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EP-A2- 1 108 849
US-A- 2 302 661
US-A- 3 718 943

Sectional door

The invention relates to a sectional door having a door leaf with panels, which are connected to be movable with regard to each other about horizontal axes. In the same manner a wicket door, the panels thereof being aligned with those of the door leaf, is configured within the door leaf. Such a wicket door is embedded by means of lateral frame elements within the door leaf, and its position may be changed by means of hinges.

Sectional doors with incorporated wicket doors are well known, for example from the document DE 200 23 495 U1 as well as from the document DE 89 06 151 U1. With these doors, the rotational connection is located outside the panels and is configured by means of a connection in the type of a toothed wheel segment. However, as the hinge connection is supported, it is very prone to damages.

The document DE 20 2006 003 330 U1 discloses a sectional door with a vertically opening door leaf and an incorporated wicket door. In this case, the wicket door is affixed via hinges, which have been displaced into the inside of the panels of the door leaf and of the panel elements of the door leaf. Such an embodiment is very expensive, because corresponding pockets for the pivoting arms of the hinge configuration need to be machined laterally into the individual panels. Furthermore, the

multiple structural components make such a pivoting connection more expensive.

A hinge connection, which does not present any hinge pin, is disclosed in the document US 3 718 943. Such an embodiment of a hinge is located on the inside of two profiles connected to each other. Thus, such a connection may be referred to as a concealed hinge. A further concealed disposition of a hinge is disclosed in the document US 2 302 661, which however has the disadvantage of allowing for unhinging the mobile leaves in the opened condition.

The document EP 1 108 849 A2 discloses a sectional door having all characteristics of the generic part of claim 1.

Therefore, the object of the present invention is to configure a sectional door having a wicket door in such a manner that a sufficient clamping protection is to be guaranteed when actuating the door. Furthermore, protruding parts should not impair the appearance of the exterior sectional door leaf, which, moreover, could be also prone to damage. Furthermore, the embodiment of such a sectional door having a wicket door should be manufacturable a reduced cost and also reduce manufacturing time by reducing structural components. Also required is an increased burglary protection for the wicket door.

The problem of the invention is solved with the features of patent claim 1. In this context the dependent claims present another structural embodiment and various application options of the inventive idea.

This invention suggests to employ a hinge connection located on the inside, which is disposed in an interspace between the panels of the door leaf and the panels of the wicket door. Hereby, with the concealed disposition of the hinge connection, in addition to a clamping protection, it is simultaneously achieved that on the outside a flush termination is created, which does not present any protruding parts. Thereby, such a connection is made safer, protected against manipulation and burglary.

By utilizing two profiles, which form the lateral termination to the panels on each side and form an essentially closed or enclosed interspace, simultaneously also the hinge connection for the wicket door, which thereby becomes an integral part of the employed profiles, is created adjacent to a portion of the door jamb. Such an embodiment is cost effective, because, in addition to receiving the hinge connection, it also accommodates the attachment of the hinges for the panels among each other, and moreover, they can also be correspondingly simply attached to the lateral panels. No further structural parts will be required for the hinge connection, whereby mounting times are reduced.

Moreover, with the wicket door being closed, the essentially closed interspace, which also includes the hinge connection, offers even space for a cable duct or the like, which may be also used for sensors or alarm systems or the like. Simultaneously, the inner space is sealed to the outside by means of an inside located seal.

The inventive hinge connection omits employing additional structural components such that the inventive hinge connection is solely configured by means of the frame elements, such that additional structural components and attachment means - such as in particular hinge pins and individual hinge parts or the like - can be omitted. Likewise, by being incorporated within the frame elements, the hinge connection does not require any additional attachment, which in addition to manufacturing time also saves mounting time.

Such a hinge connection extends respectively across the entire height of the individual panels, which are required for creating a wicket door.

Further advantages, features and application possibilities 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 listed in the list of reference numerals will be employed throughout the description, the claims and the drawings. In the drawing:

Figure 1 shows a frontal view of a panel of a sectional door with a laterally connected wicket door;

Figure 2 shows a perspective illustration of a hingeing element for the connection of two lateral panels, one of them being configured to be mobile;

Figure 3 shows the same as Figure 2, however in a pivoted position;

Figure 4 shows a top view on a section of panels, which are disposed laterally with regard to each other, and which are interconnected in conjunction with a hinge connection by means of hingeing elements, in the closed position of the wicket door;

Figure 5 shows the same as Figure 4, however in a pivoted position of the wicket door;

Figure 6 shows an individual illustration of a cross-section of a hingeing element including parts of the hinge connection;

Figure 7 shows a second hingeing element cooperating with the first hingeing element according to Figure 3;

Figure 8 shows a further preferred embodiment of a connection with two hingeing elements.

In the following description of the preferred exemplary embodiments illustrating the entire sectional door has been omitted. Therefore, Figure 1 basically shows a section of a door panel 23 and of a wicket door panel 24 with the interposed hinge connection 1. It is understood that an entire door leaf of a sectional door is composed of several door panels 23, which are connected in a mobile manner to each other by means of corresponding articulations 25. The same applies to the wicket door panels 24.

The hinge connection 1 is non-positively and positively connected to both the door panels 23 and the wicket door panels 24 via mounting branches 5 and non-illustrated lateral screw connections. The connection to the following panel is ensured by means of articulations 25. Said articulations 25 may be mounted such as to be oriented to the outside and to the inside.

The hinge connection 1 with simultaneous configuration of hingeing elements 2, 3 as the connection to the panels 23, 24 is illustrated in a perspective illustration in Figure 2. In

this case, the articulations 25, which are employed for the connection to the next panel, are likewise visible. For the transition to the following, not illustrated, panel, in the area of the articulations 25, a bridging element 26 is provided.

