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(54) **Overhead door with two-way hinge for a wicket door**

Kipptor mit Zweiwegscharnieren für einen Schlupftür

Porte basculante avec des charnières bidirectionnelles pour une porte de passage

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Description

[0001] The present invention relates to an overhead door according to the preamble of claim 1, to a two-way hinge suitable for use in the overhead door and according to the preamble of claim 5, and to a method for assembling the overhead door according to the preamble of claim 10.

[0002] Such an overhead door is generally known. The known overhead doors are built up of overhead panels which are pivotally interconnected by means of panel hinges. The overhead doors can be opened and closed, to which end they are usually guided in a rail system, a vertical part of which closes the entrance to a garage, warehouse or supplier entrance, for example, whilst the mutually pivotable and movable overhead panels can be stored in a horizontal part located thereabove. The overhead doors being referred to are provided with a wicket door, which is provided with door hinges mounted on the hinge side of the wicket door. Parts of the overhead panels also function as pivotally interconnected door panels, which are connected to the adjacent overhead panels by means of said door hinges.

[0003] The known overhead doors are built up at the overhead door factory prior to being completed at the location where the door is to be installed. Holes are predrilled in the various panels and the panel frames in which the panels are to be fixed, after which the various hinges for the overhead door and the wicket door are mounted in place. Dimensional stability, total weight and easy assembly are essential in this regard in order to be able to quickly install a high-quality and properly functioning end product at the customer's location.

[0004] Especially a correct assembly of the various types of hinges, perpendicular to each other and at the correct place, is of major importance so as to ensure that both the wicket door and the overhead door can be frequently and quickly opened and closed in a simple but nevertheless reliable, safe and splash-proof manner without any wrenching and without too much play.

[0005] US-1989658 from which claim 1 is delimited discloses an overhead door comprising panels interconnected by means of panel hinges, and a wicket door provided in the overhead door, which is connected to the panels by means of door hinges, whereby the panel hinges and door hinges are integrated in a two-way hinge.

[0006] DE-4216322 from which claim 5 is delimited discloses a two-way hinge having parts which are integrated in the two-way hinge which is suitable for use in the overhead door.

[0007] The object of the present invention is to provide an improved overhead door provided with a wicket door, which has fewer parts, in which the mounting of the various hinges relative to each other is less critical and which nevertheless leads to a dimensionally stable end product which can be assembled in a simple manner in a short time.

[0008] In order to accomplish that object, the overhead door according to the invention is characterised by the features of claim 1.

[0009] The advantage of the overhead door according to the invention is that it is no longer necessary to precisely position and mount the panel hinge and the door hinge, which must normally be mounted separately from each other, at an angle of 90 degree relative to each other, at the hinge side of the wicket door. Simple correct mounting of the two-way hinge at the location of the previous panel hinge will suffice, after which the door hinge integrated in the two-way hinge according to the invention is automatically related thereto in a dimensionally stable manner as regards mounting orientation and position and is advantageously also automatically mounted correctly.

[0010] Advantageously, said insertion spaces provide play for the overhead door panels and the wicket door panels, whose edges extend into said spaces and for which thus less stringent dimensional requirements apply. The end product meets high requirements regarding dimensional stability.

[0011] In practice the two-way hinge is fixed to the panels by means of pop rivets or bolts, for example, and the mouldings to be attached to the hinges are supported on the hinges. Advantageously, the mouldings need not be fixed to the panels, which saves assembly time. The U-shaped mouldings, on the other hand, may be attached to the panels by means of glue, pop rivets or bolts.

[0012] In addition, the dimensions of the mouldings, which are to be cut to size, are not critical because the mouldings can be readily mounted for movement within the U-shaped sections fixed to the two-way hinge. This, too, leads to a saving on preparation and assembly time.

[0013] Advantageously, the above leads to an assembly and mounting concept in which the panels are retained by the mouldings and the mouldings, by being moved into the U-shaped sections, are fixed in said sections, whilst only the hinges need to be fixed to the panels.

[0014] The finger protection, which prevents body parts, such as fingers, from getting wedged between hinging parts of the wicket door, need not be separately provided when cast in one piece with a casting. This leads to a further saving in assembly time and personnel, and thus to a reduction of the cost price.

[0015] One embodiment of the overhead door according to the invention is characterised in that the multiple hinge is made up of several, in particular four, castings which can be interconnected by means of hinge pins.

[0016] A two-way hinge made of several individual castings can be readily assembled into one solid two-way hinge onsite by means of the respective hinge pins. The panel and wicket door hinges already integrated therein are furthermore oriented at a fixed angle of precisely 90 degrees relative to each other.

[0017] The overhead door and the two-way hinge according to the invention that can be used therein will now be explained in more detail with reference to the figures below, in which like parts are indicated by the same numerals. In the drawing:

Figure 1A is a schematic view seen from the outer side of a closed overhead door according to the invention, which is provided with a partially open wicket door;

Figure 1B shows the overhead door of figure 1A in partially open position;

Figures 1C and 1D show details of the bottom side and the upper side, respectively, of the overhead door of figure 1A;

Figures 1E and 1F are detail views, seen from the inner side, of the upper side of the overhead door of figure 1A in the closed and partially open position, respectively, of the overhead door according to the invention; and

Figure 2 is a rear view of a two-way hinge according to the invention which is suitable for use in the overhead door of figure 1A;

Figure 3 is a front view of the hinge of figure 2;

Figure 4 shows a detail of one of the four castings of the two-way hinge, viz. the casting which is shown in the right-hand bottom corner of figure 2; and

Figure 5 shows a two-way hinge according to the invention combined with locally covered mouldings.

[0018] Figures 1A, 1B, 1C, 1D, 1E and 1F schematically show parts of an overhead door 1 comprising panels 3 interconnected by panel hinges 2, which door is movable in upward direction in the figures. The overhead door 1 also comprises a wicket door 4 provided therein, which is connected to the panels 3 via door hinges 5. At the boundary surface on the hinge side between the wicket door 4 and the respective panels 3 of the overhead door 1, the overhead door 1 is provided with a two-way hinge 6, in which a panel hinge 2 as well as a door hinge 5 are integrated.

[0019] Figure 2 shows a rear view of the two-way hinge 6, seen on the inner side of the overhead door 1, which hinge is made up of four castings in this embodiment, which castings are relatively easy to produce, each casting preferably taking up a quarter of the overall two-way hinge 6. The two-way hinge 6 is in that case made up of four substantially identical castings, which can be interconnected via hinge pins (not shown in the figures). Said castings are in that case relatively easy to produce from the materials mentioned below.

[0020] One of the castings, viz. the casting 7 which is shown in the right-hand bottom corner of figure 2, is shown in more detail in figure 4. The castings, such as the casting 7, are at least partially made of a lightweight material, for example plastic material, or a light metal, for example aluminium or magnesium.

