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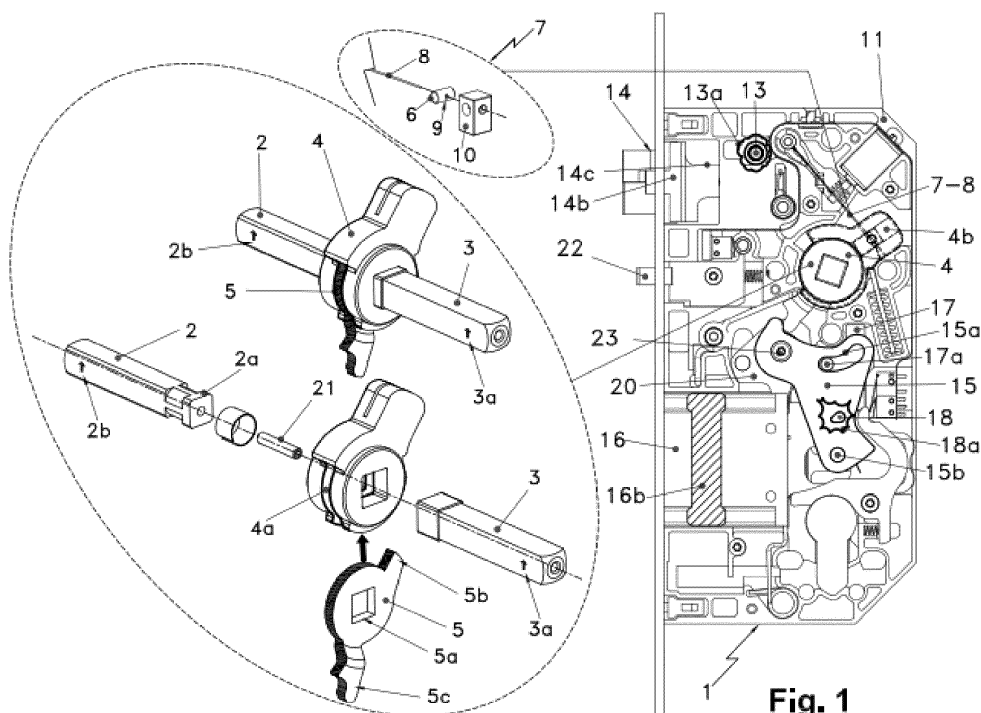
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(54) AUTOMATIC PANIC LOCK

(57) Automatic panic lock of the type having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle and can only be unlocked with the outer spindle when the clutch is in the suitable position; the follower being configured by a slotted one-piece body (4) housing an actuating follower plate (5) in its slot (4a), and the inner spindle (2) being

permanently attached to the window (5a) of the actuating follower plate (5) with its end (2a), and the outer spindle (3) being linked to the actuating follower plate (5) only when the clutch end (10) catters the slotted one-piece body (4) with the linking end (5b) of the actuating follower plate (5).

**Fig. 1**

Description

TECHNICAL FIELD

[0001] This invention relates to an automatic panic lock of the type having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle and can only be unlocked with the outer spindle when the clutch, which is inside the lock itself, is in the suitable position.

PRIOR ART

[0002] The design of locks of this type relates to automatic locks in which the lever plate is automatically triggered by the effect of a spring when the side-hinged door has reached the suitable position opposite the latch of the lock. Those locks with which the user can always quickly get out from the inside by simply actuating the inner handle are also referred to as panic locks, and to that end these locks can always be unlocked with the inner spindle and they can only be unlocked with the outer spindle when the clutch, which is inside the lock itself, is in the suitable position. The terms inner or inside will be used herein to refer to the part of the lock that is disposed inside the space which is to be kept safe, and the terms outer or outside will be used herein to refer to that part that exists outside of the lock.

[0003] ES2498892A2 describes an automatic panic lock of the type having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle and can only be unlocked with the outer spindle when the clutch is in the suitable position.

[0004] Automatic panic locks having a number of solutions are thereby known, but when these known solutions are subjected to the increasingly higher demands to be standardized and to be granted a recognized efficiency classification (being referred to as security doors, for example), they are subjected to resistance testing of the components under the successive repetition of operating cycles which at times reach up to 200.000 maneuvers, where the known solutions accumulate wear and clearances which prevent them from obtaining the quality required by Standardization Institutions.

[0005] The basis of this invention is a series of improvements made to an automatic panic lock which assures being able to attain a sufficient range of security.

DISCLOSURE OF THE INVENTION

[0006] The object of the invention is to provide an automatic panic lock as defined in the claims.

[0007] The present invention relates to an automatic panic lock of the type having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle and can only be unlocked with the outer spindle when the clutch is in the suitable position; the follower being formed by a slotted one-piece body housing a fol-

lower plate in its slot, and the inner spindle being permanently attached to a window of the actuating follower plate with its end, and the outer spindle being linked to the actuating follower plate only when the clutch end catters the slotted one-piece body with the linking end of the actuating follower plate.

