(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 157 264 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.02.2010 Bulletin 2010/08

(21) Application number: **09164806.3**

(22) Date of filing: **07.07.2009**

(51) Int Cl.:
E05C 9/04 *(2006.01)* ***E05C 9/18*** *(2006.01)*
E05B 15/02 *(2006.01)* ***E05C 9/24*** *(2006.01)*

(84) Designated Contracting States:
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 SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **21.08.2008 PCT/EP2008/060960**

(71) Applicant: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventors:
- **Mikkelsen, Søren Martin**
  6950, Ringkøbing (DK)
- **Christensen, Niels Peter**
  6950, Ringkøbing (DK)

(74) Representative: **Olsen, Lau Lund**
Zacco Denmark A/S
Hans Bekkevolds Allé 7
2900 Hellerup (DK)

(54) Outwardly opening window or door assembly

(57) The window (1) comprises a sash (3) carrying a window pane (4) being mounted movably in a frame (2). A locking device (7) comprises at least one displaceable locking element in the form of an espagnolette bolt (8a, 8b) and a handle (13) adapted to displace the locking element between a locked position and an unlocked position. An engagement portion of the espagnolette bolt is split up into a first and a second end bolt (17, 18), so that, in a closed position, the first end bolt (17) may engage a first recess (15) of a corner striking plate (10), and the second end bolt (18) may engage a second recess (16) of the corner striking plate, and so that, in a ventilation position, the second end bolt may engage the first recess (15) of the corner striking plate.

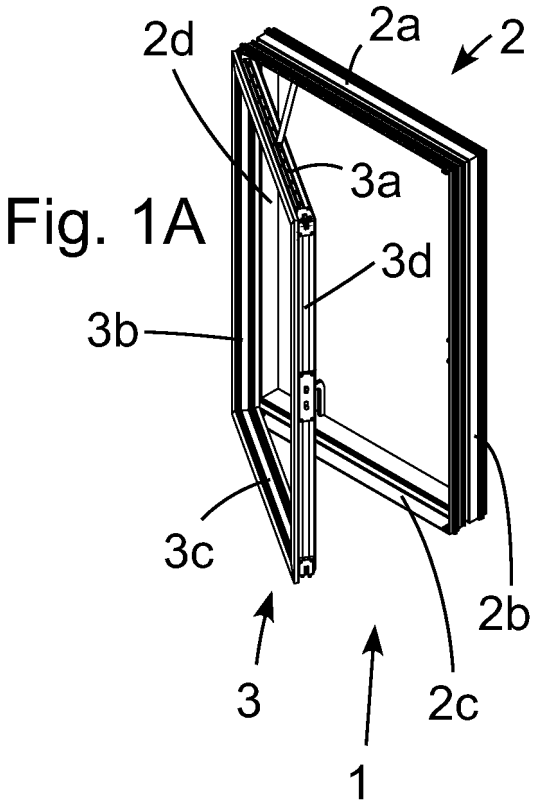

Fig. 1A

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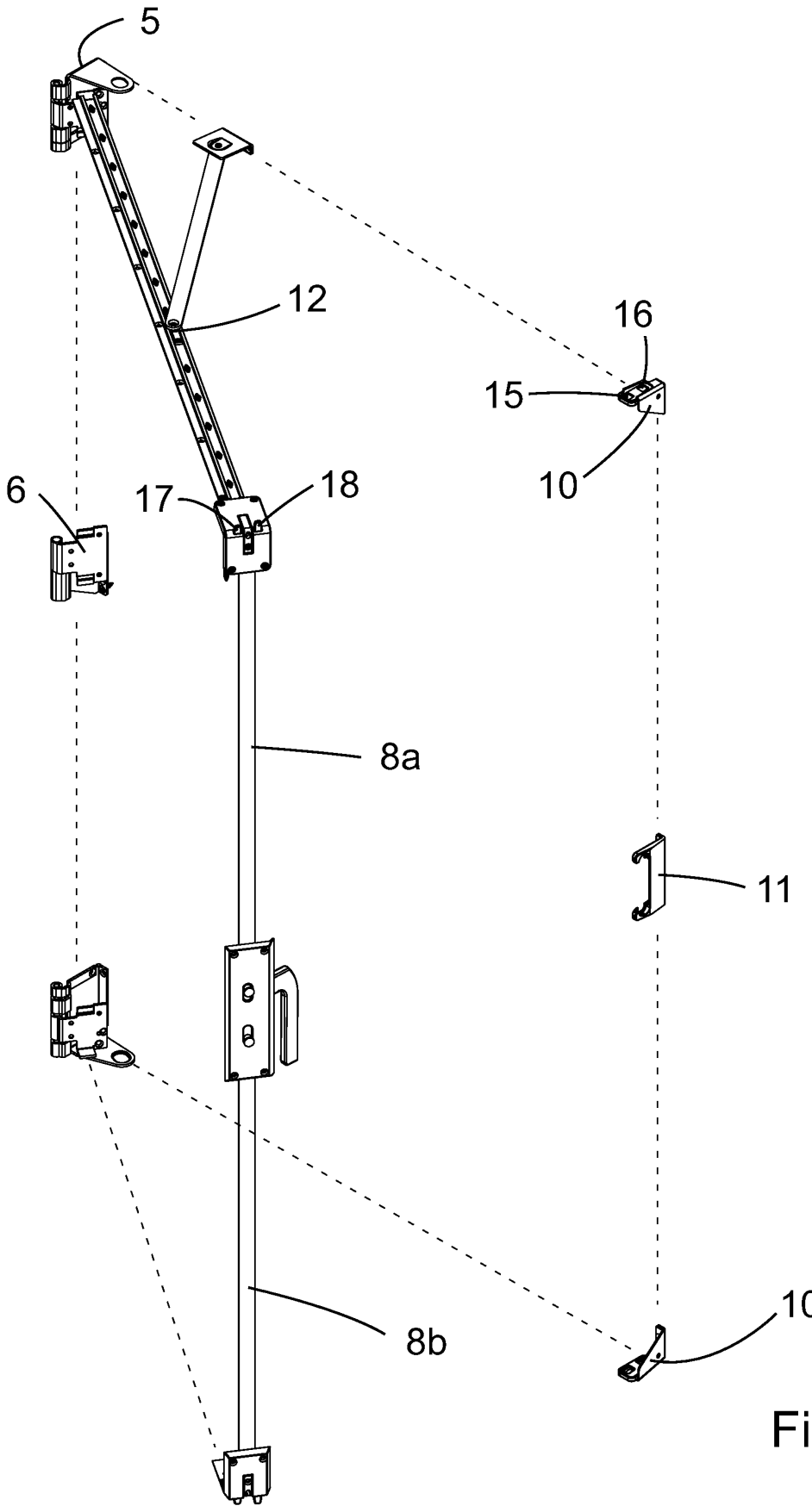

Fig. 1B

Description

[0001] The present invention relates to an outwardly opening window or door assembly comprising a sash carrying a window pane or door leaf and being mounted in a frame movable between an open position, a ventilation position and a closed position, a locking device being mounted in a cavity of a sash member of the sash, the locking device comprising at least one displaceable locking element in the form of an espagnolette bolt extending along an outer edge of the sash member comprising the locking device, and the locking device comprising a handle adapted to displace the locking element between a locked position, in which an engagement portion of the espagnolette bolt engages a corner striking plate mounted at a corresponding corner of the frame, and an unlocked position, in which the engagement portion of the espagnolette bolt is disengaged from the corner striking plate, the corner striking plate comprising a first recess adapted for engagement with the engagement portion of the espagnolette bolt in the ventilation position of the window or door assembly and a second recess being adapted for engagement with the engagement portion of the espagnolette bolt in the closed position of the window or door assembly.

[0002] In known outwardly opening window or door assemblies, a ventilation position of the window or door is obtained by providing a striking plate with a first and a second recess, so that an espagnolette bolt may engage the first recess in the ventilation position and the second recess in the closed position. However, especially in the case of a slim frame and sash construction, the space available for the striking plate may be limited and therefore result in a weak construction. Consequently, it may be difficult to obtain the required strength against an attempted break-in.

[0003] The object of the present invention is to provide an outwardly opening window or door assembly with a ventilation position, whereby improved strength against break-in is provided.

[0004] In view of this object, the engagement portion of the espagnolette bolt is split up into a first and a second end bolt spaced in a direction perpendicular to a general plane of the window pane or door leaf, so that, in the closed position of the window or door assembly, the first end bolt may engage the first recess of the corner striking plate, and the second end bolt may engage the second recess of the corner striking plate, and so that, in the ventilation position of the window or door assembly, the second end bolt may engage the first recess of the corner striking plate.

[0005] Thereby, in the closed position of the window or door assembly, an improved strength of the engagement between the espagnolette bolt and the corner striking plate may be obtained in that two separate end bolts each engages a corresponding recess of the corner striking plate.

[0006] In an embodiment, the first and the second end bolts of the engagement portion of the espagnolette bolt, in the locked position, extend through an opening formed by a separate cover bracket mounted on the sash. Thereby, improved strength against break-in may be provided, as the separate cover bracket may reinforce the first and the second end bolts of the engagement portion in the closed position of the window.

[0007] In a structurally advantageous embodiment, the first and the second end bolts are guided by the separate cover bracket. Thereby, improved functionality may be obtained.

[0008] In an embodiment, a separate corner bracket is mounted at a corner of the sash, and the separate corner bracket has a recess that is suitable for guiding a flexible band connecting the espagnolette bolt and an actuation arm, such as a brake actuation arm, arranged displaceably along an outer edge of a sash member that, at the corner of the sash, is connected to the sash member that comprises the locking device. Thereby, a displacement of the espagnolette bolt may be transferred around the corner to an actuation arm, even though little space may be available.

[0009] In an embodiment, an actuation arm, such as a brake actuation arm, is arranged displaceably along an outer edge of a sash member that, at a corner of the sash, is connected to the sash member that comprises the locking device, and a flexible band connecting the espagnolette bolt and the actuation arm is arranged between the first and the second end bolts of the engagement portion of the espagnolette bolt. Thereby, a displacement of the espagnolette bolt may be transferred around the corner to an actuation arm, even though very little space may be available. By arranging the flexible band between the first and the second end bolts of the engagement portion of the espagnolette bolt, the flexible band may bend around the corner at a suitably large radius in order to provide for a smooth operation of the locking device.

[0010] In a structurally advantageous embodiment, the engagement portion of the espagnolette bolt has the form of a fork head composed by the first and the second end bolts and a connecting piece connecting the first and the second end bolts, and the flexible band is connected to the connecting piece.

[0011] In an embodiment, a first end of the flexible band is connected to the connecting piece by abutting a side of the connecting piece facing away from the window pane or door leaf. Thereby, the flexible band may bend around the corner at a suitably even larger radius in order to provide for a smooth operation of the locking device.

[0012] In a structurally advantageous embodiment easy to assemble, the first end of the flexible band is provided with a through hole in which a protrusion on the connecting piece is engaged.