[0021] As is shown in particular in the views of figures 2, 3 the two-way hinge 6 comprises two sets of panel hinges 2-1 and 2-2 and two sets of door hinges 5-1 and 5-2, which quite particularly lie in each other's centre plane perpendicular in this embodiment. As a result, the two sets of panel hinges 2-1 and 2-2 are arranged angularly symmetrically around the virtual hinge pin 9 of the panel hinges 2 and the two sets of door hinges 5-1 and 5-2 are arranged angularly symmetrically around the virtual hinge pin 8 of the door hinges 5. This leads to a very stable and solidly constructed hinge 6.

[0022] The overhead door 2 comprises mouldings P provided around the door opening and around the wicket door 4, which mouldings form the internal and external boundaries, respectively, of ends and edges of panels 3 of the overhead door 1 and of the wicket door 4.

[0023] In figures 2, 3 and 4 there is shown that the two-way hinge 6 is provided with U-shaped sections 10 on two of its sides, which sections are preferably integrated in the castings or which are to be attached to the hinge 6, which sections define insertion spaces 11 intended for the mouldings P that accommodate the aforesaid ends and edges of the panels 3. In said spaces 11, excess panel material can be accommodated. Generally, the insertion space 11 provides some play if the dimensions and dimensional precision of the panels 3 to be received therein are not optimal. This does not adversely affect the dimensional stability of the overhead door 1, however. The panels 3 need not be fixed in the mouldings P by fastening means, because only the two-way hinge 6 is fixed, to the surrounding panels 3, in the mounting concept presented herein, which saves labour, time and manpower. The U-shaped mouldings 10, on the other hand, can be fixed to the panels by means of glue, pop rivets or bolts.

[0024] In a preferred embodiment, the two-way hinge 6 is provided with a safety device to protect body parts, such as fingers, from getting wedged. Such a safety device is preferably cast integral with one or more castings of the two-way hinge. It is for example formed by an extension V and a corresponding recess U in a connecting part 13 between upright parts 14, 15 of the U-shaped sections 10, which extension and which recess are pivotable relative to each other. The risk of body parts getting wedged during the opening or closing of the overhead door is thus reduced.

[0025] The U-shaped sections 10 can be connected to the parts 14, 15, which form part of the mouldings P that are slidably mounted or snapped in place in the sections 10, so that their dimension is advantageously not critical, either.

[0026] Figure 5 is a view of a two-way hinge 6 in mounted condition, in which the mouldings P attached thereto or snapped in place thereon are covered at the location of the hinge. The figure further shows screw holes 16, via which the hinge 6 is fixed in place in the panel material.

Claims

1. An overhead door (1) comprising panels (3) interconnected by means of panel hinges (2), and a wicket door (4) provided in the overhead door (1), which is connected to the panels (3) by means of door hinges (5), which panel hinges (2) and door hinges (5)

are integrated in a two-way hinge (6) **characterised in that** the two-way hinge (6) is at least partially provided with U-shaped sections (10), which form insertion spaces (11) for the panels (3) of the overhead door (1) and/or the wicket door (4) as well as for adjacent U-shaped sections (10) or mouldings (P), which are movable therein, and that the two-way (6) hinge is provided with a safety device (U,V) to protect body parts, such as fingers, from getting wedged which safety device (12) is at least partially cast in one piece with one or more castings (7) of the two-way hinge (6).

2. An overhead door (1) according to claim 1, **characterised in that** the two-way hinge (6) is made up of several, in particular four, castings (7) which can be interconnected by means of hinge pins (8; 9).

3. An overhead door (1) according to one of claims 1-2, **characterised in that** the two-way hinge (6) is at least partially made of a lightweight material, for example plastic material, or a light metal, for example aluminium or magnesium.

4. An overhead door (1) according to any one of claims 1-3, **characterised in that** the two-way hinge (6) comprises mouldings (P), to which the two-way hinge (6) to be fixed to the panels (3) is connected.

5. A two-way hinge (6) suitable for use in an overhead door (1) according to any one of claims 1-4, whereby at least parts of a panel hinge (2) of the overhead door (1) and of a door hinge (5) of a wicket door (4) to be provided in the overhead door (1) are integrated in the two-way hinge (6), **characterised in that** the two-way hinge (6) is at least partially provided with U-shaped sections (10), which form insertion spaces (11) for panels (3) of the overhead door (1) and/or the wicket door (4) as well as for adjacent U-shaped sections (10) or mouldings (P), which are movable therein, and that the two-way (6) hinge is provided with a safety device (12) to protect body parts, such as fingers, from getting wedged which safety device (U,V) is at least partially cast in one piece with one or more castings (7) of the two-way hinge (6).

6. A two-way hinge (6) according to claim 5, **characterised in that** the two-way hinge (6) is made of castings (7), which castings (7) each comprise part of the panel hinge (2) and part of the door hinge (5).

7. A two-way hinge (6) according to claim 5 or 6, **characterised in that** the two-way hinge (6) comprises two sets of panel hinges (2) and two sets of door hinges (5).

8. A two-way hinge (6) according to claim 7, **characterised in that** the two sets of panel hinges (2) lie in the centre plane perpendicular between the two sets of door hinges (5).

9. A two-way hinge (6) according to claim 7 or 8, **characterised in that** the two sets of door hinges (5) lie in the centre plane perpendicular between the two sets of panel hinges (2).

10. A method wherein an overhead door (1) according to any one of claims 1-4 is assembled by fixing the two-way hinge (6) according to any one of claims 5-9 to panel material of the overhead door (1) and to a wicket door (4) provided therein, **characterised in that** panels (3) of the overhead door (1) and the wicket door (4) are fitted between U-shaped sections (10) fixed to the hinge (6).

11. A method according to claim 10, **characterised in that** the two-way hinge (6) is assembled from castings (7) to be interconnected by means of hinge pins (8; 9).

Patentansprüche

1. Überkopftor (1), welches Paneele (3), die mithilfe von Paneelscharnieren (2) miteinander verbunden sind, und eine in dem Überkopftor (1) vorgesehene Schlupftür (4), welche mithilfe von Türscharnieren (5) mit den Paneelen (3) verbunden ist, umfasst, wobei diese Paneelscharniere (2) und Türscharniere (5) in einem Zweiwegscharnier (6) integriert sind, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) wenigstens teilweise mit U-förmigen Sektionen (10) versehen ist, welche Einschubräume (11) für die Paneele (3) des Überkopftors (1) und/oder der Schlupftür (4) sowie für benachbarte U-förmige Sektionen (10) oder Formteile (P), welche darin beweglich sind, bilden, und dass das Zweiwegscharnier (6) mit einer Sicherheitsvorrichtung (U, V) versehen ist, um Körperteile wie etwa Finger vor dem Einquetschen zu schützen, wobei diese Sicherheitsvorrichtung (12) wenigstens teilweise mit einem oder mehreren Gussteilen (7) des Zweiwegscharniers (6) aus einem Stück gegossen ist.

2. Überkopftor (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) von mehreren, insbesondere vier, Gussteilen (7) gebildet wird, welche mithilfe von Scharnierbolzen (8; 9) miteinander verbunden sein können.

3. Überkopftor (1) nach einem der Ansprüche 1-2, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) wenigstens teilweise aus einem leichten Material, zum Beispiel Kunststoffmaterial, oder einem Leichtmetall, zum Beispiel Aluminium oder Magnesium, hergestellt ist.

