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(54) **Metallic frame for enclosing a door or a window**

(57) A metallic frame (1) for mounting into an opening in a wall to enclose a door (3) or a window is disclosed, the frame (1) having a first part extending between the wall and the door or window enclosed by the frame, wherein said first part consists of a first, solid metal plate

(4), and the frame further comprises a second metal plate (5) connected at a right angle to the first metal plate (4) and extending into the opening of the frame (1) to be adjoined by the door (3) or the window enclosed by the frame (1), when the door (3) or the window is closed.

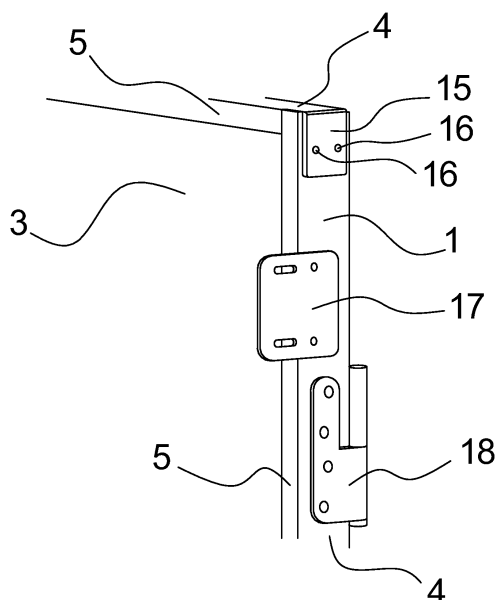


Fig. 4a

Description

[0001] The present invention relates to a metallic frame for mounting into an opening in a wall to enclose a door or a window.

Description of the related art

[0002] During renovation and modernisation of existing buildings, it is often desirable to replace doors and/or windows with new ones. Due to the fact that the standard sizes of doors and windows may have changed, typically to larger dimensions, during the period between the time of construction and the time of renovation/modernisation of the building, the existing openings in the wall often need to be enlarged before new door and window frames according to the new standards can be mounted therein.

[0003] A similar problem arises for instance when a building or a part of a building is to be modified to accommodate a disabled person using a wheel chair, since, in most countries, doors of standard sizes are typically too narrow for the passage of modern wheel chairs.

[0004] German patent application No. DE 44 44 327 A1 discloses a steel frame, which can be mounted, possibly without removing the existing frame, within a door opening, when an existing door is to be replaced by another one with a different width and/or thickness. The disclosed frame is rather bulky, and a door of larger width than the existing door enclosed by this type of frame is mounted onto the wall rather than within the wall, i.e. the plane of the door is displaced with respect to the plane of the wall, which results in a solution of poor aesthetic value.

[0005] It is an object of the present invention to provide a frame for a door or a window, which enables the door or window to be mounted in the same plane as the wall in a discrete and aesthetic way, although the dimensions of the door or window may exceed the dimensions of a door or window previously mounted within the same opening in the wall.

Brief description of the invention

[0006] The present invention relates to a metallic frame for mounting into an opening in a wall to enclose a door or a window having a first part extending between the wall and the door or window enclosed by the frame, wherein said first part consists of a first, solid metal plate, and the frame further comprises a second metal plate connected at a right angle to the first metal plate and extending into the opening of the frame to be adjoined by the door or the window enclosed by the frame, when the door or the window is closed.

[0007] The construction of a frame, wherein the part extending between the wall and a door or a window enclosed by the frame consists of a single, solid metal plate only, enables for the enclosure of a larger door or window

without having to enlarge the dimensions of the opening in the wall. Also, a metallic frame according to the present invention presents itself in a more minimalistic and aesthetic way than conventional door or window frames.

[0008] The expression "window" is to be interpreted in a broad way, meaning that it includes glass walls, glass screens and other more or less transparent building components functioning in practice as windows - although they may not be opened.

[0009] In an embodiment of the invention, the metallic frame comprises a header attached to top parts of two opposing jambs.

[0010] In a further embodiment of the invention, the metallic frame further comprises a transverse bottom member attached to bottom parts of the two opposing jambs.

[0011] A frame for a door may consist of a header and two jambs only, a threshold part at the bottom (for instance made from wood or rubber) being optional, whereas for a window frame, a transverse bottom member being a regular part of the frame will normally be required as well.

[0012] In an embodiment of the invention, the metallic frame is made from stainless steel.

[0013] The use of steel enables for the construction of frames with a higher torsional strength than conventional door or window frames, even though a frame according to the present invention will typically be of substantially smaller dimensions than conventional frames.

[0014] Generally, frames according to the present invention can be expected to be of greater strength than conventional frame made from wood or steel, and they fulfil the normal requirements related to fire security and attenuation of sound.

[0015] In an embodiment of the invention, the thickness of the first metal plate is less than 10 mm, preferably less than 5 mm.

[0016] The choice of a thickness within the specified ranges enables for the enclosure of up to approximately 5 cm broader and higher doors or windows than could have been enclosed by conventional door or window frames within the same openings in the wall.

[0017] In an embodiment of the invention, the width of the second metal plate is less than 3 cm, preferably less than 2 cm.

[0018] The choice of a width within the specified measures assures that the second metal plate does not reduce the dimensions of the door opening unnecessarily.

[0019] In an embodiment of the invention, the width of the first metal plate corresponds to the thickness of a door or a window to be enclosed by the metallic frame.

[0020] This enables for the possibility of mounting the frame in a way so that a closed door or window enclosed by the frame is aligned with the wall, and no parts of the frame protrude from the plane formed by the door or window and the wall.

[0021] In an embodiment of the invention, the second metal plate is connected to the first metal plate along an

edge of the first second plate.

[0022] This assures a very minimalistic appearance of the frame.

[0023] In a further embodiment of the invention, the first metal plate and the second metal plate are made from a single metal plate by bending it along a longitudinal direction in a substantially right angle, thus forming an L-shaped plate profile.

[0024] This enables for a simple production of the frames using profiled metal plates without any need for welding.

[0025] In an embodiment of the invention, two or more hinges for one or more doors or windows are fixed to one or both of the jambs by means of spot welding.

[0026] Depending on the weight and width of the door or window to be enclosed, two, three or four hinges may be necessary. By using spot welding, visible screw heads are avoided.

[0027] In another embodiment of the invention, two or more hinges are mounted to the wall through openings in one or both of the jambs in such a way that the hinges are not visible when the door or window enclosed by the frame.

[0028] The provision of hinges that are invisible when the door or window is closed assures an extremely minimalistic appearance of the frame system.

[0029] In an embodiment of the invention, one or more keeps are formed by one or more cut-outs in the frame in combination with one or more striking plates.

[0030] This further contributes to the minimalistic appearance of the frame.

[0031] In a further embodiment of the invention, the positions of the one or more striking plates are adjustable.