[0013] In an embodiment, a second end of the flexible band is connected to the actuation arm by abutting a side of the actuation arm facing away from the window pane or door leaf. Thereby, the flexible band may bend around

the corner at a suitably even larger radius in order to provide for a smooth operation of the locking device.

[0014] In a structurally advantageous embodiment easy to assemble, the second end of the flexible band is preferably provided with a through hole in which a protrusion on the actuation arm is engaged.

[0015] In a structurally advantageous embodiment, the flexible band is guided around the corner of the window sash by means of a separate guide piece mounted on the sash, and the separate guide piece forms a smoothly curved path for the flexible band. Thereby, a displacement of the espagnolette bolt may be transferred smoothly around the corner to the actuation arm, even though little space may be available.

[0016] In a structurally advantageous embodiment easy to assemble, the separate guide piece has the form of a substantially L-shaped element provided with a smoothly curved recess forming a part of the smoothly curved path, the smoothly curved recess being formed where the legs of the substantially L-shaped element meet each other, in the outward facing sides of the legs, and a covering element is preferably provided that fits into the smoothly curved recess in order to form another part of the smoothly curved path and in order to cover the flexible band. Thereby, a displacement of the espagnolette bolt may be transferred smoothly around the corner to the actuation arm, even though little space may be available.

[0017] In a structurally advantageous embodiment easy to assemble, the flexible band is provided with an elongated hole through which a bolt or the like extends and connects the covering element to a bottom of the smoothly curved recess of the substantially L-shaped element.

[0018] In an embodiment easy to manufacture and easy to assemble, the separate guide piece has the form of two abutting, symmetrically formed parts that are closed around the flexible band, and the two symmetrically formed parts are preferably injection moulded and preferably mutually connected by means of a film hinge.

[0019] In an embodiment easy to assemble, the engagement portion of the espagnolette bolt has the form of a separate element connected to the espagnolette bolt by means of a click-lock mechanism.

[0020] In a structurally advantageous embodiment easy to assemble, the click-lock mechanism is composed by means of a first substantially mushroom-like part and a second part having a first and a second leg, and at least one of the legs of the second part is provided with a protrusion adapted to grip under a head of the mushroom-like part.

[0021] In an embodiment, only the first leg of the second part is provided with a protrusion adapted to grip under the head of the mushroom-like part. Thereby, the engagement portion may be snap-connected to the espagnolette bolt even though it may be located in a narrow groove of the window or door sash, because with a protrusion on only the first leg, less lateral displacement of the legs in required during the snap-connection operation.

[0022] In an embodiment, the espagnolette bolt has a rectangular shape with one dimension being larger than the other dimension, so that the larger dimension is arranged perpendicular to the general plane of the window pane or door leaf. In this way, the bolts do not protrude out from the sash very much. Furthermore, since the large dimension of the cross section of the bolts is arranged perpendicular to the general plane of the window or door assembly, the strength of the bolt in the direction which would be exposed to large forces during an attempted break-in will be very large.

[0023] In a structurally advantageous embodiment easy to assemble, the espagnolette bolt is guided along the sash member by means of at least one bolt mounted in the sash member, the bolt extends through an elongated hole in the espagnolette bolt, and the bolt is provided with a head having a larger diameter that the width of the elongated hole.

[0024] In an embodiment, the corner striking plate comprises a first flange comprising the first and the second recess for engagement with the engagement portion of the espagnolette bolt and a second flange being mounted to a surface of both frame members connected at the corner. As the corner striking plate is attached to both frame members at the corner, the strength of the joint is increased, and the forces applied to the striking plate are allowed to be split between the two frame members.

[0025] In an embodiment, the second flange comprises a first and a second plate member arranged at right angles to each other and being fixed to separate frame members, respectively. Due to the arrangement of the corner striking plate, in the case where the window or door assembly is attempted to be forced open, the corner striking plate may bend such that it is even more locked.

[0026] The invention will now be explained in more detail below by means of examples of embodiments with reference to the very schematic drawing, in which

Fig. 1 show perspective illustrations of a window or door assembly according to the current invention, whereby Fig. 1A is a small-scale figure indicating the complete window or door assembly, and Fig. 1B is a large-scale figure showing the fittings only, and whereby the locking device is in the locked position.

Fig. 2 shows a perspective view of the upper corner striking plate shown in Fig. 1,

Fig. 3 shows a perspective view of the lower corner striking plate shown in Fig. 1,

Figs. 4 shows a perspective view of a detail illustrating the first and the second end bolts of the engagement portion of the upper espagnolette bolt in the unlocked position,

Figs. 5 shows a perspective view of a detail illustrating the first and the second end bolts of the engagement portion of the upper espagnolette bolt in the locked position shown in Fig. 1,

Fig. 6 shows a perspective view of an embodiment of a part of the sash and fittings of the window or door assembly according to the invention,

Fig. 7 shows a perspective view of part of the upper espagnolette bolt and fittings of the embodiment shown in Fig. 6, whereby the sash has been removed,

Fig. 8 shows a perspective, partly exploded view of part of the upper espagnolette bolt and fittings of the embodiment shown in Fig. 6, whereby the sash has been removed,

Fig. 9 shows a perspective view of a cover bracket in the form of a separate guide piece of the embodiment shown in Fig. 6, seen from above,

Fig. 10 shows a perspective view the cover bracket in Fig. 9, seen from below,

Fig. 11 shows a perspective view of another embodiment of the sash and fittings of the window or door assembly according to the invention,

Fig. 12 shows a perspective view of the espagnolette bolts and fittings of the embodiment shown in Fig. 11, whereby the sash has been removed,

Fig. 13 shows a front view of a detail of the snap-connection between the espagnolette bolt and its engagement portion,

Fig. 14 shows a side view of the espagnolette bolts and fittings of the embodiment shown in Fig. 11, whereby a separate cover bracket and a separate guide piece have been removed,

Fig. 15 shows a front view of the espagnolette bolts and fittings in Fig. 14,

Fig. 16 shows a perspective, partly exploded view of the espagnolette bolts and fittings of the embodiment shown in Fig. 12,

Fig. 17 shows a perspective view of a separate guide piece of the embodiment shown in Fig. 12,

Fig. 18 shows a front view of the separate guide piece shown in Fig. 17, before assembly,

Fig. 19 shows a perspective view of the separate guide piece shown in Fig. 18, before assembly, and

Fig. 20 shows a perspective view of a separate cover bracket of the espagnolette bolts and fittings in Fig. 12.

[0027] Fig. 1 shows an outwardly opening side hinged window assembly 1 according to the current invention. However, the invention is likewise applicable to a door assembly. The window or door assembly comprises a frame 2 made up of four frame elements or members 2a, 2b, 2c, 2d connected together with mitre joints, a sash 3 made up of four sash elements 3a, 3b, 3c, 3d connected together with mitre joints and a triple glazed pane of glass 4 arranged inside the sash 3. Two corner hinges 5 and a centre hinge 6 connect the sash 3 to the frame 2.

[0028] A locking device 7 forming part of an espagnolette mechanism is mounted in a cavity of a sash member of the sash and is used to lock the sash in a closed position or in a ventilation position, respectively. Furthermore, the locking device may activate a window brake in order to maintain the sash in an open position. The locking device 7 is adapted to displace two displaceable locking elements in the form espagnolette bolts 8a, 8b outwards in opposite directions such that they protrude from the outer edges of the sash. The locking device 7 also comprises two mushroom cams 9 which are also displaced outwards in opposite directions when the locking device is locked. The espagnolette bolts 8a, 8b engage with corner striking plates 10, which are mounted at the corners of the frame, when the window or door assembly is closed or brought to the ventilation position, and the locking device is in its locked position, and the mushroom cams 9 engage with a centre striking plate 11 mounted at the centre of a frame element 2b when the window or door assembly is closed and the locking device is in its locked position. In this way, the window or door can be locked in a slightly open position or it can be locked in a fully closed position. Fig. 1 shows the window assembly in its open position and the locking device in its locked position.

[0029] The locking device 7 comprises a handle 13 adapted to displace the espagnolette bolts 8a, 8b between the locked position, in which an engagement portion 14 of the espagnolette bolt 8a, 8b engages the corner striking plate 10 mounted at a corresponding corner of the frame 2, and an unlocked position, in which the engagement portion of the espagnolette bolt is disengaged from the corner striking plate.

[0030] As it may be seen for instance in Figs. 1 to 3 and 6, the corner striking plate 10 comprises a first recess 15 and a second recess 16 being spaced in a direction perpendicular to a general plane of the window frame 2. Correspondingly, the engagement portion 14 of the espagnolette bolt 8a, 8b is split up into a first end bolt 17 and a second end bolt 18 spaced in a direction perpendicular to the general plane of the window pane 4 or door leaf. Thereby, in the closed position of the window or door assembly, the first end bolt 17 may engage the first recess 15 of the corner striking plate 10, and the second

end bolt 18 may engage the second recess 16 of the corner striking plate, and in the ventilation position of the window or door assembly, the second end bolt 18 may engage the first recess 15 of the corner striking plate 10. It should be noted that in the present context, the expression a first recess 15 and a second recess 16 of the corner striking plate should mean any corner striking plate or the like having two distinct engagement positions each adapted to go into engagement with an end bolt. Therefore, although the first recess 15 and the second recess 16 are shown in the figures as being separated holes, they could just as well be separate indents in the edge of one single hole or opening that may, for instance be only partly surrounded by material of the striking plate or the like. Each recess 15, 16 may even be just any kind of stop suitable for engaging an end bolt.

[0031] As it may be seen for instance in Figs. 4 and 5, 6 to 12, 16 and 20, the first and the second end bolts 17, 18 of the engagement portion 14 of the espagnolette bolt 8a, 8b, in the locked position, extend through an opening 19 formed by a separate cover bracket 20 mounted on the sash 3. The first and the second end bolts 17, 18 are preferably guided by the separate cover bracket 20.

[0032] A window or door brake device 12 is mounted on the top sash element 3a and is activated by the displacement of the upper espagnolette bolt 8a of the espagnolette mechanism. The window or door brake device 12 is arranged such that the window or door is held in the open position when the locking device 7 is in the locked position. When the locking device 7 is put into its unlocked position, the window or door brake device 12 allows the sash 3 to freely open and close.

[0033] In the embodiments shown in Figs. 1 to 10, the separate cover bracket 20 has the form of a separate corner bracket 21 that is mounted at a corner of the sash 3 and has a recess 22 that is suitable for guiding a flexible band 23 connecting the espagnolette bolt 8a and an actuation arm, such as a brake actuation arm 24, arranged displaceably along an outer edge of a sash member 3a that, at the corner of the sash, is connected to the sash member 3d that comprises the locking device 7. In the unlocked position shown in Fig. 4, it may be seen that an impression 25 of the brake actuation arm 24 is at a first position near the separate corner bracket 21, and in the locked position shown in Fig. 5, it may be seen that the impression 25 of the brake actuation arm 24 is at a second position further away from the separate corner bracket 21.

