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- (54) Benævnelse: **Centreringsenhed til et dørblad inden i et stillingsforanderligt portblad**
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EP-A2- 2 698 495
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Centering unit, a sectional shutter door leaf with a door leaf which is equipped with centering units

The invention relates to a centering unit for one of a plurality of sections of a shutter door leaf which are connected together in a rotationally movable manner, into which shutter door leaf a door is integrated, the door leaf of which also consists of sections which are rotatably movable relative to one another, as well as a sectional shutter door whose shutter door leaf has an integrated door with such centering units.

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 with an additional plate which is equipped with a slot. When closing the door, the bolt is introduced into the slot, so that there is a defined closing position of the available door.

A shutter door with a sectional shutter door which is movable between a closed position and an open position is disclosed by EP 2 698 495 A2. Here, a door is integrated into the shutter door leaf, at least one ramp-like guiding surface, in connection with a guiding means, being present for the purpose of assuming the closed position. The guiding means is equipped with a rotatable contact surface, which comes to bear on the contact surface of the guiding surface during the closing movement of the door leaf.

An additional sectional shutter door is depicted by FR 3 051 821 A1. This sectional shutter door has a passive mechanical securing device which cooperates with a wicket door such that opening the wicket door is prevented when the sectional shutter door is moved into the open position.

DE 20 2017 106 659 U1 shows a wicket door with a shutter door leaf which is pivotably borne in a shutter door opening of a shutter door. Latching means, which automatically enter into a latching connection when the wicket door is closed, are assigned to a second narrow side of the wicket door, which is situated opposite the first narrow side.

An additional sectional shutter door with a door is disclosed by FR 2 887 283 A1.

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 lateral 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 shutter doors to allow persons or small vehicles 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 secure in a correct sealed state.

The object of the invention consists of providing a simple construction, which allows a secure sealed position 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 for a centering unit and through the features of Claim 6 for a sectional door with such centering units.

The subordinate claims which follow the main claim depict a further configuration of the idea according to the invention.

The inherently rigid sections of the shutter door leaf, as they are designed in sectional shutter door leaves, are connected to one another by hinges, for example. Depending on the size of the shutter door leaf, such a construction can make the sectional shutter door more unstable overall than a one-piece shutter door leaf. This unstable circumstance is strengthened in that a door leaf is integrated into the 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. However, 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 aforementioned features, it is particularly

important that no increased 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 into the shutter door leaf, it is important to obtain a correct closed state of the door leaf, because, 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 considerably disrupt the entire operating sequence of the sectional shutter door.

Sectional shutter door leaves, which consist of sections, such as panels, that are connected to one another in a rotationally movable manner, are not sufficiently protected against water, noise etc. entering from the outside, for example due to high wind pressures, due to their construction design in the hinges of the panels which are connected together. Condensation can also come into being between the door leaf and the shutter 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.

Sectional shutter door leaves, which contain a door 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 form between the shutter door leaf and door leaf. In particular, if water enters into the gaps between a shutter door leaf and a door leaf, this must be drained off again to the outside of the shutter door leaf.

The invention proposes a centering unit 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 lateral header termination members, which laterally terminate the individual sections, 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 termination must be understood in several respects: firstly, with regard to a secure closed position 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 parts of the centering unit and in the header termination members that prevent water which is present from remaining between the door leaf and shutter door leaf or entering into the building.

5

Furthermore, the inventive centering units 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, only to the main closing edge, i.e. not to the upper ends of the sections. Only the placement of the centering units
10 between the upper edges of the door wing sections and the shutter door wing sections secures a good and secure bond in the closed position between the door wing and shutter door wing in this region of the doors which have a certain amount of play.

The inventive centering unit consists of a first and a second segment. After mounting at
15 the termination members, 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 present, in one of the segments, a centering inlet which runs essentially
20 horizontally or at an incline, the aperture of which is directed towards the closing door wing and is provided with chamfers. 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 for the secure closing position. The diameter of the roller element is essentially tailored to the opening width of the centering inlet, so that with sufficient play, the door
25 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 can no longer represent a danger point.

30 Improving the water management of sections also entails reducing the air exchange rates in the corresponding buildings. For this reason, it is, for example, essential to drain condensation between the door wing and shutter door wing 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
35 leaf. One advantage of the water management design according to the invention is the rapid drainability of water accumulations inside the shutter door leaf or the door leaf. For this purpose, it is necessary to provide a separate aperture, which increases the

insulating properties of the door leaf and shutter door leaf. For this purpose, the water-removal shafts in the header termination members are designed so that they are aligned with water-removal apertures of the centering unit in order to channel away any water present in the interior. The design of the centering units with the large available
5 apertures and shafts in the header termination members makes it possible to avoid blockages, and it is also possible to perform cleaning of the shafts with appropriate means in the installed state.

To make it possible to perform effective water management with successful water
10 drainage, the apertures or openings, in the segments of the centering units, are virtually connected over one another to corresponding shafts in the header termination members. The good closing position 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
15 door leaf to be able to be performed.

The segments of the centering units can be produced cost-effectively in a plastic design, but with the rotatable roller and the associated axle being made of steel.

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

25 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 between which a rotatable door leaf is integrated.
30

Figure 2 shows one embodiment of the centering unit according to the invention in a perspective depiction.

Figure 3 shows an installation of the centering unit between the door wing and a gate wing in a sectional view.
35

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.

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

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

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Figure 8 shows a first segment in a perspective individual depiction.

Figure 9 like Figure 8, but seen from a different viewing angle, with the axle and rolling member.

15

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

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

20 Figure 12 shows termination members arranged over one another, with an inserted first segment.

Figure 13 shows a perspective depiction of a partially opened door inside a shutter door leaf.

25

The perspective depiction according to Figure 1 depicts a part of a sectional 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
30 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.

35 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 of the sections in connection with complementary configurations on the underside of the sections which interact therewith. In each case, between the main closing edge of the

door leaf 12 and the adjoining sections of the shutter door leaf 13, segments 2, 3 of a centering unit 1 are mounted at the upper end of the members, on each side of the sections. In the same way, segments of the centering units 1 are also mounted respectively on the secondary closing edge between the door leaf 12 and the shutter door leaf 13. The upper sides of the centering units 1 are equipped with 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 the 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 exhibit instability, namely at the upper end regions, a strong bond, but which is also a releasable bond, is achieved between the door leaf 12 and the shutter door leaf 13. This leads to the increase in stiffness under wind loads when the shutter door leaf 13 is in the closed position, and also reduces heat exchange between the inside and the outside of the sectional shutter door.

15

A possible 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 the depiction from Figure 2 has been depicted seen from the inside of the shutter door and door leaf. The first segment 2 and the second segment 3 are each attached to the upper ends of the header termination members 21, 22, connected via affixing flanges 4 which contain affixing bores 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 apertures 27, 29. These apertures 27, 29 make it possible to perform an effective removal of any water that comes into being in the gaps of the shutter door lead 13 and the door leaf 12. This housing configuration makes it possible, on the one hand, for simple positioning to be possible and, on the other hand, for the centering means to be configured cost-effectively. In particular, sound insulation and virtual airtightness can also be achieved in connection with seals, which are not shown.

30

The mounting of the first segment 2 at an upper end 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 can be achieved by a cover in front of the protrusion 11. At the same time, such a cover also achieves a stop-damping action when the door leaf 12 enters into the closed position. Inside the first segment 2, a centering inlet 20 has been depicted as a recess, which can have an inclined or substantially horizontal progression.