[0032] An adjustment in the opening and closing direction of the door or window enables for an adjustment of the keep in order to avoid clattering doors or windows due to draught or for other reasons.

[0033] In an embodiment of the invention, the metallic frame further comprises two or more mounting plates for displaced mounting enabling the frame to be mounted into the opening in the wall at points outside the area physically covered by the frame.

[0034] This enables, for instance, for the mounting of a narrow frame into a broader wall of a light construction and having its strength in the centre part of the wall construction and, at the same time, to mount the frame so as to assure that a door or a window enclosed therein will be aligned with one side of the wall when closed.

The drawing

[0035] In the following, a few embodiments of the invention are described and explained in more detail with reference to the drawing, where

fig. 1a illustrates schematically a cross-section of a part of a frame according to a preferred embodiment of the invention,

fig. 1b illustrates schematically a cross-section of a part of a frame according to another embodiment of the invention,

5 fig. 1c illustrates schematically a cross-section of a part of a frame according to a third embodiment of the invention,

10 fig. 2a illustrates two cut-outs for a keep of a frame according to an embodiment of the invention,

fig. 2b illustrates a striking plate for a keep of a frame according to an embodiment of the invention,

15 fig. 2c illustrates the striking plate from fig. 2b when mounted on a frame according to an embodiment of the invention,

20 fig. 3a illustrates the front side part of a striking plate for a keep of a frame according to another embodiment of the invention,

fig. 3b illustrates the back side part of the striking plate from fig. 3a,

25 fig. 4a illustrates a part of a frame according to the invention including a hinge and a mounting plate for displaced mounting according to an embodiment of the invention,

30 fig. 4b illustrates schematically the displaced mounting into a wall opening of a frame according to an embodiment of the invention, and

35 fig. 5 illustrates a hidden hinge according to an embodiment of the invention.

Detailed description

40 **[0036]** Figs. 1a, 1b and 1c illustrate schematically a cross-section of a part of different frames 1 according to preferred embodiments of the invention. The frame 1 comprises a first metal plate 4, which is mounted against a wall 2, and a second metal plate 5, which forms a right angle with the first metal plate 4 extending towards the opening of the frame 1. A door 3 is enclosed by the frame 1. In its closed position as illustrated in the figure, the door 3 adjoins the second metal plate 5.

45 **[0037]** In this embodiment as well as in the embodiments illustrated in figs. 1b and 1c, no part of the frame 1 protrudes from the wall 2. In fact, in these three embodiments the front edge of the frame 1 and the front side of the door 3 are both aligned with the wall. This means that when the door 3 is closed, only the hinges 18 (not shown in these figures) and the door handle (not shown) protrude from the wall 2, which gives a very minimalistic and aesthetic appearance of the frame 1. It almost seems like the hinges 18 has been mounted directly

in the wall 2 and, in fact, in some embodiments of the invention, some of the mounting screws (not shown) for mounting the frame 1 into the opening in the wall 2 may pass through the hinges 18.

[0038] Preferably, the three frame 1 profiles illustrated in figs. 1a, 1b and 1c are made from steel plates of 4 mm thickness only, which further contributes to the minimalist appearance of the frame 1.

[0039] In fig. 1a, the second metal plate 5 is connected to the first metal plate 4 along an edge of the first metal plate 4 resulting in an L-shaped frame 1 profile. Preferably, the frame 1 part is made from a single metal plate, which has been bent along its longitudinal axis in order to form the right angle between the first metal plate 4 and the second metal plate 5. The part of the wall 2 facing the opening, which is not covered by the first metal plate 4 can be covered (as illustrated in fig. 4b) with various kinds of materials for obtaining a characteristic appearance of the door opening, such as an old-fashioned look, a modernistic look etc.

[0040] In fig. 1b, the second metal plate 5 is not connected to the first metal plate 4 along an edge of the latter but rather along its centreline, the width of the first metal plate 4 corresponding to the thickness of the wall 2, so that part of the wall 2 facing the opening is completely covered by the frame 1.

[0041] The frame 1 profile illustrated in fig. 1c further comprises a longitudinal cavity defined by a rounded metal plate 6 for obtaining a softer appearance of the frame 1.

[0042] Fig. 2a illustrates how two cut-outs 7 for a keep have been made in the first metal plate 4 of a jamb of a frame 1 of the type illustrated in fig. 1a. The figure also shows one of several mounting screw holes 8 through which the frame 1 can be mounted to the wall 2 by means of a number of mounting screws (not shown), and two assembly screw holes 9 for assembly screws 16 (not shown in this figure) used to assemble the frame 1 by attaching the header and the jambs of the frame 1 to each other (see also fig. 4a).

[0043] Fig. 2b illustrates a striking plate 10 to be used with cut-outs 7 as the ones illustrated in fig. 2a for a keep. The striking plate 10 is designed so that, when the striking plate 10 is mounted on the back side of the first metal plate 4 of the jamb (see fig. 2c), the two protrusions 11 each protrude through a cut-out 7 in the first metal plate 4 along the foremost edge of the cut-out 7 for protecting the edge and receiving the bolt and the latch bolt of the lock of a door 3 enclosed by frame 1, respectively.

[0044] The combination of a flat part 12 adjoining the back side of the first metal plate 4 when the striking plate 10 is mounted, and a U-shaped part 13 provides the striking plate 10 with a certain elasticity allowing the protrusions 11 to be moved slightly in the direction perpendicular to the first metal plate 4. If the space between the frame 1 and the wall 2 is very narrow, it may be necessary to make a recess in the latter for accommodation of the U-shaped part 13 of the striking plate 10 when the frame 1 is mounted.

[0045] Fig. 2c illustrates the striking plate 10 from fig. 2b when mounted on a frame 1 of the type illustrated in fig. 1a. The striking plate 10 is mounted as described above with the flat part 12 adjoining the back side of the first metal plate 4 and the protrusions 11 (not shown in this figure) protruding through the cut-outs 7 (also not shown in this figure). The figure also shows two apertures 14 in the door 3 for a locking mechanism and a door handle.

[0046] Fig. 3a illustrates the front side part 24 of another striking plate 10 for a keep of a frame 1 according to the invention as seen from the front side of the frame 1. This striking plate 10 is mounted in a recess within the first metal plate 4 of a jamb by means of a couple of screws (not shown) through mounting holes 25 in the striking plate 10. Two resilient parts 26 of the striking plate 10 extends into two cut-outs 7 in the frame 1 for protecting the edge and receiving the bolt and the latch bolt of the lock of a door 3 enclosed by frame 1, respectively.

[0047] Fig. 3b illustrates the back side part 27 of the striking plate 10 from fig. 3a when mounted on a frame 1. The mounting holes 25 continue from the front side part 24 through a back plate 28 for mounting of the striking plate 10. A protection box 29 is mounted onto the back plate 28 covering the cut-outs 7 for receiving the bolt and the latch bolt.

