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(54) Benævnelse: **Centreringsenhed i forbindelse med forsatsafslutningselementer til et dørblad i et stillingsforanderligt portblad**

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Centering unit in connection with header termination members for a door leaf in a movable shutter door leaf

The invention relates to an arrangement of centering units in connection with vertical header termination members for one of a plurality of sections of a shutter door leaf which are connected to one another in a rotationally movable manner, with a door being integrated into the shutter door leaf, the door leaf of which likewise consists of sections which are rotatably movable amongst one another. The sections of the shutter door leaf and of the door leaf substantially consist of two spaced-apart metal sheets, the intermediate space of which is filled up with an insulation material, with the lateral vertical edges of the sections being sealed with the header termination members.

GB 372 919 describes a door supporting and guiding means for holding a door in the correct position. This is intended to facilitate the locking and unlocking of the door. For this purpose, a plate is used which is equipped with a rotatable bolt, which interacts in an additional plate which is equipped with a slot. When closing the door, the bolt is introduced into the slot, so that a defined closing position of the available door is reached.

Sectional shutter doors are vertically opening building structure terminations whose rigid sections are connected to one another in a rotationally movable manner via hinges and are configured over one another in the vertical position and are movable in lateral guiding arrangements. The individual sections substantially consist of two outer metal sheets which are designed in a spaced-apart manner and whose intermediate space is filled up with an insulation material. The outer ends of such sections are sealed by termination members. In order to attain a sealing of such sections relative to one another in as tight a manner as possible, the individual sections are equipped with a profiling at their upper side, with a recess configured in a complementary manner being situated on the underside of the sections.

In order to not continually open such sectional shutter doors to allow persons to pass through, the shutter door leaf can contain doors. These doors with their door leaves are constructed, in terms of their design, in the same manner in accordance with the shutter door leaves. In order not to block the operation of a shutter door during the movement in lateral guiding mechanisms, it is necessary for the integrated door to be securely in a correct sealed state.

FR2887283 discloses a centering unit for a shutter door leaf consisting of a plurality of

sections which are interconnected in a rotationally movable manner, wherein in the shutter door leaf there is integrated a door, the door leaf (12) of which likewise consists of a plurality of sections which are interconnected in a rotationally movable manner.

The object of the invention consists of providing a simple construction, which allows a secure sealed state of an integrated door leaf within a shutter door leaf, with the door leaf and the shutter door leaf consisting of a plurality of sections which are connected to one another in a rotationally movable manner. Furthermore a water management system is intended to be provided, which can be employed effectively against the ingress of water from outside or against condensation generated in spaces.

The object of the invention is achieved through the features of Claim 1. The subordinate claims which follow the main claim depict a further configuration of the idea according to the invention.

The sections of the shutter door leaf which are inherently rigid, as they are designed in sectional door shutter leaves, are connected to one another by hinges. Depending on the size of the shutter door leaf, such hinges between the individual sections can make the sectional shutter door more unstable overall than a one-piece shutter door leaf. This unstable state can be strengthened in that a door leaf is integrated into a shutter door leaf, this door leaf being connected to the corresponding sections of the shutter door leaf in a rotationally movable manner via ties or hinges. Such a door leaf within the shutter door leaf must not lead to the legal requirements, in particular wind load absorption, water tightness, air tightness, soundproofing and compliance with the required thermal resistance, being neglected. For these features which are highlighted but not exhaustively listed, it is particularly important that no unacceptably excessive heat exchange, from the inside to the outside or vice versa, takes place between the sections in the closed state. Furthermore, due to the hinged configuration between the sections, in connection with lateral guide rollers and guide rails, the shutter door leaf as a whole has a large amount of play with freedom of movement on all sides. The individual sections of the shutter door leaf are inherently very stiff and do not cause any problems. When integrating the door leaf inside the shutter door leaf, it is important to achieve a correct closed state of the door leaf. If the door leaf is not in a correct closed state in the shutter door leaf, it is not possible for it to move overall. This would have a considerable disruptive effect on the entire operating sequence of the sectional shutter door.

Sectional door shutter leaves, which consist of sections, such as panels, that are

connected to one another in a rotationally movable manner, cannot be fully protected against water, noise etc. penetrating from the outside, for example due to very strong wind pressures, due to their construction design. Condensation can also come into being in the door leaf, for example. In particular, heavy rainfall, in connection with wind loads directed onto the shutter door leaf can lead to the ingress of water into the building area behind it, but this is not desirable.

Sectional door shutter leaves, with doors that can be opened in the closed position, also represent an additional impediment to water entering from outside. Open gaps, even just to a small extent, through which water can pass, can arise between the shutter door leaf and door leaf. If water has nevertheless entered into the gaps between the shutter door leaf and door leaf, it must be drained away again to the outside of the shutter door leaf.

The invention proposes an arrangement of centering units in connection with vertical header termination members, which simultaneously fulfils the desired termination in the region of the profiling of the sections to one another and is also designed in such a way that the door leaf can be easily transferred from its open position into its closed state within the shutter door leaf. For this purpose, the centering units are each mounted on the lateral header termination members, which laterally terminate the individual sections of the shutter door leaf and of the door leaf, at the upper ends between the door leaf and the shutter door leaf. A secure and tight termination in the region of the profiling is obtained as a result. This tighter termination is to be understood in several ways. Firstly, with regard to a secure closed state of the door leaf in the shutter door leaf, but also with regard to the desired sealing against quantities of water penetrating from outside the shutter door leaf, or condensation. For this purpose, there are openings or chambers in the segments of the centering unit and in the header termination members that prevent water that is present from remaining between the door leaf and shutter door leaf.

Furthermore, the centering units of the arrangement according to the invention make the closing process much easier. In the prior art, centering aids are always affixed, between the shutter door leaf and the door leaf, at some point on the lateral termination members, i.e. not to the upper ends of the panels. It is precisely the placement of the centering units between the upper edges of the door wing sections and the shutter door wing sections that ensures an improved bond in the closed state between the door wing and shutter door wing in this region.

