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Gate with a gate element as well as lower terminal element for a gate element with an incorporated door element

The invention relates, on the one hand, to a gate with a door
5 element, which is incorporated into the gate element,
wherein preferably the gate element and the door element
consist of individual elements, which are articulately
connected among each other, and include a terminal
element at the lower border of the gate element. The gate
10 element is location-modifiably guided in laterally disposed
rails. Furthermore, the invention relates to a lower terminal
element, which underneath the gate element terminates
both the area of an existing door element and the one of the
gate element in the width thereof.

15 The document US 5,842,508 reveals a sectional gate, which
is modifiable to the top, and is composed of rectangular gate
portions, which are connected to each other by hinges. Said
hinges are directly configured at the gate portions and
namely in the shape of longitudinal tube-shaped
20 conformations. Additionally, said load-bearing hinge
elements are connected to lateral edges of neighbouring
gate portions and are carried by supporting elements, which
are disposed in the tube-shaped hinge section.

The document DE 10 2005 026 026 A1 discloses a gate, in
25 particular a sectional gate having large spans, which
includes several elements, respectively sections, which are

configured to be pivotally to each other, which are partially interrupted by a door in such a manner that the door leaf likewise has several door elements, which are pivotally in relation to each other, the pivot axes thereof being disposed
5 coaxially to the pivot axes of the gate elements, respectively of the sections. The door leaf extends as far as to the floor, respectively to a floor rail disposed at the lower gate border. An analogously configured gate with a door is disclosed in the document DE 20 2005 021 943 U1.

10 The configuration of a sill for a gate, which sill consists of the most different materials, is depicted in the document US 5,581,949 A.

The object of the invention is to further develop an underside termination of a vertically location-modifiable gate with an
15 incorporated door in that in addition to user friendliness of the door element, simultaneously also the overall stability of the gate is maintained during opening and closing movements. Such a structure should be usable in differently configured gate leaves and with diverse driving types.

20 The solution of said problem is found in that a lower terminal element extends across the entire width of the gate leaf with an incorporated door element. In this case, the lower terminal element may be larger in the width thereof than the thickness of the gate leaf and of the door element. In this
25 case, a one-sided as well as a two-sided projection with regard to the gate leaf thickness may be realized. The

structure of the terminal element has been selected such that the terminal element may accommodate an insert element for overall stability, without the insert element projecting or protruding in this case. Such an insert element
5 may extend over the entire length of the terminal element, however, it is also possible to employ said insert element only portion-wise. The partial use of the insert element for increasing the stability may be as well only employed in the area of the door element. In such utilization, however, the
10 length of the insert element is larger than the width of the door element, such that, in addition to the door cutout in the gate leaf attachments to the terminal element may be realized outside the door cutout. This means that the door cutout in the gate leaf does not result in reducing the overall
15 stability of the gate structure. Compared to the terminal element such an insert element has a higher strength. In this case, the insert element may be entirely or partially enclosed by the terminal element.

It has proven to be particularly user-friendly, if the insert
20 element be configured as a hollow profile or as a U-profile. The combination of the terminal element with the insert element may be able to achieve an additional stiffing and thereby a higher stability of the gate leaf during a change of location to counter the weakening of the gate leaf in the area
25 of the mobile door element. Simultaneously, also the combination of two different materials may achieve a reduction of the dimensions of the terminal element, for

example in the height thereof. Thereby, the passage of such a door element is to be realized barrier-free with the utilization of the insert element in conjunction with the terminal element.

- 5 With the intention to not charge the gate element with the additional weight of the insert element, the insert element may be employed for example only in the area of the door element and moreover, in the two adjoining sides. At least the same or even a larger stability is achieved after the
10 connection of the insert element to the terminal element than in a gate without incorporated door execution. However, depending on the selected structure and size of the gate, it is also possible to employ an insert element across the entire width of the gate leaf. This will be in particular then realized,
15 if the lower area underneath the gate leaf is to have a considerably higher moment of resistance, which results in smaller exterior dimensions.

Thus, in a preferred embodiment, the top side of the terminal element may include a straight supporting leg, which
20 individuals, vehicles or the like may step on and pass therethrough. For accommodating a U-shaped insert element, the terminal element may include lateral incisions oriented towards the floor, which, on the outside, delimit the terminal element by terminal legs. In such an embodiment,
25 it is possible that the insert element may be directly placed onto a supporting leg of the terminal element such that the free U-legs thereof penetrate into the terminal element.

Thereby, simultaneously a straight smooth surface is realized in the area of the door element, which surface is without any hindrance when walking or driving through the passage. The ends of the insert element laterally projecting
5 beyond the width of the door element are non-positively and positively connected to the terminal element by means of screw connections outside the door leaf width. Such a structure of the lower termination may be considered as a hybrid element. For example, the terminal element consists
10 of a light metal and the insert element of steel having a higher strength.

The terminal element in the height thereof may be straight on the outside or else may be provided with lateral chamfers. In this case, the length of the insert element is determined
15 by the stability required for the entire gate leaf, which is to be calculated.

For the attachment of said combination of terminal element and insert element to the lower end of the gate leaf, it may be resorted for example to an intermediate element. It has
20 proven to be advantageous, if said intermediate element is configured such that it is able to at least partially overlap the combination of the insert element with the terminal element. Said form closure achieves a further stability increase in terms of strength and to withstand warping in the lower area
25 of the gate. Such an intermediate element is attached for example on the inside on the gate leaf by means of a locating leg, which is non-positively and positively connected

to the lower gate element. Furthermore, lateral legs of the intermediate element existing in the side area of the terminal element form the lower termination.

5 In a structure, in which for example the terminal element does not protrude to the outside of the gate leaf, but to the inside, a leg of the intermediate element will likewise overlap the terminal element in said area.

As there are differently configured gate leaves, the above-described structure is preferably realized in sectional gates
10 having several individual panels, which are articulately connected among each other or in single-leafed gate leaves. In this case, such gate leaves are guided at the sides in rails via sliders or roller means such that a change of location is possible without any problem. With single-leafed gate leaves
15 having a door element, guides are not absolutely necessary.

In order to be able to achieve a change of location in sectional gates, i. e. a movement of the gate leaf, the individual gate elements in the lateral areas thereof are therefore provided with fittings. Simultaneously, said fittings
20 may be provided with rollers in order to be able to perform the change of location in the lateral rails. At the gate element, which is connected to the terminal element, lateral connecting elements may be attached, which for example may have an angularly shaped configuration. With the
25 intention to be able to perform a universal and standardized attachment, the intermediate element is configured such that

a simple and reliable attachment is possible via the connecting element. For this purpose, a connecting leg with a lateral angulation in the shape of a catch is provided at the connecting element. The attachment leg is configured such
5 that the latter is exchangeably connected by means of a force and a form closure to the gate element. For this purpose, in the longitudinal extension thereof the intermediate element has a recess. After mounting, the catches engage on each side into the recess in order to
10 thereby achieve a reliable seating of the connecting elements. In addition to a force and a form closure via the attachment leg, said connection type simultaneously also ensures at least a force closure via the catches in conjunction with the recess in the intermediate element. In
15 an embodiment of the gate leaf, which is lifted by means of lateral cables, the connecting elements include for example bolts or pins, in order to be able to realize a simple attachment of the ropes. However, it is likewise possible to make the door leaf location-modifiable by means of an
20 output, which is disposed in a driving rail and driving along, or by means of a direct mount drive or a ceiling hauler or the like. Thus, the change of location of different door leaves in conjunction with the terminal element is always guaranteed.

For reducing the weight of the gate leaf, it has proven to be
25 advantageous that both the intermediate element and the terminal element be manufactured for example from a light metal. Just the insert element, which is area-wise embedded

into the terminal element, may consist of steel or stainless steel having a higher strength and/or a higher moment of resistance than the other light metal structural elements.

5 Further advantages, features and application options of the present invention will result from the following description in conjunction with the exemplary embodiments illustrated in the drawings.

The terminology and associated reference numerals itemized below in the list of reference numerals will be
10 employed throughout the description, the claims and the drawings.

