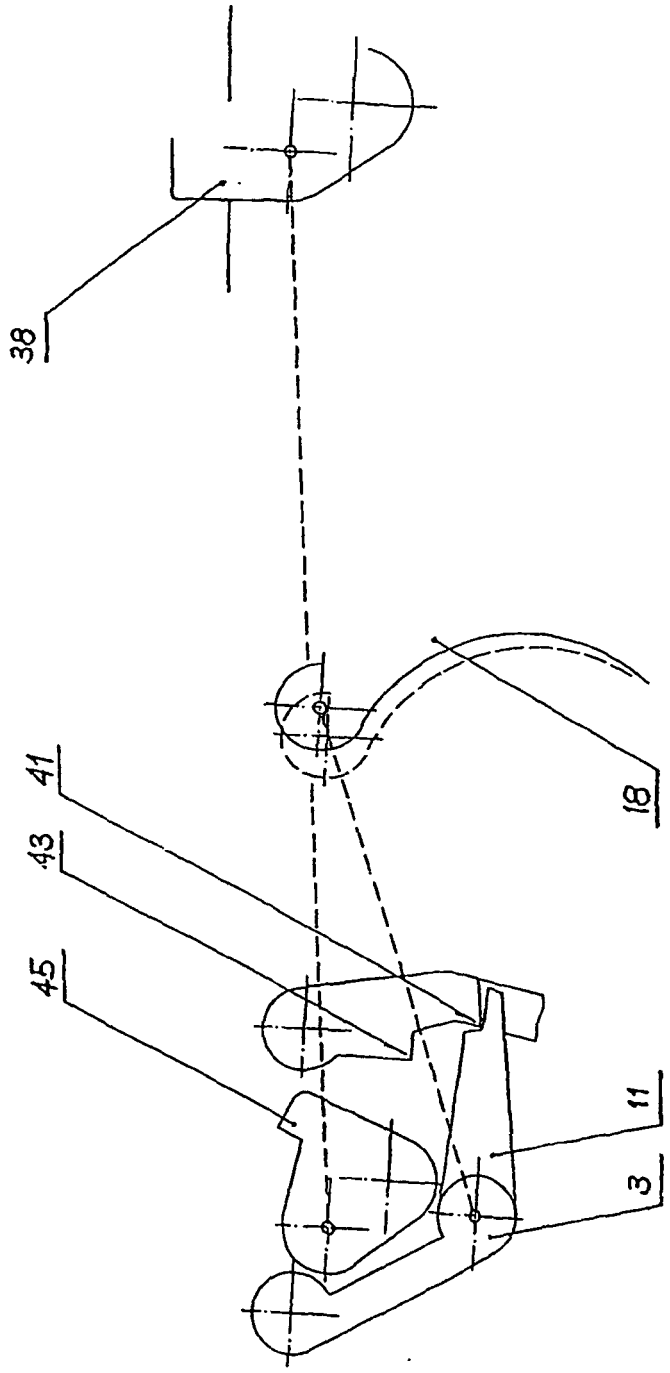


FIGURE 3.