The centering unit consists of a first and a second segment. After mounting, these

segments correspond with each other opposite each other at the sections of the shutter door leaf and simultaneously at the sections of the door leaf. The first and second segments have been designed in such a way that the two segments mesh in the closed position of the door leaf. This is achieved by the fact that there is formed in one of the segments a centering inlet which runs essentially horizontally or at a slight incline, the aperture of which is directed towards the closing door wing and is provided with chamfers on the outside. In the second segment, a rotatable roller element is arranged on a protruding, rigid axle, which corresponds to the centering inlet of the first segment of the closed state. The diameter of the roller element is essentially tailored to the opening width of the centering inlet, so that with sufficient play, the door leaf can nevertheless assume a tilt-secure closed position. The overall stability of the shutter door leaf is significantly increased by the use of the centering units between the individual sections of the door leaf and the shutter door leaf, so that the installation of the door leaf cannot represent a danger point. In order to achieve an absolutely secure sealing of the door leaf within the shutter door leaf, centering units are mounted in each case on the same upper ends of the panels on the left and right of the door leaf with the adjacent shutter door leaf elements. Such an embodiment increases the stability of the shutter door leaf as a whole.

Improving the water management of the sections in the region of the centering units also entails reducing the air exchange rates in the corresponding buildings. For this reason, it is essential to drain condensation between the door wing and shutter door wing through the centering units using water-removal devices. Of course, the water removal must be designed in such a way that the water to be drained off is channelled towards the outside of the shutter door leaf or of the door leaf. One advantage of the water management design according to the invention is the rapid drainabilty of water accumulations inside the shutter door leaf or the door leaf. A separate aperture is provided for this purpose, which increases the insulating properties of the door leaf and shutter door leaf. The water-removal chambers in the header termination members are designed so that they are aligned with the water-removal apertures of the centering unit in order to channel away any water present. The design of the centering units with large apertures and the chambers in the header termination members makes it possible to avoid blockages, and it is also possible to perform cleaning with appropriate means in the event of a blockage when in the installed state.

To make it possible to perform effective water management with successful water drainage, the apertures or openings in the segments of the centering units are directly operatively connected to corresponding chambers in the header termination members to

allow water of any kind to pass through. The good closing state made possible between the door leaf and the shutter door leaf by the centering unit can safely drain, to the outside, any water occurring in the gaps. As a result, it is possible for an effective water removal to the outside of the door and shutter door leaf to be able to be performed in the lower area.

The segments of the centering units can be produced cost-effectively in a plastic design, from polyamide or an equivalent, for example, with the rotatable roller and the associated axle being made of steel in order to prevent premature wear.

A further possibility for designing torsion-resistant door leaves within a sectional door shutter leaf may be to use concealed ties or hinges between the door leaf and shutter door leaf. Such hinges or ties give the door leaf a secure hold because they guarantee a precise design compared to simply overlying hinges.

The invention is described in greater detail hereafter using possible exemplary embodiments.

Figure 1 shows a cut-out depiction of a sectional shutter door with sections of panels, into which a rotatable door leaf is integrated.

Figure 2 shows a centering unit of an arrangement according to the invention in a perspective depiction

Figure 3 shows an installation of a centering unit between the door wing and a shutter door wing.

Figure 4 shows a depiction of a section with a mounted first segment of the centering unit.

Figure 5 shows a perspective depiction of a section of a door leaf and the second segment of the centering unit.

Figure 6 shows a second segment of the centering unit in a perspective depiction.

Figure 7 like Figure 6, but seen from a different viewing angle.

Figure 8 shows a first segment in a perspective depiction.

Figure 9 like Figure 8, but seen from a different viewing angle.

Figure 10 shows a first segment in connection with a header termination member.

Figure 11 shows an end-side configuration of a header termination member.

Figure 12 termination members arranged over one another, mounted at sections with an inserted first segment.

The perspective depiction according to Figure 1 depicts a part of a shutter door leaf 13 with an integrated door leaf 12. The shutter door leaf 13 consists of individual sections which each extend laterally relative to the door leaf 12. The sections of the door leaf 12 and of the shutter door leaf 13 have an identical structure and substantially consist of two spaced-apart metal sheets between which an insulation material has been introduced. These sections are inherently very flexurally resistant and in each case are sealed by header termination members 21, 22 at their vertical face sides.

At the sections of the door leaf 12 and the sections of the shutter door leaf 13, there are configured profilings 25 on the upper edge. These profilings 25 provide a tight seal between the sections in connection with complementary configurations on the underside of the sections arranged above them. In each case, between the main closing edge of the door leaf 12 and the adjoining section of the shutter door leaf 13, segments of a centering unit 1 are mounted, on each side of the opposing sections, on the upper end of the sections. In the same way, segments of the centering units 1 are also mounted on the secondary closing edge between the door leaf 12 and the shutter door leaf 13. The upper sides of the centering units 1 have protrusions 11 that are adapted to the configuration of the profiling 25 of the sections. By placing the centering units 1 on the main and secondary closing edges, a firm sealing of the door leaf 12 in the shutter door leaf 13 is achieved. This is achieved in particular by the fact that in the regions where the shutter door leaf 13 and the door leaf 12 are unstable, namely at the upper end regions, a stable bond, which is also releasable, is achieved between the door leaf 12 and the shutter door leaf 13. This leads to a significant increase in stiffness under wind loads and also reduces heat exchange between the inside and the outside of the sectional door shutter, which the state of the art cannot supply.

A preferred embodiment of the centering unit 1, consisting of the segments 2 and 3, is shown in a perspective depiction of Figure 2. The direction of view onto the centering unit 1 according to Figure 2 has been depicted from the inside of the shutter door and door leaf. The first segment 2 and the second segment 3 are each attached to the ends of the header termination members 21, 22, connected via affixing flanges 4 which contain affixing holes 19. The first segment 2 and the second segment 3 have housings 5, 6 which are made of plastic. The housings 5, 6, starting from the upper protrusions 11, have vertically continuous apertures 27, 29. These apertures 27, 29 make it possible to perform an effective removal of any water that arises. These housing configurations 5 and 6 make it possible, on the one hand, for simple positioning with the header termination members 21, 22 to be possible and, on the other hand, the centering means for the door leaf 12 can be implemented cost-effectively. In particular, sound insulation and virtual airtightness can also be achieved in connection with seals, which are not shown.