35

At the entrance of the centering inlet 20 are chamfers 18, which allow a centering piece 18, which is rotatably mounted on the second segment 3, to dip in.

A possible mounting of the second segment 3 to the door leaf 12 is depicted in Figure 5.

5 Here, the housing 6 has a free punch on its underside, in order to accomplish a 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. Such a design can be seen in Figure 9, for example. On the inside, an axle receptacle 26 has two opposing surfaces, with which two flat portions 39 of the axle 24 together
10 form an anti-twist mechanism. A rolling member 23 is rotatably mounted on the axle 24. The rolling member 23 has a bore 43, in order to achieve lubrication between the rolling member 23 and the axle 24. In order to provide a reservoir for lubricant, a groove 40 can be introduced into the surface of the axle 24, which continuously provides the lubricant. Prior to mounting the axle 24, the rolling member 23 must be plugged, via its inner bore
15 42, onto the axle 24. Inside the rolling member 23, at one end, there is incorporated a step 44 into which the greater projection 41 of the rolling member 23 is embedded. Only now can the axle 24 of the rolling member 23 be jointly pushed into the axle receptacle 26. The axle 24 is secured by an affixing screw 10. In order that the rolling member 23 also remains rotatable at all times, a step 38 of the axle 24 rests against a protrusion 46.
20 The rolling member 23 is thus always mounted in a freely rotatable manner. The interplay of the rolling members 23 and the centering inlets 20 guarantees a secure closed position between the door leaf 12 and the shutter door leaf 13 under all circumstances.

25 There is a stop 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 it is also possible to discern a receptacle for an end seal 15 at the second segment 3. 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 leaf 12 to the shutter door leaf
30 13, a closure seal 16 has been depicted on the inside of the first segment. Inside the shutter door leaf 12, there is a lock which is not shown, and which can be actuated by a door handle 17.

Through the centering unit 1, there is, in two directions, both a balancing between the
35 sections of the shutter door leaf 13 and of the door leaf 12, and also an overall balancing between the shutter door leaf 13 and the door leaf 12 of the shutter door, thus allowing frictionless operation.

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 these depictions; instead, the axle receptacle 26 can only be seen in Figures 6 and 7, which extends through the entire second segment 3. The axle
5 receptacle 26 is surrounded by a spacer 28 so that the axle 24 will not 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 drain off, despite the rolling member 23 being affixed. A sealing
10 channel 30 is incorporated into the screen stop 8, into which a seal for the door leaf 12 can be drawn.

The housing 6 of the second segment 3 has, in its affixing flange 4, an affixing bore 19 in the form of an elongated hole. As a result, it is possible to be able to perform precise
15 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 can be seen from Figure 8. For the running (not depicted) of the rolling member 23, the centering inlet 20 has been depicted which
20 has an even run-in surface 32 which can have a substantially straight or upwardly inclined progression. At the end of the run-in surface 32, there is a termination 33 which may be slightly recessed from the run-in surface 32 in order to thereby be able to assume a secure closing position when the door leaf 12 is in a closed state in the shutter door leaf 13.

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

Figure 10 depicts the installation of the second segment 3 in connection with the header termination member 21. Here, the second segment 3 has been fitted onto the face side of the header termination member 3. For this purpose, contour hollows 34 have been
35 designed on the header termination member 21 in order to be able to perform the placing of the segment 3 on the upper face side of the header termination member 21. The upper protrusion 11 of the second segment 3 virtually aligns with the profiling 25 of

the upper part of the shutter door leaf 13 in its longitudinal direction. To affix the second segment 3, the header termination member 21 has a stop face 35, against which the affixing flange 4 bears in order to be affixed in the header termination member 21 via the affixing bore 19, in connection with a bore 36.

5

The termination member 21 with the contour hollow 34 can be seen in the upper end region of Figure 11. It can be seen here that the contour hollows 34 extend to both side of a continuous shaft 37. 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 to this, as can be seen from Figure 1.

15 As has already been stated multiple times, the shutter door leaf 13, with the door leaf 12, consists of individual sections which are connected 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 between which the second segment 3 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 first segment 2.

The interaction of the two segments 2, 3 when a door is partially opened is depicted in Figure 13. A tie 45 has been depicted between the shutter door leaf 13 and the door leaf 12, for the purpose of their mobility. The tie 45 consists of two segments, the spacing of which can be adjusted relative to one another.

25

Reference Numbers

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

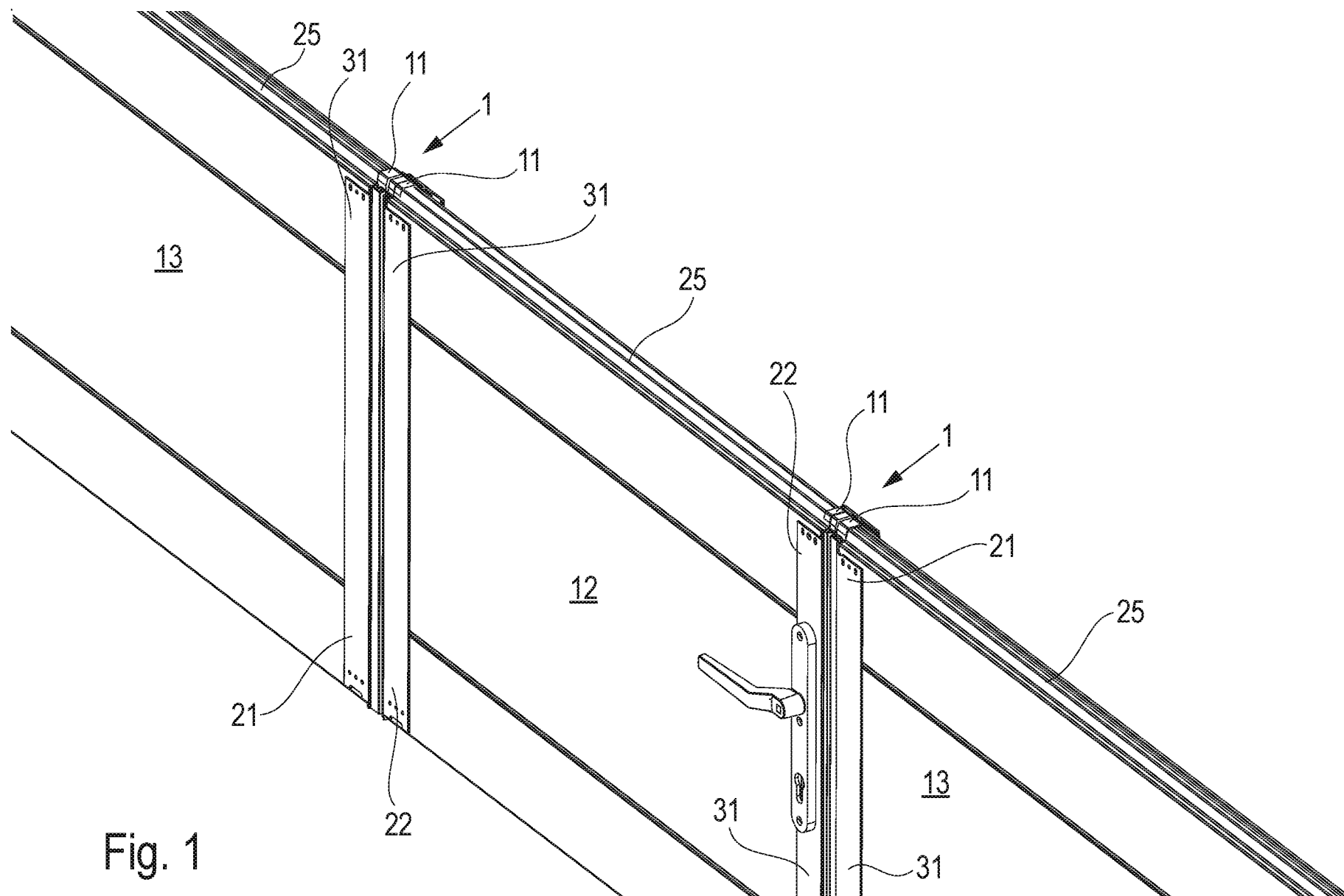
	36	bore
	37	shaft
	38	step
	39	flat portions
5	40	groove
	41	projection
	42	bore
	43	bore
	44	step
10	45	tie
	46	protrusion

