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(54) Safety lock with dual control of the latch and antipanic function

(57) Comprises the following elements:

- A latch assembly (3) that comprises a beveled end (6) with a prismatic extension (7), joined onto an auxiliary part (13) on the upper wing (15), leaving the assembly pressed by a latch spring (17) that stops on a tab (18).
- A shutter assembly (4) that comprises a shutter (19) and a balancing beam (28) capable of introducing itself in front of the lower wing (15).
- A bolt assembly (5) that comprises a lever (30) that can be blocked by a flange (32) of an oscillating stump (33).

The antipanic function is initiated by turning a follower plate (39) whose finger (40) initially lifts an oscillating blockage (45) to remove the latch assembly (3) afterwards, while simultaneously, a catch hook (42), articulated on a follower plate (39), lifts the oscillating stump (33) to remove the lever (30) afterwards, by turning on a fixed pin (47). Figures 1, 4 and 6.

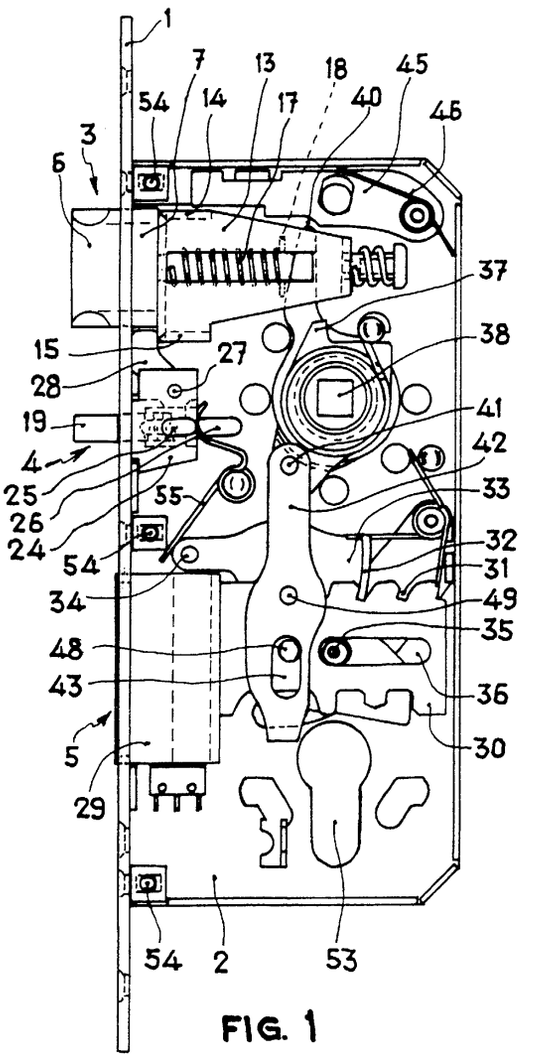

FIG. 1

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Description

[0001] This invention relates to a safety lock that incorporates dual control of the sliding latch, and at the same time uses a mechanism that permits the removal, of both the latch and the lever (or main bolt), with a simple continuous movement.

[0002] Its application field is in that of locks of high safety, installed in places of public access, where an antipanic mechanism is obligatory, although it can obviously be used for private purposes, by simply removing the obligatory antipanic bar and activating the mechanism directly with a handle, through the follower.

[0003] Devices with dual control of the sliding latch are known in the prior art, for example that disclosed in the document ES 2 048 616 of the same applicant, in which it is designed that the beveled part of the latch, ends in a prismatic extension that is immobilized by the frame when it goes into it, making the latch jump as a consequence of freeing a balance beam that restrains it, when a shutter, which is activated while closing the door, pulls on it. In this way, the possibility of opening the latch by illicit means, such as plastic or similar cards, introducing them between the frame and the door in order to move the latch backwards, is avoided. For greater safety, a rocking blockage is available that prevents, by blockage, the removal of the latch, even if considerable strength is placed on it.

[0004] In the previously disclosed device, the shutter is comprised by a part in shape of a "U", with its base towards the outside and, set out between the branches of the "U", there is a rocking balance beam on a shaft, whose ends slide in various grooves provided on the lid and on the body of the lock.

[0005] It has been proved that such a solution has some inconveniences, such as the fact that the oscillation shaft of the balance beam is situated as the extension of the shutter, thus limiting the length of the latter, and could cause bad functioning of the lock, when the space between the door and the frame is large.

[0006] To solve this problem, a new lock has been developed, in which the shutter, of considerable length, is guided through the grooves on the body and on the lid of the lock, by means of two long extensions placed at its same level, and when the shaft of the balance beam has turned towards the latch, determining a more favourable geometry from the point of view of the frame-door free movement space, the result is that the mechanism is less affected by the variations in the dimensions (manufacturing tolerance) of the different parts. This construction has permitted the removal of one of the branches of the balance beam, as used in the prior art, which, together with the shortening of the blockage of the latch, has made more space available for a plurality of detents, that are used to hold the protection shields.

[0007] On the other hand, the improvement of the safety means of the actual lock implies a risk in case a flood of people is produced in places of public use, not being sufficient with the fact that the door opens towards the outside. It is very appropriate that, in these situations, the door can be quickly opened by means of a simple operation of an interior element, such as a horizontal bar or the actual handle, pulling the follower of the lock. These devices, known as antipanic, are provided for in the different legislations, and consequently, an antipanic mechanism has been incorporated in the lock of this invention, that was not available in the lock disclosed in ES 2 048 616.