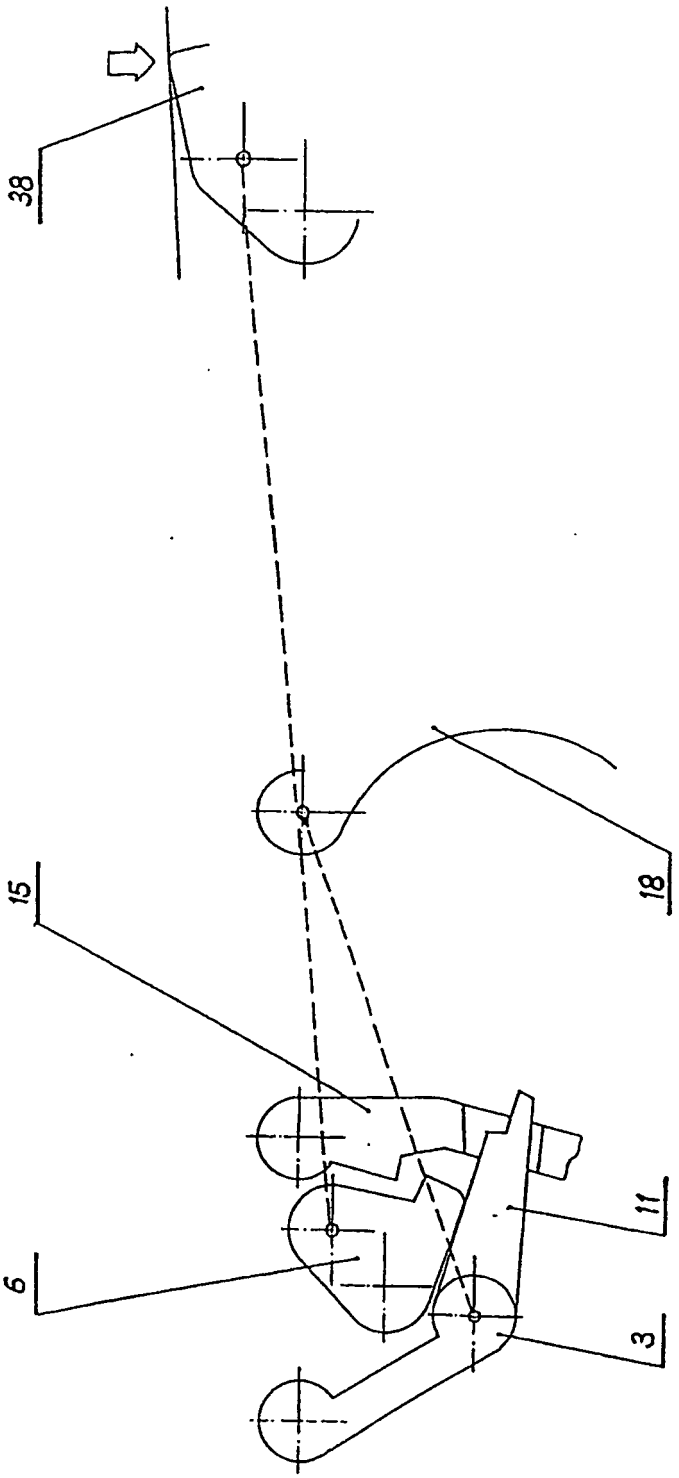


FIGURE 4.

