



(11) **EP 2 385 199 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.11.2011 Bulletin 2011/45

(51) Int Cl.:
E05B 65/10 (2006.01) **E05B 63/16** (2006.01)
E05B 59/00 (2006.01) **E05B 63/20** (2006.01)
E05B 47/00 (2006.01)

(21) Application number: **11382118.5**

(22) Date of filing: **18.04.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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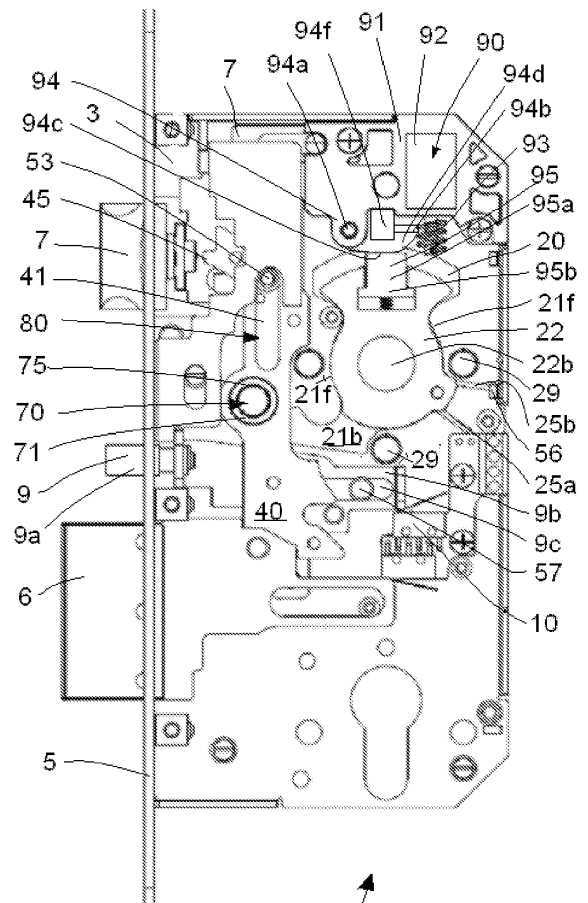
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(30) Priority: **04.05.2010 ES 201030423 U**

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(54) **Anti-panic lock adapted to doors**

(57) Anti-panic lock adapted to doors that comprises at least one lever (6) operable by a cylinder, a latch (7) operable by a first handle or by a second handle, means for transmitting the movement of the cylinder or the corresponding handle towards the latch (7) or the lever (6), the transmission means (100) comprising a first pusher (20) rotatable when operated by the first handle, a second pusher (21) rotatable when operated by the second handle, and at least one slide member (110) that moves when operated by any of the pushers (20,21), and anti-panic release means (70) that, when operated by the handles, act on the transmission means (100) releasing the lever (6). The release means (70) project out from one of the surfaces (30a,60a) of the slide member (110), thus only the pusher (20,21) that is arranged facing said surface (30a,60a) operates the anti-panic release means (90).



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FIG. 4

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Description

TECHNICAL FIELD

[0001] This invention relates to anti-panic locks adapted to doors.

PRIOR ART

[0002] Known anti-panic locks adapted to doors comprise a lever by which the door is locked, the lever being operable by a cylinder, and a latch that may be operated by an external handle or by the cylinder. The electro-mechanical lock also comprises coupling means that convert the rotational movement of the handle into a movement of the latch.

[0003] In addition, there are known anti-panic locks the object of which is to release the door quickly in an emergency situation. This type of safety device allows the user to open the door quickly from one of the sides when the door is locked, preventing opening from the other side. Locks of this type including different means for the rapid release of the lever are described in the following patent documents: EP16969525A1, ES2048616B1, ES2066673A1 and ES2211277B1

[0004] US2008/0066505A1 also describes an electro-mechanical anti-panic lock wherein it is possible to choose from which side of the door the anti-panic release means are operated. The lock comprises first and second plates, each of which is coupled to a corresponding handle, a first cam adapted to act on the latch, and a second cam adapted to act on the lever, the plate connected to the second cam determining which handle operates the anti-panic release means.

DISCLOSURE OF THE INVENTION

[0005] The object of the invention is to provide an anti-panic lock adapted to doors as described in the claims.

[0006] The anti-panic lock of the invention comprises at least one lever that may be operated by a cylinder, a latch that may be operated by a first handle arranged on one side of the door or by a second handle arranged on the opposite side of the door, and means for transmitting the movement associated to the cylinder or the corresponding handle towards the latch or towards the lever, the transmission means comprising a first pusher that rotates when operated by the first handle, a second pusher that rotates when operated by the second handle, and at least one slide member that moves when operated by the first pusher or by the second pusher.

[0007] The anti-panic lock also comprises anti-panic release means that, when operated by one of the two handles, act on the transmission means and release the lever.

[0008] The anti-panic release means are arranged inserted in the slide member projecting out from one of the surfaces of said slide member, with the result that only

the pusher that is arranged facing the surface from which the anti-panic release means project out operates said anti-panic release means, releasing the lever.

[0009] Thus, depending on which surface of the slide member the release means project out from, either the first pusher operated by the first handle or the second pusher operated by the second handle shall operate said release means.

[0010] An optimised anti-panic lock is thus obtained and which can be used in both directions, in other words the anti-panic lock may be unlocked from one side of the door by operating the first handle, or from the opposite side of the door by operating the second handle, as a result of which it is only necessary to change which surface of the slide member the release means project out from.

[0011] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0012]

Figure 1 shows a perspective view of an anti-panic lock according to the invention, in a position wherein the door is closed or locked.

Figure 2 is a ground view of the anti-panic lock shown in Figure 1, without a cover.

Figure 3 is a perspective view of the anti-panic lock shown in Figure 1, without a cover and with exploded anti-panic release means.

Figure 4 is a ground view of the anti-panic lock shown in Figure 1, wherein some elements have been hidden to aid comprehension.

Figure 5 is a partial perspective view of transmission means comprised in the anti-panic lock shown in Figure 1.

Figure 6 is a partial perspective view of the transmission means shown in Figure 5, without a first pusher.

Figure 7 is a view in perspective of an intermediate plate of the transmission means shown in Figure 5.

Figure 8 is a view in perspective of a second pusher of the transmission means shown in Figure 5.

Figure 9 is a view of a unit of followers comprised in the anti-panic lock shown in

Figure 1.

Figure 10 is a view in perspective of transmission means and anti-panic release means shown in Figure 1.

Figure 11 is a sectional view in perspective of transmission means and anti-panic release means shown in Figure 1.

Figure 12 is a view in perspective of a first cam of a slide member comprised in the anti-panic lock shown in Figure 1.

Figure 13 is a view in perspective of an intermediate cam of a slide member comprised in the anti-panic lock shown in Figure 1.

Figure 14 is a view in perspective of a second cam of a slide member comprised in the anti-panic lock shown in Figure 1.

Figure 15 is a sectional schematic view of the anti-panic lock shown in Figure 1, with anti-panic release means in a first position.

Figure 16 is a sectional schematic view of the anti-panic lock shown in Figure 1, with anti-panic release means in a second position.

DETAILED DISCLOSURE OF THE INVENTION

[0013] The anti-panic lock 1 adapted to doors according to the invention, shown in Figures 1 to 4, comprises a case 2 delimited by a base 3, a cover 4, shown in Figure 1, the base 3 and the cover 4 being arranged substantially parallel to each other, side walls 2a and a front 5 arranged substantially orthogonal to the base 3 and to the cover 4, a lever 6 that may be operated by a cylinder not shown in the figures, a latch 7 that may be operated by a first handle or a second handle not shown in the figures or the cylinder not shown in the figures, and a trigger element 9, arranged between the lever 6 and the latch 7.