[0048] A preferred way of assembling the frame 1 is illustrated in fig. 4a, which shows the upper part of a jamb and one end of a header of a frame 1 with a door 3 enclosed therein. The first metal plate 4 of the header is prolonged, and the prolonged part 15 thereof is bent over at a right angle to adjoin the back side of the first metal plate 4 of the jamb. In the illustrated embodiment, the prolonged part 15 of the header is attached to the first metal plate 4 of the jamb by means of two assembly screws 16 extending from the side of the first metal plate 4 of the jamb facing the door 3.

[0049] Fig. 4a further illustrates the use of a mounting plate 17 for displaced mounting of the frame 1 allowing the frame 1 to be mounted to the wall 2 by means of mounting screws (not shown) at points outside the area physically covered by the frame 1 (see also fig. 4b). The mounting plate 17 may be fixed to the back side of the first metal plate 4 of a jamb in various ways, for instance by means of screws or spot welding (not shown).

[0050] Finally, fig. 4a illustrates how a hinge 18 is fixed to the back side of the first metal plate 4 of the jamb by means of screws (not shown) or, in a more preferred embodiment, by means of spot welding.

[0051] Fig. 4b illustrates schematically, how a door frame 1 can be mounted in an opening in a wall 2, 19-21 by means of mounting plates 17 for displaced mounting (not visible in this figure). The illustrated wall 2 consists of a double layer of plasterboard 19 on both sides mounted onto a metal profile 21 around a lath 20. If the frame 1 was to be mounted to the wall 2 by means of mounting screws directly through the first metal plate 4 of the jamb,

these mounting screws would enter the wall 2 somewhere within the double layer of plasterboard 19, the strength of which is far from being sufficient to securely hold the frame 1 in a fixed and stable position. When using the mounting plates 17 for displaced mounting, the mounting screws (not visible) can instead be positioned to enter the lath 20, which has the sufficient strength to keep the frame 1 in a stable and fixated position. In the embodiment shown in the figure, the mounting plates 17 and the mounting screws are hidden behind a cover plate 22, which can be made from various different materials as already mentioned above. It is also illustrated how, in this embodiment, the appearance on the frame side of the door opening is very minimalistic in accordance with one of the objects of the present invention, whereas on the other side of the door opening, the appearance is more conventional including the use of an architrave 23.

[0052] Fig. 5 illustrates a hidden hinge 30 according to an embodiment of the invention. The hinge comprises a wall flange 31 that is mounted to the wall 2 through an opening 32 in the jamb, and a door flange 33 that is to be mounted in a recess in the door 3 (not shown). Between the wall flange 31 and the door flange 33 are placed a first 34 and a second 35 hinge part, which are arranged to fold together in such a way, that when the door 3 is closed, the hidden hinge 30 is not visible from any side of the door 3.

This type of hinges is known from the art and commercially available, for instance from the German manufacturer SIMONSWERK under the product name TECTUS.

[0053] It should be noted that the described embodiments are exemplary only and are not in any way meant to limit the scope of protection, which is defined by the claims listed here below.

List of reference numbers

[0054]

1. Metallic frame
2. Wall
3. Door
4. First metal plate
5. Second metal plate
6. Rounded metal plate
7. Cut-out for keep
8. Mounting screw hole
9. Assembly screw hole
10. Striking plate
11. Protrusion of striking plate
12. Flat part of striking plate
13. U-shaped part of striking plate
14. Apertures in a door for locking mechanism or handle
15. Prolonged part of frame header bent over for assembly of the frame
16. Assembly screw
17. Mounting plate for displaced mounting

18. Hinge
19. Plasterboard
20. Lath in wall construction
21. Metal profile in wall construction
22. Cover plate for door opening
23. Architrave
24. Front side part of striking plate
25. Striking plate mounting holes
26. Resilient part of striking plate
27. Back side part of striking plate
28. Back plate of striking plate
29. Protection box of striking plate
30. Hidden hinge
31. Wall flange of hidden hinge
32. Opening in jamb for hidden hinge
33. Door flange of hidden hinge
34. First hinge part of hidden hinge
35. Second hinge part of hidden hinge

Claims

1. A metallic frame for mounting into an opening in a wall to enclose a door or a window having a first part extending between the wall and the door or window enclosed by the frame, wherein said first part consists of a first, solid metal plate, and the frame further comprises a second metal plate connected at a right angle to the first metal plate and extending into the opening of the frame to be adjoined by the door or the window enclosed by the frame, when the door or the window is closed.
2. A metallic frame according to claim 1 comprising a header attached to top parts of two opposing jambs.
3. A metallic frame according to claim 2 further comprising a transverse bottom member attached to bottom parts of the two opposing jambs.
4. A metallic frame according to any of the preceding claims, wherein the frame is made from stainless steel.
5. A metallic frame according to any of the preceding claims, wherein the thickness of the first metal plate is less than 10 mm, preferably less than 5 mm.
6. A metallic frame according to any of the preceding claims, wherein the width of the second metal plate is less than 3 cm, preferably less than 2 cm.
7. A metallic frame according to any of the preceding claims, wherein the width of the first metal plate corresponds to the thickness of a door or a window to be enclosed by the metallic frame.
8. A metallic frame according to any of the preceding

claims, wherein the second metal plate is connected to the first metal plate along an edge of the first second plate.

9. A metallic frame according to claim 8, wherein the first metal plate and the second metal plate are made from a single metal plate by bending it along a longitudinal direction in a substantially right angle, thus forming an L-shaped plate profile. 5
10. A metallic frame according to any of the preceding claims, wherein two or more hinges for one or more doors or windows are fixed to one or both of the jambs by means of spot welding. 10
11. A metallic frame according to any of claims 1-9, wherein two or more hinges are mounted to the wall through openings in one or both of the jambs and to the door or window in one or more recesses therein in such a way that the hinges are not visible when the door or window is closed and enclosed by the frame. 15 20
12. A metallic frame according to any of the preceding claims, wherein one or more keeps are formed by one or more cut-outs in the frame in combination with one or more striking plates. 25
13. A metallic frame according to claim 12, wherein the positions of the one or more striking plates are adjustable. 30
14. A metallic frame according to any of the preceding claims, further comprising two or more mounting plates for displaced mounting enabling the frame to be mounted into the opening in the wall at points outside the area physically covered by the frame. 35