[0008] The incorporated antipanic mechanism consists of a follower plate that, dragged by the follower, is introduced into an auxiliary part of the latch, removing it when the blockage, which stops it from sliding towards the inside of the door, has been removed. The lever (or main bolt) of the lock is of a conventional type, presenting a plurality of entrances that permit the blockage with the flange of an oscillating guard, which can be removed by activating a cylinder with a key, as is well known in the sector. Well then, in order achieve the removal of the stump from its blockage position, and the movement of the lever towards the inside of the lock, an articulated catch hook has been provided on the follower plate, which has a longitudinal groove, where a soldered and mobile stump of the lever, moves, together with a pusher, with the aim of covering the perimeter of the stump, that for these purposes, has a boss and an adjacent entrance. In this way, when the catch hook is dragged by the turning of the follower plate, it touches a fixed stop, which causes, apart from a displacement, a rotating movement with respect to its articulation on the follower plate, causing the dragging of the guard of the lever, which is moved, in this way, towards the inside of the lock. So that this movement is possible, it is necessary that, at the beginning of the movement of the catch hook, the pusher has run around the boss of the stump, resulting in the removal of its transfixing flange from its corresponding notch on the lever, and consequently, making its movement possible. At the end of the run of the catch hook, it must be possible for the lever to remain transfixed, so that the pusher of the catch hook, fixes itself into the entrance of the stump, allowing the latter to fall and the introduction of its flange into the corresponding notch of the lever.

[0009] The lock, object of this invention, offers considerable advantages such as:

- A Latch that, apart from its automatic function due to its beveled end, presents double safety, by means of a blockage of the oscillating (or knocking) movement, and by means of introducing into the frame, a prismatic extension that is not beveled.
- An improved shutter of the latch, unaffected to a great extent by the tolerance of the different parts involved, admitting an important space for free movement, between the frame and the door.
- A simple and liable antipanic mechanism that per-

mits the movement, with a small turn of the follower, of both the latch and the bolt, removing previously, at the beginning of the movement, the transfixes that prevent the movement of both the latch and the lever of the lock.

[0010] To compliment the preceding description, and with the aim of helping in a better comprehension of the characteristics of the invention, a detailed description of a preferred embodiment, based on a set of drawings that are attached to this specification and where, for purely orientation and non restrictive purposes, the following has been represented:

Figure 1 shows a schematic view of the lock, with the door open and the bolt removed.
Figure 2 is a front view of the lock.
Figure 3 shows a schematic view of the lock, with the door closed and the bolt removed.
Figure 4 shows a schematic view of the lock, with the door closed and the bolt turned, after being activated with the key.
Figure 5 shows a schematic view of the lock, for a turn of 10° of the follower, during the antipanic mechanism operation.
Figure 6 shows a schematic view of the lock, for a turn of 26° of the follower, at the end of the antipanic mechanism operation.
Figure 7 shows a perspective view of the lock.
Figure 8 shows the latch assembly, by parts.
Figure 9 shows the shutter assembly, by parts.
Figure 10 shows a perspective view of the stump.
Figure 11 shows a perspective view of the follower.
Figure 12 shows a perspective view of the blockage latch.
Figure 13 shows a perspective view of the follower plate.

[0011] In these figures, the numeric references correspond to the following parts and elements:

1. Front
2. Body
3. Latch assembly
4. Shutter assembly
5. Bolt assembly
6. Beveled end
7. Prismatic extension
8. Latch rod
9. Threaded rivet of latch
10. Latch screw
11. First auxiliary spring
12. Auxiliary holes
13. Auxiliary part
14. Upper wing
15. Lower wing
16. Back wing
17. Latch spring
18. Tab
19. Shutter
20. Shutter rod
21. Threaded rivet of shutter
22. Shutter screw
23. Second auxiliary spring
24. Shutter body
25. Guides
26. Grooves
27. Balance beam shaft
28. Balance beam
29. Bolt
30. Lever
31. Notches
32. Flange
33. Stump
34. Stump shaft
35. Crank journal
36. Vent
37. Follower
38. Square bar
39. Follower plate
40. Finger
41. Hole for dragging
42. Catch hook
43. Opening
44. Frame
45. Oscillating blockage
46. Blockage spring
47. Pin
48. Guard
49. Pusher
50. Boss
51. Stump spring
52. Entrance
53. Cylinder case
54. Detents
55. Shutter spring

[0012] As can be seen in Figures 1 and 2, the lock object of this invention, consists of a front (1) and a body (2), planes, which are used to fix on them, the different parts and assemblies that comprise them.

[0013] Therefore, on the top part of the lock there is a latch assembly (3) and a shutter assembly (4) of the latch, while on the bottom part there is a bolt assembly (5).

[0014] The latch assembly (3) consists of beveled end (6) that afterwards extends itself into a prismatic extension (7), which ends in a latch rod (8), with a threaded rivet of latch (9) at its end, used to receive a latch screw (10), immobilized by a first auxiliary spring (11). The latch rod (8) is introduced into the auxiliary holes (12) of an auxiliary part (13), made of sheet metal that has an upper wing (14), a lower wing (15) and a back wing (16). A latch spring (17), helicoidal, holds the rod (8), leaning one end on the prismatic extension (7) and the other, on a soldered and mobile tab (18) of the lock body (2). See

figure 8.

