

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.10.2018 Bulletin 2018/41

(51) Int Cl.: **E05B 55/00** ^(2006.01) **E05B 15/02** ^(2006.01)

(21) Application number: **17164636.7**

(22) Date of filing: **03.04.2017**

(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
 Designated Validation States:
MA MD

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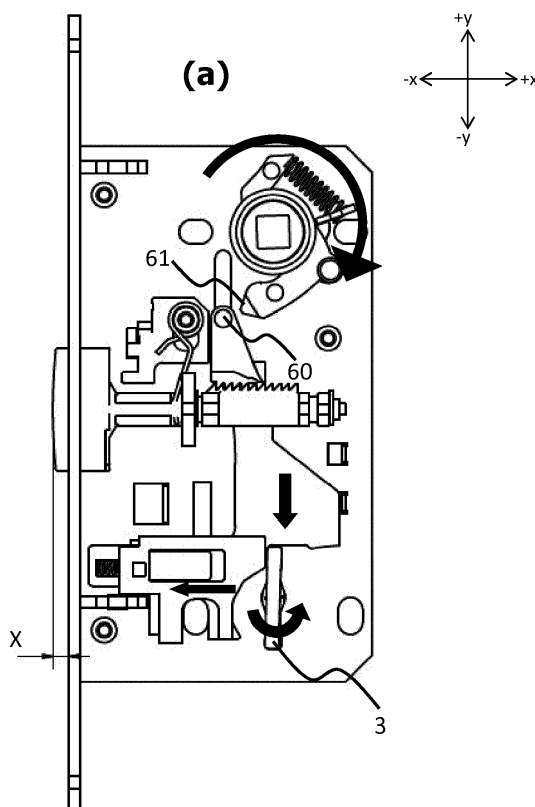
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(54) **LATCH LOCK**

(57) The present invention proposes a lock comprising a latch (50), a latch coupling element (58) provided on the latch (50), a lever (46) sized and shaped to have a movement range in a direction (+y/-y) perpendicular the movement direction (+x/-x) of the latch: the lever (46)

comprising a lever coupling element (63) sized and shaped to delimit movement of the latch (50) by coupling with a latch coupling element (58) on the latch at a locking position.



Description

Technical Field of the Invention

[0001] The present invention relates to a lock, more particularly to a lock which is locked over its latch.

Background of the Invention

[0002] Relation of a commonly used lock with a door wing and frame is exemplified in Fig. 17. As depicted in this example, the present door locks (4) includes both of the latch and bolt elements for closing and locking of the door (19). Therefore the sizes of locks (4) are big and this corresponds to high production, storage and transportation costs. Furthermore the locking and closing necessitate cavities (12 and 13) to cooperate with latch and bolt, respectively. In some other known locks, the lock does not include a bolt but only a latch. In such locks, the latch can only provide locking when it is fully extracted from the lock body, and therefore they require a latch cavity (12) formed in the frame.

[0003] Since the formation of these cavities requires precision, it causes economic losses related to time and labor in preparation of frames (8). In some cases, beddings made of plastics are used to cover these cavities (12 and/or 13) formed on the frame for latch and/or bolt, to improve the aesthetics or to provide an enhanced bedding to latch or bolt. This further increases the costs.

[0004] Locking of a door (19) according to the known state of the art, the latch should reach out of the lock body to its full extent. According to the lever rule, the farther the latch reaches out of the lock body, the higher gets the moment applied onto the latch. This corresponds to a decreased economic life of the lock.

[0005] In the present state of the art, a latch bolt plate (9) is mounted onto a frame (8) using 3 or more screws. Assembly costs increase with the sum of the labor costs for screwing down each of said screws, and with the material costs of the screw.

[0006] Starting from all the above mentioned issues, it is well understood that developing a lock is necessary, which does not necessitate any cavity on door frame.

Objects of the Invention

[0007] The main object of the present invention is provision of a solution to the above-mentioned drawbacks encountered in the state of the art.

[0008] Another object of the present invention is provision of a lock which enables locking without necessitating any cavity on the door frame.

[0009] A further object of the present invention is provision of a lock which enables locking over its latch without necessitating a bolt.

[0010] A further object of the present invention is provision of an adaptive lock which enables locking in different wing-frame gap distances by the latch extending

our to different distances away from the lock body.

Brief Description of the Invention

[0011] The present invention proposes a lock comprising a latch, a latch coupling element provided on the latch, a lever sized and shaped to have a movement range in a direction (+y/-y) perpendicular the movement direction (+x/-x) of the latch; the lever comprising a lever coupling element sized and shaped to delimit movement of the latch by coupling with a latch coupling element on the latch at a locking position.

Brief Description of the Figures

[0012] The figures, whose brief explanations are herewith provided, are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is to be interpreted in the absence of the description.

Figure 1 is a partial exploded view showing the positioning of the lock according to the present invention in an exemplary door.

Figure 2 is a perspective view of an exemplary latch bolt plate suitable for use with the lock according to the present invention.

Figure 3 is a perspective view of a lock according to the present invention.

Figure 4 is a front view exemplifying the relative positioning of the parts of a lock according to the present invention.

Figure 5 is an exemplary exploded view of a lock according to the present invention.

Figure 6 (a) is a front view showing the retraction direction of latch upon turning of the handle, and (b) resulting retracted state of the latch in a lock according to the present invention.

Figure 7 is a front view showing the distance remaining between a door suitable to be provided with the lock according to the present invention, and the respective door frame.

Figure 8-1 shows, in a state where the latch is extended to a distance X outside the lock body of a lock according to the present invention, (a) front detail view exemplifying movement of the tumbler relative to the lever, and (b) front detail view exemplifying the momentary relative position of the tumbler protrusion at passing from a first side to a second side of a tab by transcending it.

Figure 8-2 shows, in the lock shown in the Figure 8-1, at a state where the latch is extended to a distance X outside the lock body, (a) front view exemplifying the locking over the latch by means of coupling between the coupling elements on the lever and the latch, by movement of the tumbler relative to the lever and by movement of the lever relative to the lock body as a result of turning the key in a locking direction, and (b) front view exemplifying the position providing the locking by coupling between the tumbler protrusion and a (second) side of the tab on the lock body.

Figure 8-3 shows, in the lock shown in the Figure 8-1 and Fig. 8-2, at a state where the latch is extended to a distance Y different than the distance X outside the lock body,

(a) detail view showing that the locking over the latch is still available by coupling between corresponding coupling elements provided on the lever and the latch, as a result of a movement of the tumbler relative to the lever and a movement of the lever relative to the lock body upon turning of the key in the locking direction, and (b) for the same state, a front view exemplifying the position which provides locking by coupling between the tumbler protrusion and a (second) side of the tab provided on the lock body.

Figure 9 shows (a) a detailed front view exemplifying the retraction movement of the latch into the lock body in accordance with movement of the lever upon turning the key, and (b) a detailed front view exemplifying the state where the latch is thus completely retracted into the lock body, in a lock according to the present invention.

Figure 10 is a detailed front view exemplifying the movement directions of a latch at changing its directions relative to the lock body in a lock according to the present invention.

Figure 11 is a perspective view of an exemplary lever in a lock according to the present invention.

Figure 12 shows a perspective view showing details of an exemplary tumbler in a lock according to the present invention.

Figure 13 shows a perspective view showing details of an exemplary hub in a lock according to the present invention.

Figure 14 shows a perspective view showing details of an exemplary coupling member provided on a latch in a lock according to the present invention.

Figure 15 shows a perspective view showing details of an exemplary protrusion provided on an upper cover of a lock body of a lock according to the present invention.

Figure 16 (a) shows a detailed front view showing exemplary movement directions of the key and tumbler relative to the lock body prior to ending of the locked position, (b) shows a detailed front view showing uncoupled corresponding coupling members on lever and latch upon moving of the lever relative to the latch as a result of passing the tumbler over the tab by turning of the key to a limited extent in the opening direction, and (c) shows a front view showing a position where the latch retraction movement into the lock body is free, by the latch protrusion being past over the tab provided on lock body (here, the upper cover);

at transition process of a locked state where the latch extends out of the lock body to a distance Z, into an unlocked state where corresponding coupling elements provided on the lever and on the latch are separated, in a lock according to the present invention.

Figure 17 shows exploded views of (a) cavities to be formed on a frame for a lock known in state of the art, and a latch bolt plate to be aligned with those cavities, and (b) position of a state of the art lock to be coupled with the frame and latch bolt plate shown in Fig. 1 (a).

Figure 18 shows exploded view of an exemplary coupling between state of the art door and lock.

Figure 19 shows front view of an exemplary lock known in the art.

Detailed Description of the Invention

[0013] Referring to the figures mentioned above, the present invention is described below in detail. The reference numerals used in the figures correspond to the parts in the following list:

- 1 wing
- 2 handle
- 3 key
- 8 prior art frame with cavities
- 9 prior art latch bolt plate
- 10 latch bolt plate
- 12 latch cavity on prior art frame
- 13 bolt cavity on prior art frame
- 14 protrusion
- 16 screw holes
- 19 door
- 40 frame
- 41 lock

42 face plate
 43 lower cover
 44 upper cover
 45 cover pin
 46 lever
 47 lever spring
 48 tumbler
 49 tumbler spring
 50 latch
 51 latch protrusion (e.g. rear washer on the latch)
 52 front washer on the latch
 53 segment
 54 direction changing member
 55 direction changing member spring
 56 hub
 57 hub spring
 58 latch coupling element (catcher)
 59 inclined portion (inclined surface)
 60 Lever pin
 61 hub protrusion
 62 protrusion on lock body (upper cover protrusion)
 63 lever coupling element (lever teeth)
 64 tumbler protrusion (protrusion on the tumbler)
 65 latch coupling element indentation (catcher teeth)
 66 lever guide
 67 lever protrusion (or tumbler guide)
 68 tumbler spring guide
 69 tumbler spring protrusion
 70 lever spring guide
 71 hub spring protrusion
 72 lever tab
 73 a second side of the tab
 74 a first side of the tab

[0014] The lock according to the present invention includes;

- a coupling element (58) provided on a latch (50) having an essentially linear movement range in accordance with a (+x/-x) direction,
- a lever (46) shaped and sized so that it has an essentially linear movement range in accordance with a (+y/-y) direction perpendicular to the movement range of the latch (50), and
- a coupling element (63) provided on the lever (46), sized and shaped so that it couples with the coupling element (58) provided on the latch (50) at a locking position, thereby delimits the movement of the latch (50).

[0015] A preferred embodiment of the lock according to the present invention comprises

- a lock body suitable to be placed into a door wing, wherein the lock body includes an essentially flat protrusion (62) in accordance with a plane (x-y), said protrusion (62) extending in the direction -x; and
- a latch (50) arranged to reversibly extend out of the

lock body in accordance with a force exerted by a resilient member in -x direction; the movement range of the latch (50) relative to said plane (x-y) being delimited into a +x/x direction on said plane.

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[0016] A preferred embodiment of the lock according to the present invention may comprise a lever (46) under a force in direction +y exerted by a resilient member, and movement of the lever relative to the plane being delimited into a direction +y/y perpendicular to the latch movement direction. Said lever (46) may comprise a protrusion (67) extending out of said plane. The lock may further comprise a tumbler (48) which is essentially flat and essentially parallel to said plane. Here, the tumbler (48) may be under a force in direction +x exerted by a resilient member (for instance: a tumbler spring). The tumbler (48) may comprise a guide (e.g. a channel, cf. Fig. 12) having a size and shape to guide the movement of the protrusion (67) on the lever (46) and delimit relative movement on the +y/-y direction. The tumbler (48) may comprise a protrusion (64) extending out of the plane (x-y), the protrusion being sized and shaped to couple with the protrusion (62); and the lock body (for instance, on an upper cover (44) which defines a greater side of the essentially flat lock geometry, parallel to the x-y plane, and which is to protect the lock mechanism from external factors) may comprise a protrusion (62) extending towards the -x direction, said protrusion (62) being sized and shaped so that it delimits the movement of the tumbler (48) in +y/-y (i.e. +y and/or -y) when it is coupled with the protrusion (64) in a locking position.

