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(54) Hatch cover

(57) Nestable hatch cover (1), in particular of the "Frisian cap" type, for covering a hatchway giving access to a vessel's hold (3), which hatchway is bounded by two hatch beams (4) situated opposite each other. The hatch cover (1) has two end parts (12) situated opposite each other, each provided underneath with a bearing surface which is designed to rest upon said hatch beams (4), and each forming an outermost end of the hatch cover. In order to keep the clear width of the gangways of the vessel as great as possible or to be able to make the hatchway as wide as possible, in particular so wide that the maximum number of containers can be stacked in the hold (3), the bearing surfaces below the end parts (12) are bounded on their outside by at least one projection (27) projecting below said bearing surfaces, which projection in each case is situated substantially at one of the abovementioned outermost ends of the hatch cover (1). Compared with the known hatch covers, this hatch cover therefore projects less far beyond the hatch beams.

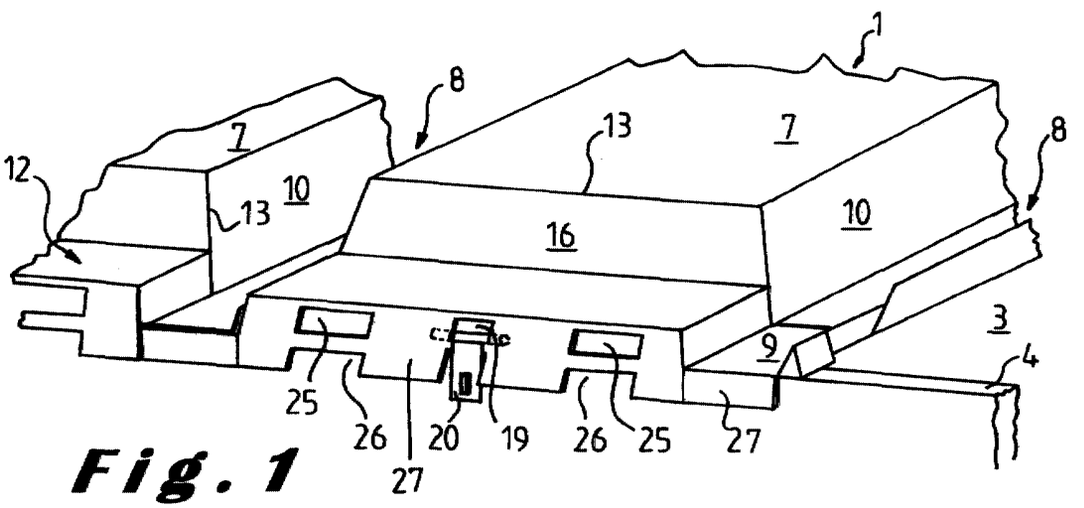

Fig. 1

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Description

[0001] The invention relates to a nestable hatch cover, in particular of the "Frisian cap" type, for covering a hatchway giving access to a vessel's hold, which hatchway is provided with a hatch coaming having two hatch beams situated opposite each other, which hatch cover has two end parts situated opposite each other, each provided underneath with a bearing surface which is designed to rest upon said hatch beams, and each forming an outermost end of the hatch cover.

[0002] Such hatch covers are used mainly in the case of inland waterway vessels and are already known from, for example BE-A-899,006 and BE-A-1,007,947. In practice, there are different types of such hatchway hoods, including, for example, the so-called "Frisian cap" hatchway hoods. The latter are made of sheet material which is shaped in such a way that a hatch cover surface and gutters situated next to it are formed. An important feature of these hatch covers is that they are shaped in such a way that they are nestable in or stackable on each other, with the result that, unlike, for example, the so-called pontoon hatch covers, which are not nestable, they can easily be stacked on the vessel itself when the hold has to be open. For receiving the gutters of the hatchway hoods, so called gutter ledge holes can be made in the hatch beam. On the other hand, it is customary to provide a transverse brace at both ends of the hatch cover, the underside of said brace being situated at the level of the underside of the gutters. In the case of such designs no cut-outs need be made in the hatch beam. Since these transverse braces generally also serve to store the locking flaps used for fixing the hatch cover to the hatch beam, these transverse braces are in practice also known as flap boxes.

[0003] A general feature of the known hatch covers is that they have a projecting lip at both ends, under which lip the lifting scoop of a hatch cover truck can engage, in order to lift and move the hatch covers during stacking. Owing to the presence of this projecting lip and the fact that the bearing surface has to project at both ends a certain distance beyond the hatch beams, in order to ensure that the hatch covers can be placed easily on the hatch beams, without any risk of the hatch covers being able to fall into the hold, the hatch covers in practice generally project a minimum distance of 8 - 10 cm beyond the hatch beams.

[0004] A major disadvantage of this is that, because of these projecting hatch covers, the clear width of the adjacent gangways is reduced. This clear width must, however, be as great as possible, in order to allow a comfortable passage, and must be at least greater than a minimum value, in order to prevent accidents. In certain countries there are in fact regulations stipulating a specific clear width. In order to obtain a maximum clear width and/or to retain a minimum width when the hold is covered with projecting hatch covers, one could consider increasing the overall width of the vessel, but in practice restrictions are also imposed on the external dimensions of the vessel, for example depending upon the locks or other structures which the vessel has to pass. Another solution which is used in practice is the selection of the width of the hatchway depending upon the minimum width of the gangways which need to be taken into consideration. For so-called dry cargo vessels, this is not so much of a problem, but if it is desired to employ these vessels also for the transportation of containers, this can lead to a considerable restriction of the transport capacity. It stands to reason that if the hatchway is just a few centimetres too narrow, this will mean that a full row of containers fewer can be transported. In practice, it is therefore found that there are special container vessels with a hatchway suitable for two, three, four, or even more rows of containers on which no hatchway hoods can, however, be placed because otherwise the width of the gangways would be less than the stipulated minimum width. A major disadvantage of these vessels is therefore that they cannot be used for the transport of dry cargo.

[0005] The object of the invention is then to provide a new nestable hatch cover which does not have to project so far beyond the hatch beams in order to be placed in a reliable manner on said hatch beams.

[0006] To this end, the hatch cover according to the invention is characterized in that the bearing surfaces by means of which the hatch cover rests upon the hatch beams are bounded on their outside by at least one projection projecting below said bearing surfaces, which projection in each case is situated substantially at one of the abovementioned outermost ends.

[0007] The presence of the projections, which extend next to the hatch beams when the hatch cover is resting with its bearing surfaces upon said hatch beams, means that the distance which said bearing surfaces extend beyond the hatch beams is kept limited, without any increase in the risk of the hatch cover being able to fall into the hold as a result. Since said projections are further situated at the respective outermost ends of the hatch cover, and there are therefore, in other words, no further projecting elements present, such as the lifting lips present in the case of the known hatch covers, this means that the total distance which the hatch covers extend beyond the hatch beams can be restricted to a substantial degree.

[0008] The provision of an edge which projects downwards along the surface with which a hatch cover rests upon the hatch beam is already known per se from BE-A-680,230. Owing to the presence of this edge and also to the fact that the corrugations in the sheet of the hatch cover are sealed at the ends, the hatch cover is not, however, nestable. Besides, the downward projecting edge is intended only to prevent water from splashing into the hold. The hatch cover itself is, in fact, only a half hatch cover, which is placed with one end in a lateral groove in a longitudinal bar in the centre of the hold and with the other end on the hatch beam. Owing to the fact

that the hatch cover is placed with one end in the longitudinal bar, said hatch cover cannot fall into the hold.

[0009] In a preferred embodiment of the hatch cover according to the invention, the abovementioned projection is provided in such a way that it butts against the outside of the hatch beams with a predetermined play.

[0010] In this way the distance which the hatch cover projects beyond the hatch beams can be limited to the maximum extent.

[0011] In a further preferred embodiment of the hatch cover according to the invention, the hatch cover is designed to be fixed on said hatch beams by means of locking flaps, and said locking flaps are hook-shaped at the top, so that they act upon the hatch cover above the bearing surface of the hatch cover, more particularly above the hatch beams upon which the hatch cover is placed.

[0012] This shape of the locking flaps also helps to ensure that the distance which the hatch cover projects beyond the hatch beams can be limited to the maximum extent.

[0013] In a special embodiment of the hatch cover according to the invention, the bearing surface with which the hatch cover rests upon the respective hatch beam is at least partially formed by a sheet part which forms a top surface of the hatch cover at both ends of the hatch cover.