Further details of the hinge connection 1 may be seen in particular in Figure 3. The articulations 25 are realized via hinge branches 29 in conjunction with bores 28 and not illustrated connecting elements. In this case, the articulation 25 has an axis 27, which is not visible with regard to the panel surface and has been displaced towards the panel inside. The articulations 25 are attached to the mounting branches 5 of the hinge connection 1, which are configured on both sides. The illustration of Figure 3 basically represents the non-illustrated wicket door in an opened position, such that a sealing element 7 is visible, which rests on a side wall, wherein furthermore, a closing branch 9 forms the exterior termination to an interspace 11.

Figure 4 reveals, in a sectional illustration, the configuration of the hinge connection 1 including the connections to the door panel 23 and the wicket door panel 24. On account of the hingeing elements 2 and 3, which, with their distancing branches 6, are configured to be spaced apart from the lateral panel surfaces, and the panels 23 and 24 simultaneously terminating on their entire height laterally respectively such that between the distancing branches 6

in particular the interspace 11 is created, any protruding parts are omitted, and, simultaneously, space is created. On the one hand, said interspace 11 accommodates the hinge connection 1, and, furthermore, a functional space 16 and optionally a potential separating wall 8. The exterior termination is formed by the closing branch 9, into which the sealing element 7 has been introduced, which rests against the surface of the distancing branch 6. Corresponding cables, respectively sensors or alarm equipment or the like may be installed within the functional space 16.

Figure 4 likewise reveals that only the mounting branches 5 and the termination branches 4, spaced apart by means of the distancing branches 6, are visible at the surfaces of the panels 23 and 24. It is thereby illustrated that in particular the function of the hinge connection 1 has been displaced into the inside of the interspace 11. In Figure 5, likewise in a sectional illustration, the pivoting of the wicket door panels 24 with regard to the door panels 23 can be likewise seen. Hereby, it is shown that in particular, by configuring the hinge connection 1, the terminal branch 4 of the wicket door panel 24 does not get into contact with the terminal branch 4 of the door panel 23.

On account of the problem to be solved, when configuring the hinge connection 1, it has been omitted to separately mount movable parts, respectively individual parts for a

hinge connection 1. Therefore, the hinge connection 1 including the hingeing elements 2 and 3 only consists of two parts. In the following, said two parts will be explained specifically.

In Figure 6, the hingeing element 3 is illustrated in a cross-sectional illustration. On the one hand, the mounting branch 5 is located at the end of the distancing branch 6 and, at the other end, the terminal branch 4. The terminal branch 4 forms the exterior termination, which in the sectional door, is visible from the outside in the closed condition. As can be seen in Figure 6, there are no structural components in any form protruding neither to the outside nor to the inside.

In continuation of the mounting branch 5, essentially the terminal branch 4 is configured, which, at its end, has an undercut 15 for the seal 7, which is not visible in this case. Furthermore, the functional space 16 is configured at the closing branch 9. The closing branch 9 forms the termination of the interspace 11 towards the inner building, in which passage the sectional door is installed. Basically at the end of the distancing branch 6, on the opposite side of the closing branch 9, is located one part of the hinge connection 1. Specifically, it is a guiding branch 18, which is configured following a segment of a circle, and which has an abutment 19 at its free end. Within the guiding branch 18 is provided a distancing branch 22, at the end thereof, a

projection being provided, which is likewise formed as a segment of a circle at its circumference. In the vicinity of the distancing branch 6 is located another abutment 20 for the counter part of the hinge connection 1, which is illustrated as a second hingeing element 2 in Figure 7. The hingeing element 2, which, like the hingeing element 3, extends across the entire height of the individual panels, is configured analogously in the area of the distancing branch 6, likewise with the mounting branch 5 and the terminal branch 4. Starting at the distancing branch 6, optionally a separating wall 8 may be conformed, which subdivides the interspace 11, for example for introducing insulation material or the like.

On the opposite side of the terminal branch 4, the second part of the hinge connection 1 of Figure 7 is revealed in detail. In this case, a guiding wall 10 is likewise configured to have the form of a segment of a circle such that the latter cooperates with the guiding branch 18 and has a complementary embodiment of the segment of a circle to the exterior configuration of the guiding branch 18. The end of the segment of a circle, forms an abutment 30, which may cooperate with the abutment 20 of the frame element 3.

In continuation of the terminal branch 4, another terminal branch 31 is provided, which forms the exterior termination towards the interspace 11. Between the terminal branch 31

and the guidance 10, a guiding space 14 is formed, in which the guiding branch 18 plunges with a projection 17. In the opening position of the wicket door, the terminal branch 31 cannot reach any contact with the terminal branch 4, such as to avoid any damage of the surface. In this case, the projection 17, which has the form of a segment of a circle, is supported in an indentation 12. By supporting the projection 17 in conjunction with the indentation 12, as well as the guiding branch 18 with the guiding wall 10, a hinge connection 1 has been created, which is ready to be employed without any additional structural components. In the closed position according to Figure 4, it can be seen that the abutment 19 reached abutment against the terminal branch 31, once the wicket door is located in the closed position. Furthermore, in the area of the indentation 12, on the opposite side according to Figure 7, an undercut 13 is illustrated, into which a seal, respectively an element for permanent lubrication or the like of the hinge connection may be inserted. An abutment 21 forms the exterior upper termination, which is relevant once the wicket door is in its opened position, which, depending on the embodiment of the hinge connection 1, may likewise extend beyond 90°.