In the drawings, represents:

- Figure 1 a lower gate element of a sectional gate leaf with an incorporated door element;
- 15 Figure 2: a partial cut of the lower area according to Figure 1;
- Figure 3 a sectional illustration through the area below the gate element;
- Figure 4 a terminal element having an embedded insert
20 element;
- Figure 5 a lateral configuration of the lower part of the gate next to a door opening;
- Figure 6 same as Figure 5, however with a view on the

opposite door rebate side;

- Figure 7 an insert of a connecting element having an intermediate element and a gate element;
- 5 Figure 8 a partial view of the gate with a connecting element, which is equipped with a bearing for a running roller;
- Figure 9 same as figure 8, however with an inserted running roller;
- 10 Figure 10 a connecting element in an individual illustration;
- Figure 11 a hinge configuration of the door element with a gate element;
- Figure 12 a partial illustration of a terminal element for the door element;
- 15 Figure 13 a partial illustration of main closing edge between the door element and the gate element.

Figure 1 shows a detail of a gate element 1, which for example is configured as a sectional gate and includes a
20 door element 14. In this exemplary embodiment, the door element 14 is disposed laterally within the gate leaf. On the right side next to the door element 14 and likewise on the left side, respectively one part of a gate element 1 has been illustrated. Basically, the position of the door element 14

within the gate leaf is freely selectable. In a sectional embodiment, vertical portions of the gate elements 1 are closed by lateral closure elements 17, which preferably have a U-shaped configuration. In this case, such gate elements

5 1 essentially consist of elements, which are executed between two covering shells with insulating material configuration. Projections 13, which cooperate with indentations 24 of the gate element 1, respectively of the door element 14 located there above, are illustrated at the

10 topside of both the gate elements 1 and of the door element 14, in order to achieve a tight connection of the individual gate elements 1 among each other of the gate leaf. Laterally, the door element 14 is delimited by door frame parts 15; the door element 14 being fastened via lateral terminal elements

15 16.

Across the width of the gate, a continuous terminal element 3, which longitudinally contains a floor sealing 2, is provided both underneath the door element 14 and underneath the

20 gate element 1. Via an intermediate element 5, the terminal element 3 is non-positively and positively connected to the gate elements 1. In the corners to the door element 14 on the right and left sides, respective terminal parts 18 are provided, which ensure a clean and closed termination, as

25 may be obtained from Figure 2.

Said basic above-describe structure may be obtained from Figure 3 in a partial sectional illustration. The floor sealing 2,

which is inserted into a sealing reception 7, is located underneath the terminal element 3. In a preferred embodiment, for increasing the overall stability and for a higher moment of resistance, the terminal element 3 includes a U-shaped insert element 4. The intermediate element 5 with a supporting leg 21 has been illustrated above the terminal element 3. Both the terminal element 3 and the insert element 4 and the intermediate element 5 are non-positively and positively connected among each other by screw connections 6.

In the sectional illustration according to Figure 4, the terminal element 3 is illustrated in conjunction with an inserted insert element 4. In this case, at the topside the terminal element 3 includes a supporting leg 12. On the end side, the terminal element 3 contains incisions 11 on each side, which are delimited towards the outside by terminal legs 25. The insert element 4 with the angled legs 9 thereof fits into the incisions 11. A base 10 of the insert element 4 comes into contact on the supporting leg 12 and is firmly connected thereto by the screw connection 6. Said straight configured base 10 of the insert element 3 allows for a barrier-free passage for individuals and vehicles through the door element in an opened location.

The assembly of the combination of terminal element 3 with the insert element 4 in conjunction with the intermediate element 5 and the gate element 1 may be obtained from Figure 3. In this case, the structural parts of the terminal

element 3, of the insert element 4 and of the intermediate element 5 are firmly connected among each other and retained by the screw connections 6. In an embodiment, in which the insert element 4 is not provided across the entire width of the gate leaf and thereby essentially only in the area of the door configuration and the thereto laterally adjoining areas of the gate element 1, on the outside the connection between the terminal element 3 and the intermediate element 5 is embodied without the insert element 4. This is possible without any issues, because the intermediate element 5 contains the supporting leg 21, which rests on the upper ends of the terminal legs 25 in the area, in which the intermediate element 5 is provided. In this case, the intermediate element 5, joining the straight plane configuration of the supporting leg 21, has end-sided lateral legs 19 and 22. Said lateral legs 19, 22 so to say partially overlap the terminal element 3 and thus form a form closure among each other. The lateral leg 19 may be disposed on the outside of the gate leaf and ends in an inside provided locating leg 8. For increasing the stability, a rounding, which then merges into the locating leg 8, may start at the lateral leg 22. However, before the lateral leg 22 merges into the locating leg 8, a configuration of a recess 20 may be provided. Said recess 20 increases the moment of resistance of the intermediate element 5, and also serves as the connection and reliable mobility of the gate leaf to a connecting element 29. Preferably, the locating leg 8 is attached by force closure on the inside of the gate element

1.

The intermediate element 5 with the recess 20 is also employed for an easier and more reliable placing of the connecting elements 29 on the lateral ends of the gate leaf, according to Figure 7. In this case, the connecting element 29 includes an attachment leg 26 and therefore an angulation 27, which is seated in front of the terminal part 18. The attachment leg 26 is attached to the gate element 1 via boreholes 26. Simultaneously for the mobility of the gate leaf, the connecting element 29 offers the possibility for disposing running rollers 38, which are guided in lateral rails. For example for being able to lift the gate leaf by means of a drive, lateral pins 30 with boreholes 31 are provided, in which lateral lifting ropes may be attached. With the intention to increase the safety, in addition to the attachment of the connecting element 29 to the gate element 1, a further attachment is provided, preferably configured as a form closure, namely via a catch 28, which engages into the horizontally extending configuration of the recess 20. Thereby, the load on the connecting screws is reduced, because the catch 28 always ensures a reliable connection between the connecting elements 29 and the gate element 1. Furthermore, said additional connection contributes to the safety of the entire gate structure during a change of location by lifting ropes.

Essentially, from Figures 5 and 6 the configuration of the border areas of the door element 14 may be obtained. In

order to be able to offer the door element 14 both as a left-handed and as a right-handed embodiment, door bearings 23 are provided to be exchangeable at the terminal parts 18.

In the detailed view of Figure 8, a gate, and at one of the lower corners thereof, the utilization and insertion of the connecting element 29 have been illustrated once more. However, in this view the insert element 4 within the terminal element 3 is omitted. A bearing 32 for the embodiment of an arrangement of a running roller is illustrated on the attachment leg 26. In this case, the bearing 32 has a borehole 33 for an axis 37 of the running roller 38. Furthermore, from this view, also the cooperation of the recess 20 with the catch 28 in the intermediate element 5 may be obtained once more. In this case, the bearing 32 is mounted to the attachment leg 26 to be adjustable via threaded bolts 35. Oblong holes 34 are provided for the adjustability. The adjustability guarantees that a precise and frictionless change of position of the running roller 38 is possible.

A running roller 38 with the axis 37 inserted into the bearing 32 may be obtained from Figure 9. In this case, the axis 37 is freely movable within the bearing in translational direction allowing for compensating mounting tolerances for example of the lateral rails.

In an individual illustration in a perspective embodiment, in Figure 10, the connecting element 29 is represented. Said

illustration very clearly shows the angulation 27 with regard to the attachment leg 26. Likewise visible in the lower area of the attachment leg 26 is the catch 28, which is oriented to the inside, i. e. towards the gate leaf, and which engages
5 into the recess 20. The pin 30 for the attachment of a non-illustrated actuating rope, in case it is inserted for the change of location of the gate leaf, is illustrated in the angulation 27. Obviously, also another change of the gate leaf from the closed location into an opened location and vice versa is
10 possible, for example by the use of a driving drive or a so-called ceiling hauler or the like.