[0008] As a result of this assembly, the existing lock system with followers formed by several parts is improved, being now a single surrounding follower body which internally houses a follower plate. Since it is not formed by several parts, the linkage of the stops does not have to be adjusted, so the strength resistance is greater; and since it is a single body, it is a more rigid element with a larger friction surface, complying with the strict controls of up to 200.000 life cycles because the wear will be less. Therefore, resistance to lock tampering is greater, and less wear caused by friction is obtained.

[0009] Another feature of the invention is that it incorporates a clutch end and a ball and socket joint which is linked to the spring rod. This configuration allows the rotation of the spring rod to take place in the ball and socket joint, unlike previous embodiments in which the rod rubbed against the inside of a clutch wheel and caused the breaking due to bending of the rod with fatigue. However, in this embodiment friction in the spring rod is prevented as a result of the linkage thereof with the ball and socket joint that absorbs stresses and allows the angular clearance, prolonging the service life of the clutch and therefore increasing user safety.

[0010] According to the invention, the body of the latch bolt comprises a flat edge on which a wheel anchored to the chassis is disposed. Rolling on the tail of the latch bolt is thereby obtained in order to maintain the latch bolt in its operational line and thereby facilitate the linear stability of the latch bolt and prevent unwanted rotational pitching, thereby preventing an incorrect locking of the lock or its interference with the blocking bar. This therefore increases the service life of the latch bolt and accordingly user safety.

[0011] Another feature of the invention is that the central arm comprises a guiding cavity in contact with the stem of the guard, and with a riveted wheel of the central arm in sliding contact with the lever plate. In other hand, the chassis comprises a riveted shaft to which the central arm and an actuator lever are joined, both the central arm and the actuator lever being able to rotate with respect to said riveted shaft. The actuator lever comprises a protrusion disposed close to a protrusion of the lever plate. Therefore, since all the elements are linked together, the assembly is operated at the same time, allowing, in the driving of the lever plate, the protrusion of the lever plate to hit against the protrusion of the actuator lever and remove the blocking bar, allowing the unlocking of the door. Connection problems between elements are thereby prevented, and there are no clearances, prolonging the service life of the lock.

[0012] Another particularity of the invention is that the lever plate comprises the egg-shaped spring housing

with an egg-shaped perimetric configuration in the form of a teardrop, wherein in its larger egg-shaped part the size is slightly greater than the circular section of the cylinder of the spiral spring, and wherein in its smaller egg-shaped part the size is slightly larger than the fixed short arm of the spiral spring. As a result of this embodiment, the spring housing of the lever plate houses a spring with a special spiral configuration which forces its short arm to be centered and secures the lever plate in its correct position by tensing the position of the central arm. The fixing of the spring is thereby advantageously and efficiently resolved, preventing the use of two stems and achieving the same effect as a result of the configuration in the form of a teardrop, without requiring using additional elements. Therefore, it is possible to prolong the service life of the lock due to the connection problems, which can be generated by the use of a larger number of fixing elements, are avoided.

[0013] The linkage of the inner and outer spindles is performed by means of a set screw with a rotating clearance in the order of 180° with respect to the thread pitch of the set screw and with the facing ends of both inner and outer spindles having respective alignment marks.

[0014] This embodiment enables an allowance for the clearance of the handle of the door, this clearance being necessary for actuating the actuating follower plate such that the inner spindle is prevented from driving the outer spindle, thereby achieving the actuation mechanism necessary for the single-part embodiment of the slotted one-piece body, and thereby providing greater user safety and privacy.

[0015] Finally, another feature of the invention is that the cross-section of the lever plate has a profile configuration of thickness greater than the width of the latch bolt.

[0016] As a result of this configuration, if for any reason the door is left unlocked with the lever plate actuated, in the event of an impact due to the closing of the door, the risk of distress and wear of both the latch bolt and the lever plate is reduced, thereby preventing deterioration of the lock and assuring a correct operation of the same.

[0017] These and other features of the invention will become evident in view of the following description.

DESCRIPTION OF THE DRAWINGS

[0018]

Figure 1 is an orthogonal projection view of the assembly of the lock (1) in the unlocked position with the clutch with the ball and socket joint (7) engaging the slotted one-piece body (4), where in the enlarged detail an exploded view of the assembly of the slotted one-piece body (4) is shown, the inner spindle (2) and the outer spindle (3), with the profile of the actuating follower plate (5) shown in black in order to distinguish its position once assembled. An enlarged isometric view of the elements making up the clutch

with the ball and socket joint (7) can also be seen. The hidden details (13a) of the wheel (13), the hidden detail (18a) of the egg-shaped spring housing (18), and a cross-section detail (16a) of the lever plate (16) are furthermore included.

