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(54) **Bandraster system, connection member therefor and method for installing a suspended ceiling using the bandraster system**

(57) Bandraster system for constructing a suspended ceiling, comprising
- a U-shaped longitudinal bandraster member (2) comprising a base (6), side walls (7,8) and flanges (11,12) delimiting a connection volume,
- and a connection member (1) with a protrusion (15),
wherein the protrusion, the connection member and the bandraster member are provided such that the bandraster member (2) can be connected by the connection member (1) by hooking the bandraster member (2) on the connection part (3) of the connection member (1) by putting the protrusion (15) between the first side wall (7) and the first flange (11) after which the connection part (3) is snap-fittingly received in the connection volume by rotating the second part (5) and the bandraster member (2) with respect to each other around the protrusion (15) into the connection volume such that it is received between the base (6) and the second flange.

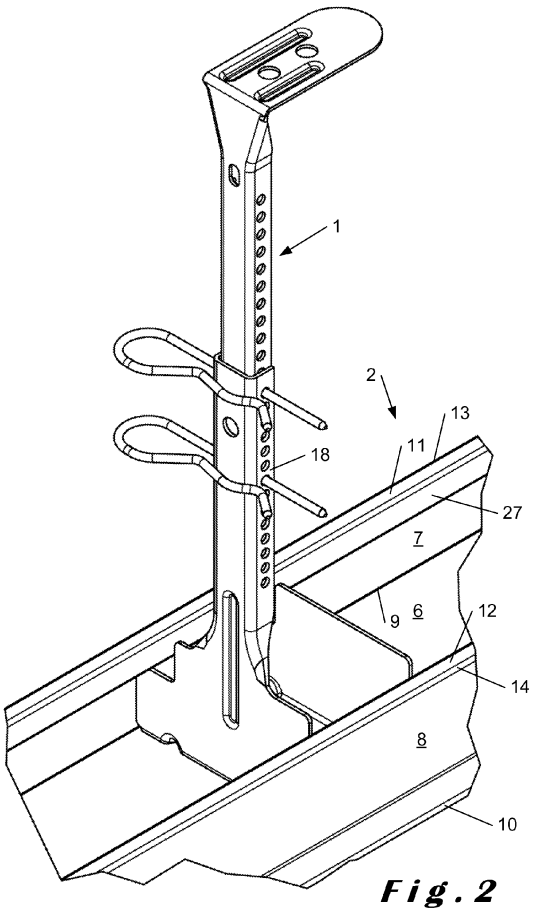

Fig. 2

EP 2 397 618 A1

Description

[0001] The present invention relates to a bandraster system for constructing a suspended ceiling, according to the preamble of the first claim.

[0002] The present invention also relates to a connection member therefor and a method for installing a suspended ceiling using the bandraster system.

[0003] Bandraster systems for construction suspended ceilings are known to the person skilled in the art. For example EP A1 1561875 and DE A1 2109596 both describe a bandraster system for construction a suspended ceiling comprising a U-shaped longitudinal bandraster member comprising a longitudinal base with respectively a first and a second longitudinally extending upright side wall along opposing longitudinal first and second edges of the base. The first and the second side wall respectively comprise a first and a second flange respectively extending inwardly from a first and a second top edge of the first and the second side wall. The base, the side walls and the flanges delimit a connection volume. The bandraster systems further comprise a connection member for connecting the U-shaped bandraster member into the remainder of the suspended ceiling. The connection member comprises a connection part for connecting the bandraster member to the connection member. The connection part is provided to be snap-fittingly received in the connection volume for releasably mounting the connection member to the bandraster member. The connection part comprises a first and second part respectively provided to be received between the first flange and the base and the second flange and the base.

[0004] The bandraster system described by EP A1 1561875 for example comprises a connection member with a connection part that is provided to be slid into position along longitudinal direction of the bandraster member such that the first and second part are respectively provided to be received between the first flange and the base and the second flange and the base.

[0005] The bandraster system described by DE A1 2109596 describes a connection member which can be snap-fitted into the connection volume. The first part comprises an upright protrusion provided to be received between the first upright side wall and the first flange. Such a connection member however must be snap-fitted into the volume by pressing the connection member into the volume with a force which is substantially perpendicular to the longitudinal direction of the base of the bandraster member since the space around the protrusion of the first part is too limited to allow any other method of snap-fitting the connection member into the volume. Such a way of mounting the connection member into the volume however often requires that the bandraster member needs to be put on the floor with the volume facing upwardly after which the connection member is pushed into place. It is difficult to mount the bandraster member to the connection member when the connection members are, for example, already suspending from a ceiling to create a suspended ceiling.

[0006] It is therefore an object of the current invention to provide a bandraster system in which mounting of the connection member to the bandraster member can be done more easily.

[0007] Thereto, the protrusion, the connection member and the bandraster member are provided such that the bandraster member can be connected by the connection member by hooking the bandraster member on the connection part of the connection member by putting the protrusion between the first side wall and the first flange after which the connection part is snap-fittingly received in the connection volume by rotating the second part and the bandraster member with respect to each other around the protrusion into the connection volume such that it is received between the base and the second flange.