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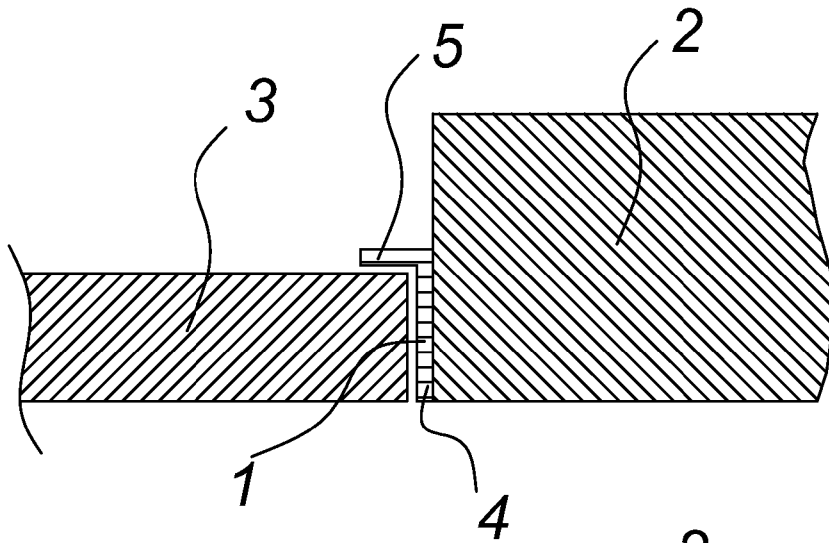