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[0017] The latch (50) may comprise a coupling element (58); said coupling element (58) may comprise one or more indentations (65) which extend in +y/-y direction.

[0018] The lever (46) may comprise a lever guide (66) sized and shaped so that it couples with a key (3) when the key is introduced into the lock in a direction perpendicular to the x/y direction and then turned, by the key (3) at least partly entering into the lever guide (66) in a direction -x, and then guiding the lever (46) to move it in directions +y/-y. Simultaneously, the lever (46) may further comprise a tab (72) sized and shaped so that it snags the key (3) upon turning of the key into an unlocking direction in a position other than the locking position and then moves the lever (46) by pushing it in a direction +y.

[0019] The latch (50) may comprise (for instance in a secured or fixed manner) one or more latch protrusions (51) (e.g. a rear washer) extending out of x-y plane. Simultaneously, the lever (46) may comprise an inclined portion (59) shaped and sized so that it provides movement of the latch (50) in +x direction by contacting the latch protrusion (51) upon moving the lever (46) in +y direction.

[0020] The lever (46) may comprise a pin (60). Simultaneously, the lock may comprise a hub (56) sized and shaped so that it is turned by means of a handle (2); and a protrusion (61) provided on said hub (56), sized and shaped so that it moves the lever (46) in +y direction

upon snagging the pin.

[0021] Fig.6 can be inspected to better understand the manner of opening and closing of the lock (41) over the handle (2). When the handle (2) is turned in an opening direction, the hub (56) connected to the handle rotates in a direction (M) depicted with the bow-shaped arrow. As a result of this rotation, a protrusion (61) provided on the hub couples with the pin (60) provided on the lever and thus the lever (46) is moved in the direction +y. At this movement, the inclined portion (59) provided on the lever (46) couples with the latch protrusion (51) (e.g. a rear washer on the latch), and from that moment on the latch (50) gets retracted into the +x direction (into the lock body).

[0022] When the door (19) gets shut, i.e. the latch (50) couples with the latch bolt plate (e.g. by passing over a latch bolt plate protrusion (14) and getting positioned beyond that), a back portion of the latch which is essentially parallel to the x-y plane matches with the latch bolt plate, and the movement of the lock with a component perpendicular to the x-y plane gets delimited by the latch bolt plate (e.g. by the protrusion (14) provided on the latch bolt plate). Inconvenient opening of the door without retraction of the latch into the lock is thus prevented.

[0023] As exemplified in Fig.7, the distance between the lock body or door wing (1) and the frame (40) (gap distance) when a door (19) is in a closed state, is not the same and standardized for each door. Different gap distances for various frame-wing couples are exemplified in drawings of the present application as X, Y and Z. The lock according to the present invention provides functionality notwithstanding the presence or depth of bolt cavity on frame, by being easily adaptable to frame-wing couples with different gap distances.

[0024] Figure 8-1, in a lock according to the present invention where the latch is extended out of the lock body to a distance X, exemplifies (a) detailed front view of the movement of the tumbler relative to the lever and the movement of the lever relative to the lock body, and (b) for the same case, a momentary position of the protrusion provided on the tumbler relative to the tab provided on the lock body when the protrusion passes over the tab thereby passing from a second side to a first side of the tab.

[0025] In a state where the door (19) is not coupled with the frame (40) (i.e. when the door is open), the latch (50) is in a state of maximum extension out of the lock body in accordance with a force exerted onto it by a resilient member. When the door (19) is coupled with the frame (40), the latch (50) can be partially pushed into the lock body (in direction +x) so that the extension of the latch (50) out of the lock body is delimited to the gap distance between the wing and frame (here: X). When the key (3) is turned in a locking direction (e.g. a direction "+" depicted with the bow-shaped arrow in Figure 8-1), the tumbler (48) gets moved to an extent where the protrusion (64) provided on the tumbler passes over the protrusion (62) provided on the lock body by pushing the

tumbler into -x direction e.g. against a spring force. At a stage of this turn, the key (66) couples with the lever guide (66) and moves the lever (along with the tumbler (48) by pulling it in -y direction.

[0026] Figure 8-2 shows, in the lock shown in the Figure 8-1, at a state where the latch is extended to a distance X outside the lock body, (a) detailed front view exemplifying the locking over the latch by means of coupling between the coupling elements on the lever and the latch, by movement of the tumbler relative to the lever and by movement of the lever relative to the lock body as a result of turning the key in a locking direction, and (b) front view exemplifying the position providing the locking by coupling between the tumbler protrusion and a (second) side of the tab on the lock body.

[0027] As mentioned above, the coupling element (63) provided on the lever couples with the coupling element (65) provided on the latch as a result of the movement of the lever (along with the tumbler (48)) by pulling it in -y direction; by further turning the key, the coupling between the key (3) and the lever guide (66) can discontinue, since the lever guide (66) can have a shape and size to provide such discontinuation. In such case, the tumbler (48) gets released from the key (3) and moves in the +x direction in accordance with a force (e.g. which is exerted by a tumbler spring (49)); thereby it remains caught at a first side (74) of the protrusion (62) provided on the lock body, which has a shape and size to prevent motion (of the tumbler along with the lever) in +y direction (e.g. in accordance with a force exerted by a lever spring).

[0028] Figure 8-3 shows, in the lock shown in the Figure 8-1 and Figure 8-2, at a state where the latch is extended to a distance Y different than the distance X outside the lock body, (a) detail view showing that the locking over the latch is still available by coupling between corresponding coupling elements provided on the lever and the latch, as a result of a movement of the tumbler relative to the lever and a movement of the lever relative to the lock body upon turning of the key in the locking direction, and (b) for the same state, a front view exemplifying the position which provides locking by coupling between the tumbler protrusion and a (second) side of the tab provided on the lock body.

[0029] As mentioned above, the latch (50) is locked by the protrusion (64) provided on the tumbler being caught at a first side (74) of the protrusion (62) provided on the lock body. Preferably the lever can have a shape and size to provide that a coupling between the lever pin (60) and the hub protrusion (61) is impossible in this locked state. In this state, the hub protrusion (61) cannot couple with the lever pin (60) even when the handle (2) is turned, and therefore it cannot release the lever coupling element (63) (e.g. lever teeth) from the latch coupling element (65) (e.g. an indentation provided on the latch coupling element, or catcher teeth) because it cannot pull the lever in +y direction; and the locked state is thereby maintained. As an example, the gap distance (Y) on Fig. 8-3 is shown different than the gap distance (X) shown in Fig.

8-1 and Figure 8-2.

[0030] In order to end the locked state, the key (3) is turned in an opening direction (e.g. a "-" direction as depicted with the bow-shaped arrow in Fig.9) opposite to the locking direction. In the course of said turning movement the key (3) moves the tumbler (48) to a distance sufficient for the tumbler goes beyond the protrusion (62) provided on the lock body by pushing the tumbler in -x direction. The lever (along with the tumbler) simultaneously moves in +y direction because of the coupling between the key (3) and the lever guide (66), in accordance with said movement the lever coupling element (63) and the latch coupling element (65) diverge from each other and thus the coupling between them ends. The lever guide (66) preferably has a shape and size so that it provides ending of the coupling between that and the key at farther turning of the key; so that the key gets released from the lever guide upon ending the coupling between the lever and the latch, thereby the tumbler (48) moves in +x direction under the force (e.g. that exerted by the tumbler spring (49)) upon ending of the coupling between the lever and the latch. Due to this movement, the tumbler protrusion (64) gets positioned at a second side of the protrusion (62) on the lock body (e.g. on an upper cover (44)) and thus couples with the protrusion (62) in an unlocked state (Fig.16).

[0031] The lever guide (66) and the tumbler (48) can have a shape and size to provide pulling of the tumbler in -x direction when the lever guide and the key are coupled, and to further provide a simultaneous and aligned contact of the lever and tumbler with the key as a result of the ending of said coupling.

[0032] It is possible that, in the unlocked state, the latch (50) can be retracted into the lock body over the handle (2) (as exemplified in Fig. 6), and independent from this, over the key (3) (as exemplified in Fig.9). In a preferred embodiment, the retraction of the latch (50) into the lock body by moving it in +x direction over the key (3) occurs according to the following mechanism:

As the key is turned (e.g. in a "-" direction as depicted with a bow-shaped arrow in Fig. 9) it snags a lever tab (72) having a shape and size so that it couples as a result of getting snagged by the key. A coupling between the key (3) and the lever tab (72) thereby gets provided. Thus, at continuation of turning of the key, the lever (46) moves in +y direction by being pushed by the key. As a result of this movement, the inclined portion (59) on the lever gets into contact with the latch protrusion (51) and pushes the latch protrusion in +x direction and thereby moves the latch in +x direction. This causes retraction of the latch (50) into the lock body. When the key (3) is released, the lever (46) moves in -y direction in accordance with a force (e.g. that exerted thereonto by a lever spring (47)). The latch (50) simultaneously moves in -x direction (e.g. so that it extends out of the lock body) to a finite extent in accordance with a

force (e.g. that exerted thereonto by a direction changing member spring (55)). The extent of this movement is preferably defined by a contact/abutment between a front washer (52) on the latch and a direction changing member (54) provided on the lock body.

[0033] In a preferred embodiment according to the present invention, the aspect of the back side of the latch (50) relative to the lock body can be changed as exemplified in Fig. 10). The direction changing member (54) defining one of the movement range limits (the limit closer to the outside of the lock body, or closer to the latch head) of the latch relative to the lock body by being provided on the lock body and by contacting the latch, gets moved, e.g. manually, e.g. from the outside of the lock body, away from the latch (e.g. by pulling in +y direction). As a result, contact between the latch and the direction changing member ends, and the respective limit of the movement range of the latch defined by the direction changing member is removed. The latch is preferably under an effect of a force exerted thereon by a resilient member (direction changing member spring (55)) in a direction outwards from the lock body (-x direction). Once the movement range limit of the latch outwards the latch body is removed, the latch can be pulled out from the lock body, or alternatively the latch protrudes out of the lock body in accordance with said force by resilient member. By turning the latch around its movement axis (e.g. 180°) and then pushing it back into the lock body, the direction changing member moves in -y direction so that it recouples with the latch by getting into the former position relative to the latch, and thereby limiting the movement range of the latch again. Thus, direction of the latch relative to the lock body can be changed.

[0034] The lock (41) according to the present invention can be put into use in case where a latch cavity and a latch bolt plate on that is already present on a door frame, by aligning the lock to said latch cavity and latch bolt plate. Alternatively, the lock (41) according to the present invention can be utilized by coupling it with a latch bolt plate (810) suitable to function therewith by including a protrusion (14), so that it does not necessitate formation of a latch cavity on the frame. Said protrusion (14) can have a shape and size to delimit the movement of the latch (50) by opposing a back portion thereof which is essentially parallel to the x-y plane in a state where the door (19) is closed. Thereby it provides sufficient surface area to prevent inappropriate opening of the door merely by pulling/pushing of the door wing. The use of a latch cavity-free, lean and low cost door frame (40) as exemplified in Fig.1 is thus enabled.

[0035] The way of montage can be easily adapted to the opening direction of the door wing thanks to that the latch bolt plate (10) has a basic (e.g. symmetrical) form as exemplified in Fig.2.

[0036] The lock (41) according to the present invention can function with a latch bolt plate (10) which does not

necessitate a cavity on the frame by including a protrusion (14) as exemplified in Fig.1. Labor on both the wing (1) and the frame (40) is thereby facilitated and related costs are minimized.

[0037] Labor and production time related costs are minimized since any cavity is no more required on the frame (40) to face the latch (50).

[0038] Since the lock (41) according to the present invention eliminates the necessity to a bolt, it is no more necessary to form a bolt cavity (13) as exemplified in Fig. 17 in frame (40) production. This eliminates time losses related to cavity (12,13) position determination and formation at production of frame (40), and thereby the present invention further provides advantages in labor costs.