[0014] The trigger element 9, shown in Figures 2 to 4, comprises a first part 9a that, in an initial open-door position not shown in the figures, projects out in relation to the front 5 towards the outside of the anti-panic lock 1, and a second part 9b that is arranged housed inside the case 2, the second part 9b including a groove 9c that cooperates with a projection 57 fixed to the base 3 to guide the movement of the trigger element 9.

[0015] The anti-panic lock 1 comprises means 100 for transmitting the movement associated to the cylinder or the corresponding handle towards the latch 7 or towards the lever 6, the transmission means 100 comprising a first pusher 20 adapted to be operated by the first handle, a second pusher 21 adapted to be operated by the second handle, and at least one slide member 110 adapted so that it may be moved, operated by the first pusher 20 or by the second pusher 21.

[0016] The slide member 110 is arranged coupled to the lever 6, the slide member 110 including a groove 65, shown in Figures 2,3,10 and 12, along which moves a connector member 55, shown in Figures 2,3 and 10, inserted in the lever 6.

[0017] The anti-panic lock 1 also includes a traction spring, not shown in the figures, one of the ends of which is arranged fixed to the base 3 of the case 2 and the other end is arranged fixed to one end of the slide member 110.

[0018] In an initial position, wherein the anti-panic lock 1 has not been operated, the trigger element 9 keeps the slide member 110 locked. At the time that the door closes, the trigger element 9 moves towards inside of the case 2, with the result that the first part 9a retracts and is housed in said case 2, and the second part 9b comes into contact with a switch 10, shown in Figure 2, generating an electrical signal that indicates that the door is closed against the frame of the door and, at the same time, releases the slide member 110. When the slide member 110 is released, the traction spring to which is arranged fixed one end of the slide member 110 attracts the slide member 110, with the result that the movement of said slide member 110 causes the operation of the lever 6, which moves and projects out in relation to the case 2 of the anti-panic lock 1, thereby locking the door.

[0019] The slide member 110 comprises a first cam 60, shown in detail in Figures 10 to 12, which has a surface 60a that is arranged facing the second pusher 21 in a locked-door position, an intermediate cam 40, shown in detail in Figure 13, which is arranged supported on a second surface 60b of the first cam 60 and a second cam 30, shown in detail in Figure 14, which is arranged supported on the intermediate cam 40 and which includes a surface 30a, shown in Figure 11, facing the first pusher 20 in the locked-door position, the cams 30,40,60 being arranged coupled to each other.

[0020] The slide member 110 also includes guide means 80 that include a first corresponding groove 31,41,61 that collaborates with a substantially cylindrical guide member 53, shown in Figures 2 to 4, 10 and 11, fixed to the base 3 of the case 2 of the anti-panic lock 1, to guide the movement of the slide member 110 in relation to said base 3. In addition, the guide means 80 comprise in the first cam 60 a second groove 64 substantially parallel to the first groove 61, which collaborates with a substantially cylindrical guide member 54 fixed to the case 2, which also acts as a support for the first cam 60, and a projection 66, shown in Figures 1 to 3, that collaborates with a groove 2b arranged on one of the walls 2a of the case 2 for the movement of the slide member 110 inside the case 2.

[0021] In addition, the intermediate cam 40 comprises a projection 45, shown in Figures 2,4,10, and 13, that acts as a stopper when the lock is in the locked position, preventing said latch 7 from moving towards the inside of the case 2. Additionally, both the intermediate cam 40 and the first cam 30 include on one end a respective housing 36,46 delimited by a surface 36b,46b, shown in

Figures 13 and 14, substantially sloping in relation to the direction of movement of the latch 7. Additionally the latch 7 comprises an internal part, not visible in the figures, housed inside the case 2, which includes a projection, not visible in the figures, which collaborates with the surface 36b,46b of the intermediate cam 40, with the result that the movement of the slide member 110 brings about the movement of the latch 7.

[0022] Although in the embodiment shown in the Figures, the slide member 110 comprises three cams 30,40,60, in other embodiments not shown in the Figures, it may comprise two cams or even be made of a single piece.

[0023] Furthermore, the first pusher 20, shown in detail in Figures 5,6, 8 and 11, comprises a plate 20a that includes an arm 20b adapted to move the slide member 110 when the first handle is operated and an opening 20c with a rectangular cross-section, in which a follower 26 is coupled.

[0024] In addition, the second pusher 21, shown in detail in Figures 5 and 11, comprises a second plate 21 a that includes a second arm 21 b adapted to move the slide member 110 when the second handle is operated, and an opening 21 c with a rectangular cross-section, in which a follower 26 is coupled. The followers 26, shown in detail in Figure 10, each comprise a central part 26b with a substantially rectangular cross-section that is arranged inserted in the opening 20c, 21 c of the corresponding pusher 20,21, and a longitudinal housing 26a in which is coupled a shaft of the corresponding handle, with the result that the followers 26 and, therefore, the respective pushers 20,21 rotate independently of each other.

[0025] The anti-panic lock 1 comprises stoppers 29, shown in Figures 2 to 4 and 10, fixed to the base 3, which collaborate with respective recesses 20f,21f in the respective pusher 20,21 to delimit the rotation of the pushers 20,21.

[0026] The transmission means 100 also comprise an intermediate plate 22, shown in Figures 5 to 7, which is arranged, in the embodiment described in the figures, fixed to the first pusher 20 by coupling pins 28, and a return spring 25 that is arranged housed inside the intermediate plate 22. For this purpose the intermediate plate 22 includes a substantially concentric housing 22a in which is housed the return spring 25, preferably a torque spring, and a side opening 23 through which a first branch 25a, and a second branch 25b of the spring 25 project out, the ends 23a,23b of the opening 23 defining the limits of rotation of the handles. The intermediate plate 22 also has a central hole 22b in which the respective followers 26 coupled to the first pusher 20 and the second pusher 21 are partially coupled.

[0027] The anti-panic lock 1 comprises a stopper 56, shown in Figures 2 and 4, that is arranged inserted in the base 3 of the case 2 against which the second branch 25b acts permanently as a stopper. In addition, the first pusher 20 comprises a projection 20d, which extends

towards the base 3, against which both branches 25a, 25b of the spring 25 act as stoppers in a position in which the handles are not operated, and against which only the first branch 25a acts as a stopper when the first handle has been operated. Additionally, the second pusher 21 also comprises a projection 21 d fixed to the second plate 21 a, which extends towards the cover 4, against which both branches 25a,25b of the spring 25 act as stoppers in a position in which the handles are not operated, and against which only the first branch 25a acts as a stopper when the second handle has been operated. Thus, in a position in which the handles are not operated, the projection 20d of the first pusher 20 and the projection 21d of second pusher 21 are arranged substantially aligned.

[0028] In addition, the anti-panic lock 1 of the invention comprises clutch means 90 that couple both pushers 20,21 for the simultaneous rotation of both handles regardless of which handle is operated by the user. The clutch means 90, shown in Figures 2 to 4, comprise a support 91 fixed to the base 3, a motor 92 supported by the support 91, an endless screw 93 coupled to the motor 92, an actuator 94 fixed at one end in a pivoting manner to the support 91 and which includes a contact member 94b that is in contact with the endless screw 93, and a clutch 95, shown in Figures 4 and 6, that couples the pushers 20,21 when operated by the actuator 94. The actuator 94 is made of flexible material.

[0029] The contact member 94 has a substantially orthogonal cross-section, its width being smaller than the distance between two consecutive threads of the endless screw 93.

[0030] The actuator 94, shown in Figures 2 and 4, comprises a base 94d that includes the contact surface 94 and which is arranged supported on the base 3 of the case 2, a first projection 94a that is fixed substantially orthogonal to the base 94d of the actuator 94, it being inserted in a hole of said base 94, by which the actuator 94 is fixed in a pivoting manner to the support 91, and a second projection 94f from which the contact member 94b is arranged substantially orthogonal to the endless screw 93.

