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(54) TRIGGER MECHANISM FOR AUTO-LOADING WEAPON, AND AUTO-LOADING MANUAL WEAPON

AUSLÖSEMECHANISMUS FÜR SELBSTLADENDE WAFFE UND MANUELLE SELBSTLADENDE WAFFE

MÉCANISME DE DÉTENTE POUR ARME À CHARGEMENT AUTOMATIQUE, ET ARME MANUELLE À CHARGEMENT AUTOMATIQUE

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Description

Field of the Invention

[0001] The invention relates to a combined trigger mechanism of the auto-loading weapon with a striking hammer enabling the shooting either in single action/double action operation having the possibility to lock and activate the hammer by the controlled manner, or in the exclusive double action operation. The invention also relates to an auto-loading manual weapon with this combined trigger mechanism, which enables the user to select a suitable shooting operation.

Background of the Invention

[0002] The following trigger mechanisms have been used in the auto-loading weapons:

The Single Action (SA) trigger mechanism, where pulling the trigger can result in releasing of the striking mechanism and thus in the shot, only if the shooter himself or via the closure movement after the previous shot firstly draws the striking mechanisms by such a way that the striking hammer stays caught in the cocked position. This mechanism can be also supplemented with a manual safety catch.

[0003] Double Action (DA) trigger mechanism works in such a way that the shooter draws the striking mechanism by the pulling of the trigger until the striking hammer is released and the projectile is initiated (fired). At the same time the striking hammer is in the front position or on the safety cog.

The combination of single action and double action trigger mechanism, SA/DA. These types of the trigger mechanisms in various construct variants are disclosed in CZ 301749 B6, EP 0 186 073 B1, US 4,028,836, US 7,257,918 B2, US 6,381,892 B1, US 6,341,442 B1. These documents do not address the safe triggering of the hammer and using in the exclusive double action operation.

DC (decocker) trigger mechanisms with the safe triggering of the hammer without a shot, i.e. having the controlled activation of the hammer, are described for example in CZ 293 435 B6, US 6,718,680 B2, US 6,481,139 B2, US 6,588,136 B2. The weapons described in these documents cannot be used in the exclusive double action operation (DAO).

The trigger mechanisms with the exclusive double action operation are described for example in EP 1 472 501 B1. This document, however, does not enable the use in SA/DA operation.

EP 0 730 135 B1 and EP 2 525 185 A1 describe the weapons with the trigger mechanisms enabling both single action and double action operations, with the possibility to adapt it for the exclusive double action operation. However such modification of the trigger mechanism requires the change of some parts of the trigger mechanism or their inactivation. It represents the intervention into the weapon construction, ant it is not possible to do such modification by any control element of the weapon.

SK 279 478 B6 describes a multifunctional trigger mechanism having the possibility to switch the shooting regimes by the control element on the weapon. This document, however, does not address a safe releasing of the hammer in the single action operation, which releasing is the important safety point.

[0004] The aim of this invention is to create a mechanism enabling easy switching of the shooting operation between single action and double action operations with the possibility to put the safety catch on; which mechanism is supplemented with the safe release of the drawn hammer and the exclusively double action operation (SA/DA+DC and DAO), for the auto-loading weapons intended for professional and civil using, without the need to disassemble the weapon.

Subject Matter of the Invention

[0005] The disadvantages of the prior art are overcome by the trigger mechanism for the auto-loading weapon, which mechanism enables to change the shooting operation by the single control element on the weapon to the single action/double action operation with the safe hammer release element with the possibility to put the cocked hammer on safety catch, and for the shooting exclusively in the double action operation. The trigger mechanism comprises the swivel pin equipped with a groove having the edge for controlling of the main hammer catch for setting the exclusive double action operation and for the safe release of the striking hammer, and equipped with a depression for inserting of the main catch, upon the deflection from the engagement with the striking hammer and the part of the cylinder surface of the swivel pin, in order to secure the main hammer closure.

[0006] The main hammer catch has a tooth for the catching of the striking hammer tooth, and a projection for the controlling of the deflection from the engagement with the striking hammer by the means of the swivel pin in DAO operation and upon the safe lowering of the hammer. The main hammer catch has a surface for the deflection from the engagement with the hammer by a transfer-bar and the projection for the securing in SA/DA operation by the means of the swivel pin.

[0007] The auxiliary hammer catch has a surface, on which the hammer falls upon its safe lowering.

[0008] The striking hammer has a tooth for the engagement with the tooth of the main hammer catch in the single action operation and the surface, by which it sits down to the auxiliary hammer catch upon its safe lowering.

The trigger mechanism according to the invention consist of the swivel, the main catcher of the hammer and the auxiliary catcher of the hammer, equipped with the means for the mutual collaboration and for the collaboration with the hammer, wherein the swivel is placed in

revolving and adjustable position, and it is controlled by the control element on the weapon surface.

Further subject matter of this invention represents the auto-loading weapon, particularly a pistol having the possibility of the selection of the suitable shooting operation by the means of the control element localized on the weapon surface, which shooting operation can be the single action/double action operation (SA/DA operation) with the safe lowering of the hammer or the possibility to secure the drawn hammer, or the exclusive double action operation (DAO). The weapon according to this invention consists of the handle, into which the container is inserted, which container is equipped with the trigger mechanism according to this invention; the auto-safety lock; the lever of the auto-safety lock; and the closure movable attached to the container lines. The trigger mechanism according to this invention consists of:

- the swivel pin comprising the edge for the controlling of the main hammer catch in DAO operation and for the safe lowering of the hammer, the depression engaging with the main catcher upon the deflection for the release of the hammer in SA/DA operation, and the part of the cylinder surface for the lock of the main hammer catch;
- the main hammer catcher equipped with the tooth for the catching of the hammer in SA operation, while the main hammer catcher further comprises the projection enabling the controlling of the deflection from the engagement with the hammer by the means of the swivel pin in DAO operation, and upon the safe lowering of the hammer; the surface for the deflection from the engagement with the hammer by the means of the transfer-bar; and the projection for the locking by the means of the swivel pin in SA/DA operation;
- the auxiliary hammer catcher equipped with the surface for the sitting down of the hammer upon the safe lowering in DC operation; and
- the hammer equipped with the tooth for the engagement with the main hammer catcher in the single action operation, and the surface, on which the auxiliary hammer catcher is sat down upon the safe lowering of the hammer,

wherein these elements of the trigger mechanisms are arranged for the mutual collaboration and the selection of the suitable shooting operation is done by the control element localized on the surface of the weapon.

[0009] The greatest advantage of the mechanism resides in the fact that the user himself can select the shooting operation as appropriate in the actual situation, which selection is not possible in case of commonly used mechanisms. Thus, the appropriate selection of the operation enables the application of all advantages provided by the individual operations. Inappropriate selection of the shooting operation does not limit the using of the weapon by any way. However, the user is losing comfort and particularly safety offered by the weapon and thus is getting closer to the commonly used standards. The caliber of the manual auto-loading weapon has no influence to the function and using of the trigger mechanism. The switching between the individual operations is accomplished by the means of the only control element positioned on the weapon without need to change the grip of the weapon. The controlling is double-sided and enables the equal control upon shooting, whether the weapon is hold in right or left hand.

Description of Drawings:

[0010]

Figure A.1.1 - view of the weapon handle
Figure A.1.2 - view of the container with the striking mechanism
Figure A.1.3 - view of the weapon closure
Figure A.1.4 - view of the fingerboard position restricter
Figure A.1.5 - view of the locking of the fingerboard position by the arresting rivets
Figure A.1.6 - view of the important construction details of the selected parts of the mechanism
Figure A.2.1 - view of the arrangement of the mechanism parts from the right
Figure A.2.1 - view of the arrangement of the mechanism parts from the left
Figure B.1 - view of the weapon and the position of the controlling fingerboards in SA operation - unlocked safety catch
Figure B.2.1 - view of the parts of the mechanism from the right in SA operation - unlocked safety catch
Figure B.2.2 - view of the parts of the mechanism from the left in SA operation - unlocked safety catch
Figure B.3.1 - section of the trigger mechanism in SA operation - unlocked safety catch
Figure B.3.2 - section of the trigger mechanism in SA operation - unlocked safety catch
Figure B.4 - section of the trigger mechanism in SA operation; the hammer is cocked manually by the closure
Figure B.5 - section of the trigger mechanism in SA operation; the hammer is cocked by the closure after the shot
Figure C.1 - view of the weapon and the position of the controlling fingerboards in SA operation - locked safety catch
Figure C.2 - detailed view of the parts of the mechanism in SA operation - locked safety catch
Figure C.3.1 - section of the trigger mechanism in SA operation - locked safety catch
Figure C.3.2 - section of the trigger mechanism in SA operation - locked safety catch
Figure D.1 - view of the weapon and the position of the controlling fingerboards in SA/DA operation
Figure D.2.1 - view of the parts of the mechanism in SA/DA operation

Figure D.2.2 - view of the parts of the mechanism in SA/DA operation
Figure D.3 - section of the trigger mechanism in DA operation, before the release of the hammer
Figure D.4 - detailed view of the parts of the mechanism in DA operation, before the release of the hammer
Figure E.1 - view of the weapon and the position of the controlling fingerboards in DC operation
Figure E.2 - detailed view of the parts of the mechanism in DC operation
Figure E.3.1 - section of the trigger mechanism in DC operation
Figure E.3.2 - section of the trigger mechanism in DC operation
Figure F.1 - view of the weapon and the position of the controlling fingerboards in DAO operation
Figure F.2 - detailed view of the parts of the mechanism in DAO operation
Figure F.3.1 - section of the trigger mechanism in DAO operation, prior starting of the hammer drawing
Figure F.3.2 - section of the trigger mechanism in DAO operation, prior starting of the hammer drawing
Figure F.4 - section of the trigger mechanism in DAO operation, before the release of the hammer
Figure F.5 - detailed view of the parts of the mechanism in DAO operation, before the release of the hammer

Examples of Invention Embodiments

[0011] In this example the trigger mechanism used in the auto-loading manual firearm, particularly the pistol, which individual main parts are illustrated on figure A.1.1 - the handle 1, figure A.1.2 - the container 2, and figure A.1.3 - the closure 3; has in its assembled form the container 2 inserted in the handle 1, and the closure 3 with the grooves 101b is movable positioned in the lines 101a on the container 2. There is the double-sided transfer-bar 21 in the handle 1 equipped with the trigger 6, and both right and left sides are equipped with the arresting rivets 24. The trigger mechanism according to this invention is placed in the container 2 equipped with the control element 22, in this case the fingerboard, and it is controlled by the trigger 6. The container comprises the lines 101a for the sliding of the closure 3 illustrated on figure A.1.3, and comprises the grooves 101b for collaboration with the lines 101a of the container 2. Figure A.1.4 illustrates the detailed view of the inside of the handle 1. It is possible to see one of the fingerboards 22 connected with the swivel pin 23 for setting of the selected position and thus the appropriate shooting operation. The handle 1 is equipped with the left and right arresting rivets 24 with the sprung ball 104d and the stop surfaces 103. The inner surface of both fingerboards is equipped with the stop 102 for the sitting of some of the stop surfaces 103 on the handle 1 and depressions 104a and 104b with the edge 104c for receiving of the sprung ball 104d of the arresting rivet 24. Figure A.1.5 shows the fingerboards 22 with the inserted swivel pin 23 in three different positions enabling three shooting operations. Figure A.1.5, on the left, shows the locking of the fingerboard by the arresting rivet 24 in the position for the operation SA/DA - locked safety catch, where the sprung ball 104d leans against the edge 104c. Figure A.1.5, in the middle, shows the locking of the fingerboard 22 by the arresting rivet 24 in the position for the operation SA/DA - unlocked safety catch, where the sprung ball 104d leans against the depression 104b. Figure A.1.5, on the right, shows the locking of the fingerboard 22 by the arresting rivet 24 in the position for the DAO operation, where the sprung ball 104d leans against the depression 104a. Figures A.1.6 show the substantial parts of the trigger mechanism in the disassembled state in two different views, while the substantial parts comprise the swivel pin 23, the main catcher 9.1 of the hammer, the auxiliary catcher 9.2 of the hammer, and the hammer 7. The swivel pin 23 is equipped with the depression with the edge 122a deflecting the main catcher 9.1. The main catcher 9.1 of the hammer is equipped with the tooth 122b for collaboration with the edge 122a of the swivel pin 23, and the tooth 108b for the collaboration with the tooth 108a of the hammer 7, and the surface114 for the collaboration with the transfer-bar 21. The auxiliary catcher 9.2 of the hammer is equipped with the sitting surface 109b for collaboration with a surface 109a on the hammer 7. Figures A.2.1 and A2.2 show the partial sections of the assembling of the individual parts of the trigger mechanisms according to this invention with the separated sideboards 35 and the fingerboards. The sideboards comprise the openings for the placing of the axes of the individual parts. The double-sided transfer-bar 21 with the projection 106 and the contact 107 comprises the trigger 6 connected by the means of the transfer-bar 21 with the mechanism consisting of the main catcher 9.1 of the hammer, the auxiliary catcher 9.2 of the hammer, the swivel pin 23, the hammer 7, the firing pin 14 with the surface 110 for collaboration with the hammer 7, the striking spring 33, the cartridge match 105, the lever 48 of the auto-safety catch, and the auto-safety catch 13.