[0034] The flexible band 23 connecting the espagnolette bolt and the brake actuation arm is arranged between the first and the second end bolts 17, 18 of the engagement portion 14 of the espagnolette bolt 8a.

[0035] The engagement portion 14 of the espagnolette bolt has the form of a fork head 26 composed by the first and the second end bolts 17, 18 and a connecting piece 27 connecting the first and the second end bolts, and the flexible band 23 is connected to the connecting piece 27.

[0036] As it is illustrated in Fig. 7 and Figs. 14 to 16, respectively, a first end 28 of the flexible band 23 is connected to the connecting piece 27 by abutting a side 29 of the connecting piece facing away from the window pane 4 or door leaf, and the first end 28 of the flexible band 23 is provided with a through hole 30 in which a protrusion 31 on the connecting piece is engaged. A second end 32 of the flexible band 23 is connected to the brake actuation arm 24 by abutting a side 33 of the actuation arm facing away from the window pane 4 or door leaf, and the second end 32 of the flexible band 23 is provided with a through hole 34 in which a protrusion 35 on the actuation arm 24 is engaged. In the embodiment shown in Figs. 11 to 20, the protrusion 31 on the connecting piece 27 has the form of a bolt.

[0037] As illustrated in Figs. 4 and 5, Figs. 6 to 10, Figs. 11, 12 and Figs. 16 to 19, the flexible band 23 is guided around the corner of the window sash 3 by means of a separate guide piece 36 that is mounted on the sash 3 and forms a smoothly curved path 37 for the flexible band 23.

[0038] In an embodiment of the invention shown in Figs. 4 and 5 and Figs. 6 to 10, the separate guide piece 36 is the same element as the earlier mentioned separate cover bracket 20 and the further mentioned separate corner bracket 21 and has the form of a substantially L-shaped element provided with a smoothly curved recess 38 that forms a part of the smoothly curved path 37 and is formed where the legs of the substantially L-shaped element meet each other, in the outward facing sides of the legs. In the embodiment shown in Figs. 6 to 10, further a covering element 39 is provided that fits into the smoothly curved recess 38 in order to form another part of the smoothly curved path 37 and in order to cover the flexible band 23.

[0039] In another embodiment of the invention shown in Figs. 11 to 20, the separate guide piece 36 has the form of two abutting, symmetrically formed parts 40 that are closed around the flexible band 23. The two symmetrically formed parts 40 are preferably injection moulded and preferably mutually connected by means of a film hinge 41.

[0040] In the embodiment shown in Figs. 11 to 20, the engagement portion 14 of the espagnolette bolt 8a, 8b has the form of a separate element connected to the espagnolette bolt by means of a click-lock mechanism 42, see especially Fig. 13. In this way, the engagement portion 14 could be made from metal and the espagnolette bolt 8a, 8b could for instance be made from a composite material. The click-lock mechanism 42 is composed by means of a first substantially mushroom-like part 43 and a second part 44 having a first and a second leg 45, 46. Only the first leg 45 of the second part 44 is provided with a protrusion 47 adapted to grip under a head 48 of the mushroom-like part 43. The espagnolette bolt 8a, 8b and the click-lock mechanism 42 is located in a groove 58 of the window sash 3d, and consequently limited space is available for the first 45 and second legs 46 to flex away from each other, when the protrusion 47 is to grip under

the head 48. Both legs 45, 46 could be provided with protrusions 47; however, in certain case where the groove 58 is narrower than shown in Fig. 13, this would result in very small protrusions being prone to break off as a result of a rust attack. Therefore, it may be preferred to employ one larger protrusion 47 on only one of the legs. It should be noted that during the snap-connection procedure, the espagnolette bolt 8a, 8b shown in Fig. 13 may be displaced slightly to the left in the figure in order to give place for the larger protrusion 47 to hop over the head 48.

[0041] As can be seen from for instance Figs. 6 and 7, the espagnolette bolts 8a, 8b are arranged as rods having a rectangular cross section. As can be seen the longitudinal axes of the bolts are arranged along the outer edge of the sash element. In the particular embodiment shown in Figs. 6 to 10, the bolts 8a, 8b are arranged visibly on the outer edge of the sash element, whereas in the particular embodiment shown in Figs. 11 to 20, they are integrated inside the sash element covered by a plate member 59. In the case where the bolts are visible, they could be made from the same material as the sash element. This will give a good visual impression.

[0042] The espagnolette bolts 8a, 8b are also arranged such that the cross section of the bolts has a rectangular shape with one dimension being larger than the other dimension, see for instance Figs. 6 and 7. The larger dimension is arranged perpendicular to the general plane of the window or door assembly, and the smaller dimension is arranged parallel to the general plane of the window or door assembly. In this way, the espagnolette bolt does not protrude out from the sash very much. Furthermore, since the large dimension of the cross section of the bolt is arranged perpendicular to the plane of the window or door assembly, the strength of the bolt in the direction which would be exposed to large forces during an attempted break-in will be very large.

[0043] The corner striking plate 10 shown in Figs. 1, 2 and 3 is arranged at the corner of the frame of the window or door assembly. As with the corner hinges, the corner striking plate is also attached to both frame members at the corner via not shown screws. This increases the strength of the joint and allows the forces applied to the corner striking plate to be split between the two frame members. The corner striking plate is also arranged such that if force is applied during a break in attempt, the corner striking plate will bend approximately about a line L extending between a first flange 49 and a second flange 50 of the corner striking plate 10, and the first flange 49 will bend into an even more locked position, that is a position closer to the sash.

[0044] The first flange 49 of the corner striking plate 10 comprises the first and the second recesses 15, 16 for engagement with the engagement portion 14 of the espagnolette bolt 8a, 8b and the second flange 50 is mounted to a surface of both frame members 2a, 2b, 2c connected at the corner. The second flange 50 comprises a first and a second plate member 51, 52 arranged at right angles to each other and being fixed to separate frame members, respectively, by means of not shown mounting screws inserted through mounting holes 53, 54, respectively.

[0045] In the embodiment shown in Figs. 6 to 10, the espagnolette bolt 8a, 8b is guided along the sash member 3d by means of at least one bolt 55 mounted in the sash member and extending through an elongated hole 56 in the espagnolette bolt 8a, 8b. The bolt 55 is provided with a head 57 having a larger diameter that the width of the elongated hole 56.

[0046] In the embodiment illustrated in Fig. 1, only the lower part of the sash 3 is provided with a brake 12 and consequently the flexible band 23 and related features are omitted at the lower corner of the frame connecting the sash elements 3d, 3c. Other features, such as the end bolts 17, 18 and the separate cover bracket 20 are preferably similar to the corresponding parts at the top of the sash. However, features that are only necessary for the brake system may be omitted at the lower corner of the sash, such as for instance the recess 22 for the flexible band 23.

[0047] It should be noted that the embodiment of the invention illustrated in the Figs. 6 to 10 has the form of a window assembly having sash and frame members made of pultruded or extruded profiles, for instance made of fibre reinforced composite materials or from plastic materials. Further, the embodiment of the invention illustrated in the Figs. 11 to 20 has the form of a window assembly having sash and frame members made wooden profiles. However, the skilled person will understand that features of these embodiments can be interchanged or combined in different ways without departing from the scope of the invention. For instance, the snap-connection shown in Fig. 13 may just as well be employed in the embodiment of the invention shown in Figs. 6 to 10. Similarly, the injection moulded separate guide piece 36 shown in Figs. 17 to 18 may just as well be employed in the embodiment of the invention shown in Figs. 1 to 10. The skilled person will understand that the fact that different kinds of sash and frame members may have different dimensions may, for a certain window assembly, render features of a certain embodiment shown preferable over features shown in another embodiment. However, in general, every feature shown in the different embodiments is interchangeable with a similar feature of another shown embodiment.

Claims

1. An outwardly opening window or door assembly (1) comprising a sash (3) carrying a window pane (4) or door leaf and being mounted in a frame (2) movable between an open position, a ventilation position and a closed position, a locking device (7) being mounted in a cavity of a sash member (3d) of the sash, the locking device (7) comprising at least one displace-

able locking element in the form of an espagnolette bolt (8a, 8b) extending along an outer edge of the sash member (3d) comprising the locking device (7), and the locking device (7) comprising a handle (13) adapted to displace the locking element between a locked position, in which an engagement portion (14) of the espagnolette bolt (8a, 8b) engages a corner striking plate (10) mounted at a corresponding corner of the frame (2), and an unlocked position, in which the engagement portion (14) of the espagnolette bolt (8a, 8b) is disengaged from the corner striking plate (10), the corner striking plate (10) comprising a first recess (15) adapted for engagement with the engagement portion (14) of the espagnolette bolt (8a, 8b) in the ventilation position of the window or door assembly and a second recess (16) being adapted for engagement with the engagement portion (14) of the espagnolette bolt (8a, 8b) in the closed position of the window or door assembly, **characterized in that** the engagement portion (14) of the espagnolette bolt (8a, 8b) is split up into a first and a second end bolt (17, 18) spaced in a direction perpendicular to a general plane of the window pane (4) or door leaf, so that, in the closed position of the window or door assembly, the first end bolt (17) may engage the first recess (15) of the corner striking plate (10), and the second end bolt (18) may engage the second recess (16) of the corner striking plate (10), and so that, in the ventilation position of the window or door assembly, the second end bolt (18) may engage the first recess (15) of the corner striking plate (10).

2. An outwardly opening window or door assembly (1) according to claim 1, **characterized in that** the first and the second end bolts (17, 18) of the engagement portion (14) of the espagnolette bolt (8a, 8b), in the locked position, extend through an opening (19) formed by a separate cover bracket (20) mounted on the sash (3), and **in that** the first and the second end bolts (17, 18) are preferably guided by the separate cover bracket (20).

3. An outwardly opening window or door assembly (1) according to claim 1 or 2, **characterized in that** a separate corner bracket (21) is mounted at a corner of the sash (3), and **in that** the separate corner bracket (21) has a recess (38) that is suitable for guiding a flexible band (23) connecting the espagnolette bolt (8a) and an actuation arm, such as a brake actuation arm (24), arranged displaceably along an outer edge of a sash member (3a) that, at the corner of the sash (3), is connected to the sash member (3d) that comprises the locking device (7).

4. An outwardly opening window or door assembly (1) according to any one of the preceding claims, **characterized in that** an actuation arm, such as a brake actuation arm (24), is arranged displaceably along an outer edge of a sash member (3a) that, at a corner of the sash, is connected to the sash member (3d) that comprises the locking device (7), and **in that** a flexible band (23) connecting the espagnolette bolt (8a) and the actuation arm (24) is arranged between the first and the second end bolts (17, 18) of the engagement portion (14) of the espagnolette bolt (8a).

5. An outwardly opening window or door assembly (1) according to claim 4, **characterized in that** the engagement portion (14) of the espagnolette bolt (8a, 8b) has the form of a fork head (26) composed by the first and the second end bolts (17, 18) and a connecting piece (27) connecting the first and the second end bolts (17, 18), and **in that** the flexible band (23) is connected to the connecting piece (27).