Fig. 1a

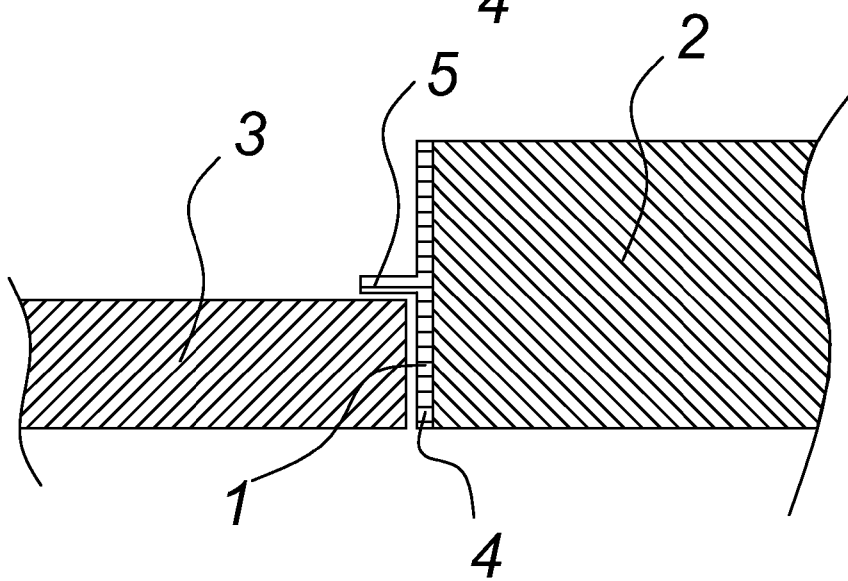


Fig. 1b

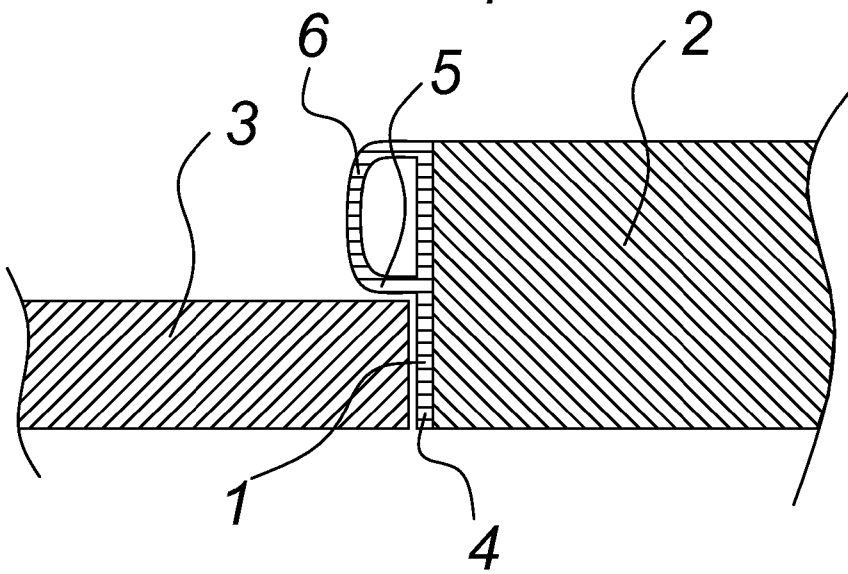


Fig. 1c

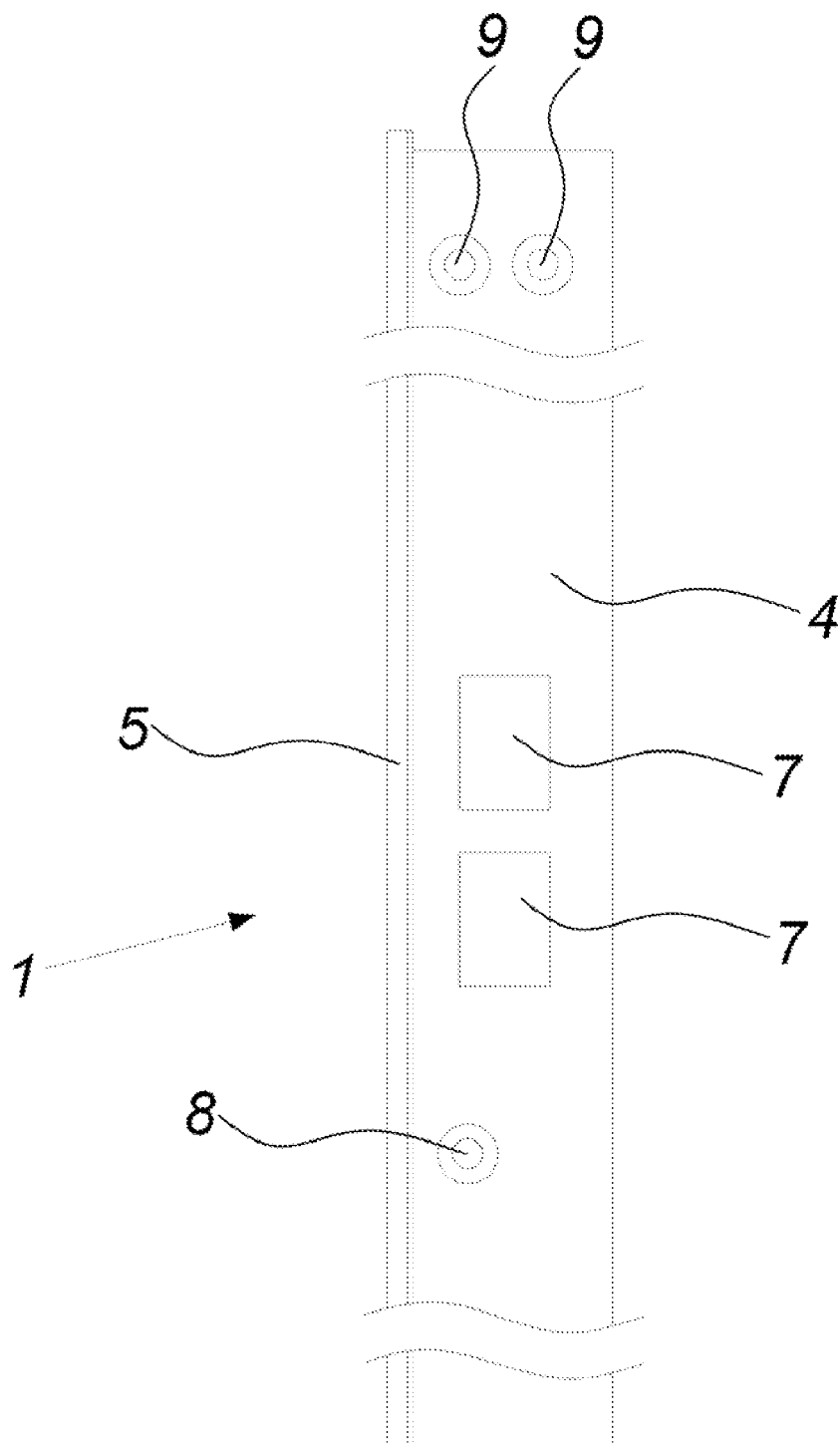