[0039] Furthermore, elimination of the need to cavity formation on the frame provides elimination of formation of burrs, thus burr-related problems in use (bedding problems, burr/splinter cuts) and on aesthetics do not arise. Therefore the requirement of use of plastics bedding for covering the cavity, and related costs are also eliminated.

[0040] With the lock according to the present invention, the latch bolt plate (10) suitable to be used without forming a cavity on the frame can be formed monolithic and can be mounted over only a couple of screw holes (16) as exemplified in Fig.2. The production, storage and transport costs of the latch bolt plate can be kept at minimum, and also it can be mounted in an easy and rapid fashion.

[0041] Use of a bolt is no more required for locking the door (19) since the lock (14) can provide locking in any gap distance (X) as exemplified in Fig.7. The lock (41) can thereby have compact dimensions, and thus, related material, storage and transport costs can be kept at minimum.

[0042] Since the lock (41) can provide locking at very short gap distances (X) between wing (1) and frame (40), it adapts to any type of wing-frame combinations. Montage and operation thereof is thereby very easy.

Claims

1. A lock comprising a latch (50),
a latch coupling element (58) provided on the latch (50),
a lever (46) sized and shaped to have a movement range in a direction (+y/-y) perpendicular the movement direction (+x/-x) of the latch;
the lever (46) comprising a lever coupling element (63) sized and shaped to delimit movement of the latch (50) by coupling with a latch coupling element (58) on the latch at a locking position.
2. The lock according to the claim 1, comprising a lock body to be placed into a door wing, the lock body including an essentially flat protrusion (62) in accordance with a plane (x-y), said protrusion (62) extend-

ing in the direction - x,

the lock body further comprising a latch (50) arranged to reversibly extend out of the lock body in accordance with a force exerted by a resilient member in -x direction; the movement range of the latch (50) relative to said plane (x-y) being delimited into a +x/-x direction on said plane.

3. A lock according to the claim 2, comprising a lever (46)
movement of which relative to the plane (x-y) being delimited into a direction +y/-y perpendicular to the latch movement direction, and
the lever being under a force in direction +y exerted by a resilient member, the lever (46) comprising a protrusion (67) extending out of the plane (x-y), the lock further comprising a tumbler (48) which is essentially flat and essentially parallel to said plane; the tumbler (48):

being under a force in direction +x exerted by a resilient member,
comprising a guide having a size and shape to guide the movement of the protrusion (67) on the lever (46) and delimit relative movement on the +y/-y direction,
the tumbler (48) comprising a protrusion (64) extending out of the plane (x-y), and the lock body comprising a protrusion (62) which extends in the -x direction and which is sized and shaped to delimit motion of the tumbler (48) in the direction +y and/or -y by coupling between the protrusion (64) on the tumbler and the protrusion (62) on the lock body at a locking position.

4. The lock according to any of the claims 1 to 3, wherein the latch (50) comprises a coupling member (58) having one or more indentation (65) extending in the direction +y/-y.
5. The lock according to any of the claims 2 to 4, wherein the lever (46) comprises a lever guide (66) sized and shaped so that it couples with a key (3) when the key is introduced into the lock in a direction perpendicular to the x/y direction and then turned, by the key (3) at least partly entering into the lever guide (66) in a direction -x, and then guiding the lever (46) to move it in directions +y/-y; and
the lever further comprises a tab (72) sized and shaped so that it snags the key (3) upon turning of the key into an unlocking direction in a position other than the locking position and then moves the lever (46) by pushing it in a direction +y.
6. The lock according to any of the claims 1 to 5, further comprising a latch bolt plate (10) having a protrusion (14) sized and shaped to delimit the motion range of the latch (50) by coupling with a back portion of the

latch, said back portion being essentially parallel to the x-y plane.

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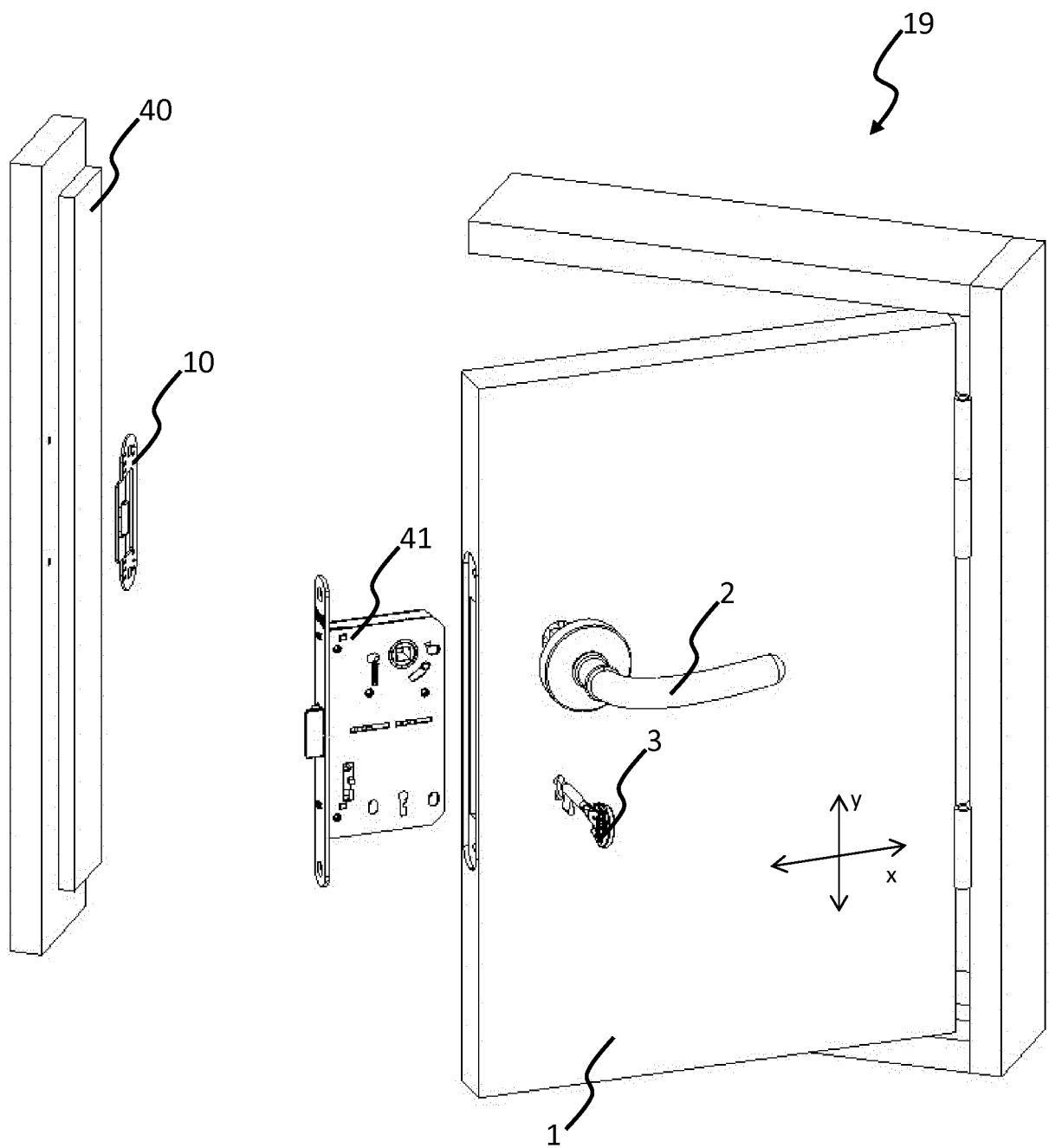