[0031] The clutch 95 is housed in the intermediate plate 22 of the transmission means 100, comprising a substantially rectangular first part 95a, and a second part 95b with a substantially rectangular cross-section, and a greater width than the first part 95a. Additionally, the intermediate plate 22, shown in Figures 6 and 7, includes a cavity 24 that has a first part 24a inside which is housed the second part 95b of the clutch 95, and a second part 24b connected to the first part 24a and the exterior, with a smaller width than the first part 24a, inside which is housed the first part 95a of the clutch 95. The clutch 95 includes in the second part 95 a housing 95c in which is housed a spring 97.

[0032] Furthermore, the first pusher 21 includes, on the end opposite the arm 21 b, grooves 21 e shown in Figure 5 where stoppers 27 are arranged inserted, arranged facing the second pusher 20 and which delimit a

housing 27b, shown in Figure 6, between them.

[0033] Thus, in an initial position of the anti-panic lock 1, both pushers 20,21 are declutched, the motor 91 is not operating, and the actuator 94 acts on the clutch 95, in particular on the first part 95a, with the result that the clutch 95 compresses the spring 96, being housed entirely in the cavity 24 of the intermediate plate 22, each pusher 20,21 being capable of rotating independently in relation to the other pusher 21,20, given that the respective projection 27 of the first pusher 21 acts as a stopper, preventing the clutch 95 from expanding outside the cavity 24. Subsequently, the respective pusher 20,21 returns to the initial position by the return spring 25.

[0034] When the motor 91 receives a certain electrical impulse the endless screw 93 rotates in an anti-clockwise direction, with the result that the contact member 94b of the actuator 94 is moved by the endless screw 93 in a direction towards the motor 91, with the result that both pushers 20,21 are coupled to each other, rotating jointly when either of the two handles is operated. In this position, the second part 95b of the clutch 95 acts as a stopper against the first part 24a of the cavity 24 of the intermediate plate 22, with the result that the first part 95a is partially housed in the housing 27b delimited by the stoppers 27, with the result that both pushers 20,21 are clutched together.

[0035] From this position, when the motor 91 receives an electrical impulse contrary to the initial one, the endless screw 93 rotates in a clockwise direction, with the result that the end 94b of the actuator 94 is moved by the endless screw 93 in a direction towards the clutch 95, with the result that the actuator 94 once more keeps the clutch 95 pressed down inside the cavity 24, thus keeping the pushers 20,21 declutched.

[0036] In addition, the anti-panic release means 70, shown in detail in Figures 15 and 16, comprise a sleeve 71 that is arranged inserted in the slide member 110, for which purpose the respective cams 30,40,60 comprised in the slide member 110 respectively include a hole 37,45,67 in which the sleeve 71 is inserted fixed. The anti-panic release means 70 also comprise a substantially cylindrical positioning member 75, inserted in a movable manner in the sleeve 71. In particular, the sleeve 71 includes an inner ring-shaped groove 72 in which is housed an elastic means 77, and the positioning member 75 also comprises a first outer groove 76a and a second outer groove 76b, both of them ring-shaped grooves, separated from each other by a certain distance. The elastic means 77 preferably includes an elastic seal. In other embodiments the elastic means 77 may include elastic washers, a spring, ring seals, etc.

[0037] When the anti-panic release means 70 are arranged in a first position, shown in Figure 15, the positioning member 75 is arranged inserted in the sleeve 71 with the result that the elastic seal 77 inserted in the inner groove 72 of the sleeve 71 is housed in the first outer groove 76a of said positioning member 75, the positioning member 75 projecting out in relation to the slide mem-

ber 110, and in particular in relation to the free surface 60a of the first cam 60, being supported on the base 3 of the case 2 of the anti-panic lock 1. As a result, starting from a position in which the door is closed and locked by the lever 6, the pushers 20,21 declutched, only the user operating the second handle can unlock the anti-panic lock 1 quickly, as when said second handle is operated, the second pusher 21 rotates and, facing the surface 60a of the first cam 60, as shown in Figure 11, acts as a stopper against the part of the positioning member 75 that projects out, thereby moving the slide member 110. The movement of the slide member 110 causes the movement of the lever 6 and the latch 7 towards the inside of the case 2, enabling the opening of the door. If the user operated the first handle, the rotation of the first pusher 20 would not move the slide member 110, and the lever 6 therefore would continue to lock the door.

[0038] In contrast, when the anti-panic release means 70 are arranged in a second position, shown in Figure 16, the positioning member 75 is arranged inserted in the sleeve 71 with the result that the elastic seal 77, inserted in the inner groove 72 of the sleeve 71 is housed tightly in the second outer groove 76b of the positioning member 75, the positioning member 75 projecting out in relation to the slide member 110, in particular in relation to the free surface 30a of the second cam 30, it being supported on the cover 4 of the case 2 of the anti-panic lock 1. As a result, starting from a position wherein the door is closed and locked by the lever 6 and the pushers 20,21 declutched, only the user operating the first handle can unlock the anti-panic lock 1 quickly, as when said first handle is operated, the first pusher 20 rotates and, facing the surface 30a of the first cam 30, as shown in Figure 11, acts as a stopper against the part of the positioning member 75 that projects out, thereby moving the slide member 110. The movement of the slide member 110 causes the movement of the lever 6 and the latch 7 towards the inside of the case 2, enabling the opening of the door.

[0039] Finally, both the cover 4 and the base 3 of the case 2 respectively comprise a hole 96, shown in Figures 1, 15 and 16, arranged concentric to each other and to the positioning member 75, with the result that by introducing a suitable tool through the corresponding hole 96, the positioning member 75 may be moved from one position to another, thereby allowing the user to change, quickly and easily from the outside of the anti-panic lock 1, the configuration of said anti-panic lock 1 in order to obtain an anti-panic lock 1 that is unlocked when the first handle is operated or is unlocked when the second handle is operated.

Claims

1. Anti-panic lock adapted to doors that comprises at least one lever (6) that may be operated by a cylinder, a latch (7) that may be operated by a first handle