The door element 14 is incorporated into the gate element 1 via a terminal element 16 in conjunction with a hinge element 39 (see Figure 11). In this case, the configuration of the
15 hinge element is such that no additional structural parts are required than the profiles necessary for the connection. A concealed hinge embodiment is illustrated for the hinge formation. Terminal legs 40, which come into contact on the surface of the door element 14 and of the gate element 1,
20 form the exterior termination. Said configuration creates a hinge formation without any protruding parts, which are moved to the inside of the space. In addition to mounting time such an embodied hinge also economizes mounting cost when compared to otherwise employed movable
25 components. In Figure 12, the configuration of the terminal element 16 at the gate element 1 is illustrated once more without the presence of the door element 14. In this case, it

becomes obvious, that a part, namely a partial hinge 43, is located at the terminal element 16 and extends over the entire height of the door element 14. Thereby a simple and clamp-free embodiment of the door element 14 is possible in an opened location, which altogether also serves for the barrier-free configuration of the terminal element 3. In the area of the partial hinge 43, the terminal element 3 has been placed onto the door bearing 23. For securing the partial hinge 43, a circular arc element 44 is located on the door bearing 23, in order to guarantee the reliable footing of the partial hinge.

Figure 13 illustrates the opposite part of the door element 14 in the closed position. In this case, a door profile 41 forms the lateral termination at the door element 14. On the one hand, the door profile 41 is provided with the terminal leg 40 at the upper surface of the door element 14 and, on the other hand, equipped with a projecting terminal leg 42. In this case, said door profile 41 cooperates with the stationary terminal element 16, which is attached to the gate element 1, and likewise has a terminal leg 42, which rests on the surface of the gate element 1. While no seals have been illustrated in the sectional illustration, however, those may be inserted into provided sealing receptions 45.

List of references numerals

	1	door element
	2	floor seal
	3	terminal element
5	4	insert element
	5	intermediate element
	6	screw connections
	7	sealing reception
	8	locating leg
10	9	leg
	10	base
	11	incisions
	12	supporting leg
	13	projection
15	14	door element
	15	door frame parts
	16	terminal elements
	17	closure element
	18	terminal part
20	19	lateral leg
	20	recess
	21	supporting leg
	22	lateral leg
	23	door bearing
25	24	depression
	25	terminal leg
	26	attachment leg

	27	angulation
	28	catch
	29	connecting element
	30	pin
5	31	borehole
	32	bearing
	33	borehole
	34	oblong holes
	35	threaded bolts
10	36	borehole
	37	axis
	38	running roller
	39	hinge element
	40	terminal leg
15	41	door profile
	42	terminal leg
	43	partial door hinge
	44	circular arc element
	45	sealing reception

P A T E N T K R A V

1. Port med et i et portblad integreret dørelement (14), hvor portbladet og dørelementet (14) er opbygget af enkelte, indbyrdes drejeledsforbundne portelementer (1) og styres stedsforanderligt i laterale skinner, hvor det nedre portelement (1) på gulvsiden via et mellemliggende element (5) er forbundet med et afslutningselement (3), som strækker sig over hele portbladbredden, **kendetegnet ved, at** afslutningselementet (3) mindst gående ud over portelementets (14) bredde yderligere er forsynet med et indsatsselement (4), som helt eller delvis omgives af afslutningselementet (3), hvor indsatsselementet (4) er udformet som hulprofil eller som U-profil, og at afslutningselementets (3) bredde er større end portelementets (1) tykkelse og kan rage ud på en side eller begge sider af portelementet (1), hvor udragningen i forhold til et mellemliggende element (5) overdækkes af sideben (19, 22).

2. Port ifølge krav 1, **kendetegnet ved, at** afslutningselementet (3) omfatter et øvre støtteben (12) og indsnit (11), mellem hvilke støttebenet (12) er udformet, hvor indsnittene (11) på ydersiden afgrænses af afslutningsben (25), og at der på undersiden af afslutningselementet (3) er udformet en langsgående orienteret tætningsoptageelement (7) til at optage en tætning (2).

3. Port ifølge kravene 1 og 2, **kendetegnet ved, at** ben (9) i U-profilet dykker ned i indsnittene (11) således, at en base (10) af U-profilet hviler på støttebenet (12), idet afslutningselementet (3) og indsatsselementet (4) er forbundet med hinanden.

4. Port ifølge krav 1, **kendetegnet ved, at** det mellemliggende element (5) er udformet lateralt uden for dørelementbredden, og derved opstår der en overdækning af afslutningselementet (3) og områdevis med indsatsselementet (4).

5. Port ifølge kravene 1 og 4, **kendetegnet ved, at** det mellemliggende element (5) omfatter et anlægsben (8), som er forbundet med det nedre portelement (1).
- 5 6. Port ifølge kravene 1 og 5, **kendetegnet ved, at** sidebenet (22) går over i anlægsbenet (8), idet der foran overgangen er udformet en reces (20) i anlægsbenet (8).
- 10 7. Port ifølge kravene 1 og 6, **kendetegnet ved, at** det nedre portelement (1) i hvert enkelt tilfælde på endesiden er forsynet med forbindelseselementer (29), som har en vinkelformet udførelse med et fastgørelsesben (26) og en afvinkling (27), hvor den nedre ende af fastgørelsesbenet (26) omfatter en medbringer (28), som i monteret tilstand på portelementet (1) griber ind i recessen (20).
- 15 8. Port ifølge et eller flere af de foregående krav, **kendetegnet ved, at** indsats-elementet (4) består af et materiale med højere styrke end afslutningselementet (3).
- 20 9. Afslutningselement (3) til direkte eller indirekte montage på undersiden af et portelement (1) i en port, hvis portblad er opbygget af enkelte, indbyrdes drejeledsforbundne elementer, hvori et dørelement (14) er integreret, idet portbladet er styret stedsforanderligt i laterale styreskiner, **kendetegnet ved, at** et indsats-element (4) helt eller delvis er forbundet med afslutningselementet (3), idet afslutningselementet (3) og indsatsselementet (4) består af forskellige materialer, hvor afslutningselementets (3) bredde er større end portelementets (1) tykkelse
- 25 og kan rage ud på en side eller begge sider af portelementet (1).
10. Afslutningselement ifølge krav 9, **kendetegnet ved, at** indsatsselementet (4) har en højere styrke end afslutningselementet (3).
- 30 11. Afslutningselement ifølge kravene 9 og 10, **kendetegnet ved, at** indsats-elementet (4) helt eller områdevist er omgivet af afslutningselementet (3).

12. Afslutningselement ifølge kravene 9 og 11, **kendetegnet ved, at** indsats-elementet (4) er udformet som U-profil med afvinklede ben (9).

13. Afslutningselement ifølge kravene 9 til 12, **kendetegnet ved, at** afslutnings-elementet (3) omfatter et støtteben (12) og indsnit (11), som på ydersiden afgræn-ses af afslutningsben (25), og at U-profilets ben (9) dykker ned i indsnittene (11) således, at en base (10) af U-profilet hviler på støttebenet (12), idet afslutnings-elementet (3) og indsats-elementet (4) er forbundet med hinanden uden for dør-elementbredden.