In a further preferred exemplary embodiment according to Figure 8, the area within the hinge connection 1 has been modified with a terminal element 32 between the profile sections of the abutment profiles shaped in a segment of a

circle. In this case, on the one hand, the terminal element 32, which preferably is configured from a suitable plastic material, which is for example abrasion-resistant, is inserted between the projection 17 and the indentation 12 and the portion of the guiding branch 18, which is not in engagement. Thereby, a play-free connection is created between the hingeing elements 2, 3, which simultaneously provides a noise reducing effect when the wicket door is operated. Such a terminal element 32 is exchangeable and preferably extends only at the ends of the hinge connection 1.

The hinge connection 1 in combination with the hingeing elements 2, 3 allows for realizing a simple and permanently effective hinge connection 1, which is realized without any additional add-on parts. Thereby, in particular manufacturing and mounting cost are reduced. Moreover, a sealing element for thermal insulation may be inserted within the interspace 11.

Such hingeing elements 2 and 3 may be inexpensively manufactured as extruded profiles, preferable from light metal. On account of utilizing the hingeing elements 2 and 3, it is possible to realize an embodiment of the wicket door for a DIN-left or DIN-right handed door without any further modifications of the panels 23 and 24. This circumstance results in considerable savings in manufacturing and stock keeping. Simultaneously, it is possible to incorporate also a

lock and a handle or the like into the mounting branch 5 of the panels 23.

List of reference numerals

1	hinge connection
2	hingeing element
3	hingeing element
4	terminal branch
5	mounting branch
6	distancing branch
7	sealing element
8	partitioning wall
9	closing branch
10	guiding wall
11	interspace
12	indentation
13	undercut
14	guiding space
15	undercut
16	functional space
17	projection
18	guiding branch
19	abutment
20	abutment
21	abutment
22	distancing branch
23	door panels
24	wicket door panels
25	articulation
26	bridging element

27 axis

28 boreholes

29 hinge branch

30 abutment

31 terminal branch

32 terminal element

33 branch

34 branch

PATENTKRAV

1. Sektionsport med et vertikalt foranderligt portblad af om horisontale akser indbyrdes bevægeligt forbundne enkeltpaneler (23), som udviser en integreret gangdør, og at gangdøren ved hjælp af skjulte hængsler kan ændres i sin relative position i forhold til de lukkede paneler (23, 24), hvor der på anslagssiden af gangdøren ved hjælp af anslagselementer (2, 3) findes en skjult hængselforbindelse (1) til gangdøren, hvor anslagselementet (3) udviser et afstandsben (6), i det væsentlige i panelernes (23, 24) tykkelse, der på sin mod inderrummet af bygningen eller lignende pegende ende udviser et lukkeben (9) og mod området på ydersiden som en del af hængselforbindelsen (1) et styreben (18) med et distanceret, delecirkelformet fremspring (17), hvor der med anslagselementet (2) på samme måde er udformet en yderligere del af hængselforbindelsen (1) i den henseende, hvor anslagselementet (2) på samme måde indbefatter et afstandsben (6) til panelerne (23, 24), hvorpå der på dets ende på ydersiden findes et afslutningsben (31) som en yderligere del af hængselforbindelsen (1), der udviser en cirkelbueformet styrevæg (10), der sammen med styrebenet (18) inde i et styrerum (14) overtager en hængselfunktion, **kendetegnet ved, at** hængselforbindelsen til gangdøren, der på anslagssiden af gangdøren er skjult af anslagselementer, er udformet i området af paneltykkelsen og strækker sig i hvert enkelt tilfælde over de enkelte panelers (23, 24) højdeudstrækning, og at der inde i hængselforbindelsen (1) findes et tætnende og/eller støjreducerende element (32), og at området af hængselforbindelsen (1) på indersiden af gangdøren er lukket af et lukkeben (9).

2. Sektionsport ifølge krav 1, **kendetegnet ved, at** hængselforbindelsen (1) er en integreret bestanddel af anslagselementerne (2, 3), der er en del af en ramme og en del af en karm eller lignende til gangdøren.

3. Sektionsport ifølge krav 1 eller 2, **kendetegnet ved, at** hængselforbindelsen er udformet klemfri.

4. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** der mellem hængselforbindelsen (1) og lukkebenet (9) findes mindst et mellemrum (11) eller funktionsrum (16).

5. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** styrebenet (18) på sin frie ende udviser et anslag (19) til gangdørens lukkestilling.

6. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** der over for styrevæggen (10) og det dermed samvirkende styreben (18) findes en bevægelig forbindelse af et fremspring (17) og en dermed samvirkende indskæring (12), der understøtter hængselfunktionen.

7. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** indskæringen (12) er anbragt inde i afslutningsbenet (31).

8. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** fremspringet (17) via et afstandsben (22) eller lignende er anbragt uden for den konkave overflade af styrebenet (18).

9. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** der i lukkebenet (9) udskifteligt findes et tætningselement (7).

10. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** anslagselementerne (2, 3) er udformet som strengpresseprofiler, fortrinsvis af letmetal.

11. Sektionsport ifølge et af de foregående krav, **kendetegnet ved, at** hængselforbindelsen (1) kan udføres i DIN-venstre eller DIN-højreudformning med de samme anslagselementer (2, 3).