- arranged on one side of the door or by a second handle arranged on the opposite side of the door, means (100) for transmitting the movement associated to the cylinder or the corresponding handle towards the latch (7) or towards the lever (6), the transmission means (100) comprising a first pusher (20) adapted to rotate when operated by the first handle, a second pusher (21) adapted to rotate when operated by the second handle, and at least one slide member (110) that moves when it is operated by the first pusher (20) or by the second pusher (21), and anti-panic release means (70) that, when operated by the handles, act on the transmission means (100) and release the lever (6), **characterised in that** the anti-panic release means (70) are arranged inserted in the slide member (110), projecting out from one of the surfaces (30a,60a) corresponding to the slide member (110), with the result that only the pusher (20,21) that is arranged facing the surface (30a,60a) from which the anti-panic release means (70) project operates the anti-panic release means (90).
2. Anti-panic lock according to the preceding claim, wherein the anti-panic release means (70) are arranged inserted in the slide member (110) selectively, in a first position, in which the anti-panic lock (1) is unlocked when the first handle is turned, or in a second position, in which the anti-panic lock (1) is unlocked when the second handle is turned.
 3. Anti-panic lock according to any of the preceding claims, wherein it comprises a cover (4) and a base (3), which are respectively included in a hole (96), arranged concentric to each other and to the anti-panic release means (70), said anti-panic release means (70) being operated through the holes (96).
 4. Anti-panic lock according to any of the preceding claims, wherein the anti-panic release means (70) comprise a sleeve (71) that is arranged inserted in the slide member (110), and a positioning member (75) inserted in a movable manner in the sleeve (71).
 5. Anti-panic lock according to the preceding claim, wherein the sleeve (71) includes an internal groove (72) in which is housed an elastic means (77), and the positioning member (75) comprises an external first groove (76a) and an external second groove (76b), with the result that the elastic means (77) inserted in the inner groove (72) is housed tightly and selectively in one of the external grooves (76a,76b).
 6. Anti-panic lock according to any of the preceding claims, wherein the first pusher (20) and the second pusher (21) respectively comprise arms (20b,21 b) that operate the slide member (110).
 7. Anti-panic lock according to any of the preceding claims, wherein the first pusher (20) and the second pusher (21) respectively comprise openings (20c, 21 c) in each of which a follower (26) is coupled jointly for the coupling of the corresponding handle.
 8. Anti-panic lock according to any of the preceding claims, wherein the transmission means (100) comprise an intermediate plate (22), arranged between the first pusher (20) and the second pusher (21), which houses a spring (25) returning the first pusher (20) or the second pusher (21) to a rest position.
 9. Anti-panic lock according to the preceding claim, wherein the intermediate plate (22) comprises an opening (23) through which the ends of the return spring (25) project out, the ends (23a,23b) of the opening (23) delimiting the limits of rotation of the first pusher (20) or the second pusher (21).
 10. Anti-panic lock according to the preceding claim, wherein the intermediate plate (22) is arranged fixed to the first pusher (20) or to the second pusher (21).
 11. Anti-panic lock according to any of the preceding claims, wherein the slide member (110) is arranged coupled to the latch (7), moving it towards the inside of a case (2) of the anti-panic lock (1), when one of the handles is operated.
 12. Anti-panic lock according to any of the preceding claims, wherein the slide member (110) includes a groove (65) through which is arranged coupled a projection (55) inserted in the lever (6).
 13. Anti-panic lock according to any of the preceding claims, wherein the slide member (110) comprises a first cam (60) that is arranged facing one of the pushers (20,21), an intermediate cam (40) that is arranged supported on the first cam (40) and a second cam (30) that is supported on the intermediate cam (40) and facing one of the pushers (21,20), the cams (30,40,60) being arranged couple to each other.
 14. Anti-panic lock according to the preceding claim, wherein the cams (30,40,60) include guide means (80) that comprise at least one first groove (31,41,61) that collaborates with a corresponding guide member (51) fixed to the base (3) in order to guide the movement of the slide member (110).