Figure 2 shows an orthogonal projection view of the assembly of the lock (1) in the unlocked position viewed from the back and with the hidden lines of the lever plate (16) and the actuator lever (20) depicted in dotted lines to enable viewing the protrusion (16a) of the lever plate (16) and the protrusion (20a) of the actuator lever (20). The configuration of the egg-shaped spring housing (18) and the spiral spring (19) in contact with the riveted wheel (15b) of the central arm (15) can be seen in the enlarged detail.

Figure 3 shows an orthogonal projection view of the assembly of the lock (1) in the locked position with the hidden lines depicted in dotted lines to enable viewing the different elements linked to the central arm (15) which is highlighted using a thicker line.

Figure 4 shows an orthogonal projection view of the actuator lever (20).

Figure 5 shows an orthogonal projection view of the lever plate (16).

Figure 6 shows a plan view of the slotted one-piece body (4).

Figure 7 shows a profile view of the assembly of the lock (1).

References:

[0019]

1. Assembly of the lock
2. Inner spindle
 - 2a. End of the inner spindle (2)
 - 2b. Alignment mark
3. Outer spindle
 - 3a. Alignment mark
4. Slotted one-piece body
 - 4a. Slot
 - 4b. Recess
5. Actuating follower plate
 - 5a. Window
 - 5b. Linking end
 - 5c. Operating blade
6. Ball and socket joint
7. Clutch with the ball and socket joint
8. Spring rod
9. Ball and socket joint hole
10. Clutch end
11. Chassis

- 12. Blocking bar
- 13. Wheel
 - 13a. Hidden detail of wheel (13)
- 14. Latch bolt
 - 14a. Active ends
 - 14b. Body of the latch bolt
 - 14c. Flat edge
- 15. Central arm
 - 15a. Guiding cavity
 - 15b. Riveted wheel
- 16. Lever plate
 - 16a. Protrusion of lever plate (16)
 - 16b. Cross-section
- 17. Guard
 - 17a. Stem
- 18. Egg-shaped spring housing
 - 18a. Hidden detail of egg-shaped spring housing (18)
- 19. Spiral spring
 - 19a. Fixed short arm
- 20. Actuator lever
 - 20a. Protrusion of the actuator lever (20)
- 21. Set screw
- 22. Trigger
- 23. Riveted shaft

DETAILED DISCLOSURE OF THE INVENTION

[0020] In the attached figures an automatic panic lock 1 according to a preferred embodiment of the invention is shown. Said lock 1 is of the type of locks having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle 2 and can only be unlocked with the outer spindle 3 when the clutch is in the suitable position. In the preferred embodiment of the invention, the lock 1 comprises a follower being formed by a slotted one-piece body 4 housing an actuating follower plate 5 in a slot 4a of said slotted one-piece body 4, the inner spindle (2) being permanently attached to a window 5a of the actuating follower plate 5 with its end 2a. The outer spindle 3 in turn is linked to the actuating follower plate 5 only when the clutch end 10 engages the slotted one-piece body 4 with a linking end 5b of the actuating follower plate 5.

[0021] As observed in the enlarged detail of Figure 1, using a single slotted one-piece body 4, surrounding therein an actuating follower plate 5, a greater strength resistance and a larger friction surface are achieved, whereby reducing wear and thereby prolonging the service life of the lock 1 and increasing user safety.

[0022] Being the slotted one-piece body 4 unengaged, only the inner spindle 2 rotates the actuating follower plate 5, which is connected to the inner spindle 2 by means of its end 2a. In this case, the outer spindle 3 does not drive the actuating follower plate 5 during its rotation, so the door only unlocks from the inside and not from the outside. Rotating the inner spindle 2 it rotates the actuating follower plate 5 which with its operating

blade 5c acts on a central arm 15 allowing the unlocking of the door.

[0023] On the contrary, if the slotted one-piece body 4 is engaged the clutch end 10 is located in the recess 4b, shown in Figure 6, of the slotted one-piece body 4. In this way, the outer spindle 3 is linked with the actuating follower plate 5, since the clutch end 10 engages the slotted one-piece body 4 with the linking end 5b of the actuating follower plate 5. Consequently, upon rotating the outer spindle 3 it rotates the actuating follower plate 5 which in turn acts on the central arm 15, allowing the unlocking of the door.

[0024] As a result of this configuration, user privacy is achieved, allowing only the unlocking of the door from the inside and from the outside only when needed, and achieving this with a single slotted one-piece body 4 that does not need to adjust the linkage of the stops between several elements, and therefore the strength resistance is greater. On the other hand, since it is a single body, it is a more rigid with a larger friction surface and thus less wear, thereby complying with the strict controls of up to 200.000 life cycles.

[0025] As seen in the enlarged view of Figure 1, the elements making up the clutch with the ball and socket joint 7 comprise a clutch end 10 and a ball and socket joint 6 which is linked to the spring rod 8. As a result of this configuration, the spring rod 8, which is housed inside the ball and socket joint 6 through the ball and socket joint hole 9, is subjected to less friction since the rotation of the spring rod 8 is carried out in the ball and socket joint 6. As a result of its angular clearance, it absorbs stresses and prevents breaking due to bending of the spring rod 8. In this way, the service life of the clutch is prolonged and therefore the user safety is increased.

