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(54) **LATCH LOCK WITH A MODIFIABLE OPENING DIRECTION**

(57) The lock (1) comprises a case (2) housing a latch (3) that is extractable through a front window (10) of the case (2), and a spring (4) for automatic extraction of the latch (3) from the window (10), the latch (3) being movable in contrast to and by action of said spring (4) between a position for extraction from the case (2) for closing the lock (1) and a position for retraction in the case (2) for opening the lock (1), the spring (4) having a configuration for engaging with the latch (3) and a configuration for disengaging from the latch (3), the case (2) having a retaining member (11) for retaining the spring (4) in the configuration for disengaging from the latch (3) for moving the latch (3) towards a position for changing the hand of the lock more rearward towards the interior of the case (2) with respect to the opening position.

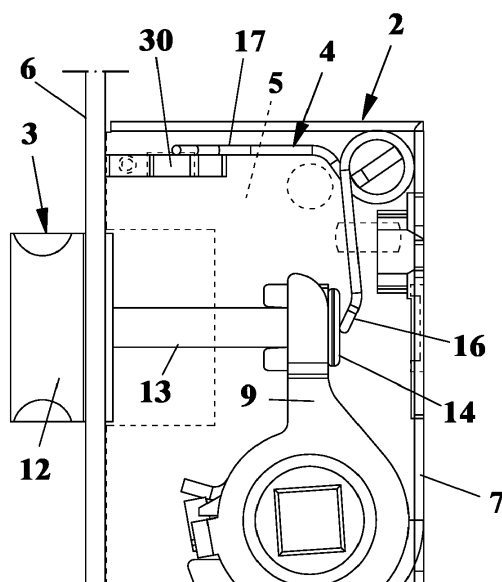


FIG. 1a

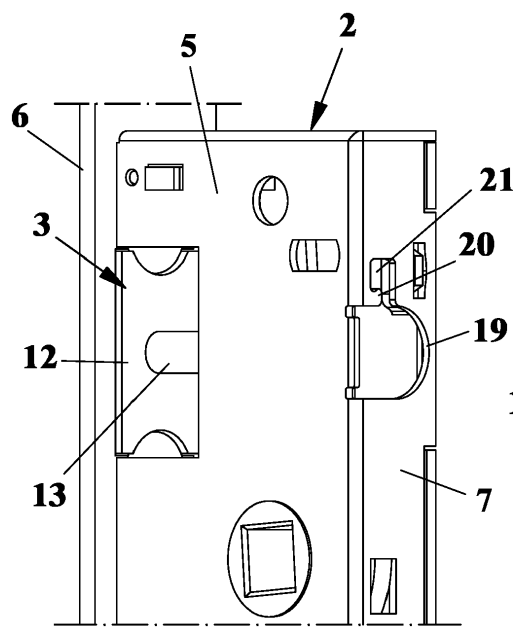


FIG. 1b

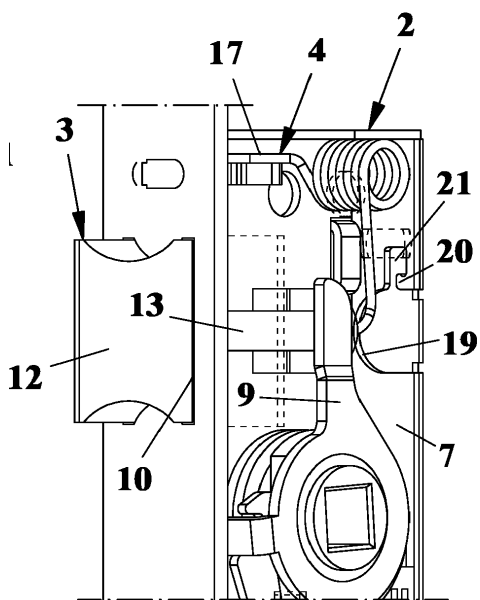


FIG. 1c

Description

[0001] The present invention refers to a latch lock provided with a system for changing the hand for use on doors opening either to the left or the right.

[0002] As is known, changing the hand is carried out by turning the latch by 180° before installation of the lock on the door.

[0003] Many systems for changing the hand of a latch lock are known in the prior art.

[0004] These systems for changing the hand complicate the construction of the latch, thus increasing the final cost thereof.

[0005] The latch as known has a head and a horizontal guide shank.

[0006] At present, to enable adjustment of the hand, additional machining processes are carried out on the latch parts or additional parts may even be provided.

[0007] For example, in one case, a threaded coupling is realized between the stem and the head of the latch so that the head can be rotated with respect to the stem.

[0008] In another case, the head and the stem are integral with each other and thus an adjustment screw is applied coaxially in the free end of the stem. This adjustment screw can be activated to have the head of the latch come completely out from the front wall of the lock case and thus make rotation of the latch possible.

[0009] There are other known systems in which the head and the stem are integral with each other and additional parts are provided that make it possible to place the latch conveniently in a position for changing the hand in which the case does not obstruct its rotation about its stem.

[0010] The technical task of the present invention is therefore to realize a latch lock with a modifiable opening direction, making it possible to eliminate the cited technical drawbacks of the prior art.

[0011] Within the scope of this technical task, an aim of the invention is to realize a simple and economical latch lock with a modifiable opening direction.

[0012] Another aim of the invention is to realize a latch lock featuring a simplified procedure for changing the opening direction thereof.

[0013] Another aim of the invention is to realize a latch lock featuring a simplified mounting procedure.

