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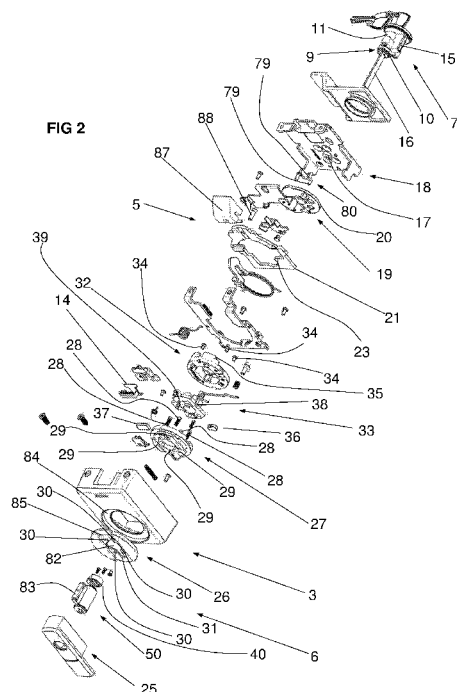
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(54) **Title:** RIM LATCH WITH CYLINDER LOCK CHANGE

(57) **Abstract:** This invention relates to a lock assembly 1 including a housing 3 with an inner actuator 6 being rotatable to move a bolt 5 relative to the housing 3. The inner actuator 6 includes a detachable portion 25 which is detachable by releasing fasteners 28.



## **RIM LATCH WITH CYLINDER LOCK CHANGE**

### **Technical Field**

[0001] This invention relates to a lock assembly for mounting to a door, including a bolt biased towards an extended position and at least an inner actuator, such as a turn knob or the like, for moving the bolt towards a retracted position. The invention is particularly suitable for use with a surface mounted lock assembly, often referred to as a rim lock assembly, and it will be convenient to hereinafter describe the invention with reference to this particular application. It should be appreciated however that the invention may have other applications.

### **Background of Invention**

[0002] A rim lock assembly will generally include a housing that is attachable to a face of the door, and a bolt movable from an extended position to a retracted position. The bolt is movable on an inner side of the door generally by operation of an inner turn knob or lever (hereinafter turn knob), and on an outer side of the door generally only by operating an outer (hereinafter second) key operated cylinder lock or the like.

[0003] The operation of the turn knob can be controlled by an inner (hereinafter first) key operated cylinder lock interacting with a lock mechanism within the housing. The coding of the first key operated cylinder lock will generally involve some form of tumbler arrangement, which can be adjusted when the lock assembly is being installed. The installer will need to remove the first key operated cylinder lock from the housing in order to achieve this adjustment. Access to the first key operated cylinder lock is from the rear of the housing and involves some level disassembly/removal of the various components of the lock assembly. This disassembly is often performed on site and can result in misplacing of the components of the lock assembly and considerable time consumed by the installer.

[0004] The bolt may take the form of a latch bolt with the lock assembly including a biasing means biasing the bolt towards the extended position. Where the lock assembly is installed on a hinged door the latch bolt head will include a bevelled

leading surface to ramp over a strike plate located on the door jamb as the door closes. The bevel on the latch bolt head must be oriented to face the door jamb regardless of whether the door is to open outwardly or inwardly. This generally involves disassembly of the lock assembly to separate the bolt from first actuator and possibly the lock mechanism. Again this disassembly is often performed on site and can result in misplacing of the components of the lock assembly and considerable time consumed by the installer.

[0005] The applicant has appreciated that ease of adjustment of components of the lock assembly of the forgoing kind could be improved.

[0006] A reference herein to a patent document or other matter which is given as prior art is not to be taken as an admission that that document or matter was, in Australia, known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

### **Summary of Invention**

[0007] According to this invention there is provided a lock assembly for use with a door, the lock assembly including a housing for positioning adjacent to an inner surface of the door which houses a bolt, the bolt being movable relative to the housing between an extended position and a retracted position, a first actuator that is rotatable by hand at front of the housing about an actuator axis, the first actuator being operable to move the bolt from the extended position towards the retracted position, a lock mechanism within the housing that when in an active condition renders the first actuator inoperable, the first actuator having a detachable portion located on an outer side of the housing, also including a first key operated cylinder lock which is aligned with the actuator axis and operable at the front of the housing for adjusting the lock mechanism between the active condition and an inactive condition. The detachable portion may take any form including part of a turn knob or a lever handle. It is further preferred that detachment of the detachable portion permits the first key operated cylinder lock to be removed at the front of the housing. This allows for changing or servicing of the cylinder lock without requiring disassembly of the rear of the lock assembly. It is preferred to control how the detachable portion is detached, and in this regard it is preferred that the lock assembly including a backing plate that

in use is fastened to the inner surface of the door, the backing plate being configured for attachment with the housing, whereby the detachable portion is inhibited from being detached when the backing plate is attached to the housing. It is further preferred that the first actuator includes an inner portion located on an inner side of the housing which is detachably fastened with the detachable portion, whereby the detachable portion can be detached from the inner portion only when the housing is detached from the backing plate. The manner in which the detachable portion is retained may include the inner portion being configured with at least one aperture there through, the first actuator also including at least one fastening member for each aperture in the inner portion respectively for fastening the detachable portion to the inner portion, whereby access to the at least one fastening member is permitted when the housing is detached from the backing plate. The lock assembly may also include a drive member within the housing that is adjustable when the lock mechanism adjusts between the active condition and the inactive condition wherein the drive member obstructs access to unfastening the at least one fastening member when the lock mechanism is in the inactive condition and does not obstruct access to unfastening the at least one fastening member when the lock mechanism is in the active condition. This has the advantage of requiring some level of understanding of how the lock mechanism functions in order to gain access to the fasteners.

[0008] Paragraph intentionally left blank.

[0009] The first actuator may also include an intermediate portion between the inner portion and the detachable portion which is configured to interact with an annular bearing surface of the housing. The intermediate portion is configured to mate with the detachable portion in either a first orientation or a second orientation, whereby the position of the detachable portion relative to the intermediate portion is adjusted through 180° when adjusting between the first orientation and the second orientation.

[0010] While the at least one fastener fastens the detachable portion to the intermediate portion it is further preferred that the intermediate portion is configured to drivingly mate with the detachable portion so that rotation of the detachable portion about the actuator axis causes the intermediate portion to rotate about the actuator

axis. This may be achieved by the intermediate portion including a lug spaced from the actuator axis that is engaged by the detachable portion to drivingly mate, however other arrangements for to achieve this are clearly possible.

[0011] It is preferred that the first actuator be configured to accommodate the first key operated cylinder lock in such a manner to limit relative movement there between when assembled. This preferably includes the intermediate portion preferably having an aperture therein to accommodate the first key operated cylinder lock, the aperture is configured relative to a shape of the first key operated cylinder lock to inhibit rotation of the first key operated cylinder lock relative to the intermediate portion. The detachable portion may also be shaped to snugly accommodate the first key operated cylinder lock.

[0012] The manner in which the lock assembly is configured to provide access to the at least one fastener from the rear of the housing may take any suitable form. One such arrangement includes the first actuator having a cam that is rotatable about the actuation axis, the cam having an aperture for accessing to unfasten the said at least one fastening member. It is preferred that the at least one fastener remains captured with the inner portion when the detachable portion is detached. In one preferred arrangement the cam facilitates capturing the at least one fastening member.

According to another aspect of this invention there is provided a lock assembly including a biasing means for biasing the bolt towards the extended position, the bolt including a bolt frame that moves within the housing and a latch bolt head that protrudes from the housing when the bolt is in the extended position, the orientation of the latch bolt head relative to the bolt frame being adjustable through 180 °, a first actuator that is rotatable by hand at front of the housing about an actuator axis, the first actuator being operable to move the bolt from the extended position towards the retracted position, a lock mechanism within the housing that when in an active condition renders the first actuator inoperable, a backing plate that in use is fastened to the surface of the door, the backing plate being configured for attachment with the

housing, whereby the adjustment of the orientation of the latch bolt head relative to the bolt frame is inhibited when the backing plate is attached to the housing.

[0014] The latch bolt head may be attached with the bolt frame by any suitable arrangement including by a fastening member. It is preferred that access to the fastening member is inhibited when the backing plate is attached to the housing. It is further preferred that the fastening member is located within the housing when the bolt is in the extended position so as to inhibit access to it once the lock assembly is installed and in operation. It is preferred that the bolt frame includes a tab and the latch bolt head includes a recess to accommodate the tab. It is further preferred that the bolt frame includes an aperture formed therein with a shoulder at the periphery of the aperture for interacting with the first actuator, however this is not essential. It is further preferred that the bolt frame moves rectilinearly within the housing when the bolt adjusts between the extended position and the retracted position.

[0015] A lock assembly may also include a second actuator operable for use from an outer surface of the door to adjust the condition the lock mechanism from the active condition to the inactive condition. The second actuator may also operate to move the bolt from the extended position toward the retracted position. The preferred form of second actuator is a second key operated cylinder lock which interacts with the lock mechanism by a tail bar, being the only actuator operable from the outer side of the door. It is further preferred that the lock assembly is a rim lock assembly.

[0016] A preferred embodiment of a lock assembly will be herein after described in greater detail by reference to the accompanying drawings. The detailed description and drawings are merely illustrative of how the invention might be put into effect so that the specific form and arrangement of the various features, as described and illustrated is not to be understood as limiting on the invention.

### **Brief Description of Drawings**

[0017] Figure 1 is a diagrammatic isometric view of a preferred embodiment of the lock assembly when installed according to this invention.

[0018] Figure 2 is an exploded isometric view of a preferred embodiment of the lock assembly according to the invention.

[0019] Figure 3 is a rear elevation view of the lock assembly with at least the backing plate removed to reveal the bolt in an extended position.

[0020] Figure 4 is a rear elevation view of the lock assembly from Figure 3 with the bolt moved to retract a position on operation of the outer cam.

[0021] Figure 5 is a rear elevation view of the lock assembly with the backing plate removed to reveal the bolt in an extended position.

[0022] Figure 6 is a rear elevation view of the lock assembly from Figure 5 with the bolt moved to a retracted position on operation of the inner cam.

[0023] Figure 7 is a rear elevation view of the lock assembly with the backing plate and bolt removed to reveal the lock mechanism in an active condition.

[0024] Figure 8 is a rear elevation view of the lock assembly from Figure 7 with the lock mechanism having been adjusted by the outer cam to adopt an inactive condition.

[0025] Figure 9 is a rear elevation view of the lock assembly with a backing plate and bolt removed to reveal the locking mechanism in an active condition.

[0026] Figure 10 is a rear elevation view of the lock assembly from Figure 9 with the lock mechanism having been adjusted to an inactive condition on operation of a cylinder cam.

[0027] Figure 11 is the exploded isometric view from Figure 2 in reverse orientation.