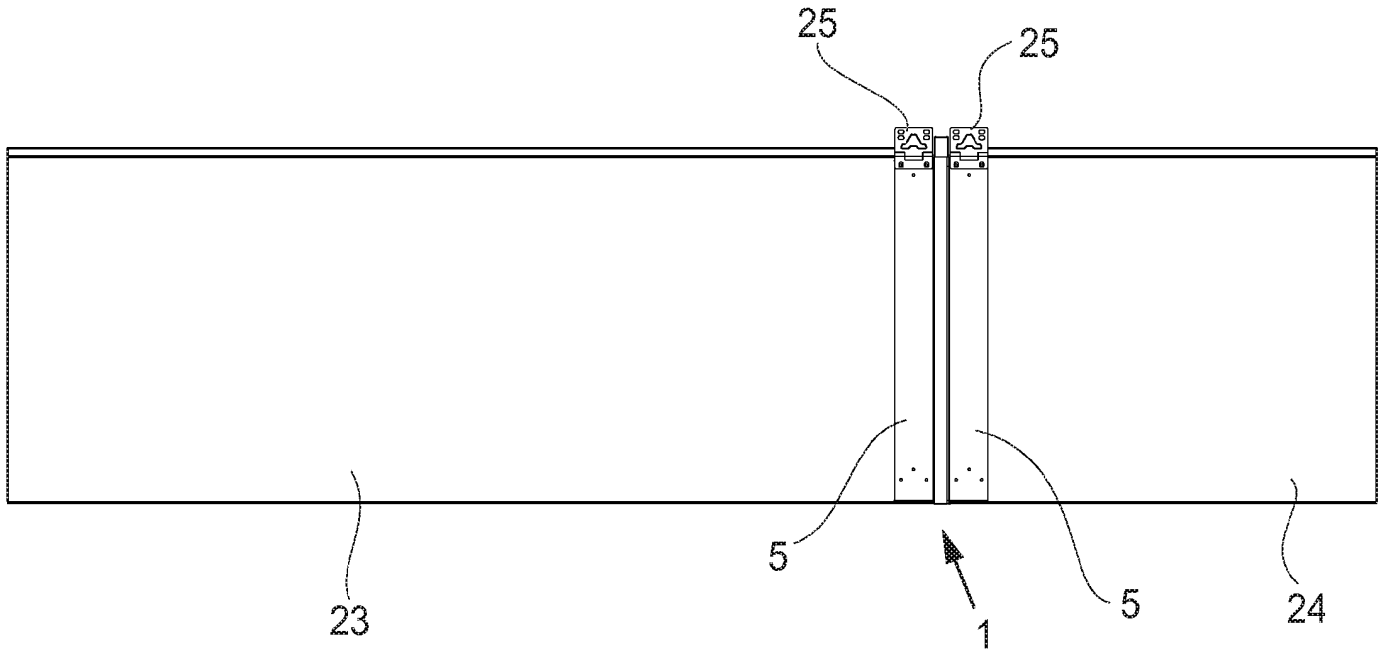

Fig. 1

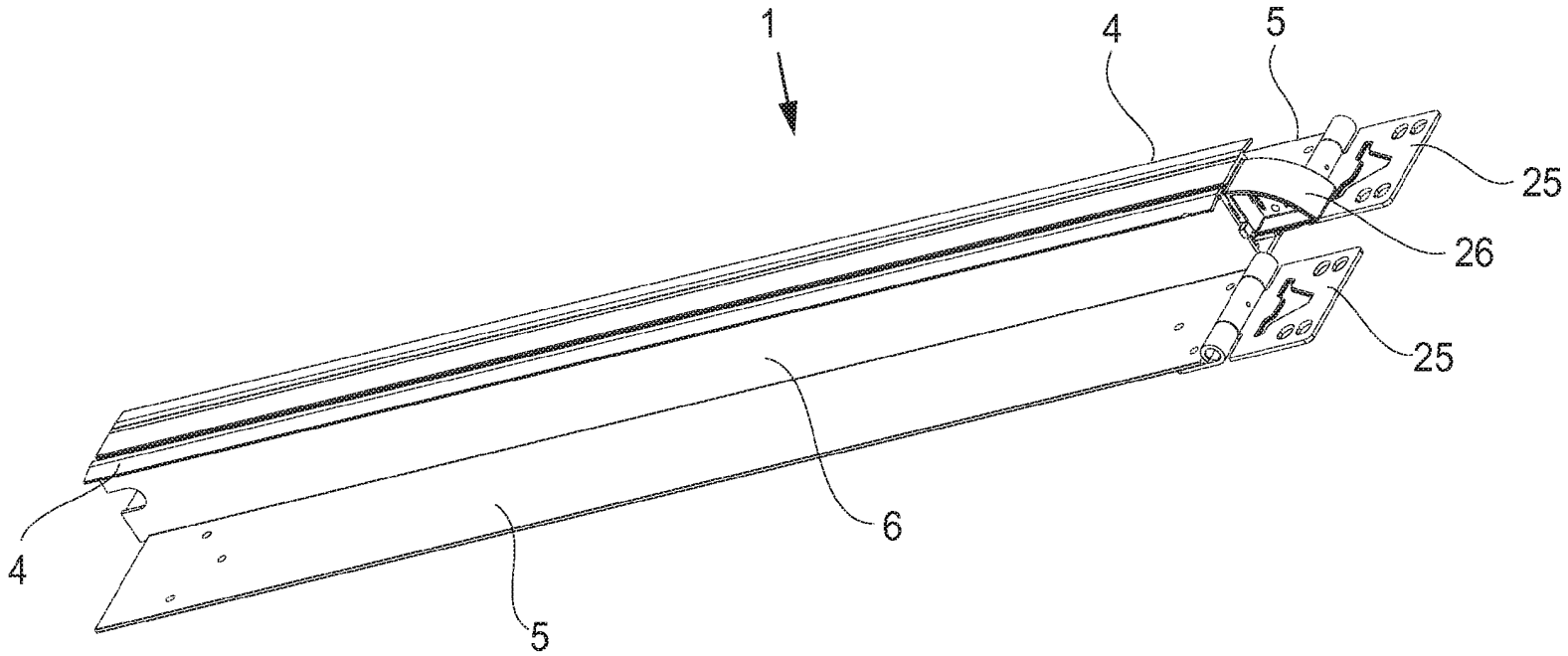