5

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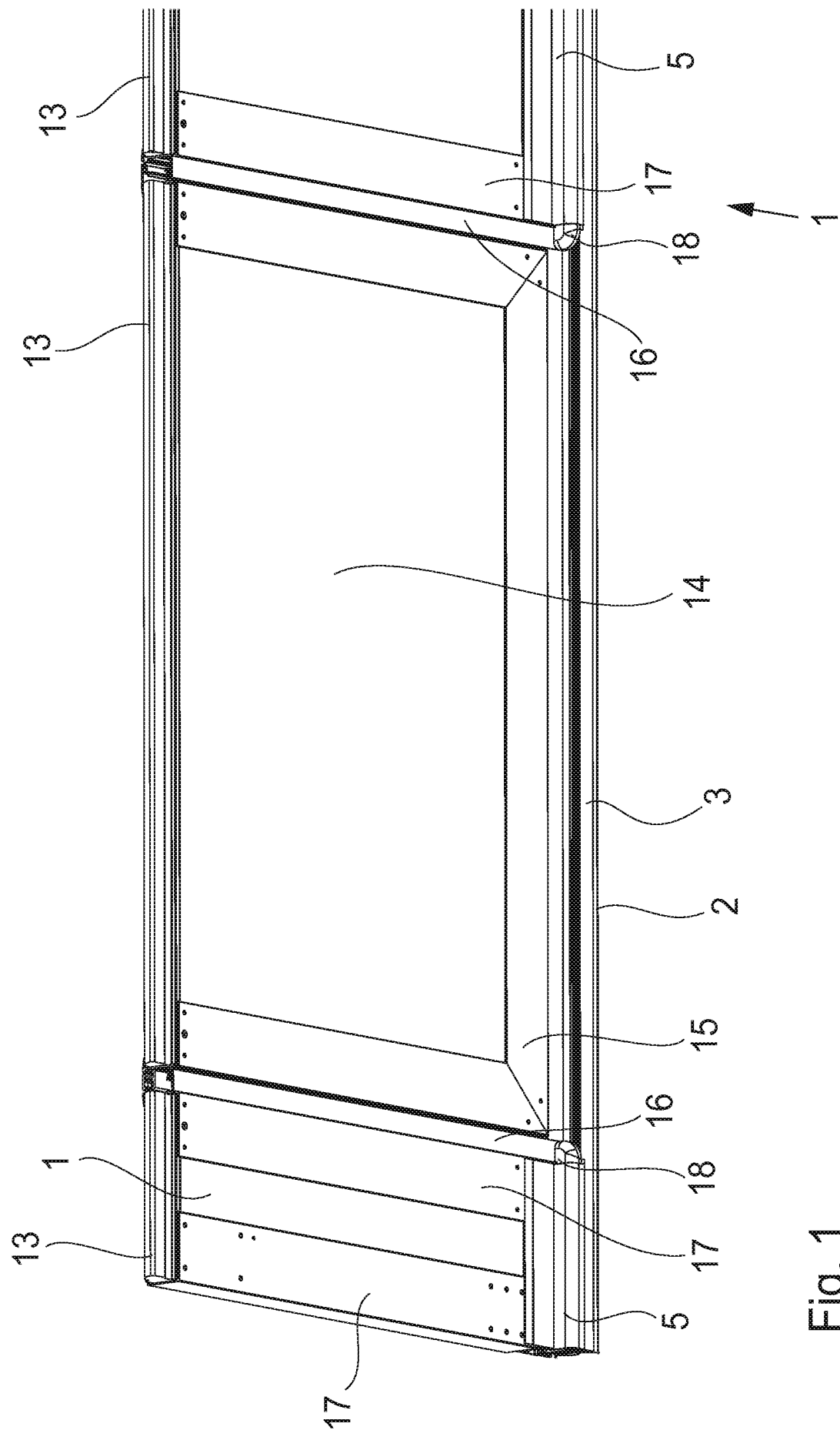