The mounting of the first segment 2 at the upper ends of the header termination members 21 can be seen in Figure 4, for example. This clearly shows that the protrusion 11 has been adapted substantially to the configuration of the profiling 25. Additional sealing against heat loss is achieved by a cover 10 in front of the protrusion 11. At the same time, the cover 10 also achieves a stop-damping action when the door leaf 12 enters into the closed position. A centering inlet 20 in the form of a recess has been depicted within the first segment 2. The centering inlet 20 can have a slightly inclined or essentially horizontal progression. Precisely through a substantially straight, horizontally running run-in surface 32 in the centering inlet 20, a very stable condition for the door leaf 12 is immediately achieved in the shutter door leaf 13 upon entry of the door leaf 12, namely by the rolling member 23, and not only when the door wing is in its actual closed position, as occurs in the prior art. The actual closed position of the door leaf 12 in the shutter door leaf 13 is additionally secured at the end of the centering inlet 20 by a termination 33 with a slight drop. At the entrance of the centering inlet 20 are chamfers 18, which allow the rolling member 23, which is rotatably mounted on the second segment 3, to dip in.

A possible design of the mounting of the second segment 3 to the door wing 12 is depicted in Figure 5. Here, the housing 6 has a free punch on its underside, in order to perform precise adaptation between the section and the header termination member 21, 22. An axle 24 is mounted in a rotationally fixed manner inside the housing 6 of the second segment 3, with a rolling member 23 being rotatably configured on the axle 24. The rolling member 23 has, on its circumference, a bore which is not referred to in any greater detail, in order to perform lubrication between the rolling member 23 and the axle

24 when necessary. In order to provide a reservoir for lubricant, one or more recesses can be introduced into the surface of the axle, which continuously provide the lubricant. The interplay of the rolling members 23 and the centering inlets 20 guarantees a secure closed state between the door wing 12 and the shutter door wing 13.

At the same time, there is a stop leg 8 on the first segment 2 facing the outside of the shutter door leaf 13, next to which there is an undercut receptacle for a stop seal 14. This is shown in Figure 3, from which a receptacle for an end seal 15 in front of the second segment 3 can also be seen. Furthermore, the segment 3 has a screen stop 9 to the outside of the door leaf 12. Furthermore, in order to securely seal the door wing 12 to the shutter door wing 13, a closure seal 16 has been depicted on the inside of the first segment 2. Inside the shutter door leaf 12, there is a lock which is not referred to in greater detail and which can be actuated by a door handle 17.

Figures 6 and 7 show possible designs of the second segment 3 of the centering unit 1 in perspective depictions. The rotatable rolling member 23, with the associated axle 24, is not shown in this depiction; instead, an axle receptacle 26 can be seen in Figures 6 and 7, which extends through the entire second segment 3. In the region of the aperture 27, the axle receptacle 26 is surrounded by a spacer so that the axle 24 cannot lead to deformation of the segment 3 when it is affixed to the second segment 3. The aperture 27 is depicted extending longitudinally through the second segment 3, which extends through the entire housing 6 of the second segment 3, so that any water which accumulates can simply pass through here, despite the axle 24 being affixed in the axle receptacle 26. A sealing channel 30 is incorporated into the screen stop 8, into which a seal for the door leaf 12 is drawn.

The housing 6 of the second segment 3 has, in its affixing flange 4, the affixing bore 19 in the form of an elongated hole. As a result, it is possible to be able to perform precise placing of the second segment 3 at the end of one of the header termination members 21 or 22.

The first segment 2 of the centering unit 1, which cooperates with the second segment 3, can be seen from Figures 8 and 9. When the door wing 12 is in the closed position, the rolling member 23 dips into the centering receptacle 20. At the end of the run-in surface 32 is the termination 33 which may be slightly recessed from the run-in surface 32 in order to thereby guarantee a secure closed state when the door leaf 12 is in a closed state in the shutter door leaf 13.

The housing 5 of the first segment 2 also has an aperture 29 which penetrates vertically in the longitudinal direction, or an aperture channel through which any water present can drain off. The affixing and closely fitting orientation of the housing 5 is performed via the affixing flange 4 in connection with the affixing bore 19, which is designed as an elongated hole, at one of the header termination members 21 or 22.

Figure 10 depicts the installation of the first segment 2 in connection with the header termination member 21. Here, the first segment 2 has been fitted onto the upper face side of the header termination member 21. For this purpose, contour hollows 34 have been designed on the header termination member 21 in order to be able to perform the placing on the upper face side of the header termination member 21, so that the upper protrusion 11 of the first segment 2 virtually aligns with the profiling 25 of the upper part of the shutter door leaf 13 in its longitudinal direction. To affix the first segment 2, the header termination member 21 has a stop face 35, against which the affixing flange 4 bears in order to be affixed to the header termination member 21 via the affixing bore 19, in connection with a bore 36.

The configuration of the termination member 21 in the upper end region can be seen in Figure 11. It can be seen here that the contour hollows 34 extend to both side walls of the shaft 37 as a continuous chamber. The shaft 37 substantially aligns with the aperture 27 or 29 of the centering unit 1. It is thus guaranteed that any accumulations of water present can be conducted virtually invisibly downwards to the shutter door leaf end. To affix the header termination member 21, it has a bearing leg 31, which bears against the surfaces of the door leaf 12 or of the shutter door leaf 13 and which can be affixed via bores 7, as can be seen from Figure 1.

As has already been stated, the shutter door leaf 13, with the door leaf 12, consists of individual sections which are connected to one another in a rotationally movable manner. In order to illustrate this once again, we refer you to Figure 12, in which two individual header termination members 21 are depicted one over the other and virtually between which the first segment 2 of the centering unit 1 is inserted. For this purpose, it should be noted that this is designed in an identical manner with the header termination member 22 in connection with the second segment 3.