Fig. 2

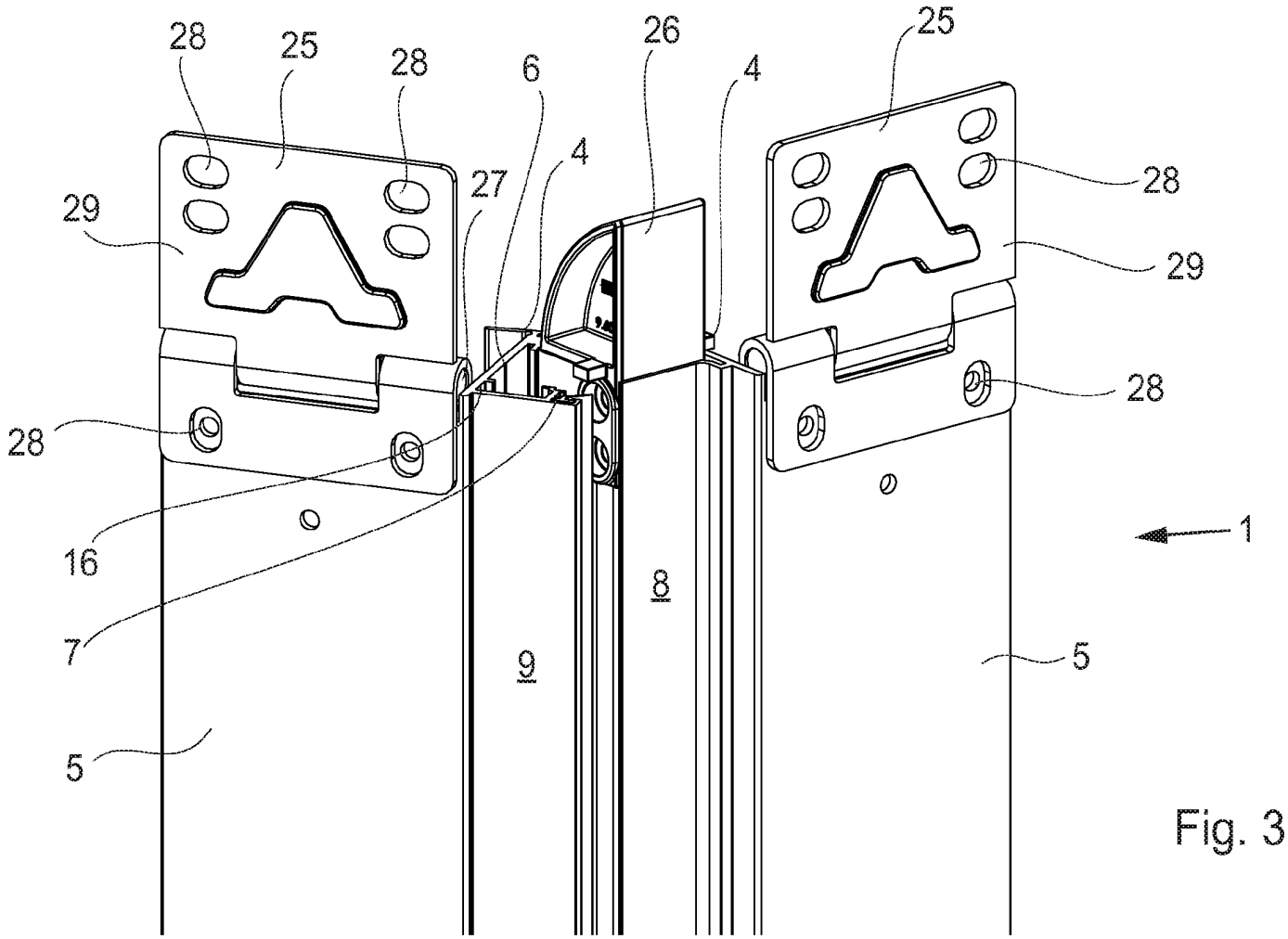

Fig. 3