[0028] Figure 12 is the exploded isometric view from Figure 11 with an alternate form of hand grip element.

[0029] Figure 13 is the exploded isometric view from Figure 11 with an alternate form of hand grip element.



[0030] Figure 14 is a rear elevation view of the lock assembly with the backing plate removed.

[0031] Figure 15 is a rear elevation view of the lock assembly with the backing plate removed and the bolt in an extended position.

[0032] Figure 16 is a rear elevation view of the lock assembly from Figure 15 with the latch bolt head detached from the latch bolt frame.

[0033] Figure 17 is a rear elevation view of the lock assembly from Figure 16 with the latch bolt head rotated through 180°.

### **Detailed Description**

[0034] Figure 1 illustrates a lock assembly 1 according to a preferred embodiment of the invention when installed on a door 2. The lock assembly includes a housing 3 which is attached to an inner side of the door and positioned adjacent a free edge 4 of the door 2. The lock assembly 1 includes a bolt 5 which projects to one side of the housing 3 when the bolt 5 is in an extended position as shown. The housing 3 is positioned relative to the edge 4 of the door 2 so that when the bolt 5 is in the extended position it is capable of interacting with a strike (not shown) which in use is fixed on a door jam (not shown) for retaining the door 2 in a closed position.

[0035] The lock assembly 1 includes an inner actuator 6 and an outer actuator 7 each of which is operable in a manner that will be described later in the specification, for moving the bolt 5 from the extended position as shown towards a retracted position. The inner actuator 6 illustrated includes a turn knob 8 which is rotatable about an actuation axis X-X so as to retract the bolt 5. The turn knob 8 illustrated can be substituted by a lever handle (see figure 12) if preferred. In contrast the outer actuator 7 illustrated is in the form of a key operated cylinder lock 9 which includes a barrel 10 being rotatable relative to a casing 11 about the actuation X-X, on insertion of appropriately coded key 12. The lock assembly illustrated in Figure 1 may be described as a rim lock assembly.

[0036] Figure 1 also illustrates the housing 3 having an aperture 13 positioned proximate the bolt 5. Whilst the location of the aperture 13 may vary from that as

illustrated, to be located for example on the turn knob 8, the function of the aperture is to provide a viewing window through which an indicator member 14 (see Figure 2) can be made visible.

[0037] Referring now to Figure 2, which illustrates a specific form of the outer actuator 7 including the cylinder lock casing 11 with a tumbler bible 15 orientated substantially vertically. A tail bar 16 is positioned to engage with a barrel 10 of the cylinder lock 11. The length of a tail bar 16 may vary from that illustrated depending upon the thickness of the door 2 (See Figure 1) to which the lock assembly 1 is installed. When installed the tail bar 16 extends through a central aperture 17 formed in a backing plate 18 to engage with an outer cam 19 which is rotatable about the actuator axis X-X (see Figure 1) on rotation of the tail bar 16.

[0038] It should be noted from Figure 2 that the outer cam 19 includes an axially extending projection 20 spaced radially from the centre of the outer cam 19. This projection 20 is positioned to interact with the bolt 5, or more specifically the bolt frame 21 when moving the bolt 5 between the extended and retracted positions. The interaction of the projection 20 with the frame 21 is more clearly illustrated in greater detail with reference to Figures 3 and 4 which illustrate a rear view of the lock assembly 1 partially assembled. The backing plate 18 and the majority of the outer cam 19 removed. However, the projection 20 is visible. Figure 3 illustrates the bolt 5 in the extended position relative to the housing 3, being urged towards this position by a bolt torsion spring 21 having a free end engaging behind a head 22 of the bolt 5. The bolt head 22 is connected to the bolt frame 21 and has an internally formed shoulder 23 positioned adjacent the projection 20. When comparing Figure 4 with Figure 3 it is to be understood that the outer cam 19 has been rotated in an anti-clockwise direction to move the projection 20 through an arc which results in movement of the bolt 5 to the retracted position against the urging of the bolt torsion spring 24. The bolt 5 is considered to be in a retracted position when the bolt head 22 is within the housing 3.

[0039] The assembly and operation of the inner actuator 6 will now be explained firstly with reference to Figure 2. The inner actuator 6 includes the turn knob 8 which is illustrated in the form of a turn knob assembly including a hand grip element 25, an

outer bearing plate 26, and an inner bearing plate 27. The outer bearing plate 26 and the inner bearing plate 27 are positioned on opposed sides of the lock housing 3, and are secured in this position by four screws 28 which locate in appropriately spaced apertures 29, 30 formed in the inner bearing plate 27 and outer bearing plate 26 respectively. The finger grip element 25 is formed with screw flutes 78 (see Figure 11) internally thereof for engagement with the four screws 28 so as to retain the finger grip element 25 adjacent the outer bearing plate 26. The outer bearing plate 26 also includes a radially extending channel 31 to receive the finger grip element 25 therein, so as to facilitate transferring any rotational force applied by the user on the finger grip element 25 through the outer bearing plate 26 to rotate the inner bearing plate 27.

[0040] Figure 2 also the inner actuator 6 also including an inner cam plate 32 which is spaced from the inner bearing plate 27 in Figure 2 by a drive member 33. The function of the drive member 33 will be explained later in the specification. The inner cam plate 32 is attached to the inner bearing plate 27 by four screws 34 (only three of which are visible), so that rotation of the turn knob assembly 25, 26, 27 results in rotation of the inner cam plate 32. It can be appreciated from Figure 2 that the inner cam plate 32 is formed with a radially spaced projection 35 which is positioned to interact with the shoulder 23 on the bolt frame 21. The purpose of this engagement is described in greater detail with reference to Figures 5 and 6.

[0041] Figure 5 illustrates the rear view of the lock assembly 1, similar to Figure 3 with the outer cam plate 19 removed. The bolt 5 is shown in the extended position, urged towards that position by the bolt torsion spring 24. The turn knob 8, (see Figure 1), is in the horizontal position, whereby the projection 35 is spaced from the shoulder 23. When comparing Figures 5 and 6 it can be appreciated that rotation of the inner cam plate 32 causes the projection 35 to engage the shoulder 23 causing the bolt 5 to retract from the extended position illustrated in Figure 5 to the retracted position illustrated in Figure 6.

[0042] The lock assembly 1 according to the invention includes a lock mechanism, that when in an active condition the inner actuator is rendered inoperable for retracting the latch bolt 5 from the extended position. The preferred elements of and

method for achieving this as illustrated in Figure 2 include the drive member 33 that is positioned between the inner cam plate 32 and inner bearing plate 27 in conjunction with an upper detent 36 and a lower detent 37. The drive member 33 includes an upper ramp surface 38 and a lower ramp surface 39 for driving an upper detent 36 and lower detent 37 in a radial direction respectively on movement of the drive member 33 in a direction substantially perpendicular to the actuator axis X-X. The drive member 33 is moved as a result of engagement and rotation by either the outer cam plate 19 or the inner cylinder cam 40. This engagement and movement is more clearly illustrated in Figures 7 to 11.

[0043] Figure 7 illustrates a rear view of the lock assembly 1 with the backing plate 18, bolt 5, inner cam 32 and part of the outer cam 19 (see all in Figure 2) removed. The lock mechanism is shown in Figure 7 in an active condition. The internal configuration of the housing 3 is formed with an annular bearing wall 41 which intermittently surrounds the inner bearing plate 27 defining a space within which the inner bearing plate 27 can rotate when the lock mechanism is in the inactive condition. The annular bearing wall 41 is formed with an upper recess 42 and a lower recess 43 configured to accommodate a portion of the upper detent 36 and lower detent 37 respectively when the lock mechanism is in an active condition. This prevents retraction of the bolt 5 by rotation of the inner cam 32.

[0044] Figure 7 also illustrates a central projection 44 of the outer cam plate 19 (see also Figure 2), having a pair of opposed bores, with bore accommodates a leg 79 of a lock release element 80 (See Figure 2). Rotation of the outer cam plate 19 causes either one of the legs 79 to engage a block 81 (see also Figure 11) on a rear surface of the drive member 33. For example, rotation of the outer cam plate 19 in an anti-clockwise direction from the position shown in Figure 7 will cause the lower leg 79 to engage the block 81 as illustrated in Figure 8. That rotation causes the driven member 33 to move to the left. This movement of the drive member 33 results in retraction of the lower detent 37 as a knob 45 (see Figure 7) on the lower detent 37 slides along the lower ramp surface 39, whilst the upper detent 36 slides along the upper ramp surface 38 to move free of the upper recess 36. With the upper detent 37 and lower detent 37 in these positions the inner turn knob 8 (see Figure 1) is free to

rotate to retract the bolt 5, and the lock mechanism is considered to be in the inactive condition.

[0045] Referring now to Figure 9 which again illustrates the lock mechanism in the active condition similar to the arrangement illustrated in Figure 7, however illustrating the cylinder cam 40 rather than the outer cam 19, interacting with the drive member 33. The upper detent 36 and lower detent 37 are located in the upper recess 42 and lower recess 43 respectively resulting from the location of the drive member 33 relative to inner bearing plate 27. Figure 9 illustrates the surface formation 46 on the inner cam designed to interact with opposed abutments 47, 48 of the drive member 33, to adjust its position relative to the inner bearing plate 27. In contrast Figure 10 illustrates the cylinder cam 40 being rotated, by rotation of a barrel 49 (see Figure 1) of the inner cylinder lock 50, by an appropriately coded key 51. This adjusts the position of the upper detent 36 and lower detent 37 relative to the upper recess 42 and lower recess 43 respectively. Once the upper detent 36 and lower detent 37 are in the position illustrated in Figure 10, the lock mechanism is considered to be in an inactive condition, whereby the inner actuator 6 (See Figure 1) is free to rotate to retract the bolt 5.

[0046] The lock assembly, as previously described with reference to Figures 2 and 11 includes a hand grip element 25 which is detachable by releasing the fasteners 28. This facilitates interchangeability of the hand grip element 25 from the short lever illustrated in Figures 2 and 11, to a long lever version as illustrated in Figure 12 and a turn knob as illustrated in Figure 13. It also allows for inner cylinder lock 50 to be removed at the front of the housing 3 whilst a substantial portion of the lock assembly remains assembled. It can be appreciated from Figure 2 that the outer bearing plate 26 (referred to as the intermediate portion in the claims), is formed with a central aperture 82 configured to accommodate the inner cylinder lock. More specifically, the central aperture 82 includes an elongate portion shaped to accommodate a bible 83 of the inner cylinder lock 51 so as to inhibit rotation of the cylinder lock 51 relative to the outer bearing plate 26. Furthermore, the central aperture 82 is configured to accommodate the inner cylinder lock 50 in either one of the two orientations adjusted through 180°.