[0012] Functions of the individual parts of the trigger mechanism:

The closure 3 draws the hammer 7 by the backward movement after the shooting or manually before the shooting and by the transfer-bar 21 disrupts the contact of the trigger 6 with the main catcher 9.1 of the hammer through the projection 106 after the shooting.

[0013] The trigger 6 in the single action trigger operation (SA) controls the main catcher 9.1 of the hammer and the auxiliary catcher 9.2 of the hammer by the means of the transfer-bar 21. In double action trigger operation (DA) the trigger 6 controls the main catcher 9.1 of the hammer and the auxiliary catcher 9.2 of the hammer by

the means of the transfer-bar 21. In the exclusive double action operation (DAO) the trigger control the hammer 7 by the means of the transfer-bar 21.

[0014] In all operations the trigger controls the auto-safety catch 13 through the transfer-bar 21 and the lever 48 of the auto-safety catch.

[0015] The hammer 7 together with the striking spring 33 provides the source of kinetic energy for putting the firing pin 14 into movement by the hit on the surface 110 of the firing pin 14.

[0016] The main catcher 9.1 of the hammer in the single operation (SA) - catches the hammer 7 on the tooth 108b by the tooth 108a in cocked position in the single action operation (SA).

[0017] In the regime of safe hammer release (DC) - the auxiliary catcher 9.2 of the hammer catches the hammer 7 by the hit on the surface 109b upon the controlled lowering of the hammer 7 in the position, where the hammer 7 does not contact the firing pin 14, and simultaneously it serves as the safety catch in case of the spontaneous (uncontrolled) release of the hammer 7 in SA/DA operations, when the trigger 6 is not pulled.

[0018] The auto-safety catch 13 - (the falling safety catch) is the safety element blocking the movement of the firing pin 14 and prevents its contact with the projectile until the trigger 6 is pulled to the firing position.

[0019] Upon the hit of the hammer 7 on the surface 110 of the firing pin 14 the firing pin is put into movement and the projectile is fired by the hit on the primer 105 surface.

[0020] The transfer-bar 21 transfers the movement of the trigger 6 to the main catcher 9.1 of the hammer and the auxiliary catcher 9.2 of the hammer.

[0021] In the double action operation (DA) and exclusive double action operation (DAO) the transfer-bar 21 transfers the movement of the trigger 6 to the hammer 7. The transfer-bar 21 transfers the movement of the trigger 6 to the auto-safety catch 13 through the lever 48 of the auto-safety catch. The transfer-bar 21 interrupts the contact of the trigger 6 with the main catcher 9.1 of the hammer in the single action operation (SA) by the contact of the projection 106 with the closure 3 after the shot. The transfer-bar 21 disrupts the contact of the trigger 6 with the hammer 7 by the contact 107 of the transfer-bar 21 with the swivel pin 23 in DA and DAO operations.

[0022] The fingerboard 22 is the control element of the mechanism, which element switches between the SA/DA, SA locked safety catch, DAO operations by the means of the swivel pin 23 and launches the controlled lowering of the hammer 7.

[0023] The swivel pin 23 is controlled by the movement of the finger boards 22 and by the movement of the main catcher 9.1 of the hammer and locks the mechanism in SA operation against the shot upon the cocked hammer 7 by stopping of the movement by the part 118a of the cylinder surface of the swivel pin 23 by the projection 118b of the main catcher of the hammer. In SA operation, when the hammer 7 is drawn, upon the downward movement of the finger boards 22 the hammer 7 is released by the pulling through the edge 122a of the swivel pin 23 by the projection 122b of the main catcher 9.1 of the hammer from the tooth 108b of the main catcher 9.1 of the hammer and thus lowering the hammer 7 safely. Upon the downward moving of the fingerboards the edge 122a of the swivel pin 23 presses the projection 122b of the main catcher 9.1 of the hammer and thus the main catcher 9.1 of the hammer is inactivated and the mechanism is switched to DAO operation.

[0024] The arresting rivet 24 - fixes the position of the finger boards 22 by the sprung ball 104d against the spontaneous movement.

[0025] The striking spring 33 - together with the hammer 7 serves as the source of the kinetic energy for the actuation of the firing pin 14.

[0026] Other parts of the trigger mechanism provide the securing of the individual main parts in the container and handle. They include the container 2, the ejector 10, the sideboard 35, and the pegs used for hanging of the individual parts, and the spring for the enforcement of the position and directing of the movement, which function is obvious from the representation on other figures.

Description of the function in the individual operations:

[0027] SA (Single Action) - single action mechanism - figure B.1 shows the overall view of the weapon with the fingerboards in horizontal position. In this case it corresponds with the operation of the unlocked single action trigger mechanism (SA operation - unlocked safety catch). Figures B.2.1 and B.2.2 show the positions of the individual elements in SA operation - unlocked safety catch, from the right and from the left, respectively. In SA operation the trigger 6 controls the main catcher 9.1 of the hammer by the means of the transfer-bar 21, and the auto-safety catch 13 by the means of the lever 48 of the auto-safety catch. In SA operation the tooth 108b of the main catcher 9.1 of the hammer is fixed by the tooth 108a of the hammer 7 wherein the hammer 7 is always in the cocked position in SA operation before the shooting. In SA operation, there are three ways of the hammer 7 drawing: manual direct drawing of the hammer 7, manual drawing by the means of the closure 3, and self-drawing with the closure 3 after the shot. On figures B.3.1 and B.3.2 the hammer 7 is cocked directly manually by the pressure on the hammer 7 in the direction of arrow 111, where it is caught by the tooth 108b of the main catcher 9.1 of the hammer. Figure B.4 shows the drawing of the hammer 7 by manual backward movement of the closure 3 in direction of the arrow 112, wherein the closure 3 pressing on the surface 113 of the hammer 7 presses the hammer 7, which is - by the means of the tooth 108a of the hammer 7, caught on the tooth 108b of the main catcher 9.1 of the hammer. The closure 3 comes back to the position illustrated on figure B.3.1 and the mechanism is thus prepared for the shot. Upon the pulling of the trigger 6 in the direction of the arrow 115 and the it

is afterwards turned about the point 116 and by the moving of the transfer-bar 21 presses on the surface 114 of the main catcher 9.1 of the hammer, which catcher deflects into the depression 123 on the swivel pin 23 and thus releases the hammer 7, which hits on the firing pin 14 and fires the projectile. After the shot (see figure B.5) the closure 3 draws the hammer 7 by the backward movement in the direction of the arrow 117 on the surface 113 of the hammer 7, which hammer remains cocked and caught by its tooth 108a on the tooth 108b of the main catcher 9.1 of the hammer, and simultaneously the pressure of the closure 3 on the transfer-bar 21 in the position of the projection 106 interrupts the contact of the trigger 6 with the main catcher 9.1 of the hammer. After the shot the closure 3 returns to the position illustrated on figure B.3.1 and the released trigger 6 resets the mechanism to the original configuration, and the next shot follows by the pulling of the trigger 6 in SA operation. If the projectile is in the projectile chamber before the first shot, it is necessary to cock the hammer 7. The shot in SA operation is characterized by lower resistance and shorter pace of the trigger 6 in comparison with DA and DAO operations, as well as by the substantially shorter reset of the mechanism in comparison with DAO operation.

[0028] SA locked by the manual safety catch - figure C.1 shows the overall view of the weapon, when the finger boards 22 are levered in position SA/DA- locked, the hammer 7 is drawn. The position of the fingerboards 22 is locked against the self-movement by the arresting rivets 24. Figure C.2 shows the detailed view (for better representation the left finger board 22 is pushed away) illustrating the principle of the locking performed by the turning movement of the finger boards 22 upwards in the direction of the arrow 124, which finger boards turn slightly the swivel pin 23 to the position, where the cylindrical surface 118a blocks the movement of the main catcher 9.1 of the hammer in the projection 118b against the release of the hammer 7. The situation is illustrated on figure C.3.1, where the swivel pin 23 blocks the movement of the main catcher 9.1 of the hammer in positions 118a and 118b, and does not enable its release from the tooth 108a on the hammer 7. Figure C.3.2 shows the position and arrangement of the auxiliary catcher 9.2 of the hammer, which catcher serves as the secondary safety element in the locked SA operation, in case of eventual spontaneous release of the hammer 7.

[0029] DA (Double Action) - double action mechanism referred also as single action/double action - SA/DA mechanism. Figure D.1 shows the overall view of the weapon, where the finger boards 22 are in SA/DA position (horizontally), and the hammer 7 is lowered. Figure D.2.1 and figure D.2.2 show the arrangement of the parts. Further to the method of SA operation the hammer 7 can be cocked also through the transfer-bar 21 by the pulling of the trigger 6 in the direction of arrow 115, when it engages in the position of teeth 119 on the hammer 7 and draws the hammer 7 into the position shown in figure D.3 and figure D.4, where the gradual press, up to the position defined by the mechanism, releases the teeth 119 of the hammer 7 from the transfer-bar 21 by pushing the transfer-bar 21 in the place of the surface 120 away from the swivel pin 23 and the released hammer 7 fires the projectile by the hit on the firing pin 14. Simultaneously the transfer-bar 21 pushes the auto-safety catch 13 through the lever 48 of the auto-safety lock and thus releases the blocked firing pin 14. After the shot the hammer 7 stays cocked by the closure 3 on the main catcher 9.1 of hammer as shown on figure B.5. After the reset the mechanism is prepared for the next shot in SA operation with the arrangement of the parts illustrated on figure B.3.1. DA mechanism is always in combination with SA mechanism and when the projectile is in the projectile chamber, it is not necessary have the hammer 7 cocked before the first shot.

[0030] DC (DeCocker) - deactivation of the cocked hammer is the supplement of SA/DA mechanism with the controlled lowering of the hammer 7 without the shot, even when the projectile is in the projectile chamber. We start from the state illustrated on figures B.3.1 and B.3.2, where the hammer 7 is cocked. Figure E.1 shows the view of the weapon illustrating the situation of the controlled lowering of the hammer 7 without the shot by the pushing of the finger boards 22 downwards in the direction 121 and the hammer 7 is lowered into the state according to figure E.1. Figure E.2 provides the detailed illustration of the arrangements of the parts of the mechanism. The finger boards 22 slightly turns the swivel pin 23, which pushes the main catcher 9.1 of the hammer away by the edge 122a in the point of the projection 122b and lowers the hammer 7, which is stopped by the impact of the surface 109a on the surface 109b of the auxiliary catcher 9.2 of the hammer. Figures E.3.1 and E.3.2 show the mechanism after the controlled lowering of the hammer 7, where you can see that the hammer 7 remains caught in the safe distance from the firing pin 14. Even in the case of failure, e.g. due to the mechanical damage of the auxiliary catcher 9.2 of the hammer or the hammer 7 the firing pin 14 is locked against the movement of the auto-safety catch 13 and no shot is fired.

[0031] DAO (Double Action Only) mechanism - the overall view of the weapon is shown on figure F.1, where the finger boards 22 are in DAO position, while the hammer 7 is lowered. The position of the fingerboards is locked against the self-movement by the arresting rivets 24. Figure F.2 shows the arrangement of the parts, where the switch to DAO shooting operation is carried out by the pushing of the finger boards downward and thus turning slightly the swivel pin 23, which pulls away the main catcher 9.1 of the hammer by the edge 122a by the pressing of the main catcher on the projection 122b and thus inactivates it. Figure F.3.1 and figure F.3.2 show the mechanism prepared for the shooting in DAO operation. The pulling of the trigger 6 in the direction 115 results in the drawing of the hammer 7 by the means of the transfer-bar 21 through teeth 119 and by the continuing pulling up to the position defined by the mechanism according

to figures F.4 and F.5 the hammer 7 is released by the pushing of the transfer-bar 21 away from the swivel pin 23 in the place of the surface 120 and by the hit on the firing pin 14 the projectile is fired. Simultaneously the transfer-bar 21 pressing the lever 48 of the auto-safety catch lifts the auto-safety catch 13 and releases the firing match 14 before the shot. After the shot the hammer 7 remains decocked and returns together with the closure 3 to the position before the shot as shown on figures F.3.1 and F.3.2. The hammer 7 is slowed by the surface 125 of the closure 3 to prevent the firing upon the hit on the firing pin. After the reset of the mechanism the next shot is again in DAO operation. Drawing of the hammer 7 is characterized by the higher resistance and the long pace of the trigger 6, as well as by the long reset of the trigger mechanism.

[0032] Reset of the trigger mechanism - it is the act needed for the re-preparation of the mechanism for the shooting after the interruption of the contact of the trigger 6 and the main catcher 9.1 of the hammer after the shot as shown on figure B.5, where the closure 3 in the point of the projection 106 pushes the transfer-bar 21. Reset is performed by the forward movement of the trigger 6 against the movement 115, spontaneously by the pressure of the expansion spring 30 to the trigger 6 position before the shot as shown on figure B.3.1, in SA operation, or on figure F.3.1, in DAO operation.

Claims

1. A trigger mechanism for an auto-loading weapon, comprising:

   ◦ a control element (22) enabling to select an appropriate shooting operation mode between either a single action/double action (SA/DA) operation and a decocker with a safe release of a hammer (7) and with the possibility to lock the cocked hammer, or the exclusive double action only operation (DAO);
   ◦ a trigger (6) controlling the hammer (7) by means of a two-arm transfer-bar (21), **characterized in that** the selected shooting operation is enabled by:

      ◦ a swivel pin (23),
      ◦ a main catcher (9.1) for the hammer (7) and
      ◦ an auxiliary catcher (9.2) for the hammer (7),

   that are equipped with inter-engaging surfaces (118a, 114), edges (122a) and notches (122b, 108b, 108a, 118b), for their mutual collaboration and for their collaboration with the hammer (7) and the transfer-bar (21), wherein the swivel pin (23) is rotationally adjustable positioned and controlled by the control element (22) on the surface of the weapon.