[0014] Realizing a latch lock with a system for changing the opening direction that requires the lowest possible number of components is another aim that is not least in importance.

[0015] Realizing a latch lock with a system for changing the opening direction that requires the lowest possible number of machining processes is another aim that is not least in importance.

[0016] The technical task, as well as the latter and other aims, according to the present invention, are achieved by realizing a lock comprising a case housing a latch that is extractable through a front window of the case, and a spring for automatic extraction of the latch from said win-

dow, said latch being movable in contrast to and by action of said spring between a position for extraction from the case for closing the lock and a position for retraction in the case for opening the lock, characterized in that said spring has a configuration for engaging with said latch and a configuration for disengaging from said latch, said case having a retaining member for retaining said spring in said configuration for disengaging from said latch for moving said latch towards a position for changing the hand of the lock more rearward towards the interior of the case with respect to said opening position.

[0017] Preferably, said retaining member acts as a stop for said spring when said latch is pushed rearward beyond said opening position.

[0018] In a preferred embodiment of the invention, said case has lateral undercuts configured to receive the head of the latch during rotation of the latch about its own stem in said more rearward position for changing the hand of the lock.

[0019] In a preferred embodiment of the invention, said case has, on a rear wall, an undercut configured to receive the stem of the latch in said more rearward position.

[0020] In a preferred embodiment of the invention, in said more rearward position, said latch is disengaged from said front window and aligned with said lateral undercuts.

[0021] In a preferred embodiment of the invention, said retaining member is made up of an engaging tooth afforded on one wall of said case.

[0022] In a preferred embodiment of the invention, said wall has a gap in the material in the area surrounding said engaging tooth, said gap in the material being configured for passage of a leg of the spring from the interior of the case to the exterior of the case for engaging said tooth.

[0023] In a preferred embodiment of the invention, said gap communicates with said undercut.

[0024] Advantageously, according to the invention, the spring for extraction of the latch is the element, which, when shifted from its operating state between the opening position and the closing position, enables the latch to reach a position for changing the hand and in which it can be rotated.

[0025] Positioning for changing the hand is brought about deliberately and therefore the position for changing the hand cannot be reached during the normal operating state of the lock, whether or not it has been installed.

[0026] The system for changing the hand has been minimized, for it is made up of only the latch and the extraction spring, which has the function of stopping the latch during the normal operating state and freeing it to reach the position for changing the hand.

[0027] In addition, the latch can be realized as a single piece or at most in two pieces, one for the head and one for the stem, with one fastened to the other.

[0028] Advantageously, in the normal operating state, the retaining member does not function as a limit stop for the latch. The handle and the key are equipped with

their own stops. The extraction spring functions as a limit stop only if the latch is pushed by hand beyond the front plate of the lock inside the case.

[0029] Therefore, in the normal operating state, the retaining member is never triggered.

[0030] Further characteristics and advantages of the invention will become more apparent from the description of a preferred, but not exclusive, embodiment of the latch lock according to the invention, which is illustrated by way of approximate and nonlimiting example in the attached drawings, of which:

Figures 1a, 1b and 1c are views of the lock with the latch arranged for use on doors opening to the right; Figures 2a and 2b are views of the lock with the latch in the opening position;

Figures 3a, 3b and 3c are views of the lock with the latch in the position for changing the hand;

Figures 4a, 4b and 4c are views illustrating a step for changing the hand of the lock;

Figures 5a and 5b are views illustrating the step of reinsertion of the latch in the window in the front panel of the case; and

Figures 6a, 6b and 6c are views of the lock with the latch now arranged for use on doors opening to the left.

[0031] With reference to the figures cited, a lock 1 is shown and indicated in its entirety by reference number 1.

[0032] The lock 1 comprises a case 2 housing a latch 3 and a spring 4 for automatic extraction of the latch 3.

[0033] The case 2, which is generally parallelepiped in shape, comprises in a manner known in the prior art, two flanks 5, a front plate 6 provided with a window 10 for extraction of the latch 3, a rear wall 7, a lower wall and an upper wall.

[0034] Once again in a manner known in the prior art, inside the case 2, the lock has a control panel 8 for retraction of the latch 3 in which an unillustrated control handle is engageable, and a lever 9 rotating integrally with the panel 8 and connected directly to the latch 3 for controlling retraction of the latch 3.

[0035] The latch 3 has a head 12 and a stem 13, which has an enlarged terminal end 14.

[0036] The latch 3 is supported in a translatable manner by virtue of the guided coupling of the head 12 in the window 10 and of the stem 13 in a specific guide 15 afforded in the case 2.

[0037] The window 10 is quadrangular and complementarily shaped to the head 12 so as not to enable rotation, but only translation along the axis of the stem 13.

[0038] The spring 4 is a torsion spring that has one leg 16 engaged with the terminal end 14 of the latch 3 and one leg 17 constrained at an internal front point 30 of the case 2.

[0039] The latch 3 is movable in contrast to and by action of the spring 4 between a position in which it is extracted from the case 2 for closing the lock and a re-

tracted position in the case 2 for opening the lock.

[0040] Advantageously, the spring 4 has a configuration for engaging with the latch 3 and a configuration for disengaging from the latch 3.

5 **[0041]** Moreover, the case 2 advantageously has a retaining member 11 for retaining the spring 4 in the configuration for disengaging from the latch 3 for moving the latch 3 into a position for changing the hand of the lock.