[0047] Figure 2 also illustrates the housing 3 being formed with an annular bearing surface 84 to positively locate the outer bearing plate 26. It is preferred that the hand grip element 25 be configured to interact with the outer bearing plate 26 so that rotation of the hand grip element 25 about the actuator axis causes the outer bearing plate 26 to rotate about the actuator axis X-X. This is achieved by not only the fasteners 28, but also by a lug formed on the outer bearing plate 26 positively locating within a recess 86 (see Figure 11) of the hand grip element 25. Still furthermore, this interaction is facilitated by the hand grip element 25 positively locating within radially extending channel 31.

[0048] It is preferred that access to the fastening members to unfastening the hand grip element 25 be limited. More specifically, the housing 3 must be detached from the backing plate 28 before access can be gained. Furthermore, as can be appreciated by comparing Figures 7 and 8 access to the fastening members 28 is inhibited when the drive member 33 is in the inactive condition (Figure 8), and permitted when the drive member 33 is in the active condition (Figure 7). It is also preferred that the fastening members 28 remain captured within the housing once the hand grip element 25 has been unfastened. In this regard, Figure 13 illustrates the fastening members being retained within the housing 3 by their location behind the inner cam 32. Clearly other arrangements for capturing the fastening members 28 within the housing 3 are possible.

[0049] The lock assembly according to another aspect of the invention includes a latch bolt head 87 that is adjustable relative to the bolt frame. Figure 2 illustrates the latch bolt head 87 detached from the bolt frame 21. Figure 14 illustrates the bolt 5 in an extended position. When the bolt is in the extended position, a fastener is accessible through an aperture 89 formed in the cover plate 90. Once the latch bolt head 87 is detached from the frame 21 (see Figure 15), it can be rotate through 180° (see Figure 16) and re-attached to the bolt frame 21. This allows for adjustment of the orientation of the bevel on the latch bolt head relative to the bolt frame 21 when adjusting between an inwardly opening and an outwardly opening door. It ought to be appreciated that access to the fastener 88 is prevented when the housing 3 is attached to the backing plate 18.

[0050] The lock assembly as hereinbefore described is configured to facilitate relatively simple adjustments of its functionality without compromising on its security.

[0051] Various alteration and/or additions may be introduced into the lock assembly as hereinbefore described without departing from the spirit or amber of the invention.

## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A lock assembly for use with a door, the lock assembly including a housing for positioning adjacent to an inner surface of the door which houses a bolt, the bolt being movable relative to the housing between an extended position and a retracted position, a first actuator that is rotatable by hand at front of the housing about an actuator axis, the first actuator being operable to move the bolt from the extended position towards the retracted position, a lock mechanism within the housing that when in an active condition renders the first actuator inoperable, the first actuator having a detachable portion located on an outer side of the housing, also including a first key operated cylinder lock which is aligned with the actuator axis and operable at the front of the housing for adjusting the lock mechanism between the active condition and an inactive condition, wherein the detachable portion of the first actuator forms part of a turn knob or hand lever, and detachment of the detachable portion permits the first key operated cylinder lock to be removed at the front of the housing.
2. A lock assembly according to claim 1 including a backing plate that in use is fastened to the inner surface of the door, the backing plate being configured for attachment with the housing, whereby the detachable portion is inhibited from being detached when the backing plate is attached to the housing.
3. A lock assembly according to claim 2 wherein the first actuator includes an inner portion located on an inner side of the housing which is detachably fastened with the detachable portion, whereby the detachable portion can be detached from the inner portion only when the housing is detached from the backing plate.
4. A lock assembly according to claim 3 wherein the inner portion is configured with at least one aperture there through, the first actuator also including at least one fastening member for each aperture in the inner portion respectively for fastening the detachable portion to the inner portion, whereby access to the at least one fastening member is permitted when the housing is detached from the backing plate.



5. A lock assembly according to claim 3 or 4 wherein the lock mechanism includes a drive member within the housing that is adjustable when the lock mechanism adjusts between the active condition and the inactive condition wherein the drive member obstructs access to unfastening the at least one fastening member when the lock mechanism is in the inactive condition and does not obstruct access to unfastening the at least one fastening member when the lock mechanism is in the active condition.
6. A lock assembly according to any one of claims 3 to 5 wherein the first actuator includes an intermediate portion between the inner portion and the detachable portion which is configured to interact with an annular bearing surface of the housing.
7. A lock assembly according to claim 6 wherein the intermediate portion is configured to mate with the detachable portion in either a first orientation or a second orientation, whereby the position of the detachable portion relative to the intermediate portion is adjusted through 180° when adjusting between the first orientation and the second orientation.
8. A lock assembly according to claim 6 or 7 wherein the intermediate portion is configured to drivingly mate with the detachable portion so that rotation of the detachable portion about the actuator axis causes the intermediate portion to rotate about the actuator axis.
9. A lock assembly according to claim 8 wherein the intermediate portion includes a lug spaced from the actuator axis that is engaged by the detachable portion to drivingly mate.
10. A lock assembly according to any one of claims 6 to 9 wherein the intermediate portion includes an aperture therein to accommodate the first key operated cylinder lock, the aperture is configured relative to a shape of the first key operated cylinder lock to inhibit rotation of the first key operated cylinder lock relative to the intermediate portion.

11. A lock assembly according to any one of claims 4 to 10 wherein the first actuator includes a cam that is rotatable about the actuation axis, the cam having an aperture for accessing to unfasten the said at least one fastening member.
12. A lock assembly according to claims 4 to 11 wherein the at least one fastening member remains captured with the inner portion when the detachable portion is detached.
13. A lock assembly according to any one of the preceding claims including a second actuator operable for use from an outer surface of the door to adjust the condition the lock mechanism from the active condition to the inactive condition.
14. A lock assembly according to claim 13 wherein the second actuator is also operable to move the bolt from the extended position toward the retracted position.
15. A lock assembly according to claim 14 wherein the second actuator is a second key operated cylinder lock which interacts with the lock mechanism by a tail bar, being the only actuator operable from the outer side of the door, the first key operated cylinder lock and second key operated cylinder lock both being operable about the actuator axis.
16. A lock assembly according to any one of the preceding claims including a biasing means for biasing the bolt towards the extended position, the bolt including a bolt frame that moves within the housing and a latch bolt head that protrudes from the housing when the bolt is in the extended position, the orientation of the latch bolt head relative to the bolt frame being adjustable through 180 °, a first actuator that is rotatable by hand at front of the housing about an actuator axis, the first actuator being operable to move the bolt from the extended position towards the retracted position, a lock mechanism within the housing that when in an active condition renders the first actuator inoperable, a backing plate that in use is fastened to the surface of the door, the backing plate being configured for attachment with the housing, whereby

the adjustment of the orientation of the latch bolt head relative to the bolt frame is inhibited when the backing plate is attached to the housing.

17. A lock assembly according to claim 16 wherein the latch bolt head is attached with the bolt frame by a fastening member, whereby access to the fastening member is inhibited when the backing plate is attached to the housing.
18. A lock assembly according to claim 17 wherein the fastening member is located within the housing when the bolt is in the extended position.
19. A lock assembly according to any one of claims 16 to 18 wherein the bolt frame includes a tab and the latch bolt head includes a recess to accommodate the tab.
20. A lock assembly according to any one of claims 16 to 19 wherein the bolt frame includes an aperture formed therein with a shoulder at the periphery of the aperture for interacting with the first actuator.
21. A lock assembly according to any one of claims 16 to 20 where in the bolt frame moves rectilinearly within the housing when the bolt adjusts between the extended position and the retracted position.
22. A lock assembly according to any one of the preceding claims wherein the lock assembly is a rim lock assembly.