[0008] Such a connection member allows to mount the bandraster member to the connection member without having to exert a perpendicular force to the base but instead allows to rotate the second part and the bandraster member with respect to each other around the protrusion into the connection volume such that it is received between the base and the second flange after hooking the bandraster member on the connection part of the connection member by putting the protrusion between the first side wall and the first flange. This different way of mounting a connection member to a bandraster member has been found much easier than the known methods.

[0009] In preferred embodiments of the bandraster system according to the current invention, the second part comprises a second upright protrusion provided to be received between the second upright side wall and the second flange when the second part is provided between the second flange and the base. Such a second protrusion improves the mounting of the connection part into the volume of the bandraster element and decreases the risk that the connection part unwontedly leaves the volume.

[0010] In preferred embodiments of the bandraster system according to the current invention, the second part is at least partly delimited by an upright edge for guiding the second wide wall during rotation of the second part, the upright edge extending outwardly from the base of the bandraster member to the second side wall when the connection member is mounted to the bandraster member. Such an upwardly extending edge allows a more easy mounting of the connection member to the bandraster member as prior to establishing the snap-fit connection of the connection part in the volume of the bandraster member, during rotation of the connection member, the second side wall is pushed outwardly with respect to the volume creating the necessary space for allowing the connection part to enter the volume.

[0011] In preferred embodiments of the bandraster system according to the current invention, the connection member comprises a suspension part for attaching the connection member to a ceiling. Such a suspension part

allows the connection member to be used for suspending the bandraster member to a ceiling and therefore to create a suspended ceiling. Such a connection member allows to more easily connect a bandraster member into a suspended ceiling as the bandraster member can be hooked on the connection members and can suspend from the connection member before establishment of the snap-fit connection of the connection part into the volume. Therefore, the bandraster member can be intermediately suspended before having to mount the connection member to the bandraster member and the bandraster member and the connection member, for example, no longer need to be premounted before attaching the connection member to the ceiling.

[0012] In preferred embodiments of the bandraster system according to the current invention, the connection member comprises a second connection part for connecting a second bandraster member to the connection member. Such a second connection part allows to connect a second bandraster member to the connection member, for example to longitudinally interconnect two bandraster members when the first and the second connection part of the connection member longitudinally extend away from each other.

[0013] In preferred embodiments of the bandraster system according to the current invention, the connection part comprises a paramagnetic flange running substantially parallel with the base of the bandraster member when the connection member has been mounted to the bandraster member. Such a flange allows to mount a magnetic element to the connection part. As the paramagnetic flange runs substantially parallel with the base of the bandraster member when the connection member has been mounted to the bandraster member, a mark for indicating the position correct position of the bandraster member and/or connection member and/or the suspended ceiling which is created can be magnetically mounted to the connection member during mounting such that the position, more in particular the height, of the connection member can be adapted to the required position.

[0014] In preferred embodiments of the bandraster system according to the present invention, the second part comprises a foldable securing flange extending out of the volume, when the connection part is snap-fittingly received in the volume, and provided to be at least partly folded around the second flange.

[0015] The invention also relates to such a connection member.

[0016] The invention also relates to a method for constructing a suspended ceiling using a bandraster system according to the invention in which the following steps are performed:

- attaching at least one connection member to a ceiling,
- hooking at least one bandraster member on the suspension parts by putting the protrusion between the first side wall and the first flange and
- snap-fitting the suspension part into the suspension volume of the bandraster member by snap-fittingly receiving the connection part in the connection volume by rotating the second part around the protrusion into the connection volume such that it is received between the base and the second flange.

[0017] Such a method allows a more easy creation of a suspended ceiling as it allows to intermediately suspend a bandraster member to the at least one connection member or at least two connection members or to interconnect two bandraster members to each other with the at least one connection member. It becomes for example possible that a single person is able to mount the suspended ceiling in which case firstly the connection members are suspended after which the bandraster members are hooked on it and after which the bandraster members are snap-fitted into the volume.

[0018] Other details and advantages of the bandraster system according to the invention will become apparent from the enclosed figure and description of preferred embodiments of the invention.

Figure 1 shows an embodiment of the connection member according to the current invention.
Figure 2 shows the connection member shown in figure 1 mounted to a bandraster member.
Figure 3a, 3b and 3c show different embodiments of the connection member according to figure 1.
Figure 4a shows a view in perspective of another embodiment of the connection member according to the present invention.
Figure 4b shows a side view of the connection member according to figure 4a.
Figure 4c shows another side view of the connection member according to figure 4a.
Figure 4d shows a top view of the connection member according to figure 4a.
Figure 5a, 5b, 5c, 5d and 5e show the different steps for mounting a connection member according to figures 4a, 4b, 4c and 4d to a bandraster member in a side view.
Figure 6a, 6b, 6c, 6d and 6e show the different steps for mounting a connection member according to figures 4a, 4b, 4c and 4d to a bandraster member in a view in perspective.
Figure 7a shows a different embodiment of the connection member of figure 4a in a view in perspective.
Figure 7b shows the connection member according to figure 7a mounted to a bandraster member in a view in perspective.
Figure 8 shows a different embodiment of the connection member shown in figure 1.