2. The trigger mechanism according to claim 1, **characterized in that** the swivel pin (23) is equipped with the edge (122a), depression (123) and the part (118a) of the cylindrical surface for the collaboration with the main catcher (9.1) of the hammer; and the main catcher (9.1) for the collaboration with the swivel pin (23) is equipped with the projection (122b) for the collaboration with the edge (122a), the tooth (118b) for the collaboration with the part (118a) of the cylindrical surface of the swivel pin (23), and with the surface (114) for the collaboration with the two-arm transfer-bar (21).

3. The trigger mechanism according to claim 1, **characterized in that** the auxiliary catcher (9.2) of the hammer is equipped with the surface (109b) for collaboration with the hammer (7), and the hammer (7) is equipped with the sitting surface (109a) for the sitting of the auxiliary catcher (9.2) of the hammer.

4. The trigger mechanism according to claim 1, **characterized in that** the controlling element (22) of the swivel pin (23) on the surface of the weapon is accessible from both the right and left sides of the weapon in the form of the fingerboards.

5. An auto-loading weapon, particularly a pistol, having a control element on its surface, enabling to select an appropriate shooting operation mode, which can be: single action/double action (SA/DA) operation and a decocker with a safe release of a hammer (7) and with the possibility to lock the cocked hammer (7), or the exclusive-double action only operation (DAO),
   comprising:

   - a container (2) equipped with the lines (101a),
   - a handle (1), into which the container (2) is inserted,
   - an auto-safety catch (13), a lever (48) of the auto-safety catch, and
   - a closure (3) movably arranged in the lines (101a),

   characterized in that, the container (2) comprises the trigger mechanism according to any of claims 1 to 4 wherein:

   - the pin (23) comprises the edge (122a) for controlling the main catcher (9.1) for the hammer in DAO operation and for safe lowering of the hammer (7), and the depression (123) for engaging with the main catcher (9.1.) upon the deflection for the release of the hammer (7) in SA/DA operation, and the part (118a) of the cylinder surface for locking of the main catch (9.1.) for the

hammer;
- the main catcher (9.1) of the hammer is equipped with the notch (108b) for catching of the hammer (7) in SA operation, wherein the main catcher (9.1.) for the hammer further comprises the projection (122b) for enabling the controlling of the deflection from the engagement with the hammer (7) by the means of the swivel pin (23) in DAO operation and upon the safe lowering of the hammer (7), the surface (114) for the deflection from the engagement with the hammer (7) by the means of the transfer-bar (21), and the projection (118b) for locking by the means of the pin (23) in SA/DA operation;
- the auxiliary catcher (9.2.) for the hammer is equipped with the surface (109b) for the sitting down of the hammer (7) upon the safe lowering in - decocker operation; and
- the hammer (7) is equipped with the notch (108a) for the engagement with the main catcher (9.1) for the hammer in the SA operation and with the surface (109a) for reception of the auxiliary catcher (9.2) for the hammer upon the safe lowering of the hammer (7).

Patentansprüche

1. Abzugsmechanismus für eine selbstladende Waffe, bestehend aus:

   ◦ einem Steuerungselement (22) welches den gewünschten Feuermodus zwischen single action/double action (SA/DA) ermöglicht, sowie einem Entspanner mit einer sicheren Hammerauslösung (7) sowie der Möglichkeit der Sperrung des gespannten Hammers oder des ausschließlichen double action Feuermodus (DAO);
   ◦ dem Abzug, der den Hammer (7) über eine zweiarmige Zugstange (21) steuert,
   bezeichnend ist das der Schussvorgang ausgelöst wird durch:

      ◦ einem Drehzapfen (23),
      ◦ einem Greifer (9.1) für den Hammer (7) und
      ◦ einem Hilfsgreifer (9.2) für den Hammer (7),

   die mit ineinandergreifenden Flächen (118a, 114), Kanten (122a) und Kerben (122b, 108b, 108a, 118b) für deren Zusammenwirkung und deren Zusammenwirkung mit dem Hammer (7) und der Abzugstange (21) ausgestattet sind, während der Drehzapfen (23) drehend einstellbar gelagert ist, gesteuert vom Steuertaste (22) auf der Oberfläche der Waffe.

2. Abzugsmechanismus gemäß Anspruch 1, **der folgendermaßen funktioniert:** der Drehzapfen (23) ist mit Kante (122a), Kerbe (123) sowie Teil (118b) der zylindrischen Oberfläche ausgestattet, um mit dem Hauptgreifer (9.1) des Hammers zusammenzuwirken; der Hauptgreifer (9.1) der mit dem Drehzapfen (23) zusammenwirkt, ist mit der Kerbe (122b) ausgestattet um mit der Kante (122a), der Zacke (118b) für das Zusammenwirken mit dem Teil (118a) der Zylinderoberfläche des Drehzapfens (23) zusammenzuwirken sowie mit Oberfläche (114) ausgestattet, um mit der zweiarmigen Abzugstange (21) zusammenzuwirken.

3. Abzugsmechanismus gemäß Anspruch 1, **der folgendermaßen funktioniert:** der Hilfsgreifer (9.2) des Hammers weist eine Oberfläche (109b) auf, die zum Zusammenwirken mit dem Hammer (7) bestimmt ist, der Hammer (7) ist mit einer Sitzfläche (109a) ausgestattet auf dem der Hilfsgreifer (9.2) des Hammers aufsitzt.

4. Abzugsmechanismus gemäß Anspruch 1, **mit folgender Beschreibung:** das Steuerungselement (22) des Drehzapfens (23) auf der Waffenoberfläche ist gleichermaßen von rechter wie linker Seite der Waffe in Form von Griffbrettern zugänglich.

5. Eine selbstladende Waffe, namentlich eine Pistole mit Bedienelement auf ihrer Oberfläche, der die Wahl des gewünschten Feuermodus ermöglicht, entweder: single action/double action (SA/DA) Betrieb mit einem Entspanner und einer sicheren Hammerauslösung (7) sowie der Möglichkeit der Sperrung des gespannten Hammers oder des ausschließlichen double action Feuermodus (DAO), bestehend aus:

   - Container (2) mit Schienen (101a),
   - Griffteil (1), in welchen der Container eingesetzt ist,
   - Autosicherheitsschnapper (13), Hebel (48) des Autosicherheitsschnappers sowie
   - Verschluss (3), der beweglich in die Schienen (101a) eingesetzt wird,

   ihre Beschreibung ist wie folgt: Der Container (2) beinhaltet den Abzugsmechanismus gemäß Anspruch 1 bis 4, wonach:

   - Der Drehzapfen (23) eine Kante (122a) zur Steuerung des Greifers (9.1) für den Hammer im DAO Modus sowie für das sichere Absenken des Hammers (7) besitzt, sowie eine Versenkung (123) zum Einrasten des Greifers (9.1) bei Umlenkung für die Freigabe des Hammers (7) bei SA/DA Modus ermöglicht, sowie den Teil (118a) der Zylinderoberfläche zur Sperrung des

Greifers (9.1) für den Hammer;
- der Greifer (9.1) des Hammers mit einer Kerbe (108b) für das Einfangen des Hammers (7) in SA-Modus ausgestattet ist, hierbei befindet sich auf dem Greifer (9.1) weiterhin eine Kerbe (122b) zur Steuerung der Umlenkung vom Einrasten des Hammers (7) durch den Drehzapfen (23) in DAO Modus und bei sicherer Absenkung des Hammers (7) durch die Abzugsstange (21) und die Zacke (118b) zur Sperrung mithilfe des Drehzapfens (23) in SA/DA-Modus;
- sich auf dem Hilfsgreifer (9.2) für den Hammer eine Fläche (209b) befindet auf dem der Hammer (7) zur sicheren Absenkung im Entspanner aufsetzt; und
- sich auf dem Hammer (7) eine Kerbe (108a) für das Einrasten mit dem Greifer (9.1) für den Hammer in SA-Modus befindet sowie eine Oberfläche zur Aufnahme des Hilfsgreifers (9.2) für den Hammer bei sicherer Absenkung desselben Hammers (7).

Revendications

1. Mécanisme de déclenchement pour une arme avec auto-chargement, comprenant :

• un élément de contrôle (22) permettant de sélectionner un mode opératoire de tire adéquat, à savoir soit une opération avec actionnement simple/double (SA/DA) et un levier de désarmement avec déblocage sûr du chien (7) et avec la possibilité de bloquer le chien armé, soit la seule opération exclusive avec actionnement double (DAO);
• un déclencheur (6) contrôlant le chien (7) à travers une barre de transfert avec double bras (21), **qui est caractérisé par la fait que** l'opération de tir sélectionnée est activé grâce à:

• un axe de pivotement (23),
• un accrocheur principal (9.1) pour le chien (7) et
• un accrocheur auxiliaire (9.2) pour le chien (7),

qui sont équipé de surfaces s'engageant les unes dans les autres (118a, 114), bords (122a) et encoches (122b, 108b, 108a, 118b) pour leur interaction réciproque et pour leur interaction avec le chien (7) et la barre de transfert (21), où l'axe de pivotement (23) est réglable en rotation, positionné et contrôlé par l'élément de contrôle (22) sur la surface de l'arme.

2. Mécanisme de déclenchement selon la demande 1, **caractérisé par la fait que** l'axe de pivotement (23) est équipé d'un bord (122a), d'un système de dépression (123) et de la partie (118a) de la surface cylindrique pour l'interaction avec l'accrocheur principal (9.1) du chien. Au même temps, l'accrocheur principal (9.1) pour l'interaction avec l'axe de pivotement (23) est équipé d'une projection (122b) pour l'interaction avec le bord (122a), d'une dent (118b) pour l'interaction avec la partie (118a) de la surface cylindrique de l'axe de pivotement (23) et également d'une surface (114) pour l'interaction avec la barre de transfert à deux bras (21).

3. Mécanisme de déclenchement selon la demande 1, **caractérisé par la fait que** l'accrocheur auxiliaire (9.2) du chien est équipé d'une surface (109b) pour l'interaction avec le chien (7); et, au même temps, le chien est équipé d'une surface (109a) pour le positionnement de l'accrocheur auxiliaire (9.2) du chien.

4. Mécanisme de déclenchement selon la demande 1, **caractérisé par la fait que** l'élément de contrôle de l'axe de pivotement (23) sur la surface de l'arme est accessible du côté gauche et du côté droit de l'arme sous la forme de touches.

5. Une arme avec auto-chargement, notamment un pistolet, avec un élément de contrôle sur sa surface, permettant de sélectionner un mode opératoire de tire adéquat - à savoir : soit une opération avec actionnement simple/double (SA/DA) et un levier de désarmement avec déblocage sûr du chien (7) et avec la possibilité de bloquer le chien armé (7), soit la seule opération exclusive avec actionnement double (DAO),
comprenant :

- un conteneur (2) équipé de lignes (101a),
- une poignée (1) où le conteneur est inséré (2),
- un accrochage de sécurité automatique (13), un levier (48) de l'accrochage de sécurité automatique, et
- une fermeture (3) fixée dans les lignes (101a) de manière mobile,

caractérisé par la fait que le conteneur (2) inclut le mécanisme de déclenchement selon toutes les demandes de 1 à 4, où :

- l'axe (23) inclut le bord (122a) pour le contrôle de l'accrocheur principal (9.1) pour le chien dans le mode opératoire DAO et pour un abaissement tout à fait sûr du chien (7), et la dépression (123) pour l'interaction avec l'accrocheur principal (9.1) sur la déflection pour le dégagement du chien (7) dans le mode opératoire SA/DA, et la partie (118a) de la surface du cylindre pour le blocage de l'accrocheur principal (9.1) pour le

chien;

- l'accrocheur principal (9.1) du chien est équipé d'une encoche (108b) pour l'accrochage du chien dans le mode opératoire SA, où l'accrocheur principal (9.1) pour le chien inclut également la projection (122b) permettant le contrôle de la déflection de l'engagement avec le chien (7) à travers l'axe de pivotement (23) dans le mode opératoire DAO avec un abaissement tout à fait sûr du chien (7), la surface (114) pour la déflection de l'engagement avec le chien (7) à travers la barre de transfert (21), et la projection (118a) pour la fermeture à l'aide de l'axe (23) dans le mode opératoire SA/DA;
- l'accrocheur auxiliaire (9.2) pour le chien est équipé de la surface (109b) pour le positionnement du chien (7) pour un abaissement tout à fait sûr pendant l'actionnement du un levier de désarmement ; et
- le chien (7) est équipé d'une encoche (108a) pour l'interaction avec l'accrocheur principal (9.1) pour le chien dans le mode opératoire SA et avec la surface (109a) pour la réception de l'accrocheur principal (9.2) pour le chien avec un abaissement tout à fait sûr du chien (7).