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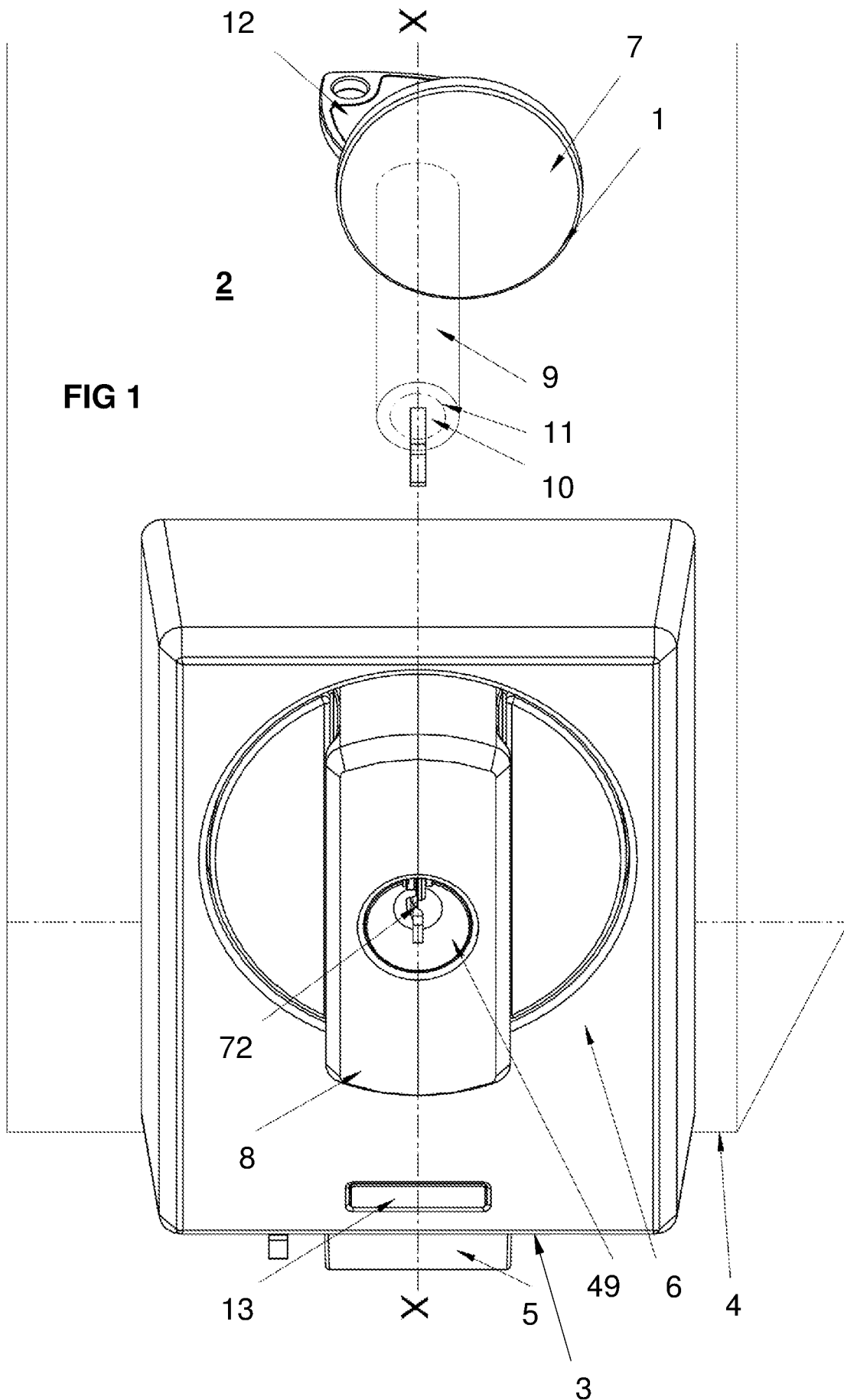
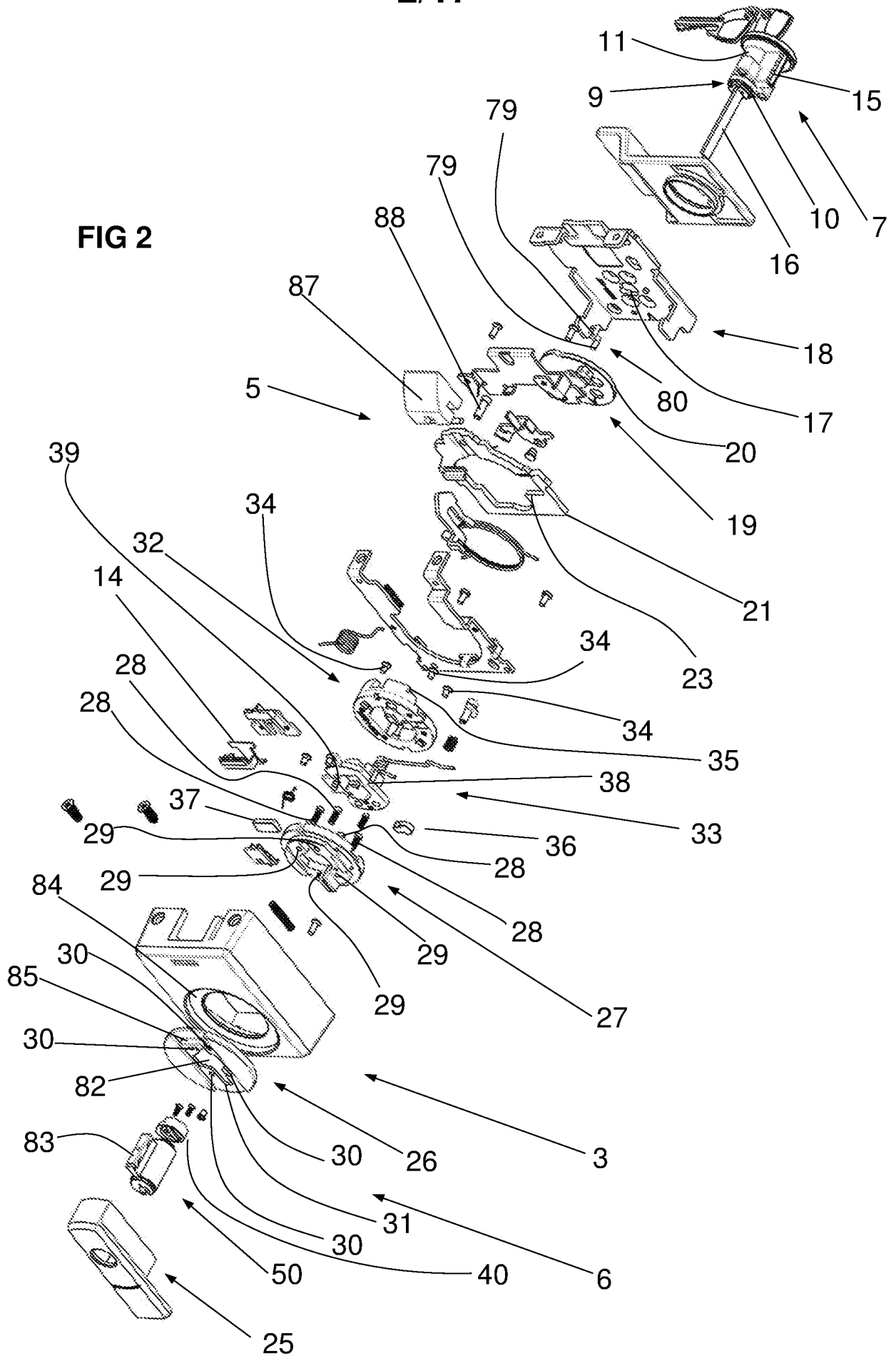
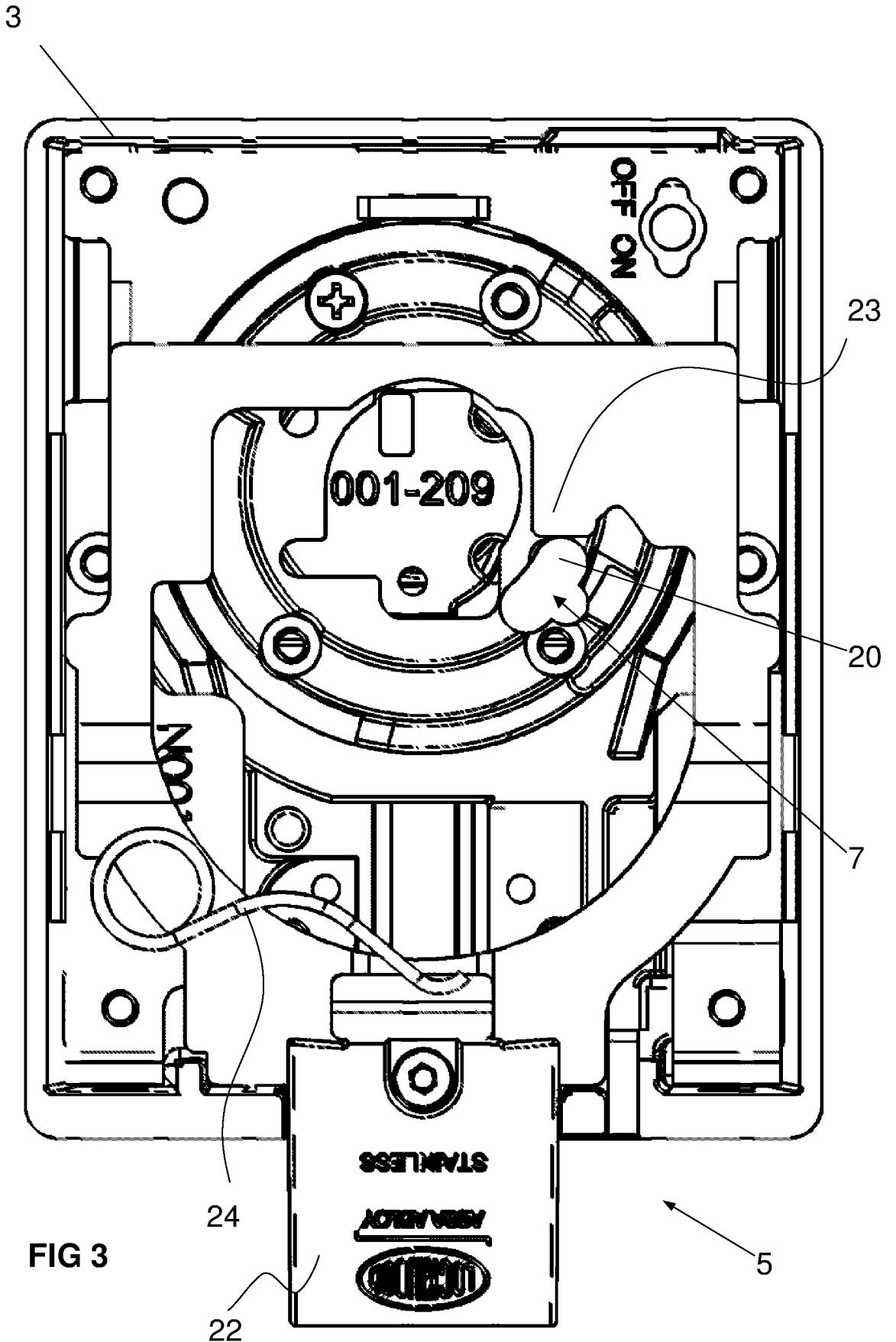