[0015] The shutter assembly (4) consists of a shutter (19), beveled, which later extends into a shutter rod (20) that ends in a threaded rivet of shutter (21), used to receive a shutter screw (22), immobilized by a second auxiliary spring (23). On the shutter rod (20), a shutter body (24) is assembled, which has two long guides (25), used to move around in the corresponding grooves (26) of the body (2) and of the front lid (not represented) of the lock. On the shutter body (24), and moved with respect to the shaft of the shutter (19), there is a balance beam shaft (27) on which a balance beam (28) can freely oscillate. See figure 9.

[0016] The bolt assembly (5) consists of a bolt (29) that is extended by a soldered and mobile lever (30), provided with notches (31) in which the flange (32) of a stump (33) moves, articulated on a stump shaft (34), fixed to the body (2) of the lock. The bolt (29) with its lever (30) can move together horizontally, guided by a crank journal (35), fixed, that moves within a vent (36) on the lever (30).

[0017] The antipanic mechanism consists of a follower (37), that has in its center, a square bar (38) used to receive an operational element (not represented), being either a handle or an antipanic bar. Concentric with the follower (37) and dragged by it, is a follower plate (39) that above it, extends into a finger (40), used to release the latch assembly (3), while below it, there is a hole for dragging (41), where a plane catch hook (42), articulates, that has an opening (43), longitudinally, where a guard (48), soldered and mobile with the lever (30), moves.

[0018] While the door is being closed, an automatic release of the latch assembly (3) is produced, which will be described later on. As can be seen in figure 1, before the closure, the latch assembly (3) is partially removed, because, as the shutter (19) is poking out from the front (1), the balance beam (28) is introduced in front of the lower wing (15) of the auxiliary part (13). During the closing process of the door, the frame (44) pushes the shutter (19) which produces the turning of the balance beam (28) and releases the lower wing (15) of the auxiliary part (13), causing the movement of all the latch assembly (3) towards the outside of the front (1), pushed by the latch spring (17), leaving the prismatic extension (7) introduced in the frame (44). In this way, the use of a plastic card between the front (1) and the frame (44) will not allow the removal of the latch assembly (3), that no longer is caught in its beveled end (6). For double safety, the release of the latch assembly (3) allows an oscillating blockage (45) to fall, pushed by a blockage spring (46), in such a way that the upper wing (14) of the auxiliary part (13), which is part of the latch assembly (3), is blocked. See figure 3, where a closed door is represented, shutter (19) drawn back, up to the level of the frame (44), removed balance beam (28) and latch assembly (3) in released position, blocked by the oscillating blockage (45).

[0019] The antipanic mechanism allows the opening of the door by means of a handle or a special bar. In this way, starting from the situation represented in figure 4, that shows the door closed with the latch assembly (3) released and the bolt (29) turned (presumably by a cylinder with key, known by the skilled in the art and not represented), which pulls on the follower (37), causing the dragging of the follower plate (39) in its turning movement, so that, in its initial phase (turn of 10° shown in figure 5), removes the oscillating blockage (45) and begins the removal of the latch assembly (3), by dragging the finger (40) of the follower plate (39) on the back wing (16) of the auxiliary part (13), and at the same time pressing the latch spring (17) against the tab (18), and in a second phase (turn of 26° shown in figure 6), removes the bolt (29), due to the turn of the catch hook (42) against the pin (47), causing the dragging of the guard (48), joined to the lever (30) by the sides of the opening (43) of the catch hook (42). Obviously, so that the movement of the lever (30) can take place, it is necessary that the stump (33) be lifted previously, which is achieved by the movement of the pusher (49) onto the boss (50), that the stump (33) presents, as shown in figure 5. Once the bolt (29) has been removed, the lever (30) is again blocked by the flange (32) of the stump (33), which falls, pushed by the stump spring (51) when the pusher (49) remains in an entrance (52) that the stump presents, as represented in figure 6.

[0020] Leaving the lock with the latch and bolt removed, at the disposal of being opened.

[0021] In the interest of a better clarification of the description and the drawings, omission has been made to the representation of the different known elements, even though they are necessary to operate the locks, they are not directly related to the object of this invention. Furthermore, a cylinder with key for the normal operation of the bolt has been omitted, although a cylinder case (53) can be seen in the figures. Likewise, three detents (54) have been represented for holding of the known shield protections on the sides, but nothing would stop these detents from being in different positions, from being available in different amounts, or from being presented, instead of in the cubic shape, in any other design, known by those skilled in the art.

Claims

1. Safety lock with dual control of latch and antipanic function, **characterized in that** it comprises:

   - A latch assembly (3) that consists of a beveled end (6) that afterwards extends itself into a prismatic extension (7), ending in a latch rod (8) on which is fixed, a soldered and mobile auxiliary part (13), that has an upper wing (14), a lower wing (15) and a back wing (16), leaving the prismatic extension (7) pressed by a latch spring,

(17) which stops at a fixed tab (18).