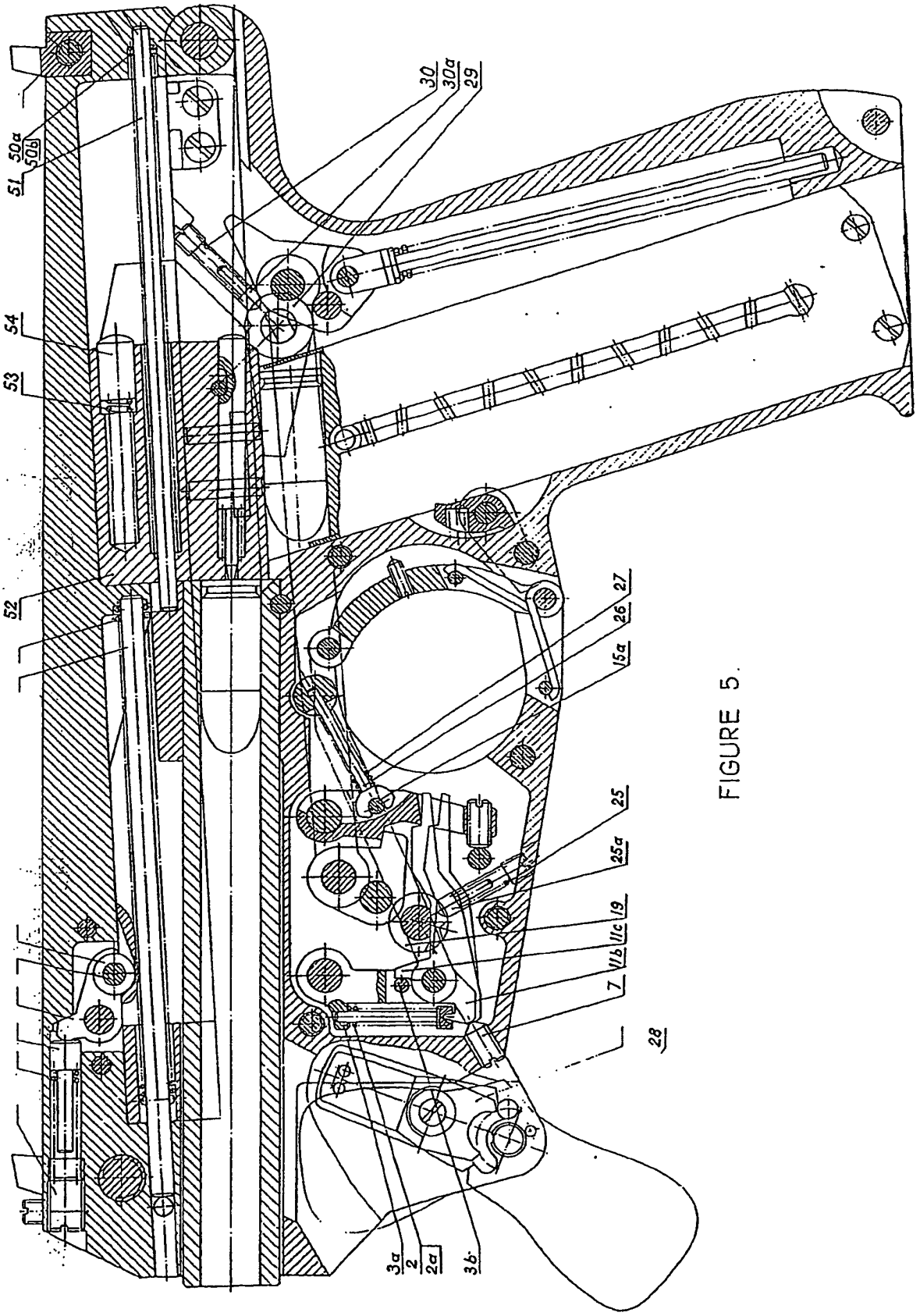

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3a
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FIGURE 5.

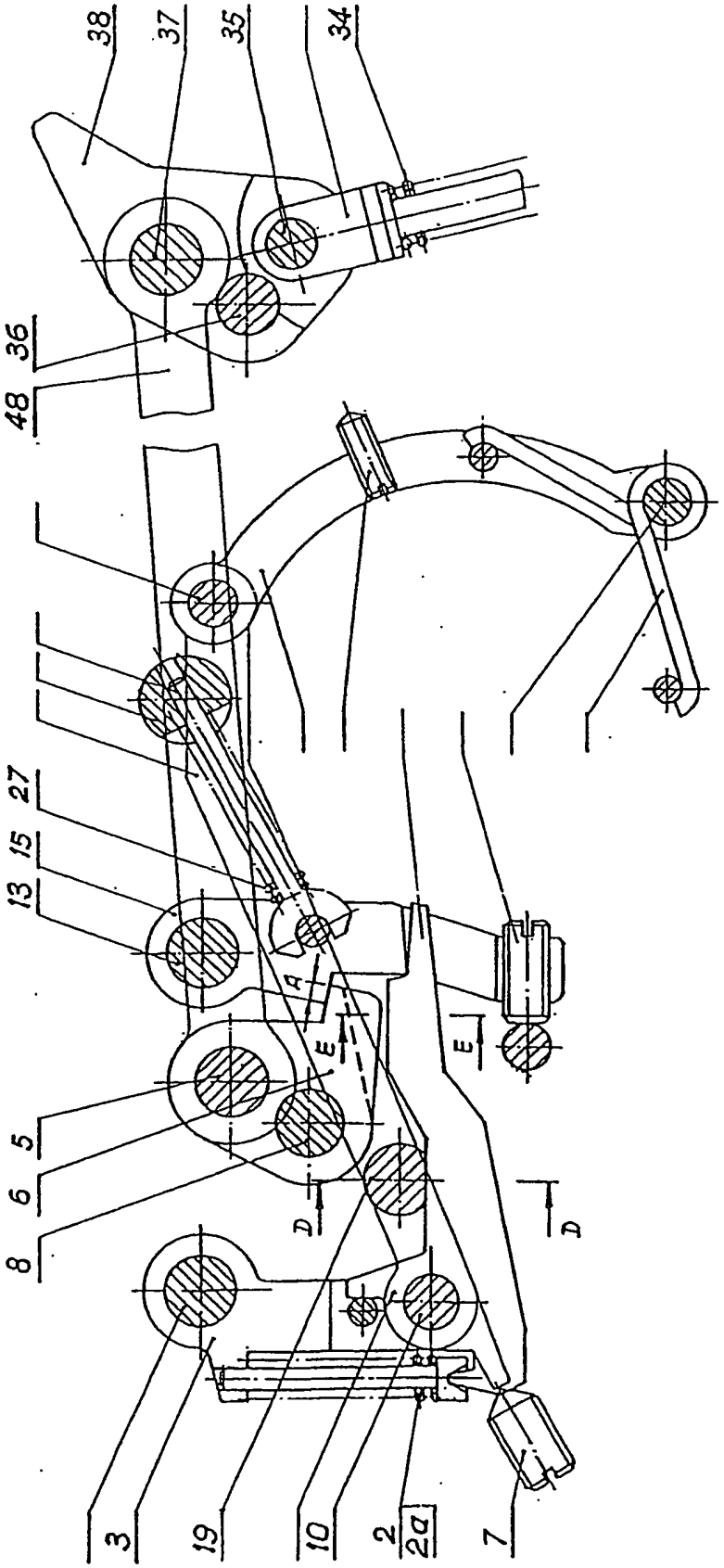


FIGURE 6.