6. An outwardly opening window or door assembly (1) according to claim 5, **characterized in that** a first end (28) of the flexible band (23) is connected to the connecting piece (27) by abutting a side (29) of the connecting piece facing away from the window pane (4) or door leaf, and **in that** the first end (28) of the flexible band (23) is preferably provided with a through hole (30) in which a protrusion (31) on the connecting piece (27) is engaged.

7. An outwardly opening window or door assembly (1) according to any one of the claims 4 to 6, **characterized in that** a second end (32) of the flexible band (23) is connected to the actuation arm (24) by abutting a side (33) of the actuation arm (24) facing away from the window pane (4) or door leaf, and **in that** the second end (32) of the flexible band (23) is preferably provided with a through hole (34) in which a protrusion (35) on the actuation arm (24) is engaged.

8. An outwardly opening window or door assembly (1) according to any one of the claims 4 to 7, **characterized in that** the flexible band (23) is guided around the corner of the window sash (3) by means of a separate guide piece (36) mounted on the sash, and **in that** the separate guide piece (36) forms a smoothly curved path (37) for the flexible band (23).

9. An outwardly opening window or door assembly according to claim 8, **characterized in that** the separate guide piece (36) has the form of a substantially L-shaped element provided with a smoothly curved recess (38) forming a part of the smoothly curved path (37), the smoothly curved recess (38) being formed where the legs of the substantially L-shaped element meet each other, in the outward facing sides of the legs, and **in that** a covering element (39) is preferably provided that fits into the smoothly curved recess (38) in order to form another part of the smoothly curved path (37) and in order to cover the

flexible band (23).

10. An outwardly opening window or door assembly according to claim 8, **characterized in that** the separate guide piece has the form of two abutting, symmetrically formed parts (40) that are closed around the flexible band (23), and **in that** the two symmetrically formed parts (40) are preferably injection moulded and preferably mutually connected by means of a film hinge (41).

11. An outwardly opening window or door assembly (1) according to any one of the preceding claims, **characterized in that** the engagement portion (14) of the espagnolette bolt (8a, 8b) has the form of a separate element connected to the espagnolette bolt by means of a click-lock mechanism (42).

12. An outwardly opening window or door assembly according to claim 11, **characterized in that** the click-lock mechanism (42) is composed by means of a first substantially mushroom-like part (43) and a second part (44) having a first and a second leg (45, 46), and **in that** at least one of the legs of the second part (44) is provided with a protrusion (47) adapted to grip under a head (48) of the mushroom-like part (43).

13. An outwardly opening window or door assembly according to claim 12, **characterized in that** only the first leg (45) of the second part (44) is provided with a protrusion (47) adapted to grip under the head (48) of the mushroom-like part (43).

14. An outwardly opening window or door assembly according to any one of the preceding claims, **characterized in that** the espagnolette bolt (8a, 8b) has a rectangular shape with one dimension being larger than the other dimension, so that the larger dimension is arranged perpendicular to the general plane of the window pane (4) or door leaf.

15. An outwardly opening window or door assembly according to claim 14, **characterized in that** the espagnolette bolt (8a, 8b) is guided along the sash member (3d) by means of at least one bolt (55) mounted in the sash member, **in that** the bolt (55) extends through an elongated hole (56) in the espagnolette bolt, and **in that** the bolt (55) is provided with a head (57) having a larger diameter that the width of the elongated hole (56).

16. An outwardly opening window or door assembly according to any one of the preceding claims, **characterized in that** the corner striking plate (10) comprises a first flange (49) comprising the first and the second recess (15, 16) for engagement with the engagement portion (14) of the espagnolette bolt (8a, 8b) and a second flange (50) being mounted to a surface of both frame members (2a, 2b, 2c) connected at the corner.

17. An outwardly opening window or door assembly according to claim 16, **characterized in that** the second flange (50) comprises a first and a second plate member (51, 52) arranged at right angles to each other and being fixed to separate frame members, respectively.