- A shutter assembly (4) that comprises a shutter (19), which is beveled, joined to a shutter body (24), provided with guides (25), that move in fixed grooves (26), assembled and articulated on the shutter body (24) is a balance beam (28) capable of being introduced between the prismatic extension (7) and the lower wing (15) of the auxiliary part (13), with the aim of holding back the jump of the latch assembly (3), pushed by the latch spring (17).
- A bolt assembly (5) that comprises a bolt (29) joined onto a lever (30), capable of moving itself horizontally, being able to block the lever (30) in various positions, by introducing a flange (32) with an oscillating stump (33), on some of its notches (31), which are on the lever (30), for this purpose.
- An antipanic mechanism that consists of a follower (37), capable of dragging a follower plate (39), with a finger (40) and a hole for dragging (41), so that the finger (40) initially lifts the oscillating blockage (45) by means of a shutter spring (55), in order to remove the latch assembly (3) afterwards, by pushing the back wing (16) of the auxiliary part (13) against the movement of the latch spring (17) while simultaneously, a catch hook (42) articulated on the hole for dragging (41), is moved by lifting the stump (33) with a pusher (49) until it touches a fixed pin (47), moment where the turn of the catch hook (42) causes the removal of the lever (30) and of the bolt (29) associated to it, by the dragging of a guard (48) joined to the lever (30) by the sides of an opening (43) on the catch hook (42).

2. Safety lock with dual control of the latch and antipanic function, according to claim 1, **characterized in that** the horizontal movement of the lever (30) is achieved by a fixed crank journal (35) that moves within a vent (36) on the lever (30).

3. Safety lock with dual control of the latch and antipanic function according to claim 1, **characterized in that** the auxiliary part (13) is soldered and mobile on the latch rod (8) with a latch screw (10), immobilized with a first auxiliary spring (11).

4. Safety lock with dual control of the latch and antipanic function according to claim 1, **characterized in that** the oscillating blockage (45) that blocks the upper wing (14) of the auxiliary part (13) of the latch assembly (3), is pushed towards its blocking position by a blockage spring (46).

5. Safety lock with dual control of the latch and antipanic function, according to claim 1, **characterized in that** the balancing beam (28) of the shutter assembly (4) is assembled, articulated on a balance beam shaft (27) available outside the plane defined by the shutter (19) and the guides (25).

6. Safety lock with dual control of the latch and antipanic function, according to claim 1, **characterized in that** during the antipanic operation, the pusher (49) of the catch hook (42), firstly pulls on a boss (50) of the stump (33) to unblock the lever (30) and at the end of the maneuver, it introduces itself into an entrance (52) on the stump (33), thus allowing it to pass onto the blocking position of the lever (30), when pushed by a stump spring (51), until the flange (32) is introduced in the corresponding notch (31) of the lever (30).

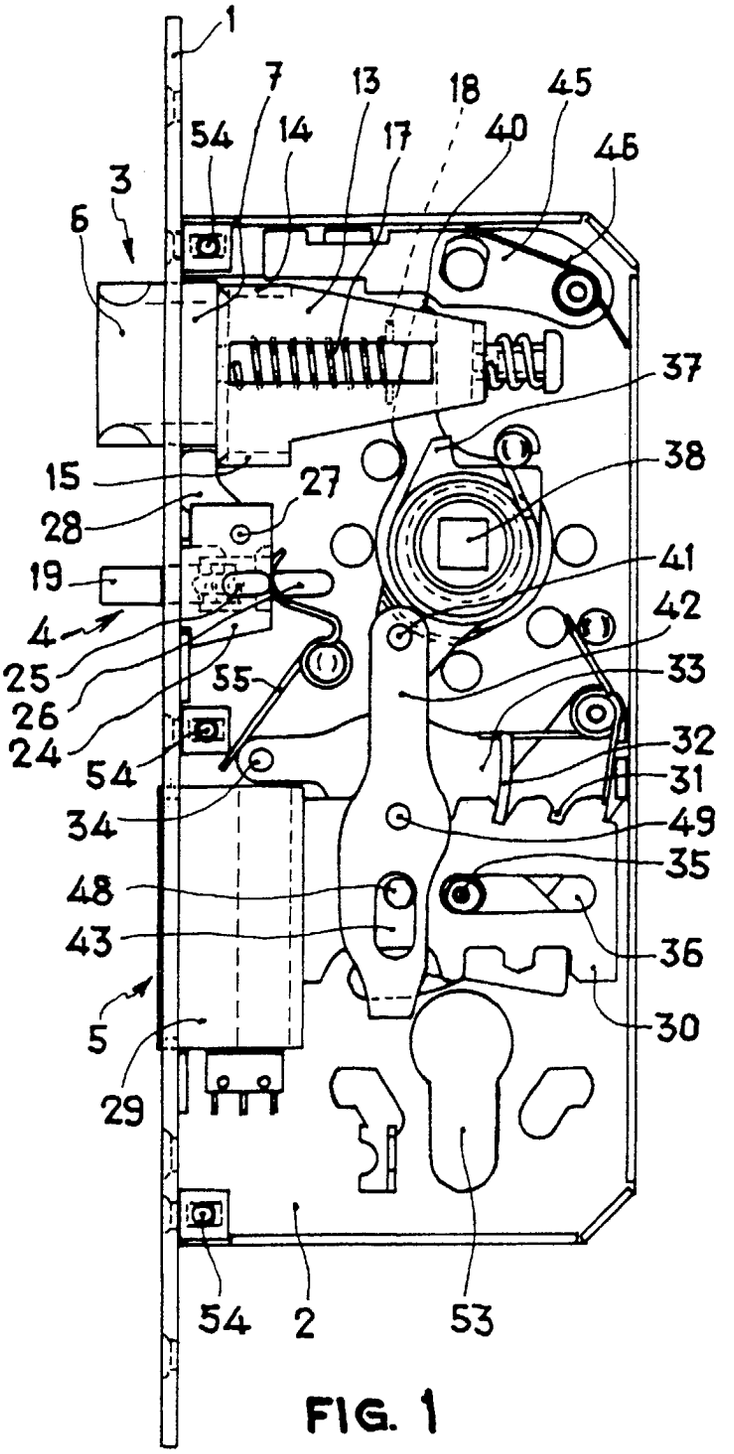
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FIG. 1