P A T E N T K R A V

1. Centreringsenhed (1) til et portblad (13), som består af flere indbyrdes dreje-
bevægeligt forbundne sektioner, og som styres i laterale styreskiner, hvor en dør
5 er integreret i portbladet (13), hvis dørblad (12) ligeledes består af flere indbyrdes
drejebevægelige sektioner, som via bånd (45) er drejebevægeligt forbundet med
portbladets sektioner, hvor sektionerne består af to distancerede plader, hvis
mellemrum er udfyldt med et isoleringsmateriale, hvor de laterale vertikale rande
af sektionerne er lukket ved hjælp af forsatsafslutningselementer (21, 22), og hvor
10 sektionerne på oversiden er forsynet med profileringer (25), hvor afslutnings-
elementernes (21, 22) øvre ender i sammenbygget tilstand i området af sektioner-
nes profileringer (25) mellem portbladet (13) og dørbladet (12) på hoved-
lukkekanten og den sekundære lukkekant i hvert tilfælde er forsynet med en
centreringsenhed (1), hvor centreringsenheden (1) består af et første delstykke
15 (2), som er forsynet med et centreringsindløb (20), som omfatter en vandret eller
skråt forløbende indløbsflade (32), og af et andet delstykke (3), som er forsynet
med en stationær aksel (24), og hvor der på akslen (24) er anbragt et drejeligt
rulleelement (23), hvis udvendige diameter er afstemt efter centreringsindløbets
(20) åbningsbredde således, at rulleelementet (23) med spillerum under dørens
20 (12) lukkeproces kan løbe ind i centreringsindløbet (20), og hvor det første del-
stykke (2) og det andet delstykke (3) i sammenbygget tilstand stående over for
hinanden i hvert tilfælde ligger an mod portbladets (13) og dørbladets (12)
sektioner og indbyrdes i dørbladets (12) lukkestilling griber centrerende ind i port-
bladet (13), **kendetegnet ved, at** akslen (24) er anbragt drejesikret i det andet
25 delstykke (3) over flader (39), og at delstykkerne (2, 3) er forsynet med en vertikalt
gennemgående afvandingsåbning (27, 29), som i sammenbygget tilstand står i
forbindelse med skakter (37), som er indeholdt i forsatsafslutningselementerne
(21, 22), og i den forbindelse er skakterne (37) udformet over forsatsafslutnings-
elementernes (21, 22) samlede udstrækning, og at delstykkerne (2, 3) i det

mindste på en af deres ydersider er forsynet med et anslag (8) eller et blænd-
anslag (9), som i sammenbygget tilstand kommer til anlæg mod et anslagsben
(31) på forsatsafslutningselementerne (21, 22).

- 5 2. Centreringsenhed ifølge krav 1, **kendetegnet ved, at** delstykkerne (2, 3) i
centreringsenheden (1) foreligger i en kunststofudførelse, hvor rulleelementet (23)
og akslen (24) består af stål.
- 10 3. Centreringsenhed ifølge kravene 1 og 2, **kendetegnet ved, at** akslen (24) er
forsynet med en rundtgående rille (40), som overdækkes af rulleelementet (23).
4. Centreringsenhed ifølge krav 1, **kendetegnet ved, at** båndene (45) anven-
des i en skjult udførelse.
- 15 5. Centreringsenhed ifølge krav 1, **kendetegnet ved, at** forsatsafslutnings-
elementerne (21, 22) er udformet som letmetalprofiler og omfatter en anslagsflade,
hvorpå delstykkerne (2, 3) kan fastgøres.
- 20 6. Sektionsport, hvis portblad (13) omfatter en dør med et portblad (12), hvis
sektioner er indbyrdes forbundet drejebevægeligt og består af to distancerede
plader med et mellemrum, som er udfyldt med isoleringsmateriale, hvor de late-
rale, vertikale rande af sektionerne er lukket ved hjælp af forsatsafslutnings-
elementer (21, 22), som på forsatsafslutningselementernes (21, 22) øvre ender er
anbragt i området af sektionernes profileringer (25) mellem portbladet (13) og dør-
25 bladet (12) på hovedlukkekanten og den sekundære lukkekant i hvert enkelt til-
fælde med en centreringsenhed (1) ifølge et eller flere af de foregående krav.