[0014] In this embodiment the thickness of the hatch cover at the level of the hatch beam is thus limited to the thickness of the sheet material from which the bearing material, and possibly the entire hatch cover, is made. Such a limited thickness has the advantage that persons can walk more easily along the gangway, and it can be important for fulfilling the stipulated minimum gangway width. It is in fact usually stipulated in practice that from a certain height upwards the gangway must be broader, in order to allow safe movement of persons along it. However, in order to obtain the maximum hold capacity, the hatch beams generally already have this maximum height. By now limiting the thickness of the hatch covers at the level of the hatch beams to the thickness of the sheet material itself, it is ensured that hatch covers can still be placed without appreciably having to restrict the height of the hatch beams. A little further towards the centre of the hatch covers, it is possible, if necessary, also to provide transverse braces which leave a sufficiently clear gangway width.

[0015] Further advantages and details of the invention will emerge from the description which follows of a number of special embodiments of the hatch cover according to the invention. This description is, however, given only by way of example and is not intended to limit the scope of protection, as determined by the claims. The reference numerals indicated in the description relate to the appended drawings, in which:

Figure 1 shows diagrammatically a perspective view of one end of two hatch covers according to the invention, resting upon a hatch beam;

Figure 2 shows on a larger scale a front view of the hatch covers according to Figure 1;

Figures 3 and 4 show diagrammatically, in side view, two possible general shapes of the hatch cover according to the invention;

Figure 5 shows a longitudinal section according to line V-V in Figure 2;

Figure 6 shows a longitudinal section similar to that of Figure 5, but with three hatch covers stacked on or nested in each other, the locking flap being shown only in the top hatch cover;

Figure 7 shows a front view of the locking flap shown in side view in Figures 5 and 6;

Figures 8 and 9 each show a view similar to that of Figure 6, but in each case with hatch covers according to another embodiment of the invention;

Figures 10 and 11 each show a view similar to that of Figure 5, but in each case relating to yet further possible embodiments of the hatch cover according to the invention;

Figures 12 and 13 show views similar to those of Figures 1 and 5, but in which the hatch cover is adapted for use on hatch beams provided with gutter ledge holes; and

Figure 14 shows diagrammatically a front view of a row of hatch covers with through-running flap boxes.

[0016] The hatch cover 1 according to the invention can be in different forms, for example with or without catway 2 in the centre of the hatch cover (see Figures 3 and 4), but is generally provided for covering a hatchway which gives access to a vessel's hold 3 and is bounded by a hatch coaming having two hatch beams 4 situated opposite each other. A gangway 6 is provided in each case between said hatch beams 4 and the outside wall 5 of the vessel. As already indicated above, the object of the invention is to provide a new hatch cover which only has to project a minimal distance beyond the hatch beams 4, so that the clear width of the gangways 6 can thus remain at a maximum level.

[0017] A preferred embodiment of such a hatch cover is shown in Figures 1 to 6. Said hatch cover 1 comprises a top hatch cover surface 7 and gutters 8 extending next to said hatch cover surface 7 which have a bottom 9 and a slanting gutter wall 10 extending between the top hatch cover surface 7 and said bottom. If desired, the top hatch cover surface 7 can be split by so-called inner gutters 11 (see, for example Figure 14) into two or more parts. The whole of the top hatch cover surfaces 7 and 8 is preferably made of a sheet material by folding, welding or possibly forming in another way, for example by gluing, pressure joining etc., and forms the basic part of the hatch cover. The sheet material is generally a metal such as an aluminium alloy or stainless steel.

[0018] In the embodiment according to Figures 1 to 6, two end parts 12, situated opposite each other, are also

welded against this basic part of the hatch cover, more specifically along the welded seam 13. Said end parts 12 each have underneath a bearing surface 14, which is designed to rest upon the hatch beams 4. In order to obtain a good seal between the hatch beams 4 and the bearing surfaces 14, the latter are preferably covered with an elastic material, in particular with a rubber layer 15. The ends 12 may, if desired, be connected to the basic part in other ways, for example by gluing, with rivets, with snap-in systems, or by folding them integrally from the same sheet as the basic part.

[0019] The top side of the end parts 12 is preferably connected by way of a slanting surface 16 to the top hatch cover surface 7 in such a way that a so-called "dolphin hatch cover" is obtained. The bearing surface 14 of such hatch covers can thus extend substantially at the level of the bottoms 9 of the gutters 8 without the stack height being increased (see Figure 6). The fact is that, as a result of the slanting arrangement of the surface 16, the nestability of the hatch cover is retained. The advantage of this embodiment is that the end parts 12 have a flat underside and can thus rest upon a flat hatch beam 4. In the variant according to Figures 12 and 13, the top hatch cover surface 7, on the other hand, runs to the outermost ends of the hatch cover, and the bearing surface 14 of the end parts 12 is situated above the bottom 9 of the gutters 8 in such a way that so-called gutter ledge holes 17 have to be made in the hatch beams 4 for these gutters 8.

[0020] In the embodiment according to Figures 1 to 6 the bearing surface 14 by means of which the hatch cover rests with an end part 12 upon the hatch beams 4 forms the underside of a hollow reinforcement structure 18. In the front side of said reinforcement structure 18, provision is first made for a flap aperture 19 for allowing a locking flap 20 to be passed through, by means of which flap the hatch cover can be fixed on the hatch beams 4. As can be seen from Figure 7, said flap has on the top a T-shaped end 21, by means of which it sits hooked securely behind the aperture 19 in the transverse bracing structure 18. In its bottom part the flap is provided with an elongated aperture 22, by means of which it can be slipped over an eye 23 on the hatch beam 4 and locked. When the flap is released it can, as shown in Figure 6, be partially stored in the transverse bracing structure 18, its T-shaped end 21 hooking behind a raised edge 24. Because of this storage facility, the transverse brace is in practice also called the flap box. In order to fit and, if necessary, replace the locking flaps 20, apertures which can be closed off by means of a plate 29 and bolts 39 are provided in the rear of the flap boxes 18.

[0021] In the front of the transverse bracing structure 18 two or more lifting apertures 25 are further provided, through which apertures two teeth of the fork of a hatch cover truck can be inserted into said transverse bracing structure, in order to lift the hatch cover. Openings 26 are further provided below these lifting apertures 25, in such a way that if several hatch covers are stacked on each other as shown in Figure 6, this full stack or a part thereof can be picked up by the teeth of a hatch cover truck through the openings 26 and the apertures 25.

[0022] As already stated above, the object of the invention is to provide a hatch cover in which the end parts resting upon the hatch beams are formed in such a way that the distance that the ends of the hatch cover projects beyond the hatch beams can be limited by comparison with the known hatch covers. According to the invention, for this purpose the bearing surfaces 14 below the end parts 12 are bounded on their outside by at least one projection 27 projecting below said bearing surfaces 14, said projection in each case being situated substantially at one of the outermost ends of the hatch cover.

[0023] As can be seen clearly from Figures 1 and 5, in this preferred embodiment the projection is formed by a downward projecting edge 27, in which the openings 26 for the teeth of the hatch cover truck are made. Said edge 27 forms part of the slanting sides of the hatch cover and thus has a slanting inside which widens downwards from the hatch beam 4. In this way a centring effect is obtained, with the result that the hatch cover can be placed easily on the hatch beams, despite the fact that the edge 27 butts against the outside of the hatch beam 4 with a predetermined minimum play. In Figure 5 the edge 27 butts fully against the hatch beam, but at other points, where the distance between the two hatch beams is slightly smaller, some distance will be produced between the hatch beam and the edge. Since the edge 27 forms the outermost end of the hatch cover and the gripping means for picking up the hatch cover are formed by the apertures 25 situated between the outermost ends of the hatch cover, in the embodiment according to Figure 5 the hatch cover projects only a minimal distance beyond the hatch beams, in particular only a distance of 1.5 to 2.5 cm. It will be clear that if the centring effect is reduced by placing the edges 27 in a straighter position, the distance that the hatch cover projects beyond the hatch beams can be limited even further.

[0024] Owing to the fact that the edges 27 butt against the hatch beam, in this preferred embodiment a special locking flap 20 is used, namely a locking flap 20 which is hook-shaped at the top, in such a way that it can act upon the hatch cover above the bearing surface 14 or, in other words, above the hatch beam. On account of this special shape of the locking flap 20, the flap aperture 19 is provided laterally in the hollow transverse bracing structure 18 and the flap by means of which the hatch cover is fixed on the hatch beams extends through said lateral aperture 19. In the case of the known hatch covers, on the other hand, although it is common to take the flaps out of the flap box 18 through a lateral aperture, when they are in the fixed state said flaps hang out of the transverse bracing structure 18 through one aperture in the underside of said transverse bracing struc-

ture. With the hook-shaped flaps, said bottom aperture can thus be dispensed with, and the hatch cover therefore does not have to extend so far beyond the hatch beams.