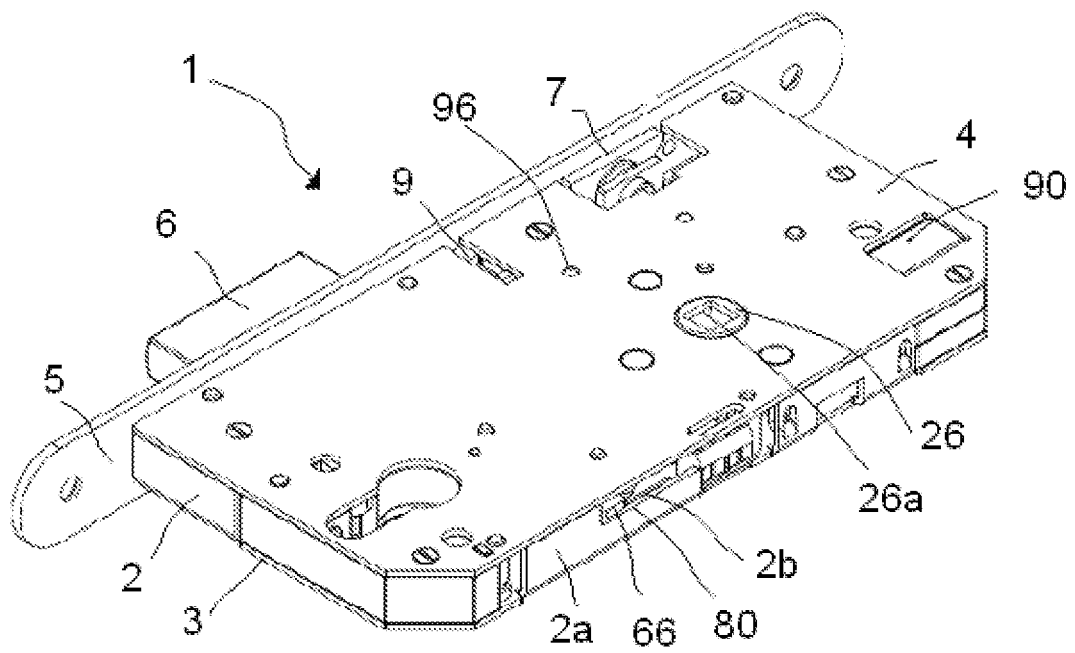


FIG. 1

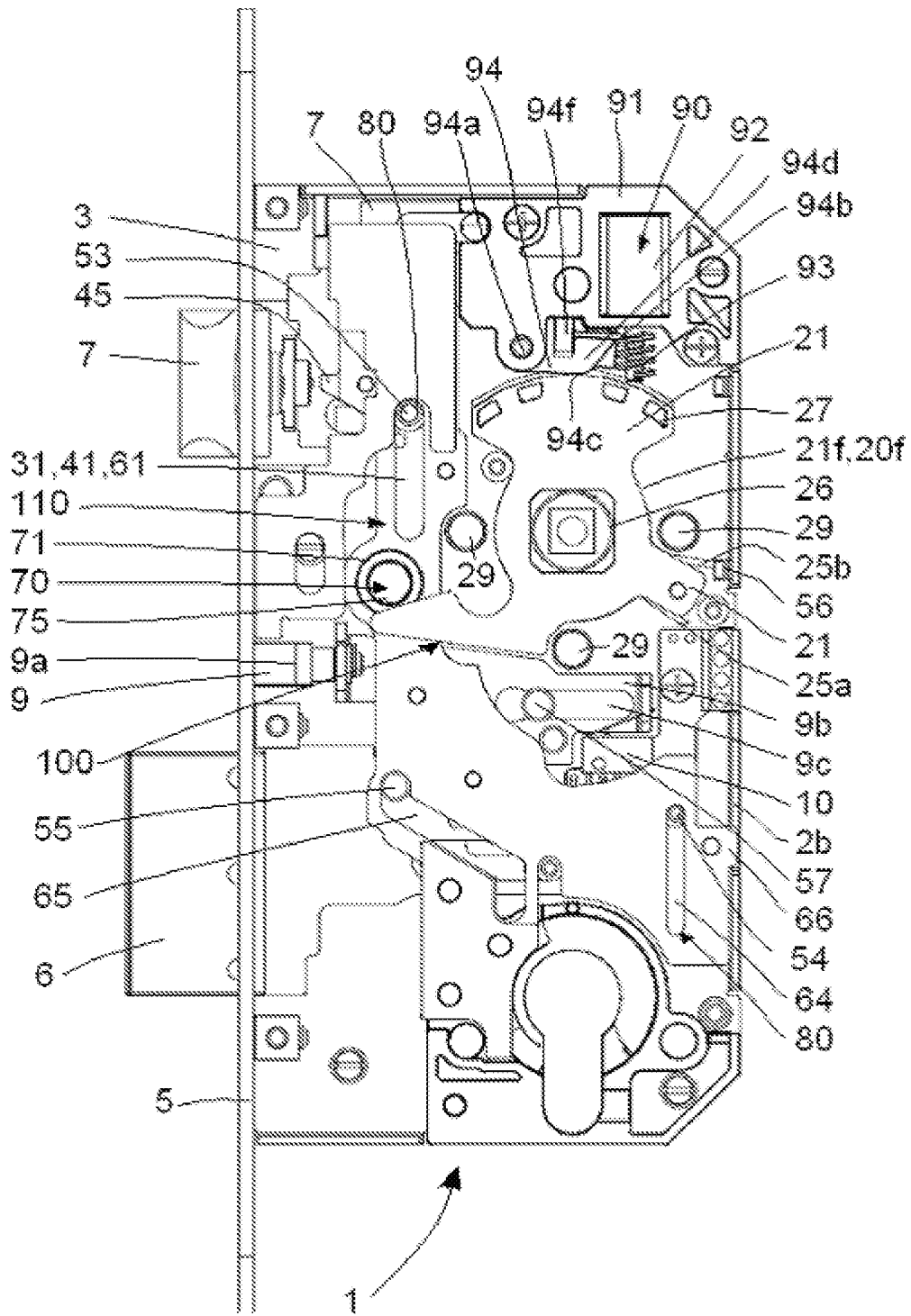
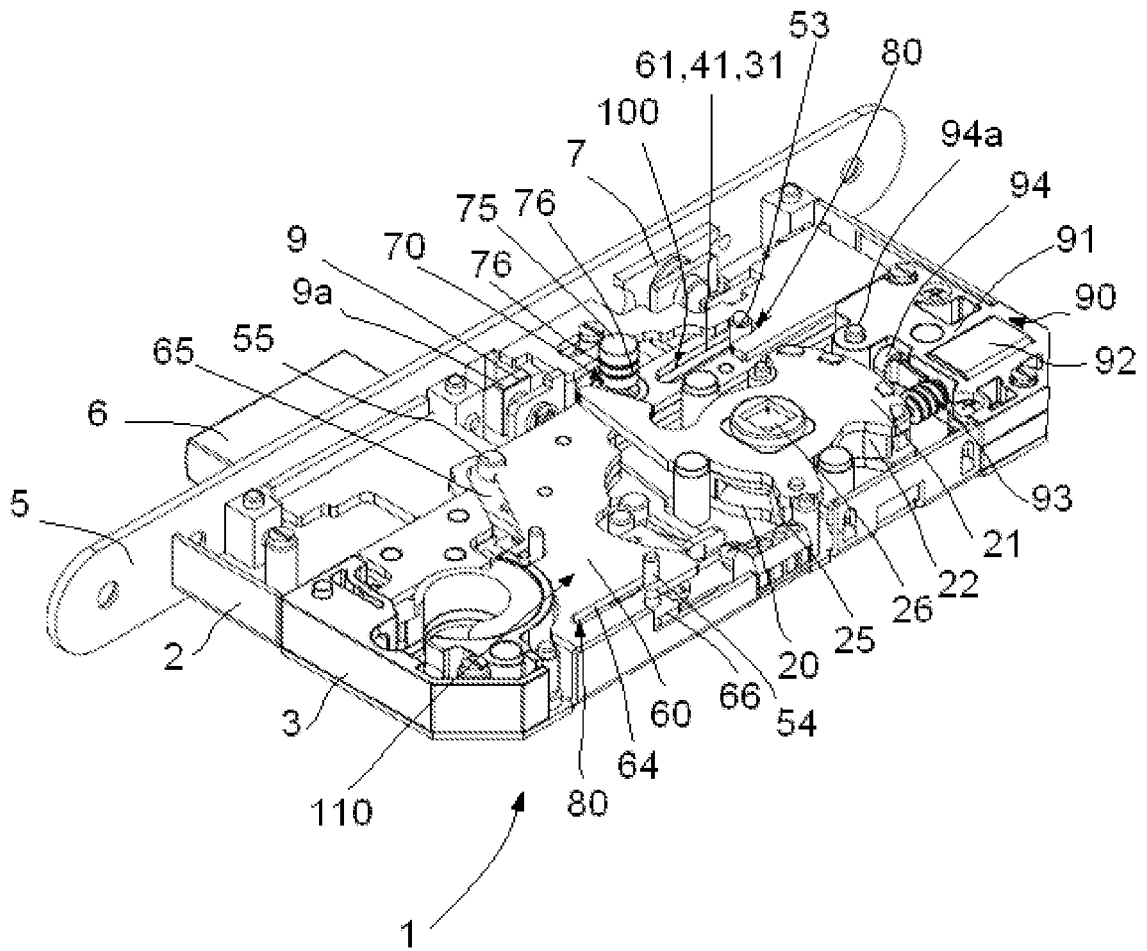