[0026] Figure 2 and the hidden detail 13a of Figure 1 show the existence of a wheel 13 anchored to the chassis 11 of the lock 1. Said wheel 13 cooperates with the body of the latch bolt 14b, on its flat edge 14c, in the movement of the latch bolt 14 during the locking of the door, maintaining the latch bolt 14 in its operational line during sliding, thereby preventing the unwanted rotational pitching or interference with the blocking bar 12. Incorrect locking of the lock 1 or the unwanted activation of the blocking bar 12 are thereby prevented, generating less wear and thereby providing greater security for the lock.

[0027] As seen in Figure 3, the central arm 15 is linked by means of a guiding cavity 15a to the guard 17 through a stem 17a, and positioned in sliding contact with a lever plate 16 through a riveted wheel 15b). The chassis 11 comprises a riveted shaft 23 through which the central arm 15 and an actuator lever 20 are joined, rotating both with respect to said riveted shaft 23. The actuator lever 20 comprises a protrusion 20a disposed close to a protrusion 16a comprised in the lever plate 16, as shown in Figures 2, 3, 4, and 5. When the protrusion 16a of the lever plate 16 collides the protrusion 20a of the actuator lever 20 the blocking bar 12 is removed, allowing the unlocking of the door. This configuration, which keeps all

the elements linked together, prevents allowances and prolongs the service life of the lock 1.

[0028] In the hidden detail 18a of the egg-shaped spring housing 18 shown in Figure 1 and in Figures 2, 3, and 5, it can be seen that the lever plate 16 comprises the egg-shaped spring housing 18 with an egg-shaped perimetric configuration in the form of a teardrop and is able to receive the spiral of the spiral spring 19 in its larger egg-shaped part and the fixed short arm 19a of the spiral spring 19 in its smaller egg-shaped part, as can be seen in the enlarged detail of Figure 2. In this way, the spiral spring 19 keeps the lever plate 16 in the correct position by means of the movable long arm 19b of the spiral spring 19, the fixed short arm 19a and the spiral spring 19 remaining inside the egg-shaped spring housing 18 of the lever plate 16, thus simplifying the mechanism due to it is not necessary to use additional elements, so that it is possible to prolong the service life of the lock 1 as they avoid connection problems that could generate the use of a larger number of fixing elements.

[0029] In the enlarged detail of the slotted one-piece body 4 of Figure 1, it can be seen how the inner spindle 2 and the outer spindle 3 are linked by means of a set screw 21. The set screw 21 is tightened as much as possible, attaching the inner spindle 2 and the outer spindle 3. Then the inner spindle 2 or the outer spindle 3 is loosened an angle, in the order of 180°, generating a gap between both spindles 2 and 3. In this position, a mark 2b is made on the inner spindle 2 and another mark 3a is made on the outer spindle 3, both marks 2b and 3a being disposed on an aligned face of each inner spindle 2 and outer spindle 3. The mark 2b of the inner spindle 2 and the mark 3a of the outer spindle 3 are thereby aligned.

[0030] In the future assembly of the inner spindle 2 and the outer spindle 3, if the faces with the marks 2b and 3a are aligned, once the set screw 21 is tightened, a gap will be available between the inner spindle 2 and the outer spindle 3 so that the outer spindle 3 can rotate without driving the inner spindle 2, which would drive the actuating follower plate 5, unlocking the door. This configuration allows, upon rotating the outer spindle 3 from the outside, the actuating follower plate 5 to not be rotated if the lock is not engaged, thereby achieving the desired user privacy function by using to that end a single slotted one-piece body 4.

[0031] Finally, as can be seen in the cross-section 16b of Figure 1 and in the profile view of Figure 7, another feature of the invention is that the lever plate 16 comprises a cross-section 16b having a profile configuration of thickness greater than the width of the latch bolt 14. Therefore, if due to an oversight or due to cleaning the door is left unlocked with the lever plate 16 outside of the lock 1, upon impact of the door, the active ends 14a of the latch bolt 14 are not reached, thus avoiding wear and deterioration of the latch bolt 14, and thus assuring the correct operation of the lock 1.