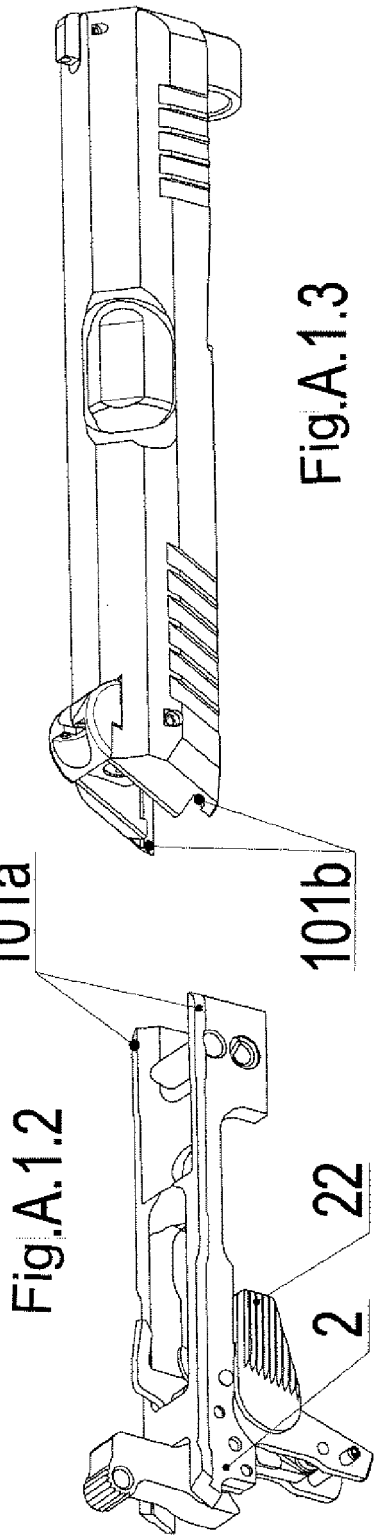


Fig.A.1.2

Fig.A.1.3

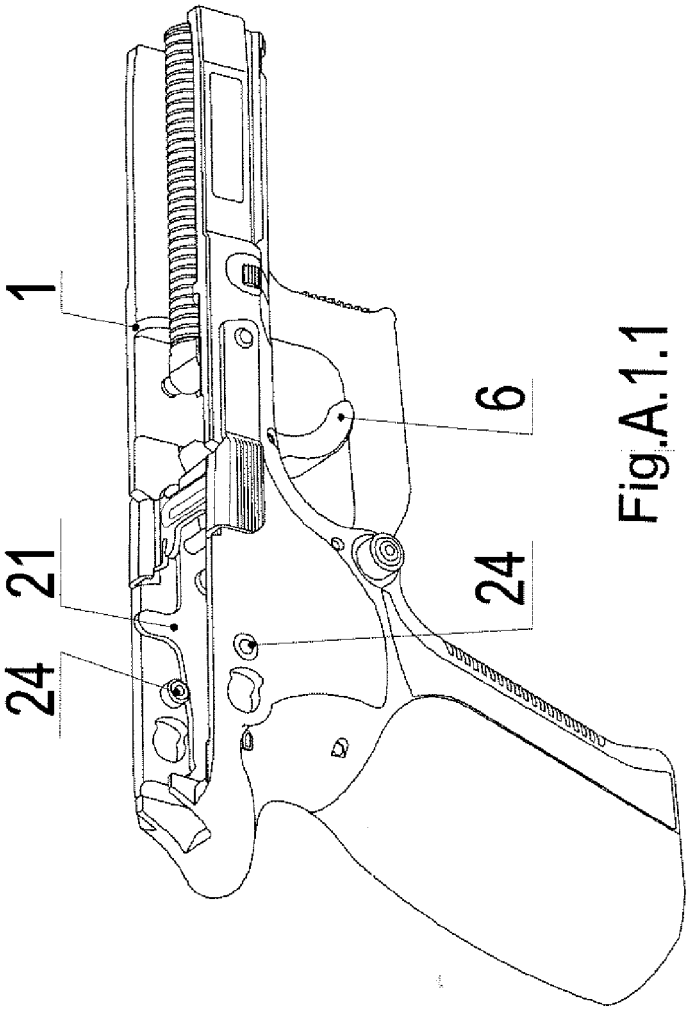


Fig.A.1.1

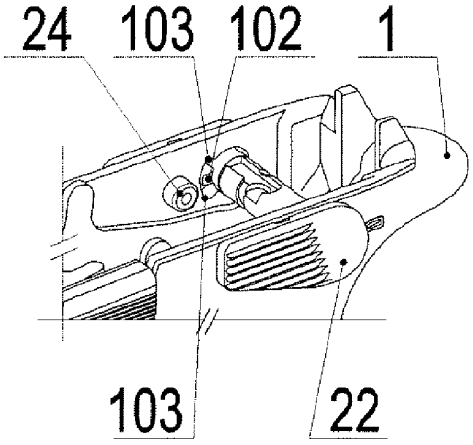


Fig.A.1.4

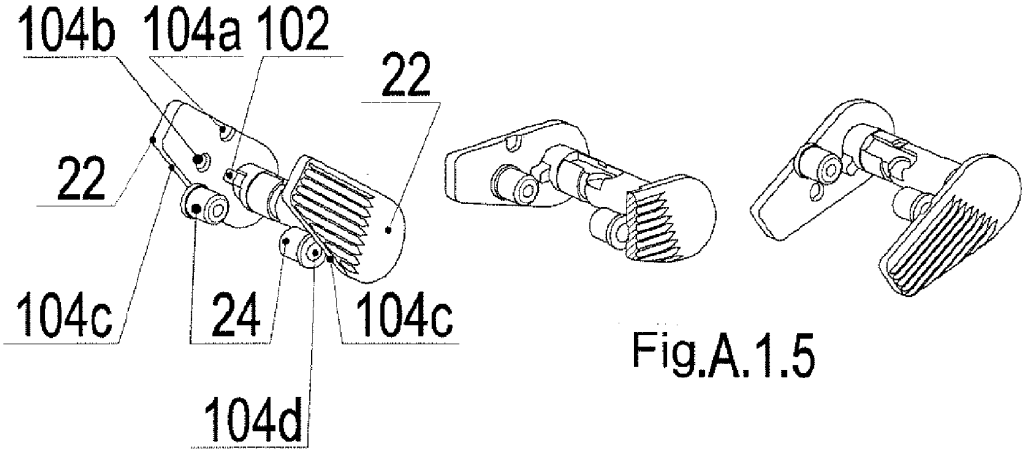


Fig.A.1.5

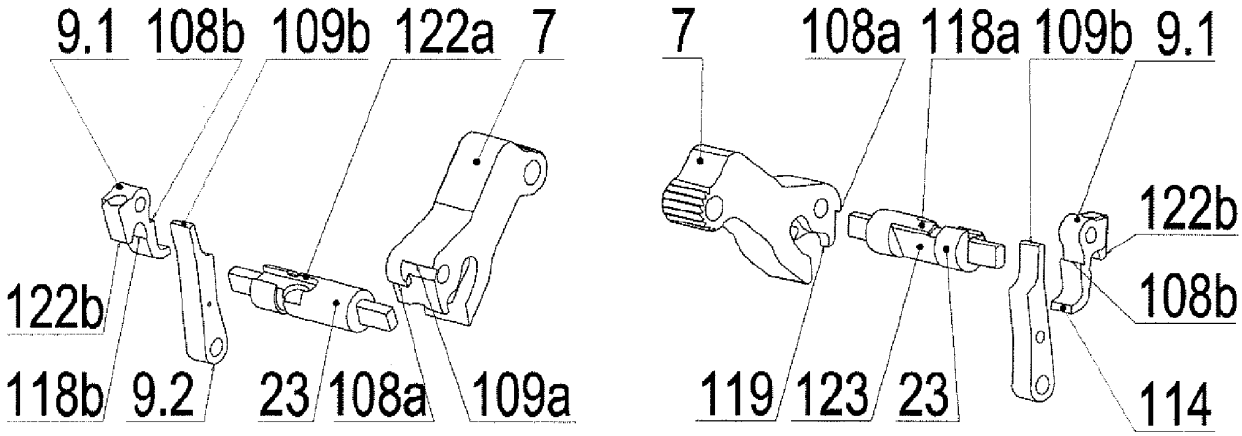


Fig.A.1.6

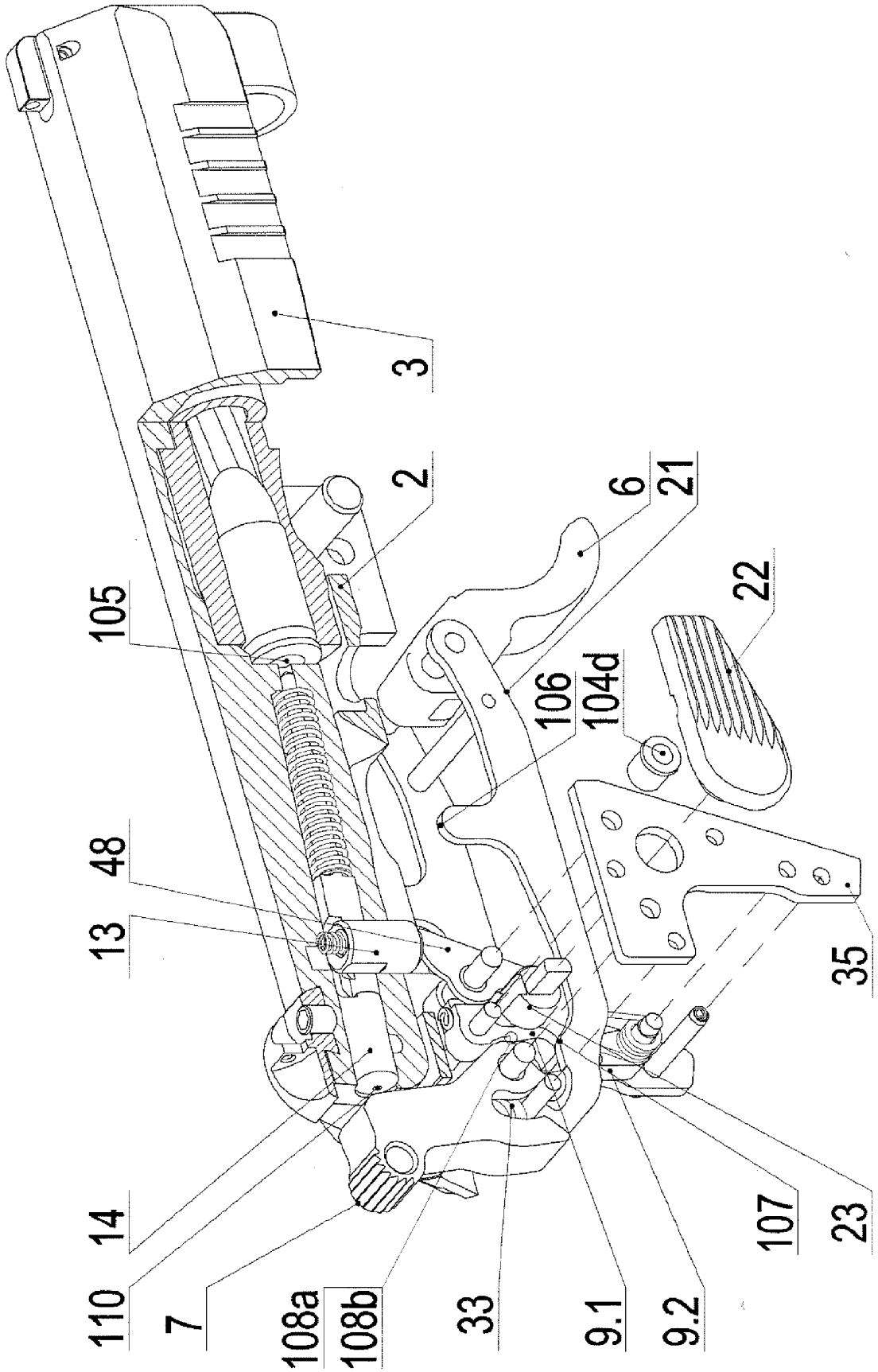


Fig.A.2.1

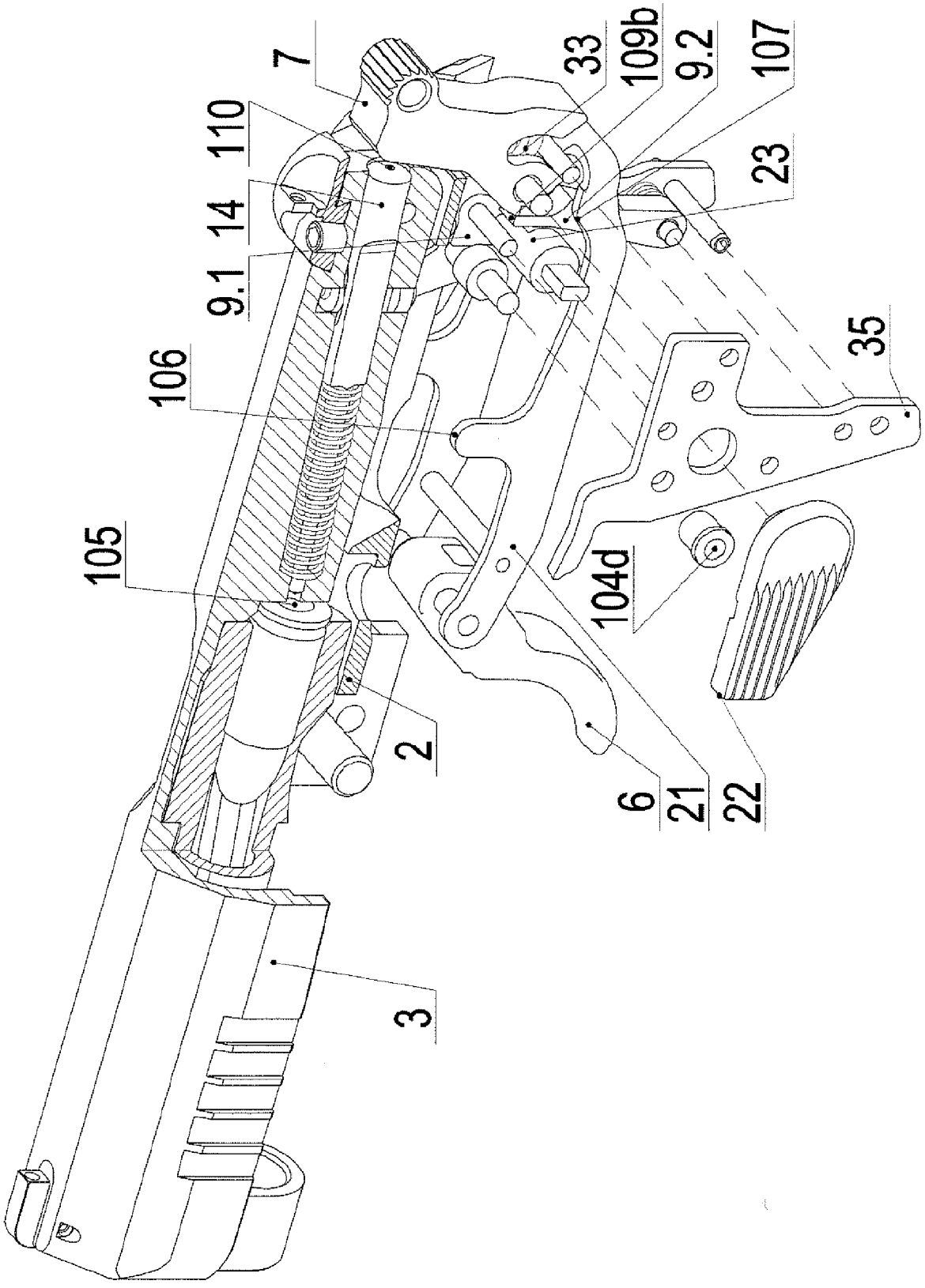