10 **[0042]** The position assumed by the latch 3 for changing the hand of the lock is more rearward towards the interior of the case 2 with respect to the opening position.

[0043] More specifically, in the configuration for engaging with the latch 3, the leg 16 of the spring 4 is engaged resting against the terminal end 14 of the stem 13, whereas in the configuration for disengagement from the latch 3, the leg 16 is engaged with the retaining member 11.

[0044] The retaining member 11 acts as a stop for the spring 4 only when the latch 3 is manually pushed rearward beyond the opening position.

20 **[0045]** The case 2 has lateral undercuts 18 on its flanks 5, said undercuts 18 being configured to receive the head 12 of the latch 3 during rotation of the latch 3 about its own stem 13 in said position for changing the hand of the lock.

25 **[0046]** On the rear wall 7, the case 2 also has an undercut 19 configured to receive the stem 13 of the latch 3 in the position for changing the hand of the lock.

[0047] In the position for changing the hand of the lock, the head 12 of the latch 3 is disengaged from the window 10 in the front plate 6 and aligned with the lateral undercuts 18 on the flanks 5.

[0048] The retaining member 11 is made up of an engaging tooth 20 afforded on one wall of the case 2.

30 **[0049]** More specifically, the tooth 20 is afforded on the rear wall 7 of the case 2 and it extends coplanarly with the rear wall 7 of the case 2.

35 **[0050]** The rear wall 7 of the case 2 has a gap in the material 21 in the area surrounding the engaging tooth 20, said gap in the material 21 being configured for the passage of the leg 16 of the spring 4 from the interior of the case 2 to the exterior of the case 2 for engaging the tooth 20.

[0051] The gap in the material 21 communicates with the undercut 19 on the rear wall 7 of the case 2.

40 **[0052]** The process for changing the hand of the lock prior to installation of the lock in a door is carried out in the following manner.

[0053] Using one hand, from the window 10, the operator pushes the head 12 of the latch 3, thereby causing it to move rearward, overcoming the opposing force of the spring 4, the leg 16 of which is thus drawn from the terminal end 14 of the stem 13 towards the tooth 20.

[0054] When the latch 3 reaches the opening position, the leg 16 of the spring 4 moves so as to rest against the internal side of the tooth 20 which thus acts as a stop.

55 **[0055]** In this position, the leg 16 of the spring 4 is facing the undercut 19 on the rear wall 7 of the case 2 and it is thus easily accessible to the operator.

[0056] To make the latch 3 perform an additional course of travel rearward so as to reach the position for changing the hand, at this point the engagement of the leg 16 of the spring 4 on the internal side of the tooth 20 needs to be eliminated.

[0057] Using his/her fingers directly or possibly with the aid of a tool, the operator moves the end of the leg 16 of the spring 4 laterally and has it pass through the gap in the material 21 so as to pass over the tooth 20.

[0058] After having extracted the end of the leg 16 of the spring 4 from the rear wall 7 of the case 2, the operator moves it laterally, positioning it against the external side of the tooth 20.

[0059] When it is released by the operator, the end of the leg 16 of the spring 4 automatically remains engaged to the external side of the tooth 20, owing to its state of tension.

[0060] At this point, the latch 3, now released from the spring 4, is finally free to move rearward until the position for changing the hand is reached.

[0061] After pushing the latch 3 to the position for changing the hand, the operator rotates the latch 3 by 180°, while holding it, through the lateral undercuts 18.

[0062] Rotation of the latch 3 on itself is made possible by the fact that it is unrestricted by the window 10 and by the fact that the head 12 can freely rotate in the lateral undercuts 18.

[0063] After having rotated the latch 3, the operator moves the end of the leg 16 of the spring 4 laterally until they are no longer resting on the tooth 20, so as to return to rest on the terminal end 14 of the stem 13 of the latch 3.

[0064] Thus conceived, the system for changing the hand is susceptible to numerous modifications and variants, all of which falling within the scope of the inventive concept. Moreover, all details may be replaced with other technically equivalent elements.

[0065] The materials used, as well as the dimensions, may in practice be of any type, according to needs and the state of the art.

Claims

1. A lock (1) comprising a case (2) housing a latch (3) that is extractable through a front window (10) of the case (2), and a spring (4) for automatic extraction of the latch (3) from said window (10), said latch (3) being movable in contrast to and by action of said spring (4) between a position for extraction from the case (2) for closing the lock (1) and a position for retraction in the case (2) for opening the lock (1), **characterized in that** said spring (4) has a configuration for engaging with said latch (3) and a configuration for disengaging from said latch (3), said case (2) having a retaining member (11) for retaining said spring (4) in said configuration for disengaging from said latch (3) for moving said latch (3) towards a position for changing the hand of the lock more rear-

ward towards the interior of the case (2) with respect to said opening position.