Figure 1

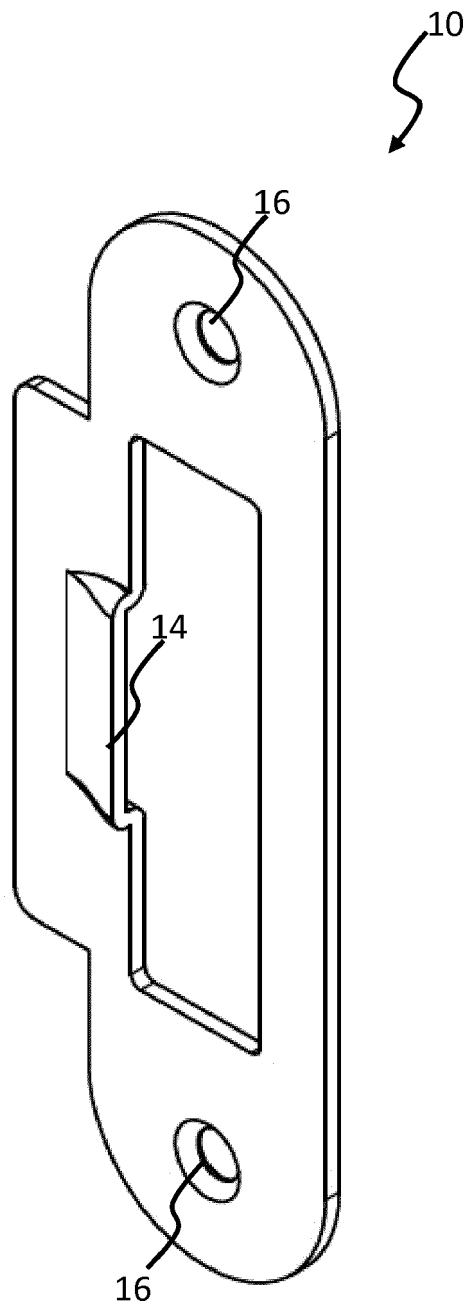


Figure 2

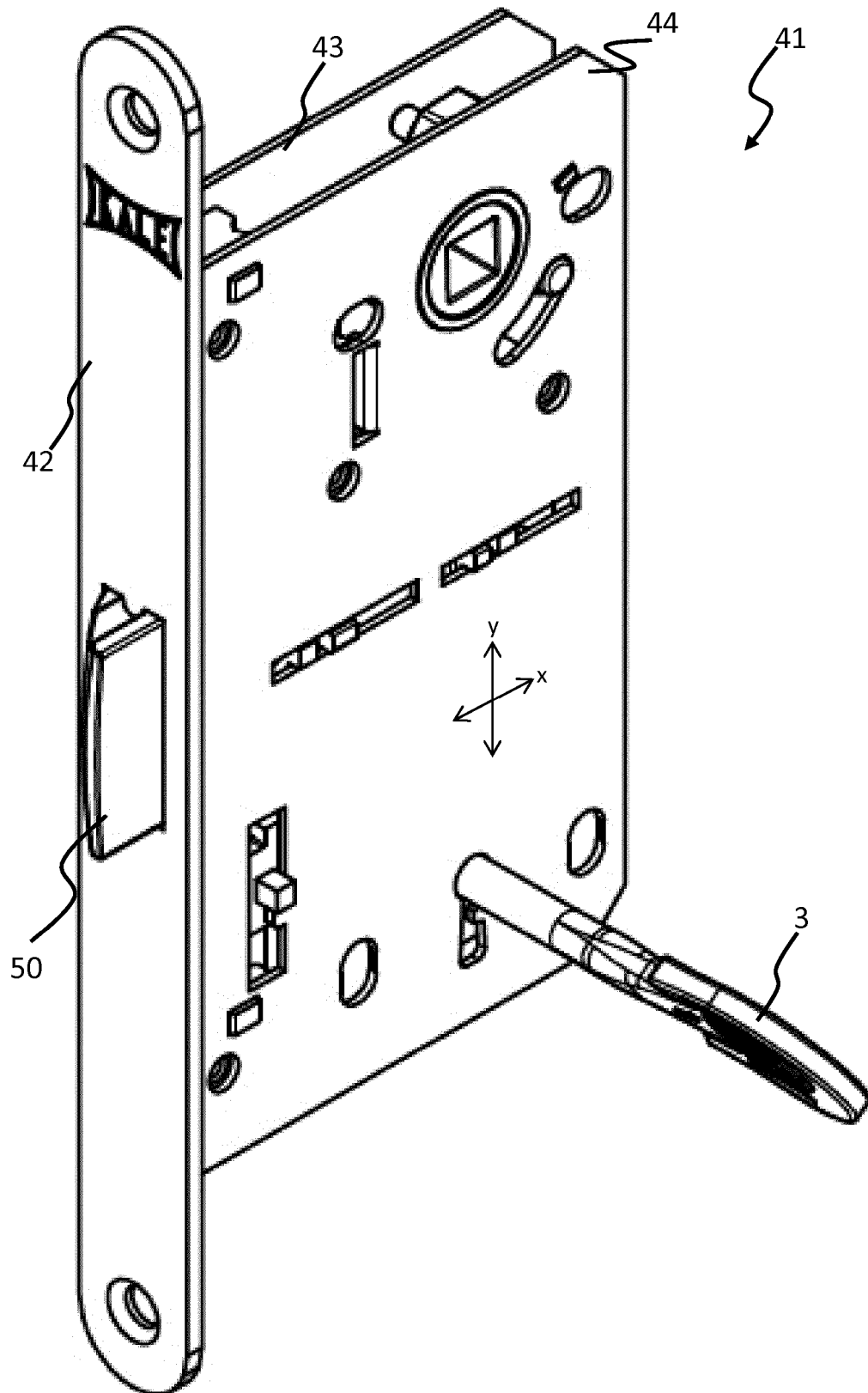


Figure 3

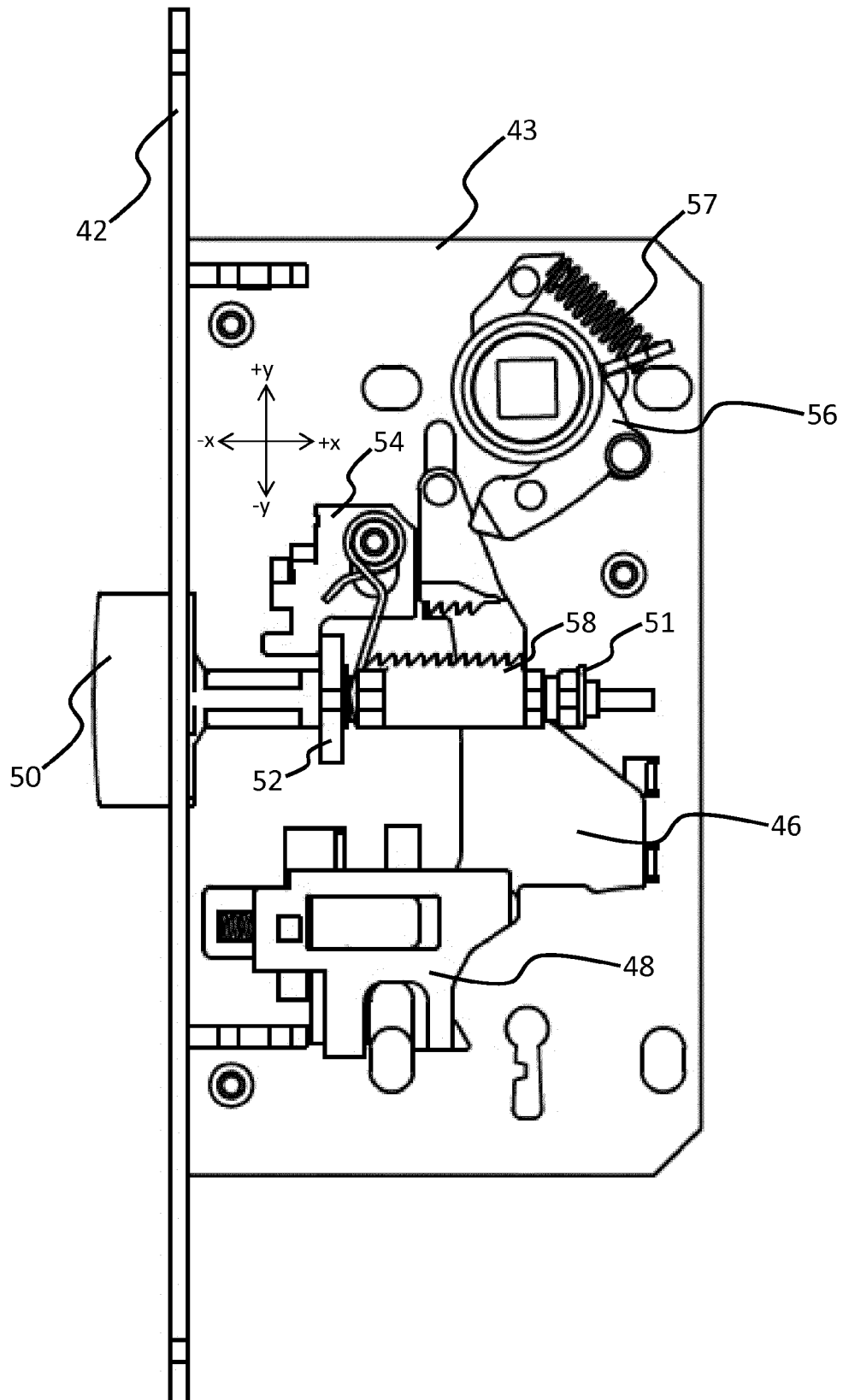


Figure 4

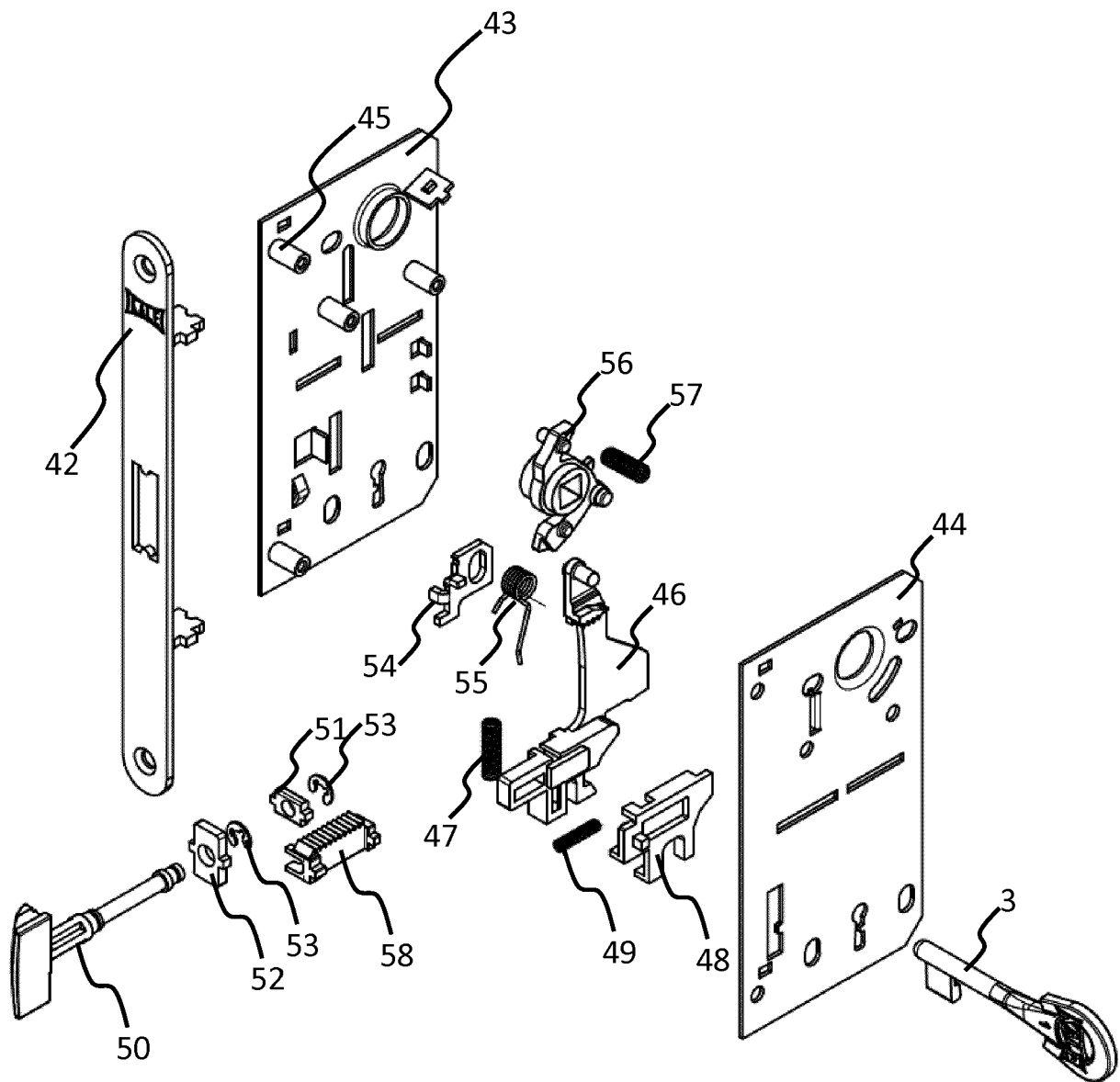
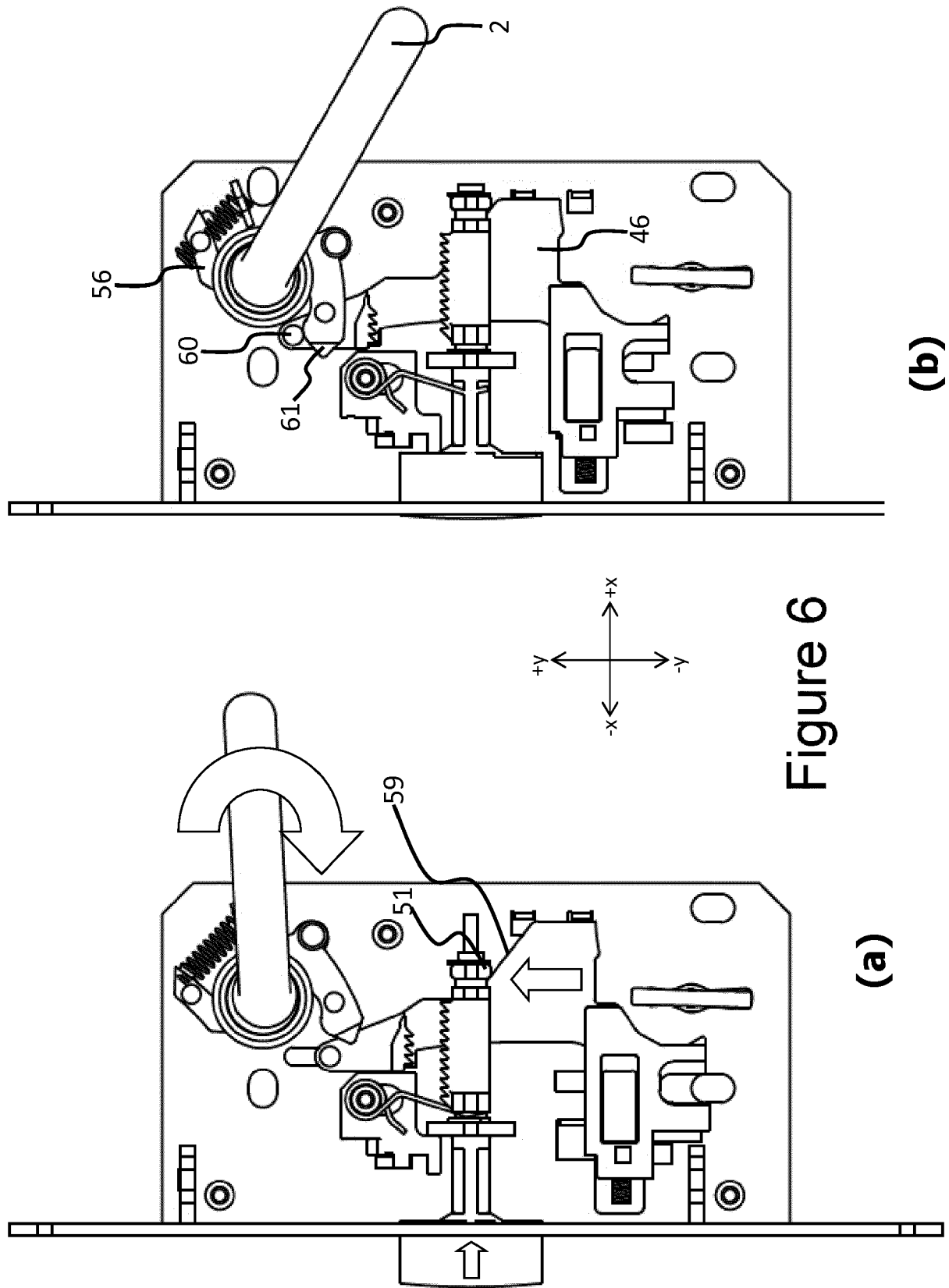