[0025] However, in the variant embodiment shown in Figure 8 a straight flap 20 is used, which flap comes out of the flap box 18 at the bottom. Notwithstanding this straight flap 20, the distance that the hatch cover projects beyond the hatch beam is still limited, owing to the fact that the downward projecting edge 27 alongside the bearing surface 14 of the hatch cover determines the outermost end of the hatch cover. The gripping means provided in this embodiment is a lifting lip 28, which extends, however, between the outermost ends of the hatch cover. On account of the low height of the edge 27, a stack of hatch covers can be lifted by means of a conventional hatch cover truck with a through-running lifting scoop.

[0026] Figure 9 shows a further variant embodiment, which differs from the previous embodiment in that a slanting surface 30 is provided on the inside of the edge 27 in such a way that again a centring effect is obtained. At the position of the locking flap 20, the edge 27 and the slanting surface 30 are interrupted in such a way that the hatch cover still only has to project the same minimal distance beyond the hatch beams as in the preceding embodiment. The width of the slanting surface is in fact limited substantially to the thickness of the locking flap 20. The edge 27 could be raised further if desired, in which case openings then have to be made in said edge 27, for picking up a stack of hatch covers by means of a hatch cover truck with two teeth which can engage in said openings below the lifting lip 28.

[0027] In the preceding embodiments the bearing surface 14 with which the hatch cover rests upon the hatch beam 4 is in each case formed by the underside of the transverse bracing structure or flap box 18. In the embodiment according to Figure 10, said bearing surface 14 is now formed by a sheet part 31, which at the end sections 12 forms the top surface of the hatch cover. This has the advantage that a greater clear gangway width is obtained directly above the hatch beam. Next to the sheet part 31, as in the embodiment according to Figure 10, it is possible if necessary to provide a transverse brace 18. In the case of Figure 10 this brace in fact still serves as a flap box. In order to make this possible, use is made of locking flaps 20 which are composed of at least two parts, which pivot relative to each other. They can be, for example, a chain. The top part 32 is, however, preferably formed by a straight part, as shown, provided with the T-shaped end 21 and connected by way of a pivot pin 33 in a pivoting manner to the bottom part 34. Said bottom part 34 can again have a hook-shaped top end, by means of which it acts upon the hatch cover 1 above the hatch beams 4.

[0028] Another way of fixing the hatch cover according to Figure 10 on the hatch beams 4 is to make use of locking flaps 20 which are no longer fixed to the hatch cover itself, but to the hatch beams 4. Such a flap 20 is illustrated in Figure 11, in which, however, the flap again engages in a hollow transverse bracing structure 18. The flap 20 has on the top a hook-shaped end 35, by means of which it can grip behind a raised edge 36 of the hatch cover, more particularly again above the bearing surface 14 with which the hatch cover rests upon the hatch beam 4. At the bottom the locking flap 20 has an elongated aperture 37, by means of which in a replaceable manner it is fixed around an eye, pin or hook 38 fixed on the hatch beam 4, more particularly in such a way that it can move up and down. In the bottom position, illustrated by dashed and dotted line, the locking flap can then be blocked by means of a pin (not shown) below the eye 38. For the use of such a locking flap system, only a raised edge 36 need be provided on the sheet part 31 in Figure 10, this being at least at the position of the gripping point of the locking flap on the hatch cover.

[0029] In Figure 14, finally, yet another possible hatch cover type with two outer gutters 8 and one inner gutter 11 is illustrated, the flap box 18 running on over the inner gutters 11 and, for the so-called top hatch covers, also over the outer gutters 8. At the position of the gutters 8, 11 only apertures 40 for allowing through water are provided in the flap box 18. These apertures may also, if desired, serve to lift the hatch cover, since the teeth of the hatch cover truck can also be designed to be inserted into these apertures 40. If it is desired to use these apertures 40 for that purpose, it is, however, preferable to provide the hatch cover with at least two inner gutters 11 or, in other words, with at least three hatch cover surfaces, in such a way that the hatch cover can be lifted more easily in a stable manner. Instead of making the transverse braces run on over the inner gutters, it is possible to obtain the same advantage by providing transverse braces between the side walls of the inner gutters 11, in particular round or flat bars, below which the aperture 40 in which the teeth of the hatch cover truck can engage is then formed.

[0030] It will be clear from the above description of a number of special embodiments of the hatch cover according to the invention that numerous changes can be made to it, inter alia as regards the shape, the composition and the material of the various parts, without going beyond the scope of the invention as determined by the appended claims.

[0031] For instance, the gripping means for lifting the hatch cover could also be formed by, for example, eyes or rings on top of the ends of the hatch cover. Furthermore, the flap boxes do not have to be made of metal, but could, if desired, also be made of plastic. In particular, use can also be made here of extruded plastic or aluminium sections, instead of starting from sheets that then have to be folded.

Claims

1. Nestable hatch cover, in particular of the "Frisian cap" type, for covering a hatchway giving access to a vessel's hold, which hatchway is provided with a hatch coaming having two hatch beams situated opposite each other, which hatch cover has two end parts situated opposite each other, each provided underneath with a bearing surface which is designed to rest upon said hatch beams, and each forming an outermost end of the hatch cover, **characterized in that** said bearing surfaces are bounded on their outside by at least one projection projecting below said bearing surfaces, which projection in each case is situated substantially at one of the abovementioned outermost ends.

2. Hatch cover according to Claim 1, **characterized in that** said projection is formed by a downward projecting edge.

3. Hatch cover according to Claim 2, **characterized in that** openings are made underneath in said edge.

4. Hatch cover according to one of Claims 1 to 3, **characterized in that** said projection is provided in such a way that it butts against the outside of the hatch beams with a predetermined play.

5. Hatch cover according to one of Claims 1 to 4, **characterized in that**, when the hatch cover is resting with its bearing surfaces upon the hatch beams, said projections have a slanting inside which faces said hatch beams and flares out downwards from the respective hatch beam.

6. Hatch cover according to one of Claims 1 to 5, **characterized in that** said projections determine the outermost ends of the hatch cover, and **in that** the hatch cover is such that it can be fixed on said hatch beams by means of locking flaps, said locking flaps in the fixed state of the hatch cover either extending outside the outermost ends of the hatch cover and substantially butting against the respective outermost end or said locking flaps in the fixed state extending more inwards, preferably within the outermost ends of the hatch cover.

7. Hatch cover according to one of Claims 1 to 6, **characterized in that** both end parts are provided with gripping means for picking up the hatch cover, which gripping means are situated between said outermost ends of the hatch cover.

8. Hatch cover according to Claim 7, **characterized in that** said gripping means comprise a lifting lip.

9. Hatch cover according to Claim 7, **characterized in that** it comprises at least two hatch cover surfaces separated from each other by an inner gutter, said gripping means comprising a transverse connection provided in the inner gutter at the level of said end parts.

10. Hatch cover according to one of Claims 1 to 9, **characterized in that** said bearing surface is at least partially formed by an underside of a transverse bracing structure which is provided on the end parts of the hatch cover.

11. Hatch cover according to Claims 7 and 9, **characterized in that** said gripping means comprise lifting apertures provided in said transverse bracing structure.

12. Hatch cover according to Claim 10 or 11, **characterized in that** provision is made for it to be fixed by means of locking flaps on said hatch beams, **in that** said transverse bracing structure is hollow, and **in that** at least one flap aperture is such that it allows through one of said locking flaps when the hatch cover is fixed by means of said locking flap on the hatch beam.

13. Hatch cover according to Claim 12, **characterized in that** said flap aperture is provided laterally in the hollow transverse bracing structure, and **in that**, when the hatch cover is fixed on the hatch beam by means of the locking flap, said locking flap extends through said lateral aperture.

14. Hatch cover according to one of Claims 1 to 9, **characterized in that** said bearing surface is at least partially formed by a sheet part which forms a top surface at said end parts of the hatch cover.

15. Hatch cover according to one of Claims 1 to 14, **characterized in that** the hatch cover is designed to be fixed on said hatch beams by means of locking flaps, which locking flaps have a top end, provided in such a way as to engage detachably on the hatch cover, and a bottom end with which they are fixed on the hatch beam.

16. Hatch cover according to one of Claims 1 to 15, **characterized in that** it is designed to be fixed on said hatch beams by means of locking flaps, which locking flaps are composed of at least two parts which pivot relative to each other.

17. Hatch cover according to one of Claims 1 to 16, **characterized in that** it is designed to be fixed on said hatch beams by means of locking flaps, which locking flaps are hook-shaped at the top, so that they act upon the hatch cover above the bearing surface of the hatch cover.