Fig.A.2.2

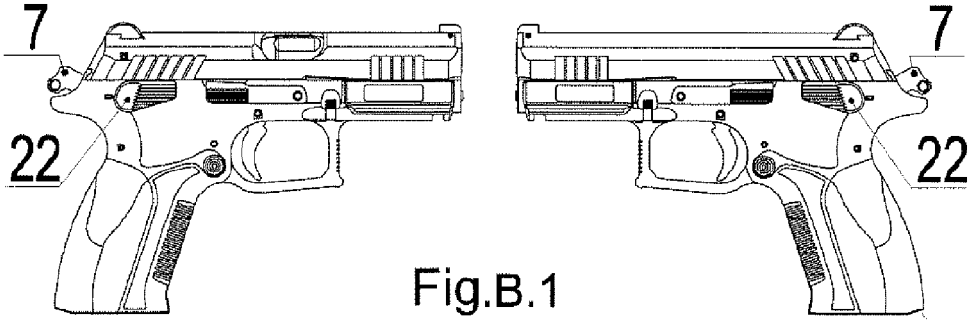


Fig.B.1

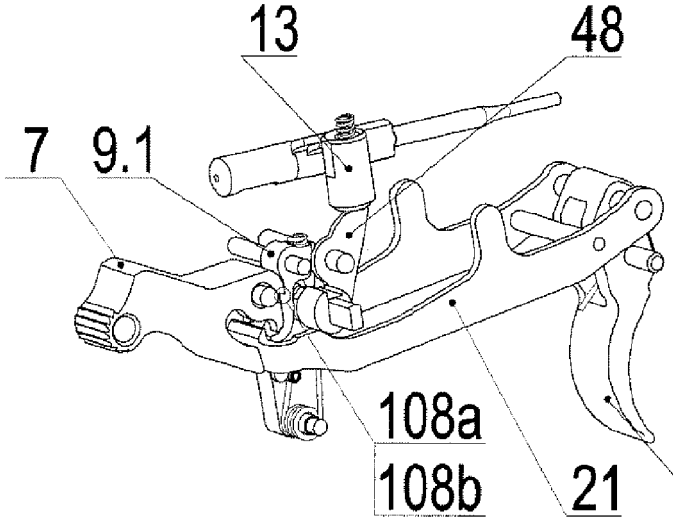


Fig.B.2.1

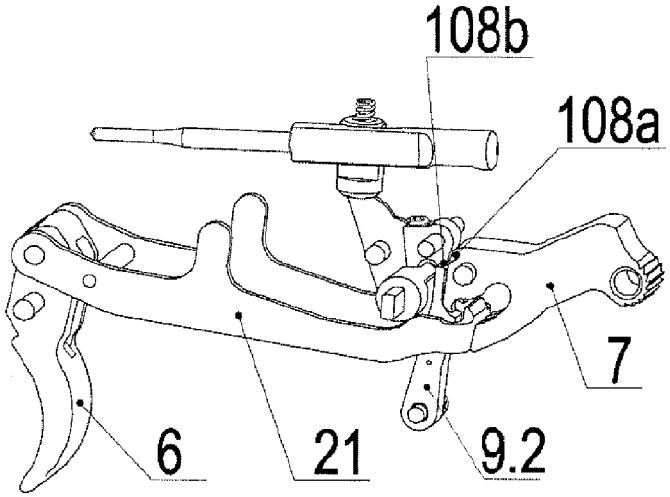


Fig.B.2.2

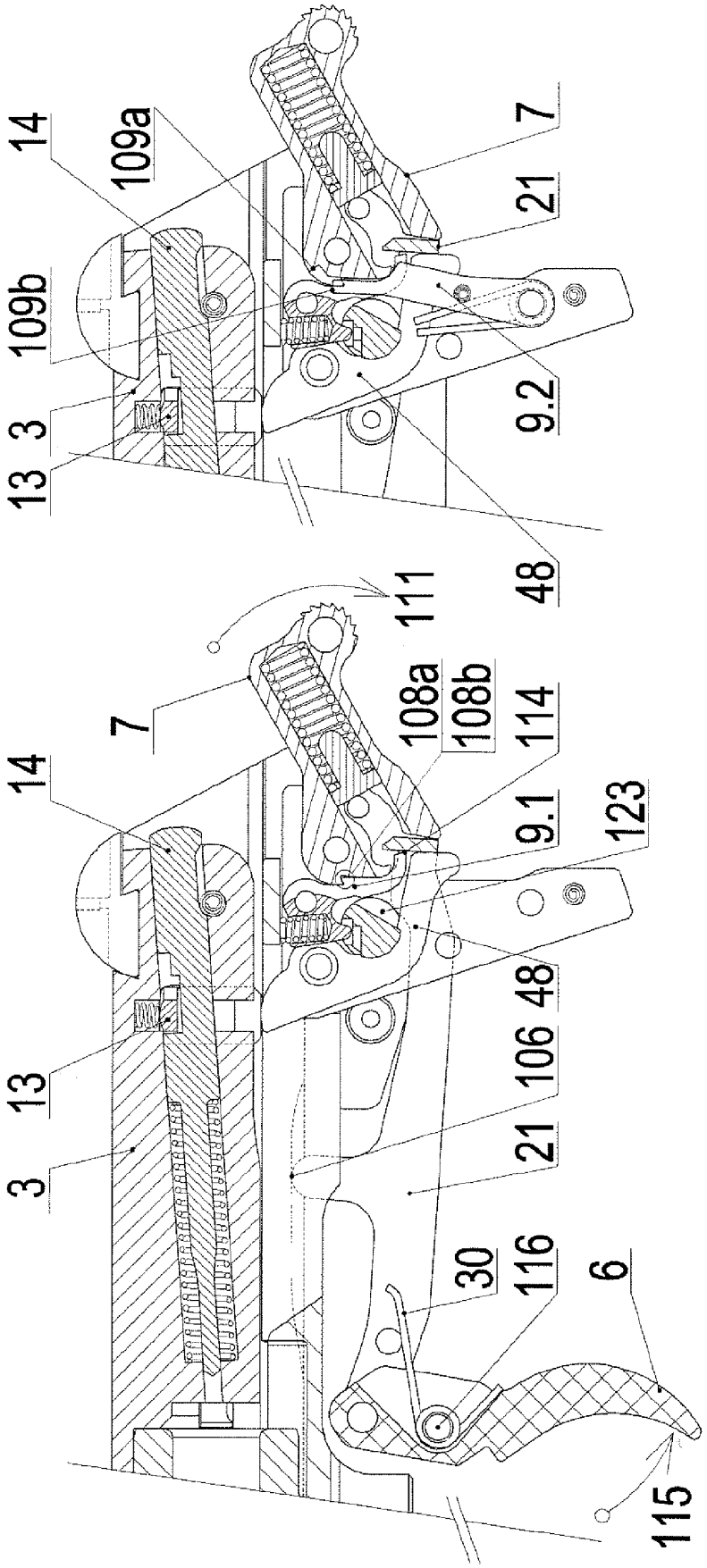


Fig.B.3.2

Fig.B.3.1

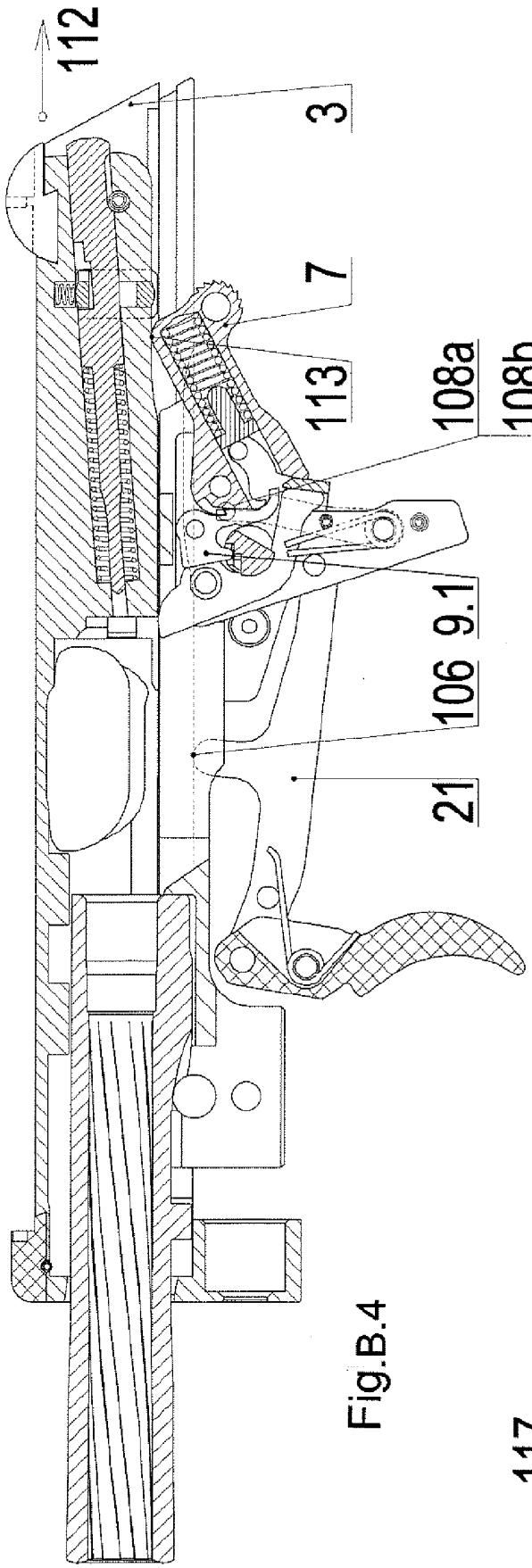


Fig.B.4

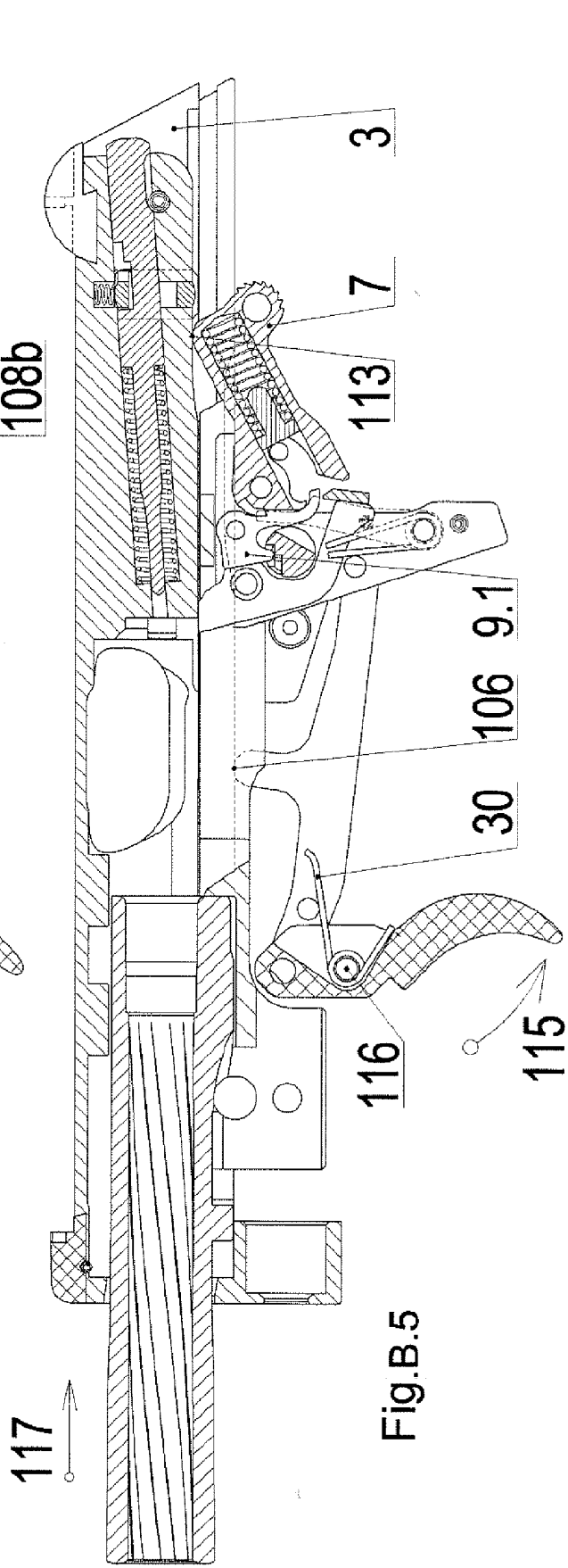


Fig.B.5