Figure 5



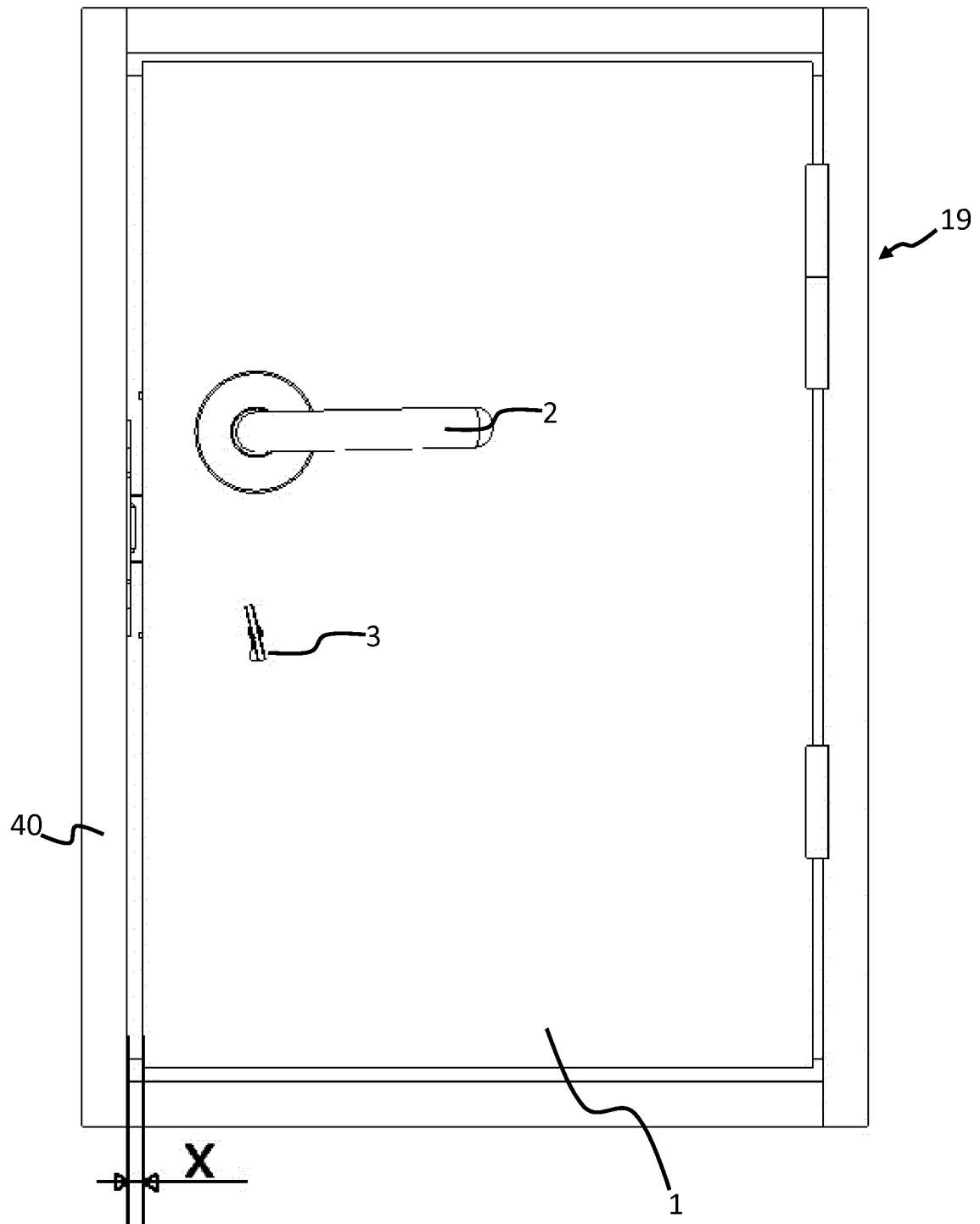


Figure 7

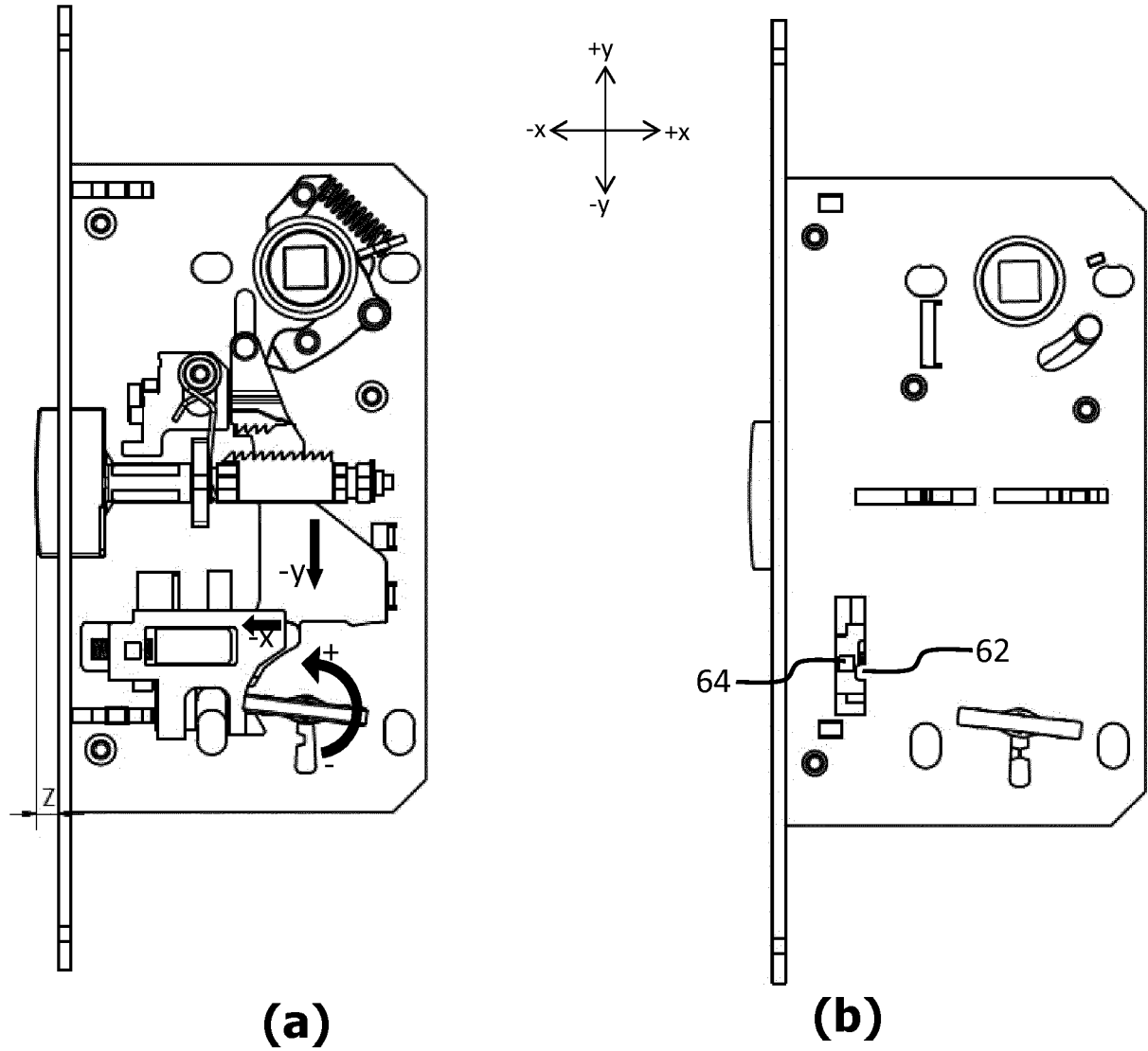


Figure 8-1

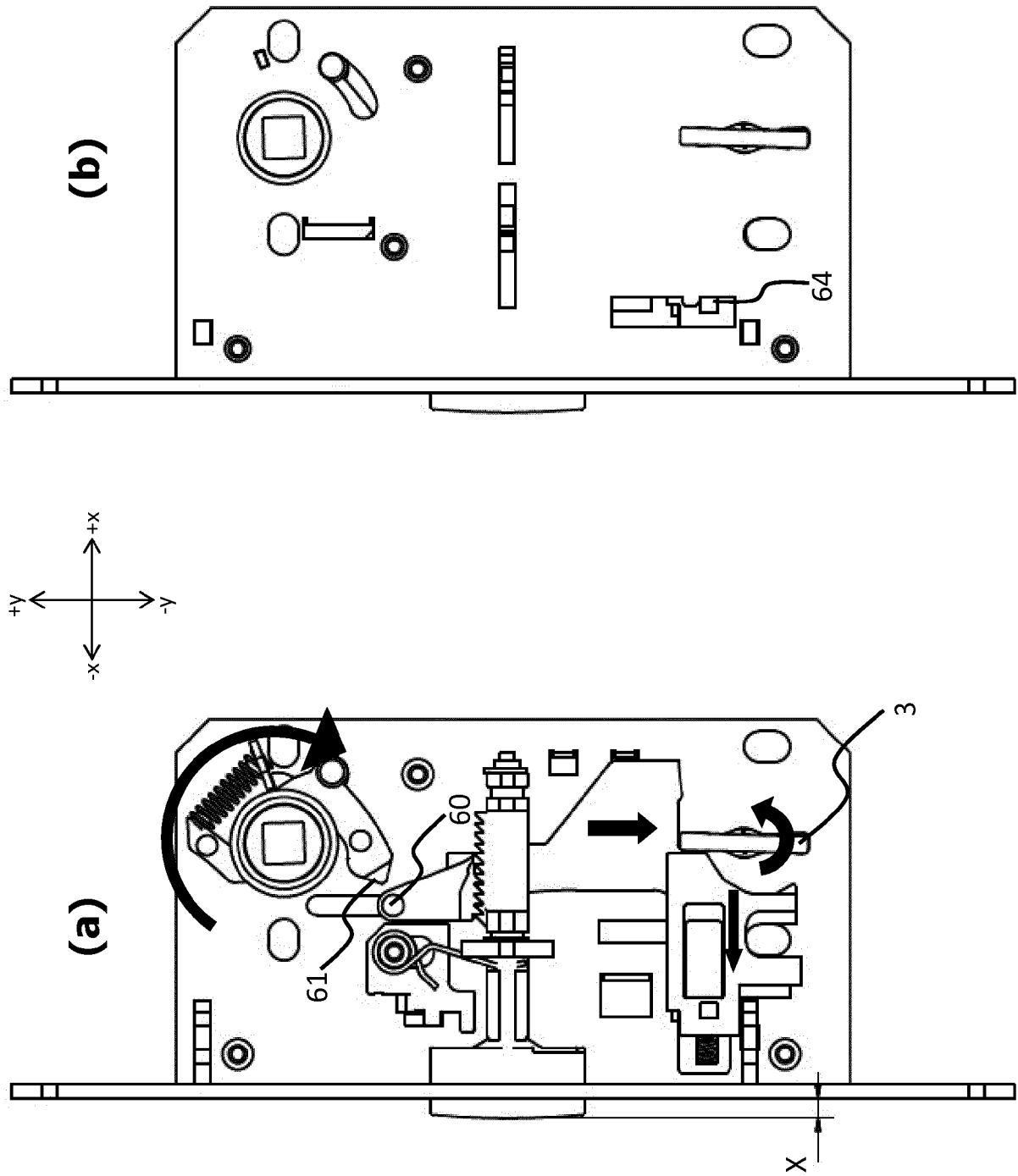