Fig. 1

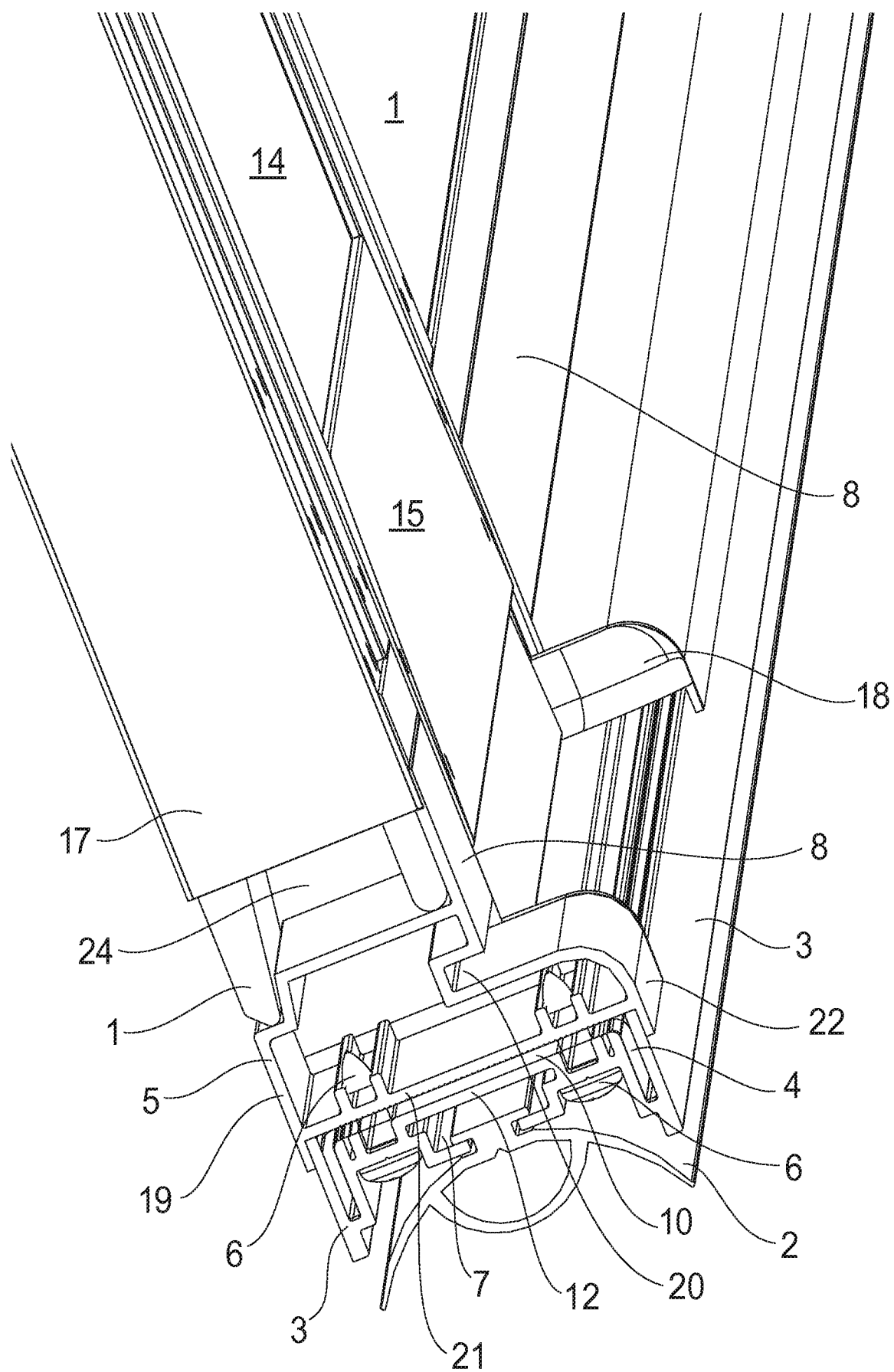


Fig. 2

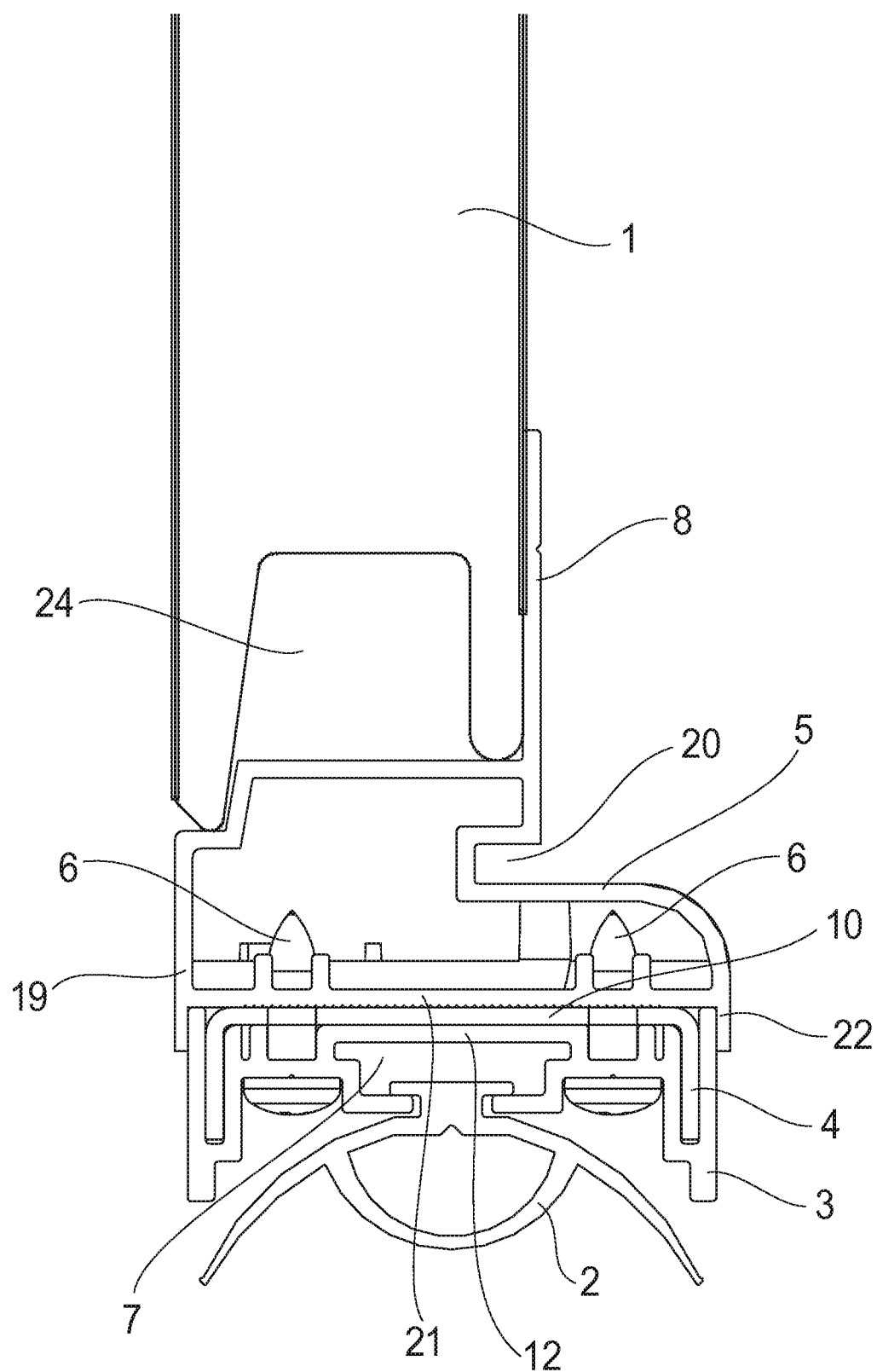


Fig. 3

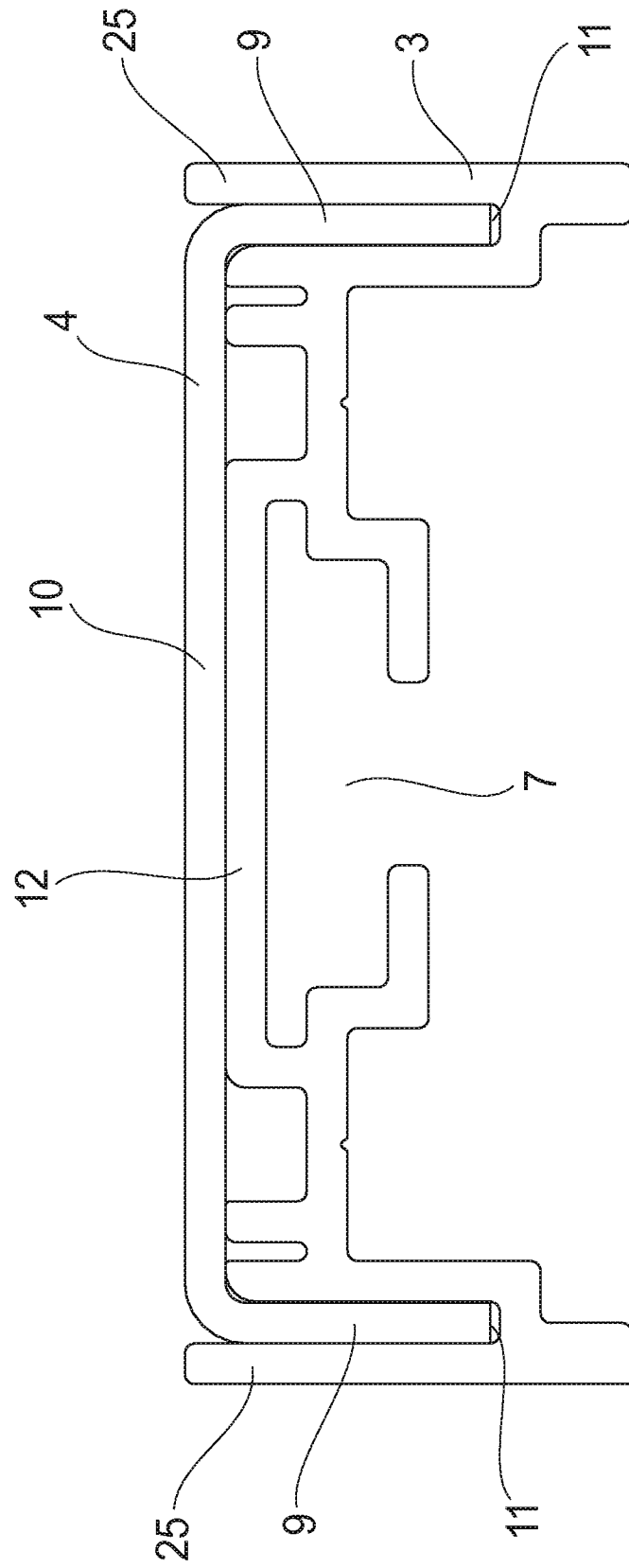