Claims

1. Automatic panic lock comprising an inner spindle (2) and an outer spindle (3), the lock (1) being of the type having a spring-loaded automatic locking, and which can always be unlocked with the inner spindle (2) and can only be unlocked with the outer spindle (3) when a clutch end (10) is in a certain position, **characterised in that** the lock (1) comprises a follower formed by a slotted one-piece body (4) housing an actuating follower plate (5) in a slot (4a), the inner spindle (2) being permanently attached to the window (5a) of the actuating follower plate (5) with its end (2a), and the outer spindle (3) being linked to the actuating follower plate (5) only when the clutch end (10) catters the slotted one-piece body (4) with a linking end (5b) of the actuating follower plate (5).
2. Automatic panic lock according to claim 1, incorporating the clutch end (10) and a ball and socket joint (6) which is linked to a spring rod (8).
3. Automatic panic lock according to claim 1 or 2, wherein in the body of the latch bolt (14b) there is a flat edge (14c) on which a wheel (13) anchored to the chassis (11) is disposed.
4. Automatic panic lock according to any of the preceding claims, comprising a central arm (15) comprising a guiding cavity (15a) cooperating with a stem (17a) of the guard (17), said central arm (15) cooperating with a riveted wheel (15b) which is in sliding contact with a lever plate (16).
5. Automatic panic lock according to claim 4, wherein the central arm (15) is joined to the chassis (11) of the lock (1) through a riveted shaft (23), an actuator lever (20) comprising a protrusion (20a) which is disposed close to a protrusion (16a) of the lever plate (16), being also joined to the riveted shaft (23).
6. Automatic panic lock according to claim 4 or 5, wherein the lever plate (16) comprises an egg-shaped spring housing (18) with an egg-shaped perimetric configuration in the form of a teardrop which in its larger egg-shaped part comprises a size that is slightly greater than the circular section of the cylinder of a spiral spring (19) and which in its smaller egg-shaped part comprises a size slightly larger than the fixed short arm (19a) of the spiral spring (19).
7. Automatic panic lock according to any of claims 4 to 6, wherein the lever plate (16) comprises a cross-section (16b) of the with a profile configuration of thickness greater than the width of the latch bolt (14).
8. Automatic panic lock according to any of the preceding claims, wherein the inner spindle (2) and the outer

spindle (3) are linked by means of a set screw (21) with a rotating clearance in the order of 180° , with respect to the thread pitch of said set screw (21), and the facing ends of both the inner spindle (2) and outer spindle (3) comprising respective alignment marks (2b) and (3a). 5

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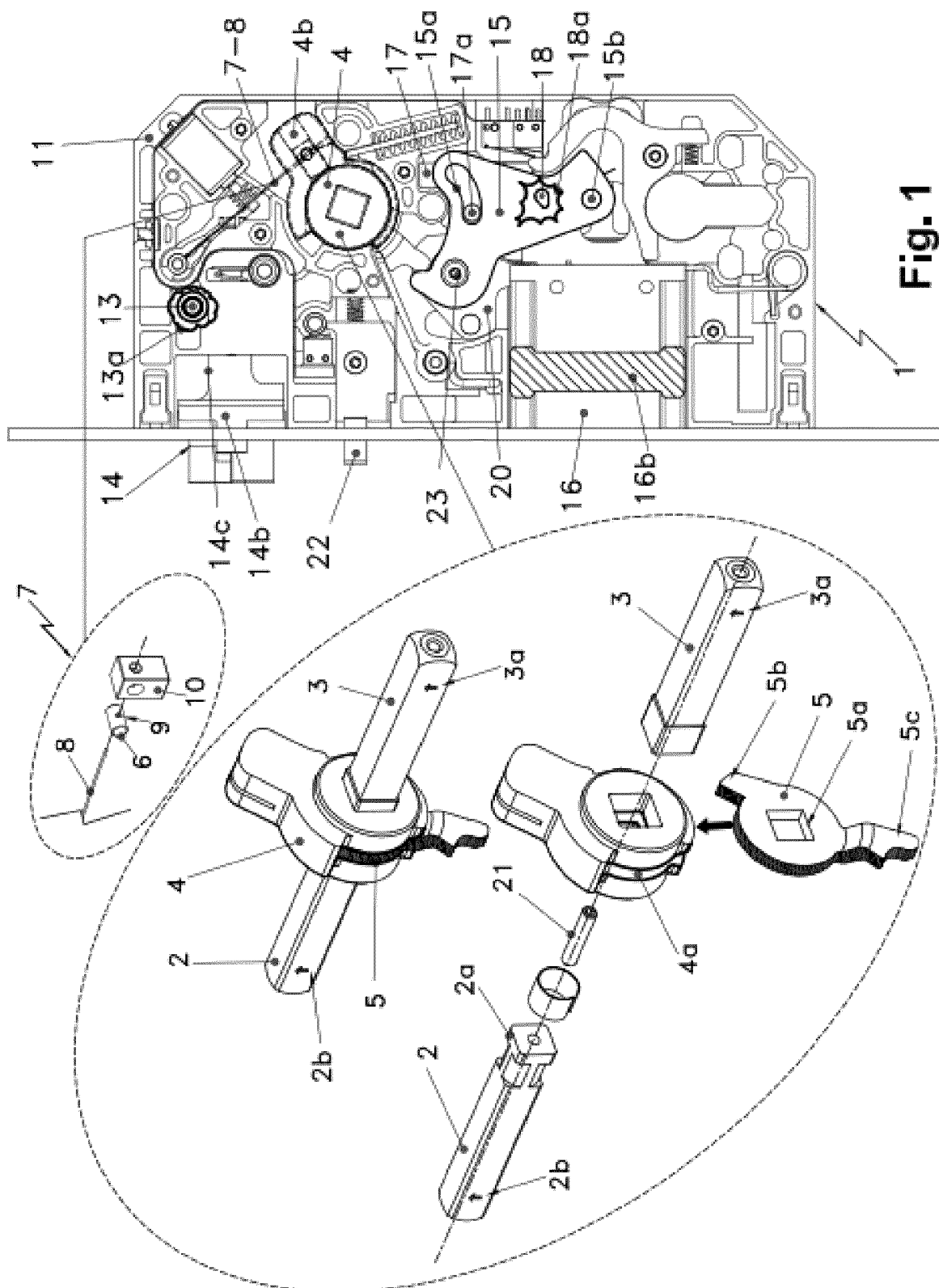