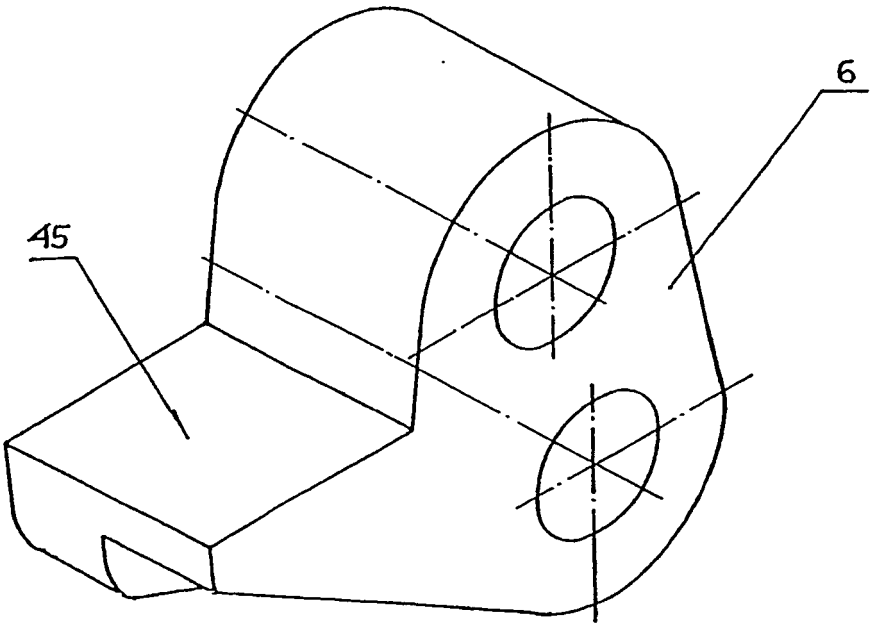


FIGURE 7.

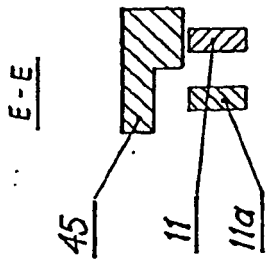


FIGURE 8.