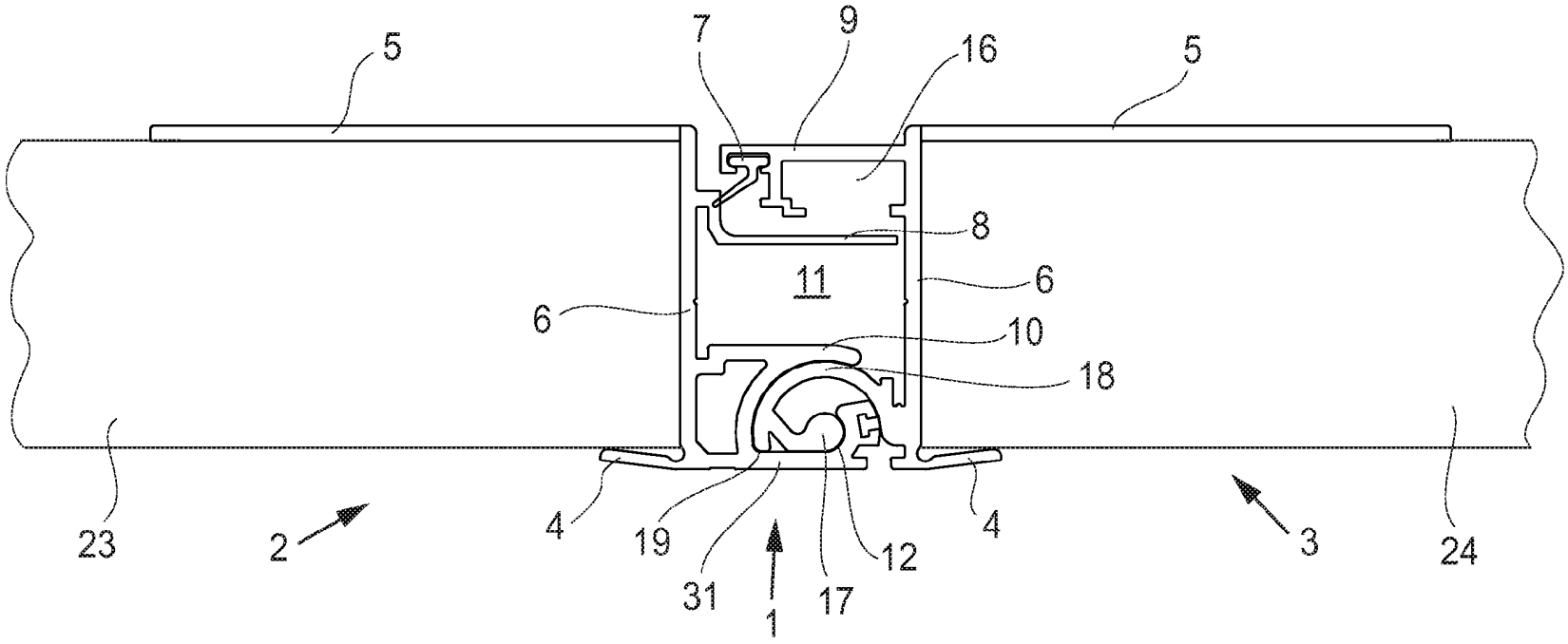

Fig. 4

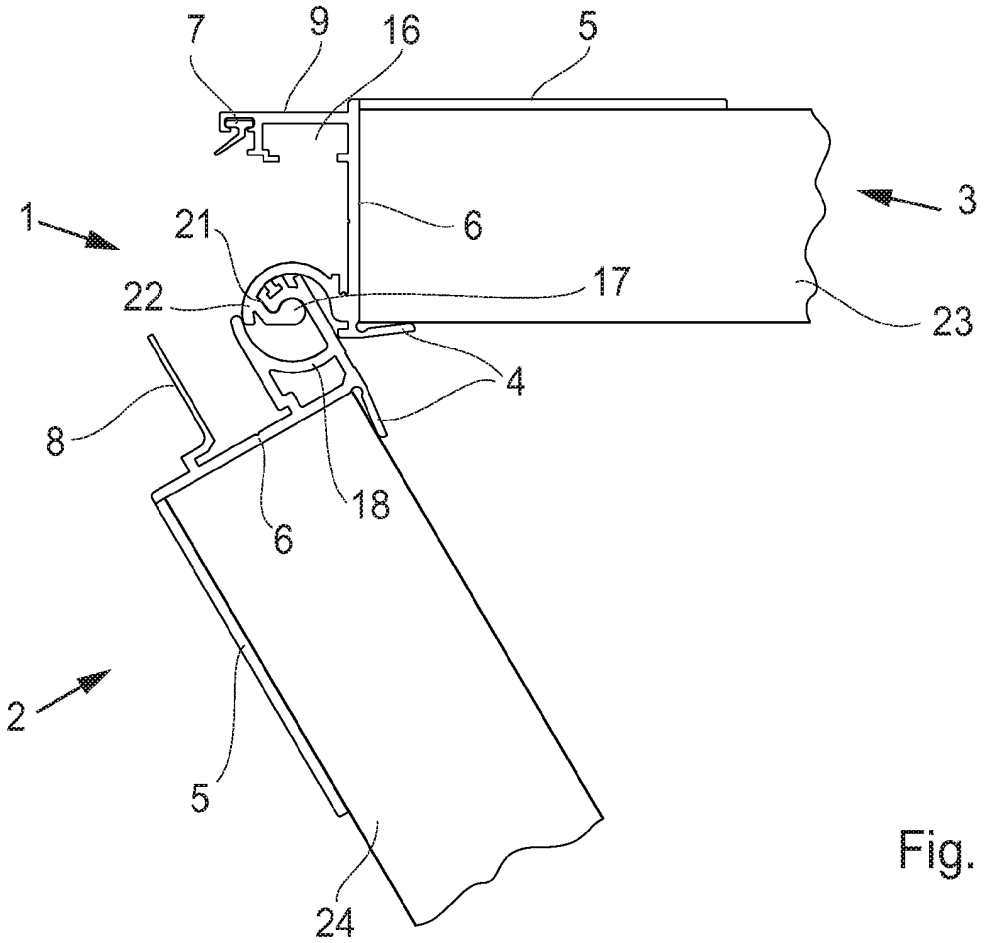