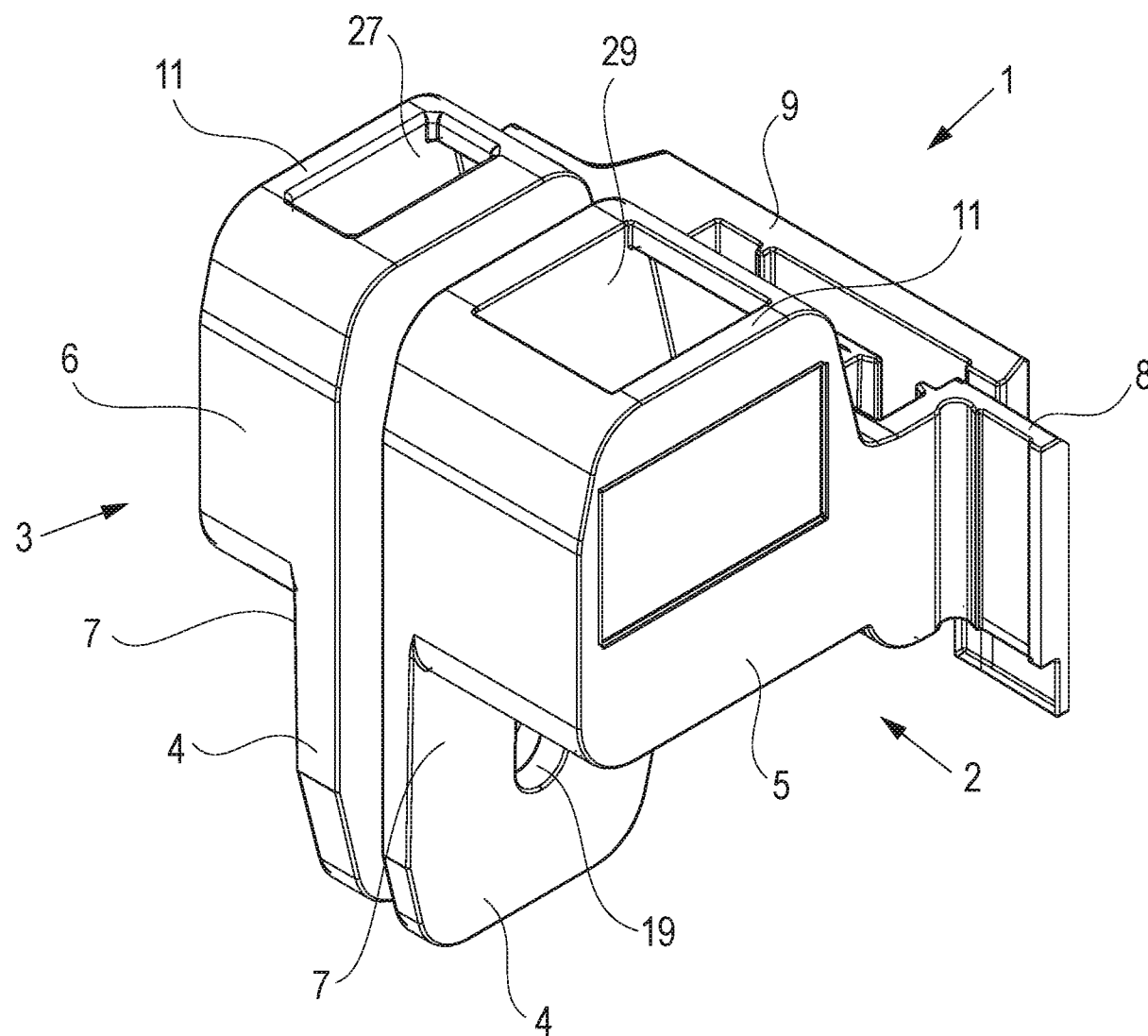
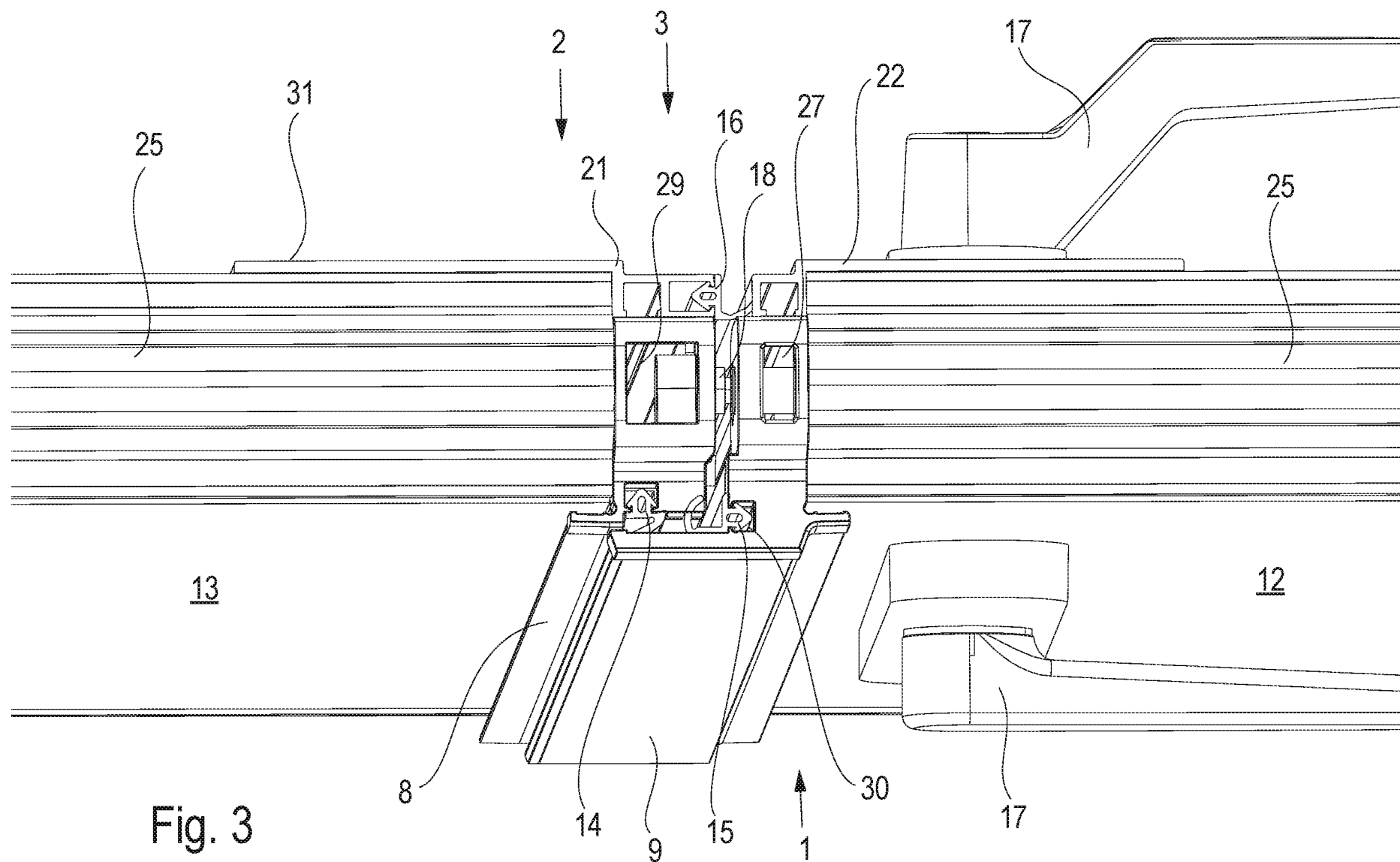