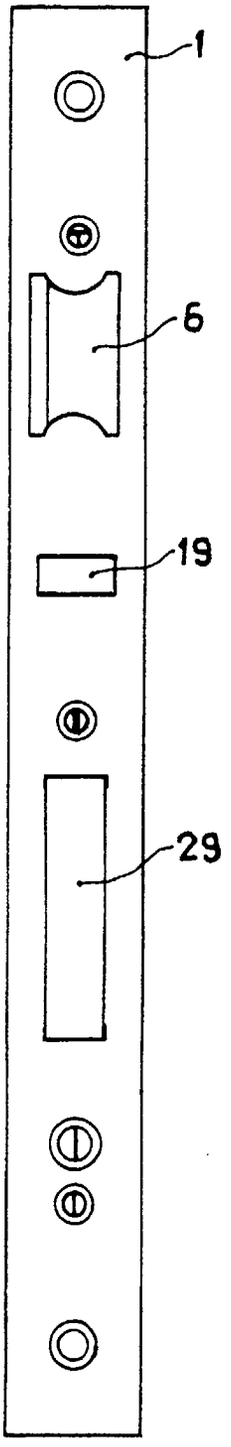
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FIG. 2

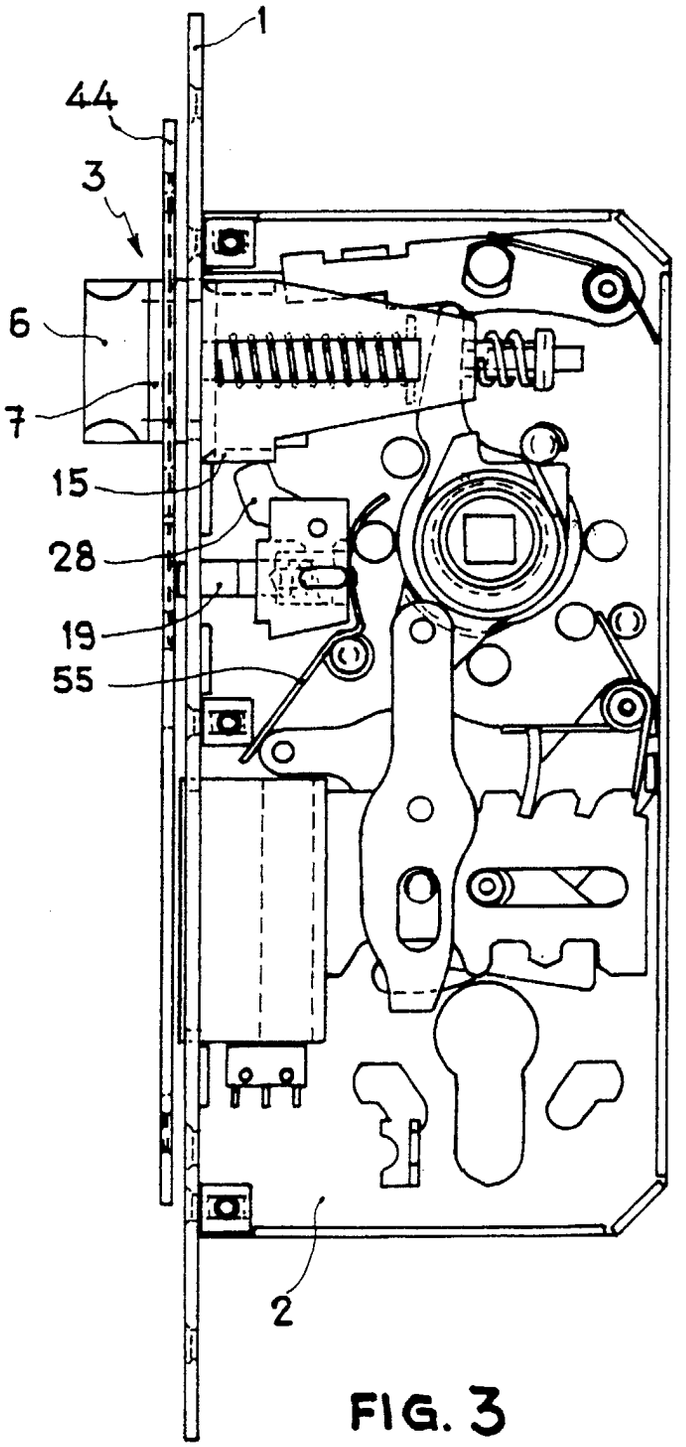

FIG. 3

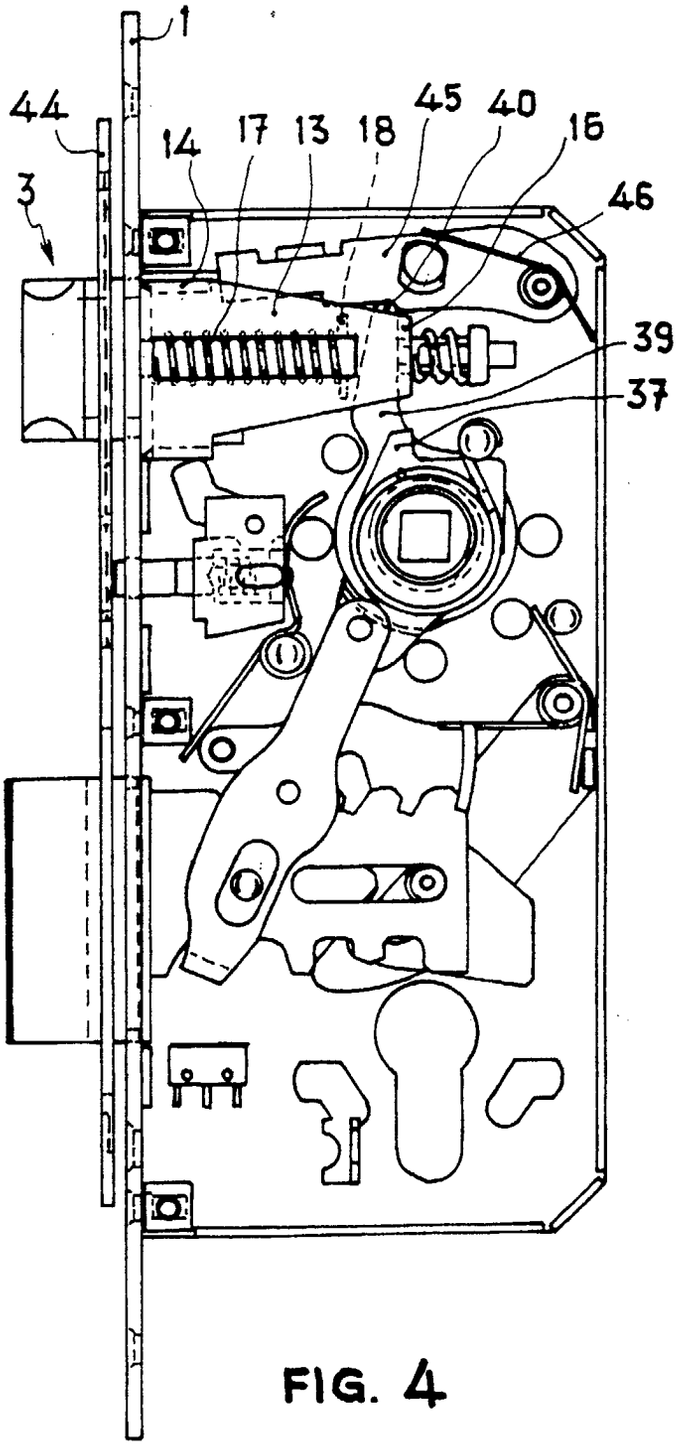

FIG. 4

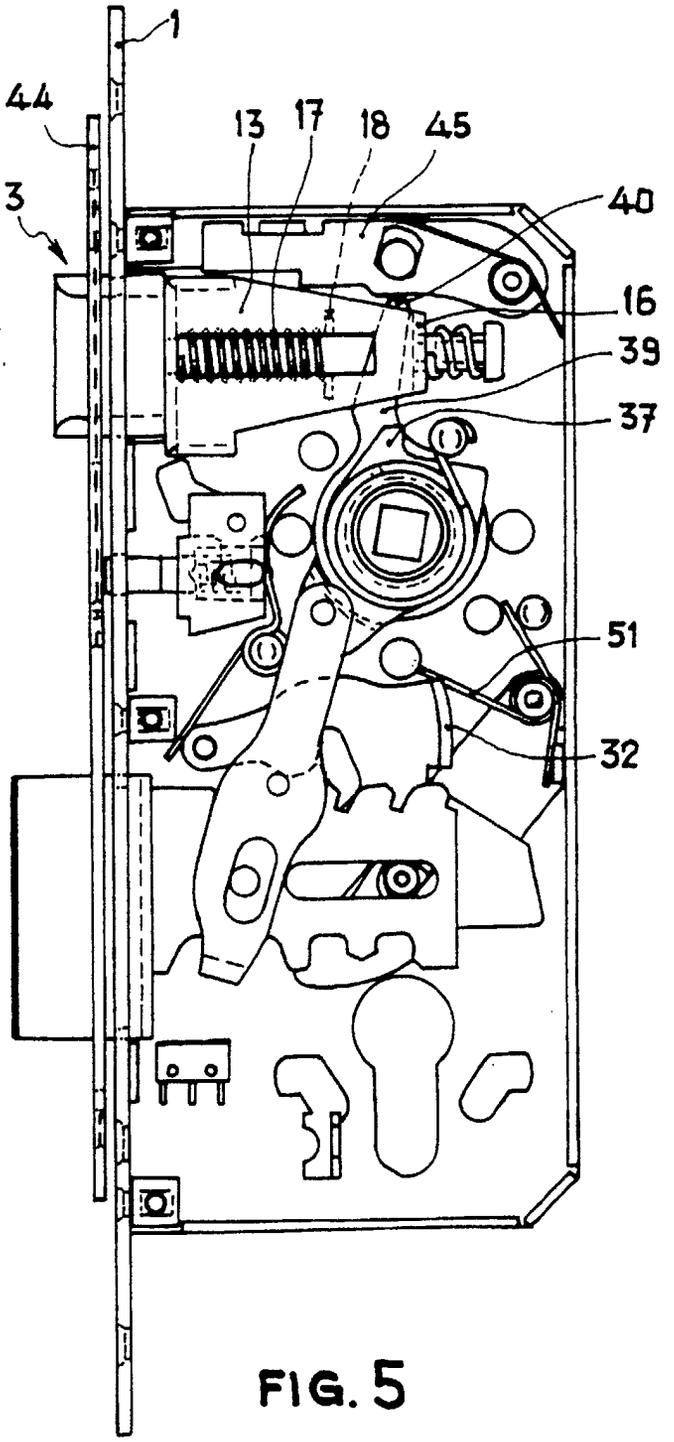

FIG. 5

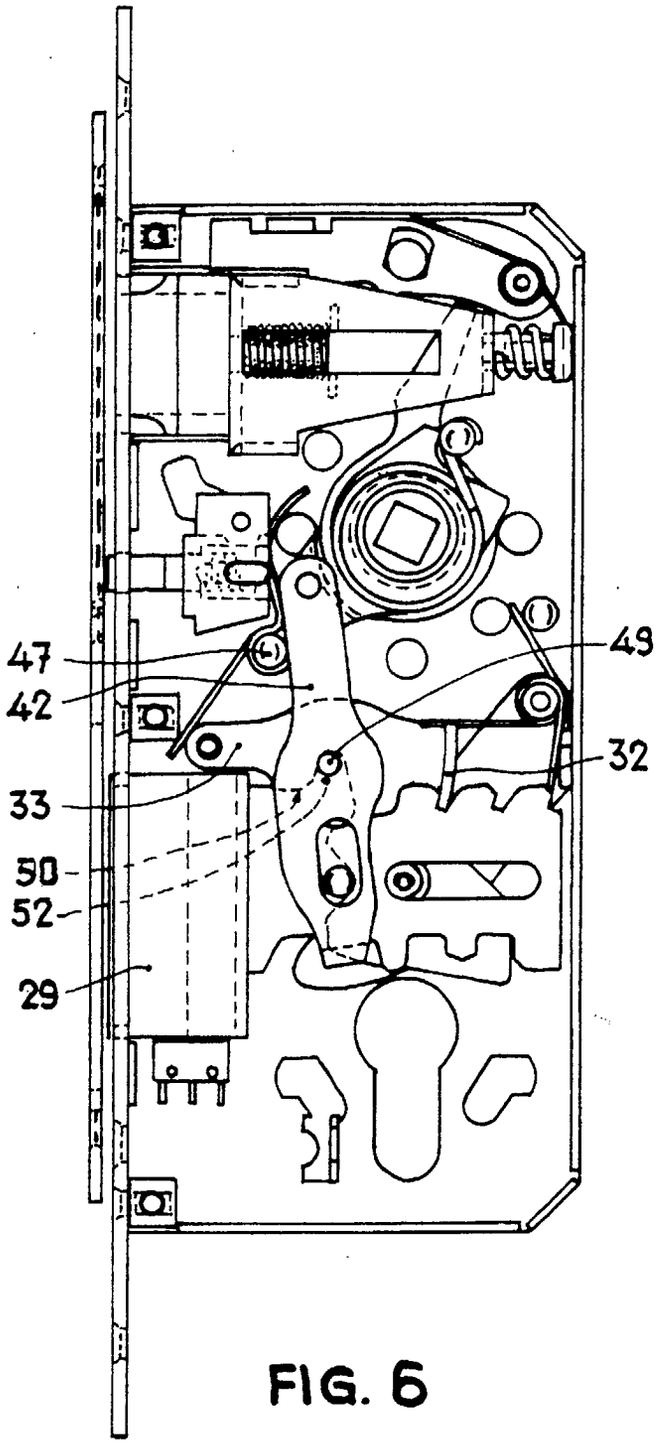