[0019] Figure 1 shows an embodiment of the connection member 1 according to the current invention. The connection member 1 is adapted to connect a U-shaped bandraster member 2 into the remainder of the suspend-

ed ceiling. Figure 2 for example shows that the connection member 1 of figure 1 is mounted into a U-shaped bandraster member 2 such that the bandraster member 2 can be attached to a ceiling for creating a suspended ceiling. Different embodiments of the connection member 1 are for example shown in figures 3, 3b and 3c.

[0020] U-shaped bandraster members 2 are known to the person skilled in the art and comprise a longitudinal base 6 with respectively a first and a second 8 longitudinally extending upright side wall along opposing longitudinal first 9 and second 10 edges of the base 6. The first 7 and the second 8 side wall respectively comprise first 11 and second 12 flanges respectively extending inwardly from a first 13 and a second 14 top edge of the first and the second 8 side wall.

[0021] Such U-shaped bandraster members 2 are usually made of metal such as for example steel, more in particular stainless steel or galvanized steel, and are often folded from a single metal plate.

[0022] The base 6, the side walls 7, 8 and the flanges 11, 12 delimit a connection volume. The connection volume is for example shown in figures 2, 3a, 3b and 3c and is in this case rectangular. The shape of the volume however can be adapted to the specific application of the bandraster system.

[0023] The connection member 1 comprises a connection part 3 for connecting the bandraster member 2 to the connection member 1 and provided to be snap-fittingly received in the connection volume for releasably mounting the connection member 1 to the bandraster member 2.

[0024] The connection part 3 comprises a first 4 and second 5 part. The first part 4 is provided to be received between the first flange 11 and the base 6. The second part 5 is provided to be received between the second flange 12 and the base 6 when snap-fitted into the connection volume.

[0025] The first part 4 shown in figure 1 comprises an upright protrusion 15 provided to be received between the first upright side wall 7 and the first flange 11. The first part 4 preferably is provided to fit, more preferably snugly fit, between the first flange 11 and the base 6 to further improve the mounting of the connection member to the bandraster member 2.

[0026] The protrusion 15, the connection member 1 and the bandraster member 2 are provided such that the bandraster member 2 can be connected by the connection member 1 by hooking the bandraster member 2 on the connection part 3 of the connection member 1 by putting the protrusion 15 between the first side wall 7 and the first flange 11 after which the connection part 3 is snap-fittingly received in the connection volume by rotating the second part 5 and the bandraster member 2 with respect to each other around the protrusion 15 into the connection volume such that it is received between the base 6 and the second flange 12. The rotating of the second part 5 and the bandraster member 2 with respect to each other around the protrusion 15 into the connection volume such that it is received between the base 6 and the second flange 12 is for example shown in figures 5a, 5b, 5c and 5d. Although the connection member shown in figures 5a, 5b, 5c and 5d differs from the connection member shown in figure 1 and figures 3a, 3b and 3c, the rotating movement to mount the connection member 1 to the bandraster member 2 is substantially the same.

[0027] A connection member 1 according to the present invention mounted into a bandraster member 2 is shown in figure 2. The protrusion 15 is invisible as it is hidden behind flanges of the bandraster member 2.

[0028] As shown in figure 1 the second part 5 comprises a second upright protrusion 16 provided to be received between the second upright side wall 8 and the second flange 12 when the second part 5 is provided between the second flange 12 and the base 6. As shown in figures 3a, 3b and 3c the first and the second flange 11, 12 often, and preferably, comprise further flanges 27 extending from it and extending towards and into the volume of the bandraster member 2. Preferably, in such a case the second protrusion 16 is provided to be received between the further flange 27, the second flange 12 and the second side wall 8. Such a second protrusion 16 allows the connection part 3 to be more securely snap-fitted into the volume allow a more secure mount of the connection member 1 to the bandraster member 2.

[0029] When the bandraster member 2 comprises such further flange 27 on the first upright side wall 7, the first protrusion 15 provided on the first part 4 is preferably also provided to be received between the further flange 27, the first flange 11 and the first side wall 7. When the first protrusion 15 is received between the further flange 27, the first flange 11 and the first side wall 7, the mounting of the connection member 1 to the bandraster member 2 is further secured.

[0030] Although it is preferred that the bandraster member 2 comprises further flanges 27 extending from both the first and the second flange 11, 12, this is not critical for the invention and the bandraster member 2 can for example comprise none of a single further flange 27 extending from the first or second flange 11, 12.

[0031] The first part 4 preferably is provided to fit, more preferably snugly fit, between the further flange 27 and the base 6 to further improve the mounting of the connection member to the bandraster member 2.