Fig. 4

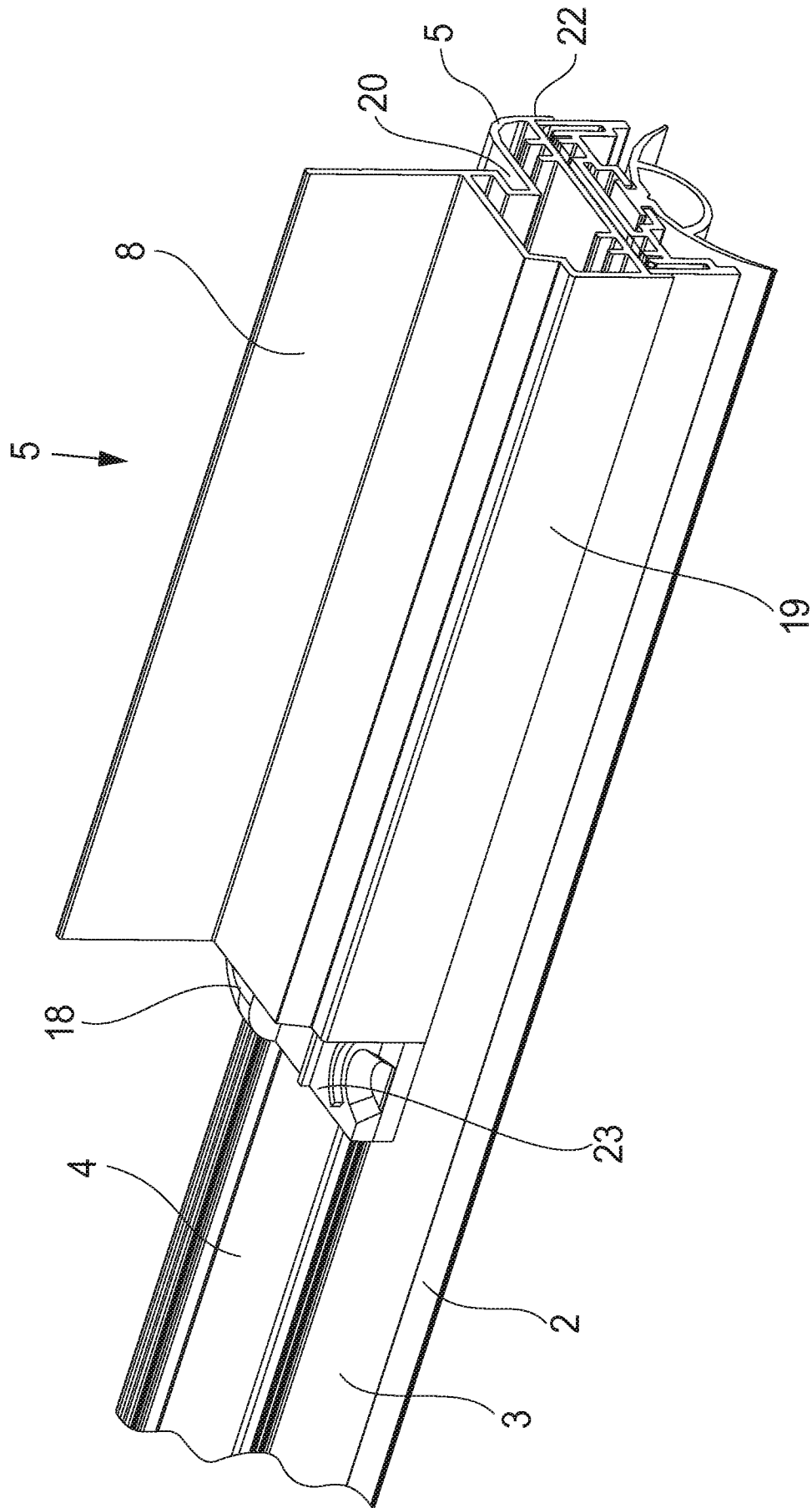


Fig. 5

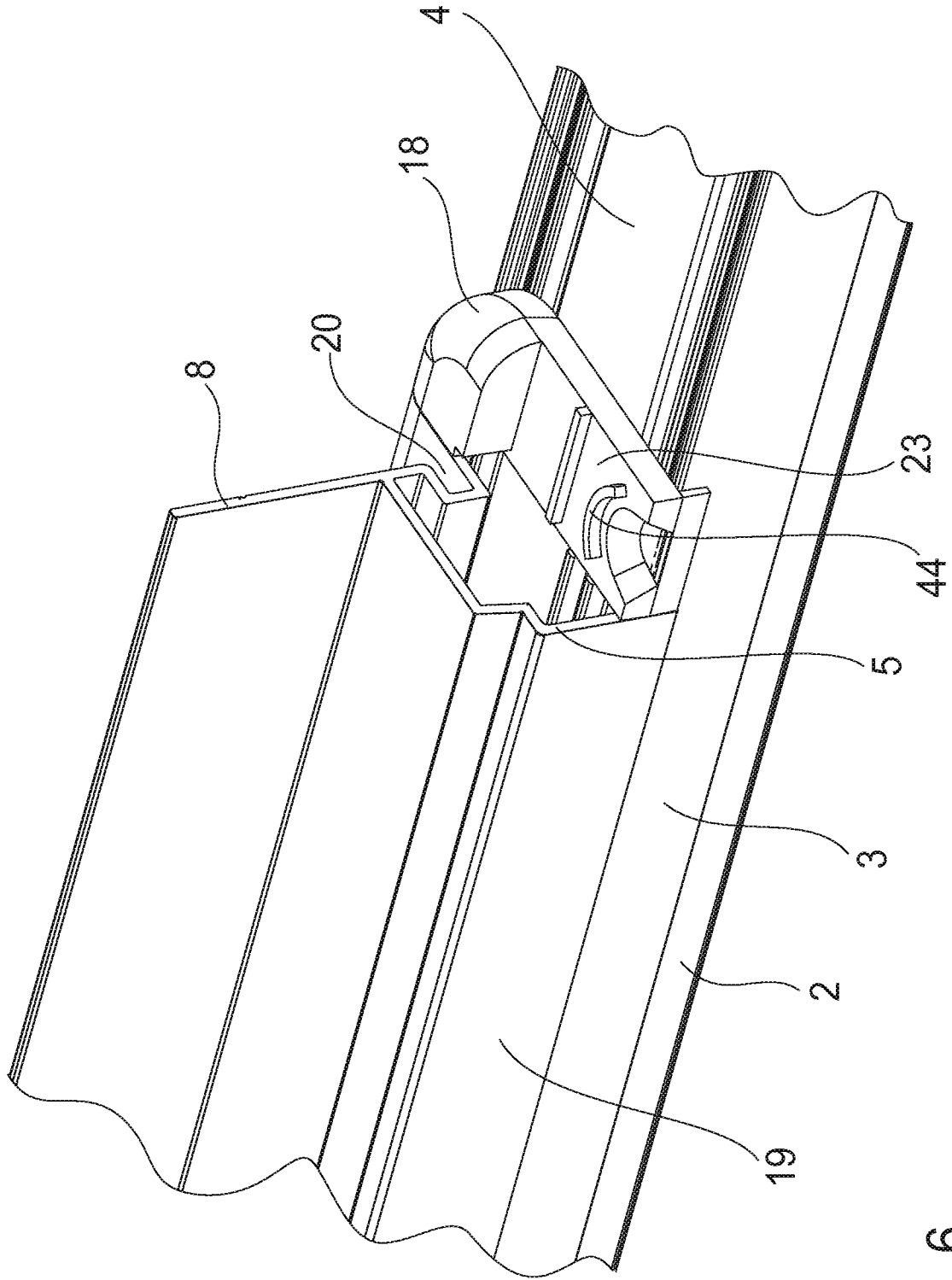
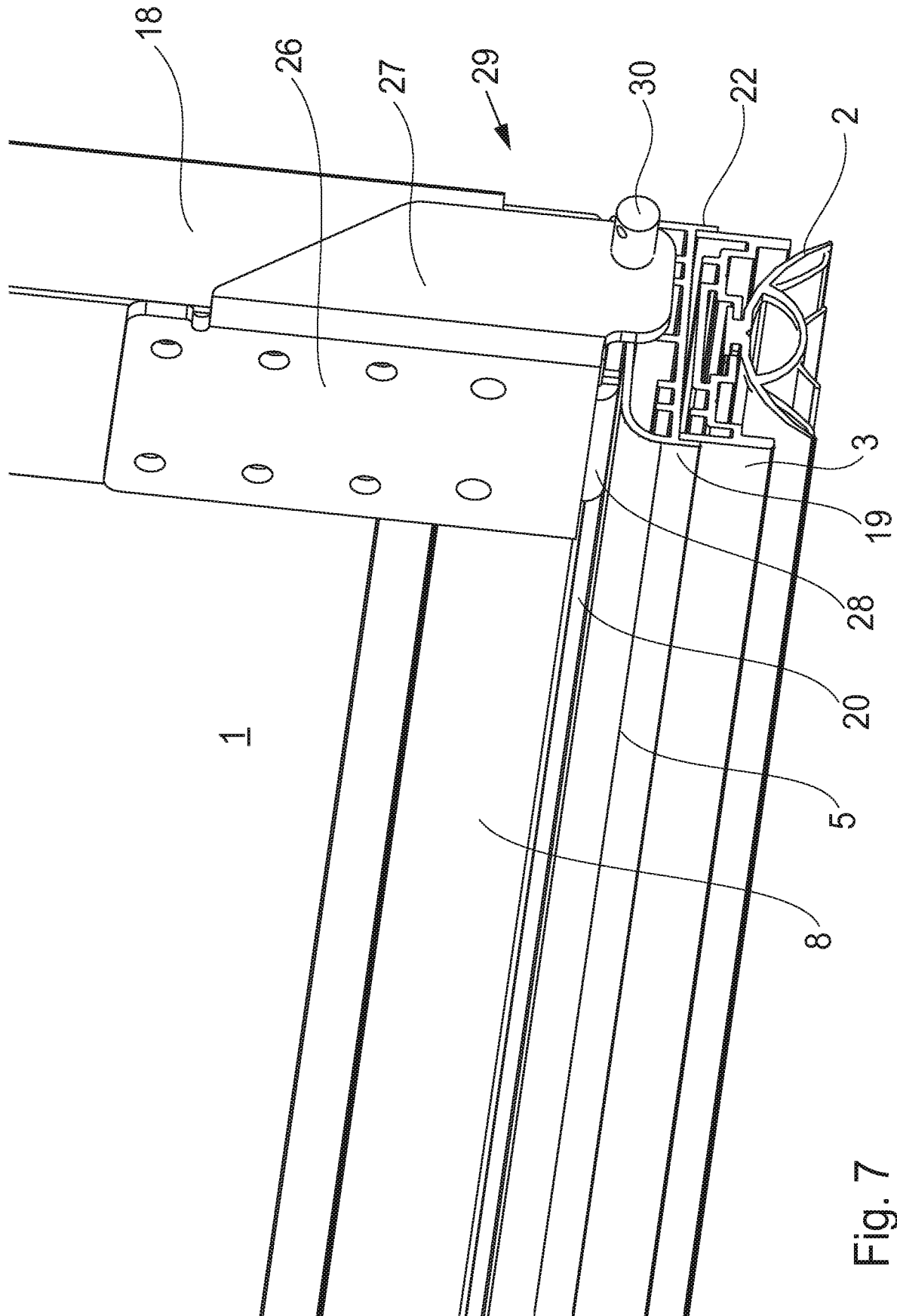