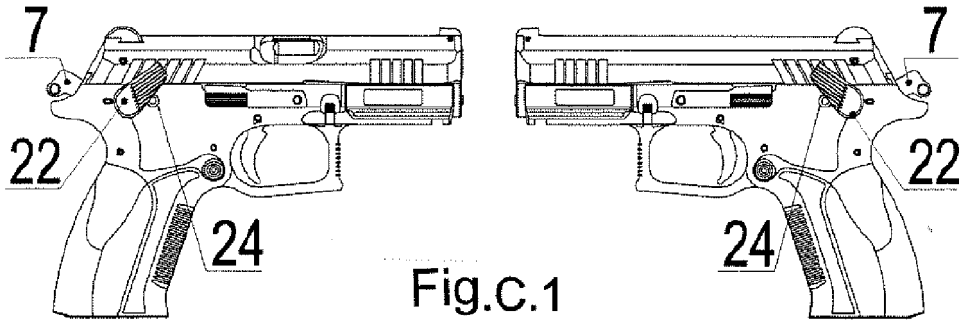


Fig.C.1

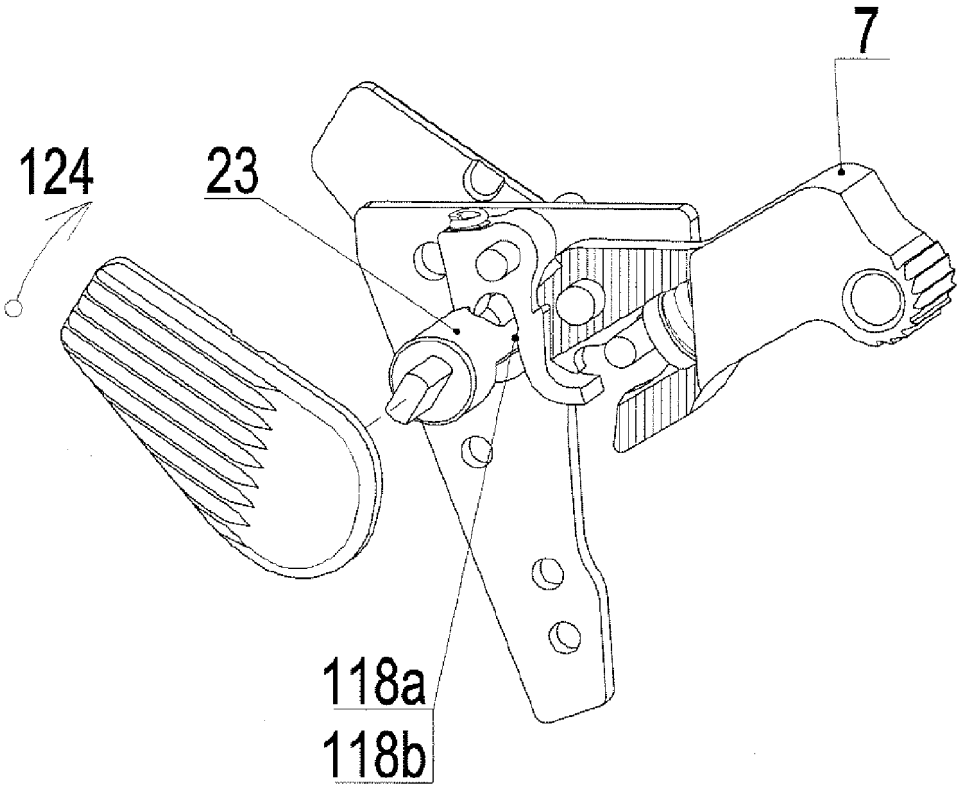


Fig.C.2

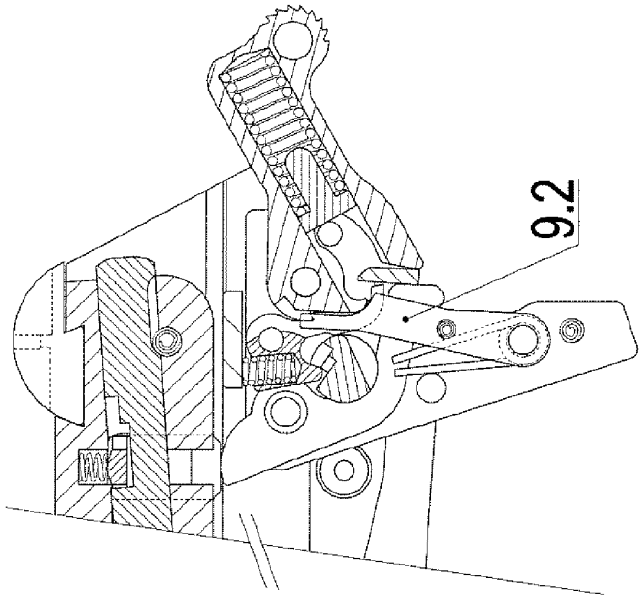


Fig.C.3.2

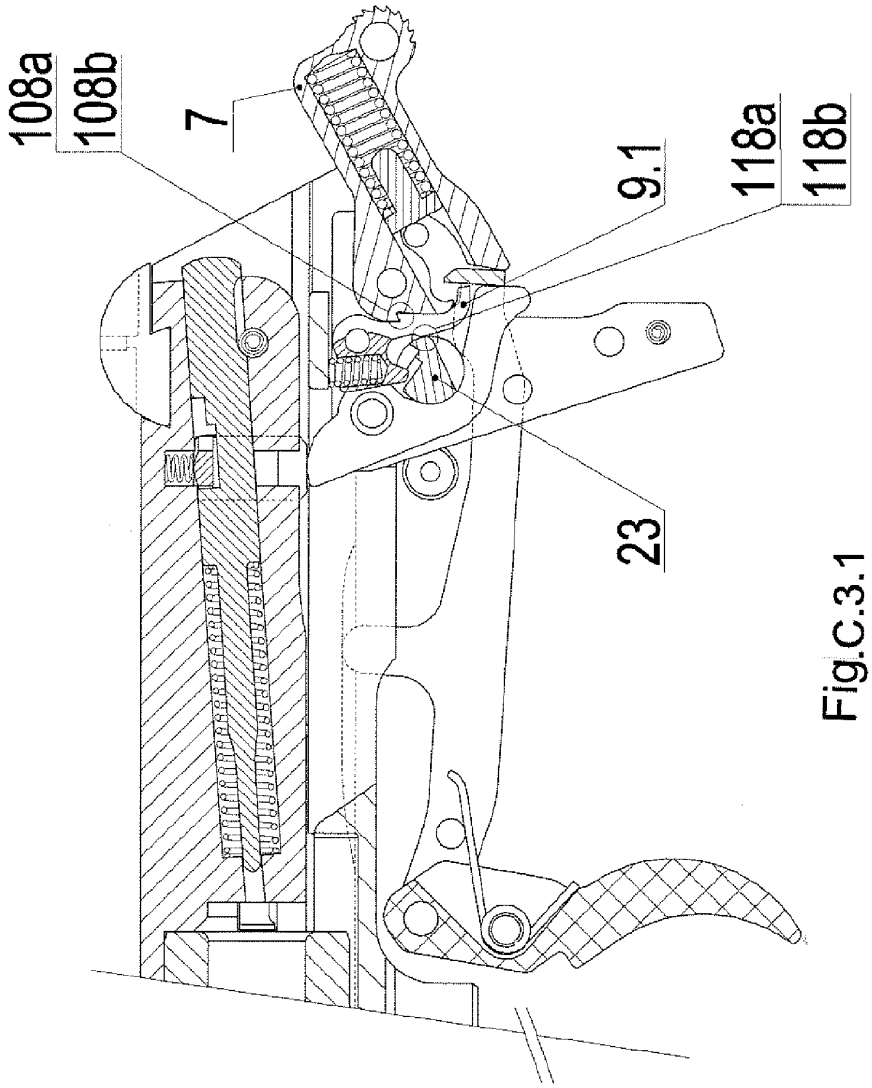


Fig.C.3.1

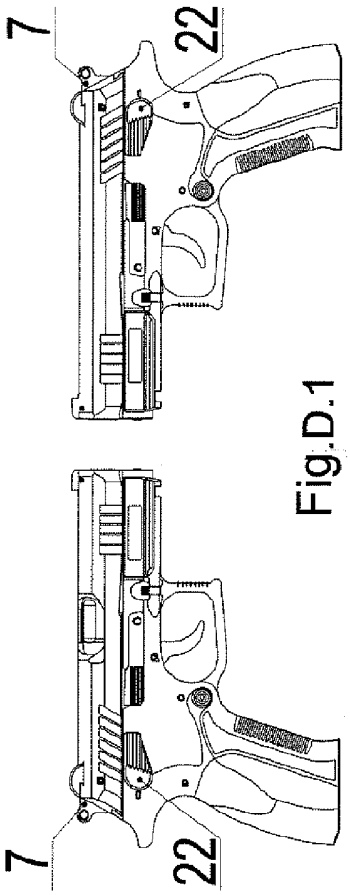


Fig.D.1

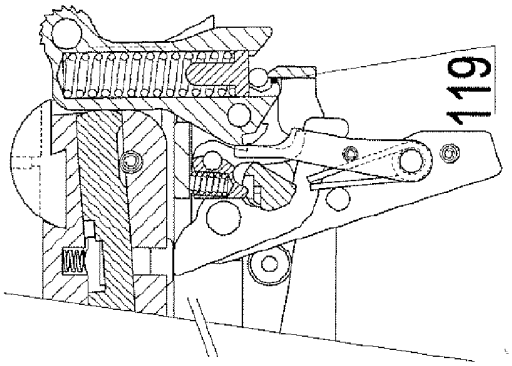


Fig.D.2.2

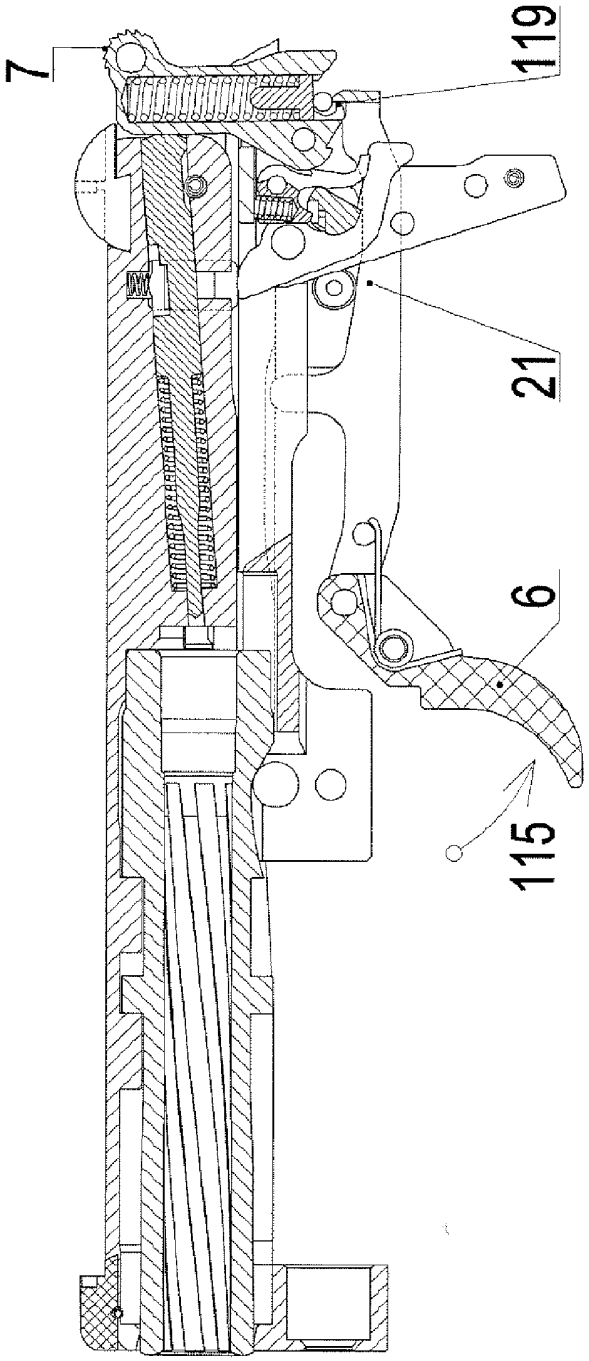