Fig. 2



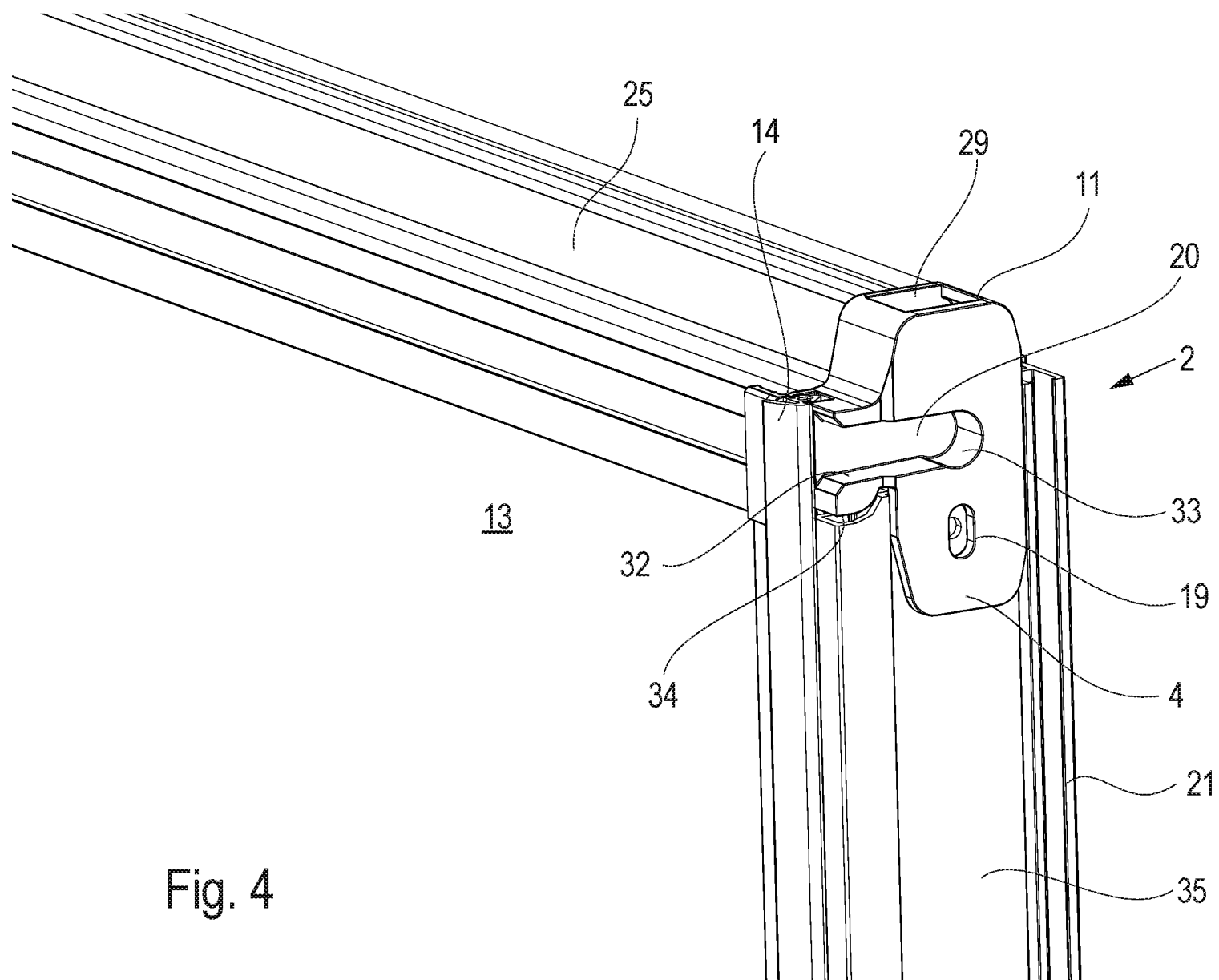


Fig. 4

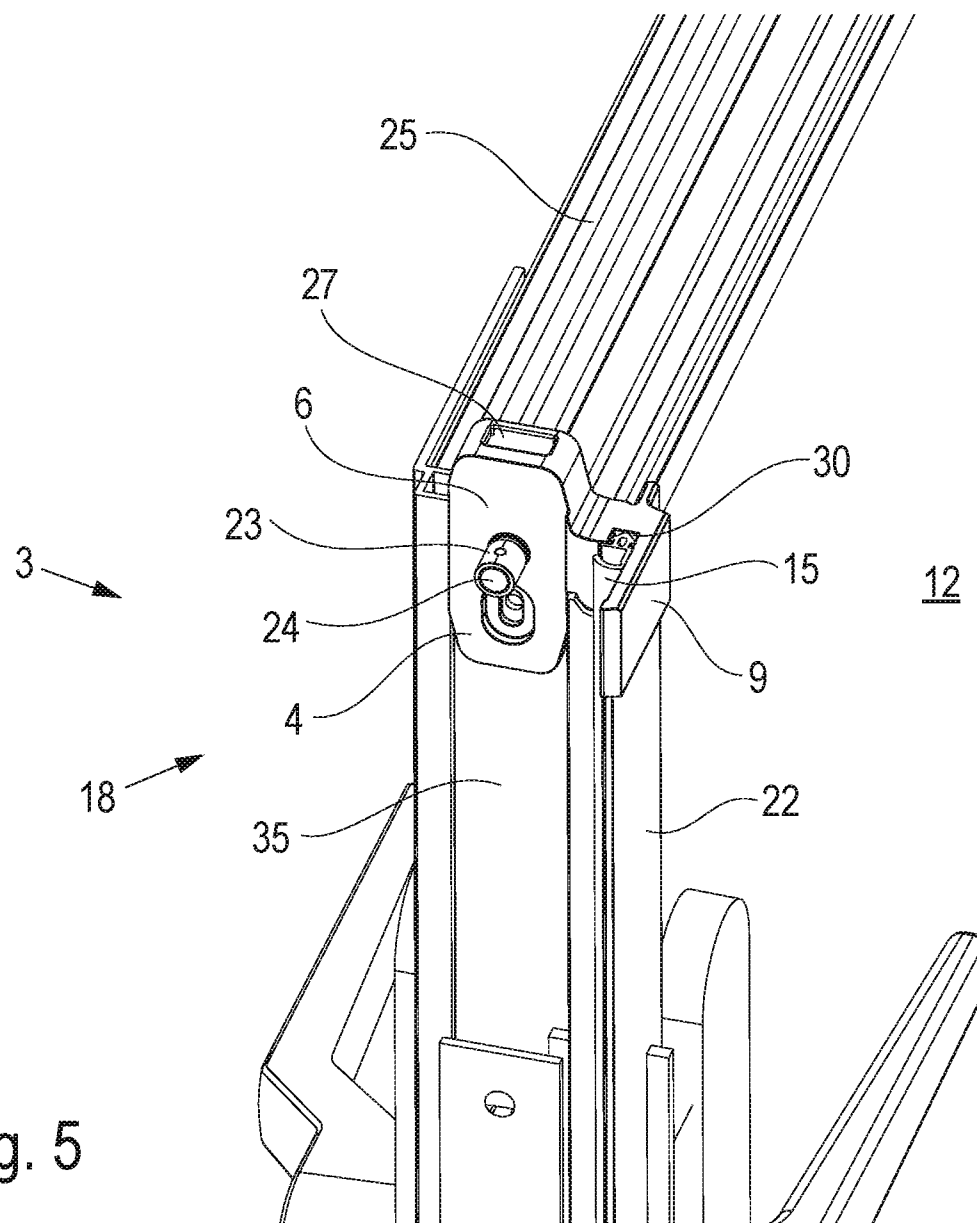
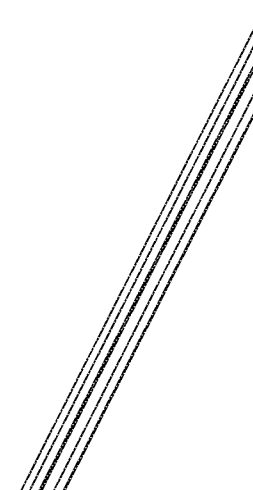