Figure 8-2

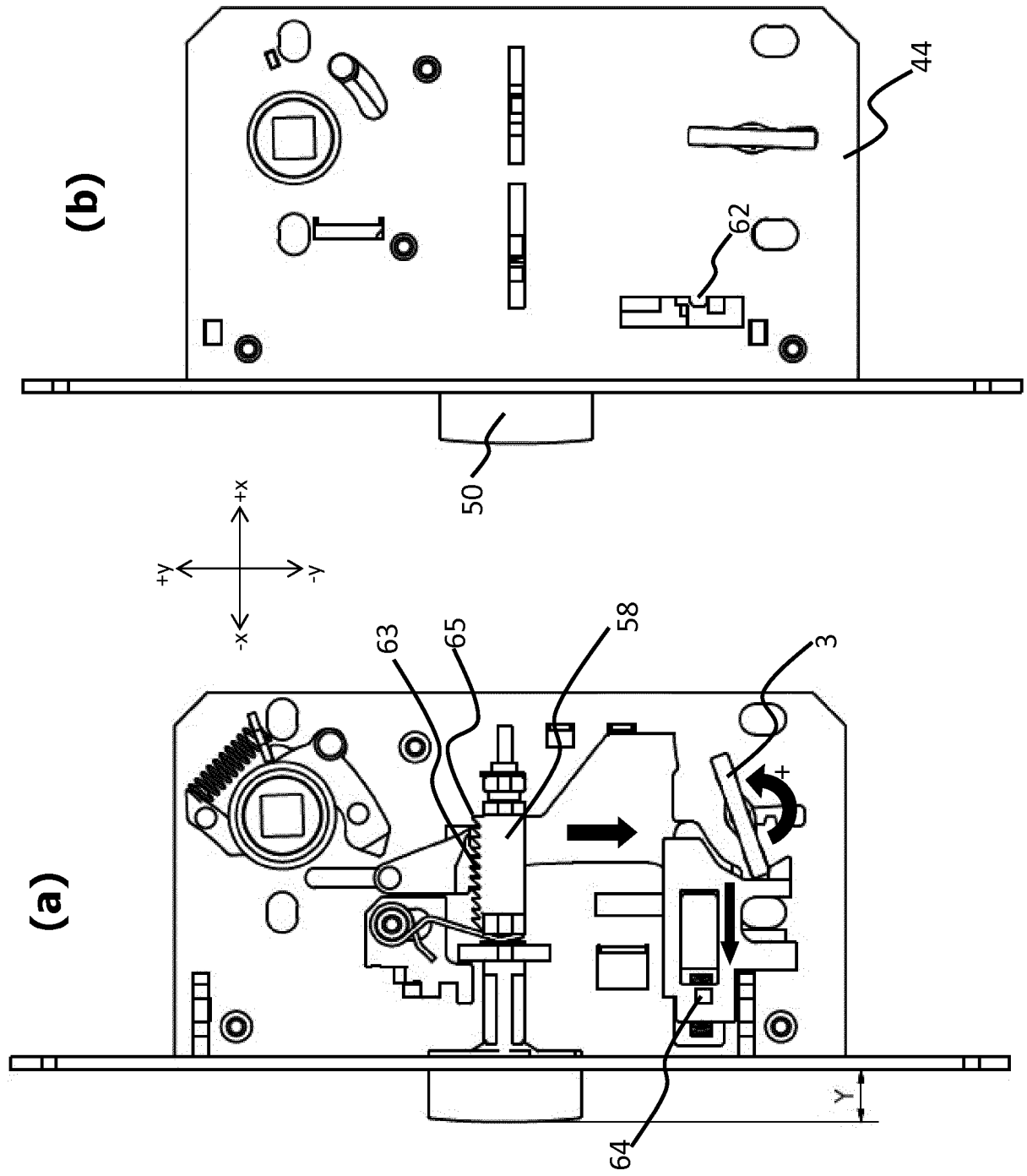


Figure 8-3

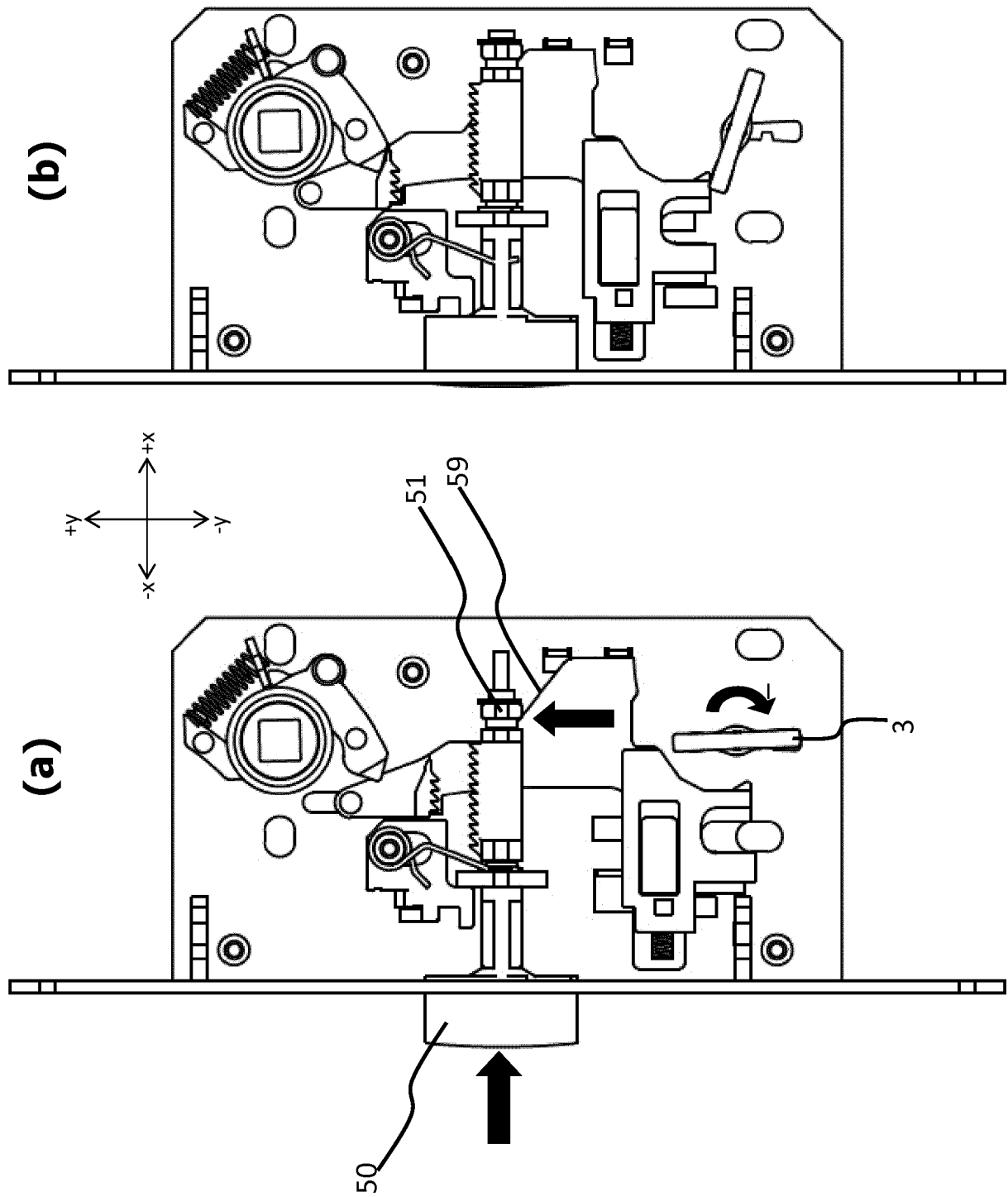


Figure 9

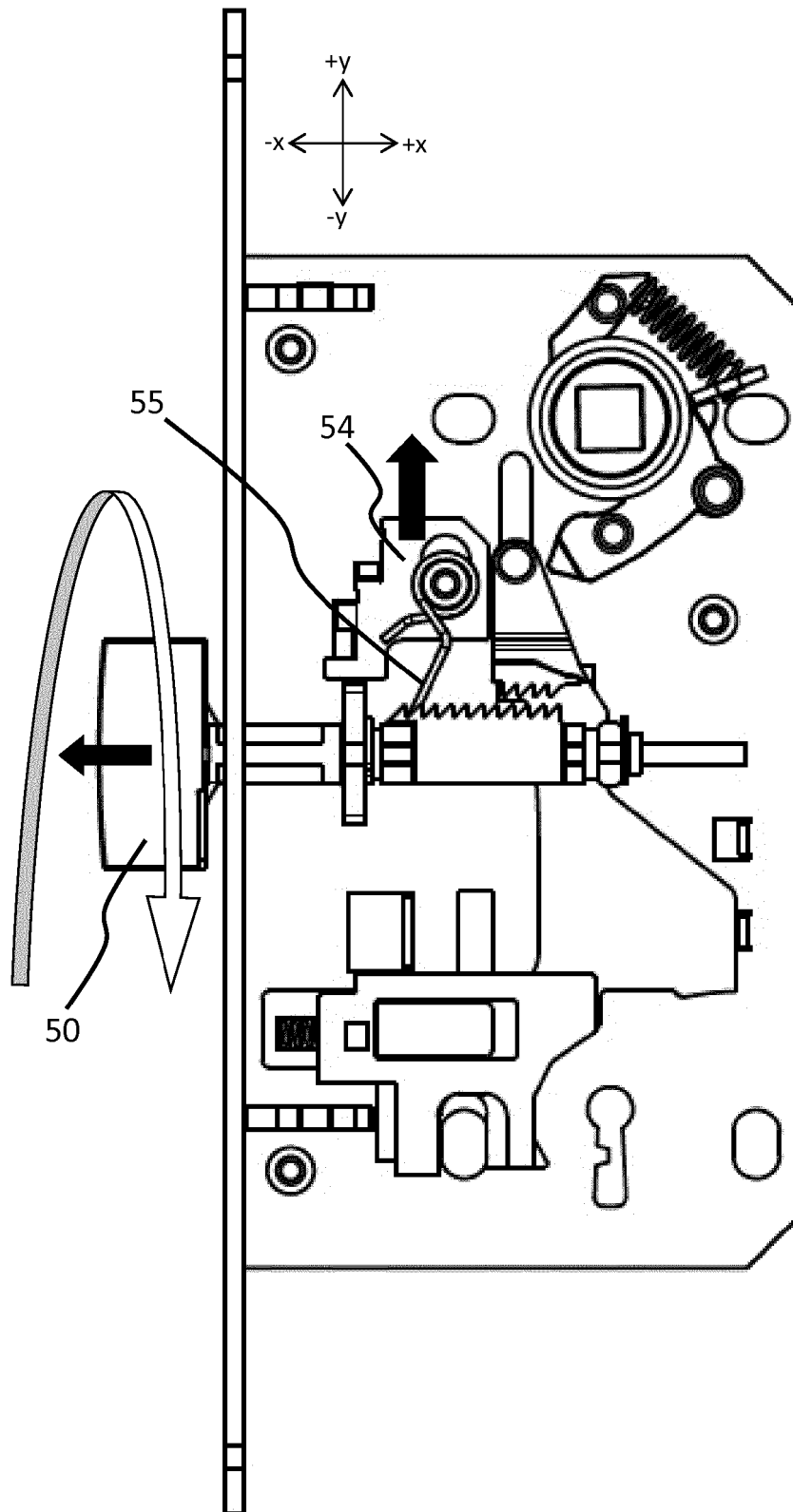