Fig. 1

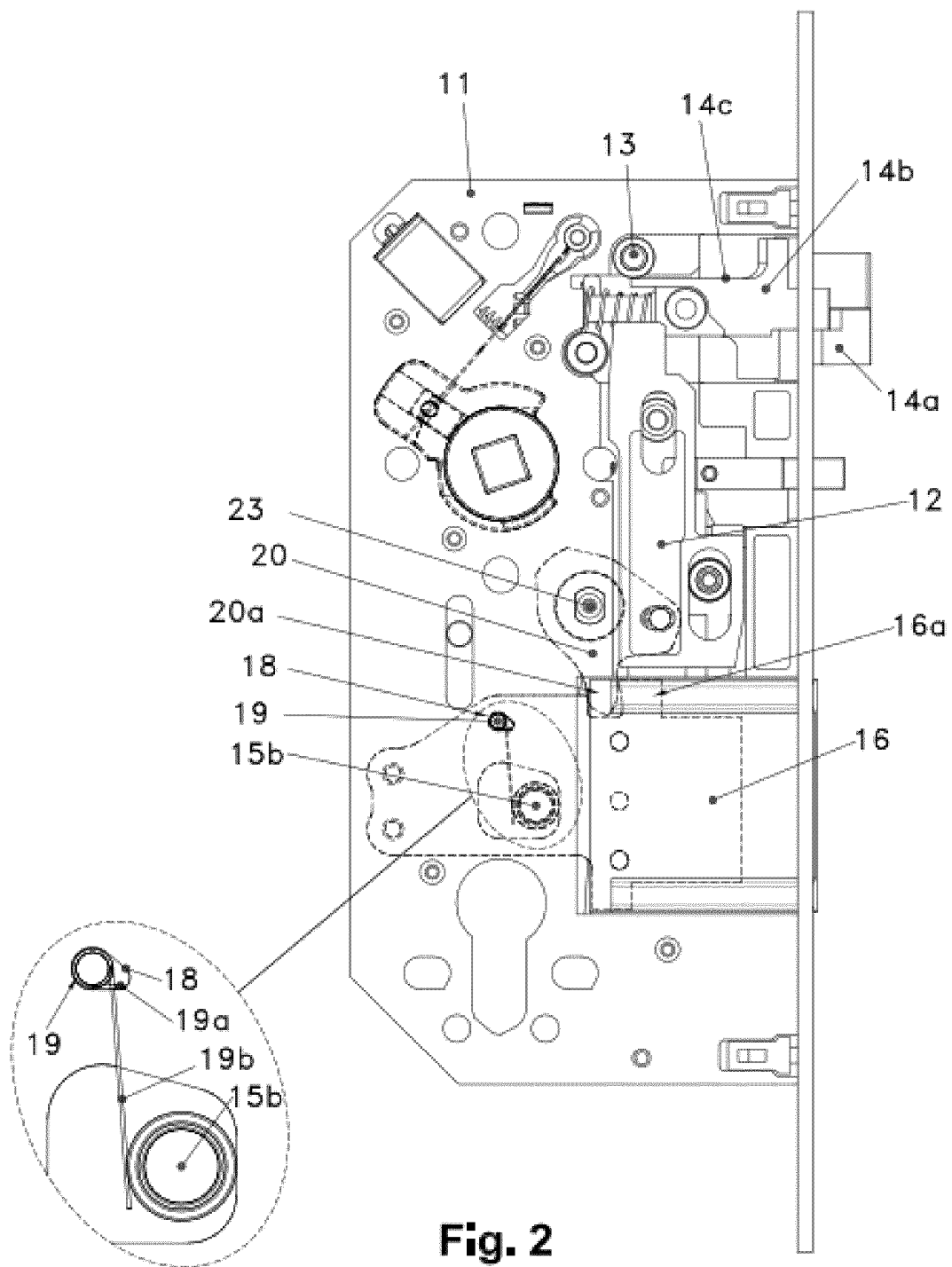


Fig. 2

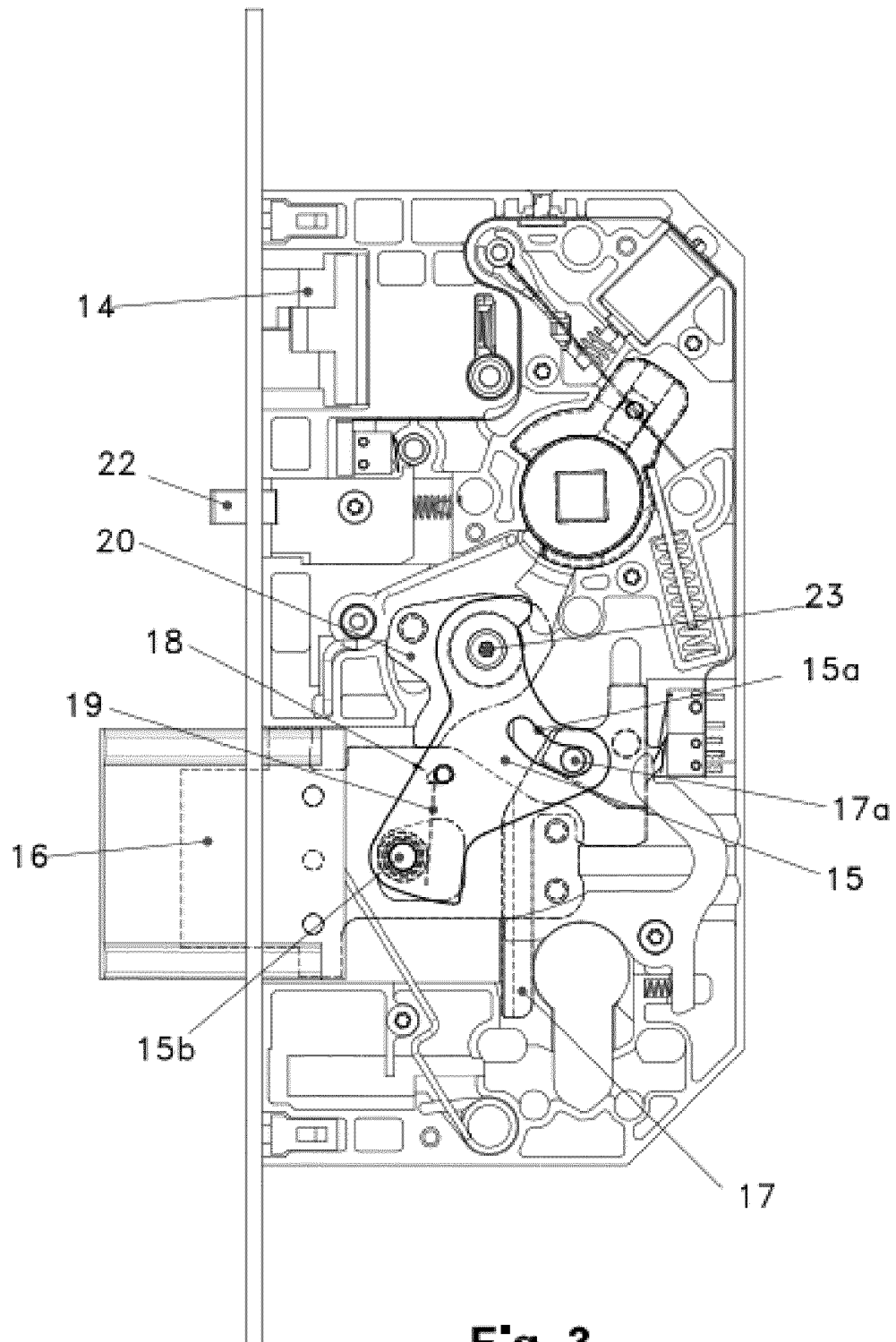


Fig. 3

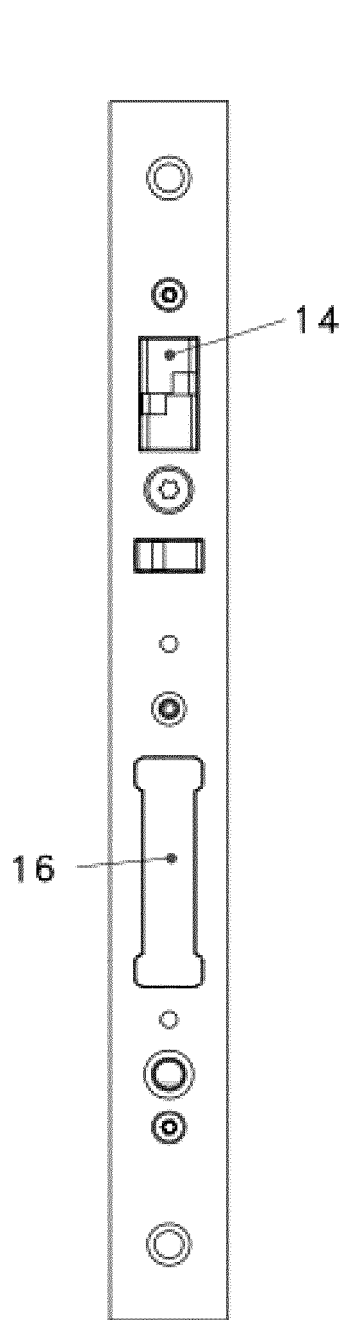


Fig. 7

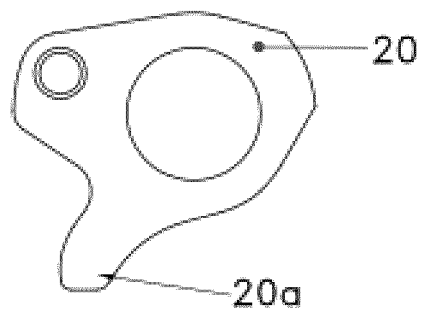


Fig. 4

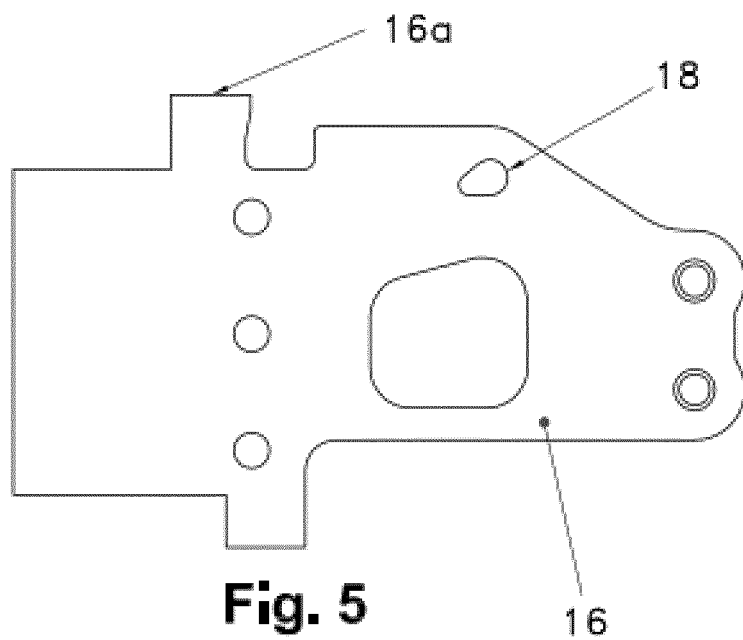


Fig. 5

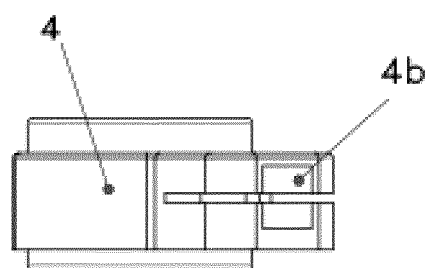


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 8 292 336 B2 (MOON CHARLES W [US]; TOWNSTEEL INC [US]) 23 October 2012 (2012-10-23) * column 10, line 28 - column 12, line 16 * * * column 13, line 10 - line 45 * * figures 5-20 *	1-8	INV. E05B47/06 E05B63/16 E05B63/20 E05B65/10 E05B15/00