18. Hatch cover according to one of Claims 1 to 17, **characterized in that** it comprises at least one top hatch cover surface and gutters extending next to said hatch cover surface which have a bottom and a gutter wall extending between said top hatch cover surface and said bottom, in which said bearing surface extends between said gutters substantially at the level of the bottoms of said gutters.

19. Hatch cover according to one of Claims 1 to 18, **characterized in that** said bearing surface is covered with an elastic material, in particular with a rubber layer.

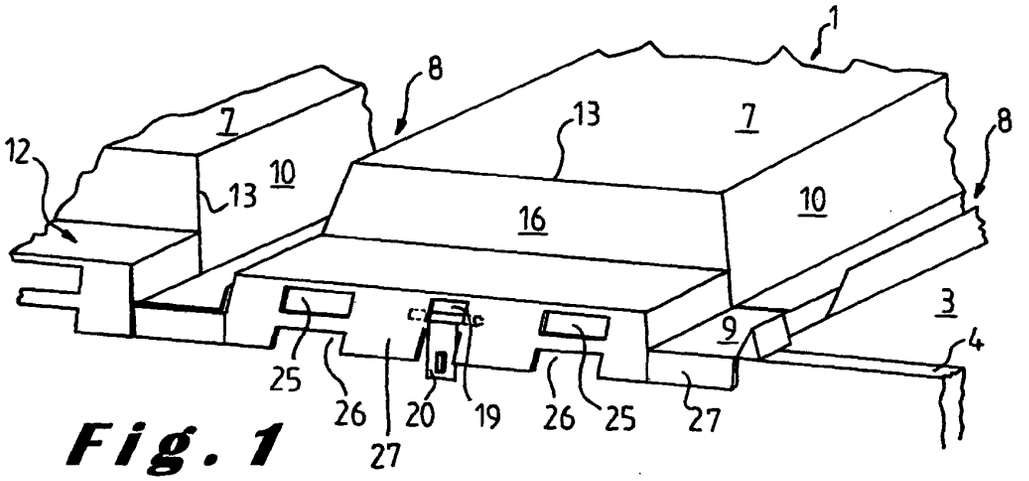
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Fig. 1

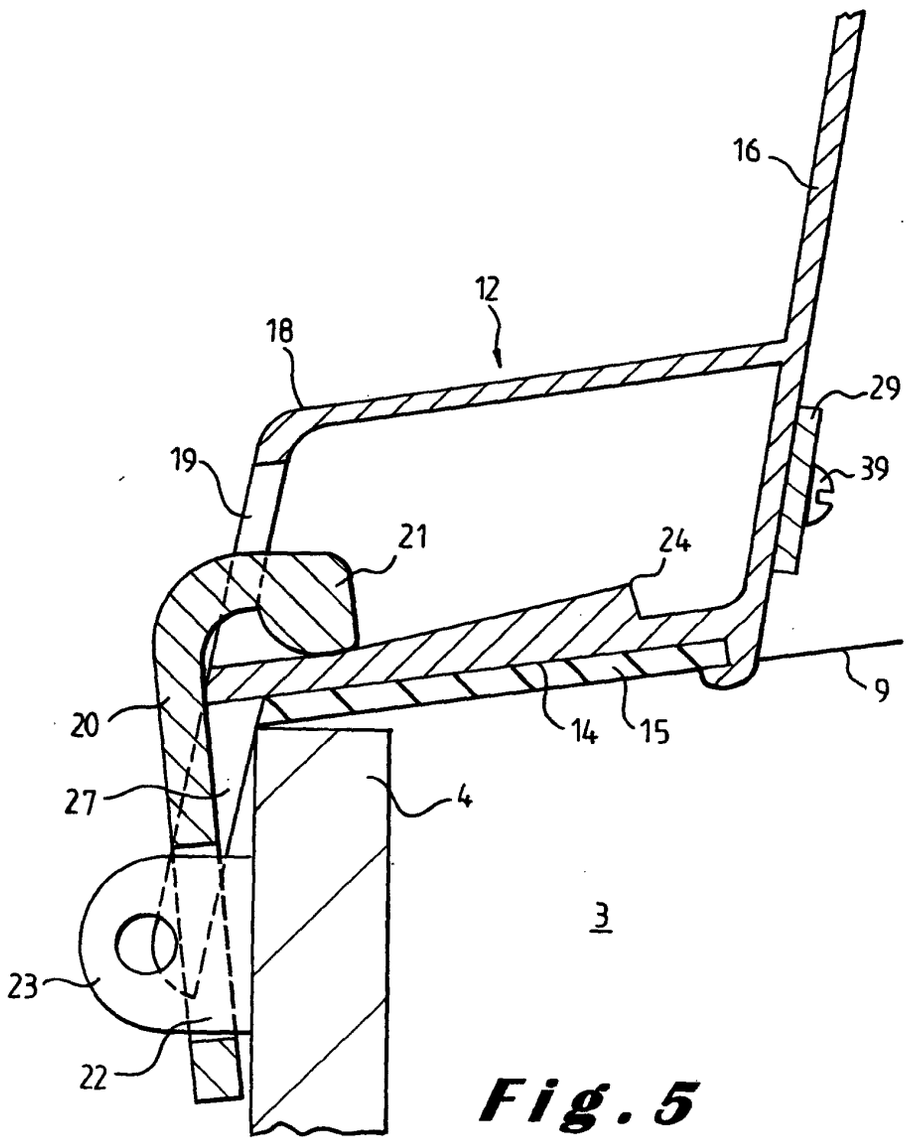
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Fig. 5