2. The lock (1) according to claim 1, **characterized in that** said latch (3) has a head (12) and a stem (13), and **in that** said spring (4) is a torsion spring that has a leg (16) engaged with said stem (13) in said engagement configuration, and with said retaining member (11) in said disengagement configuration.
3. The lock (1) according to any one of the preceding claims, **characterized in that** said retaining member (11) interferes with said spring (4) acting as a stop for said spring (4) when said latch (3) is pushed rearward beyond said opening position.
4. The lock (1) according to either claim 2 or 3, **characterized in that** said case (2) has lateral undercuts (18) configured to receive the head (12) of the latch (3) during rotation of the latch (3) about its own stem (13) in said position for changing the hand of the lock.
5. The lock (1) according to any one of claims 2 to 4, **characterized in that** said case (2) has, on a rear wall, an undercut (19) configured to receive the stem (13) of the latch (3) in said position for changing the hand of the lock.
6. The lock (1) according to the preceding claim, **characterized in that** in said position for changing the hand of the lock, said head (12) of the latch (3) is disengaged from said front window (10) and aligned with said lateral undercuts (18).
7. The lock (1) according to any one of the preceding claims, **characterized in that** said retaining member (11) is made up of an engaging tooth (20) afforded on one wall (7) of said case (2).
8. The lock (1) according to the preceding claim, **characterized in that** said wall (7) has a gap in the material (21) in the area surrounding said engaging tooth (20), said gap in the material (21) being configured for passage of said leg (16) of the spring (4) from the interior of the case (2) to the exterior of the case (2) for engaging said tooth (20).
9. The lock (1) according to the preceding claim, **characterized in that** said gap in the material (21) communicates with said undercut (19).
10. The lock (1) according to any one of claims 7 to 9, **characterized in that** said tooth (20) is coplanar with said wall (7).