Fig. 2a

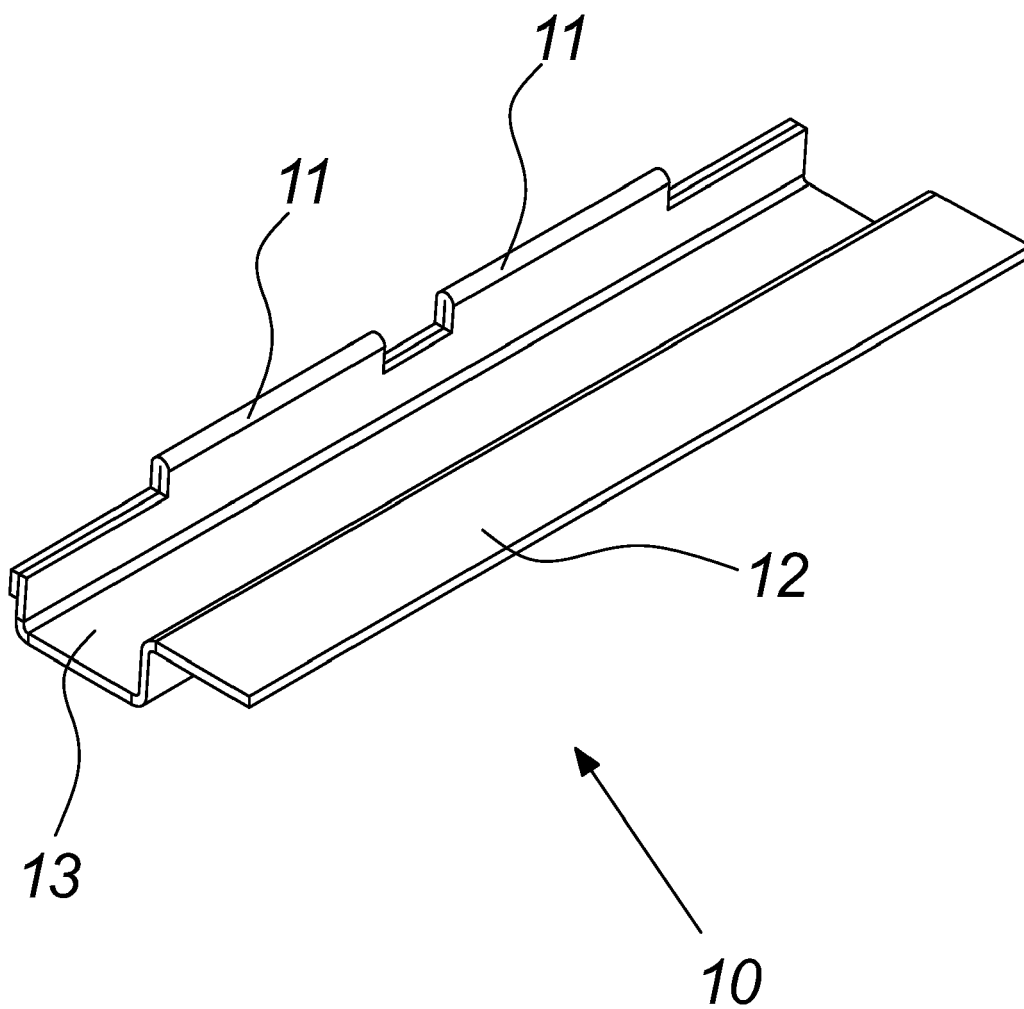


Fig. 2b

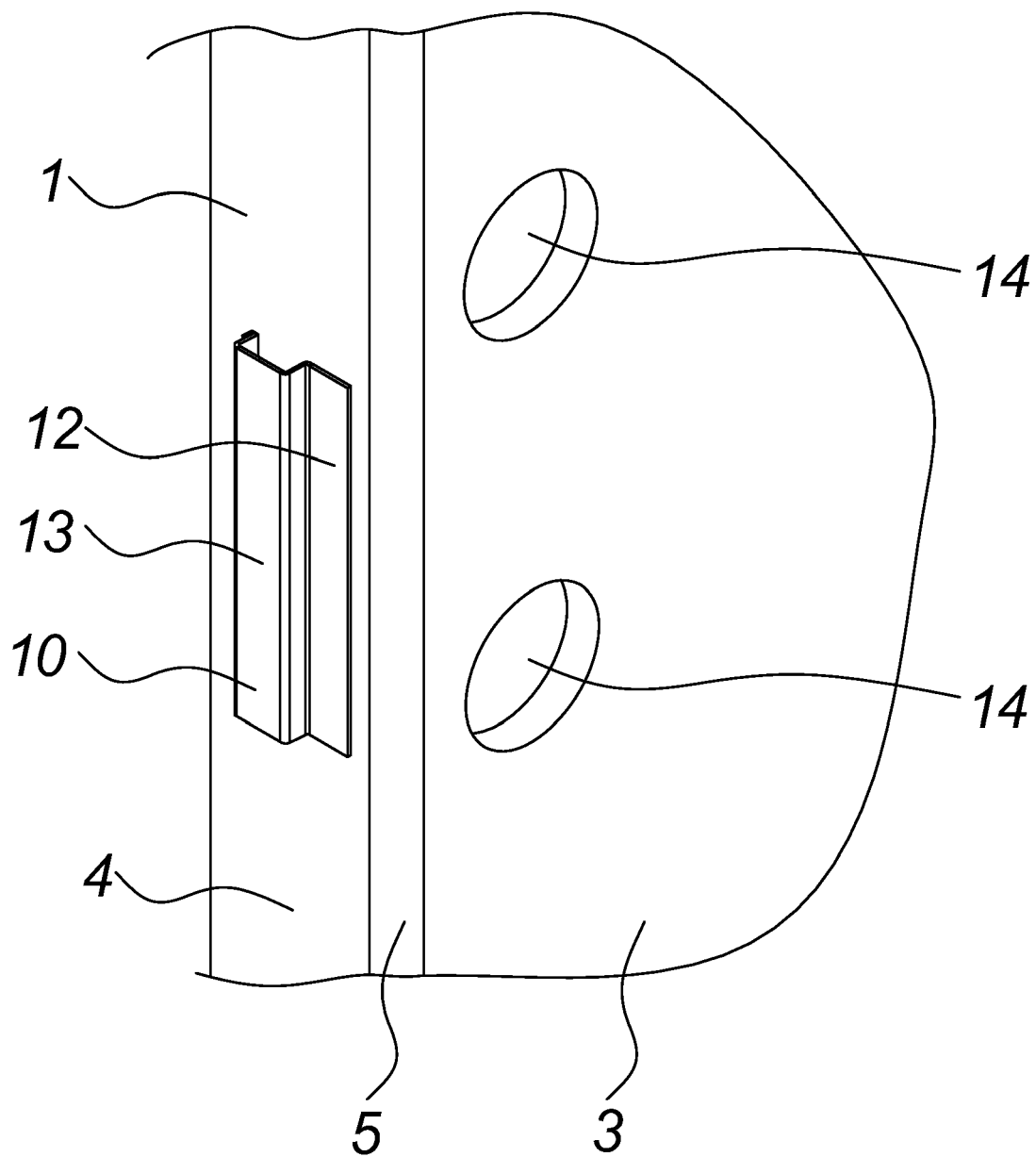


Fig. 2c

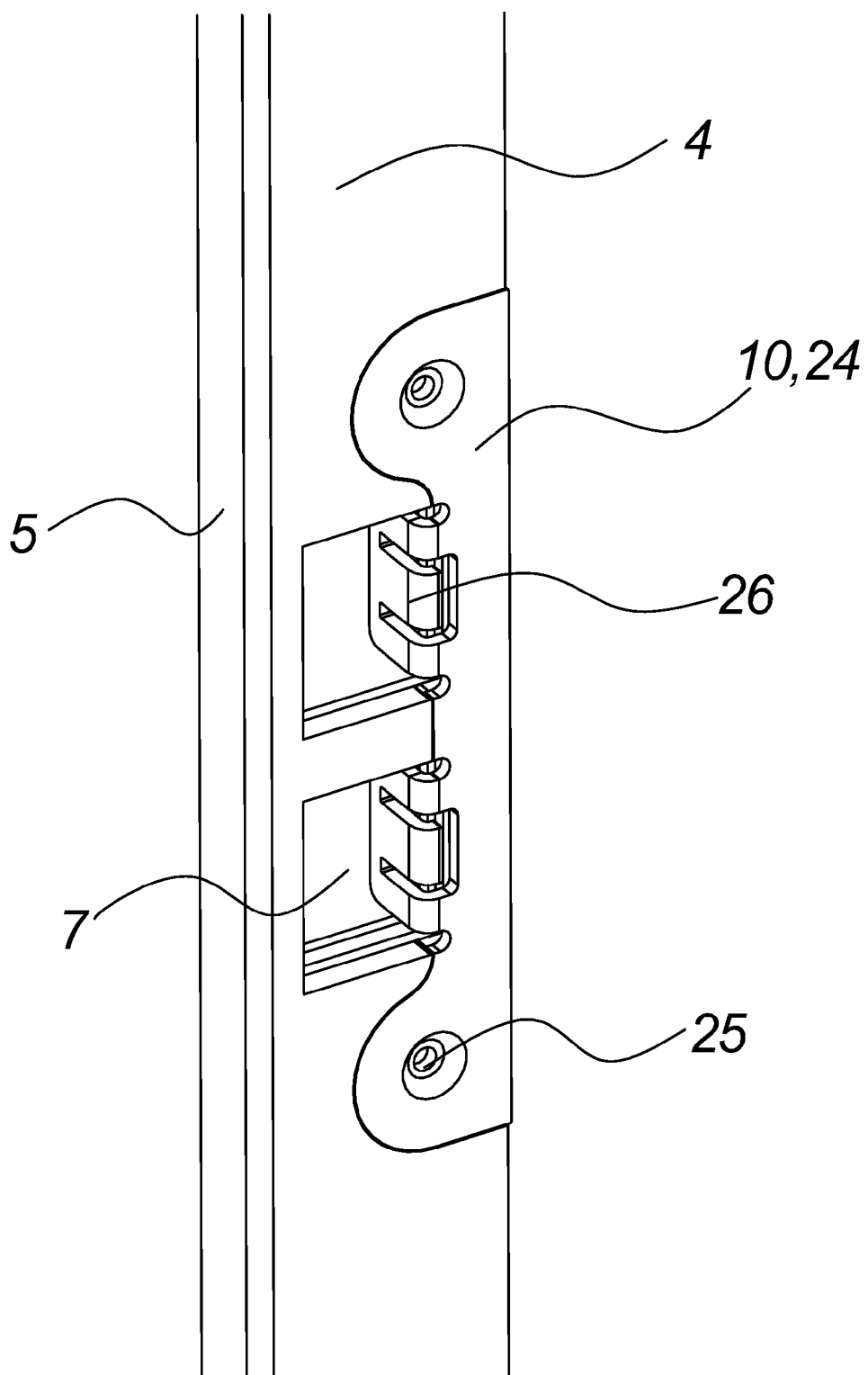