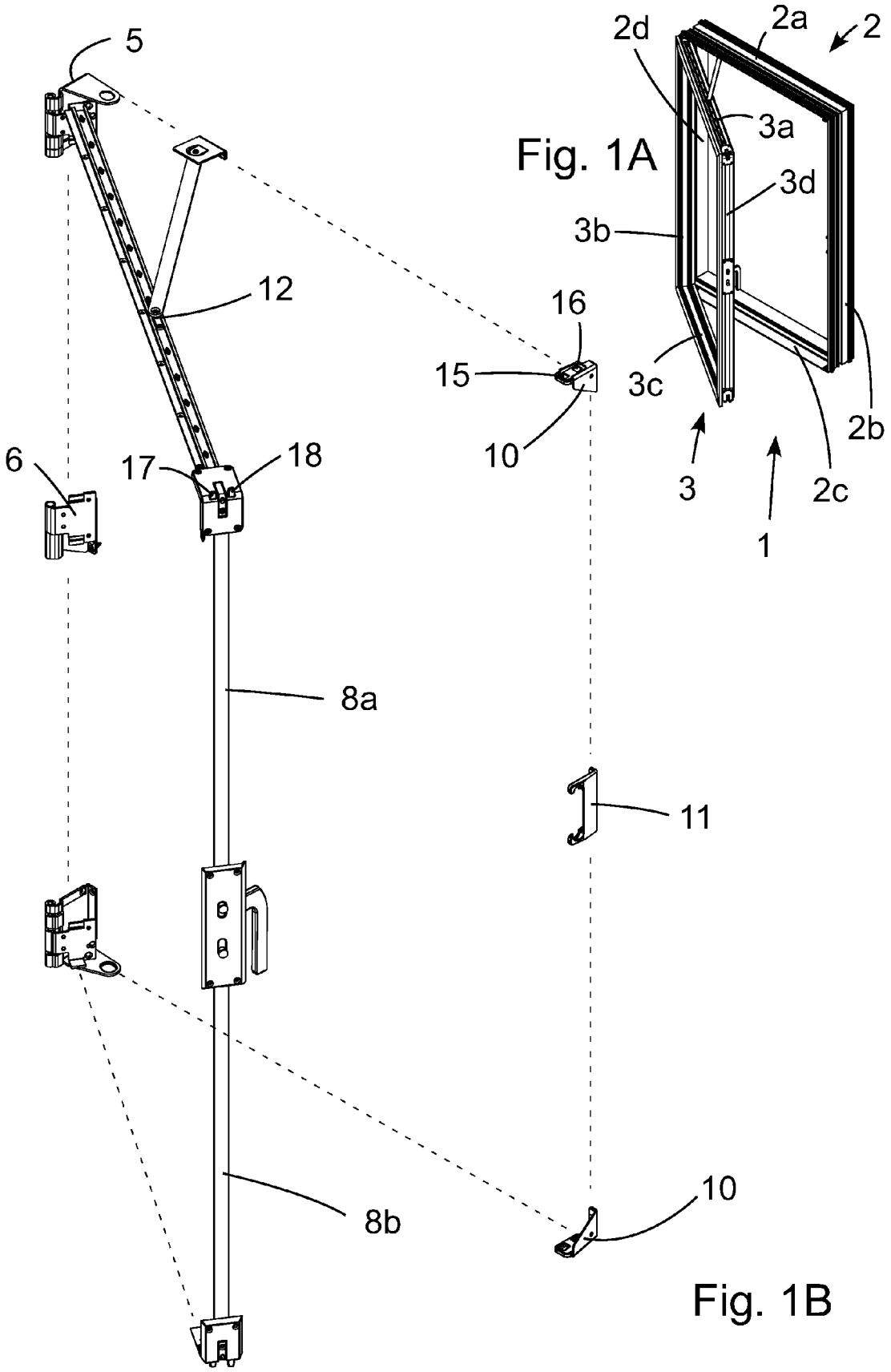

Fig. 1A

Fig. 1B

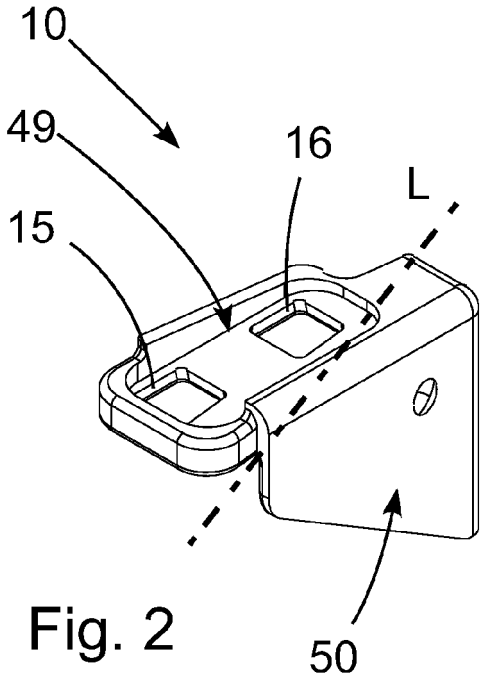

Fig. 2

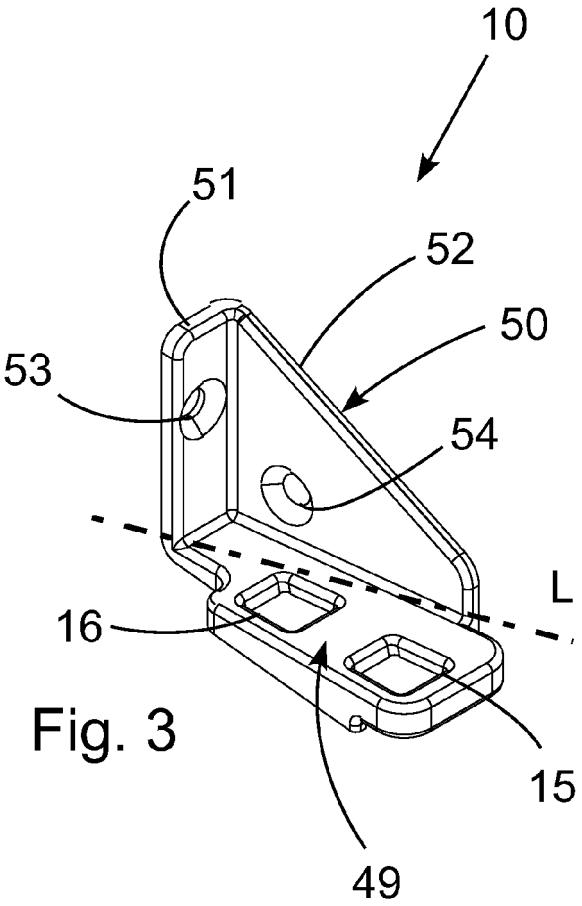

Fig. 3

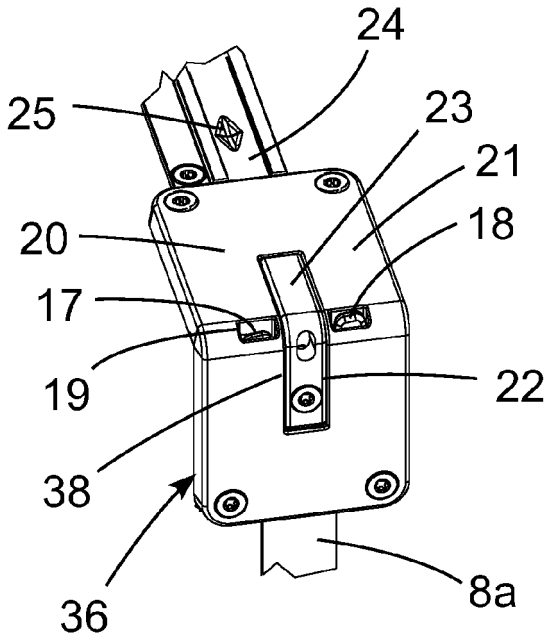

Fig. 4

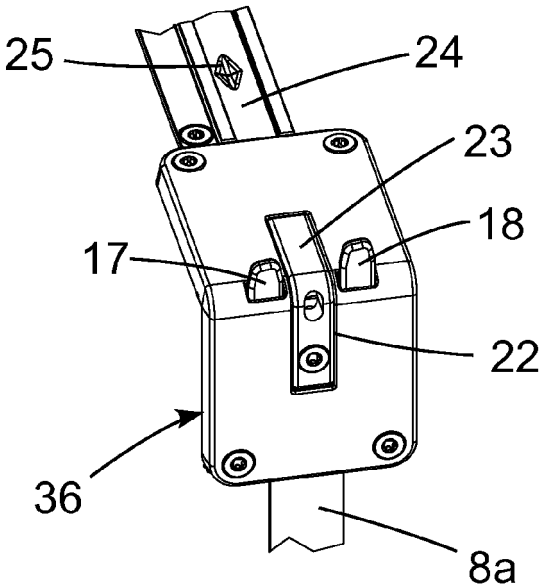

Fig. 5

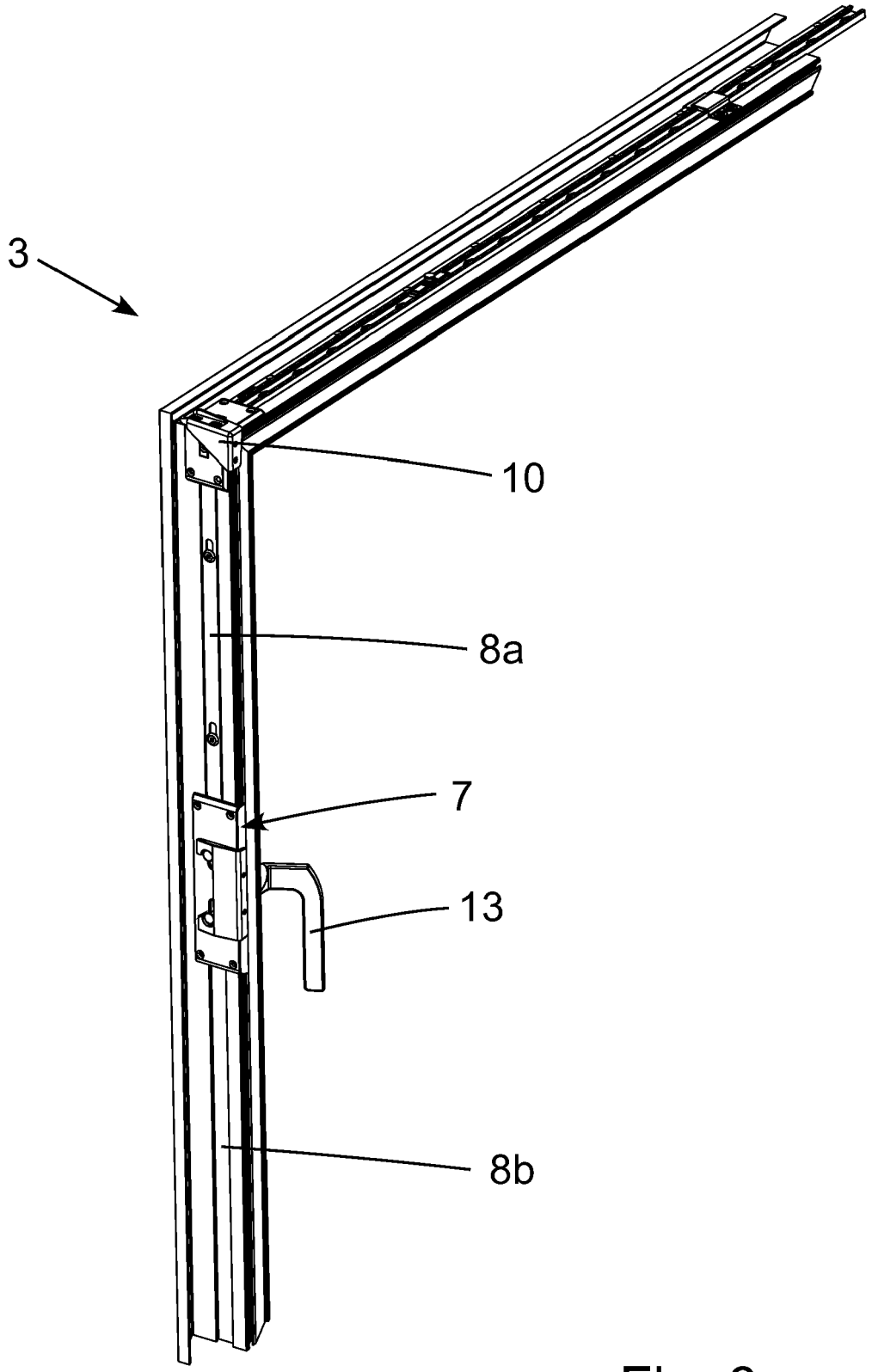

Fig. 6

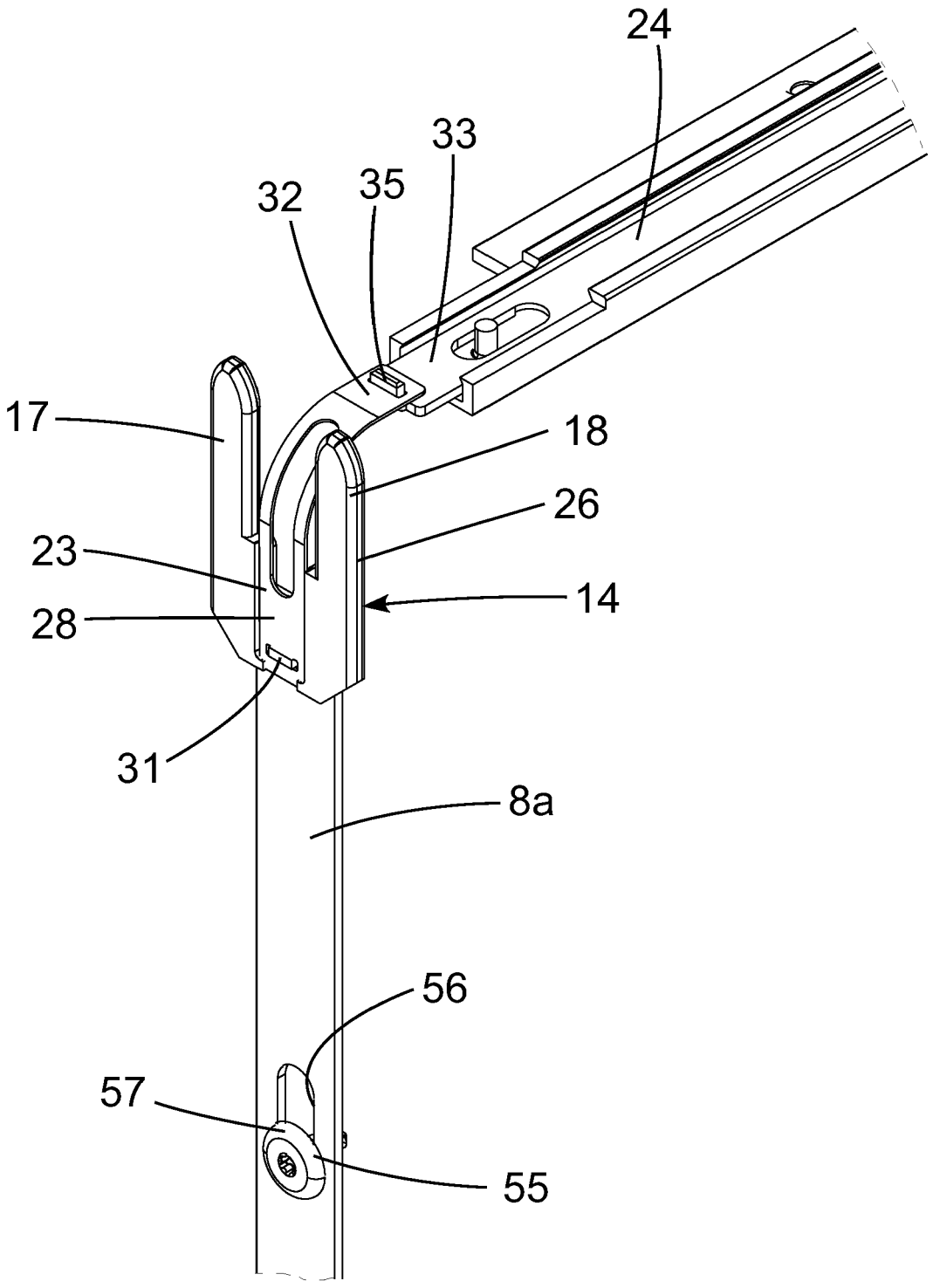

Fig. 7

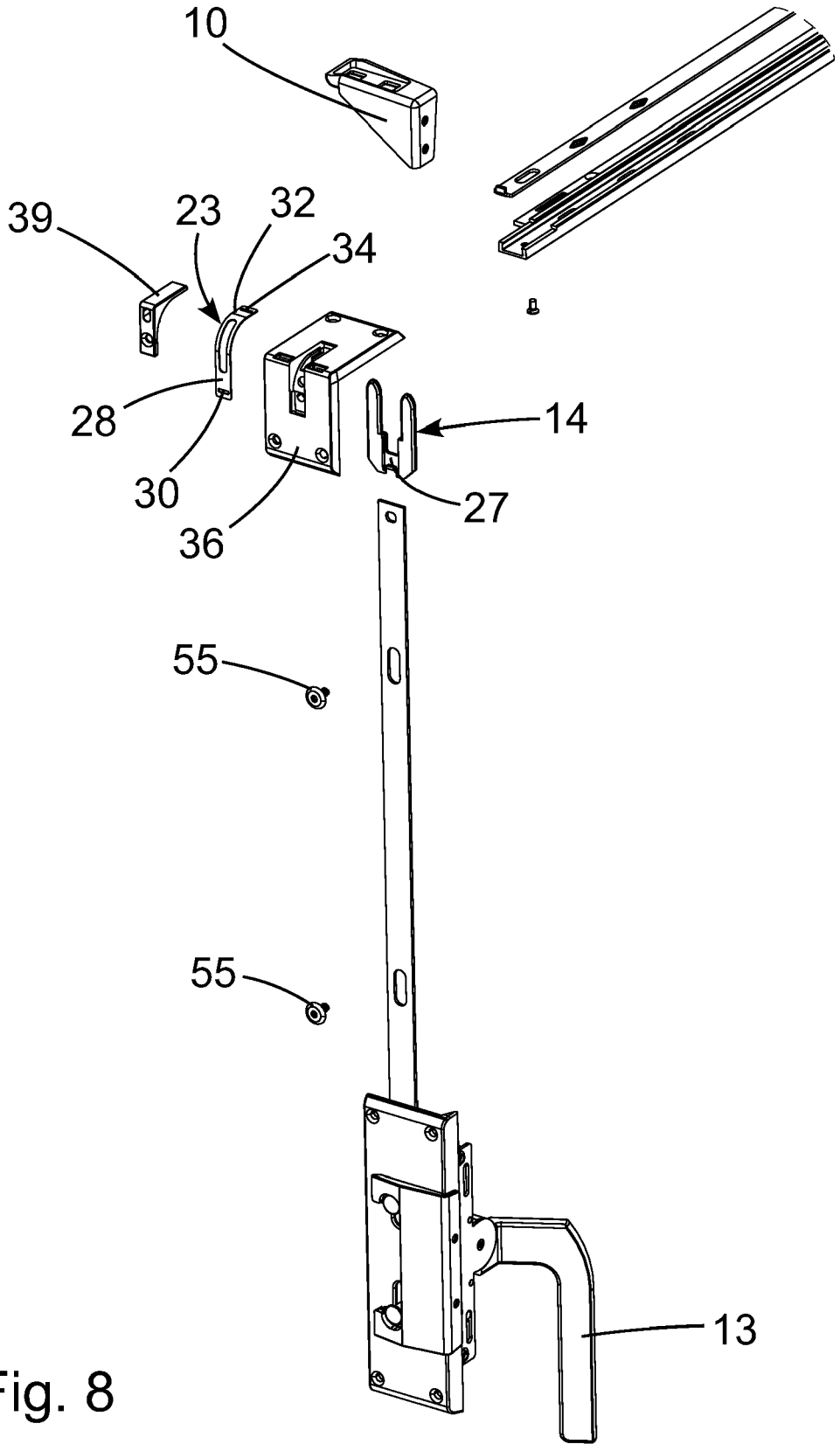

Fig. 8