Reference Numbers

1	centering unit
2	first segment
3	second segment
4	affixing flange
5	housing, first segment
6	housing, second segment
7	bore
8	stop leg
9	screen stop
10	cover
11	protrusion
12	door leaf
13	door shutter leaf
14	stop seal
15	end seal
16	closure seal
17	door handle
18	chamfers
19	affixing bore
20	centering inlet
21	header termination member
22	header termination member
23	rolling member
24	axle
25	profiling
26	axle receptacle
27	aperture
28	spacer
29	aperture
30	seal
31	bearing leg
32	run-in surface
33	termination
34	contour hollow
35	stop face

36 bore

37 shaft

PATENTKRAV

1. Arrangement af centreringsenheder (1) i forbindelse med vertikale forsatsafslutningselementer til et portblad (13), som består af flere indbyrdes drejebevægeligt forbundne sektioner, og som styres i laterale styreskinner, hvor en dør er integreret i portbladet, hvis dørblad (12) ligeledes består af flere indbyrdes drejebevægelige sektioner, hvor sektionerne består i det væsentlige af to distancerede ydre plader, hvis mellemrum er udfyldt med et isoleringsmateriale, hvor de laterale vertikale rande af sektionerne i sammenbygget tilstand er lukket ved hjælp af forsatsafslutningselementerne (21, 22), hvor dørbladets (12) sektioner via bånd er drejebevægeligt forbundet med portbladets (13) sektioner, hvor forsatsafslutningselementernes (21, 22) øvre ender i området af profileringer (25) på portbladets (13) og dørbladets (12) sektioner er forsynet med centreringsenheder (1), som i dørbladets (12) lukkestilling korresponderer med portbladet (13), **kendetegnet ved, at** centreringsenhederne (1) består af et første delstykke (2) og et andet delstykke (3), hvor det første delstykke (2) omfatter et hus (5), hvori et omtrent vandret forløbende centreringsindløb (20) er indeholdt, som går over i en afslutning (33) på endesiden, og hvor der i et hus (6) i det andet delstykke (3) er monteret en stationær aksel (24), hvorpå et drejeligt rulleelement (23) er anbragt, hvor rulleelementets (23) diameter er afstemt efter centreringsindløbets (20) åbningsbredde således, at rulleelementet (23) i dørbladets (12) lukkestilling trænger ind i centreringsindløbet (20), og at husene (5, 6) i delstykkerne (2, 3) endvidere omfatter vertikalt forløbende åbninger (27, 29), som står i forbindelse med skakter (37) indeholdt i forsatsafslutningselementerne (21, 22), hvor skakterne (37) strækker sig over forsatsafslutningselementernes (21, 22) samlede længdeudstrækning og i forbindelse med åbningerne (27, 29) i delstykkerne (2, 3) tilvejebringer en gennemgående fluidforbindelse over dørbladets (12) samlede højde.

2. Arrangement ifølge krav 1, **kendetegnet ved, at** delstykkerne (2, 3) på deres overside er forsynet med fremspring (11), som omtrent svarer til udformningen af profileringen (25).

3. Arrangement ifølge krav 1, **kendetegnet ved, at** delstykkerne (2, 3) er forsynet med et anslag (8) eller et blændanslag (9) i det mindste på en af deres ydersider, hvor anslaget (8) eller blændanslaget (9) kommer til anlæg mod forsatsafslutningselementernes (21, 22) ydersider.

4. Arrangement ifølge krav 1, **kendetegnet ved, at** husene (5, 6) i delstykkerne (2, 3) er forsynet med på undersiden udkragende fastgørelsesflanger (4), hvori der er indeholdt fastgørelsesboringer (19) til orientering og anlæg mod forsatsafslutningselementerne (21, 22).

5. Arrangement ifølge et eller flere af de foregående krav, **kendetegnet ved, at** et af centreringsenhedens (1) delstykker (2, 3) i hvert tilfælde er anbragt på de vandret forløbende ender af dørbladets (12) sektioner og på portbladets (13) korresponderende sektioner.

6. Arrangement ifølge et eller flere af de foregående krav, **kendetegnet ved, at** forsatsafslutningselementerne (21, 22) er udformet som hulprofiler med skakterne (37), og at der findes anlægsben (31) med anslagsflader (35), som krager lateralt ud fra hulprofilerne.

7. Arrangement ifølge et eller flere af de foregående krav, **kendetegnet ved, at** husene (5, 6) på over- og undersiderne af forsatsafslutningselementerne (21, 23) griber ind i konturrecesser (34).

8. Arrangement ifølge et eller flere af de foregående krav, **kendetegnet ved, at** centreringsenhedens (1) delstykker (2, 3) foreligger i en kunststofudførelse og forsatsafslutningselementerne (21, 22) i letmetalprofiludformning.