Fig. 3a

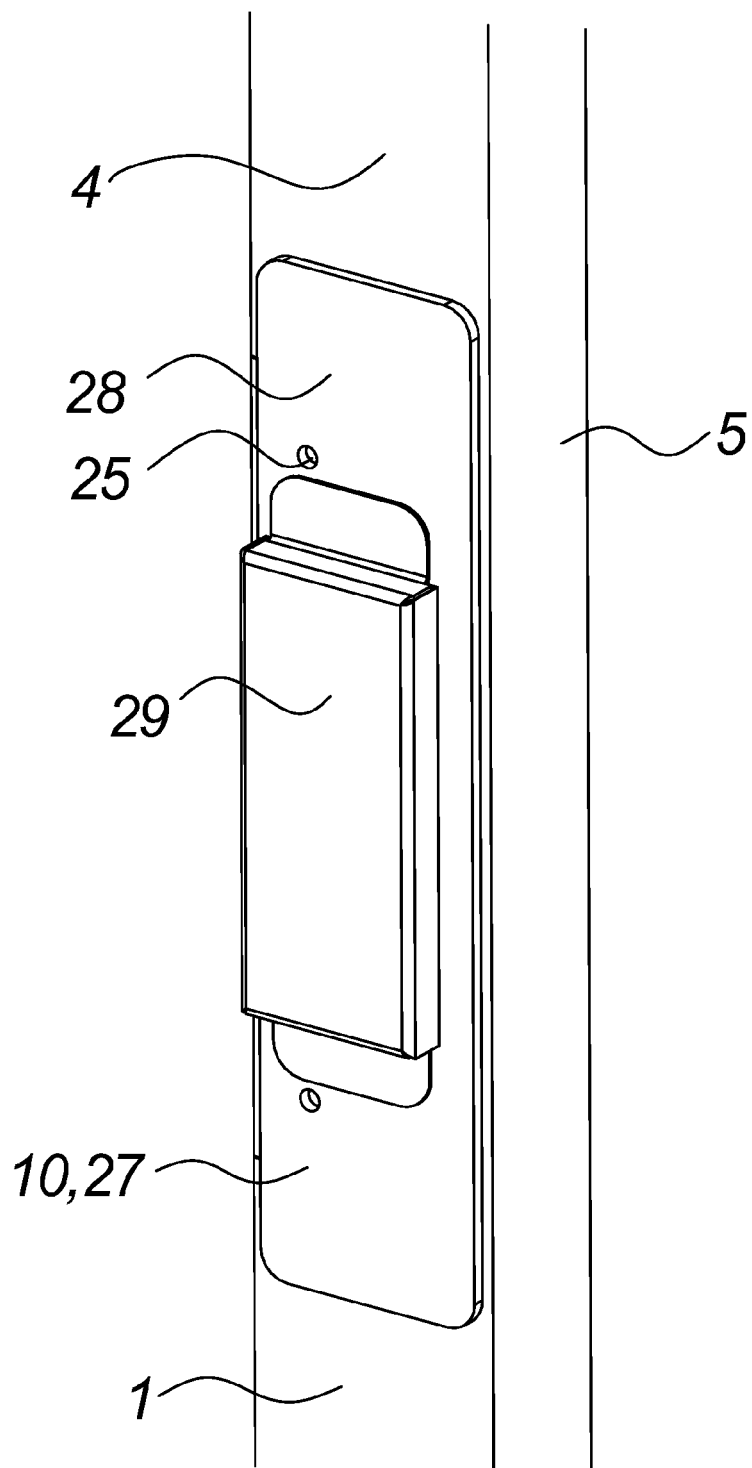


Fig. 3b

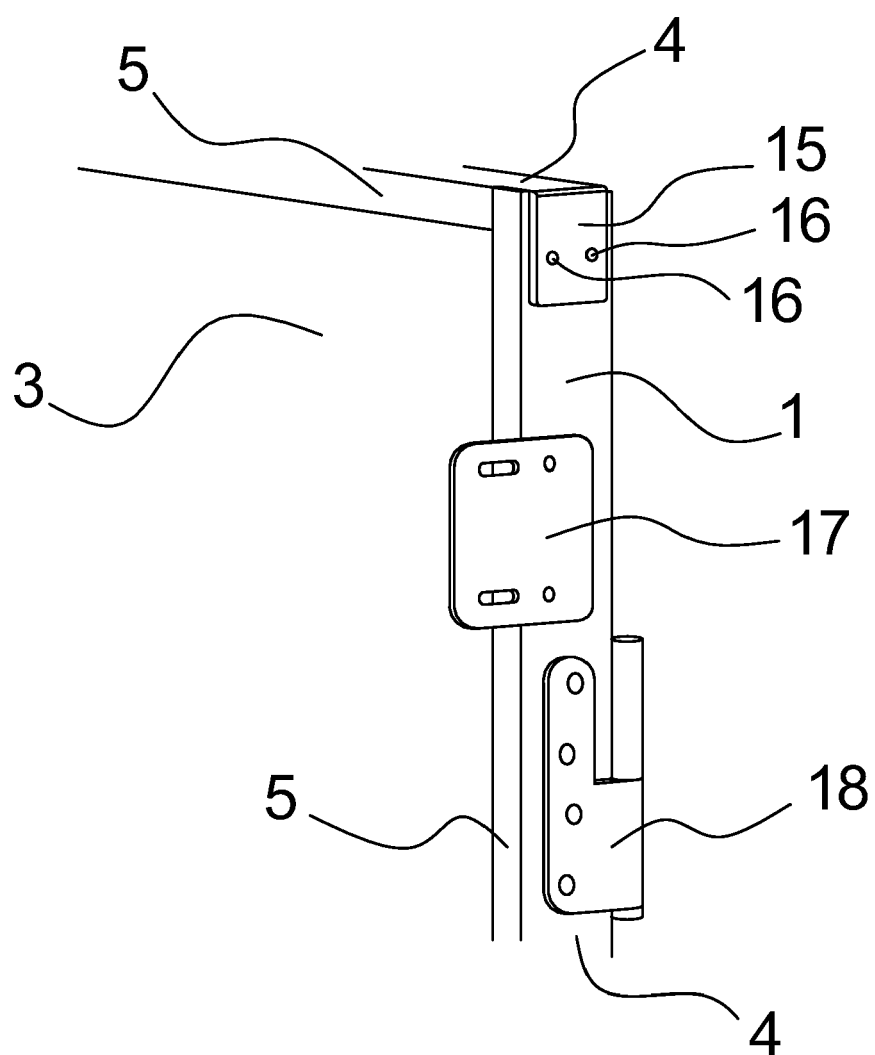


Fig. 4a

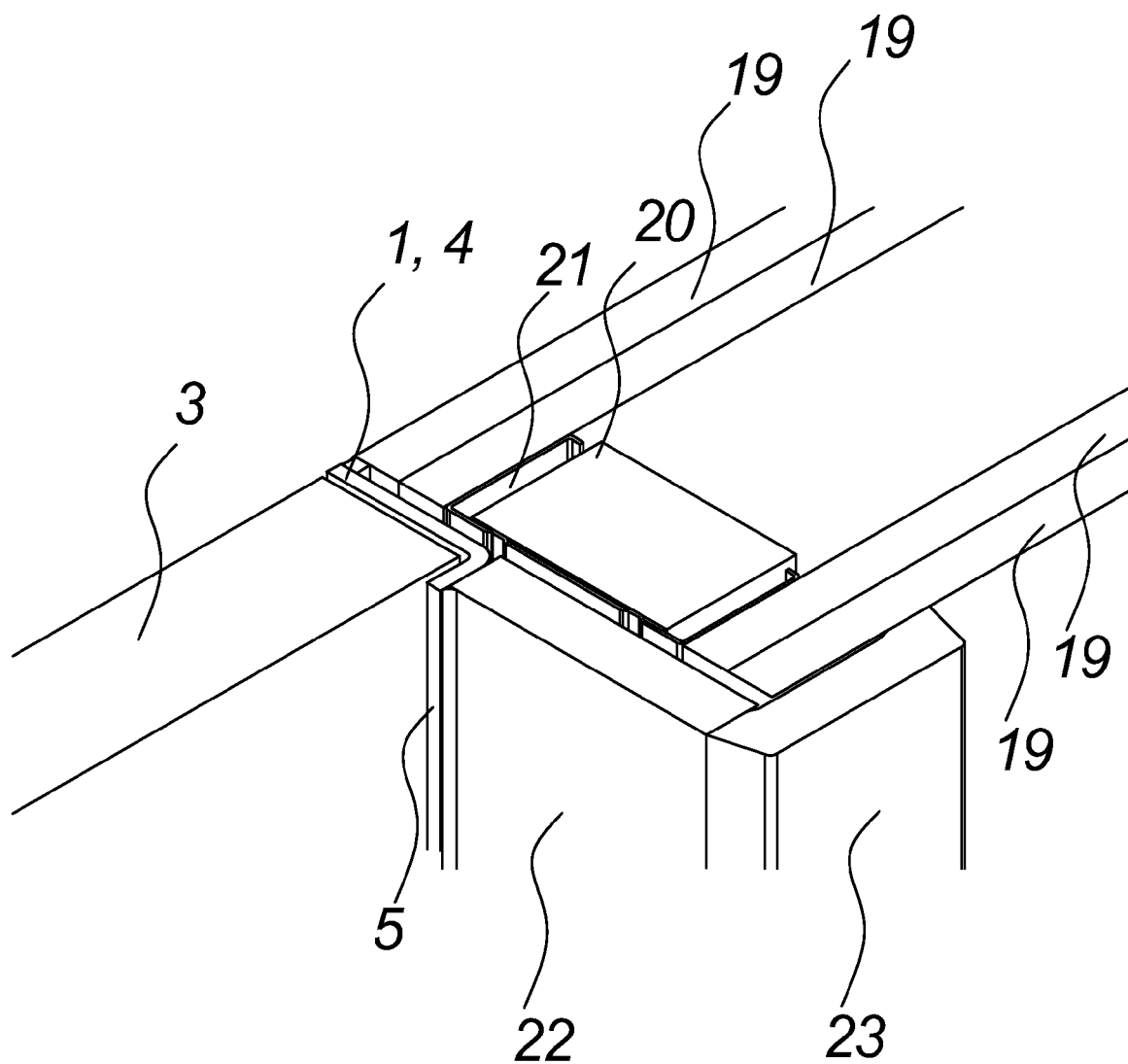