Fig. 5

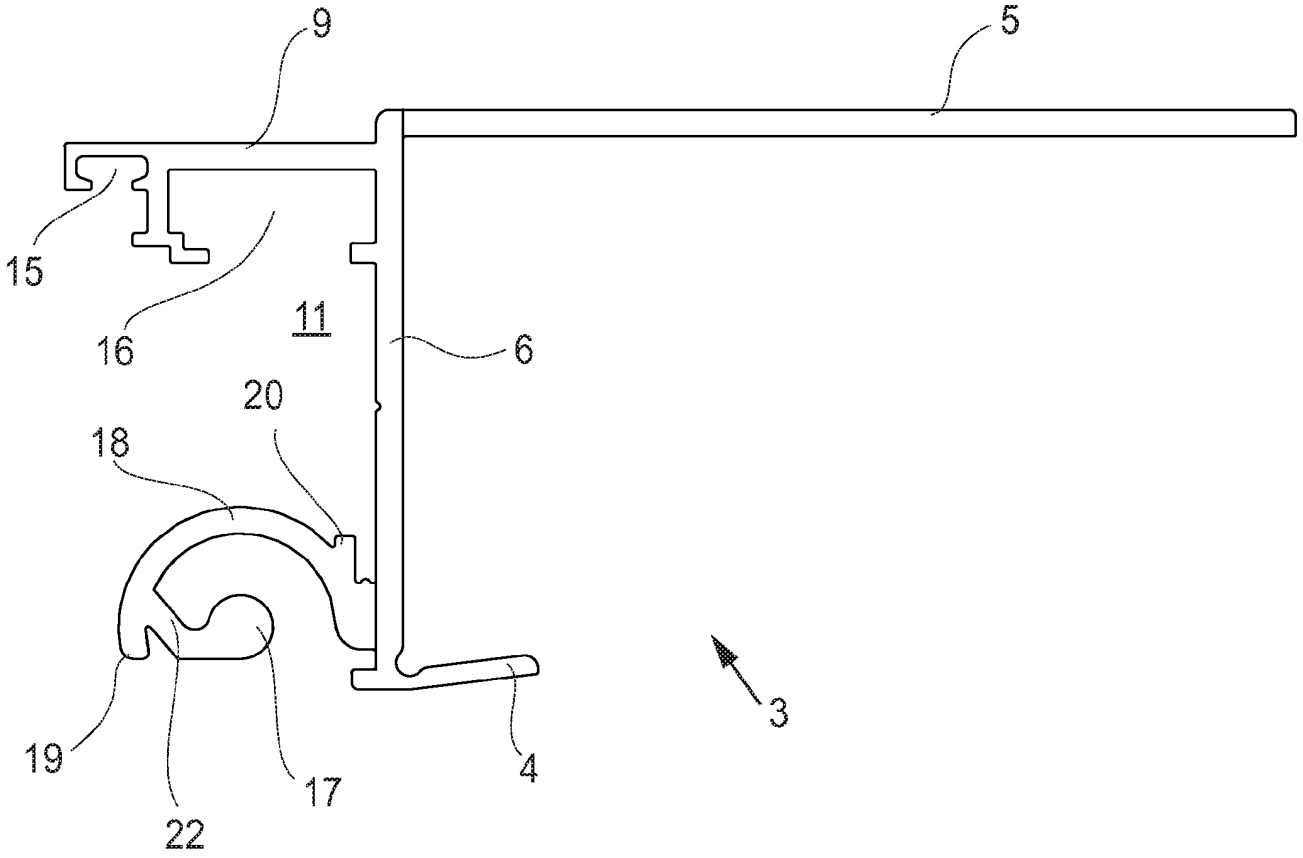

Fig. 6