FIG 1

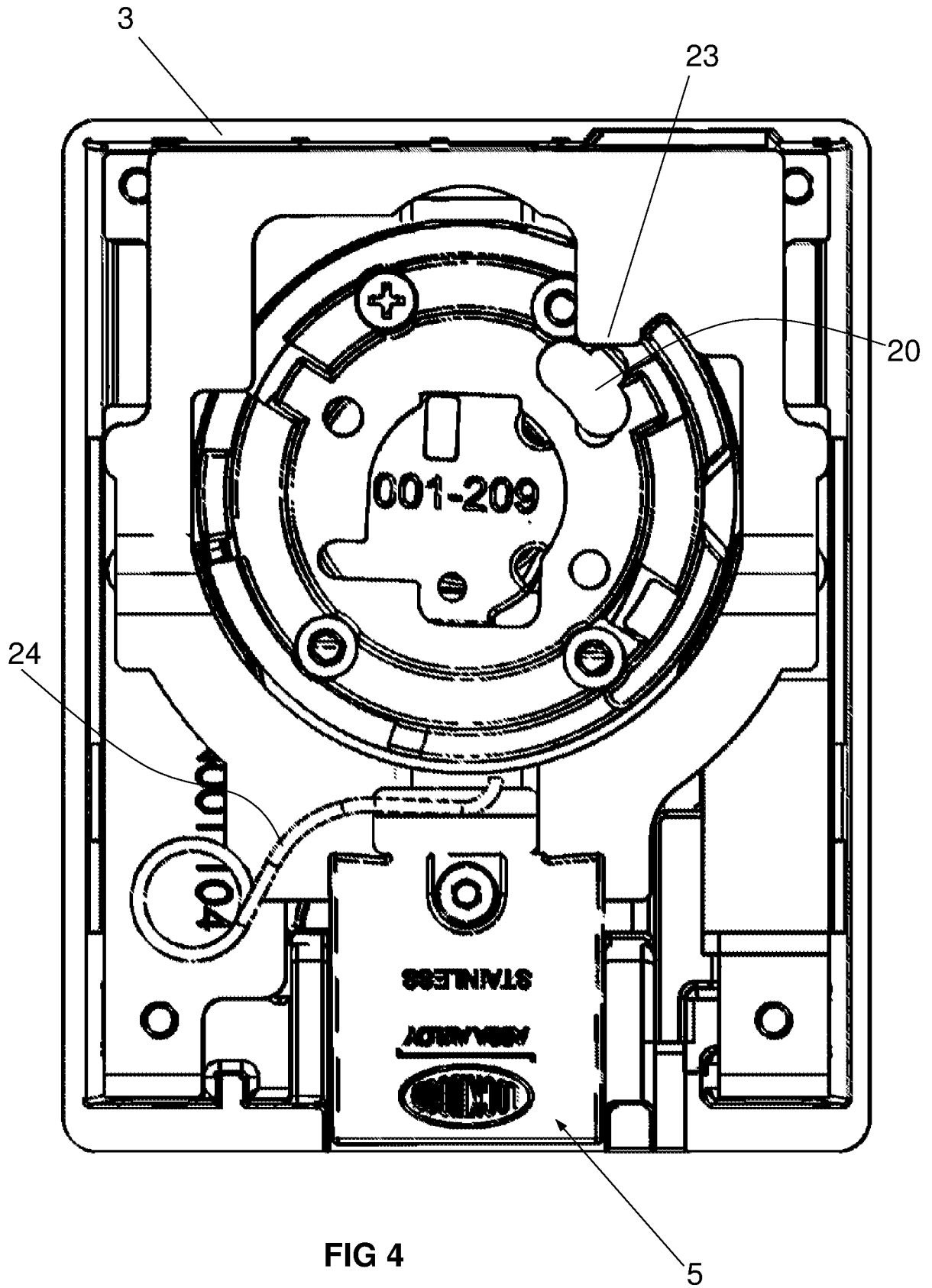
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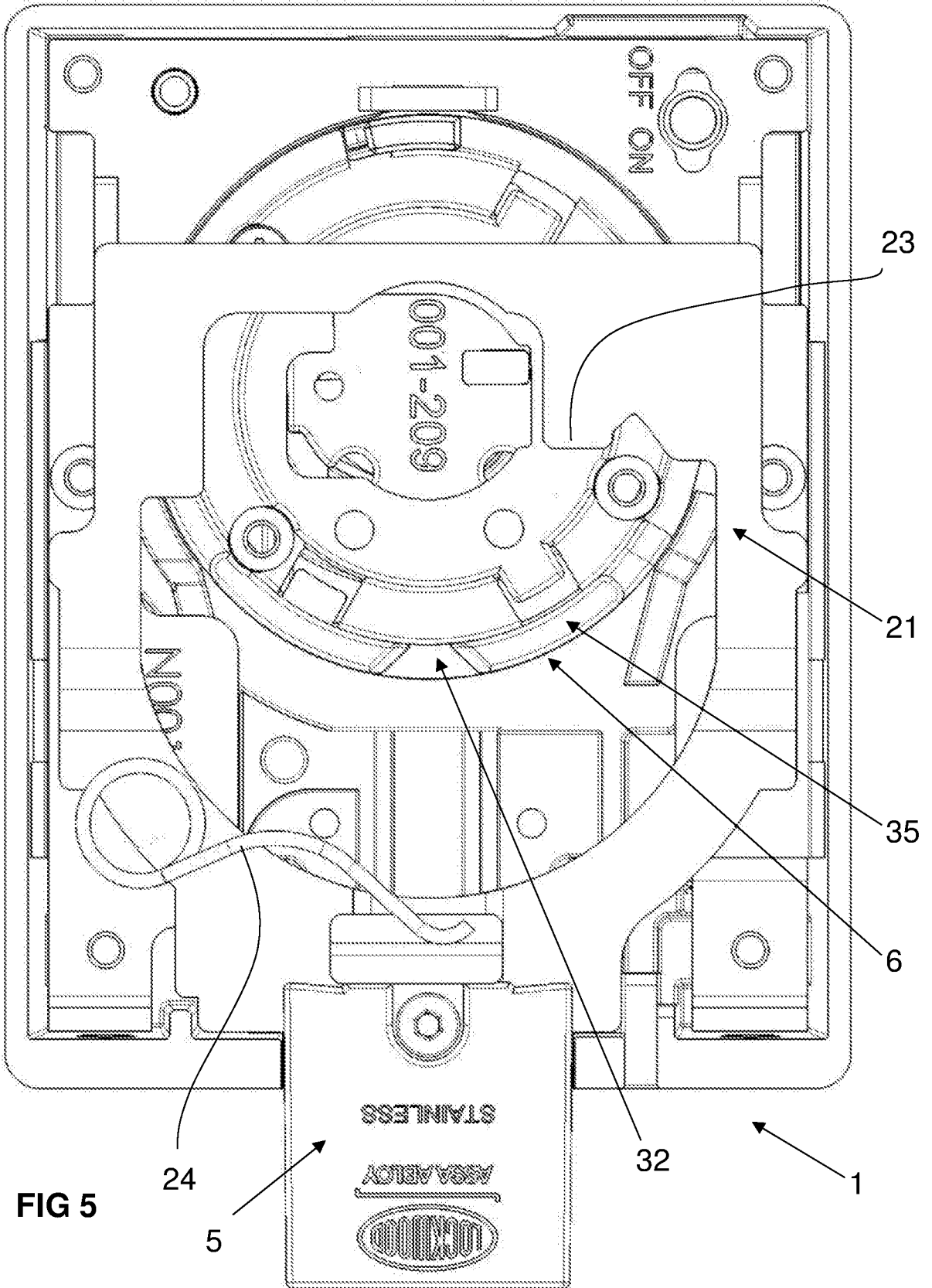
FIG 2





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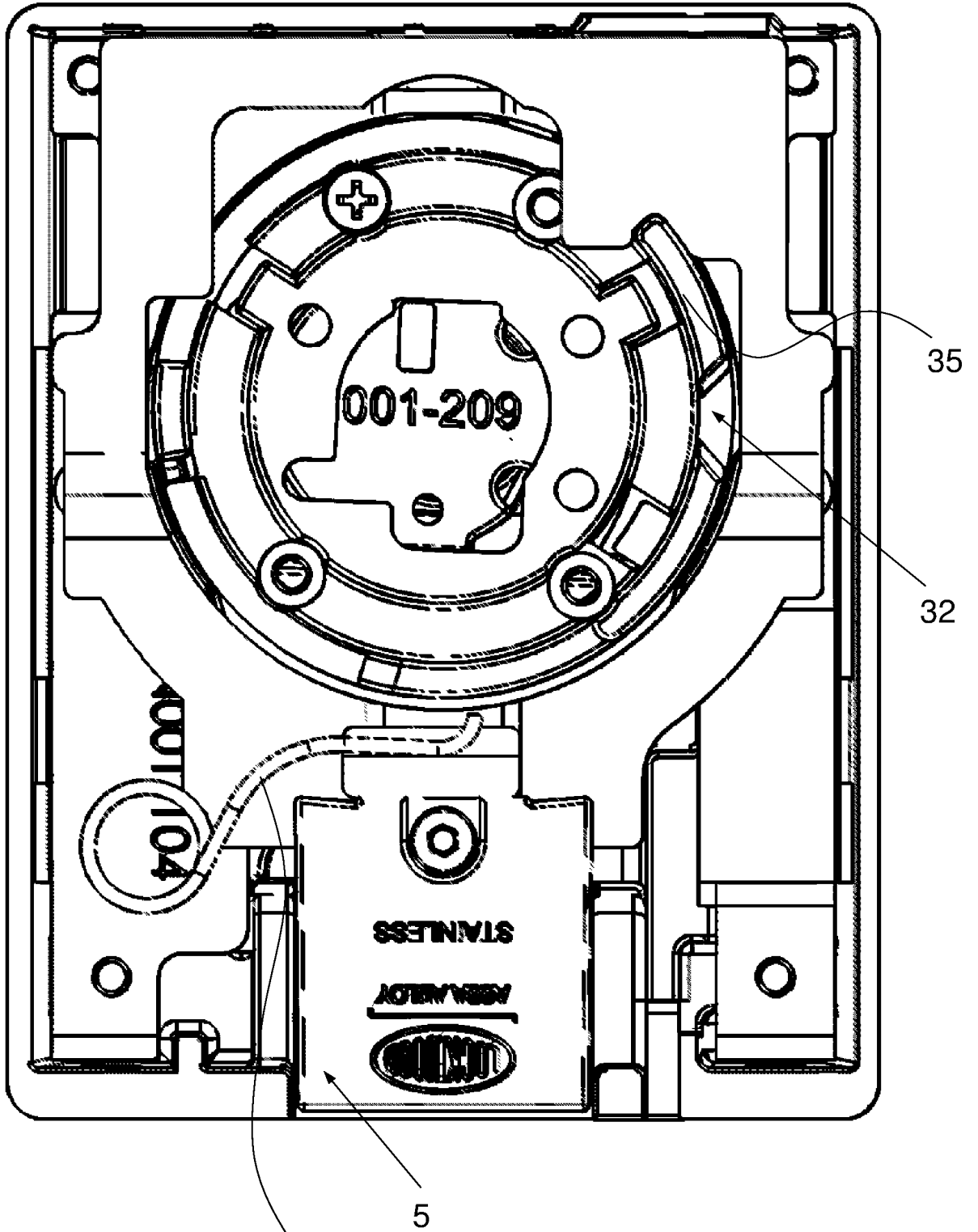


FIG 6

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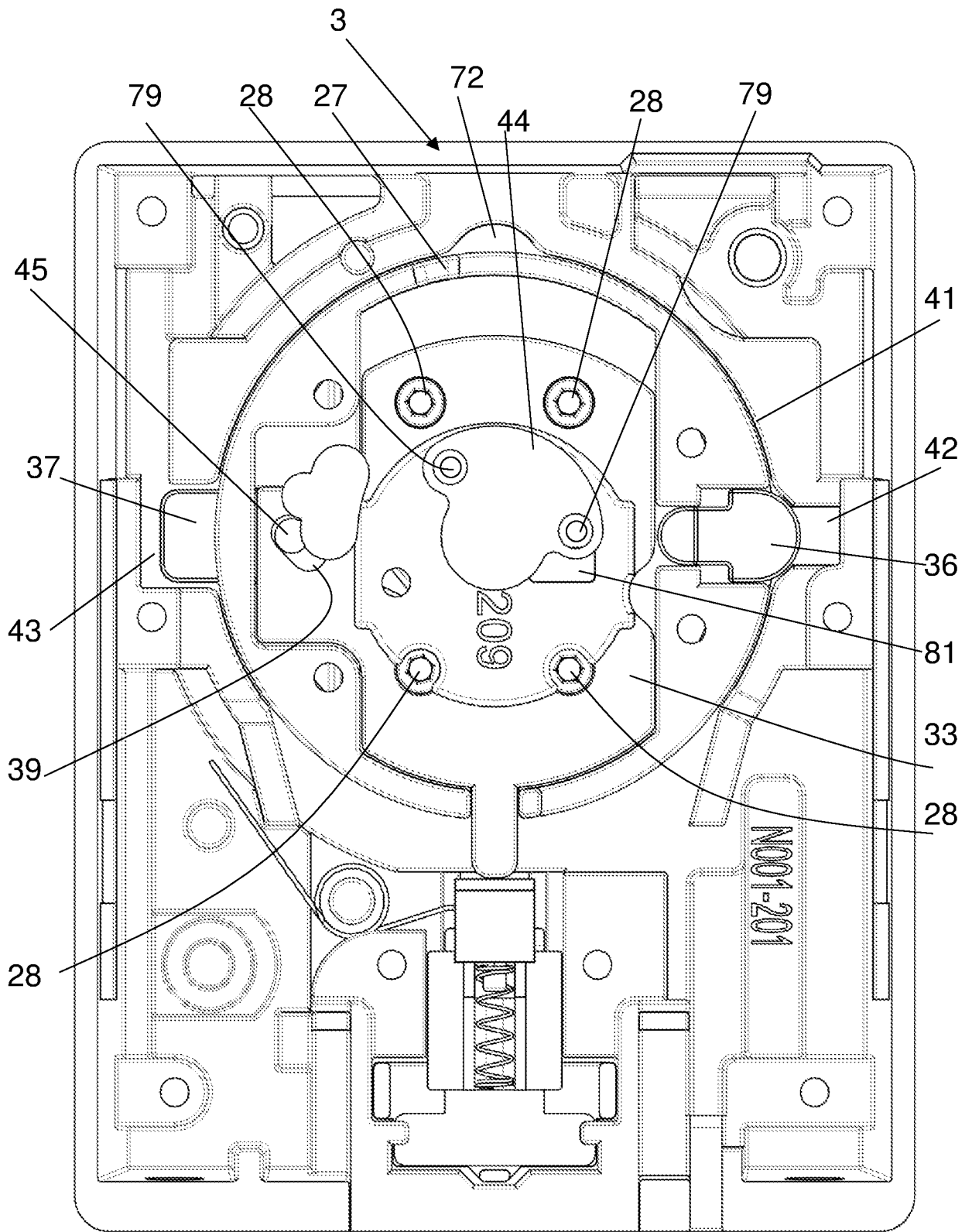