[0032] As shown in figure 1 the second part 5 is at least partly delimited by an upright edge 17 for guiding the second wide wall 8 during rotation of the second part 5, the upright edge 17 extending outwardly from the base 6 of the bandraster member 2 to the second side wall 8 when the connection member 1 is mounted to the bandraster member 2. The upright edge 17 is preferably provided to gradually push to the second side wall 8 outwardly during rotation of the of the second part 5 and the bandraster member 2 with respect to each other around the protrusion 15 into the connection volume until it reaches the end of the upright edge 17 and the second side wall 8 snaps around the second side wall 8 and the con-

nection part 3 is snap-fitted into the volume.

[0033] The upright edge 17 can be an edge provided by cutting and/or folding as shown in figure 1. However the edge can also be a surface as shown in figure 4a.

[0034] The connection member 1 can comprise a suspension part 18 for attaching the connection member 1 to a ceiling as shown in figure 1. Any type of known suspension part 18 can be used to suspend the connection member 1 to a ceiling. As shown in figures 3a, 3b and 3c, the suspension part 18 can be fastened to the connection member 1 in any way deemed appropriate by the person skilled in the art such as for example by screwing, nailing, bolting, riveting, gluing, etc. As shown in figures 3a, 3b and 3c different orientations of the suspension part 18 are possible.

[0035] Figure 2 shows a way of attaching the suspension part 18 to a ceiling by screwing. Any other type of attaching the suspension part 18 to a ceiling known to the person skilled in the art can be used such as for example, bolting, nailing, riveting, gluing, etc.

[0036] The suspension part 18 preferably is made of metal, such as for example steel, galvanized steel or stainless steel. This is however not critical for the invention and other materials are possible. More preferably, the suspension part 18 is made of a folded metal plate, as for example shown in figures 3a, 3b and 3c. The suspension part 18 can however also be a chain, for example in metal or in plastic, a rope, etc.

[0037] As shown in figures 4a, 4b, 4c and 4d, the connection member 1 can comprises a second connection part 19 for connecting a second bandraster member to the connection member 1. In figures 4a, 4b, 4c and 4d such a second connection part 19 is identical to the first connection part 3. This is however not critical to the invention and the first 3 and the second connection part 19 can be different from each other. Preferably, as shown in figures 4a, 4b, 4c and 4d, the first and the second connection part 3, 19 extend longitudinally with respect to each other such as to allow two different bandraster members to be longitudinally mounted with respect to each other. In this way the connection member 1 can be used to create a longitudinally extending sequence of bandraster members.

[0038] In figures 6a, 6b, 6c, 6d and 6e it is shown how the connection member 1 according to figure 4a can be used to connect a second bandraster member to the connection member 1.

[0039] Although not specifically shown in the figures, the connection member 1 can comprise both the embodiment comprising the second connection part 19 as, for example, shown in figure 4b and the suspension part 18 as shown in, for example, figure 1, 3a, 3b or 3c. This is however not critical for the invention and can be further determined by the person skilled in the art.

[0040] As shown in figure 1, 3a, 3b and 3c the connection part 3 preferably comprises a paramagnetic flange 20 running substantially parallel with the base 6 of the bandraster member 2 when the connection member 1 has been mounted to the bandraster member 2. The paramagnetic flange 20 is preferably made from the same material as the remained of the connection part 3 and therefore can be made from steel such as for example galvanized steel. As shown in figure 3c, the paramagnetic flange 20 can also be used to establish a connection with the suspension part 18 therefore possibly serving a double purpose.

[0041] It is also possible to provide the connection member 1 with a marker marking vertical position of the connection member 1, such that, during installation of the connection member 1, the ceiling can be given the proper location with respect to the existing ceiling. This makes it possible to provide the suspended ceiling at the correct height by using a centrally located standard with a laser marking the proper height of the suspended ceiling by positioning the connection member 1 such that the marker coincides with the laser indication. In figure 8 the connection member 1 for example comprises two holes 28 indicating different distances from the hole to, for example, the underside of the tile.

[0042] As shown in figures 1, 3a, 3b, 3c, 4a, 4b, 4c and 4d, the connection part 3 can comprise a U-shaped part comprising a connection base 21 and with respectively a first and a second longitudinally extending upright connection side wall 22, 23 along opposing longitudinal first and second edges 24, 25 of the connection base 21, the first and second connection side wall 22, 23 respectively comprising the first and the second part 4, 5 of the connection part 3.

[0043] This is however not critical for the invention and an alternative embodiment is for example shown in figure 8. The connection part 3 comprises a folded side provided to extend along the second side wall 8 when the connection member 1 is mounted to the bandraster member 2. Such a side prevents the bandraster member 2 to rotate around the first and the second upright protrusions 15, 16.

[0044] As shown in figures 1, 3a, 3b and 3c, the first part 4 can comprise part of the connection base 21 and the first and the second connection side wall 22, 23 whereas the second part 5 comprises part of the connection base 21 and the first and the second connection side wall 22, 23.