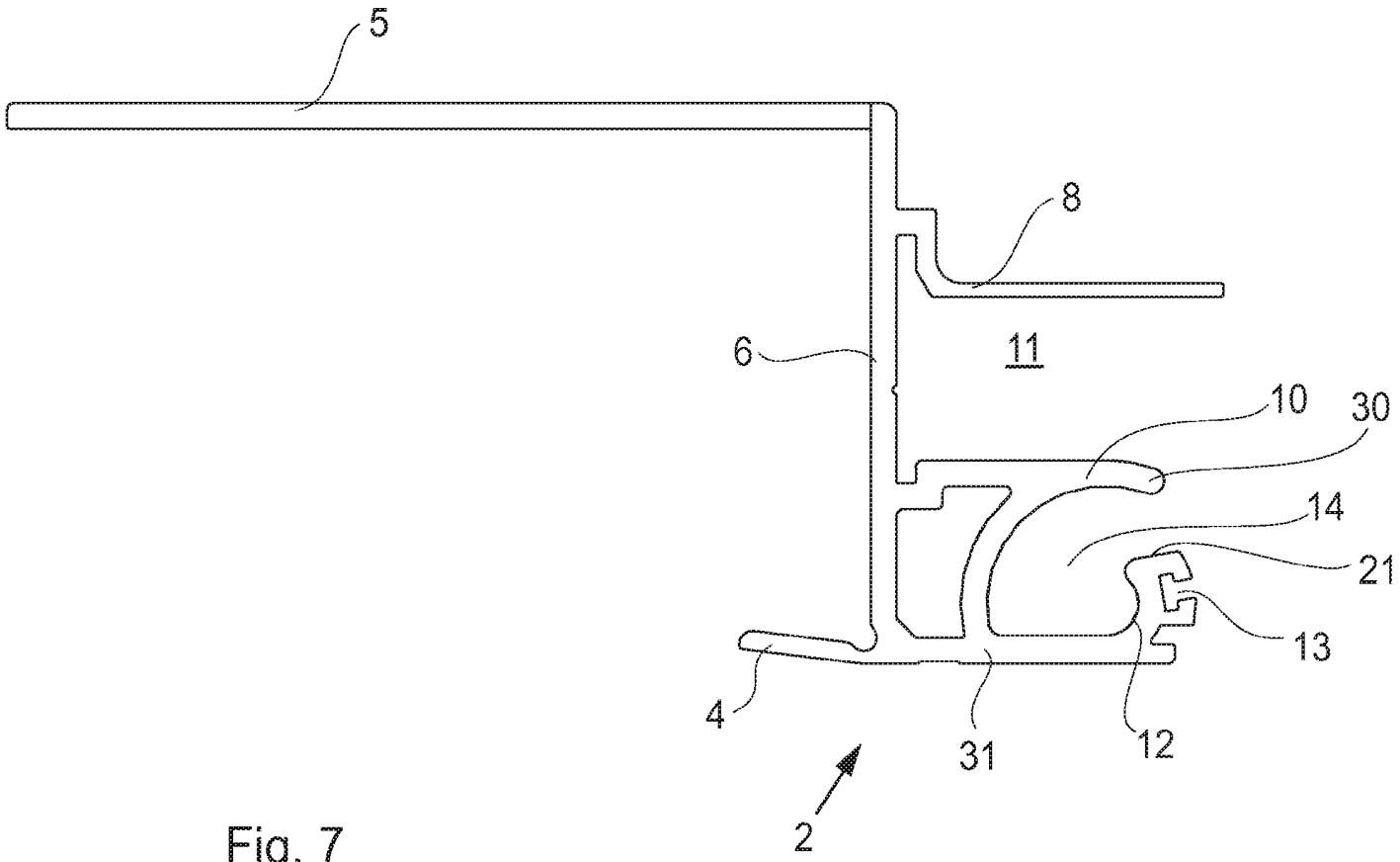

Fig. 7

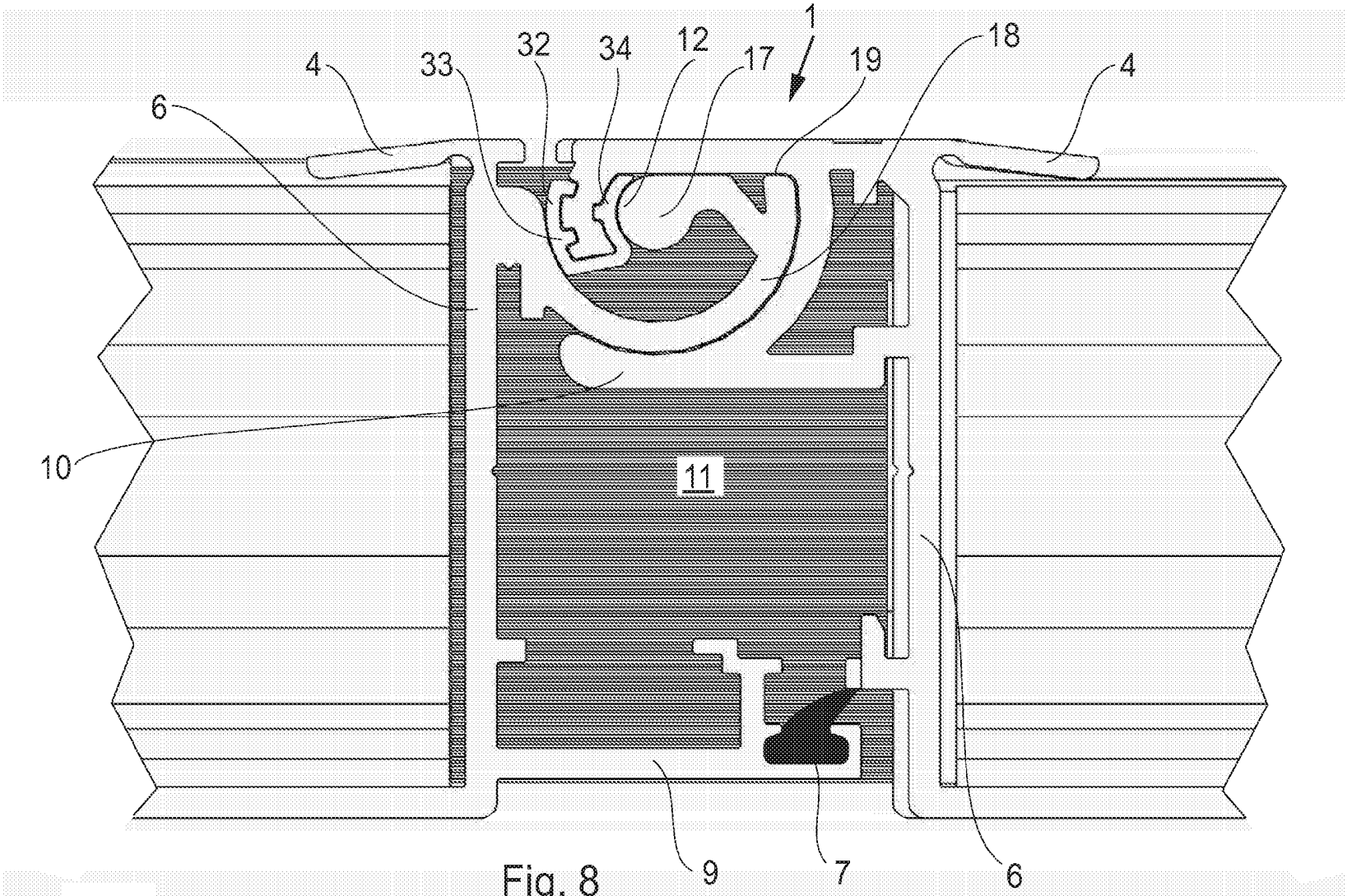

Fig. 8