Fig. 5



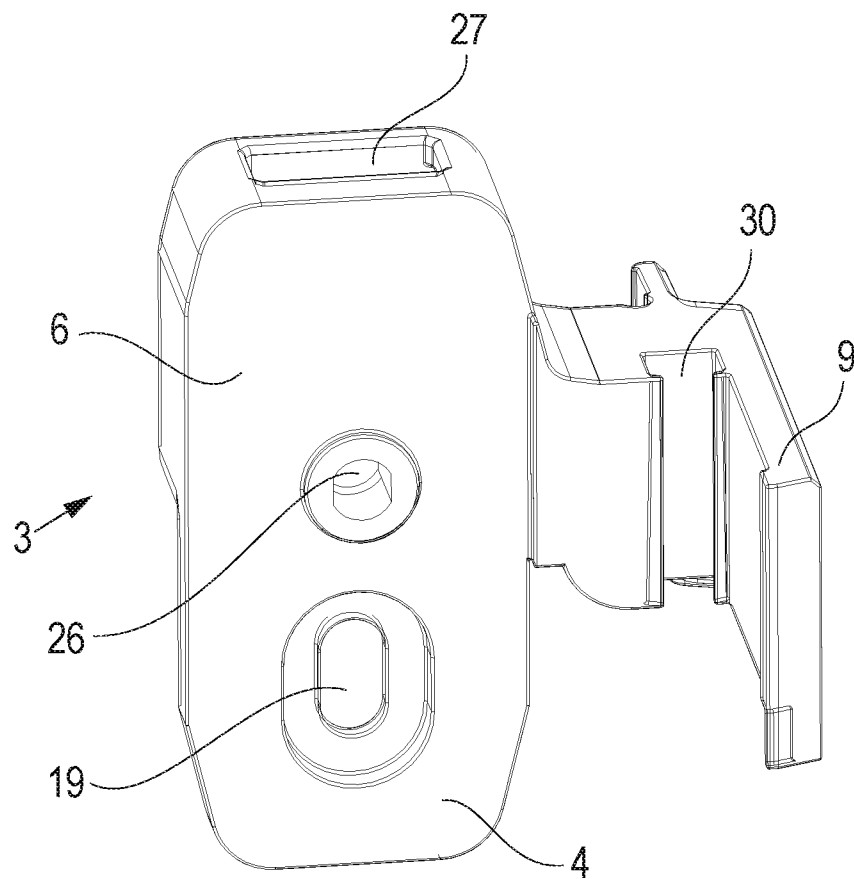


Fig. 6

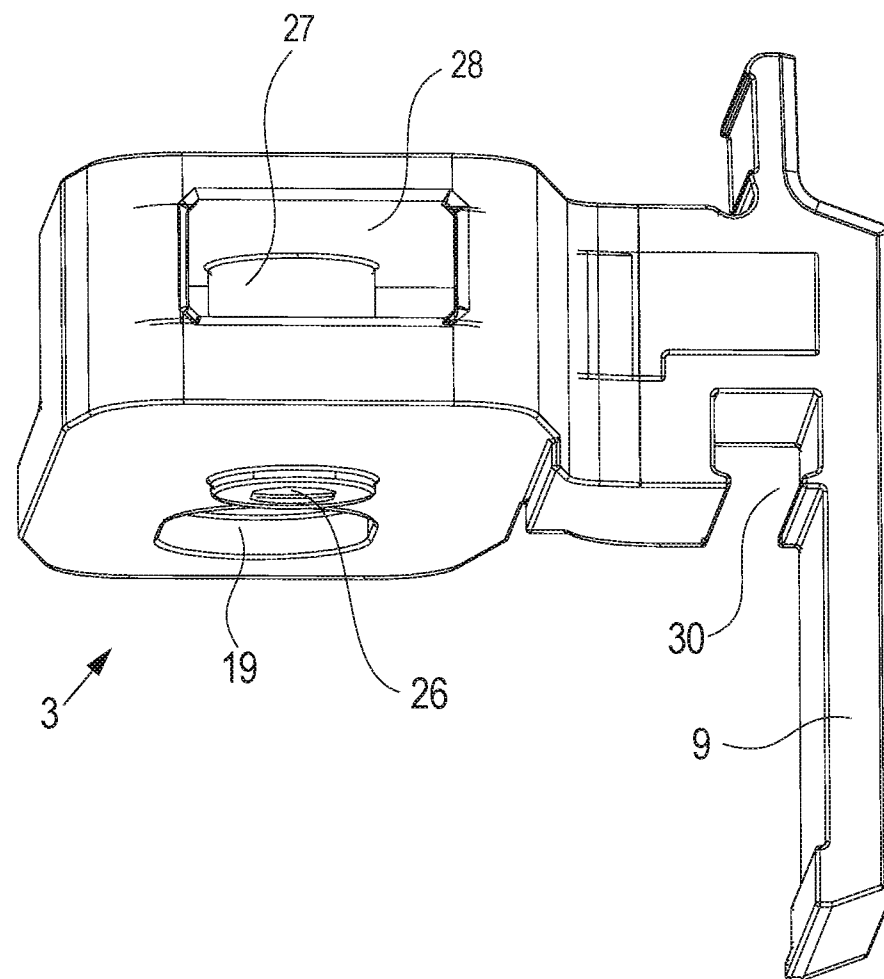


Fig. 7

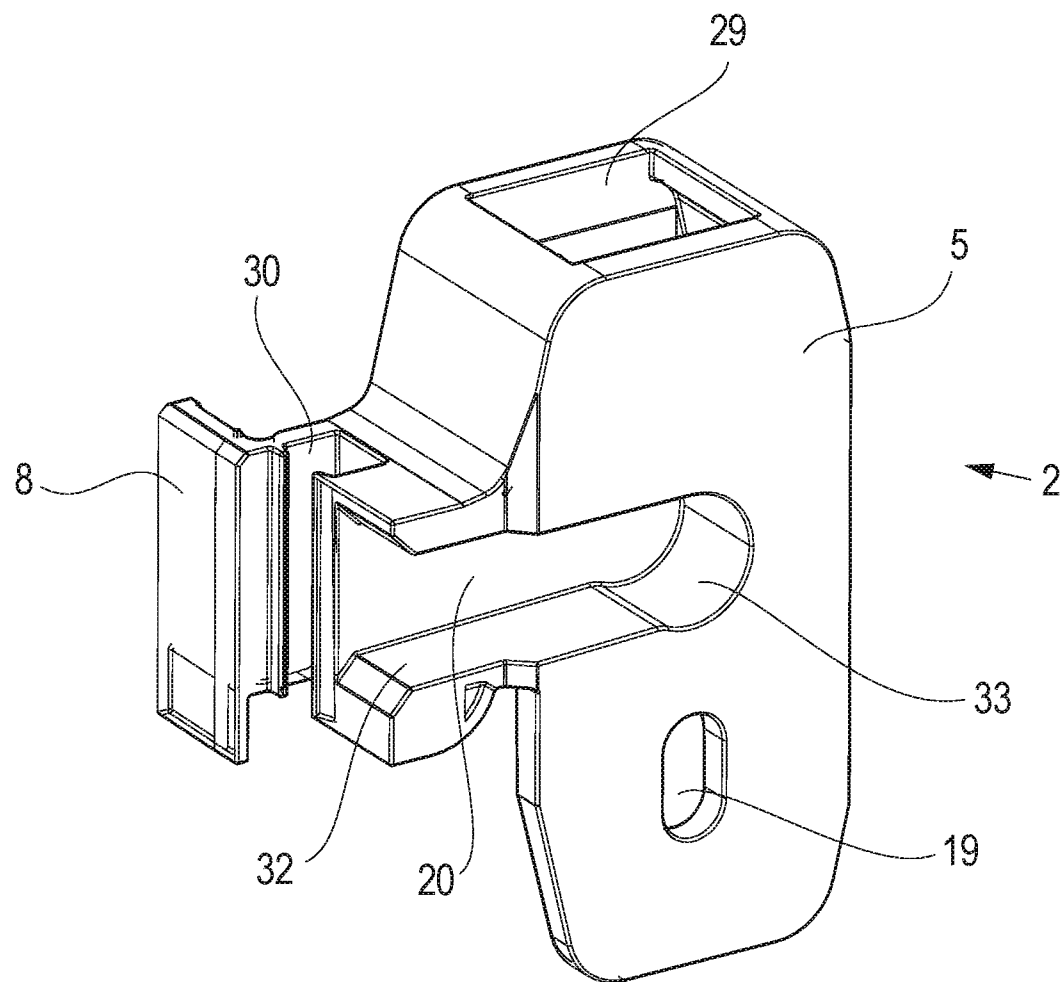