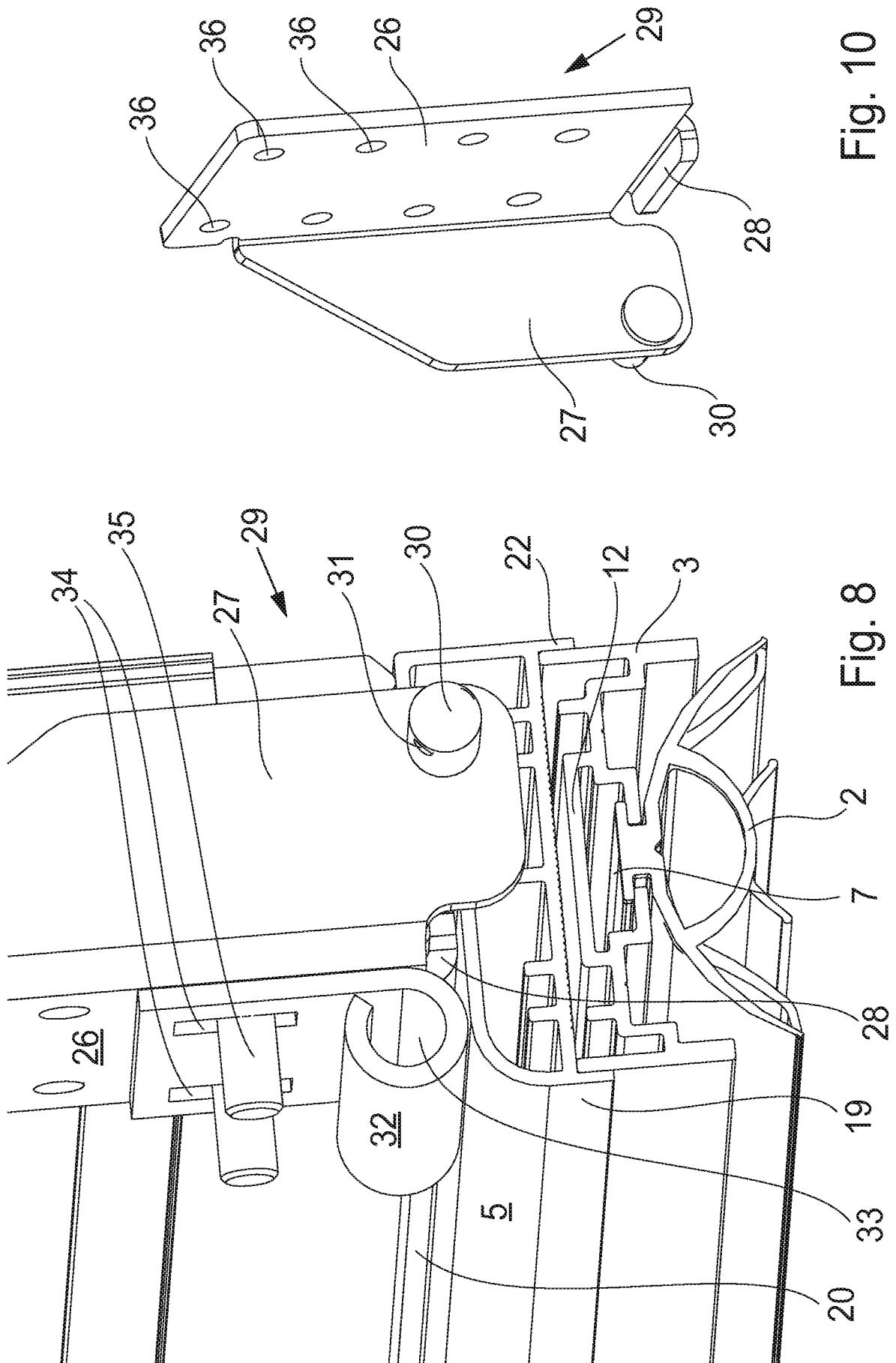
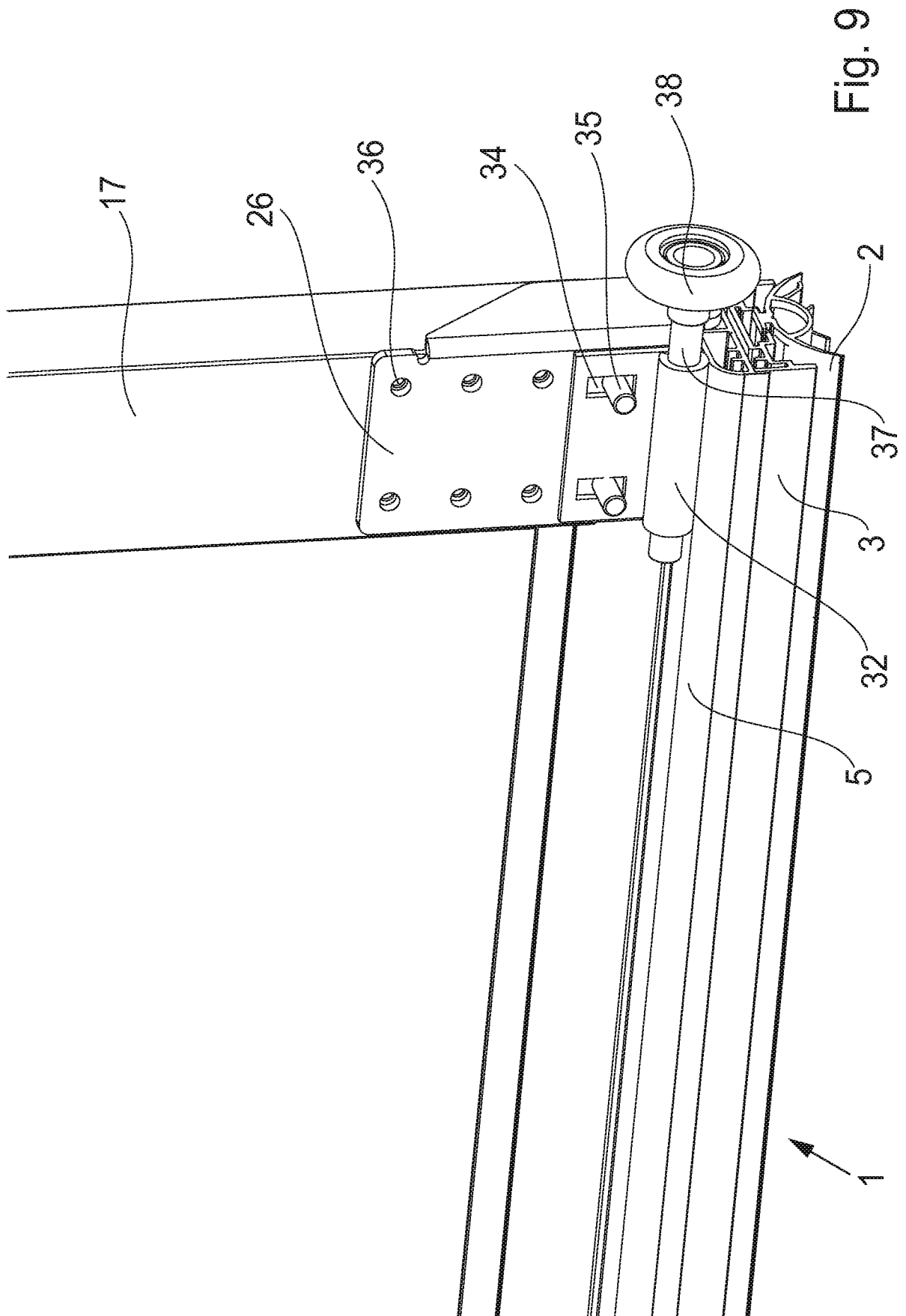
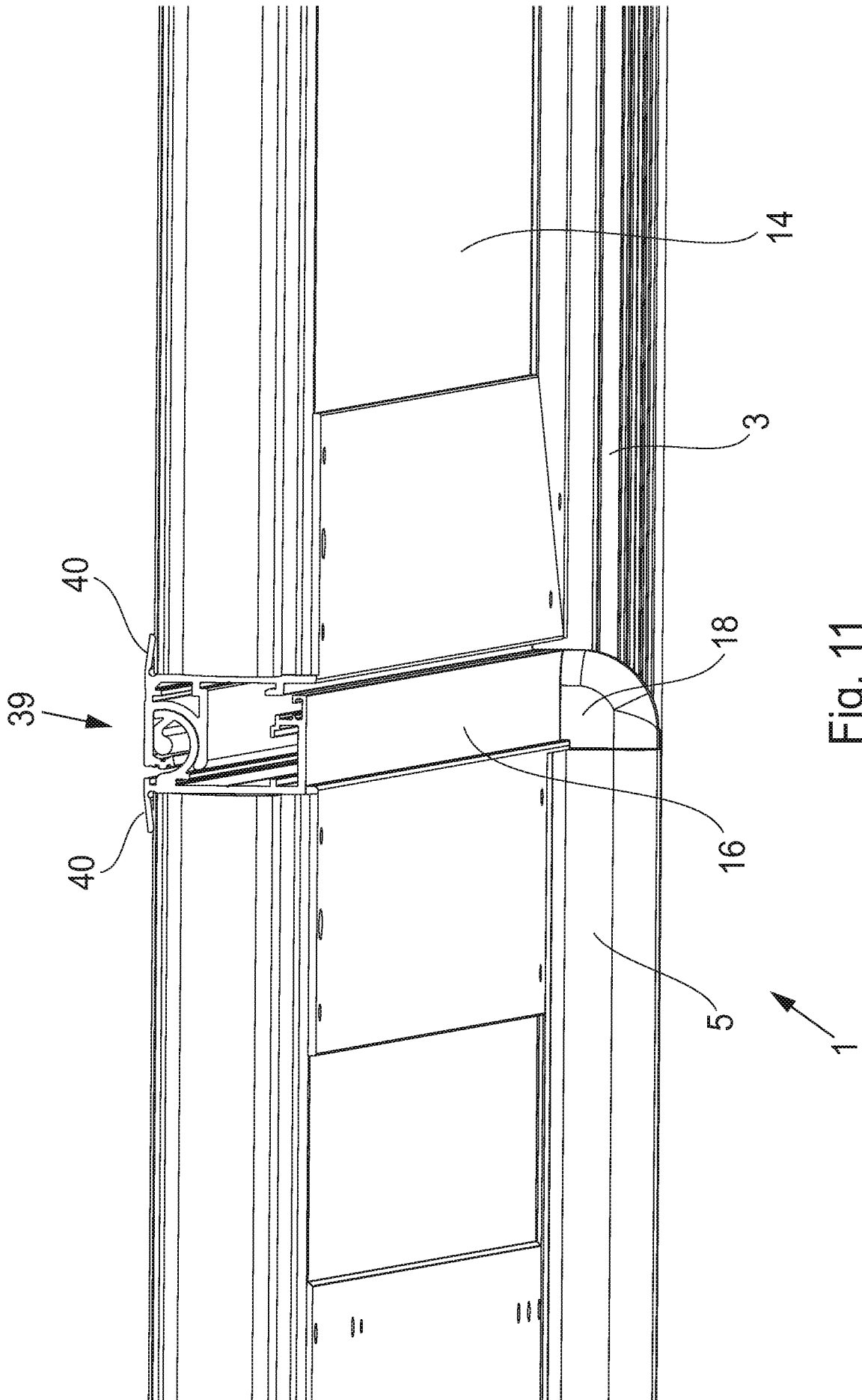