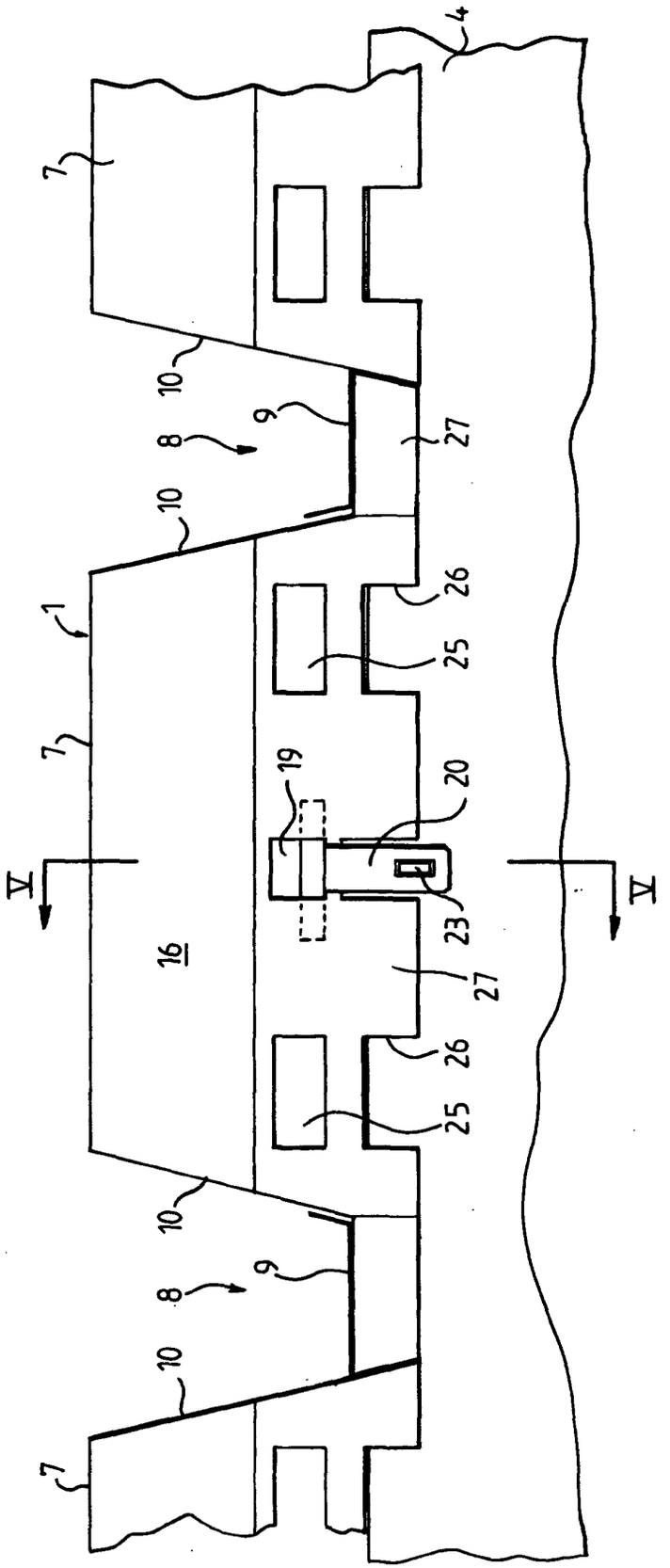

Fig. 2

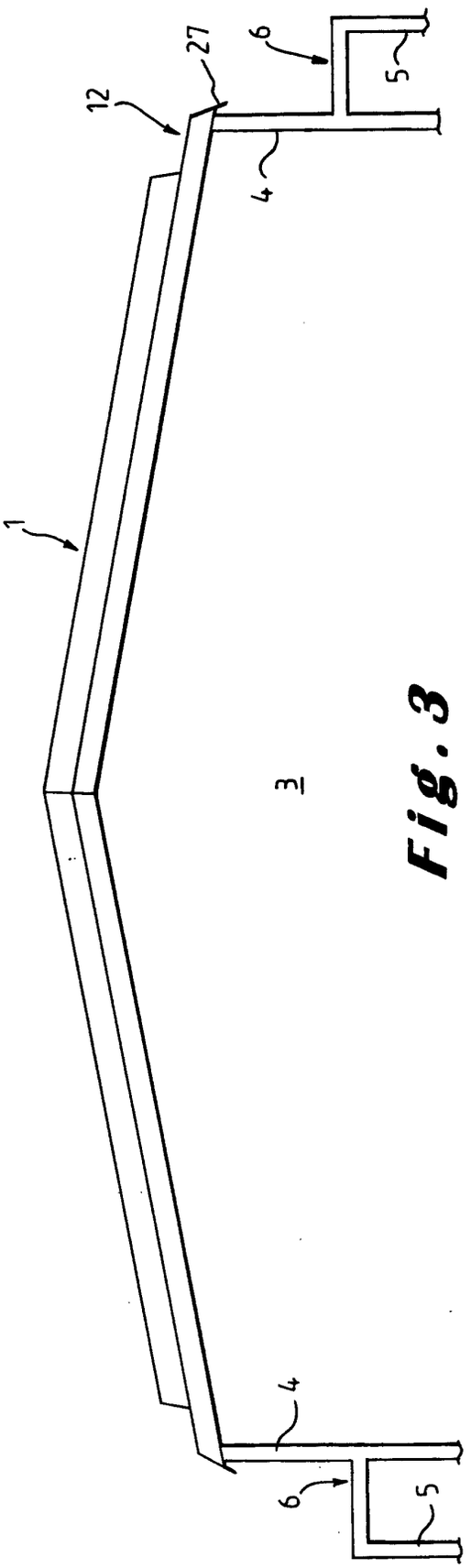

Fig. 3

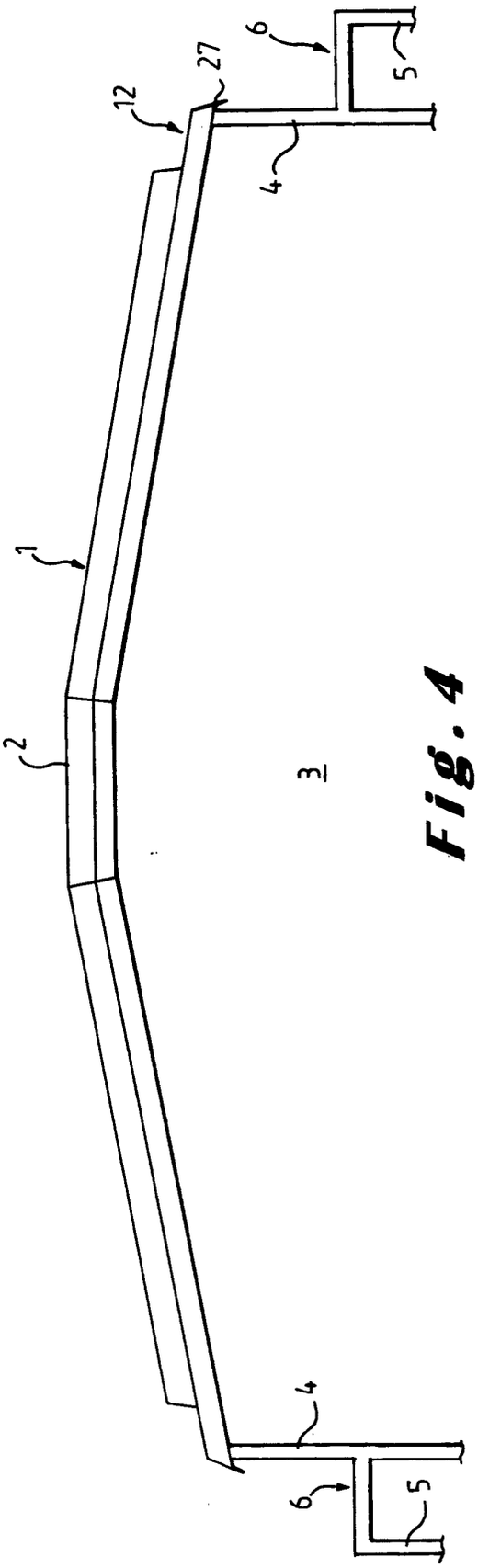

Fig. 4