Fig. 8

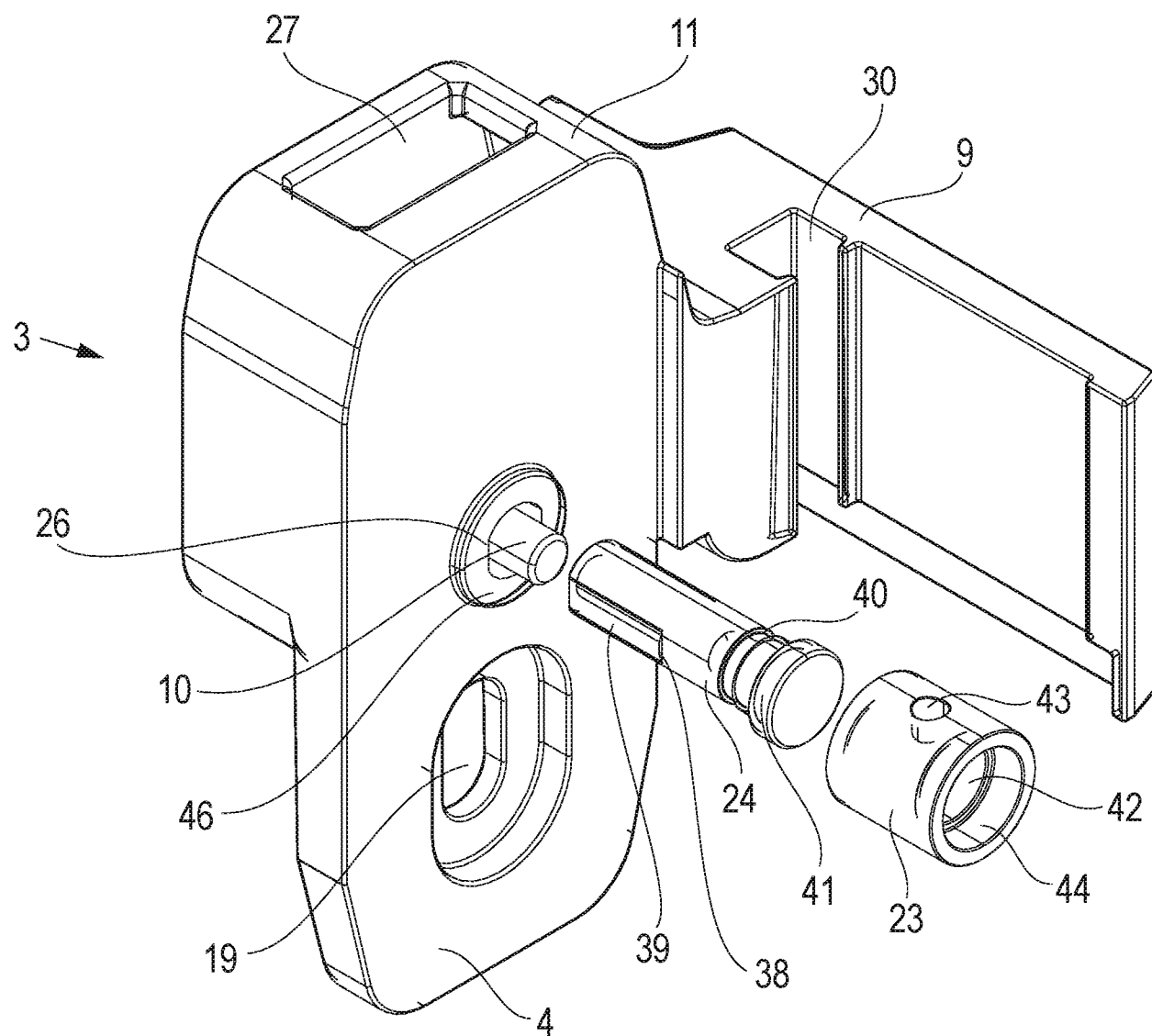
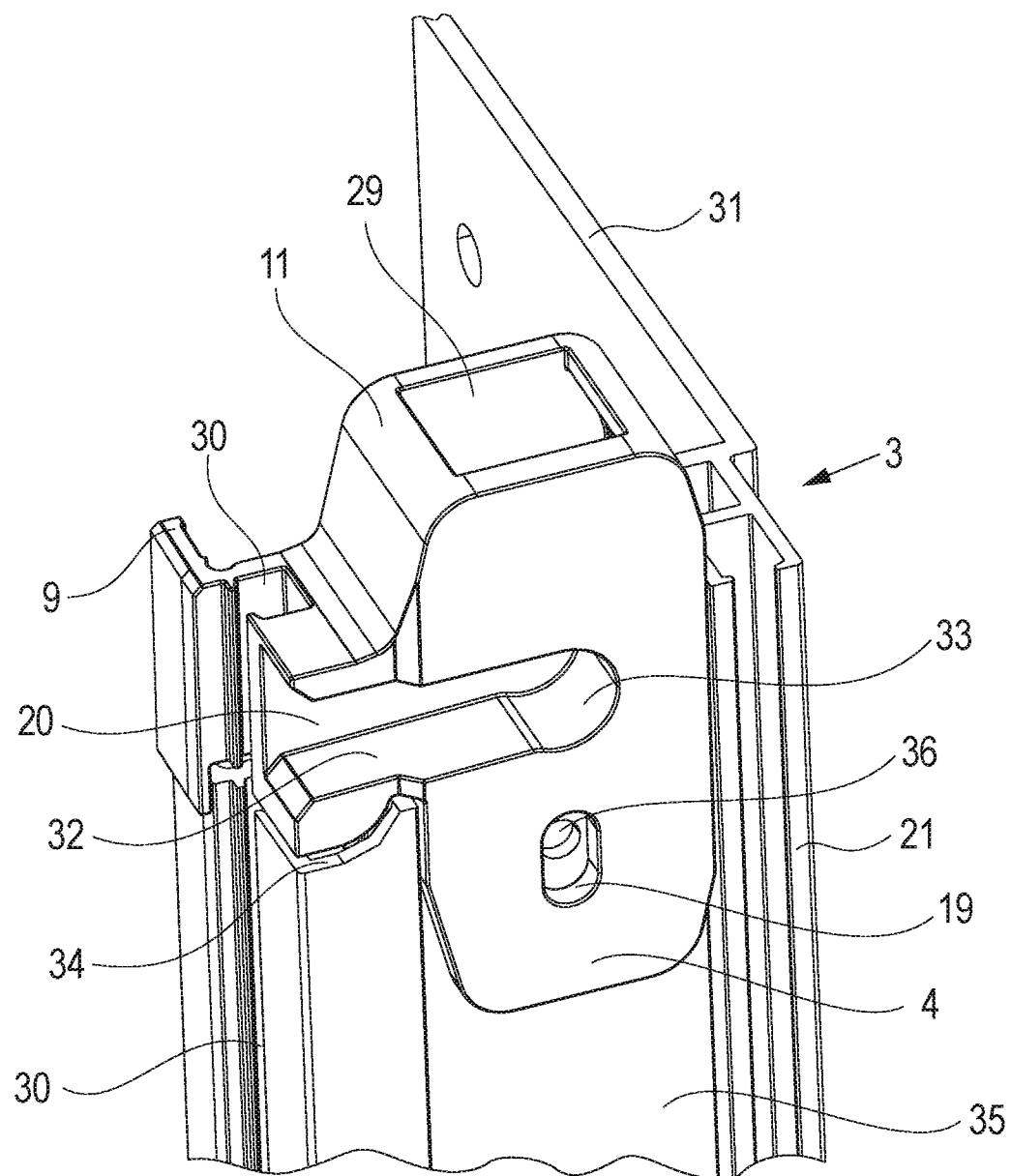
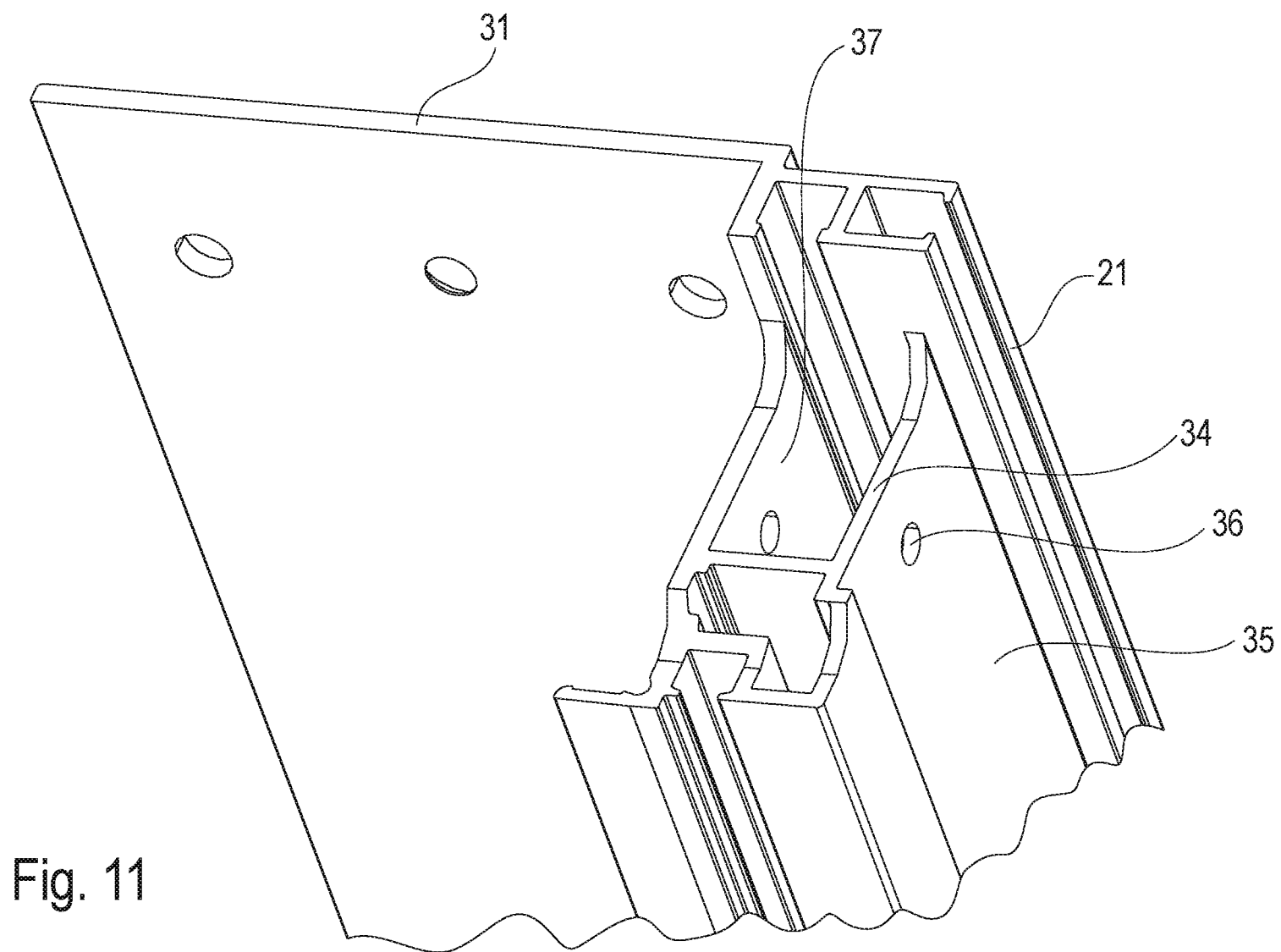