Fig. 6









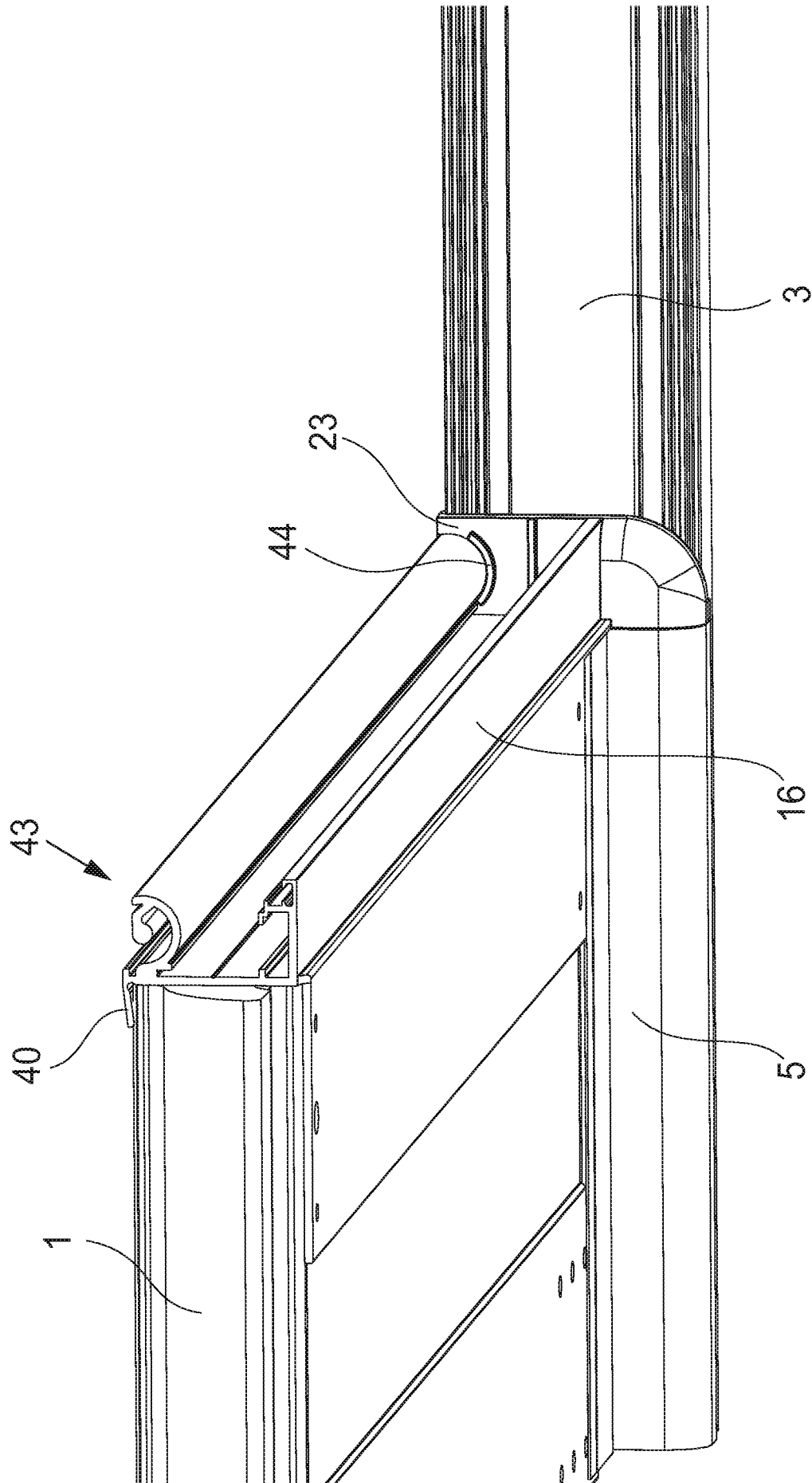


Fig. 12