FIG 7

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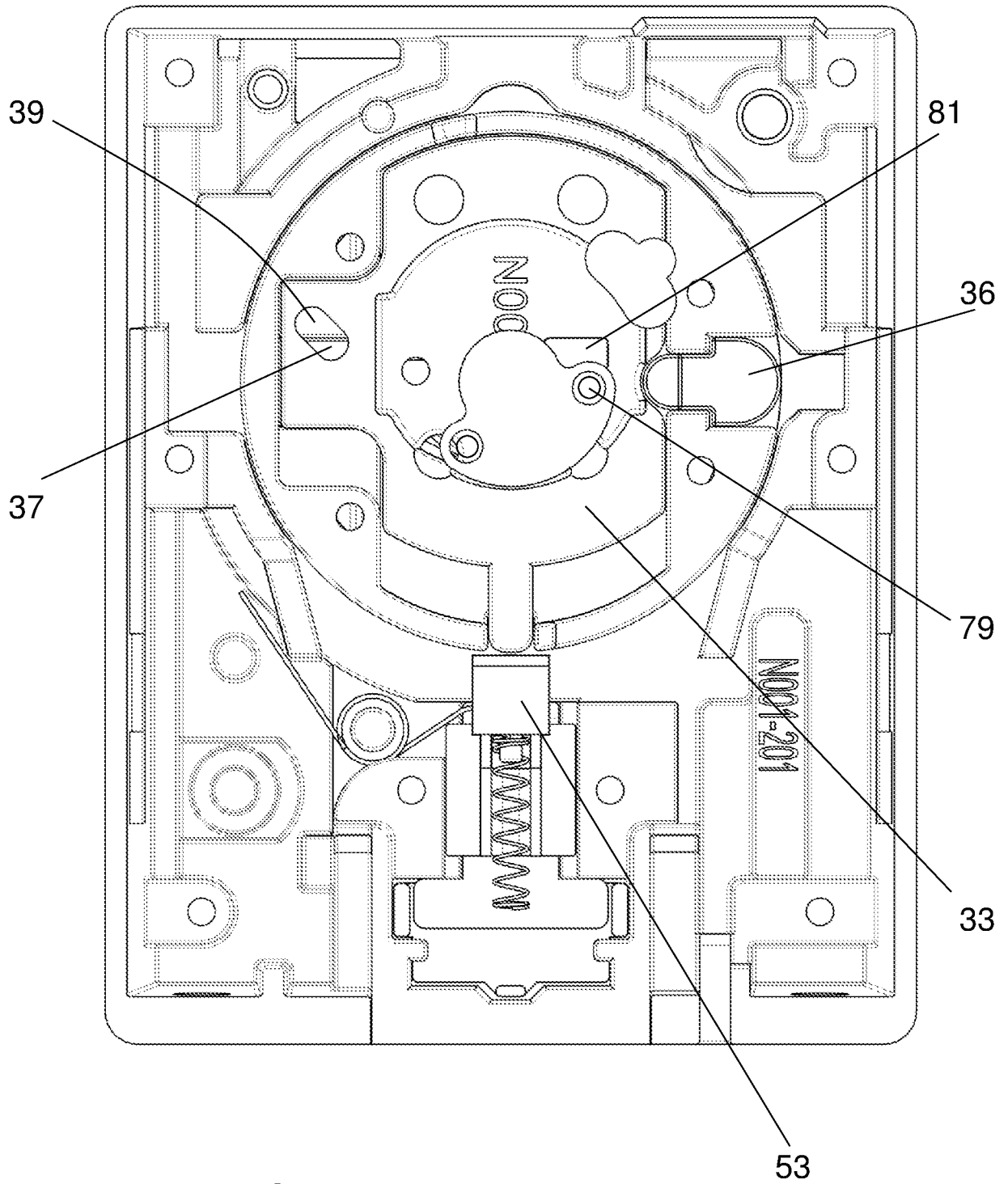


FIG 8

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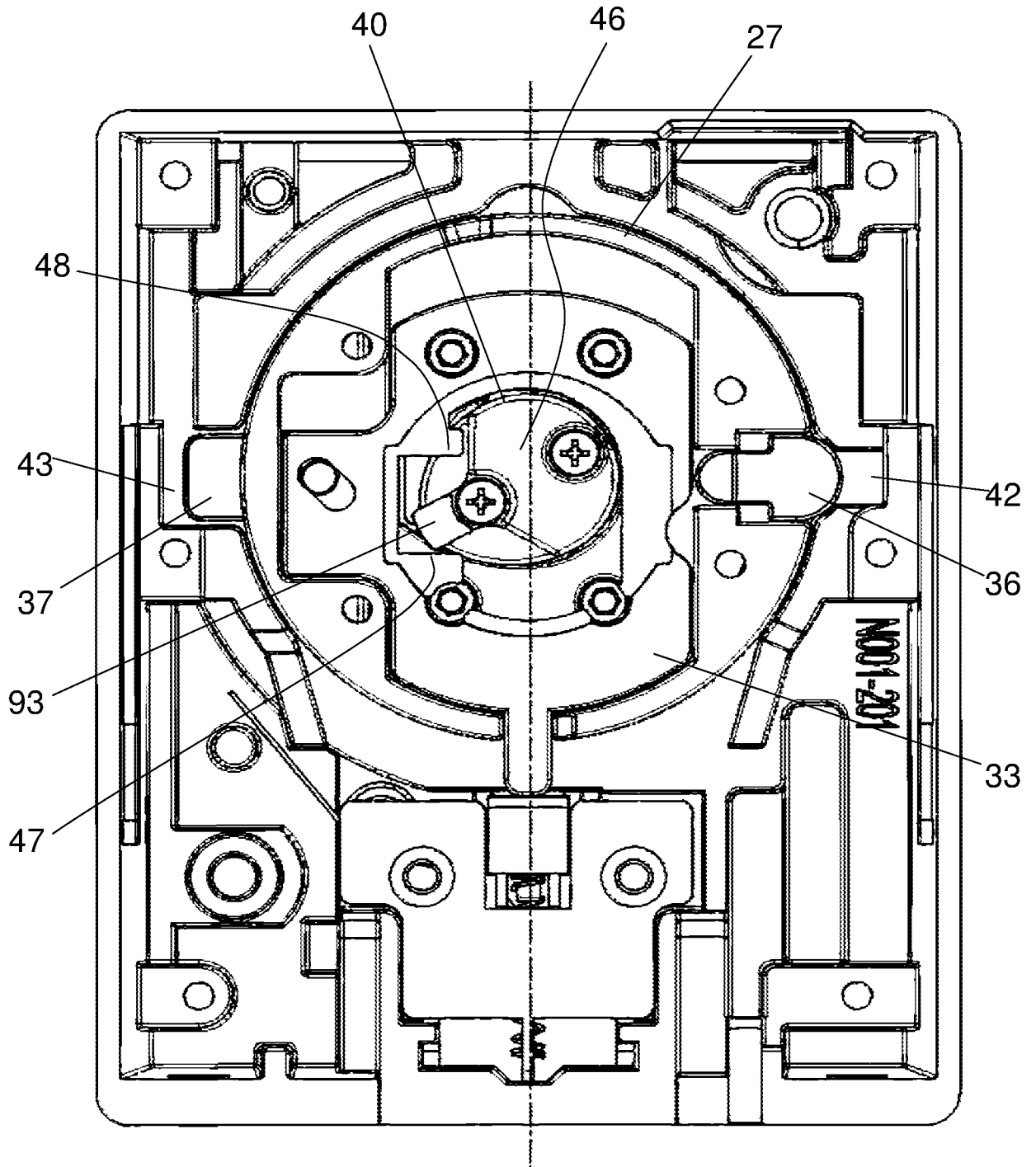