[0045] As shown in figures 4a, 4b, 4c and 4d, the first part 4 can also substantially be the first connection side wall 21 and the second part 5 can substantially be the second connection side wall 22. The first and the second side wall 22, 23 are respectively provided to run along the first and the second side wall 7, 8 of the bandraster member 2.

[0046] As shown in figure 7a and 7b such a connection member 1 can also comprise a connection part 18 for attaching it to a ceiling.

[0047] As shown in figures 4a, 4b, 4c and 4d, the second part 5 comprises a foldable securing flange 26 extending out of the volume and provided to be at least partly folded around the second flange 12. Such foldable securing flange 26 has been found to increase the secu-

rity of the mounting of the connection member 1 to the bandraster member 2. Moreover, such foldable securing flange 26, when the connection member is used to linearly interconnect two bandraster members 2, allows a more linear interconnection of the two interconnected bandraster members 2. Such a foldable securing flange 26 is however not critical for the invention and can be omitted.

[0048] The connection part 3 and preferably, the whole of the connection member 1 is made from a metal, such as for example, steel or stainless steel.

[0049] The connection part 3 preferably is made from a single metal plate which is folded into the shape of the connection part 3. Such a connection part 3 is for example shown in figure 1, 3a, 3b and 3c and in figures 4a, 4b, 4c and 4d.

[0050] The current invention also relates to a method comprising the following steps:

- attaching at least one, but also more than one such as for example two, three, four, etc., connection members to a ceiling,
- hooking at least one bandraster member on the suspension part by putting the protrusion between the first side wall and the first flange and
- snap-fitting the suspension part into the suspension volume of the bandraster member by snap-fittingly receiving the connection part in the connection volume by rotating the second part around the protrusion into the connection volume such that it is received between the base and the second flange.

Claims

1. Bandraster system for constructing a suspended ceiling, comprising

   - a U-shaped longitudinal bandraster member (2) comprising a longitudinal base (6) with respectively a first (7) and a second (8) longitudinally extending upright side wall along opposing longitudinal first (9) and second (10) edges of the base (6), the first (7) and the second (8) side wall respectively comprising first (11) and second (12) flanges respectively extending inwardly from a first (13) and a second (14) top edge of the first (7) and the second (8) side wall, the base (6), the side walls (7, 8) and the flanges (11, 12) delimiting a connection volume,
   - and a connection member (1) for connecting the U-shaped bandraster member (2) into the remainder of the suspended ceiling, comprising a connection part (3) for connecting the bandraster member (2) to the connection member (1) and provided to be snap-fittingly received in the connection volume for releasably mounting the connection member (1) to the bandraster member (2), the connection part (3) comprising a first (4) and second (5) part respectively provided to be received between the first flange (11) and the base (6) and the second flange (12) and the base (6) when snap-fitted into the connection volume, the first part (4) comprising an upright protrusion (15) provided to be received between the first upright side wall (7) and the first flange (11),

   characterised in that the protrusion (15), the connection member (1) and the bandraster member (2) are provided such that the bandraster member (2) can be connected by the connection member (1) by hooking the bandraster member (2) on the connection part (3) of the connection member (1) by putting the protrusion (15) between the first side wall (7) and the first flange (11) after which the connection part (3) is snap-fittingly received in the connection volume by rotating the second part (5) and the bandraster member (2) with respect to each other around the protrusion (15) into the connection volume such that it is received between the base (6) and the second flange (12).

2. The bandraster system according to claim 1, **characterised in that** the second part (5) comprises a second upright protrusion (16) provided to be received between the second upright side wall (8) and the second flange (12) when the second part (5) is provided between the second flange (12) and the base (6).

3. The bandraster system according to claim 1 or 2, **characterised in that** the second part (5) is at least partly delimited by an upright edge (17) for guiding the second wide wall (8) during rotation of the second part (5), the upright edge (17) extending outwardly from the base (6) of the bandraster member (2) to the second side wall (8) when the connection member (1) is mounted to the bandraster member (2).

4. The bandraster member as claimed in any one of the preceding claims, **characterised in that** the connection member (2) comprises a suspension part (18) for attaching the connection member (1) to a ceiling.

5. The bandraster member as claimed in any one of the preceding claims, **characterised in that** the connection member (1) comprises a second connection part (19) for connecting a second bandraster member to the connection member (1).

6. The bandraster member as claimed in any one of the preceding claims, **characterised in that** the connection part (3) comprises a paramagnetic flange (20) running substantially parallel with the base (6) of the bandraster member (2) when the connection

member (1) has been mounted to the bandraster member (2).

7. The bandraster member as claimed in any one of the preceding claims, **characterised in that** the connection part (3) comprises a U-shaped part comprising a connection base (21) and with respectively a first and a second longitudinally extending upright connection side wall (22, 23) along opposing longitudinal first and second edges (24, 25) of the connection base (21), the first and second connection side wall (22, 23) respectively comprising the first and the second part (4, 5) of the connection part (3) and being respectively provided to run along the first and the second side wall (7, 8) of the bandraster member (2).