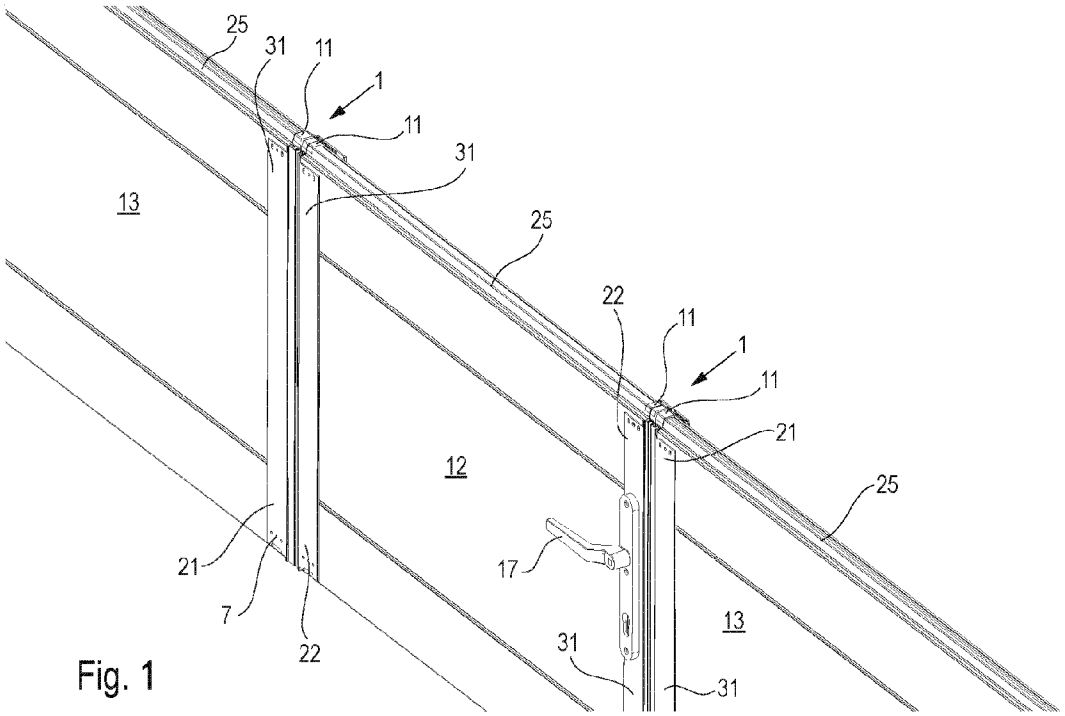

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Fig. 1

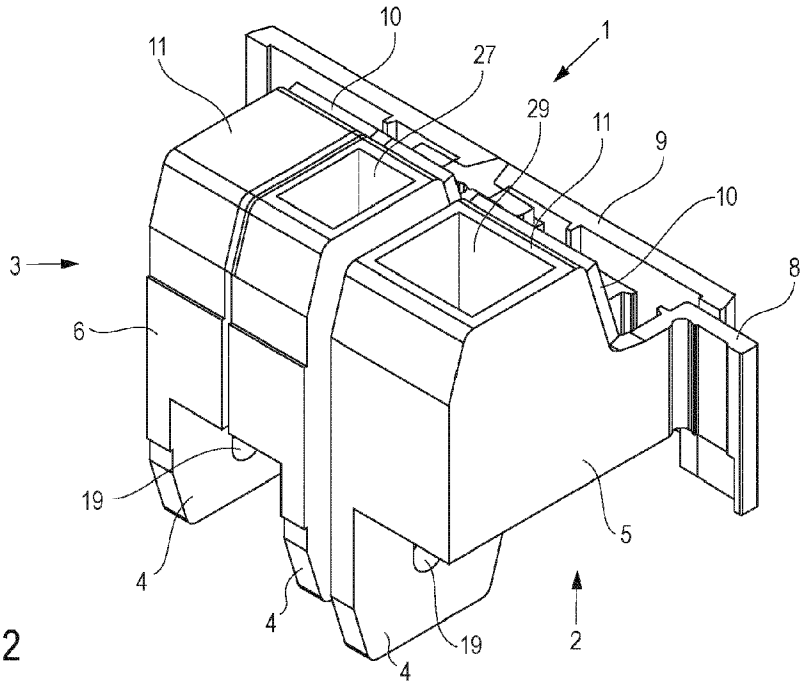

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Fig. 2