A	EP 1 130 195 A2 (ESCUDOS KALA INTERNAC S L [ES]) 5 September 2001 (2001-09-05) * paragraph [0036] - paragraph [0067] * * figures 1-9 *	1-8	ADD. E05B59/00 E05B15/10 E05B17/00 E05B15/04
A	EP 1 353 028 A1 (CERRAJERA IND [ES]) 15 October 2003 (2003-10-15) * paragraph [0012] - paragraph [0019] * * figures 1-13 *	1-8	
A	EP 1 672 153 A1 (ROTO FRANK AG [DE]) 21 June 2006 (2006-06-21) * paragraph [0015] - paragraph [0039] * * figures 5a-6b *	1-8	TECHNICAL FIELDS SEARCHED (IPC) E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 June 2018	Examiner Antonov, Ventseslav
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 38 2219

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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06-06-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8292336 B2	23-10-2012	US 2010263418 A1	21-10-2010
		US 2012198896 A1	09-08-2012
EP 1130195 A2	05-09-2001	AT 308653 T	15-11-2005
		DE 60114487 D1	08-12-2005
		DE 60114487 T2	20-07-2006
		DK 1130195 T3	06-03-2006
		EP 1130195 A2	05-09-2001
		ES 2193793 A1	01-11-2003
		US 2001018837 A1	06-09-2001
EP 1353028 A1	15-10-2003	EP 1353028 A1	15-10-2003
		ES 2211277 A1	01-07-2004
EP 1672153 A1	21-06-2006	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- ES 2498892 A2 [0003]