4. Überkopftor (1) nach einem der Ansprüche 1-3, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) Formteile (P) umfasst, mit welchen das an den Paneelen (3) zu befestigende Zweiwegscharnier (6) verbunden ist.

5. Zweiwegscharnier (6), welches für eine Verwendung in einem Überkopftor (1) nach einem der Ansprüche 1-4 geeignet ist, wobei wenigstens Teile eines Paneelscharniers (2) des Überkopftors (1) und eines Türscharniers (5) einer Schlupftür (4), die in dem Überkopftor (1) vorgesehen werden soll, in dem Zweiwegscharnier (6) integriert sind, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) wenigstens teilweise mit U-förmigen Sektionen (10) versehen ist, welche Einschubräume (11) für Paneele (3) des Überkopftors (1) und/oder der Schlupftür (4) sowie für benachbarte U-förmige Sektionen (10) oder Formteile (P), welche darin beweglich sind, bilden, und dass das Zweiwegscharnier (6) mit einer Sicherheitsvorrichtung (12) versehen ist, um Körperteile wie etwa Finger vor dem Einquetschen zu schützen, wobei diese Sicherheitsvorrichtung (U, V) wenigstens teilweise mit einem oder mehreren Gussteilen (7) des Zweiwegscharniers (6) aus einem Stück gegossen ist.

6. Zweiwegscharnier (6) nach Anspruch 5, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) aus Gussteilen (7) besteht, wobei diese Gussteile (7) jeweils einen Teil des Paneelscharniers (2) und einen Teil des Türscharniers (5) umfassen.

7. Zweiwegscharnier (6) nach Anspruch 5 oder 6, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) zwei Sätze von Paneelscharnieren (2) und zwei Sätze von Türscharnieren (5) umfasst.

8. Zweiwegscharnier (6) nach Anspruch 7, **dadurch gekennzeichnet, dass** die zwei Sätze von Paneelscharnieren (2) in der Mittelebene liegen, die senkrecht zwischen den zwei Sätzen von Türscharnieren (5) verläuft.

9. Zweiwegscharnier (6) nach Anspruch 7 oder 8, **dadurch gekennzeichnet, dass** die zwei Sätze von Türscharnieren (5) in der Mittelebene liegen, die senkrecht zwischen den zwei Sätzen von Paneelscharnieren (2) verläuft.

10. Verfahren, wobei ein Überkopftor (1) nach einem der Ansprüche 1-4 zusammengebaut wird, indem das Zweiwegscharnier (6) nach einem der Ansprüche 5-9 an Paneelmaterial des Überkopftors (1) und an einer darin vorgesehenen Schlupftür (4) befestigt wird, **dadurch gekennzeichnet, dass** Paneele (3) des Überkopftors (1) und der Schlupftür (4) zwischen U-förmigen Sektionen (10), die an dem Scharnier (6) befestigt sind, angebracht werden.

11. Verfahren nach Anspruch 10, **dadurch gekennzeichnet, dass** das Zweiwegscharnier (6) aus Gussteilen (7) zusammengebaut wird, die mithilfe von Scharnierbolzen (8; 9) miteinander zu verbinden sind.

Revendications

1. Porte basculante (1) comprenant des panneaux (3) interconnectés au moyen de charnière de panneaux (2), et un portillon incorporé (4) prévu dans la porte basculante (1), qui est raccordé aux panneaux (3) au moyen de charnières de porte (5), lesquelles charnière de panneaux (2) et charnières de porte (5) sont intégrées dans une charnière bidirectionnelle (6), **caractérise en ce que** la charnière bidirectionnelle (6) et au moins partiellement pourvue de sections en forme de U (10), qui forment des espaces d'insertion (11) pour les panneaux (3) de la porte basculante (1) et/ou le portillon incorporé (4) ainsi que pour des sections en forme de U adjacente (10) ou des moulages (P), qui sont déplaçables à l'intérieur de celle-ci et **en ce que** la charnière bidirectionnelle (6) est pourvue d'un dispositif de sécurité (U,V) pour protéger les parties du corps, comme les doigts, afin d'éviter qu'il se coince, lequel le dispositif de sécurité (12) est au moins partiellement moulé en un seul tenant avec un ou plusieurs moulages (7) de la charnière bidirectionnelle (6).

2. Porte basculante (1) selon la revendication 1, **caractérisée en ce que** la charnière bidirectionnelle (6) est constituée de plusieurs, en particulier quatre, moulages (7) qui peuvent être interconnectés au moyen de goupilles de charnière (8; 9).

3. Porte basculante (1) selon une des revendications 1-2, **caractérisée en ce que** la charnière bidirectionnelle (6) est au moins partiellement fabriquée dans un matériau ultraléger, par exemple une matière plastique ou un métal léger par exemple de l'aluminium du magnésium.

4. Porte basculante (1) selon une quelconque des revendications 1-3, **caractérisée en ce que** la charnière bidirectionnelle (6) comprend des moulages (P), auxquels la charnière bidirectionnelle (6) à fixer aux panneaux (3) est raccordée.

5. Charnière bidirectionnelle (6) convenant à une utilisation dans une porte basculante (1) selon une quelconque des revendications 1-4, moyennant quoi au moins des parties d'une charnière de panneau (2) de la porte basculante (1) et d'une charnière de porte (5) d'un portillon incorporé (4) à prévoir dans la porte

basculante (1) sont intégrées dans la charnière bidirectionnelle (6), **caractérisé en ce que** la charnière bidirectionnelle (6) est au moins partiellement pourvue de sections en forme de U (10), qui forment des espaces d'insertion (11) pour les panneaux (3) de la porte basculante (1) et/ou le portillon incorporé (4) ainsi que pour des sections en forme de U adjacente (10) ou des moulages (P), qui sont déplaçables à l'intérieur de celle-ci et **en ce que** la charnière bidirectionnelle (6) est pourvue d'un dispositif de sécurité (12) pour protéger les parties du corps, comme les doigts, afin d'éviter qu'il se coince, lequel le dispositif de sécurité (U, V) est au moins partiellement moulé en un seul tenant avec un ou plusieurs moulages (7) de la charnière bidirectionnelle (6).

6. Charnière bidirectionnelle (6) selon la revendication 5, **caractérisée en ce que** la charnière bidirectionnelle (6) est constituée de moulages (7), lesquels moulages (7) comprennent chacun une partie de la charnière de panneau (2) et une partie de la charnière de porte (5).

7. Charnière bidirectionnelle (6) selon la revendication 5 ou 6, **caractérisée en ce que** la charnière bidirectionnelle (6) comprend deux ensembles de charnières de panneaux (2) et deux ensembles de charnières de porte (5).

8. Charnière bidirectionnelle (6) selon la revendication 7, **caractérisée en ce que** les deux ensembles de charnières de panneaux (2) sont situés dans le plan central perpendiculaire entre les deux ensembles de charnières de porte (5).

9. Charnière bidirectionnelle (6) selon la revendication 7 ou 8, **caractérisée en ce que** les deux ensembles de charnières de porte (5) sont situées dans le plan central perpendiculaire entre les deux ensembles de charnières de panneaux (2).