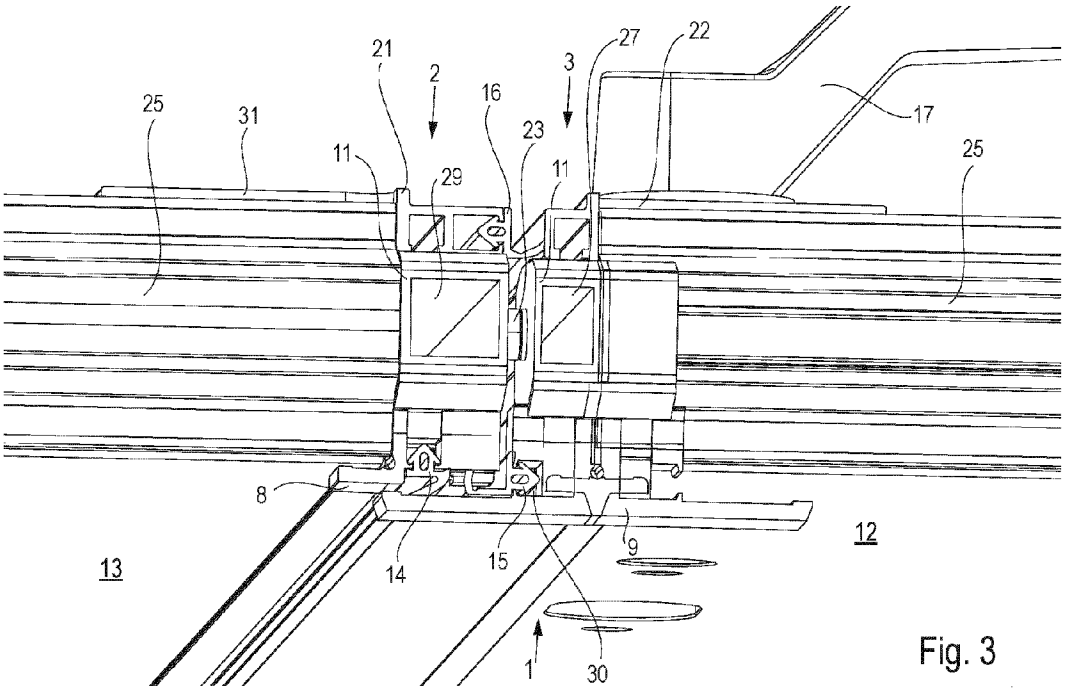

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Fig. 3

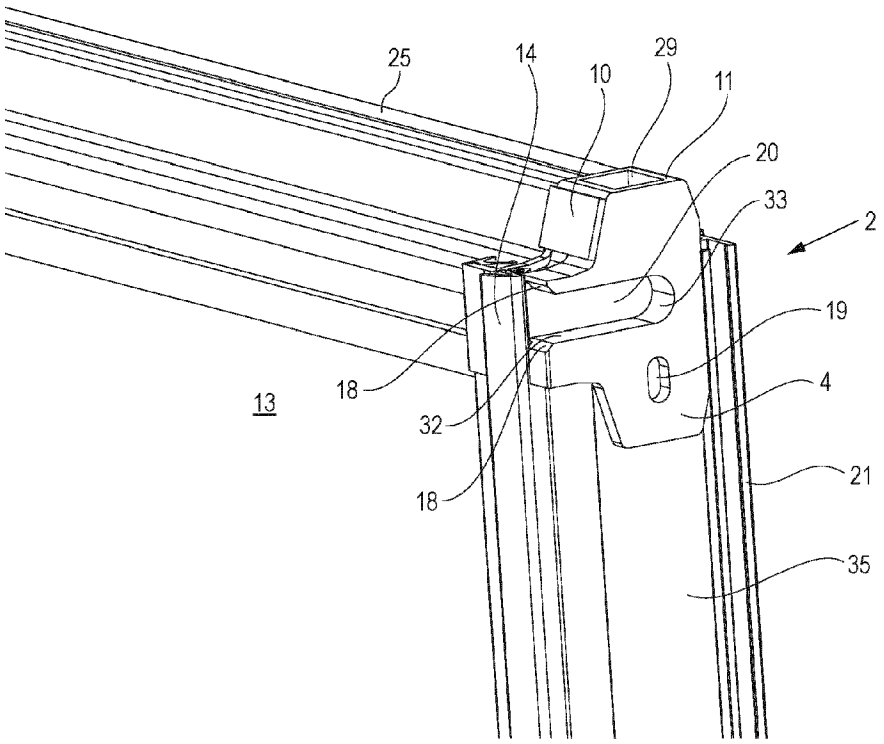

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Fig. 4