FIG 9

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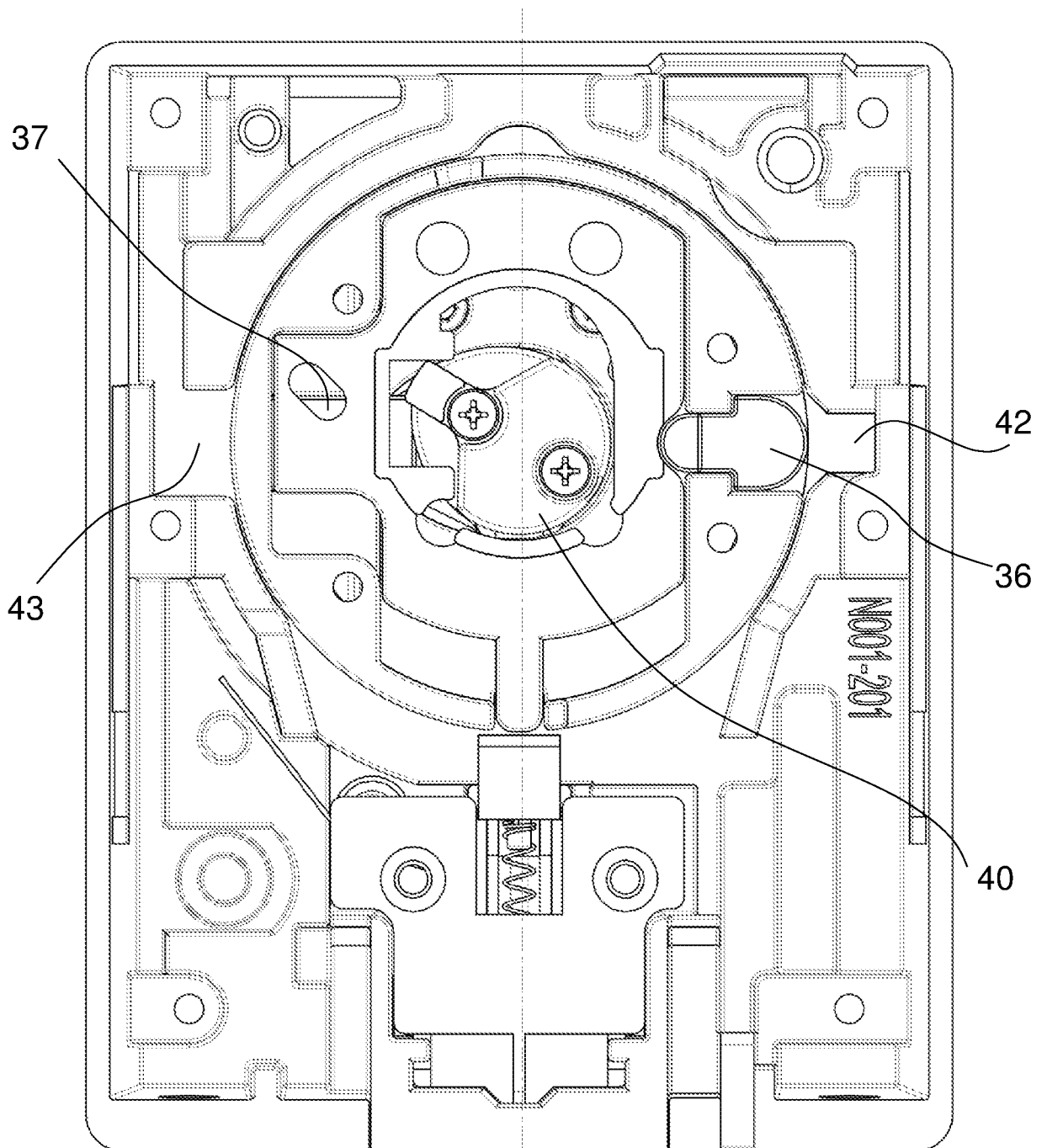


FIG 10

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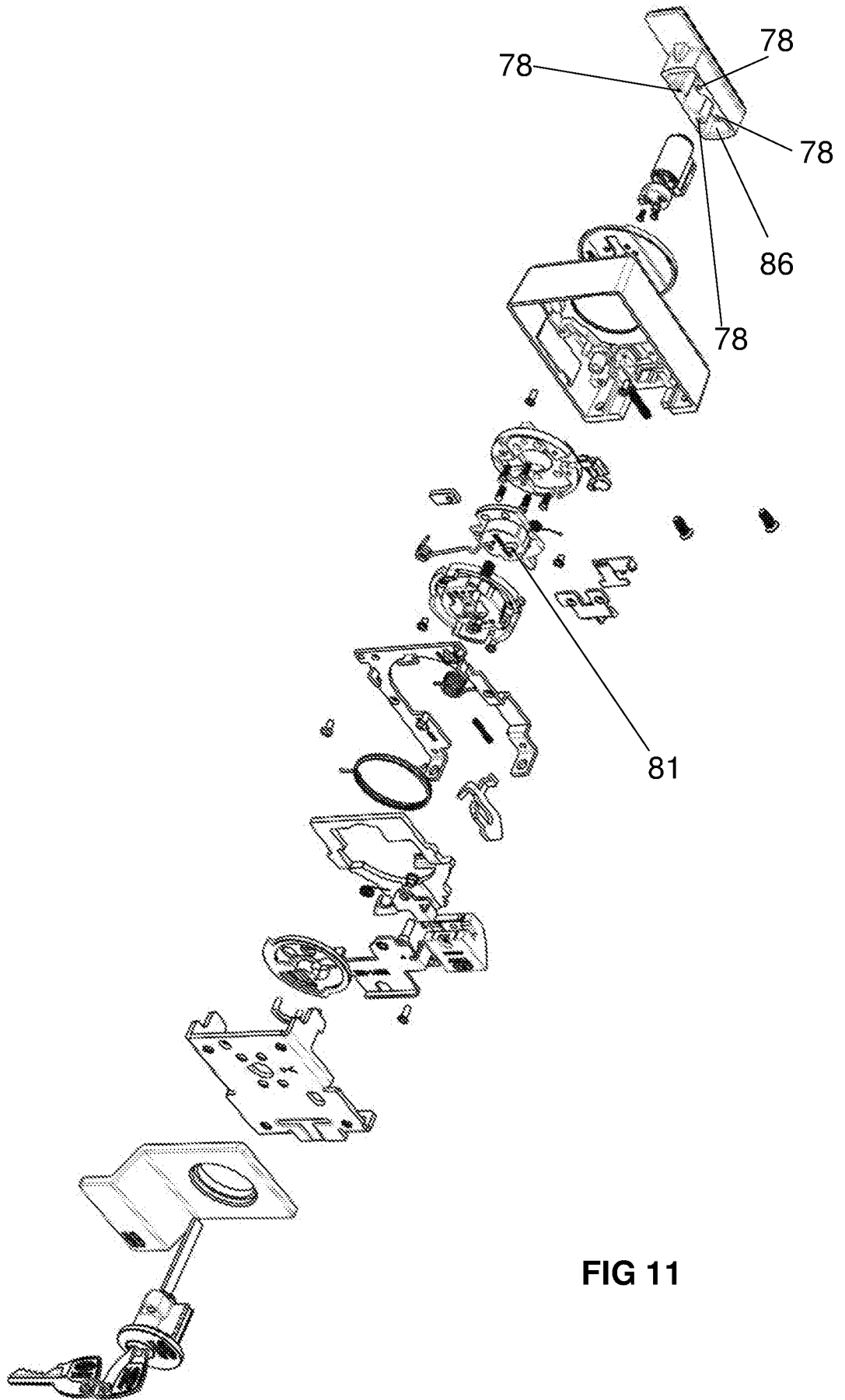


FIG 11

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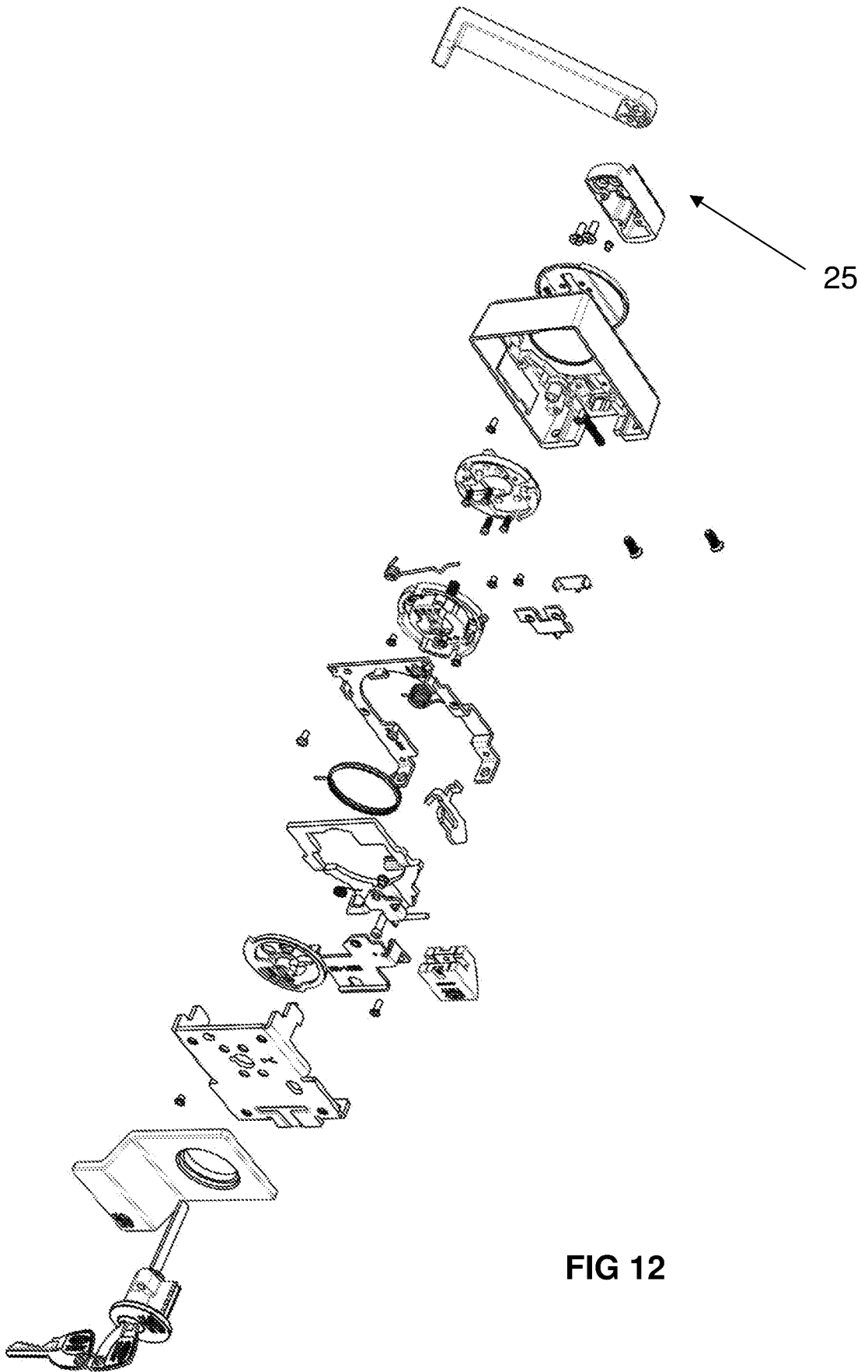