10. Procédé dans lequel une porte basculante (1) selon une quelconque des revendications 1-4 et assemblées en fixant la charnière bidirectionnelle (6) selon une quelconque des revendications 5-9 au matériau de panneau de la porte basculante (1) et à un portillon incorporé (4) prévu dans celle-ci, **caractérisée en ce que** les panneaux (3) de la porte basculante (1) et le portillon incorporé (4) sont ajustés entre des sections en forme de U (10) fixées à la charnière (6).

11. Procédé selon la revendication 10, **caractérisé en ce que** la charnière bidirectionnelle (6) est assemblée à partir de moulages (7) à interconnecter au moyen de goupilles de charnière (8; 9).

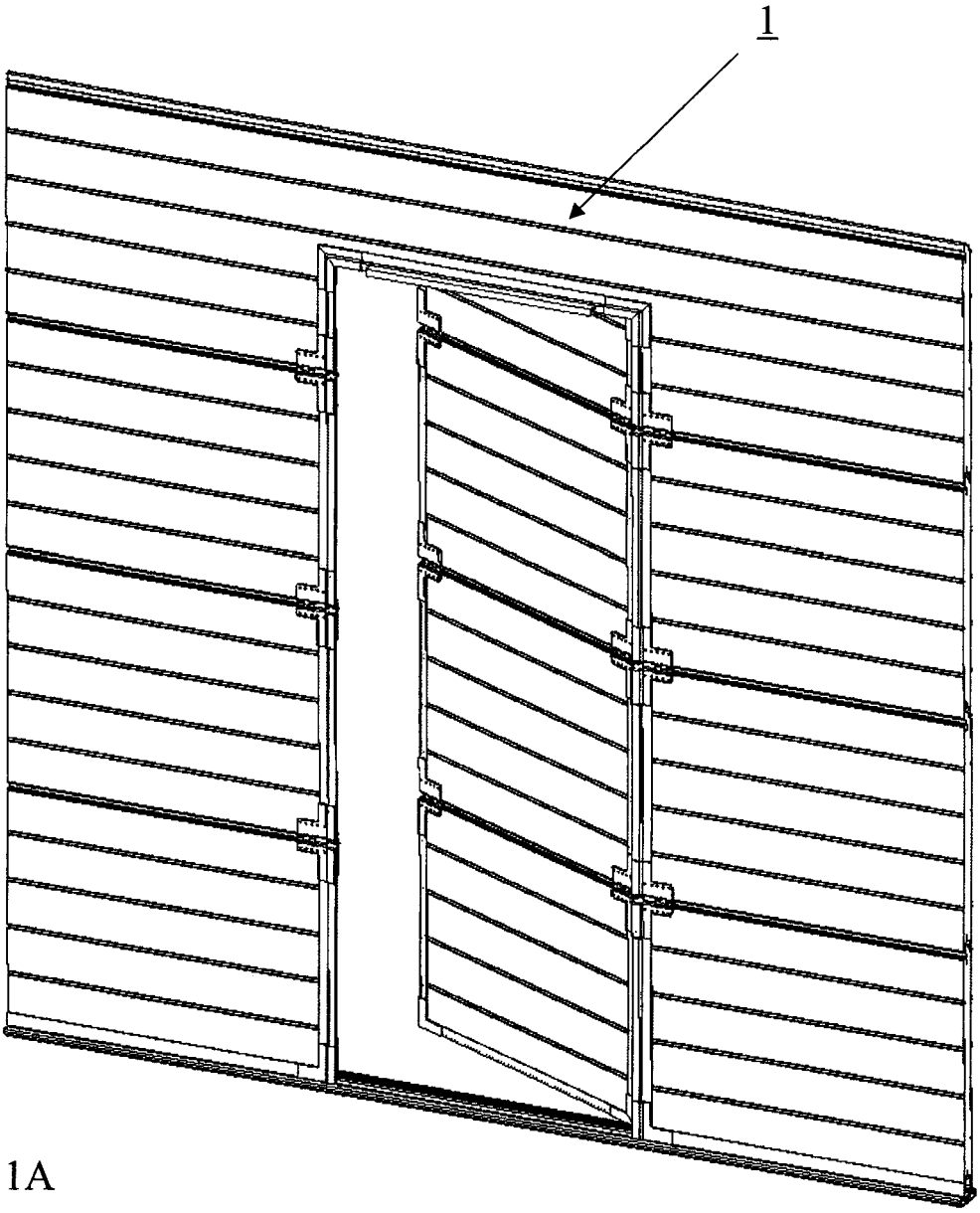


Fig 1A

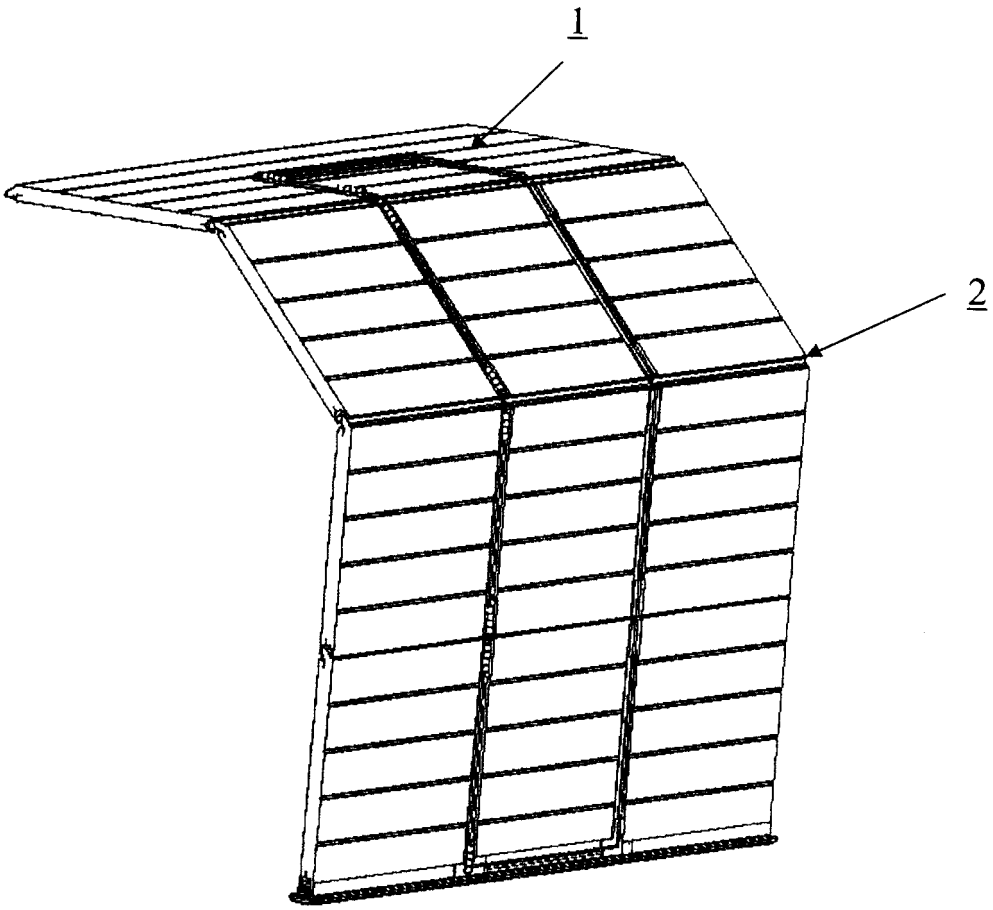


Fig 1B