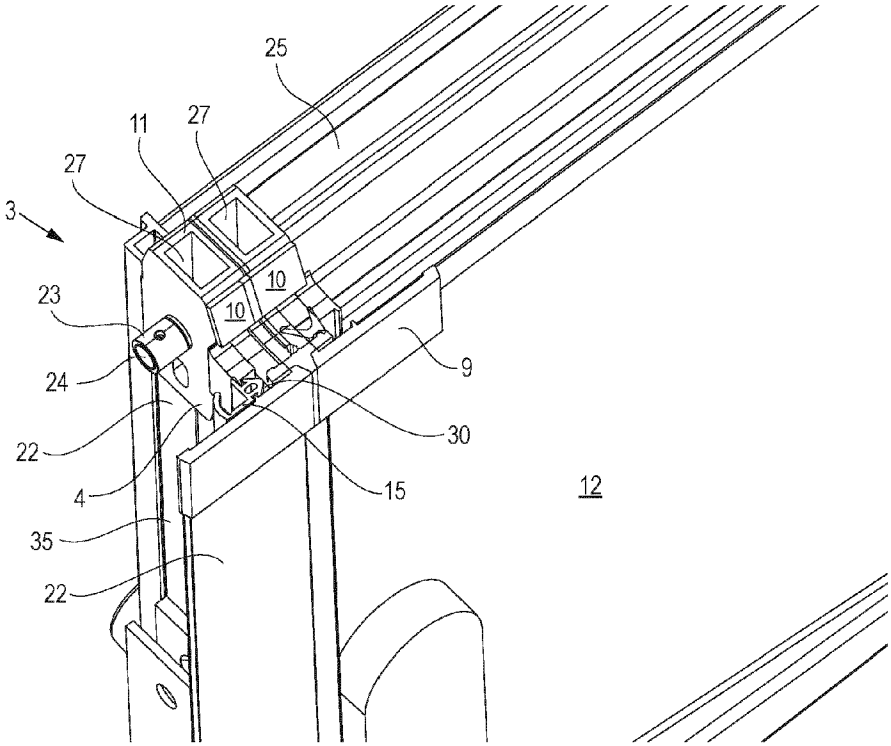


Fig. 5

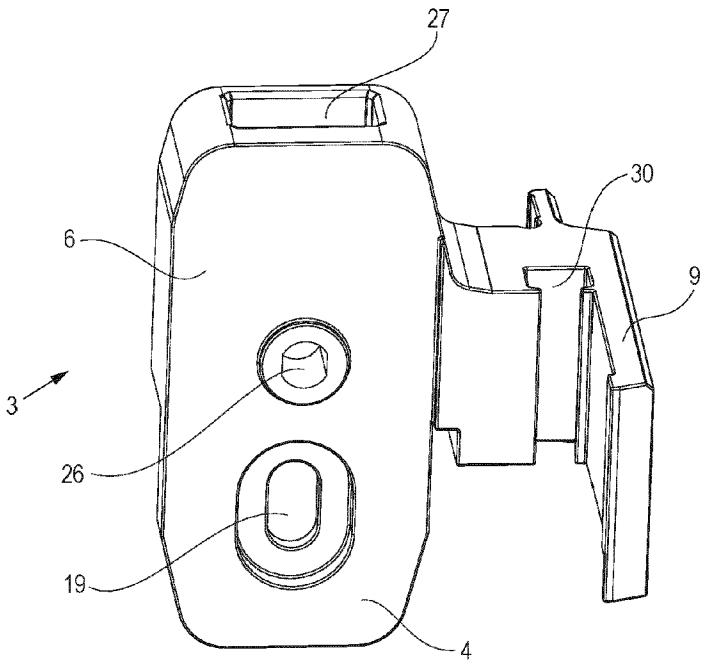


Fig. 6

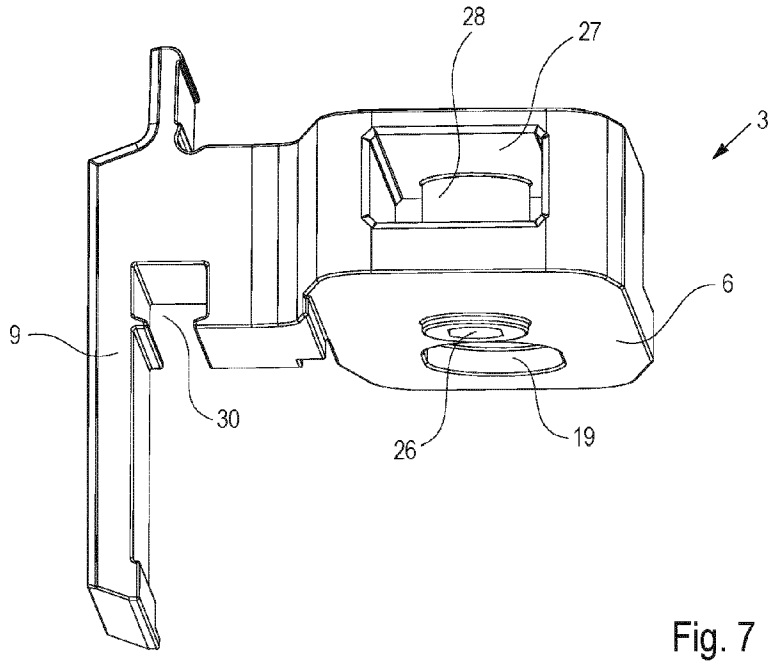


Fig. 7

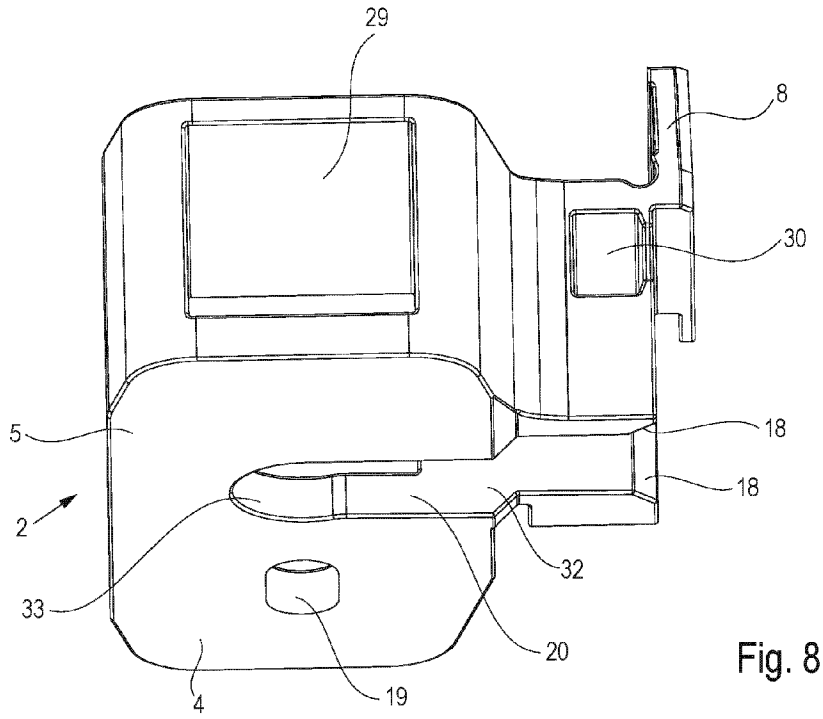


Fig. 8