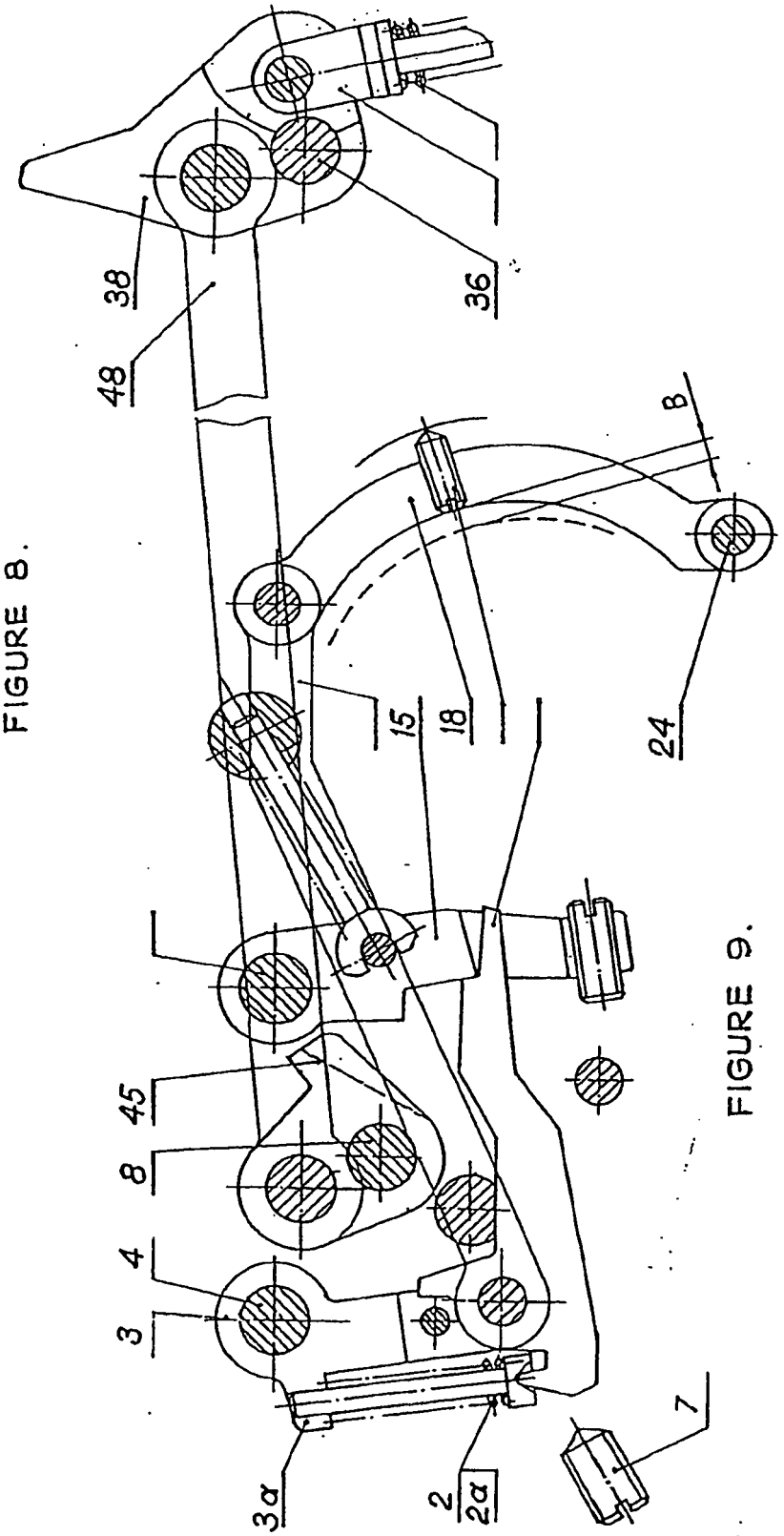


FIGURE 9.

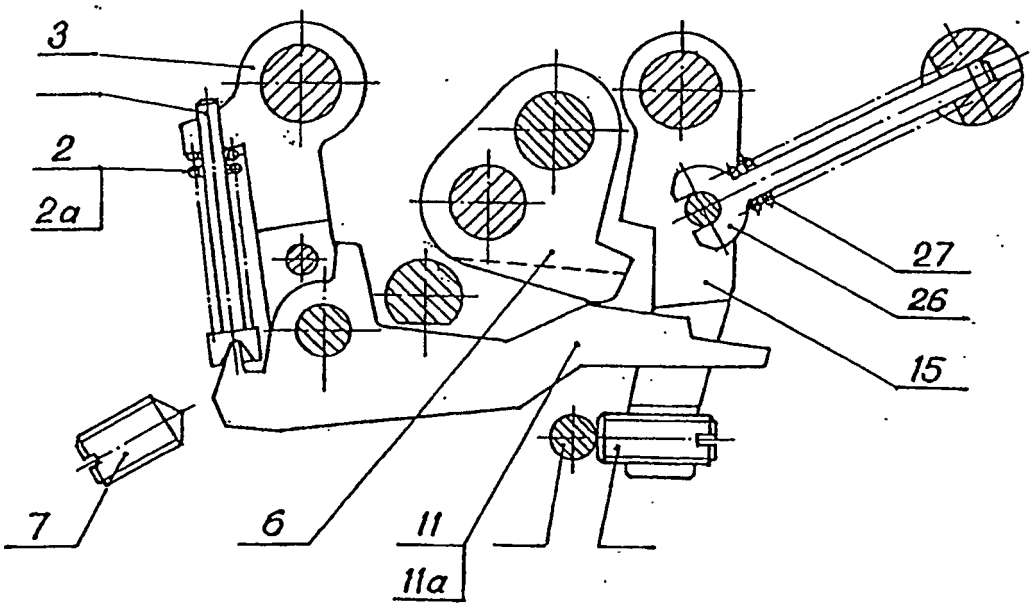


FIGURE 10.