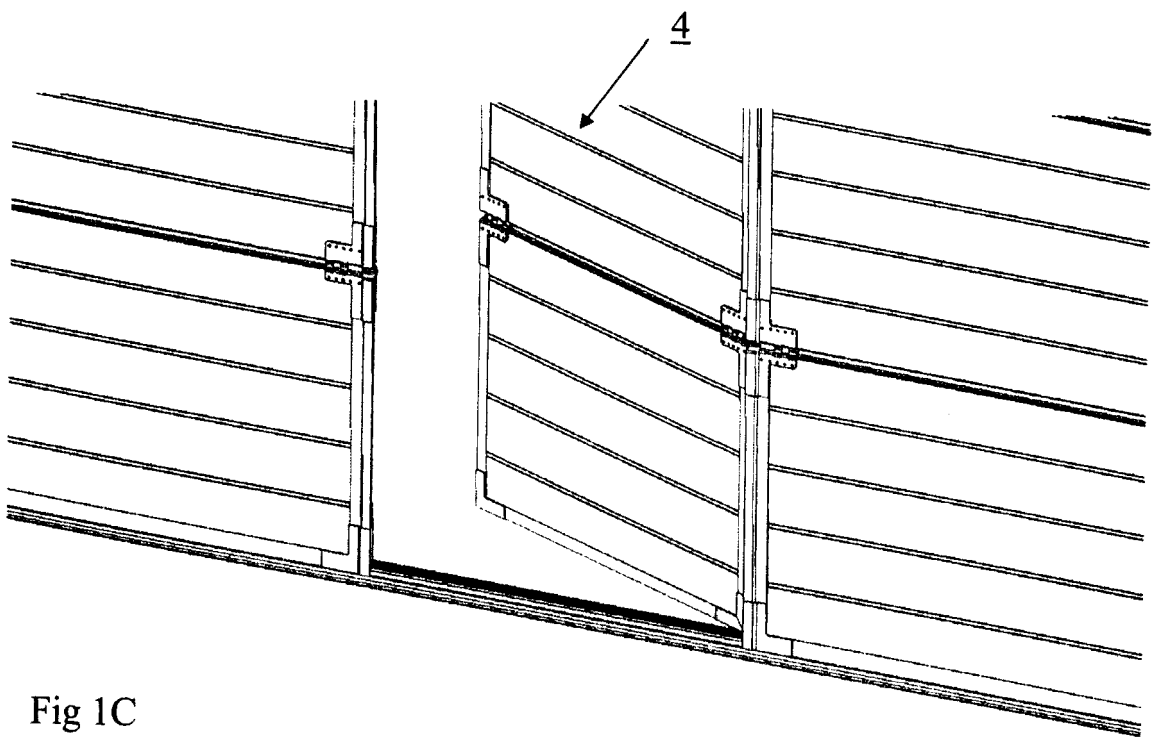


Fig 1C

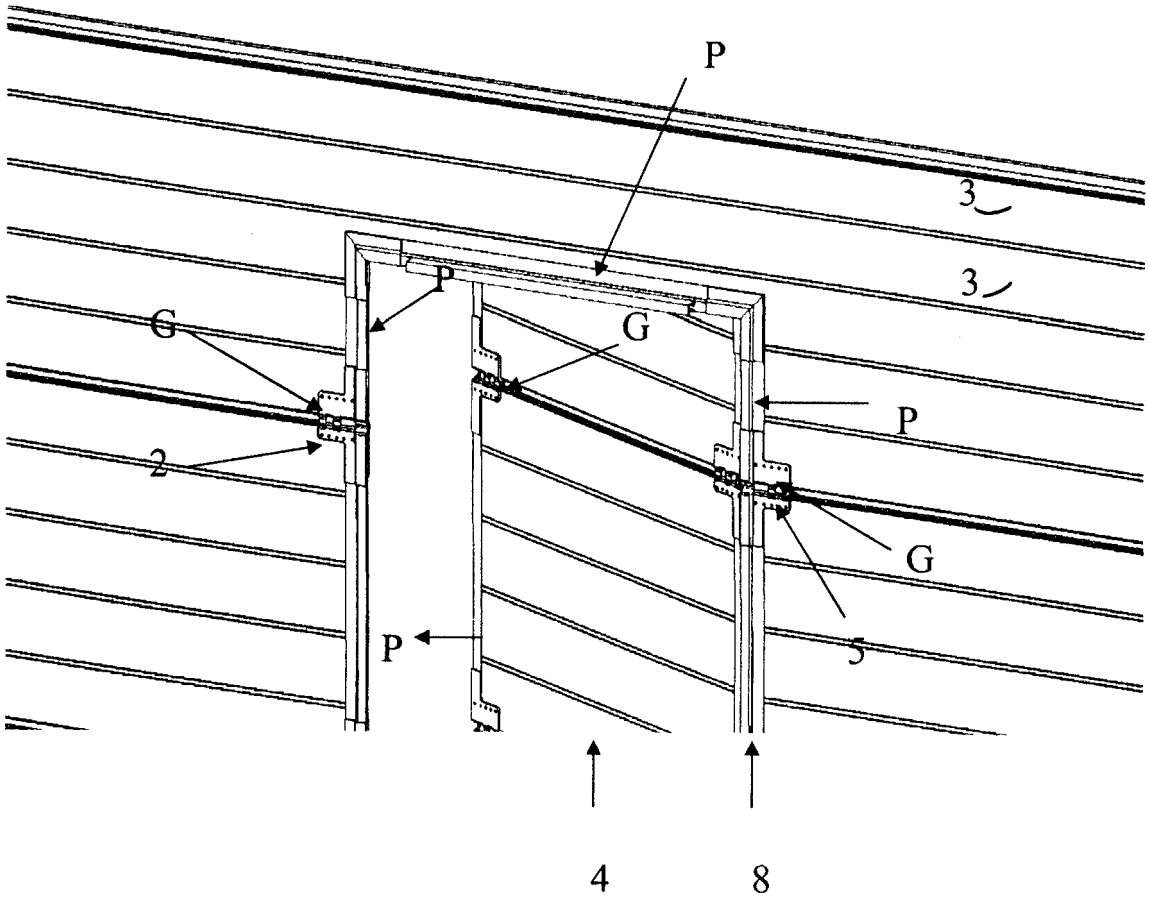


Fig 1D

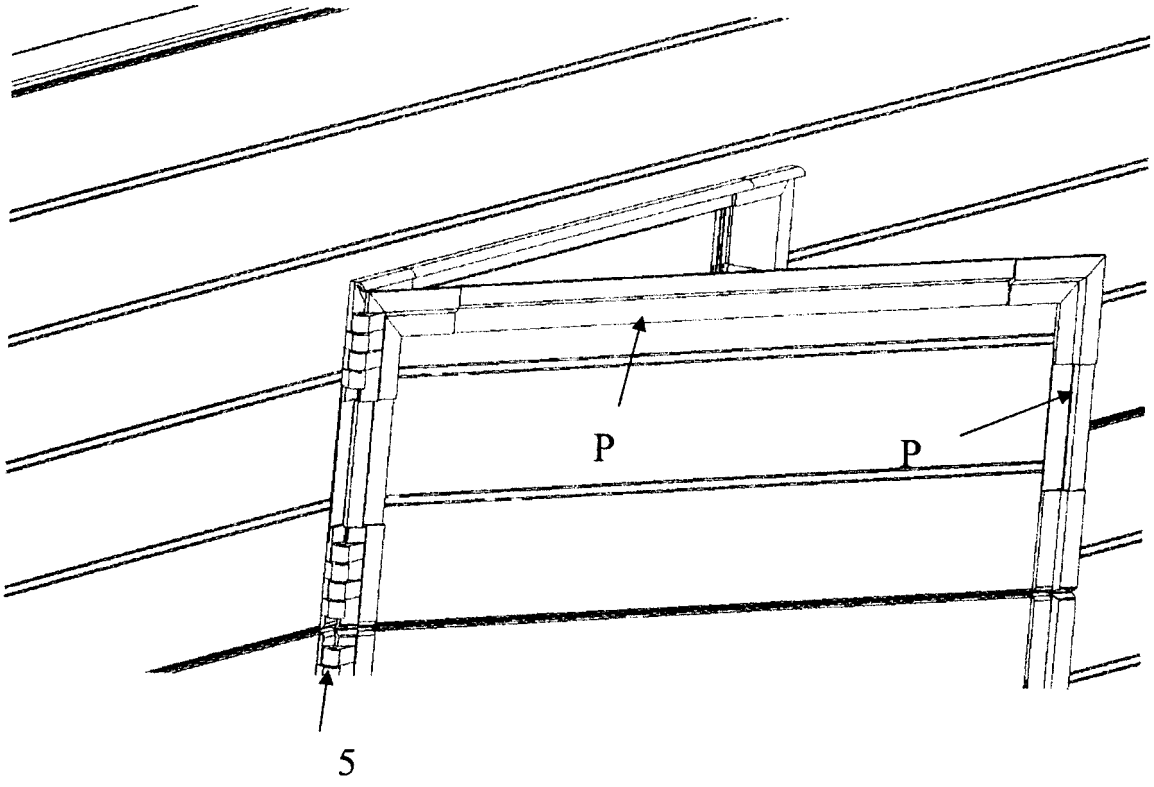


Fig 1E

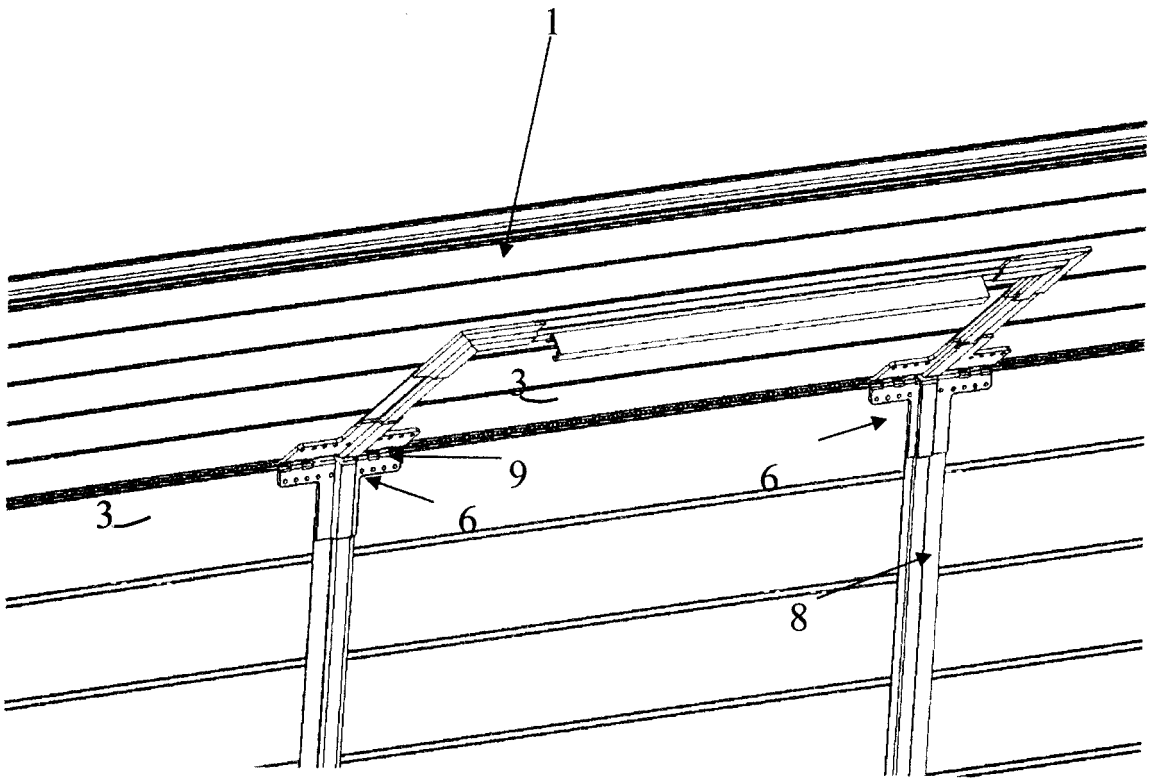


Fig 1F

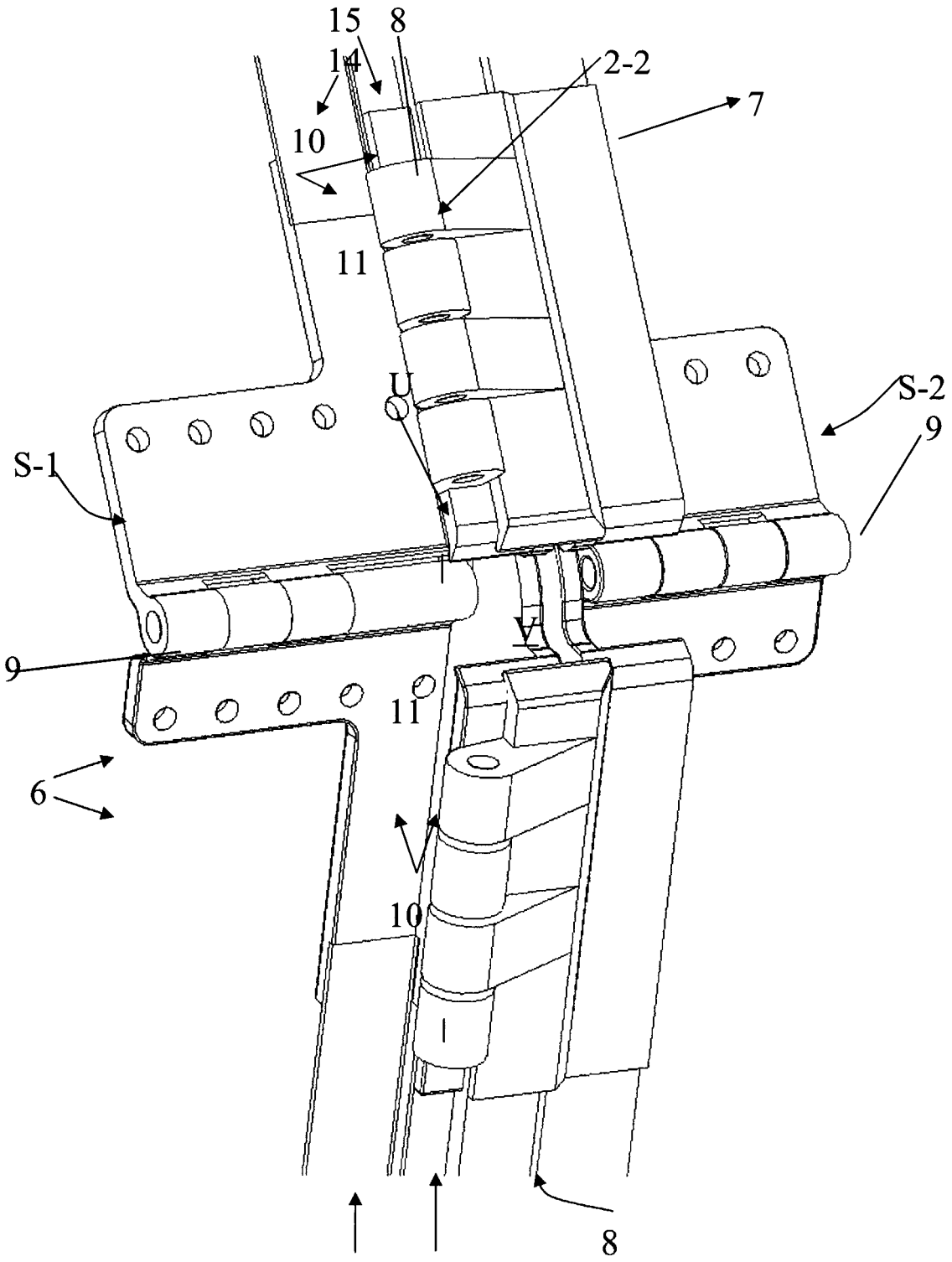


Fig 2