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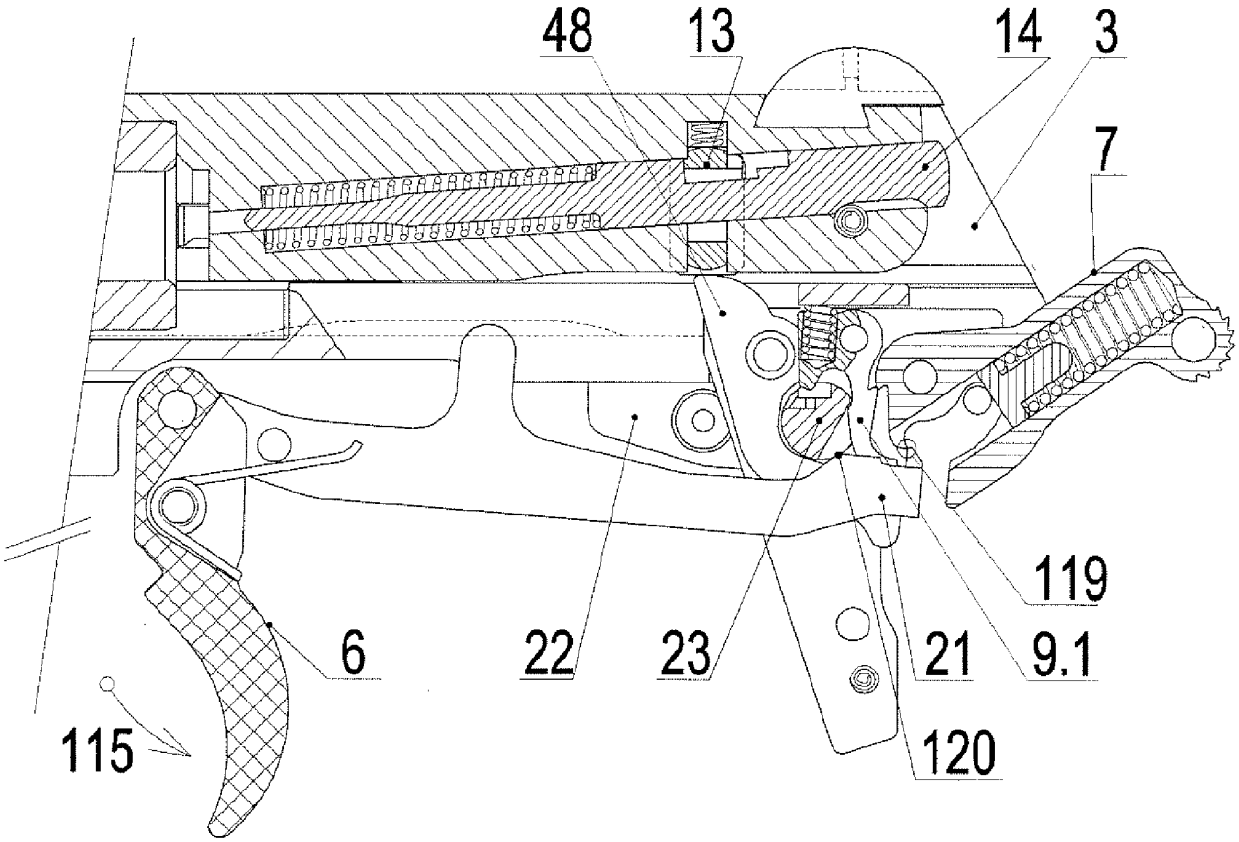


Fig.D.3

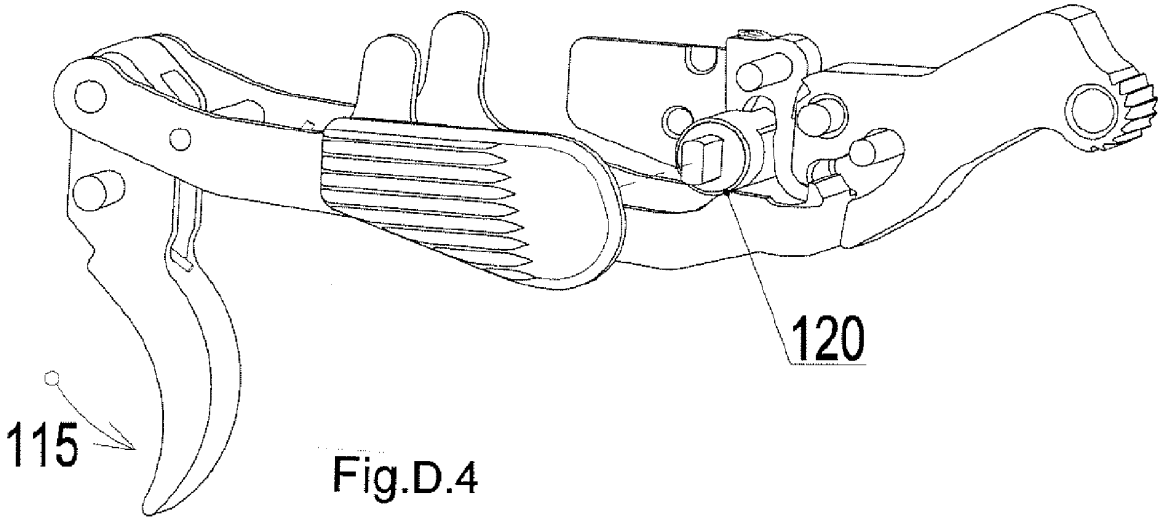


Fig.D.4

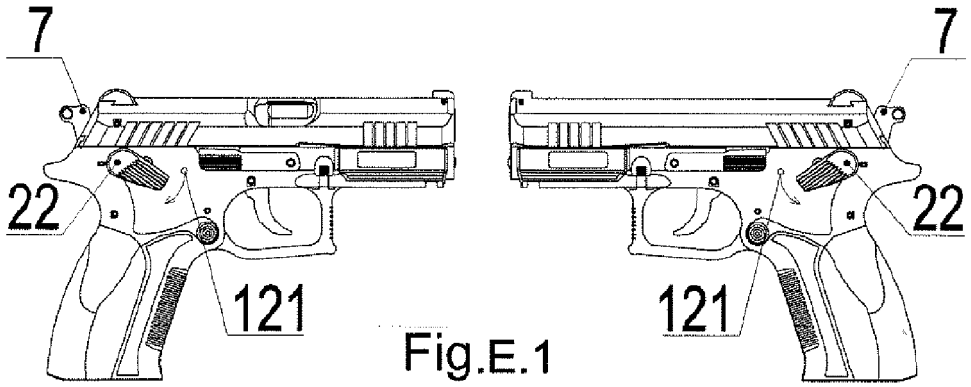


Fig.E.1

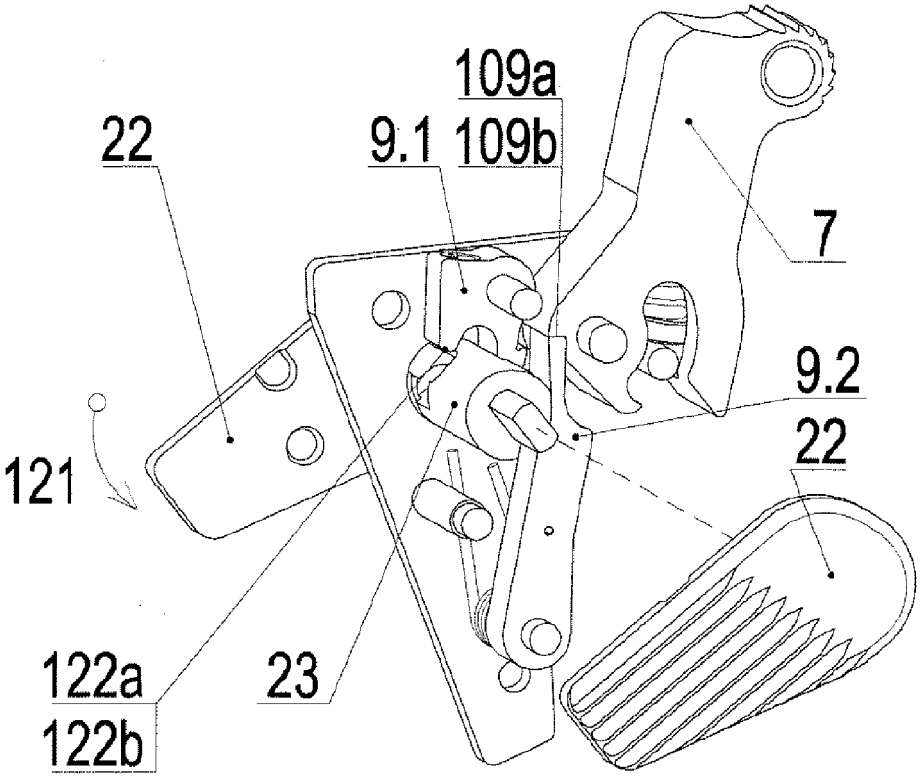


Fig.E.2

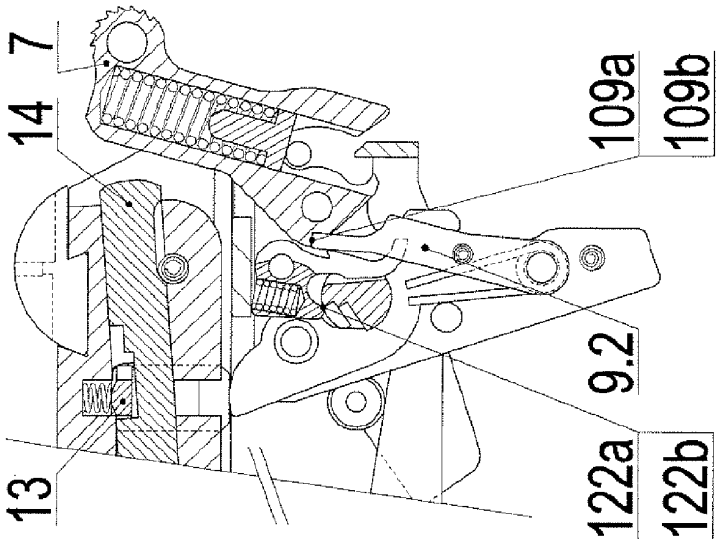


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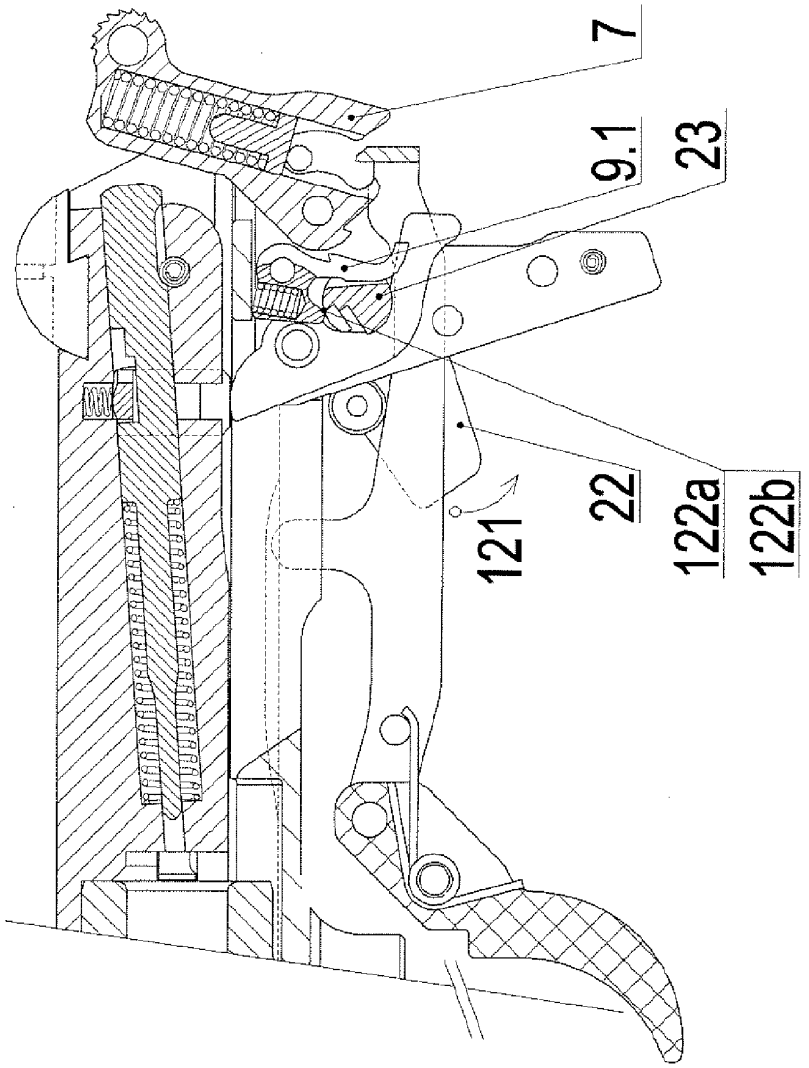