Fig. 9

Fig. 10





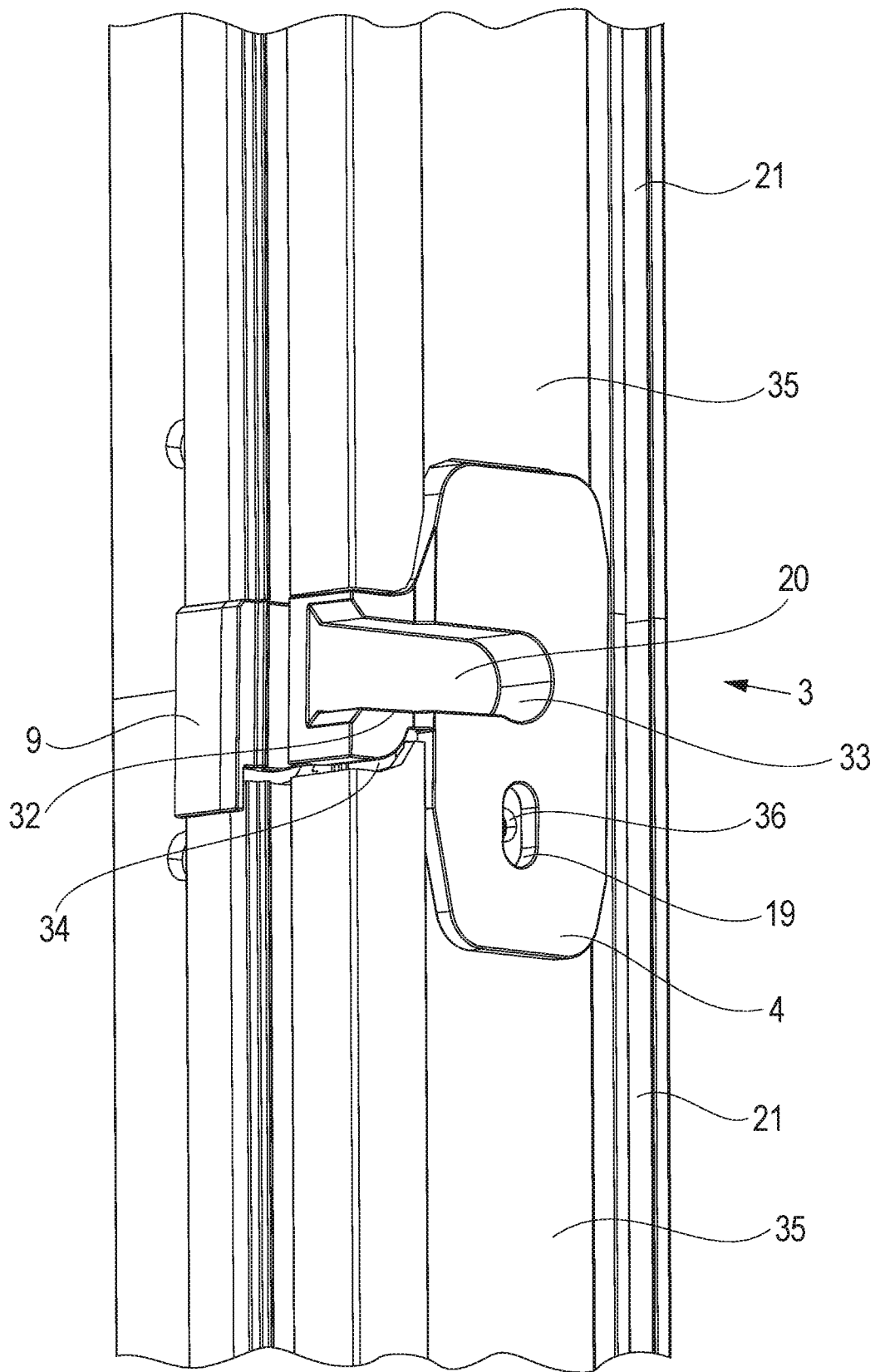


Fig. 12