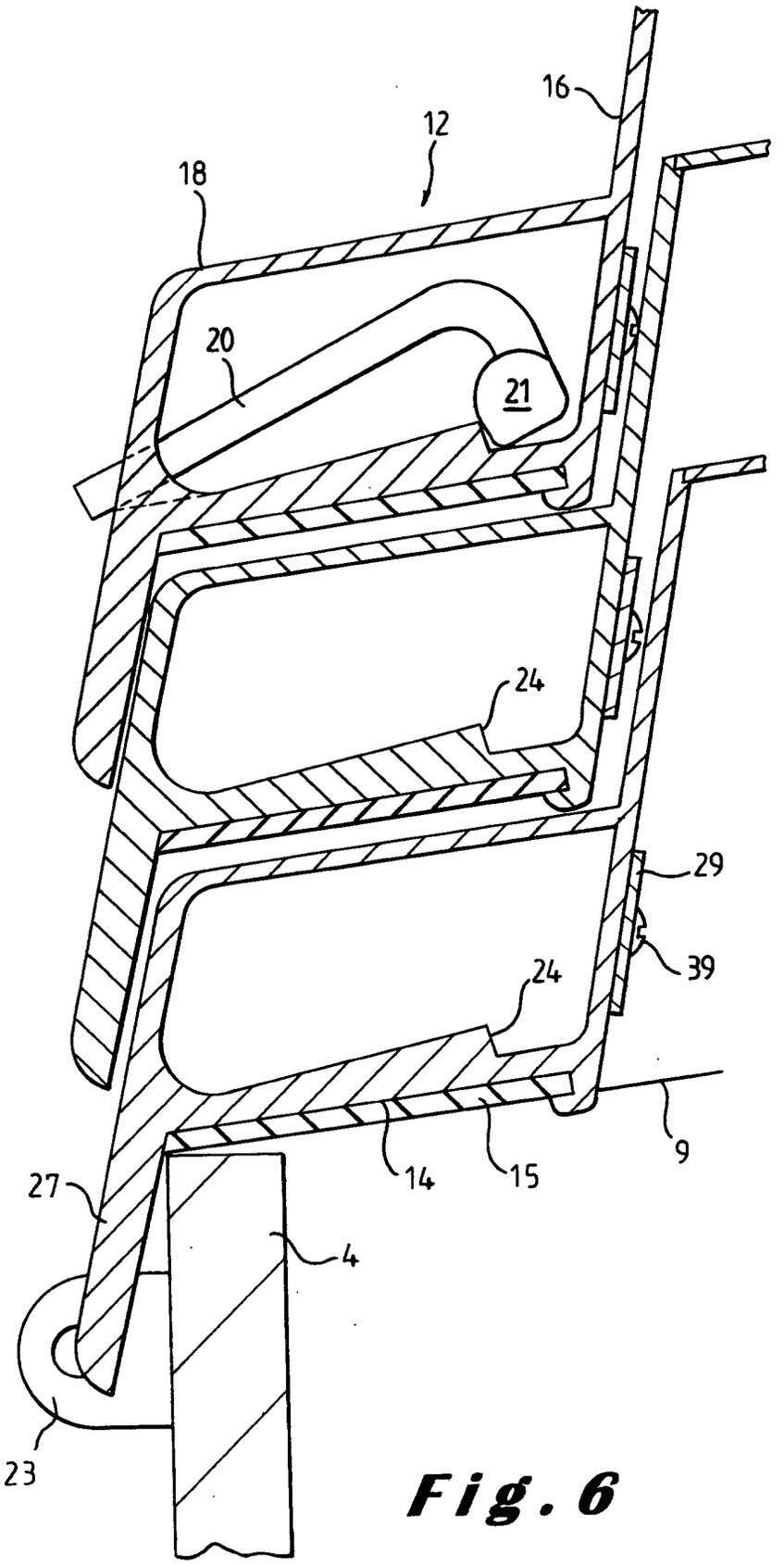

Fig. 6

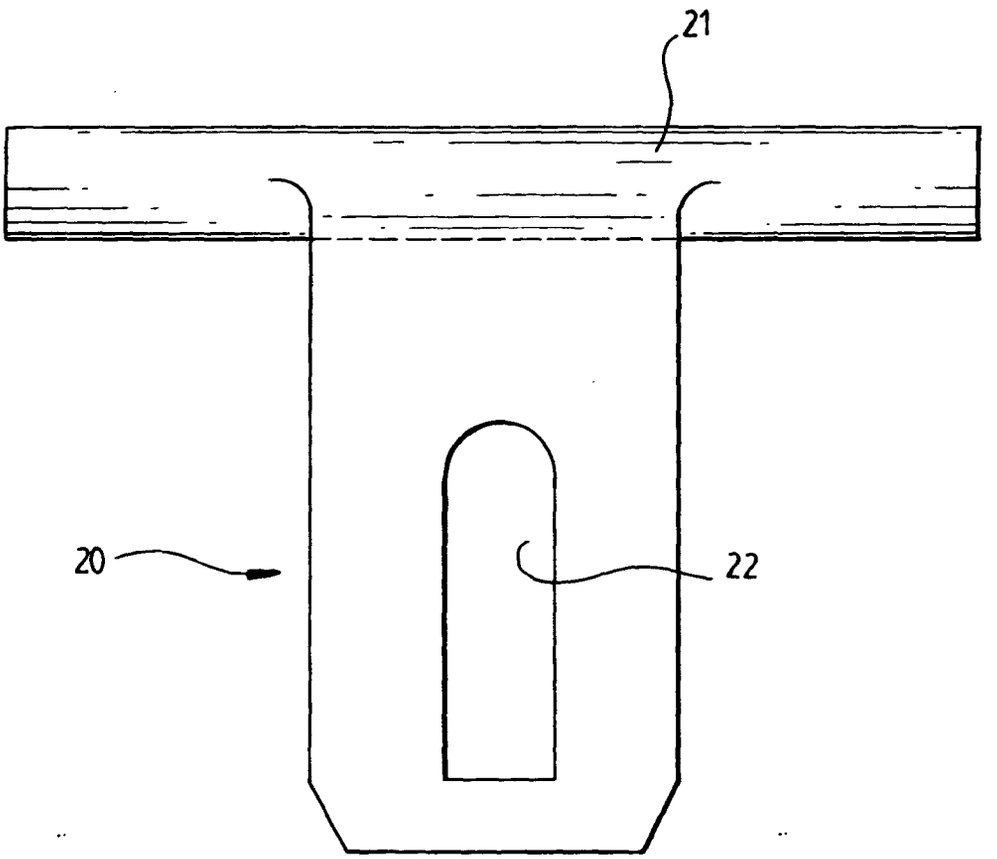

Fig. 7

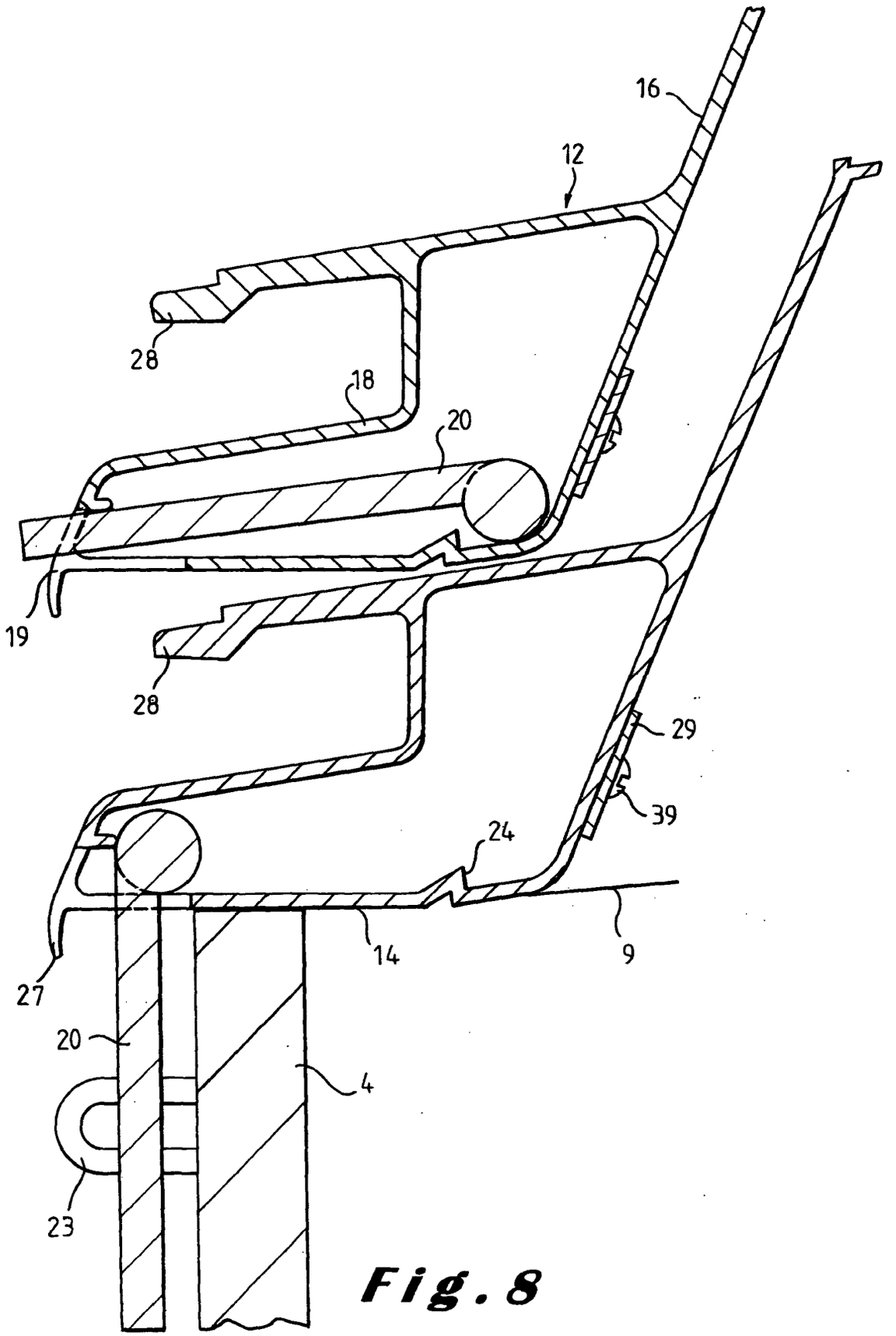

Fig. 8