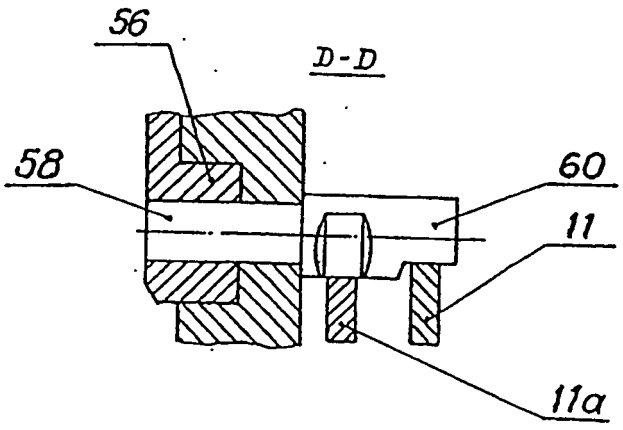


FIGURE 11.

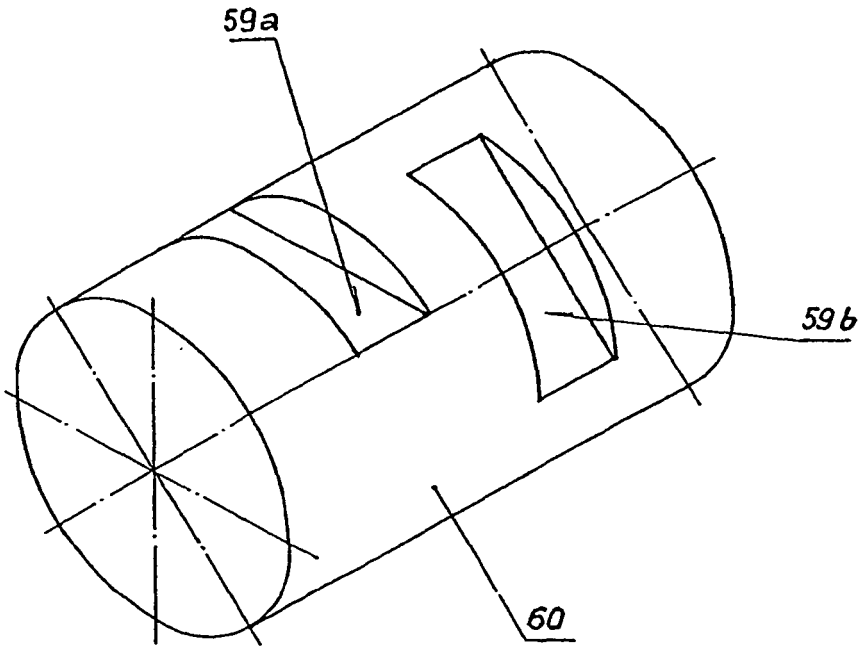


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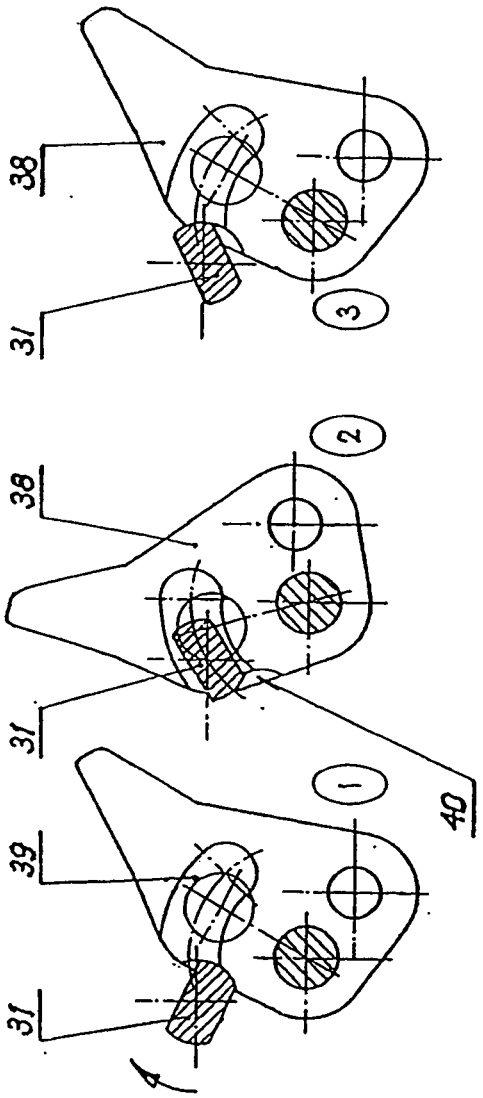


FIGURE 13.