Figure 10

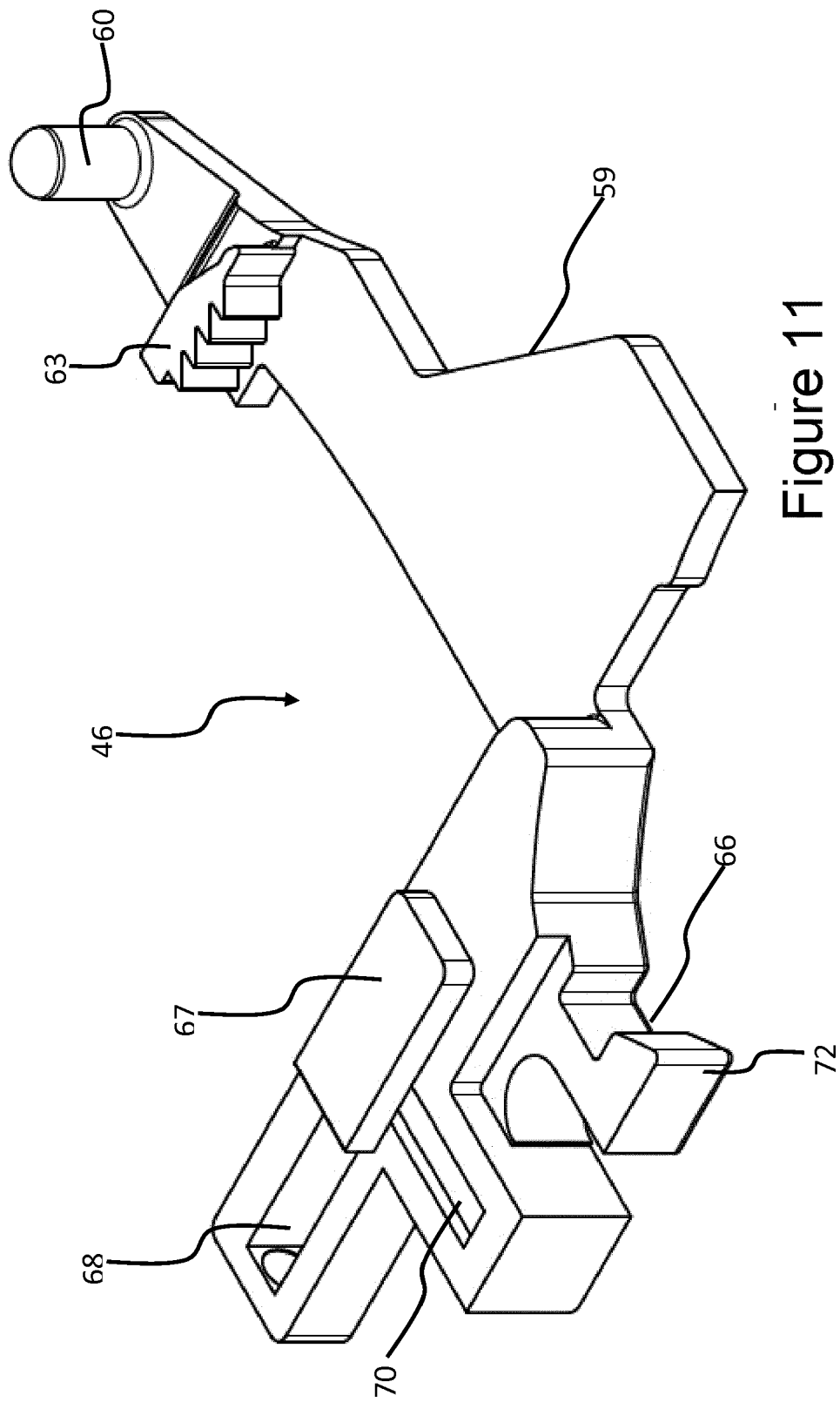


Figure 11

Figure 12

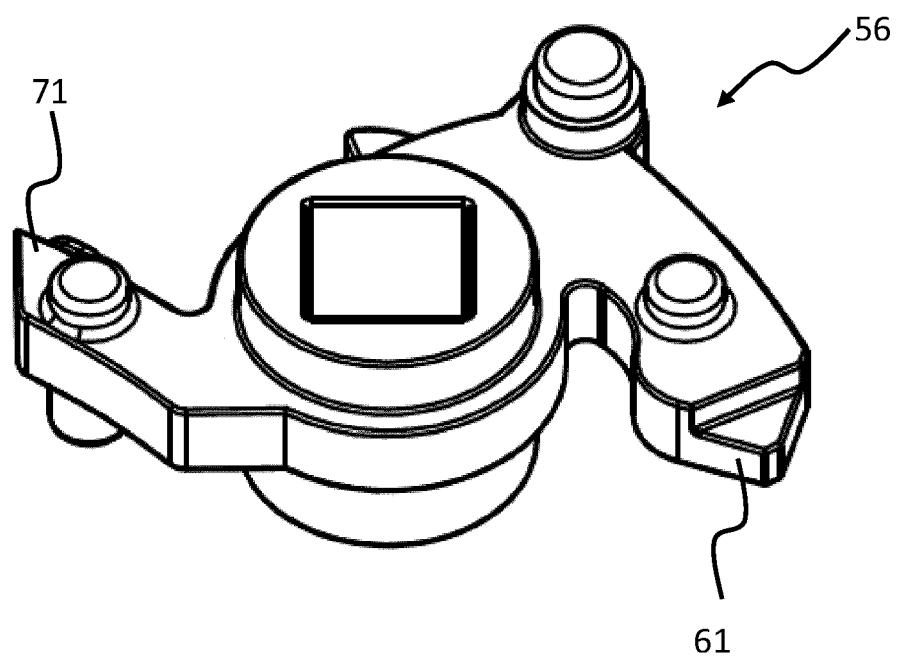
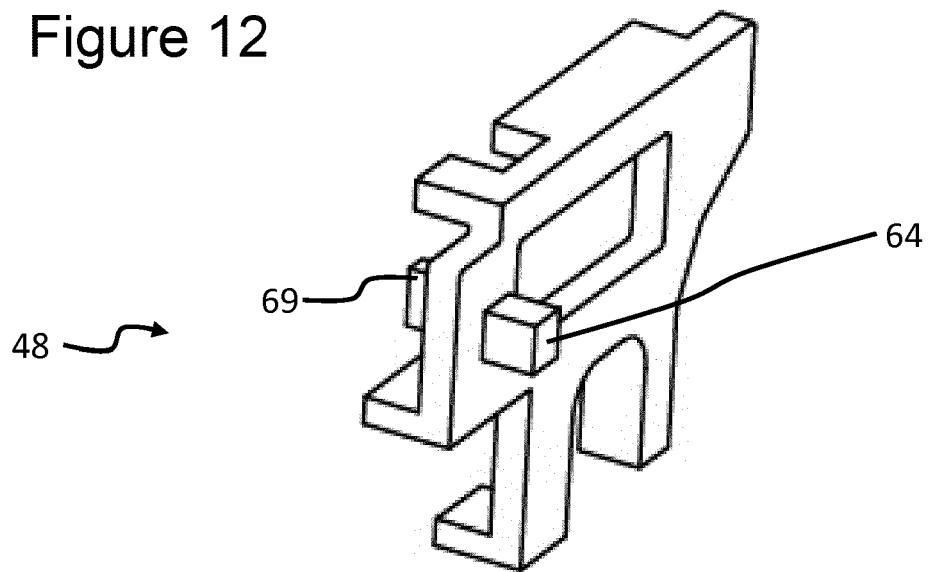