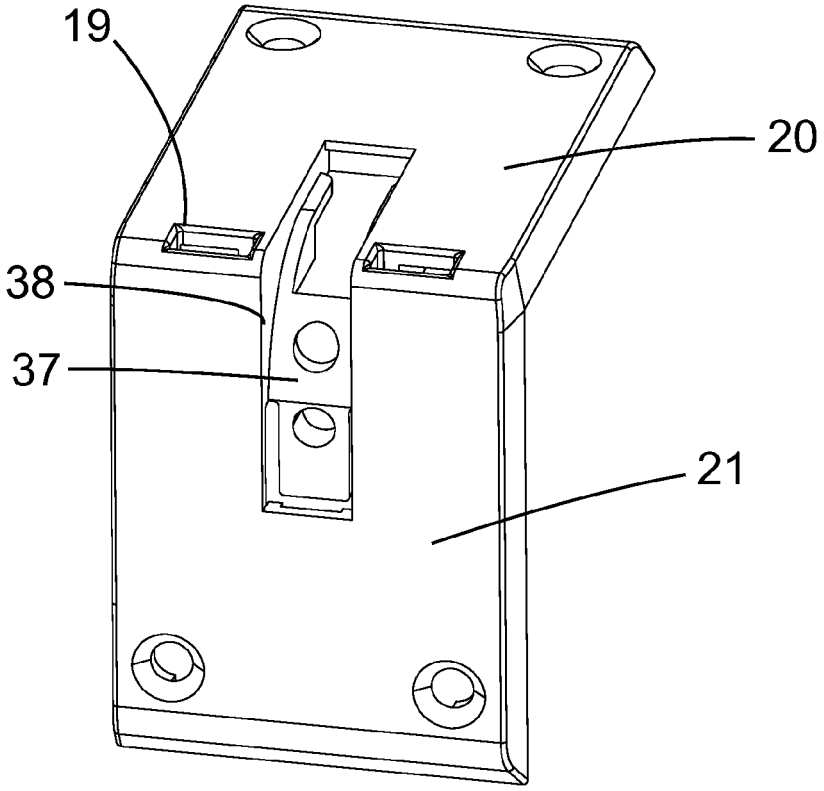

Fig. 9

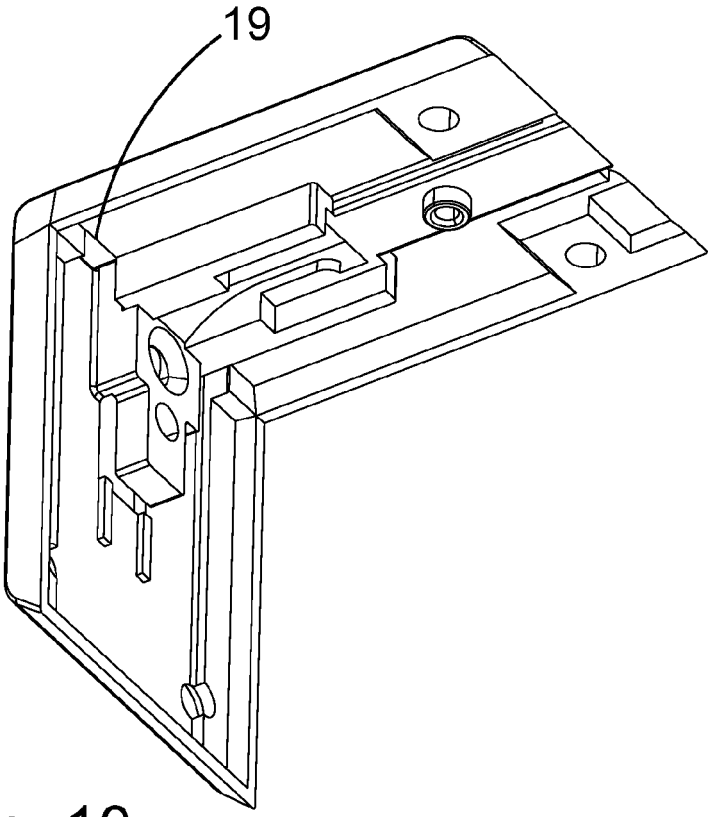

Fig. 10

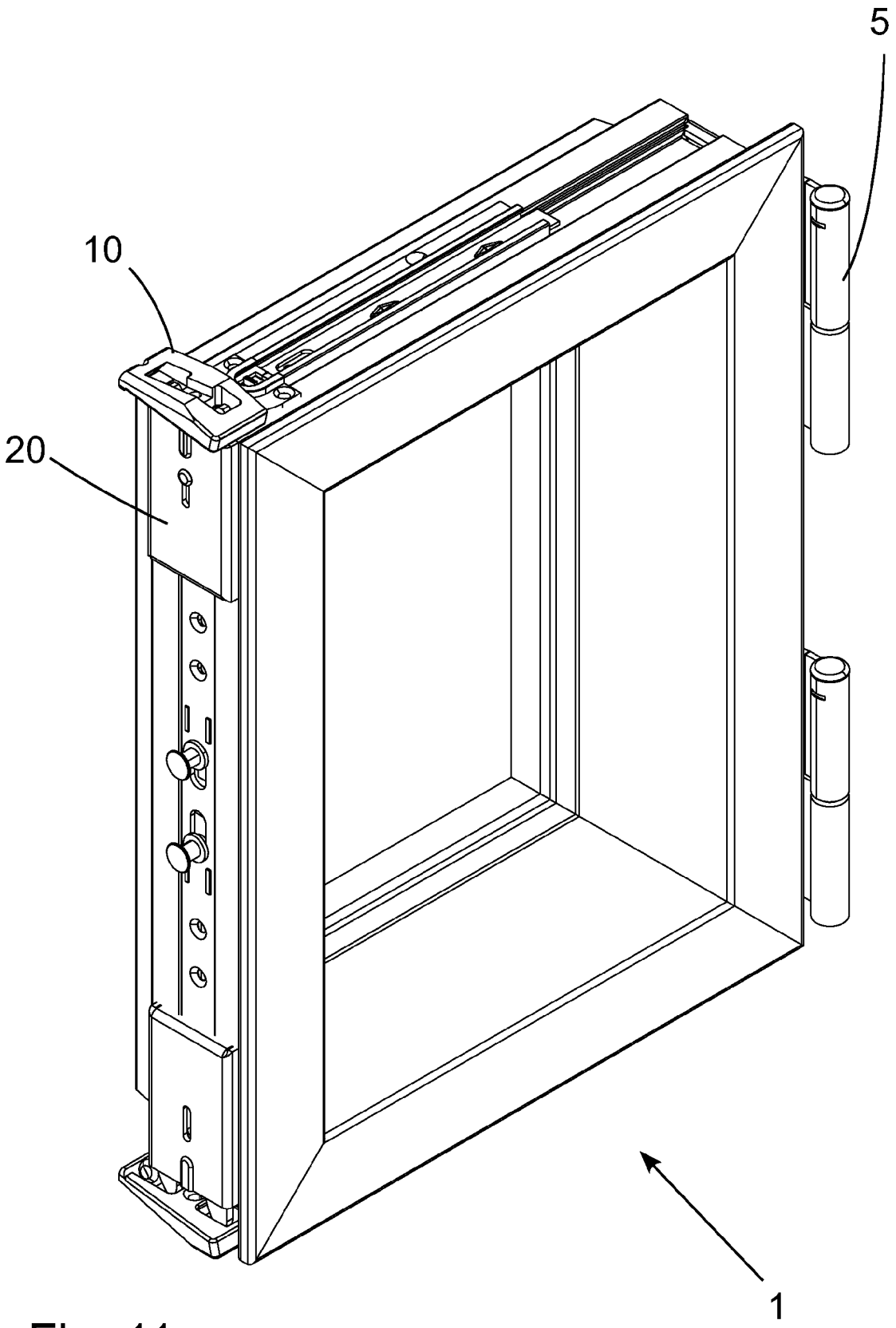

Fig. 11

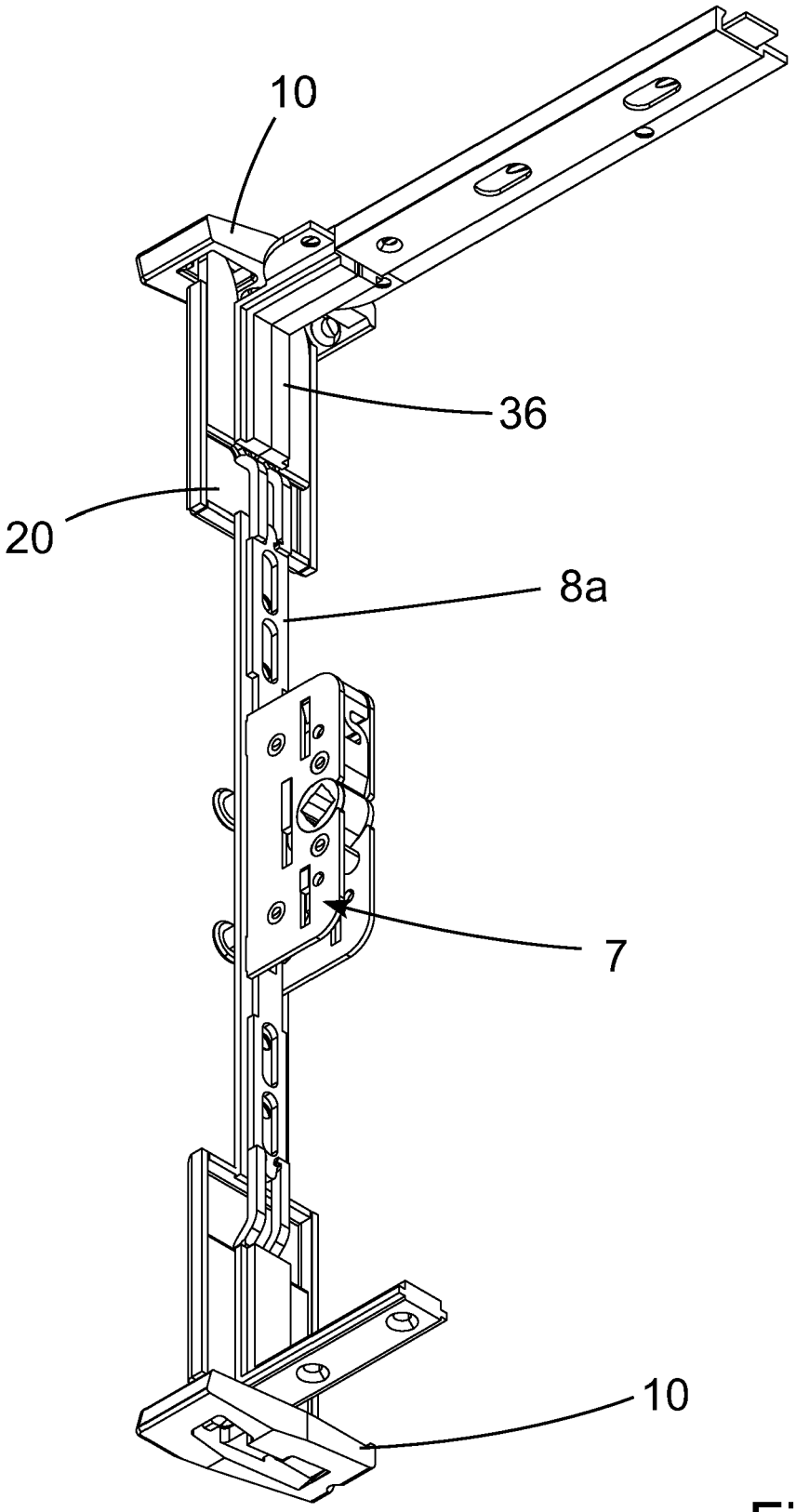

Fig. 12

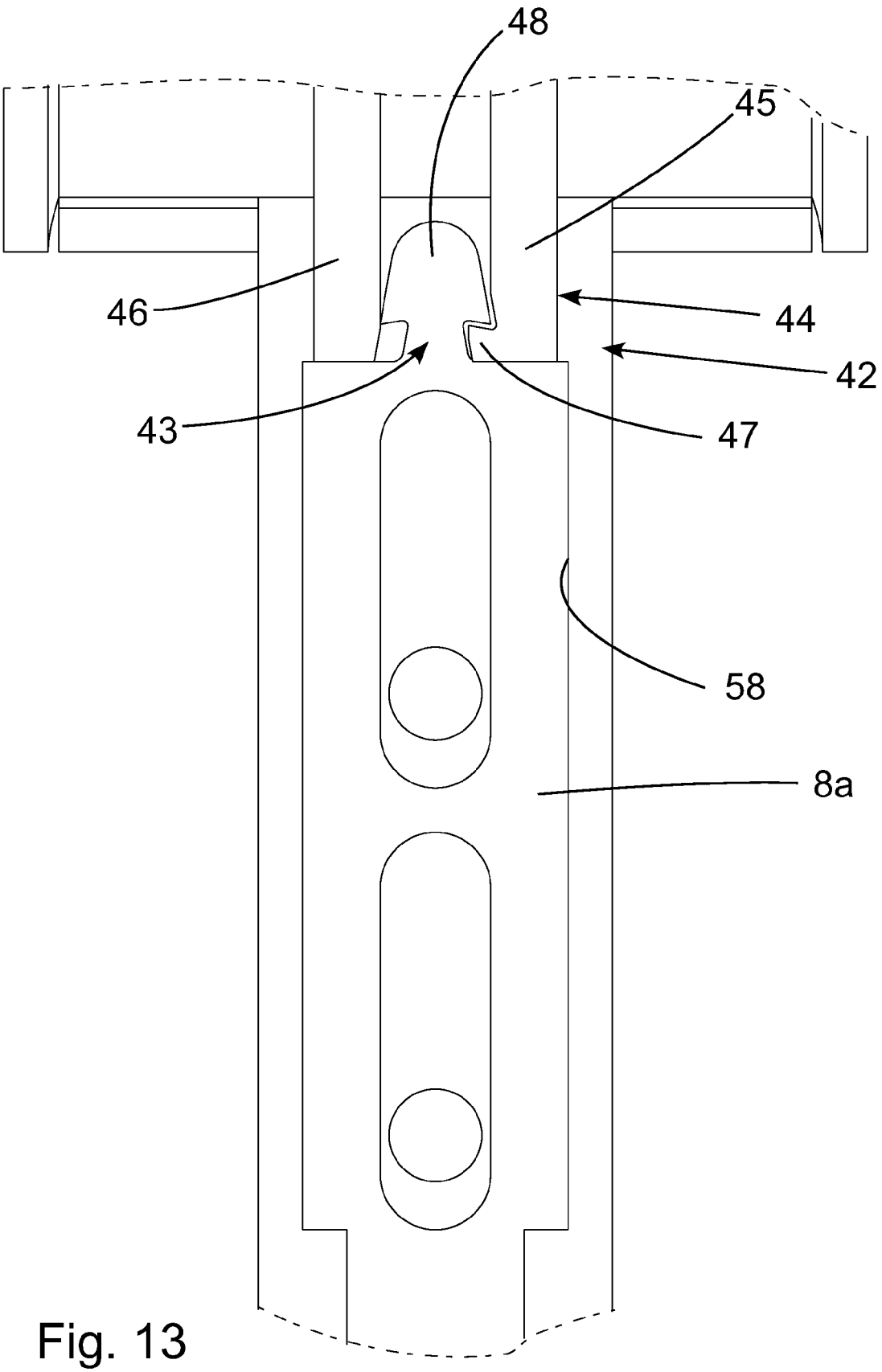

Fig. 13

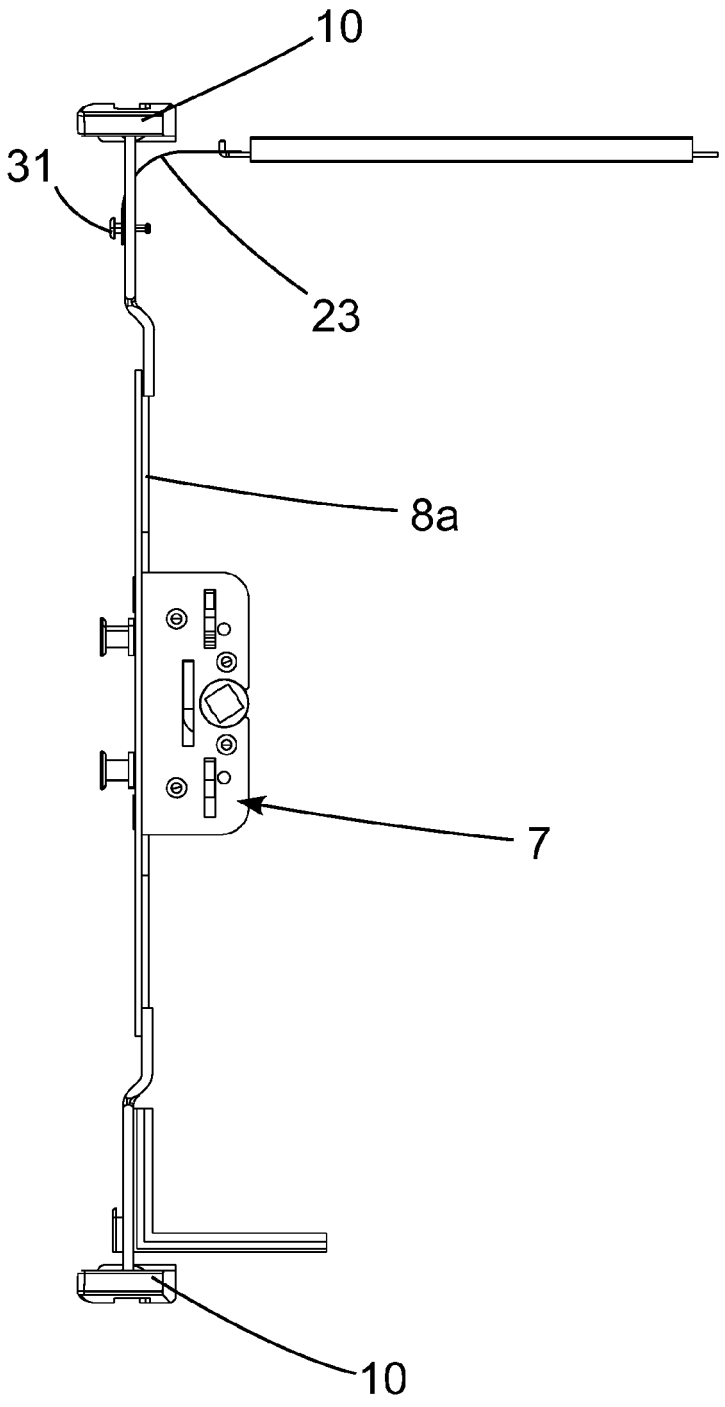

Fig. 14

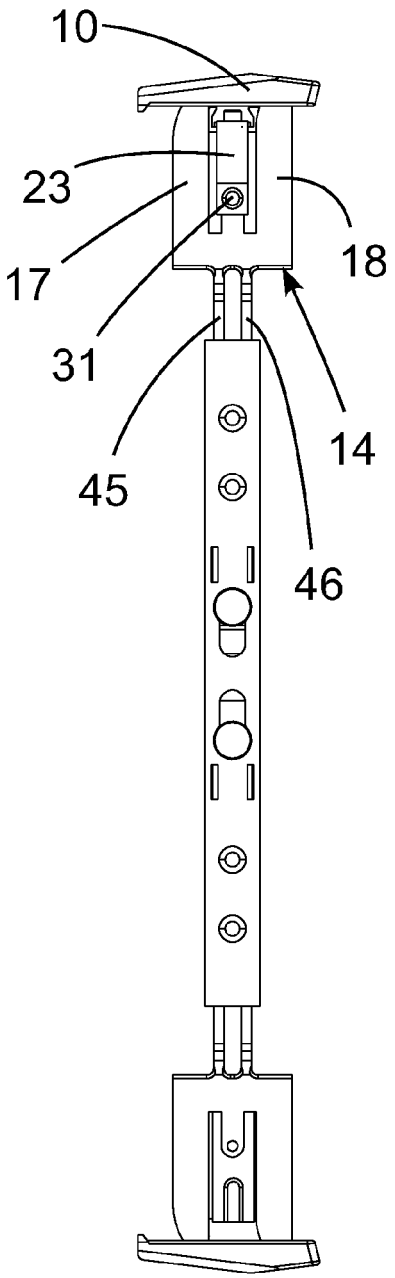

Fig. 15

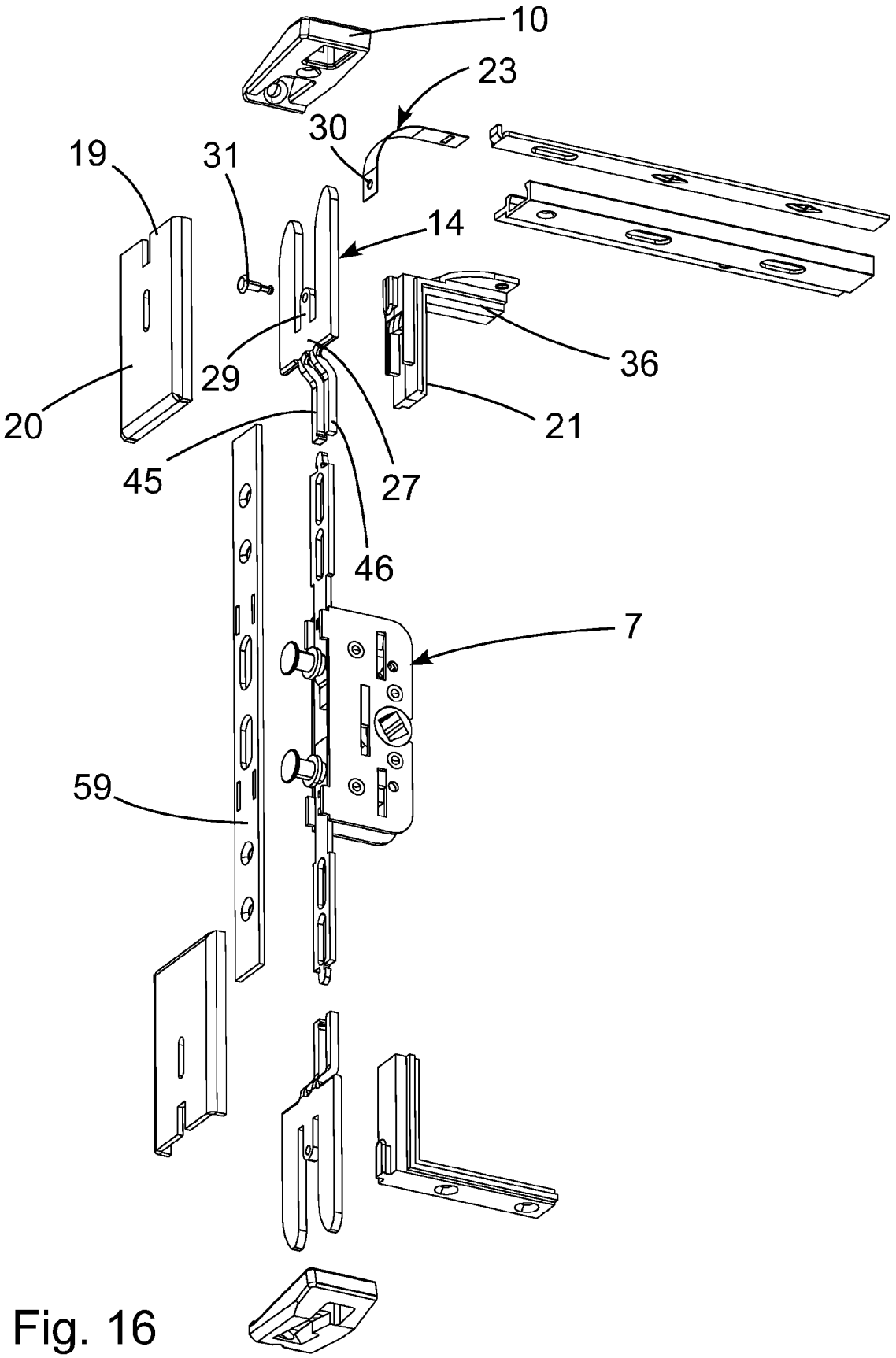

Fig. 16

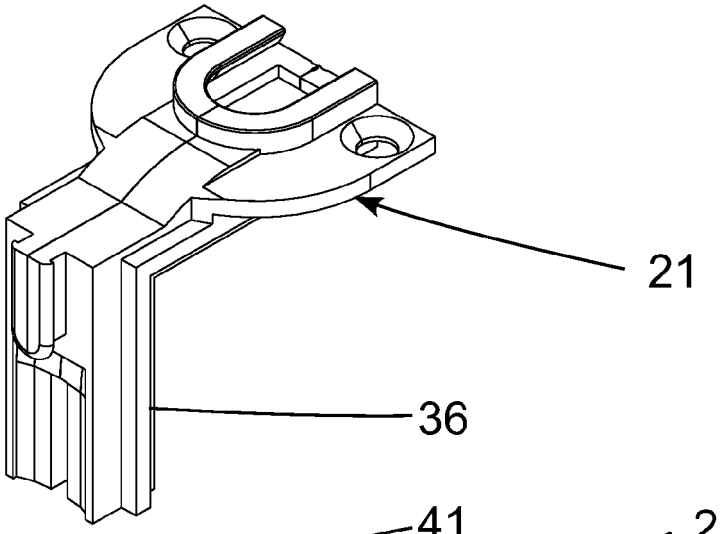