FIG. 6

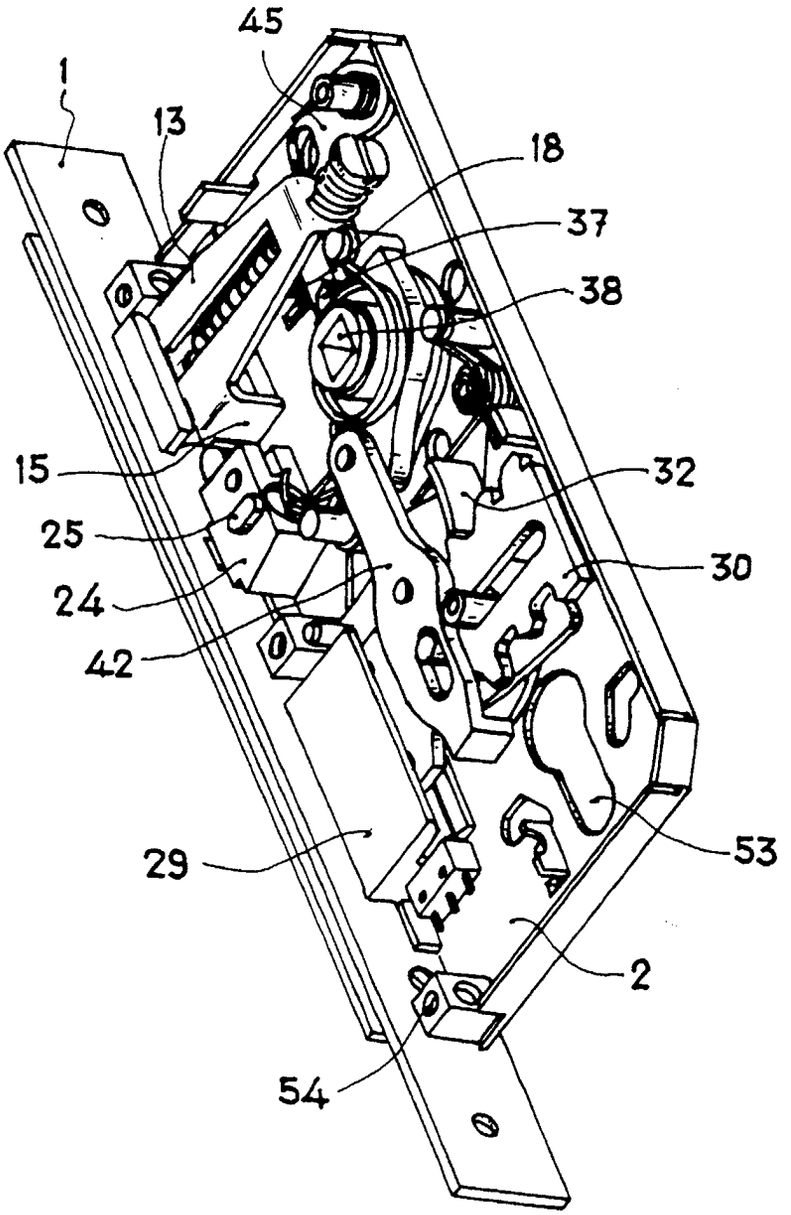

FIG. 7

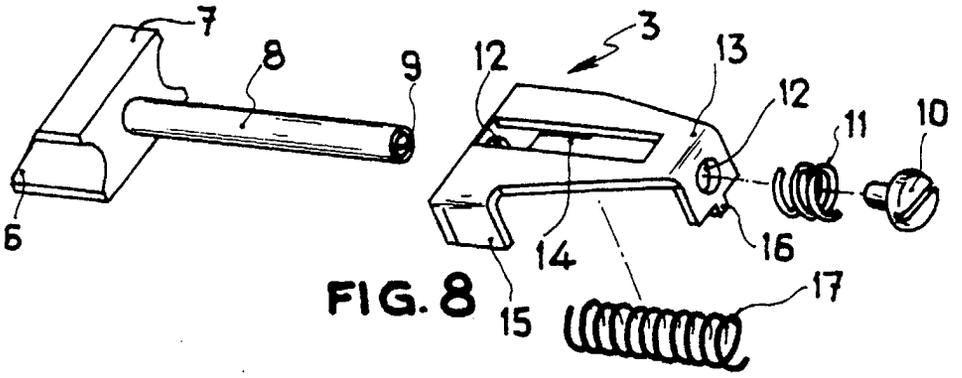

FIG. 8

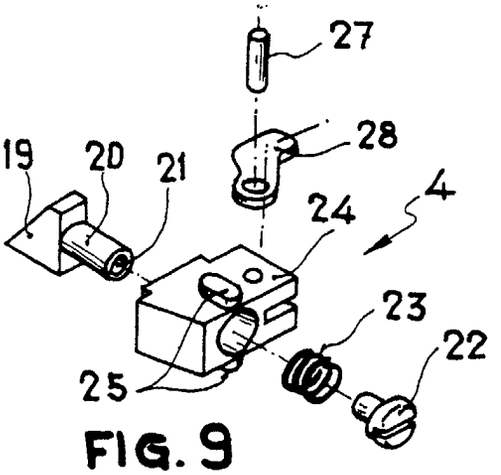

FIG. 9

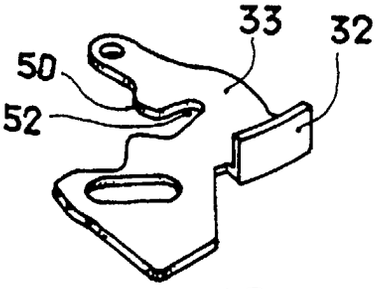

FIG. 10

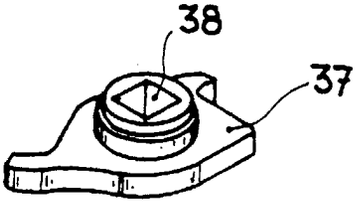

FIG. 11

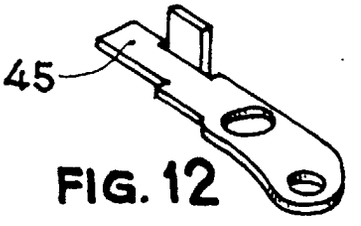

FIG. 12

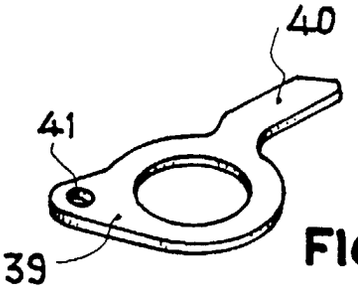

FIG. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 38 0090

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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Y	DE 43 24 300 A (TALLERES ESCORIAZA SA) 27 January 1994 (1994-01-27) * column 8, line 14 - column 9, line 3; figures *	1-6	
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	4 July 2003	Vacca, R

CATEGORY OF CITED DOCUMENTS

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04-07-2003

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