Figure 13

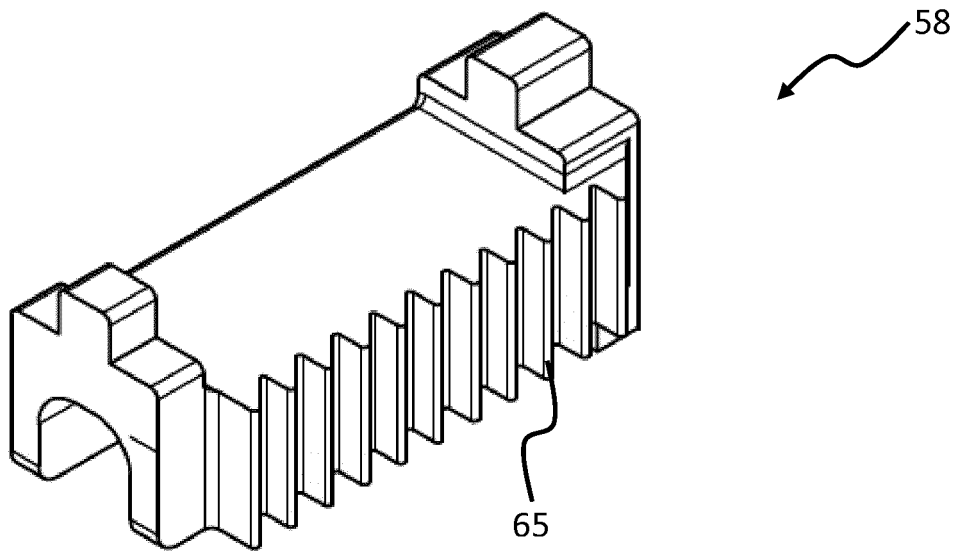


Figure 14

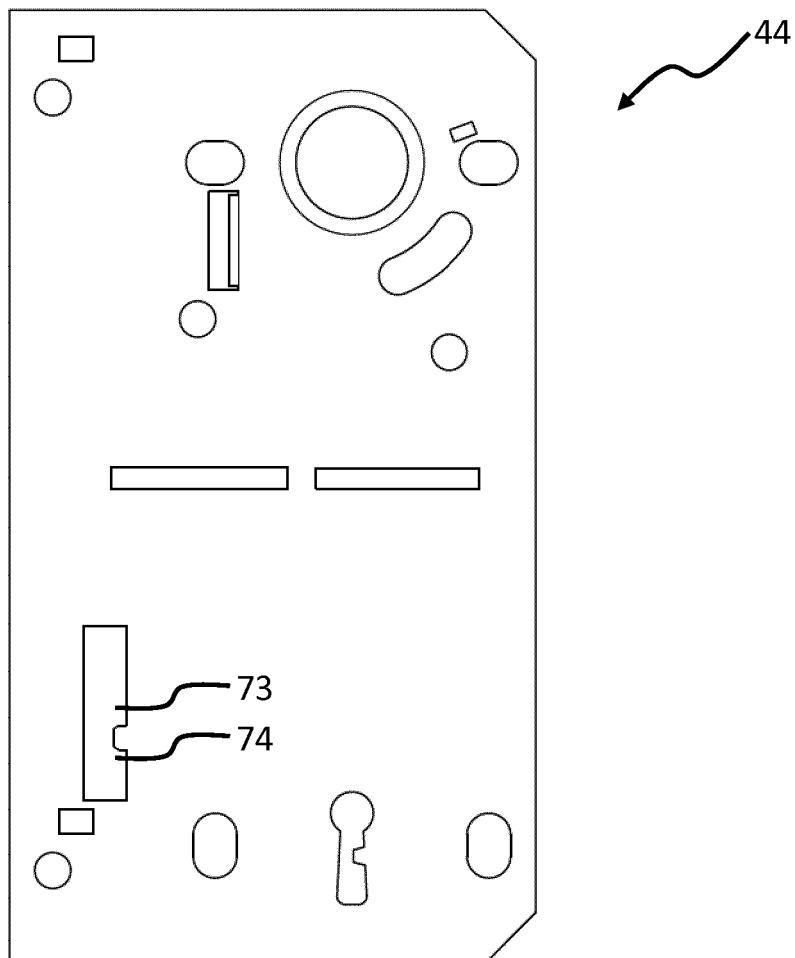


Figure 15

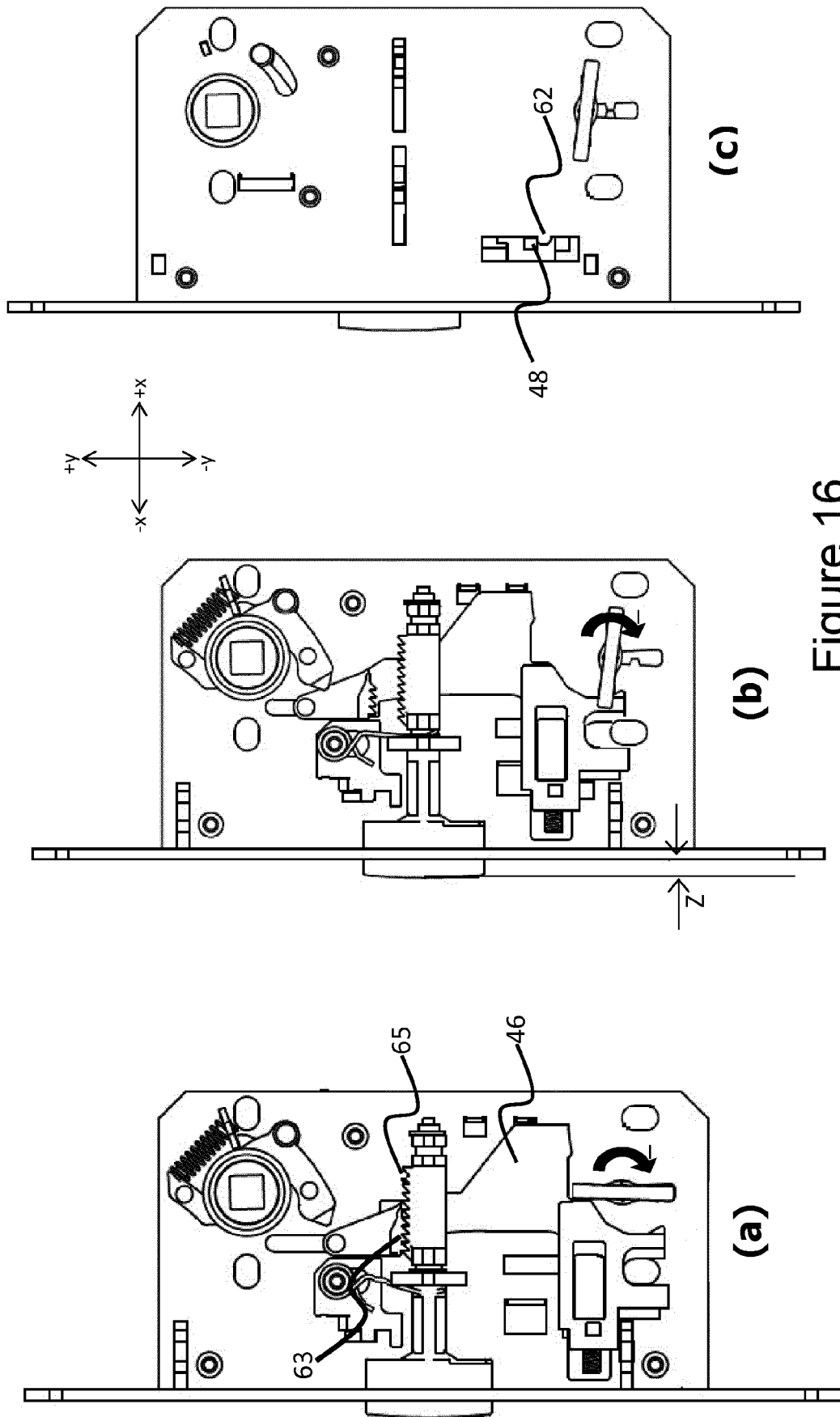


Figure 16

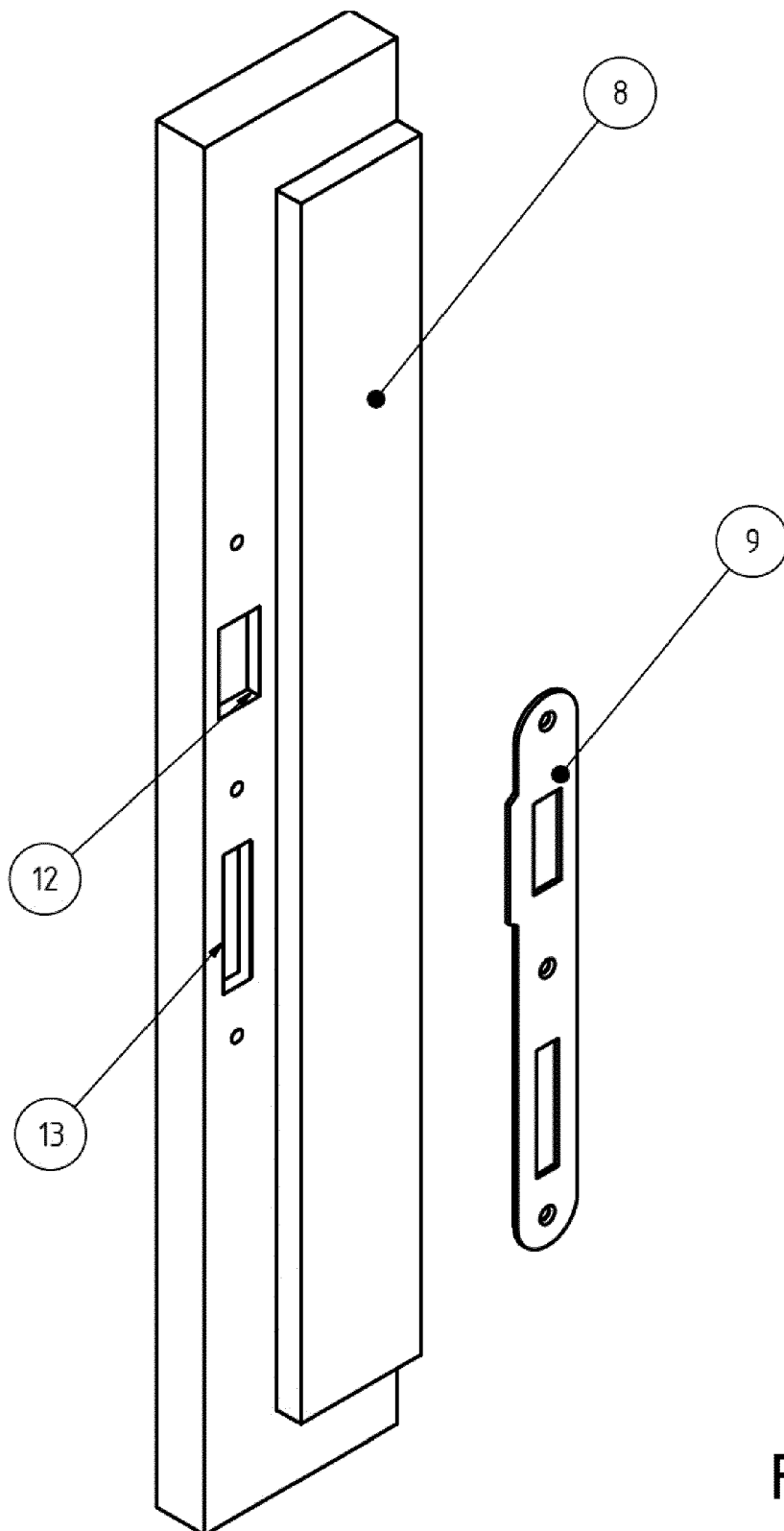


Figure 17
(Prior Art)

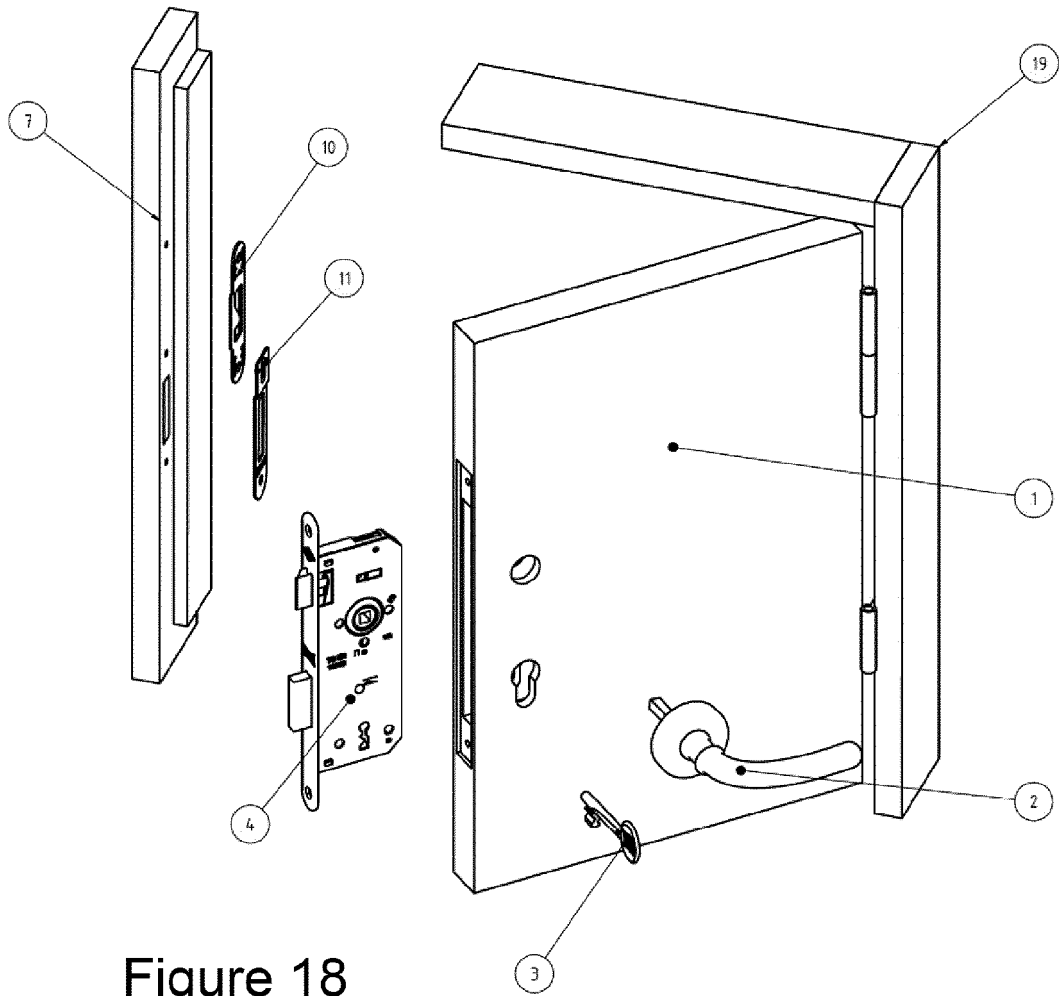


Figure 18
(Prior Art)

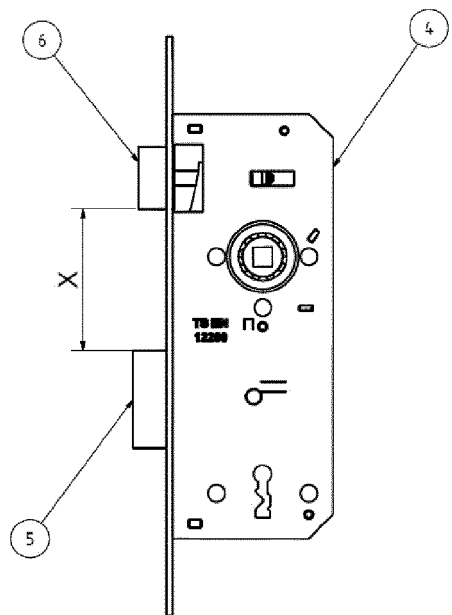


Figure 19
(Prior Art)



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)
X	US 1 560 914 A (MOORE PRESSLEY A C) 10 November 1925 (1925-11-10)	1-5	INV. E05B55/00
Y	* the whole document *	6	ADD. E05B15/02
X	US 4 286 812 A (SPREKELER OTTO G G) 1 September 1981 (1981-09-01)	1,2,4,5	
A	* the whole document *	3,6	
Y	EP 2 278 107 A2 (JELD WEN DANMARK AS [DK]) 26 January 2011 (2011-01-26)	6	
A	* figure 3a *	1-5	
			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 4 October 2017	Examiner Cruyplant, Lieve
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82