Fig. 4b

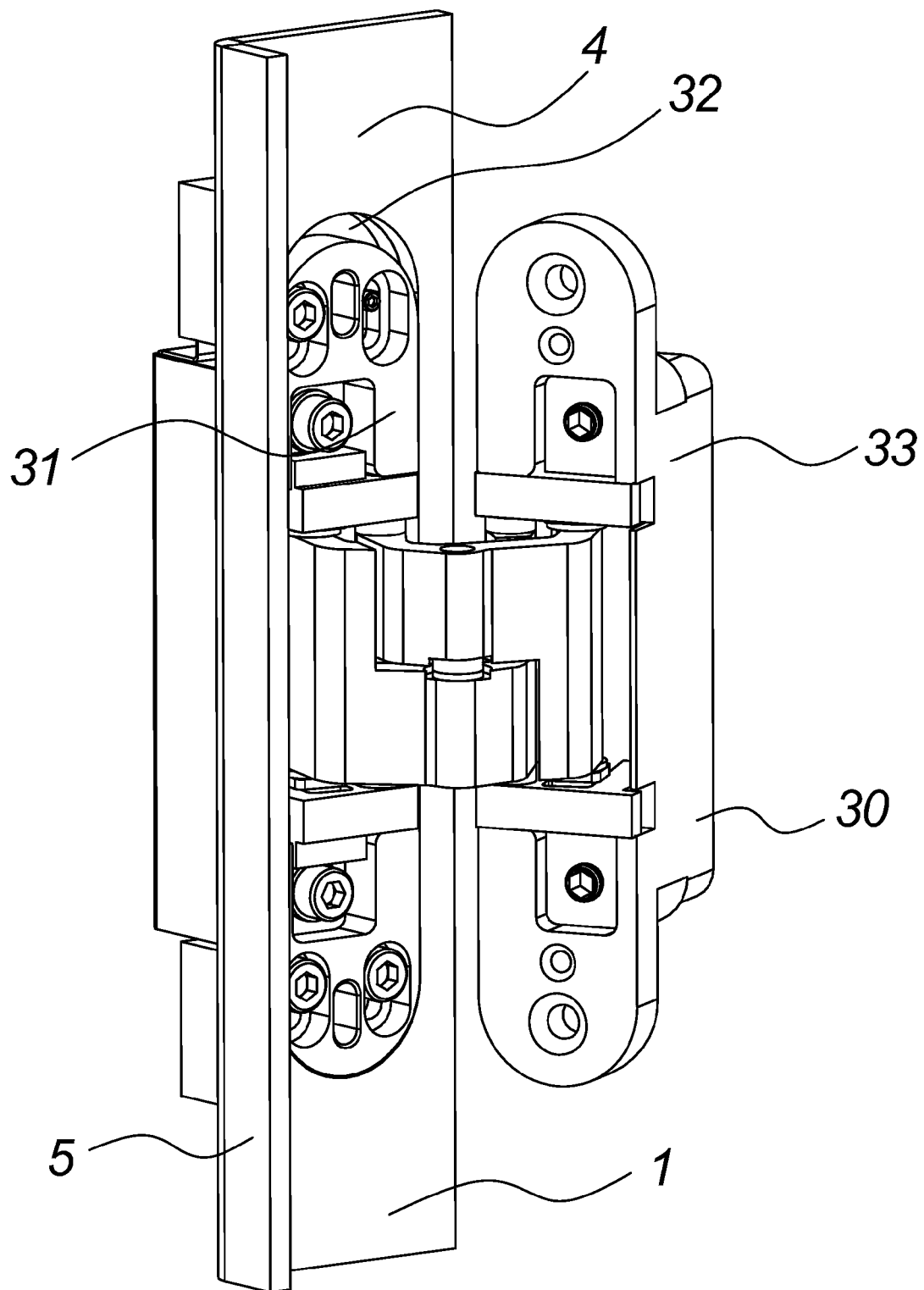


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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