FIG. 2



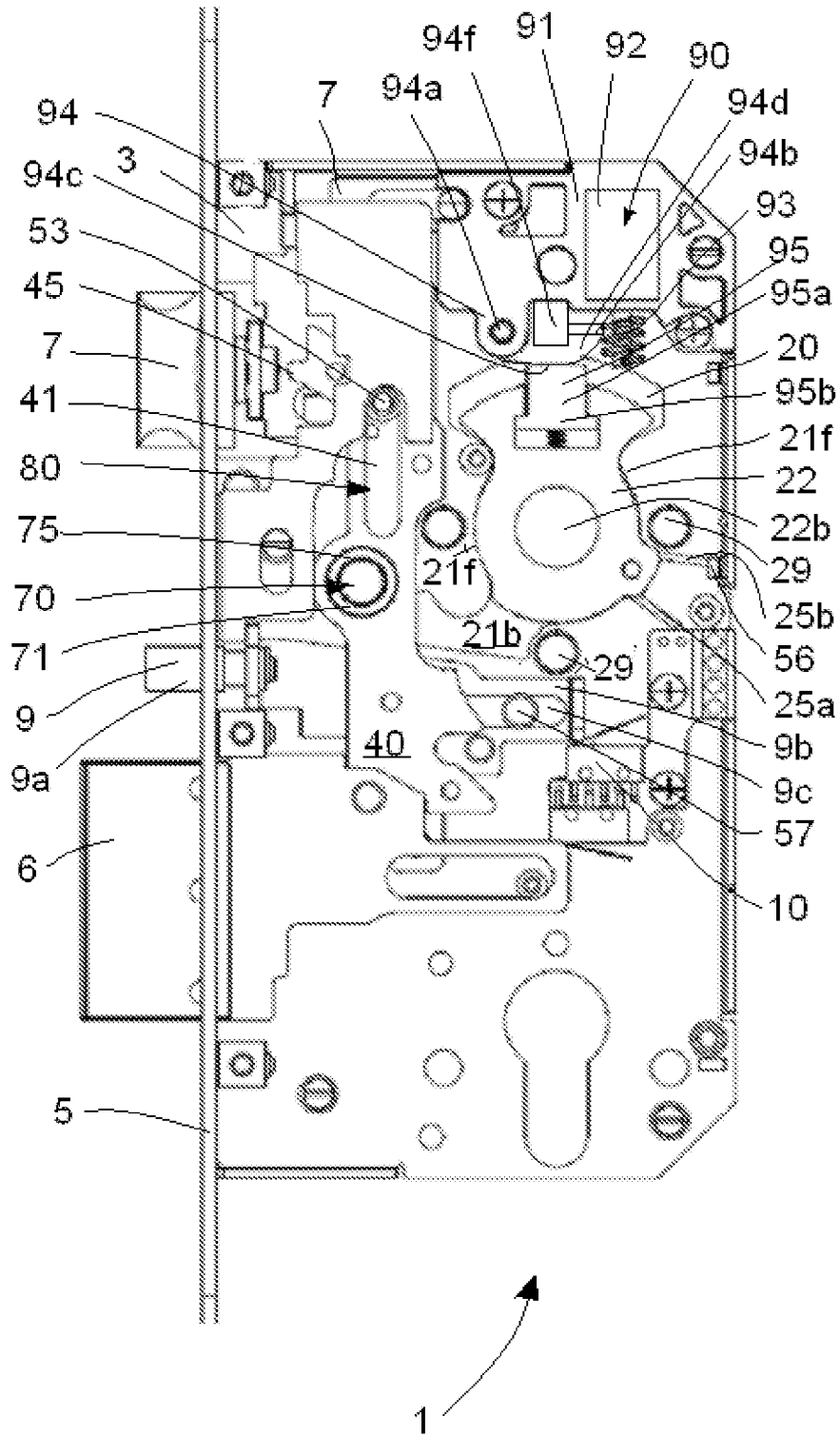


FIG. 4

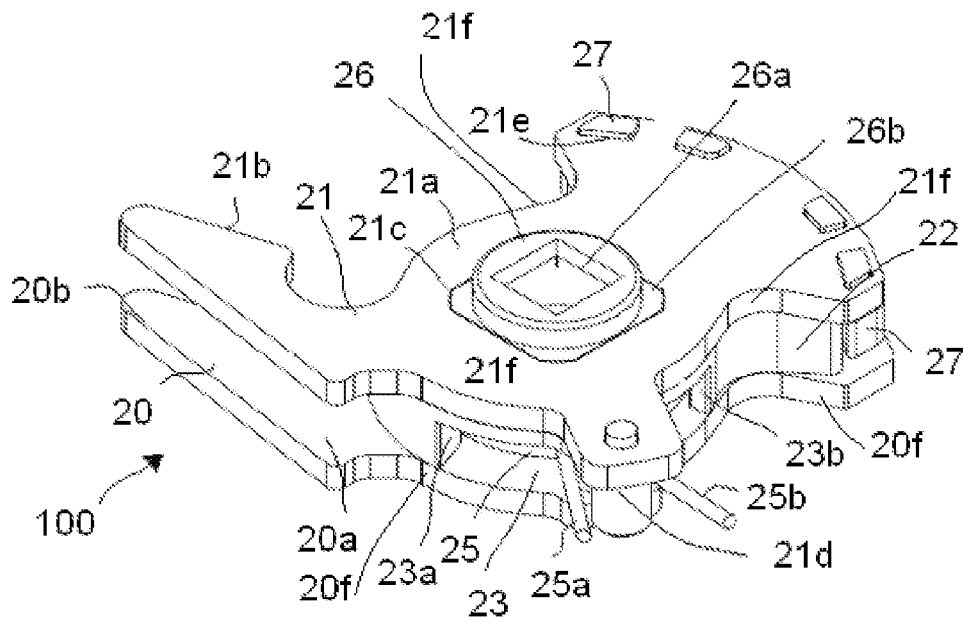


FIG. 5

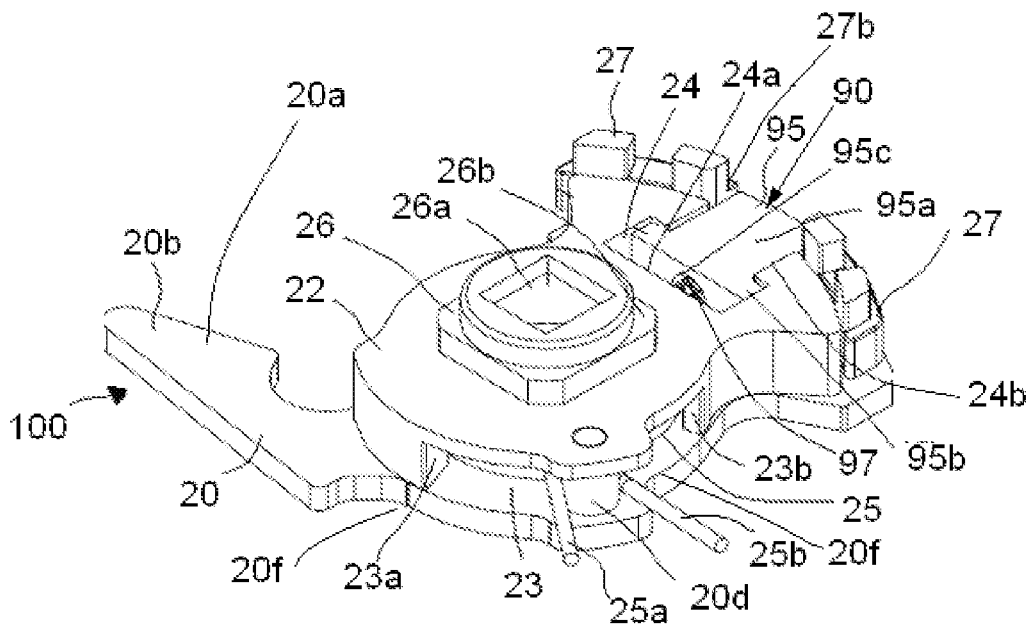


FIG. 6

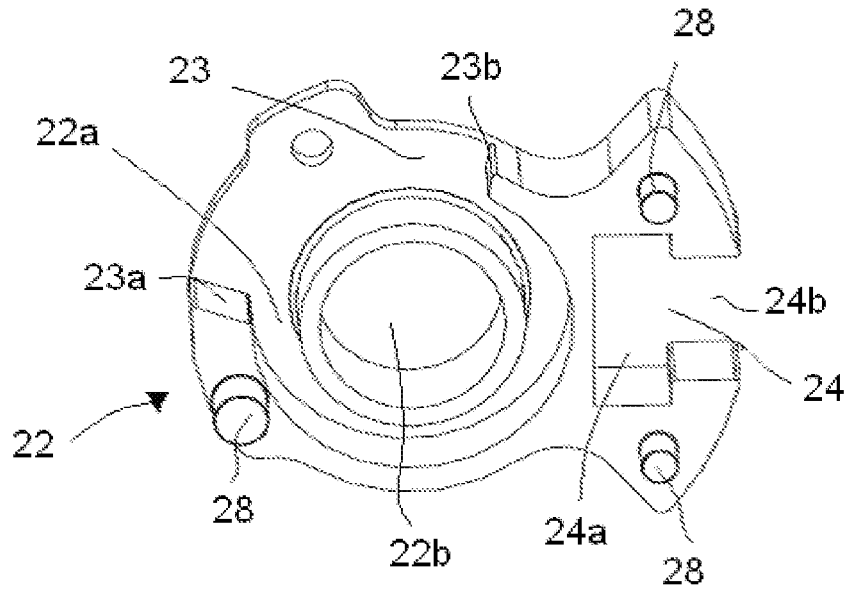


FIG. 7

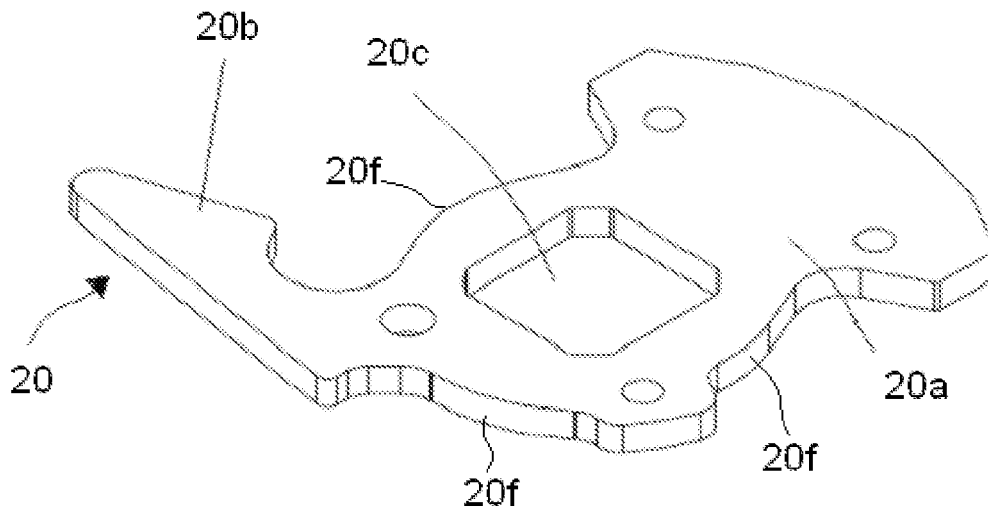