Fig.E.3.1

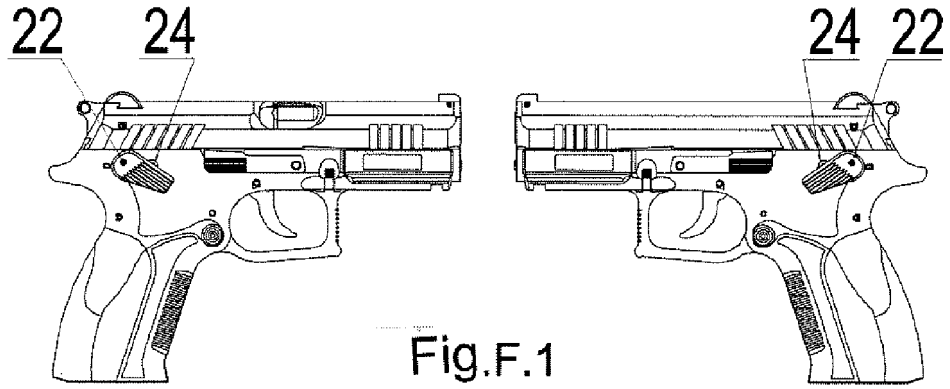


Fig.F.1

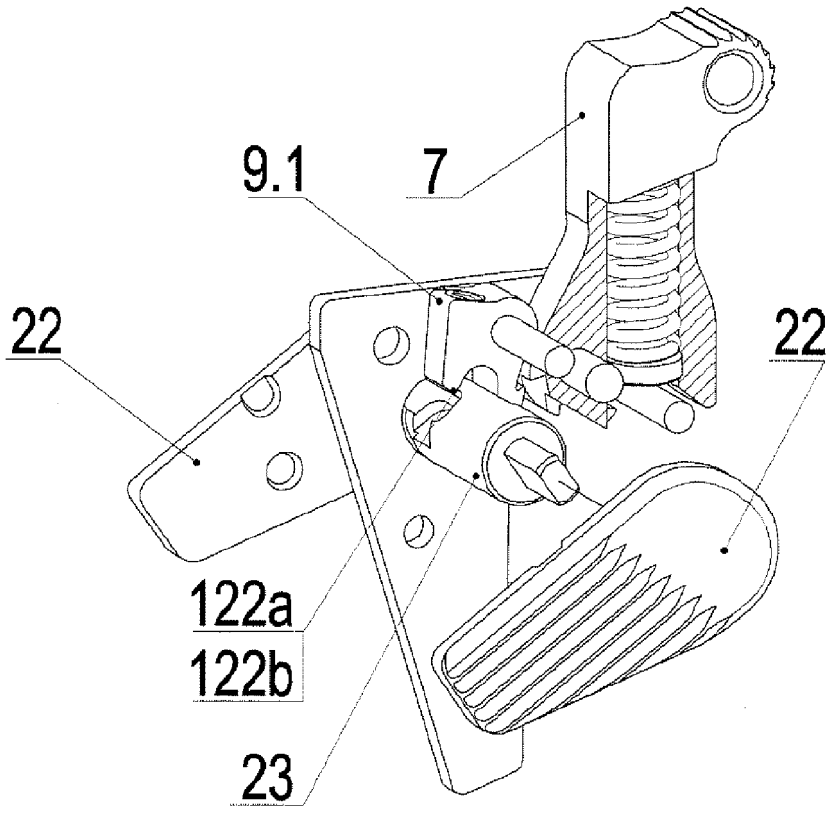


Fig.F.2

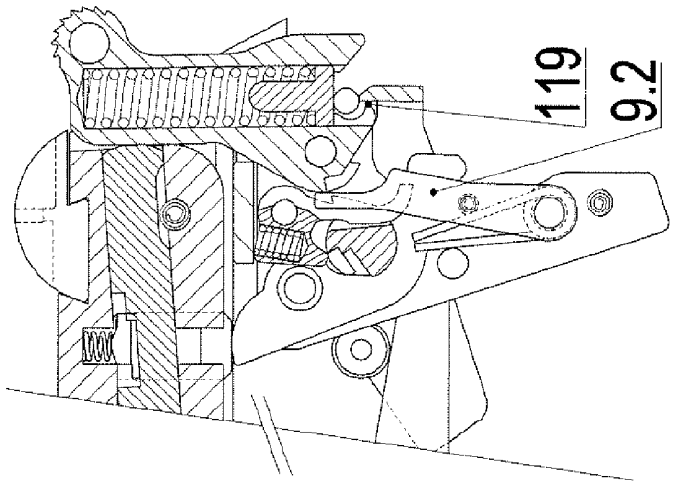


Fig.F.3.2

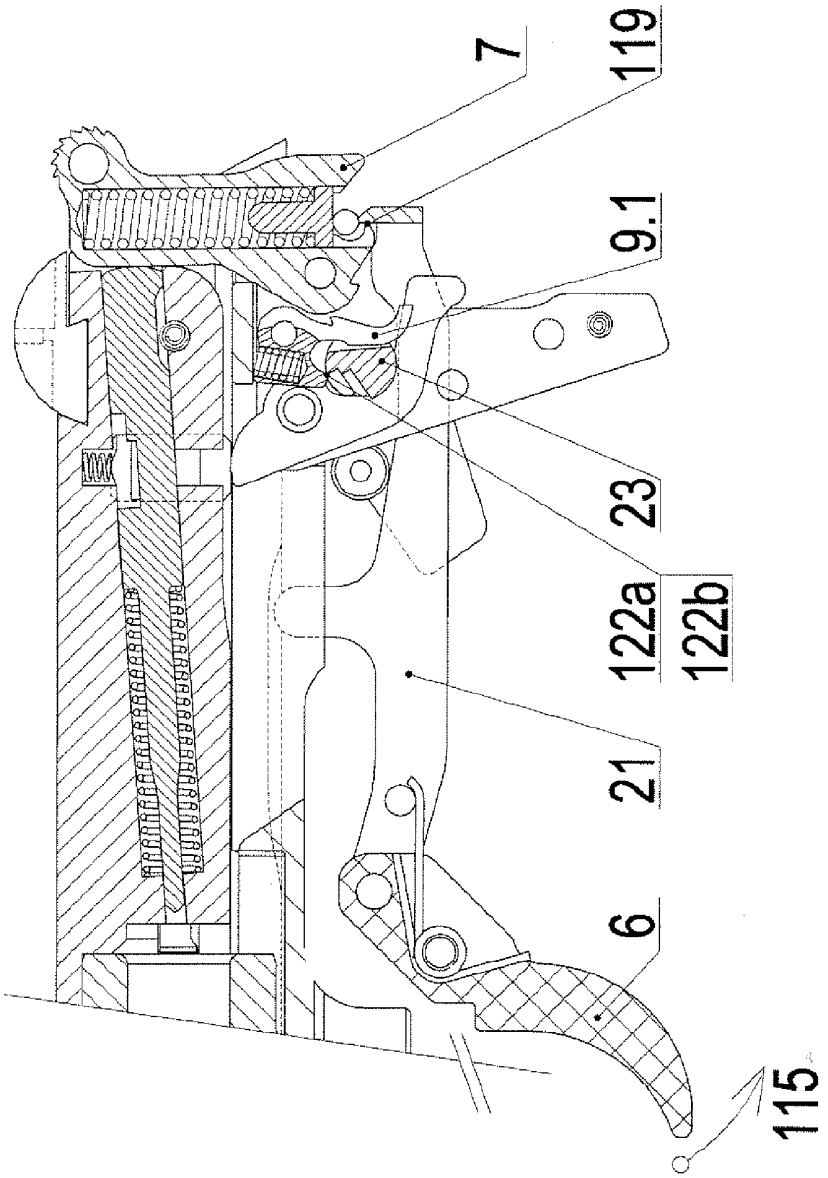


Fig.F.3.1

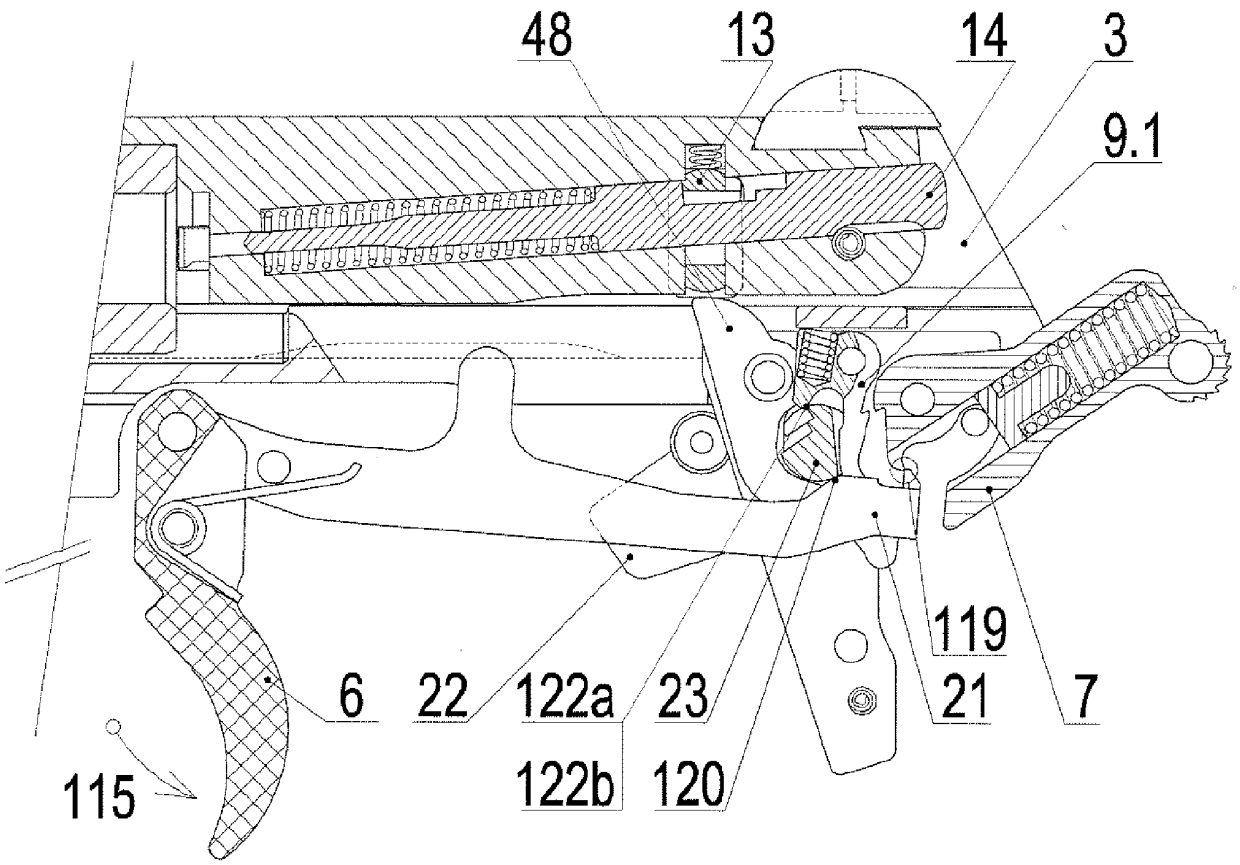


Fig.F.4

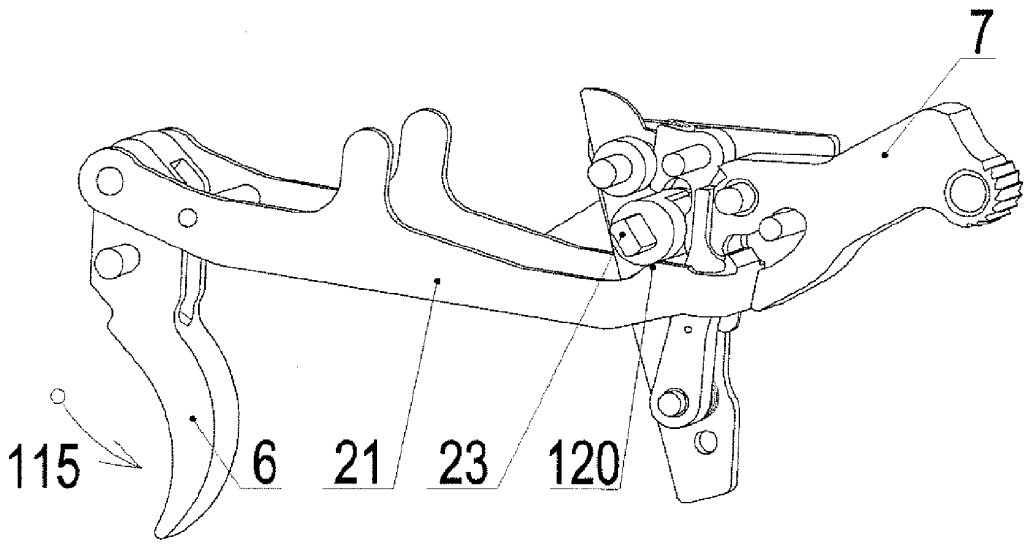


Fig.F.5

REFERENCES CITED IN THE DESCRIPTION

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- US 7257918 B2 **[0003]**
- US 6381892 B1 **[0003]**
- US 6341442 B1 **[0003]**
- CZ 293435 B6 **[0003]**
- US 6718680 B2 **[0003]**
- US 6481139 B2 **[0003]**
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- EP 1472501 B1 **[0003]**
- EP 0730135 B1 **[0003]**
- EP 2525185 A1 **[0003]**
- SK 279478 B6 **[0003]**