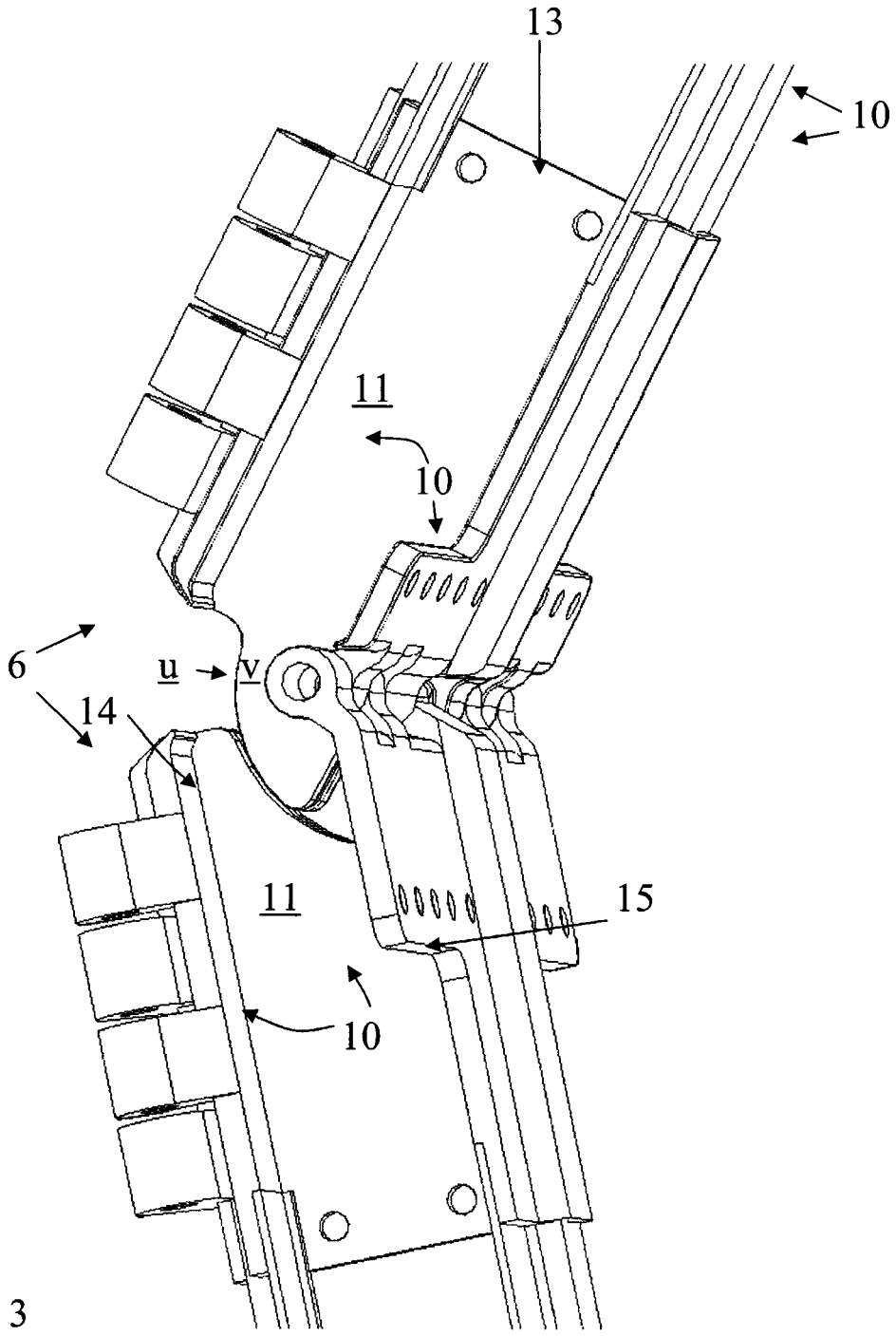


Fig 3

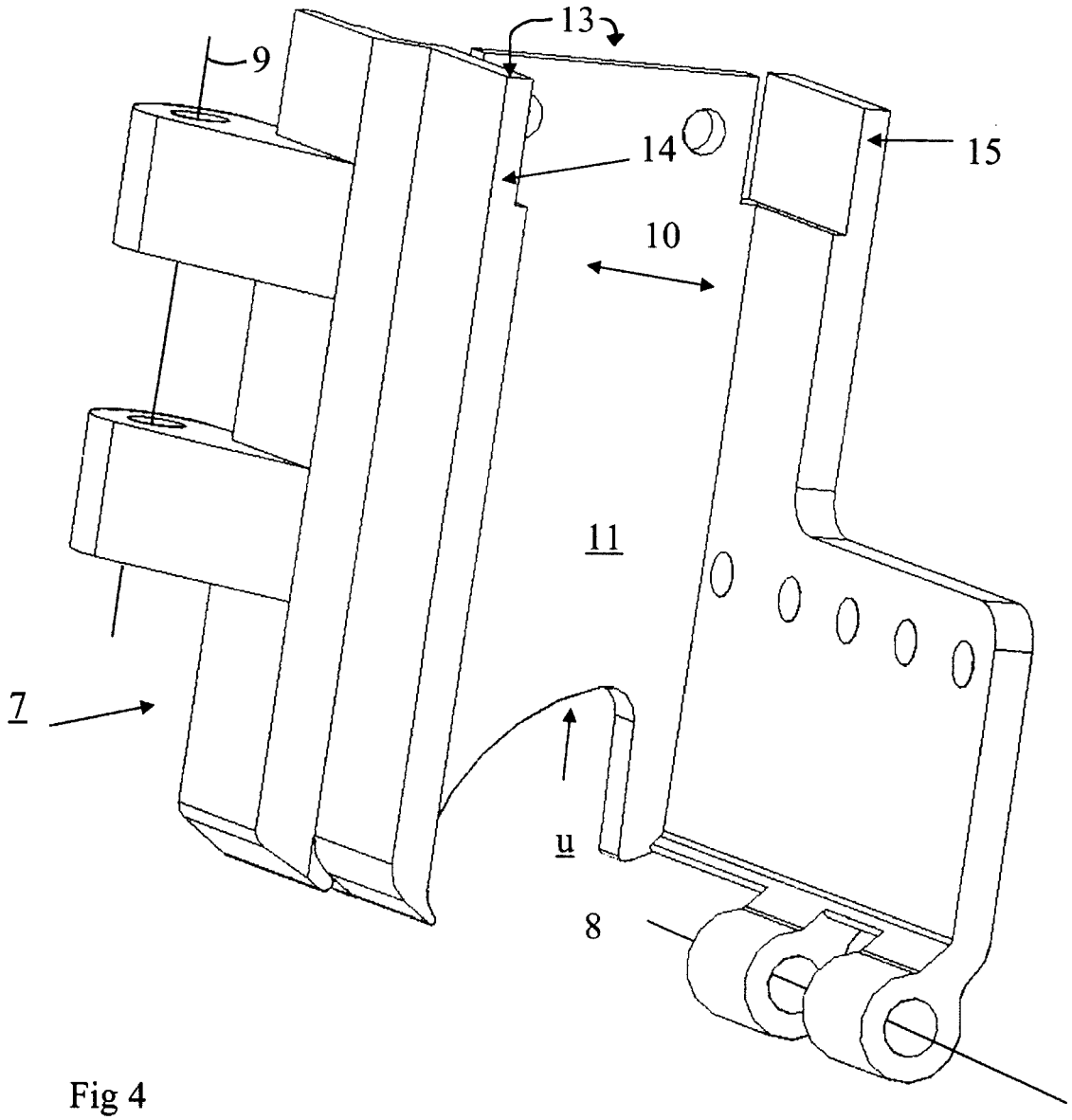


Fig 4

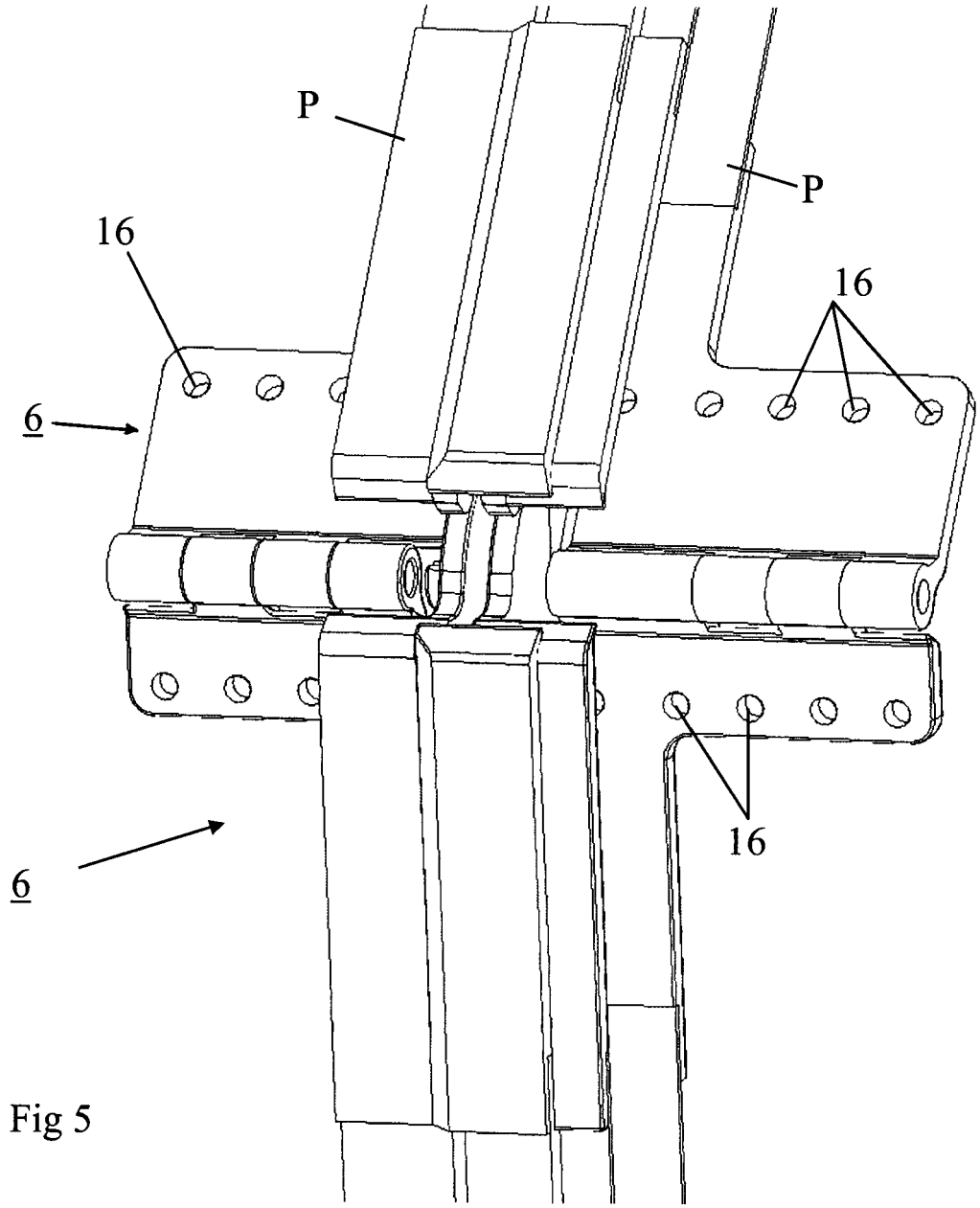


Fig 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 1989658 A **[0005]**
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