FIG. 8

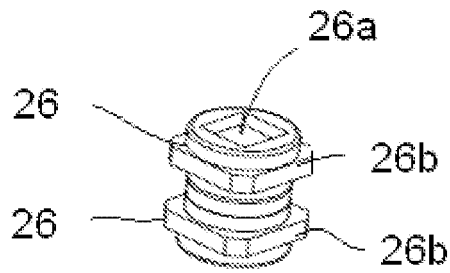


FIG. 9

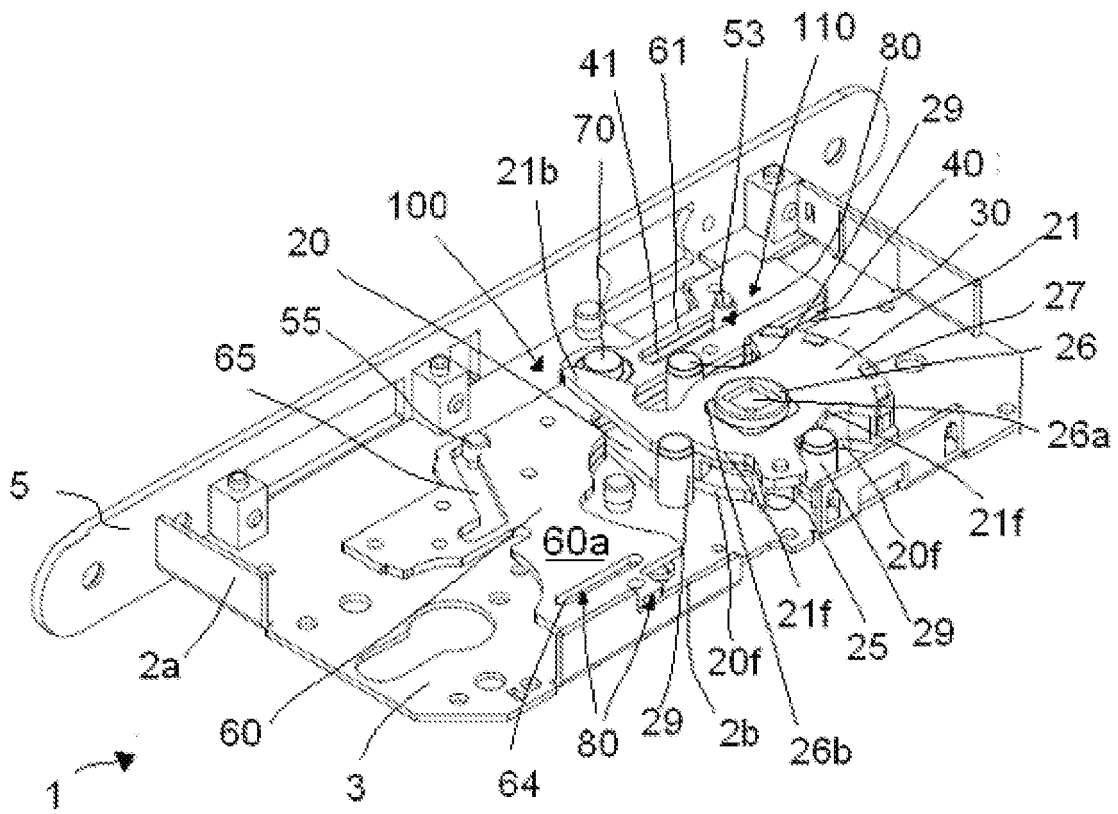


FIG. 10

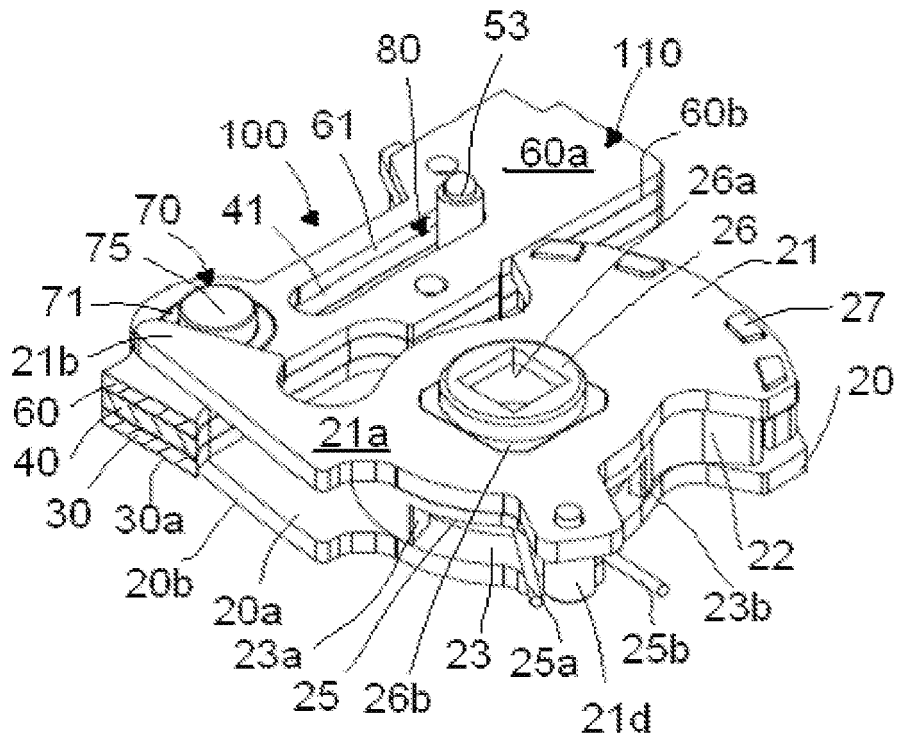


FIG. 11

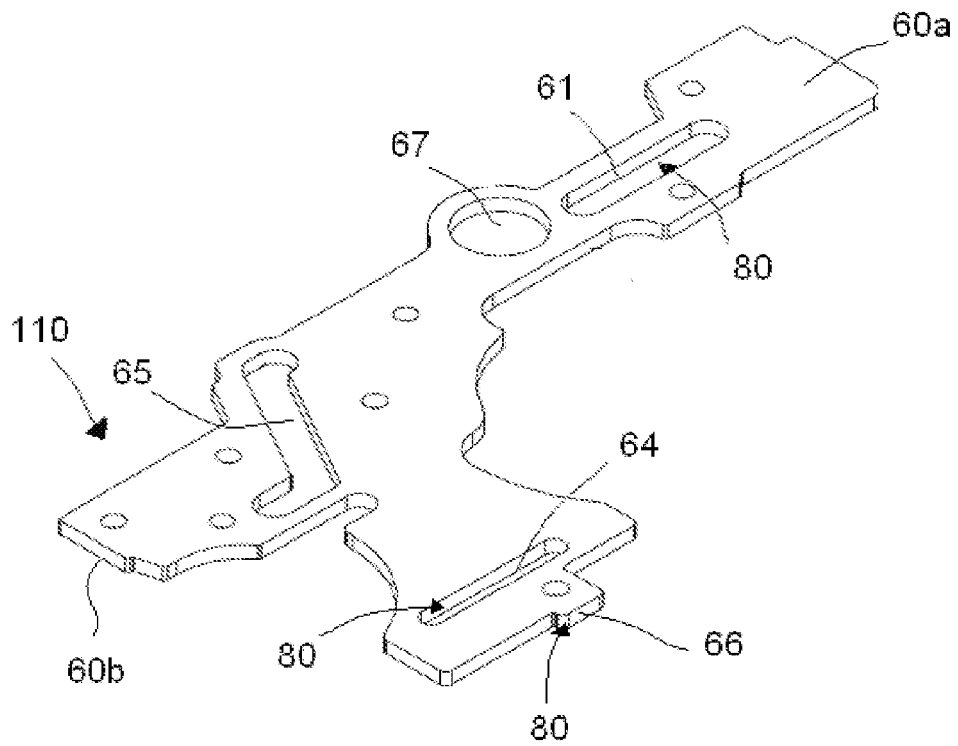


FIG. 12

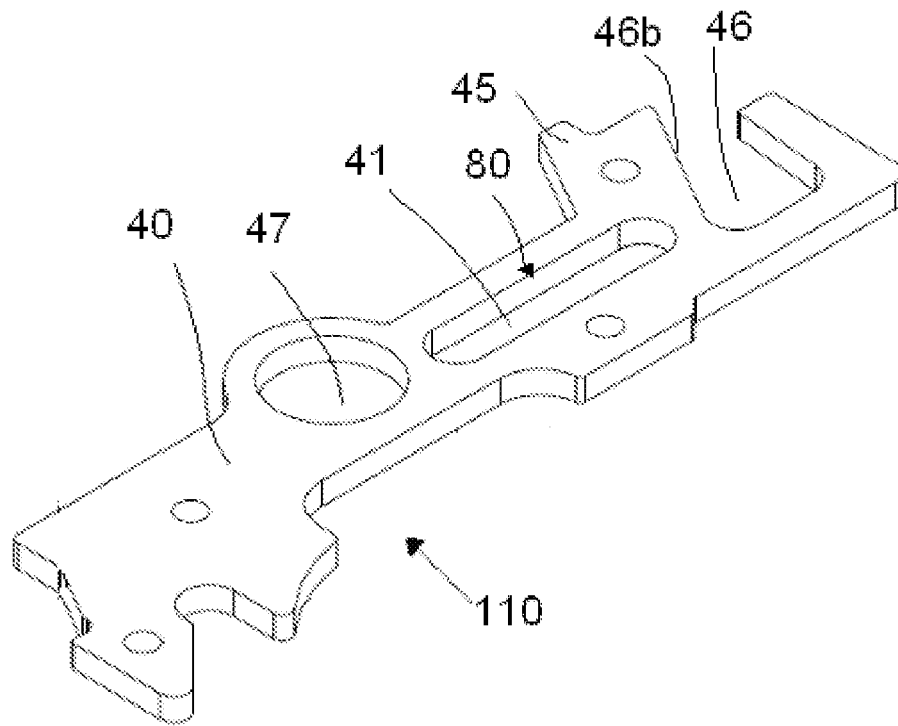