Fig. 17

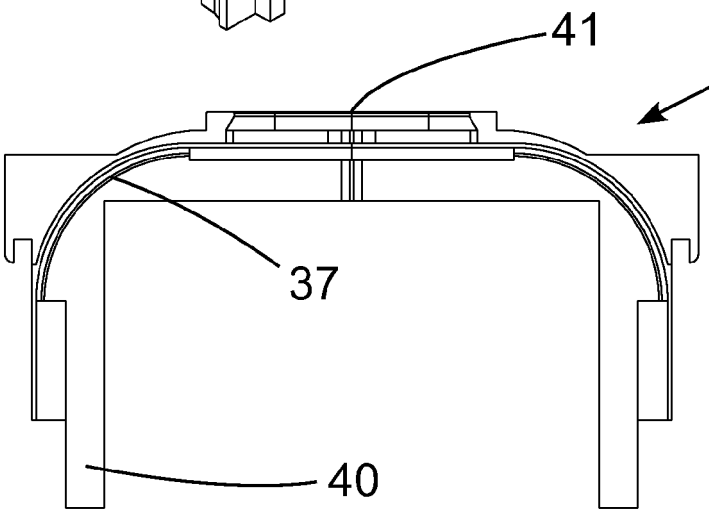

Fig. 18

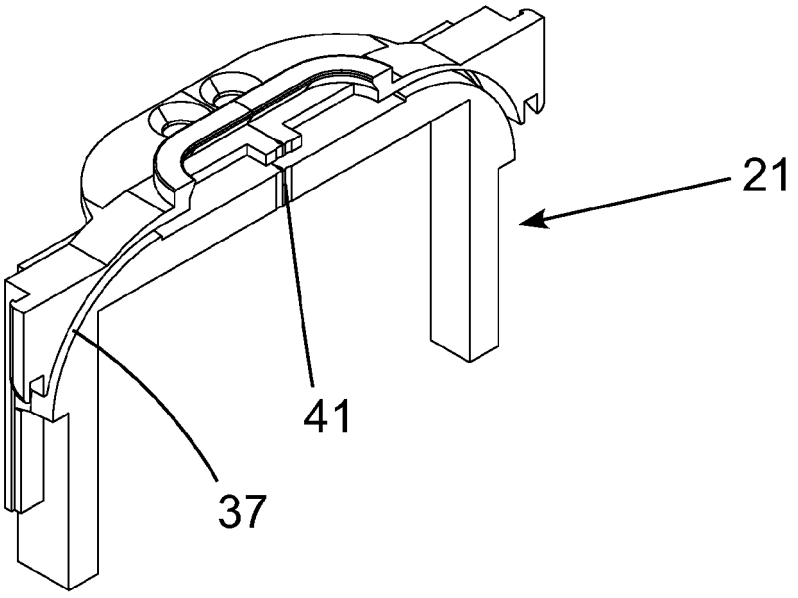

Fig. 19

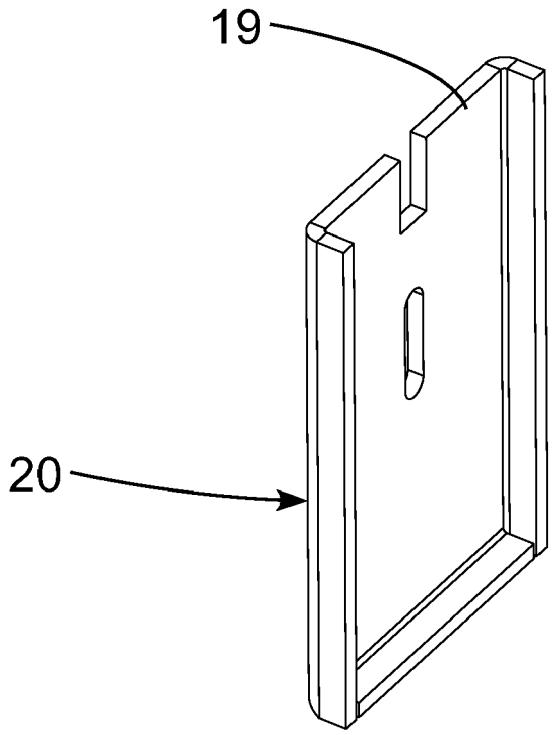

Fig. 20

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 4806

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	GB 2 439 212 A (LAPORTA GIOVANNI MARIA) 19 December 2007 (2007-12-19) * page 18, line 25 - page 23, line 26; figures 24-29 *	1,14,16	INV. E05C9/04 E05C9/18 E05B15/02 E05C9/24
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A	US 5 709 111 A (JOSE GABRIEL HENAO) 20 January 1998 (1998-01-20) * column 5, line 22 - column 6, line 36; figures 1,2 *	1,11	
			TECHNICAL FIELDS SEARCHED (IPC) E05C E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 October 2009	Perez Mendez, J

CATEGORY OF CITED DOCUMENTS

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