FIG 12

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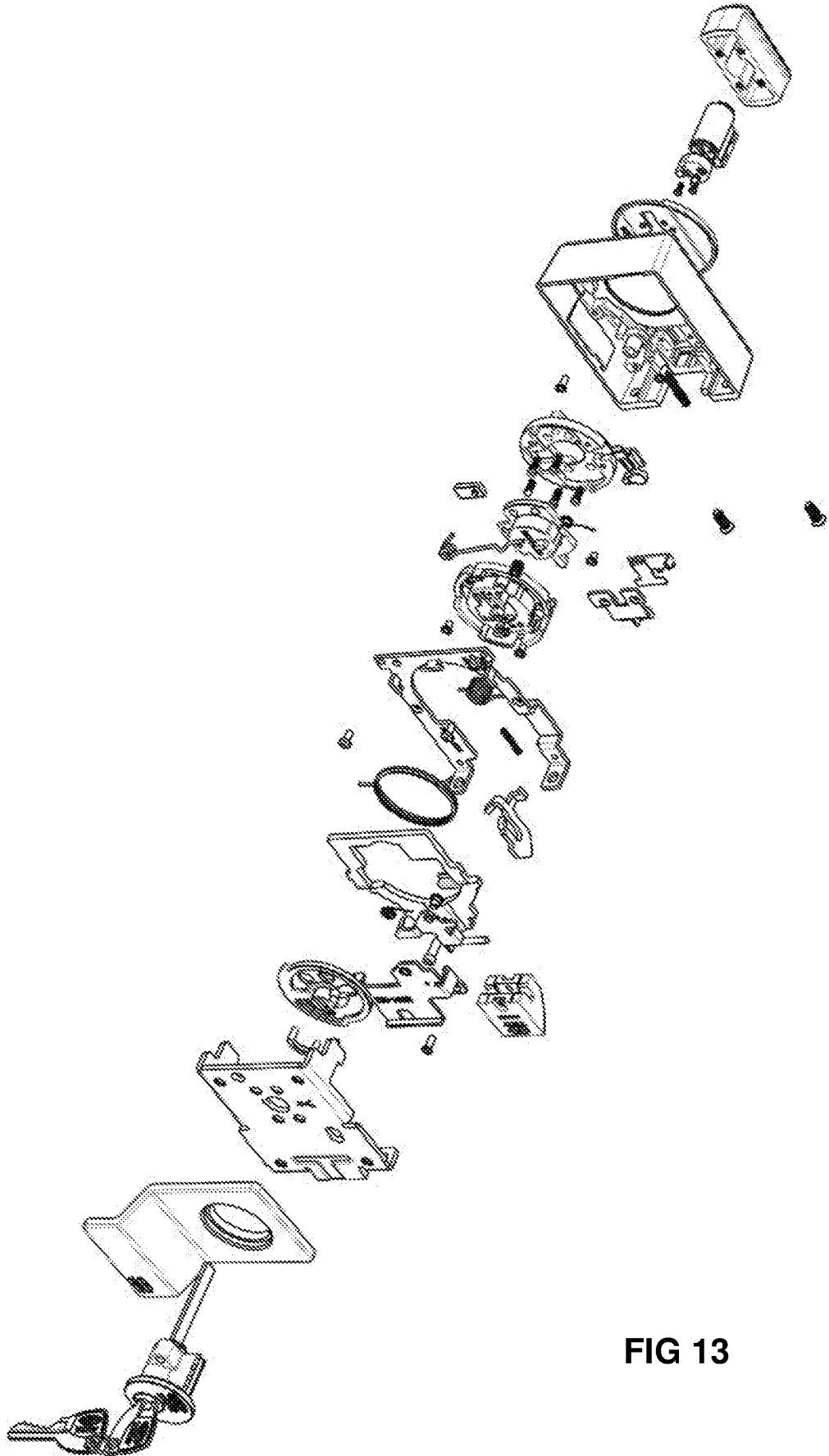


FIG 13



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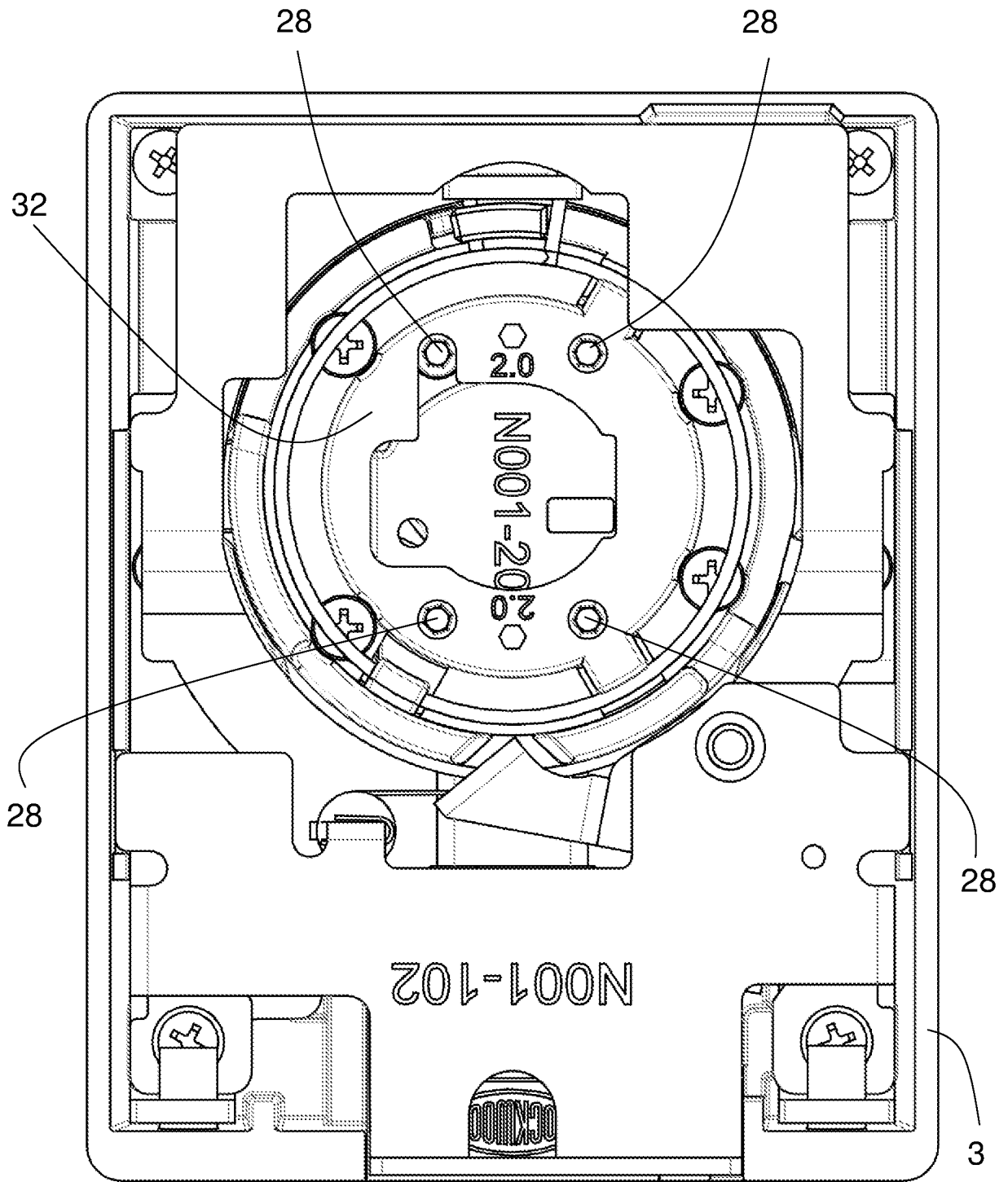
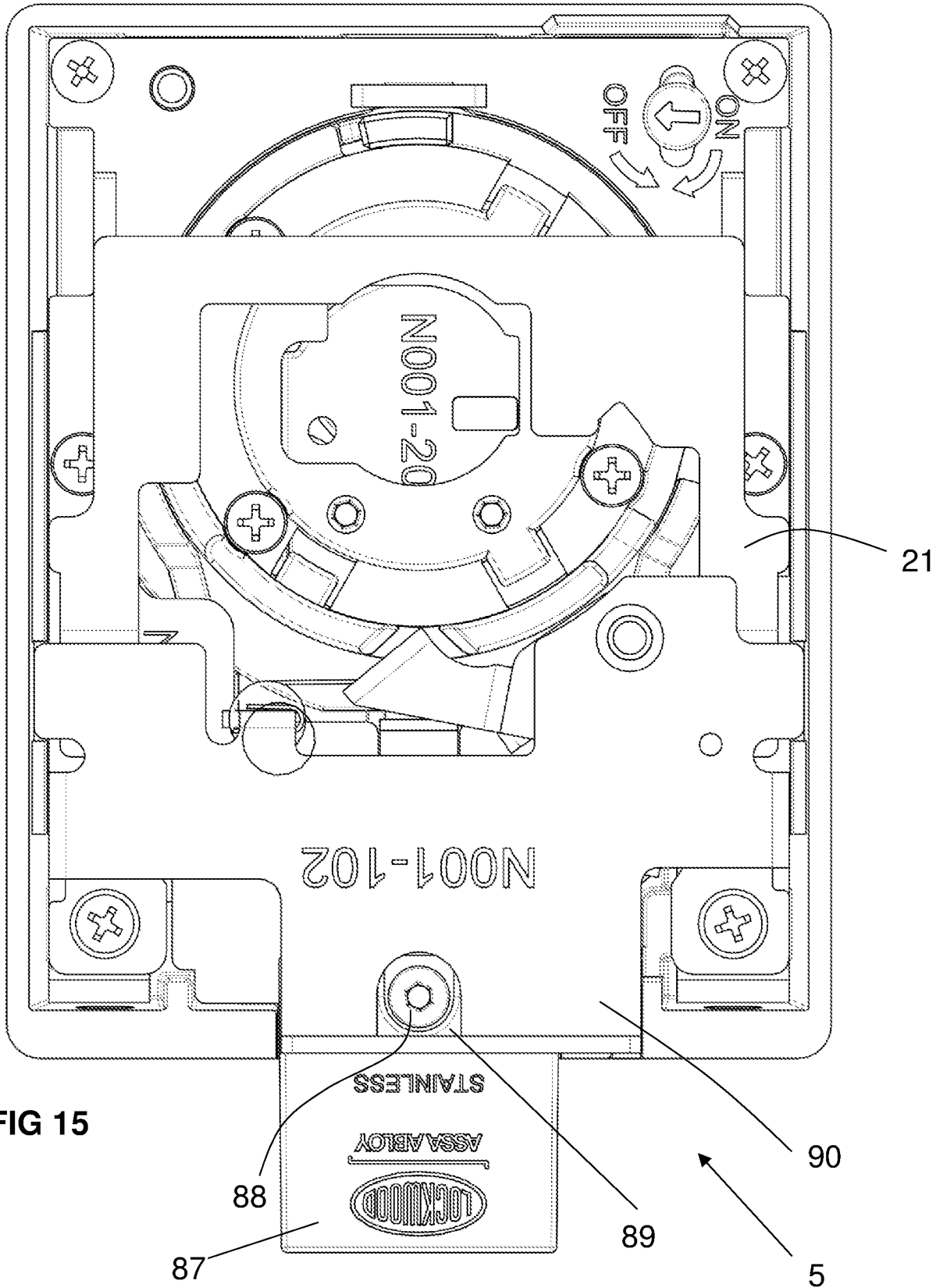


FIG 14



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