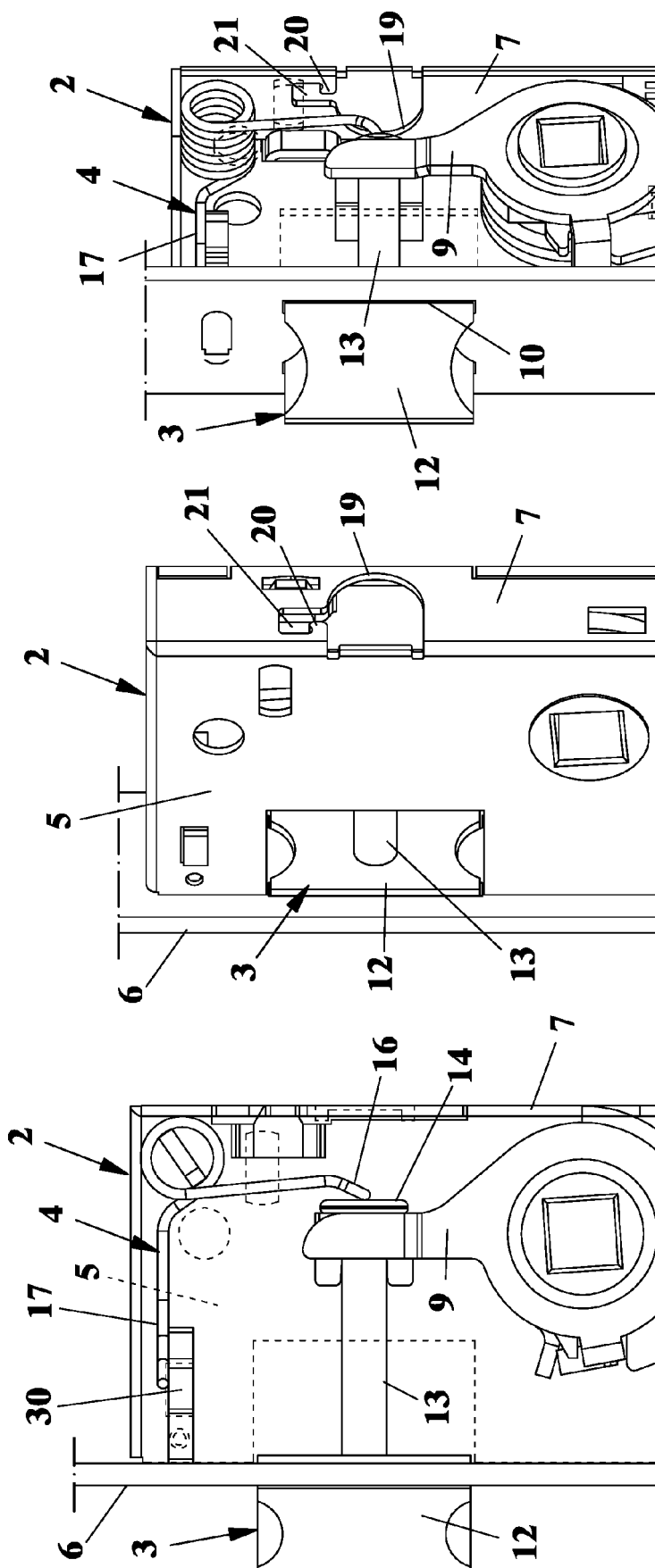


FIG. 1a

FIG. 1b

FIG. 1c

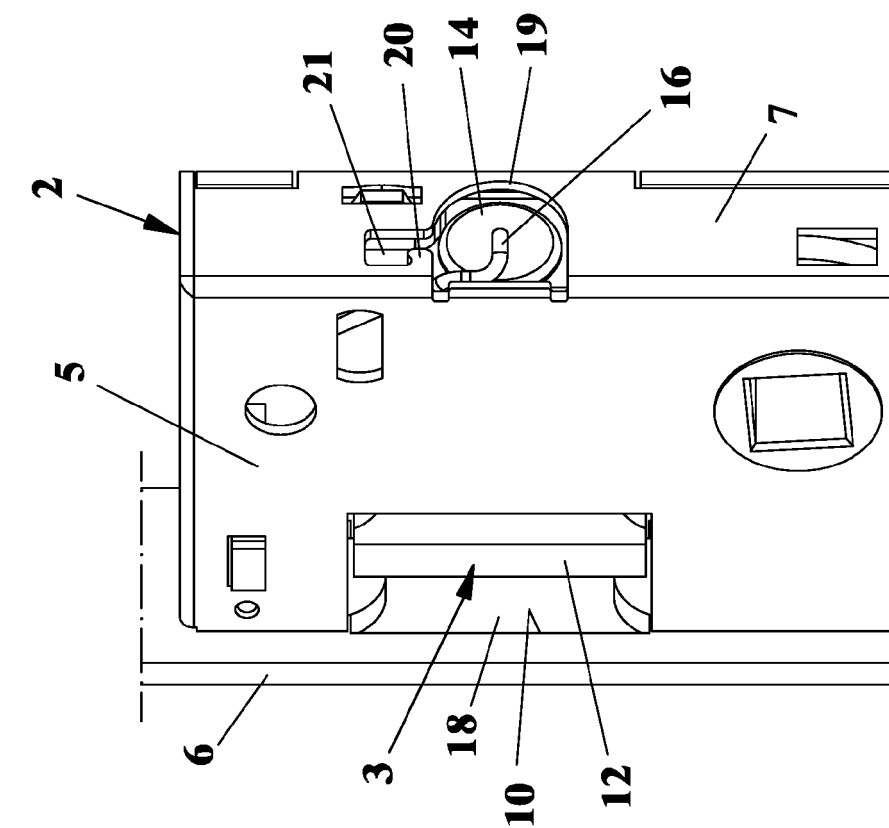


FIG. 2a

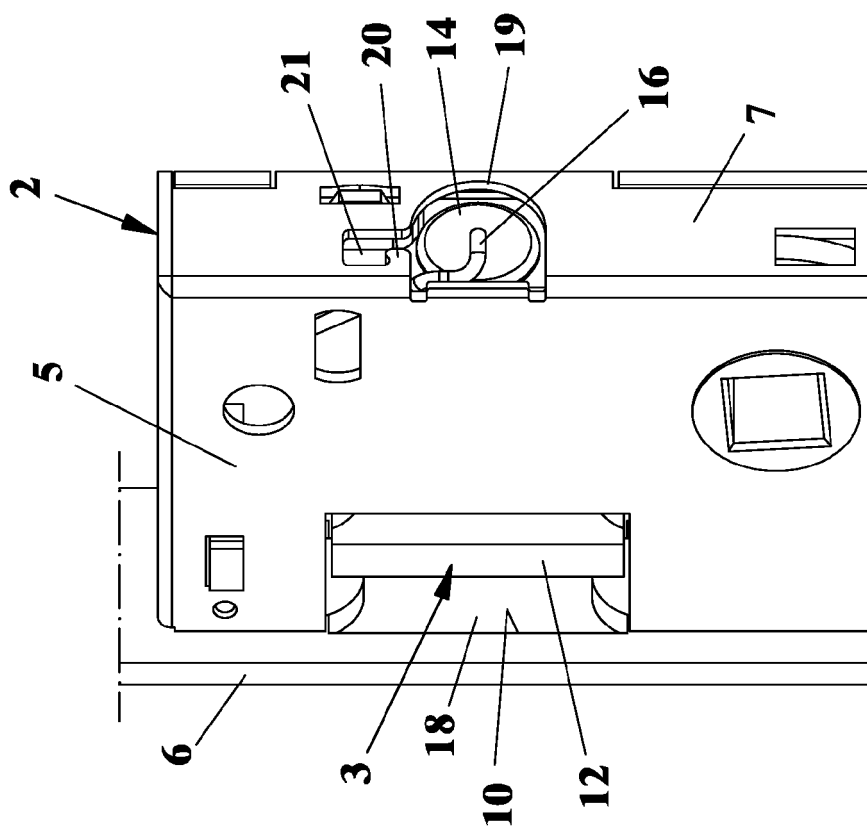


FIG. 2b

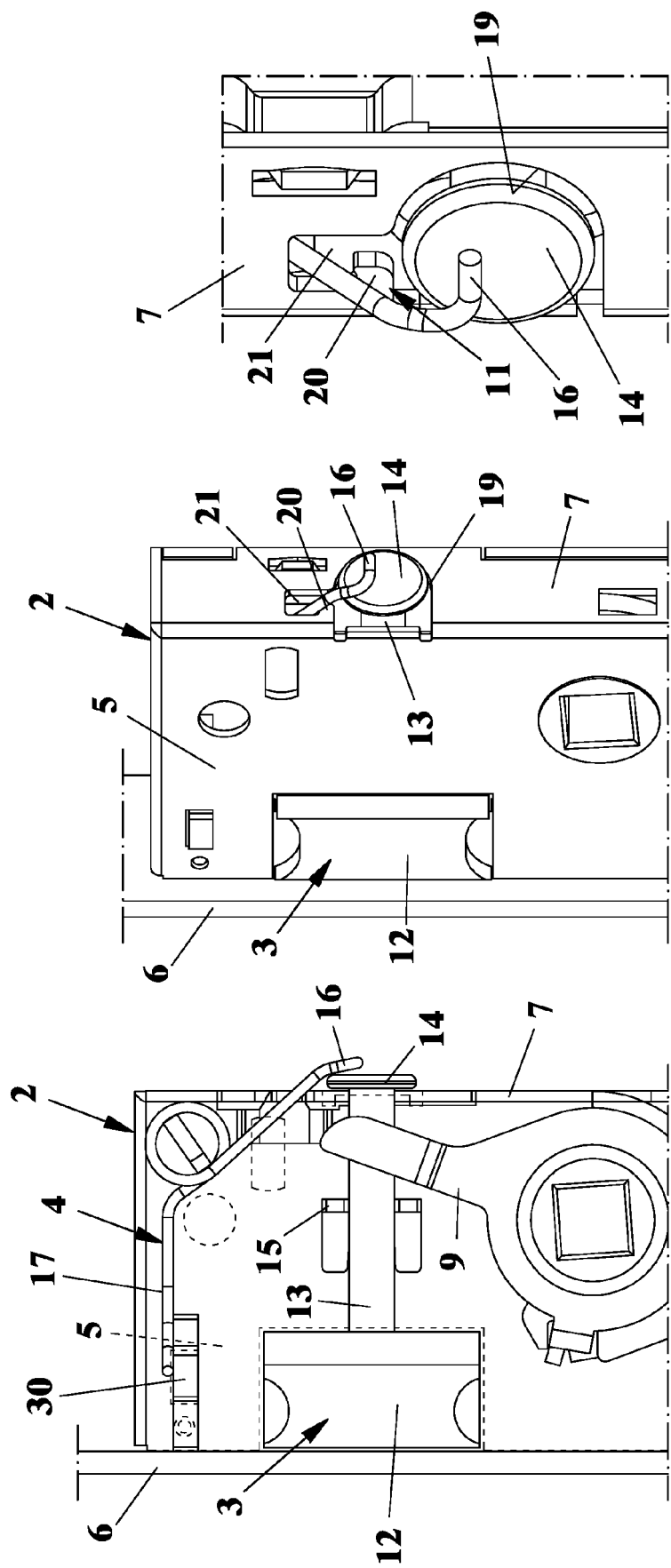


FIG. 3a

FIG. 3b

FIG. 3c

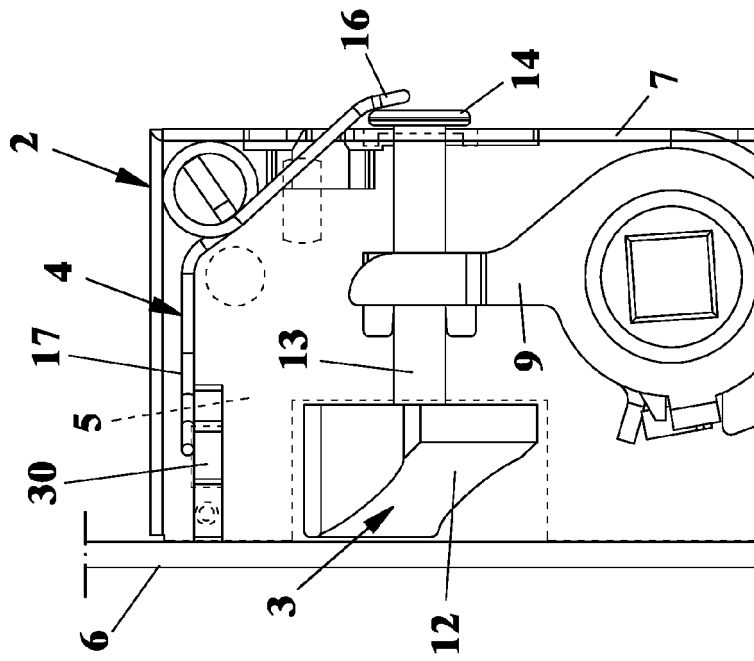


FIG. 4a

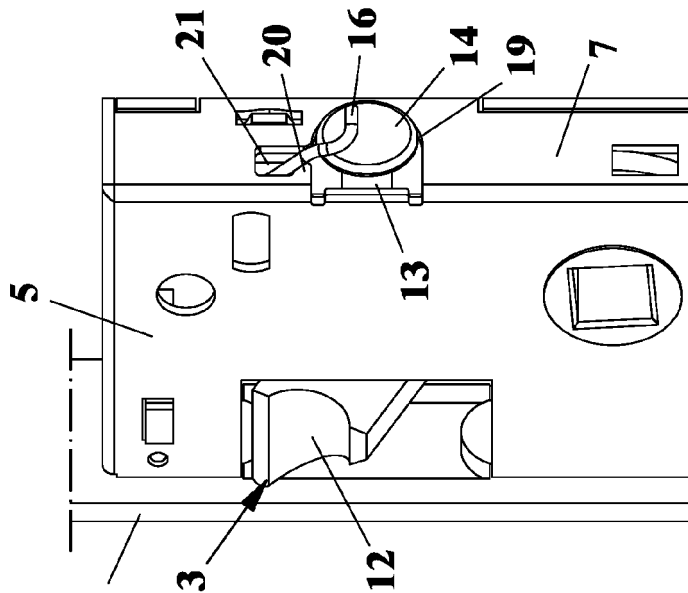


FIG. 4b

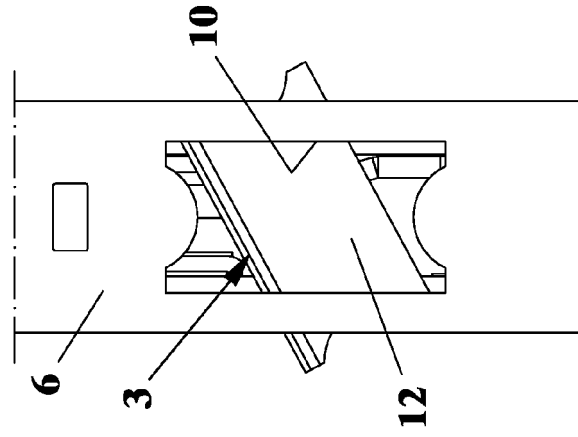


FIG. 4c

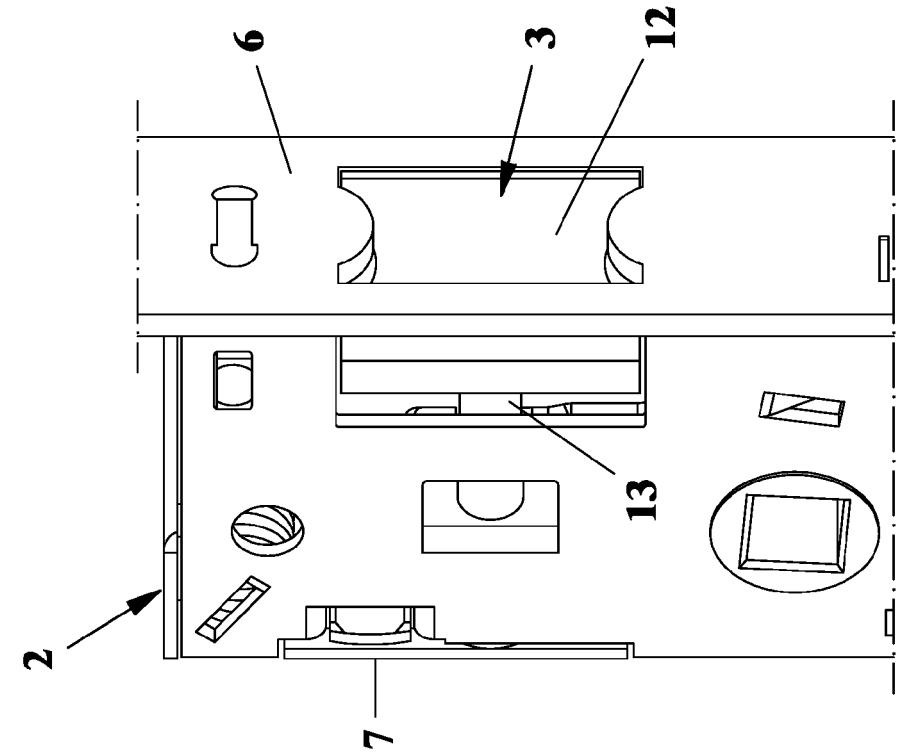