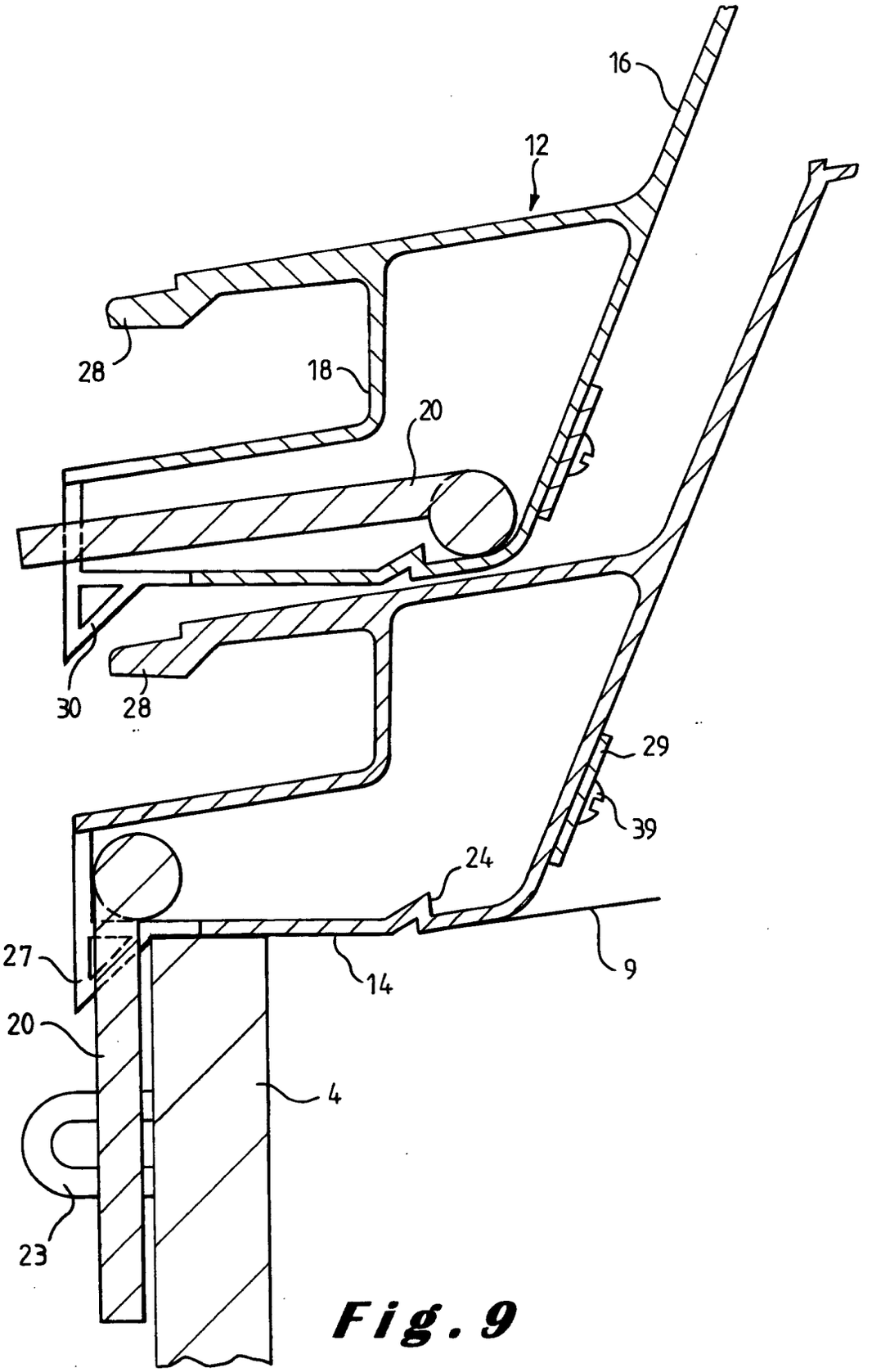

Fig. 9

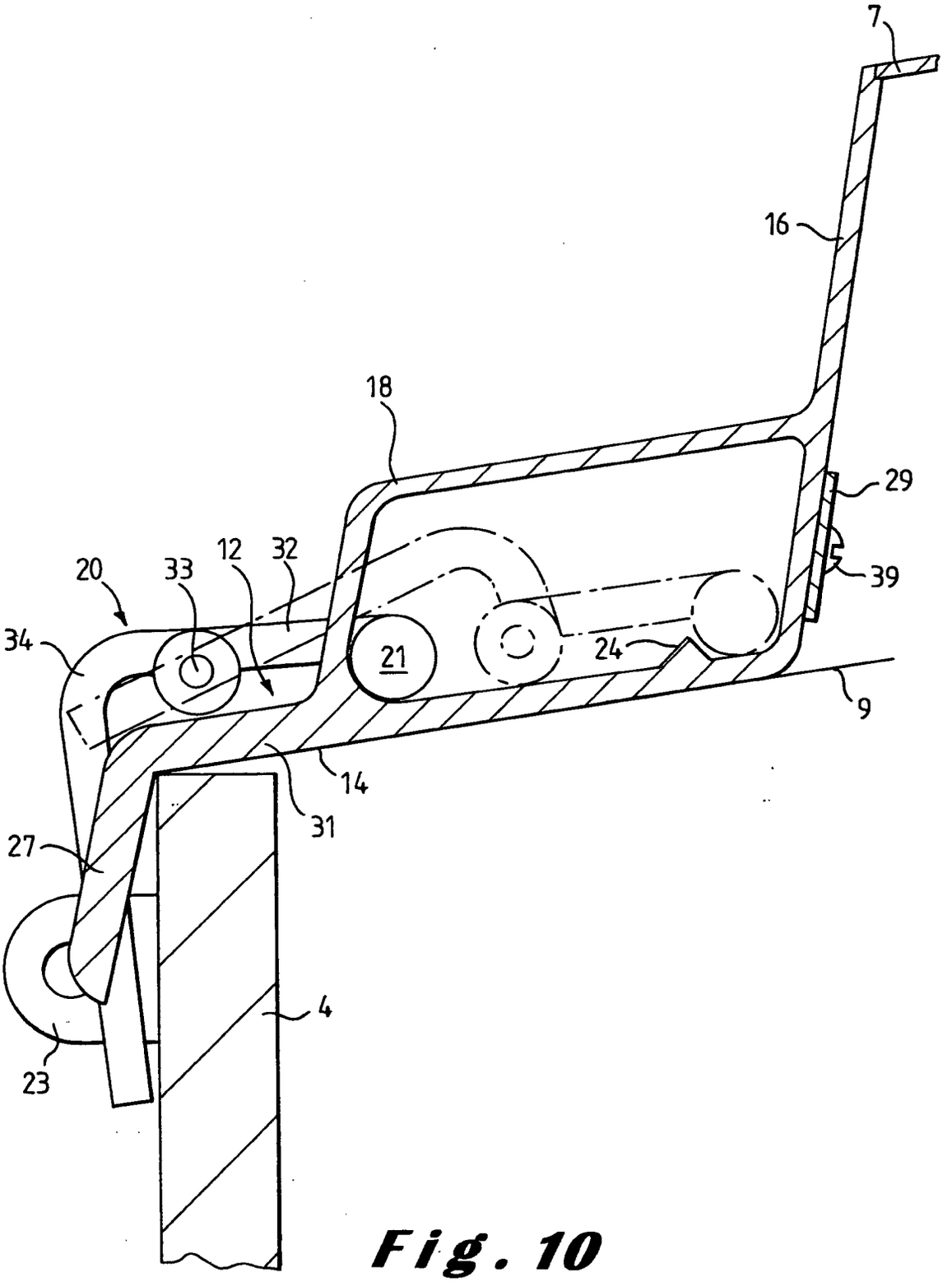

Fig. 10

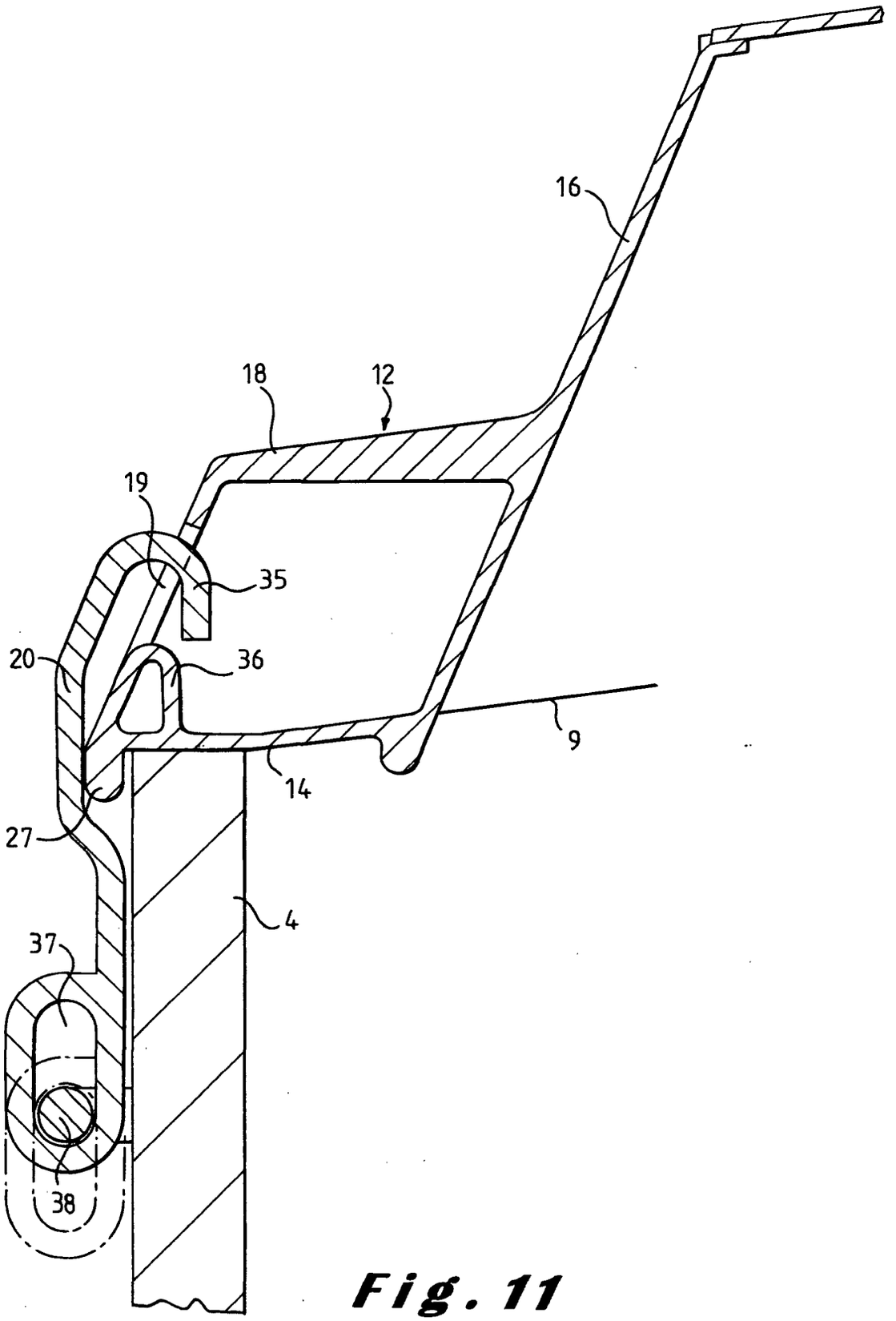

Fig. 11