FIG. 13

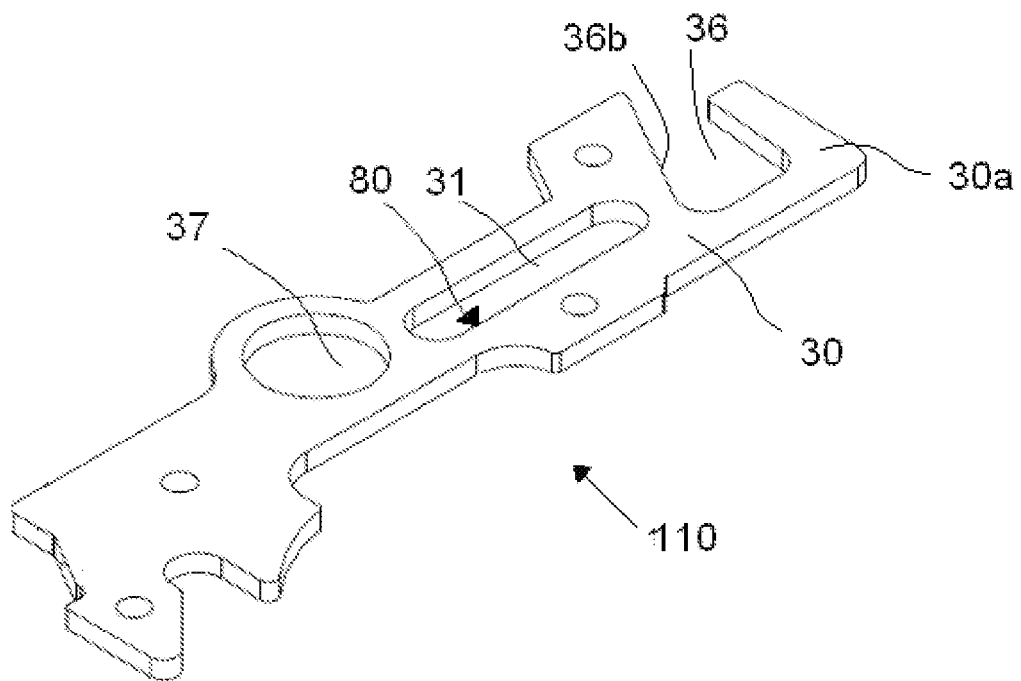


FIG. 14

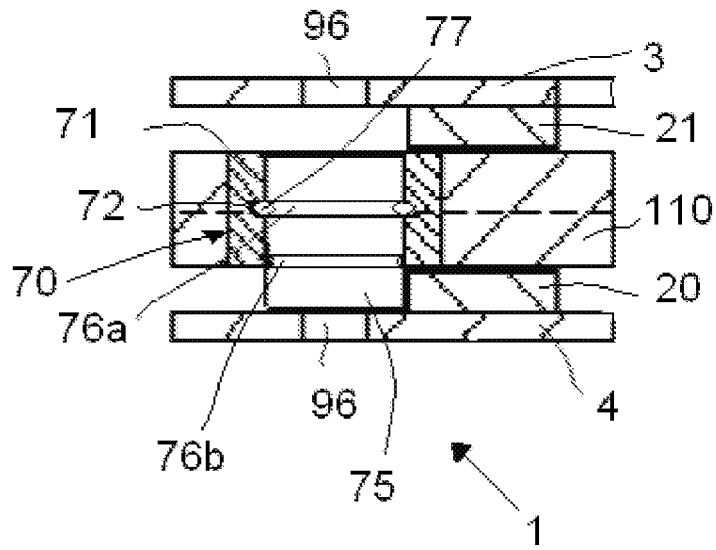


FIG. 15

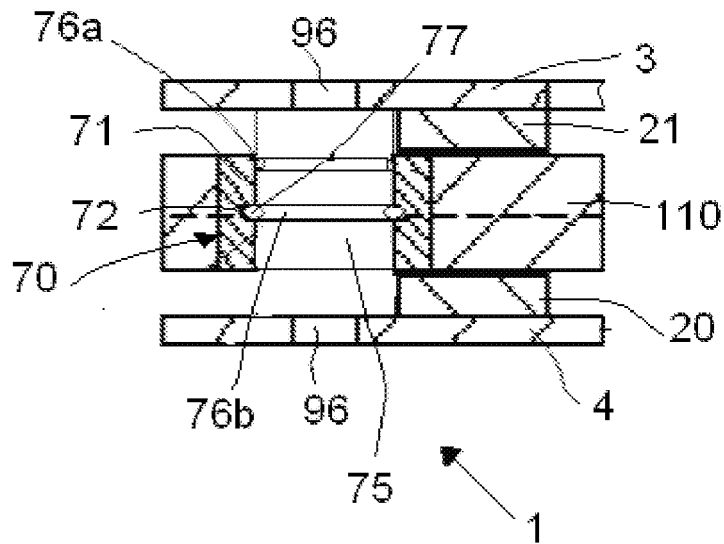


FIG. 16

REFERENCES CITED IN THE DESCRIPTION

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