FIG. 5b

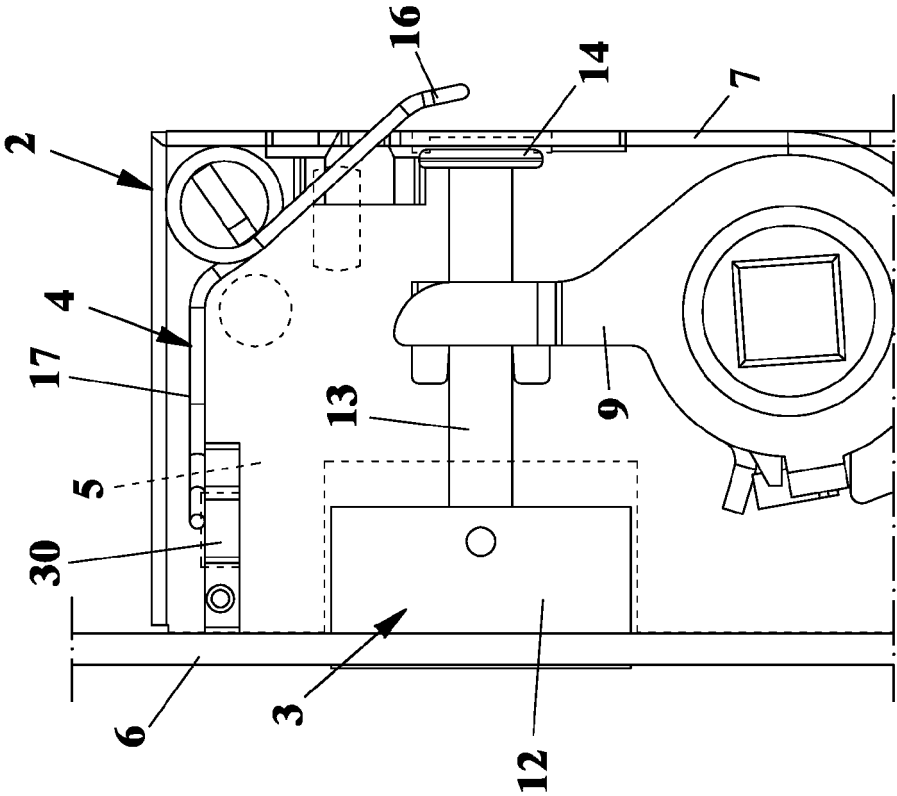


FIG. 5a

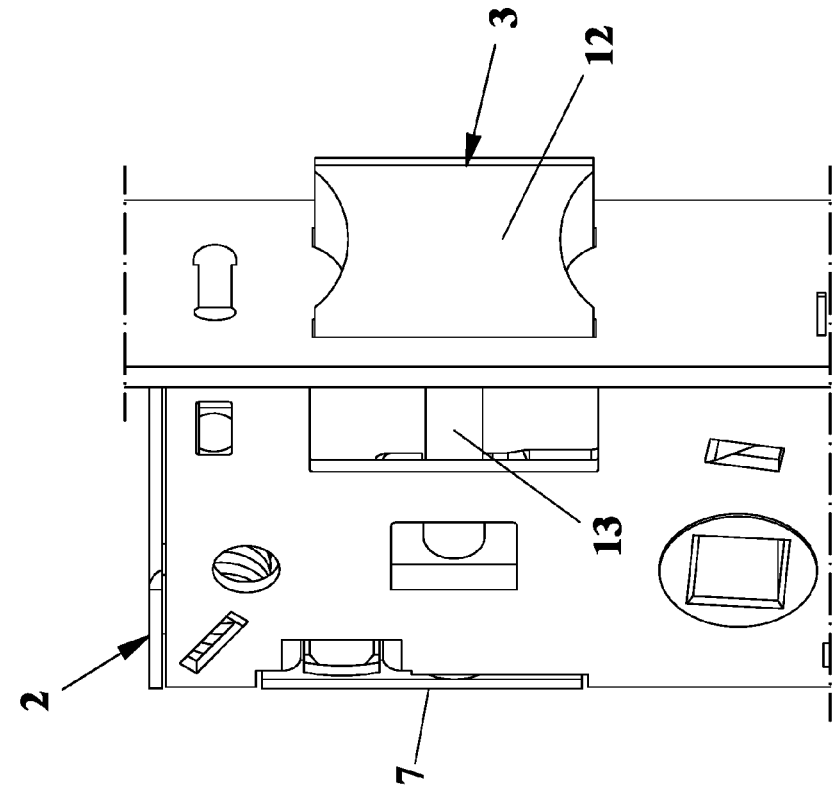


FIG. 6a

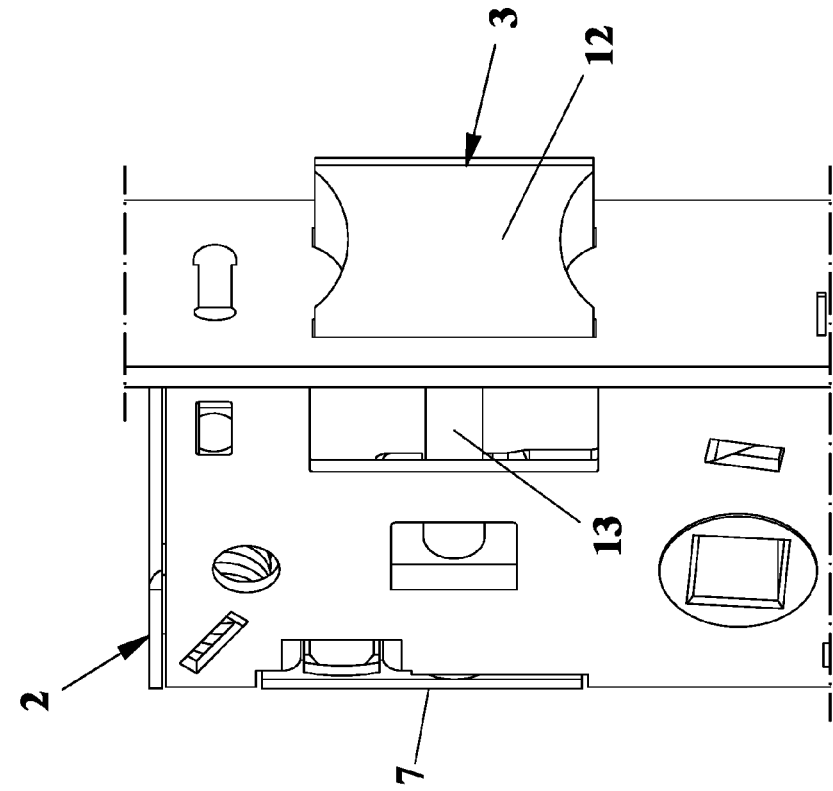


FIG. 6b



EUROPEAN SEARCH REPORT

Application Number
EP 17 16 8346

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EPO FORM 1503 03.82 (P04C01)

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	CH 277 920 A (SCHLOSS UND BESCHLAEGEFABRIK A [CH]) 30 September 1951 (1951-09-30)	1-6	INV. E05B63/04
A	* page 2, line 70 - page 3, line 15; figures 1-3 *	7-10	ADD. E05B15/04
A	DE 10 82 155 B (LUDWIG ROCHOLL & CIE) 19 May 1960 (1960-05-19) * column 3, line 53 - column 4, line 14; figures 1-7 *	1,2,4-6	
A	FR 2 743 387 A1 (BRICARD SOCIETE ANONYME [FR]) 11 July 1997 (1997-07-11) * page 4, line 18 - page 5, line 9; figures 1-6 *	1,4,6	
A	AT 390 639 B (GRUNDMANN GMBH GEB [AT]) 11 June 1990 (1990-06-11) * page 2, line 53 - page 3, line 13; figures 1-3 *	1,4,6	
			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 24 August 2017	Examiner Pérez Méndez, José F
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ON EUROPEAN PATENT APPLICATION NO.**

EP 17 16 8346

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24-08-2017

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