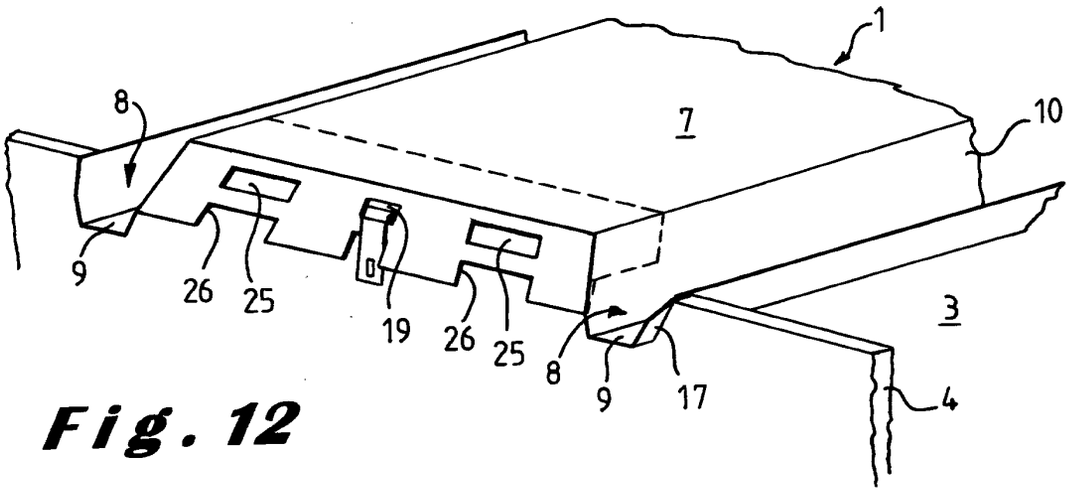

Fig. 12

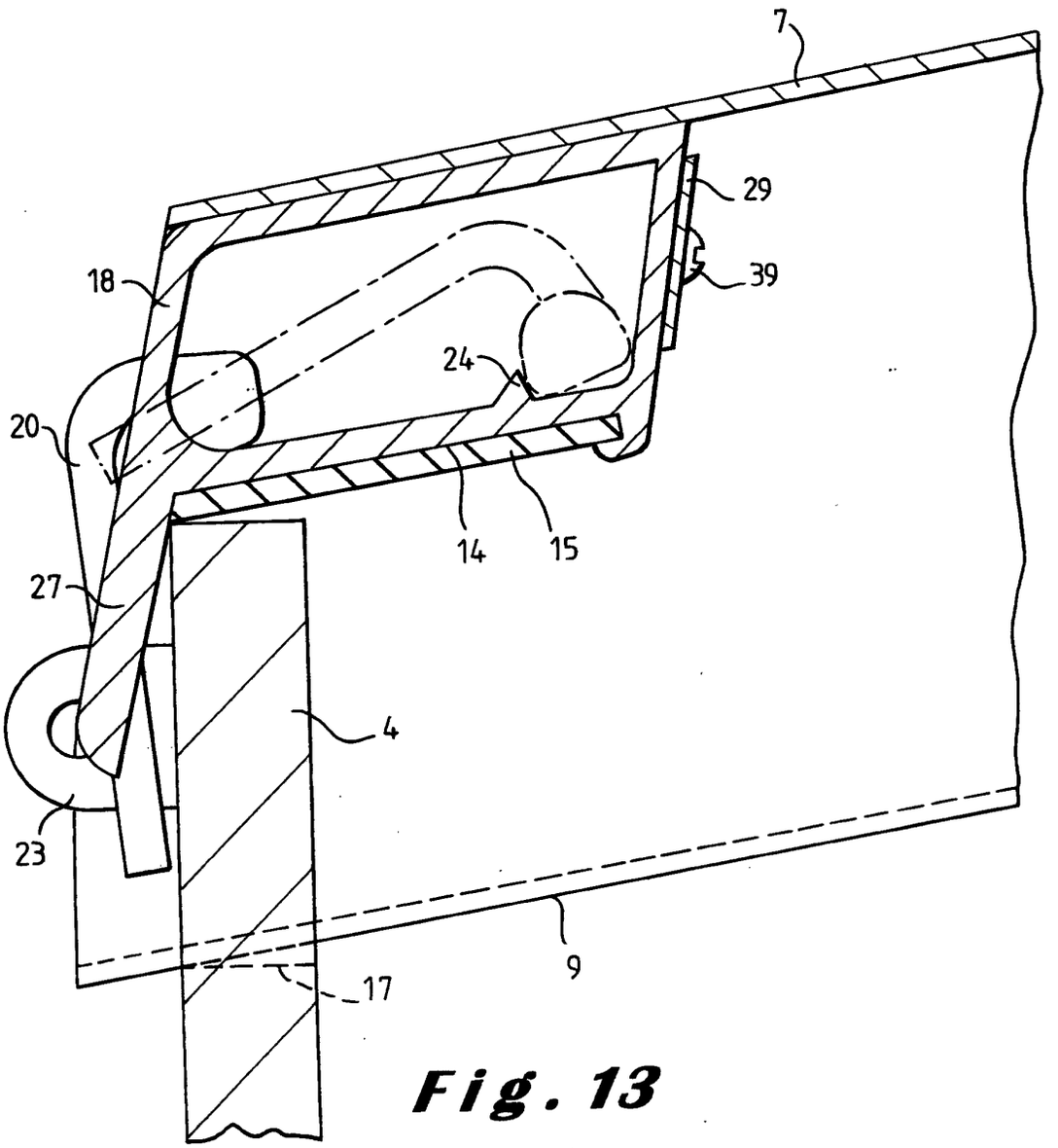

Fig. 13

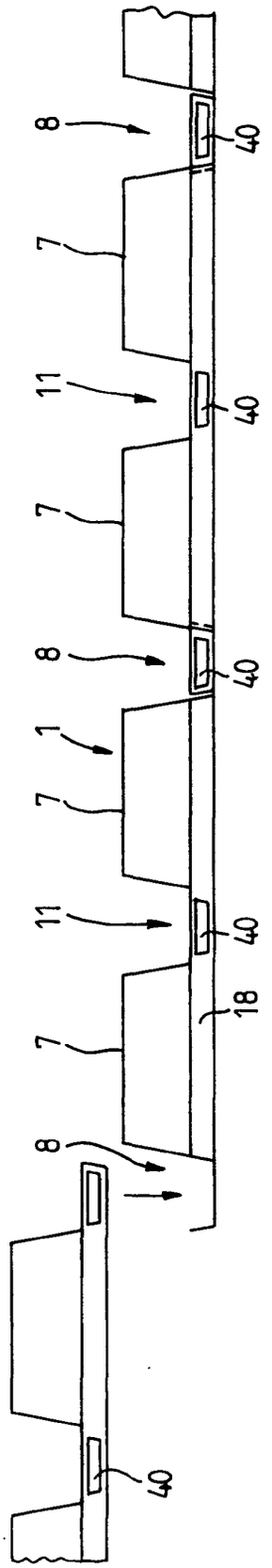

Fig. 14