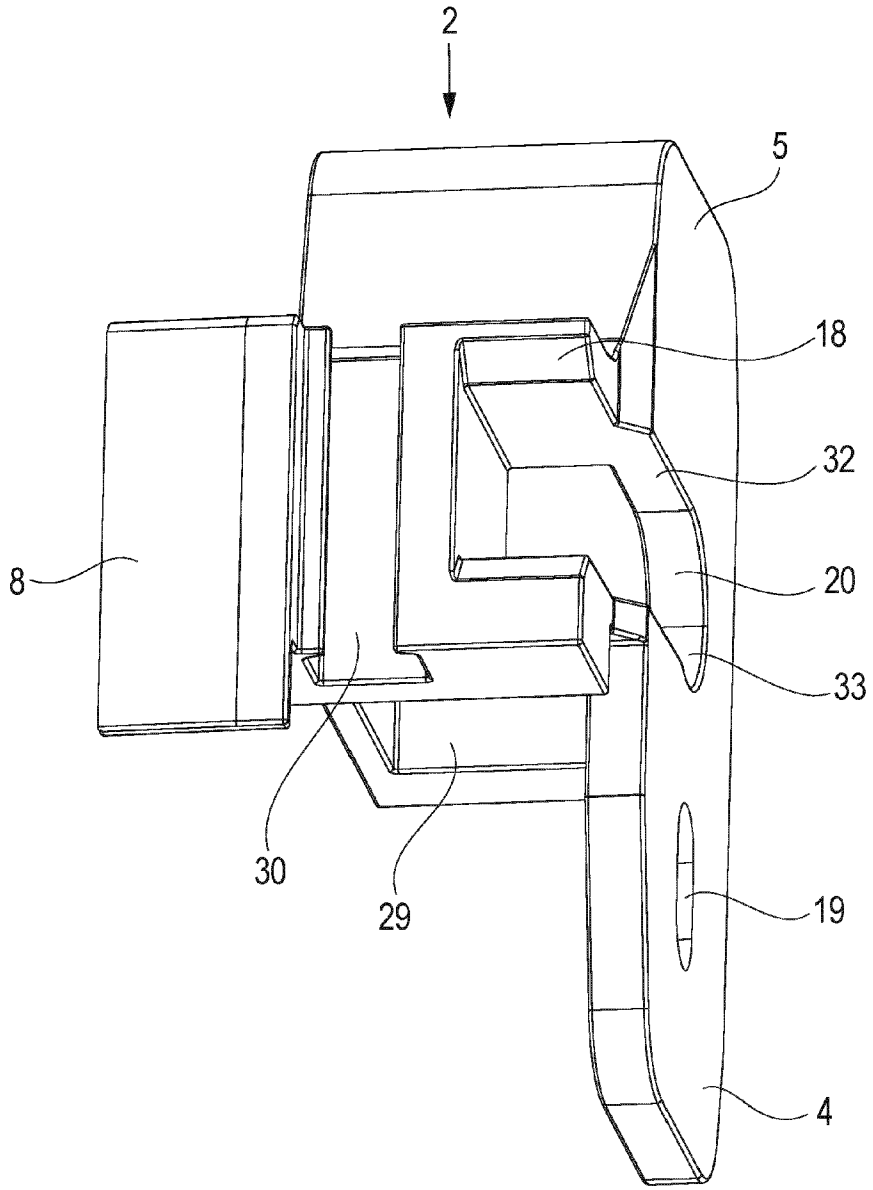


Fig. 9

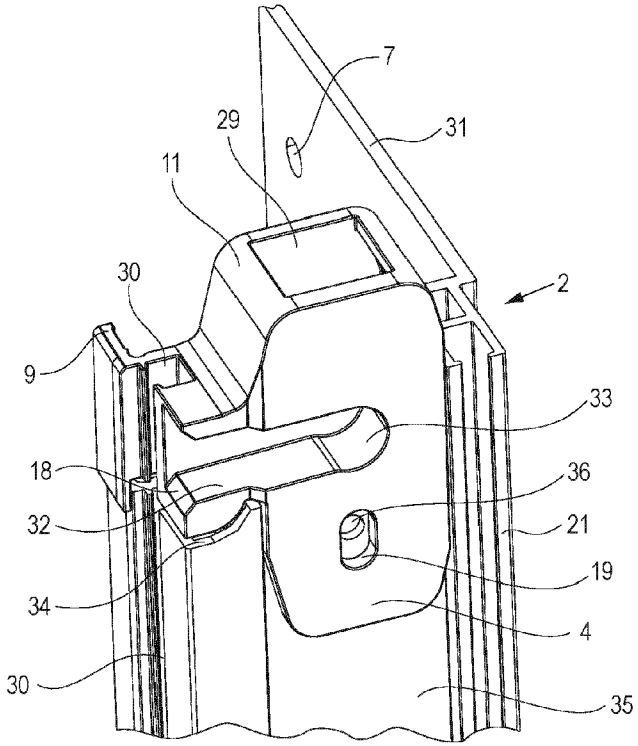


Fig. 10

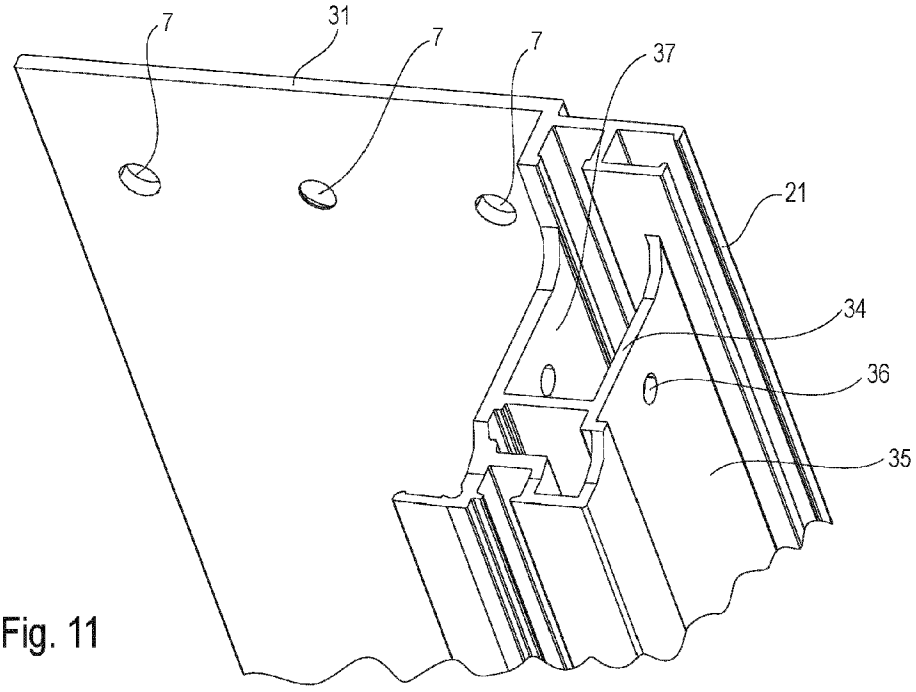


Fig. 11

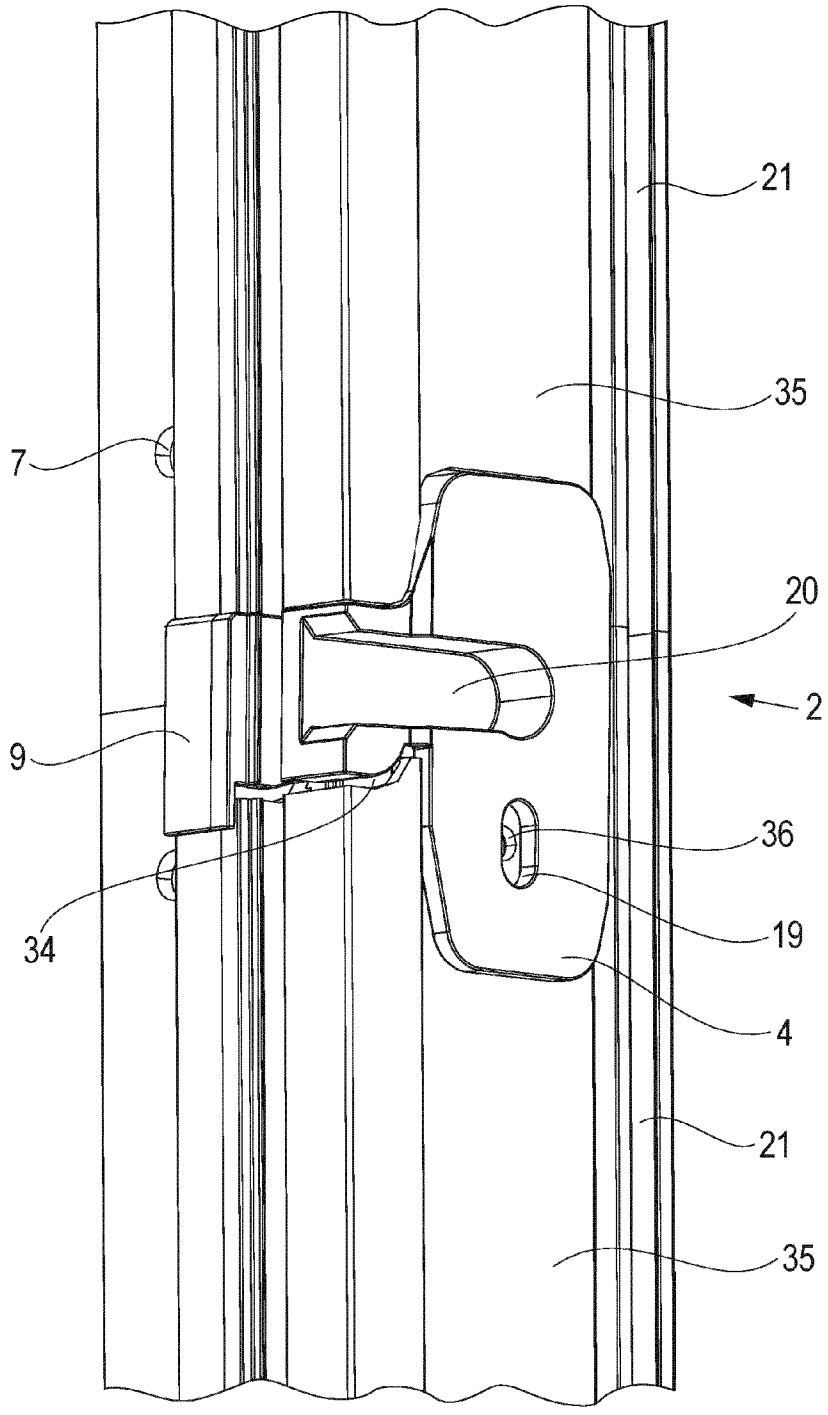


Fig. 12