8. The bandraster member as claimed in any one of the preceding claims, **characterised in that** the second part (5) comprises a foldable securing flange (26) extending out of the volume, when the connection part (3) is snap-fittingly received in the volume, and provided to be at least partly folded around the second flange (12).

9. Connection member as claimed in any one of the preceding claims.

10. Method for constructing a suspended ceiling using a bandraster system according to any one of claims 1 - 8, **characterised in that** the following steps are performed:

    - attaching at least one connection member to a ceiling,
    - hooking at least one bandraster member on the suspension part by putting the protrusion between the first side wall and the first flange and
    - snap-fitting the suspension part into the suspension volume of the bandraster member by snap-fittingly receiving the connection part in the connection volume by rotating the second part around the protrusion into the connection volume such that it is received between the base and the second flange.

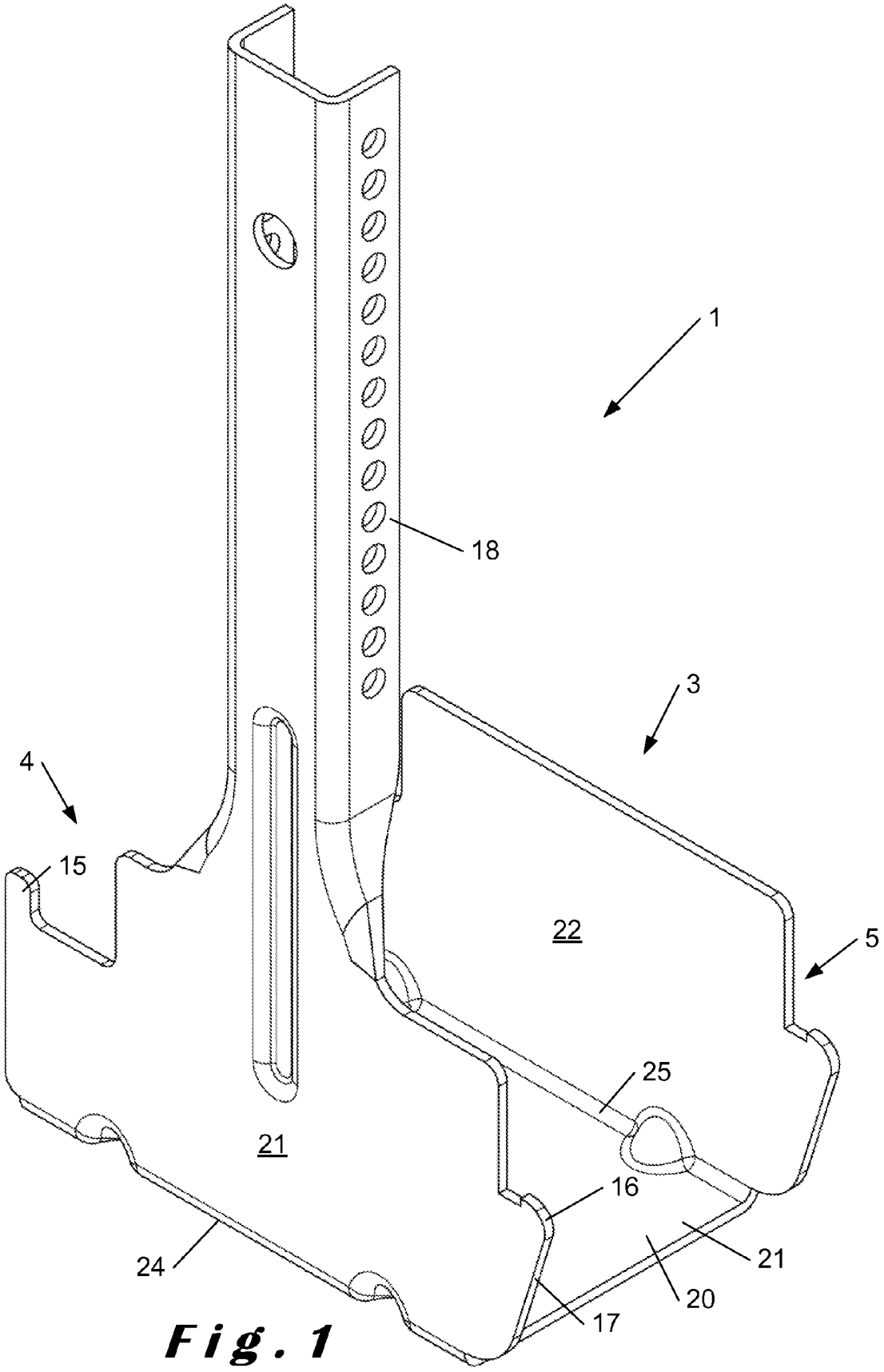

Fig. 1

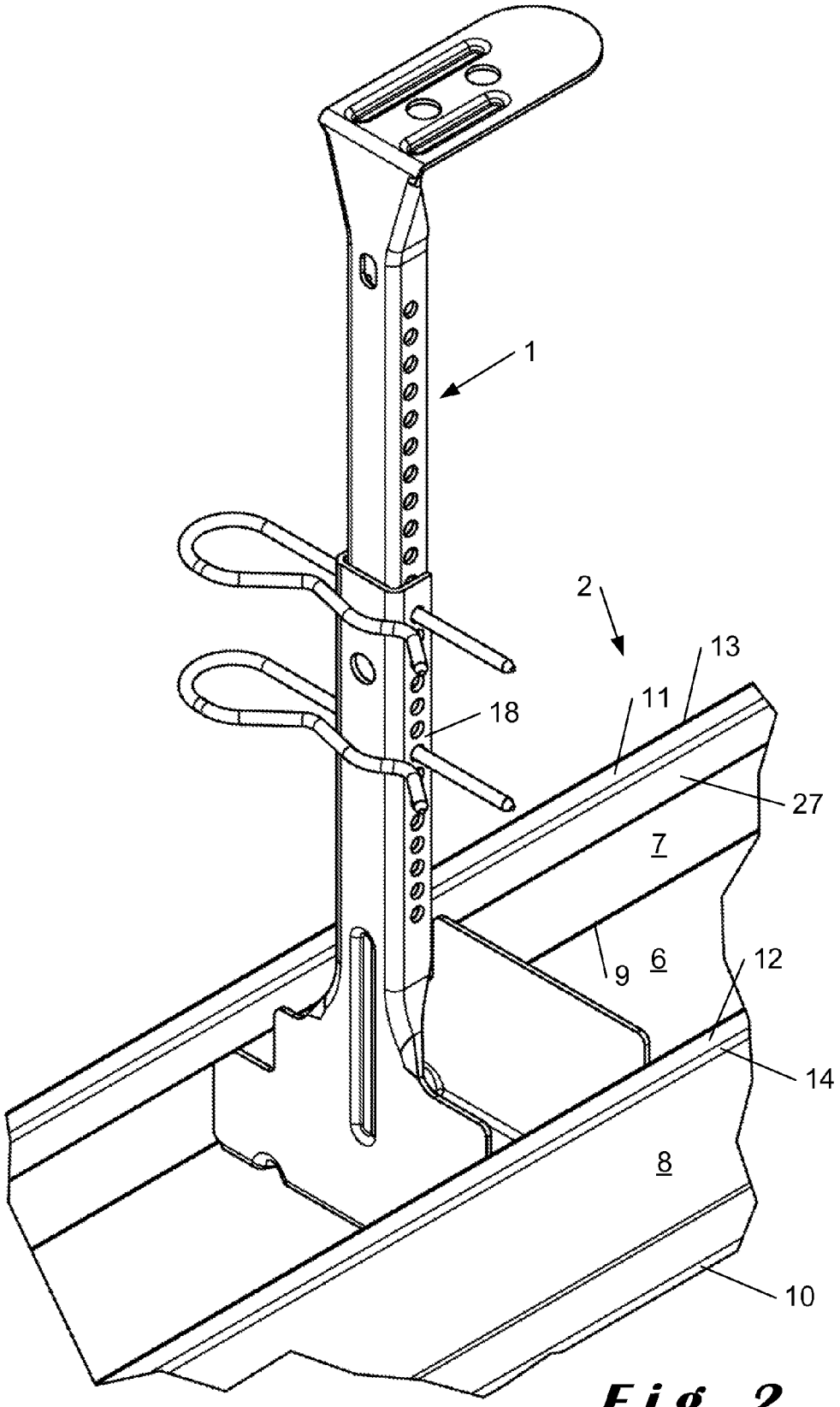

Fig. 2

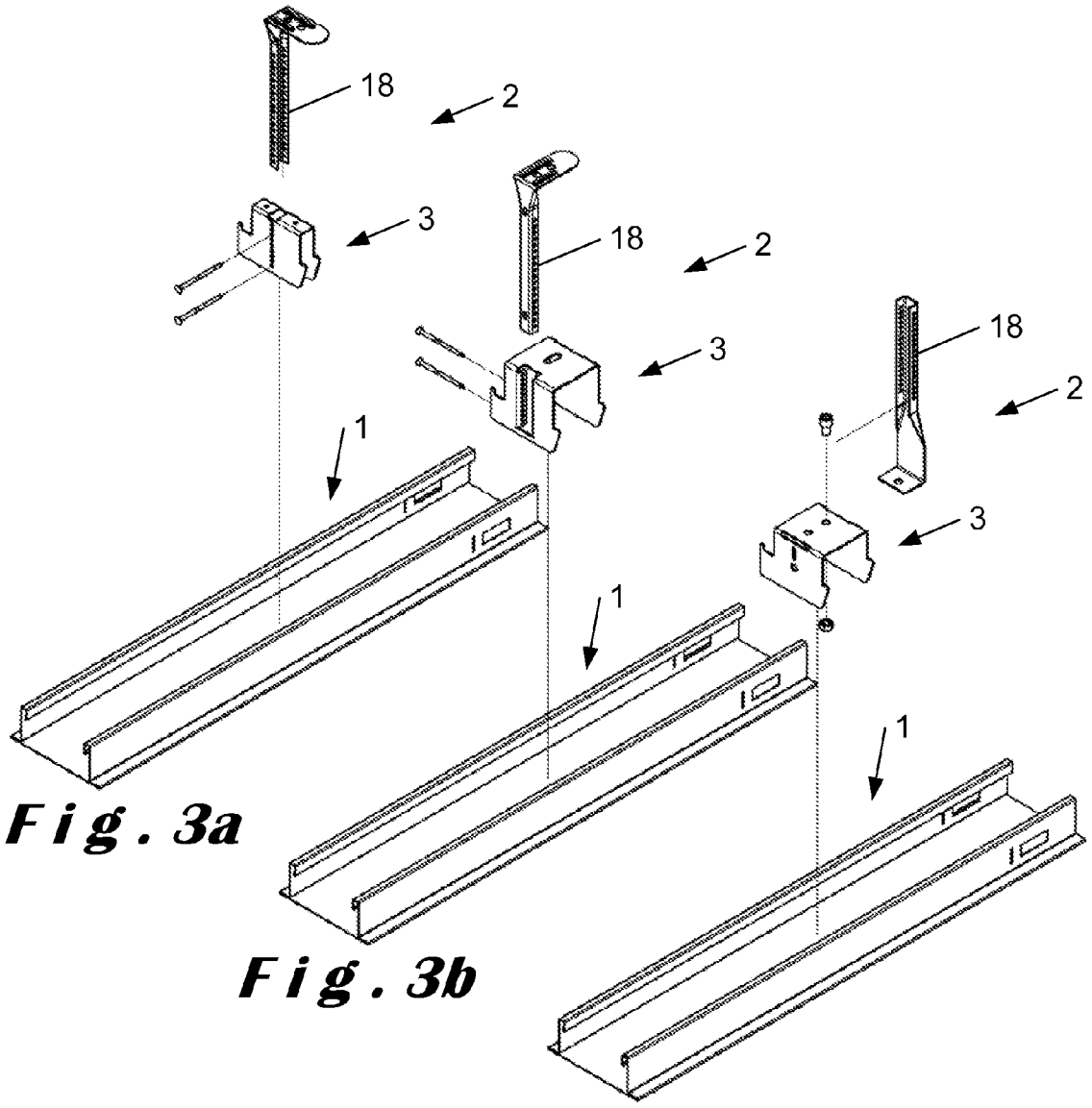

Fig. 3a

Fig. 3b

Fig. 3c

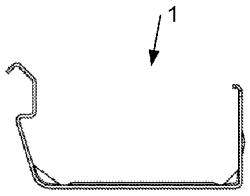

Fig. 4b

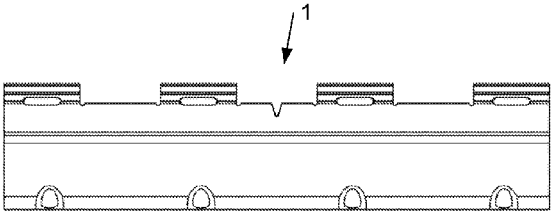

Fig. 4c

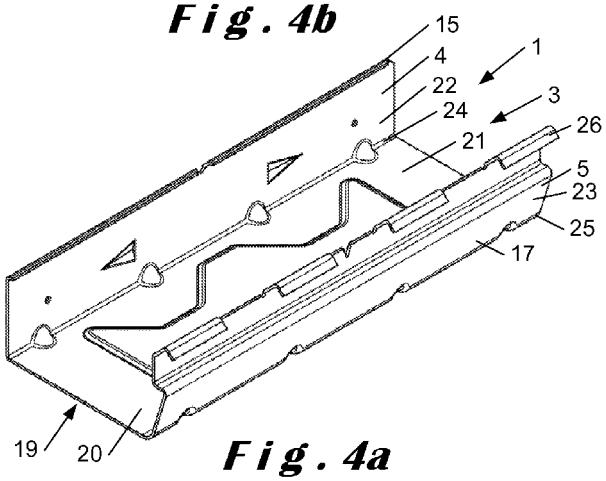

Fig. 4a

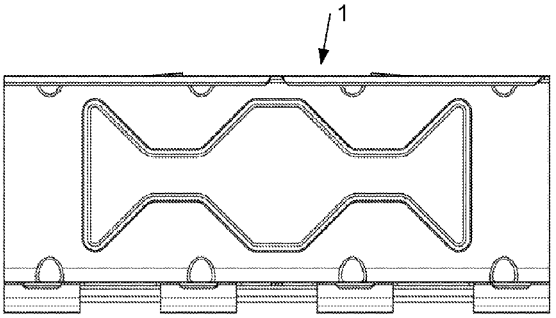

Fig. 4d

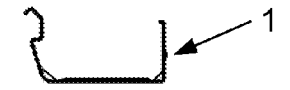

Fig. 5a

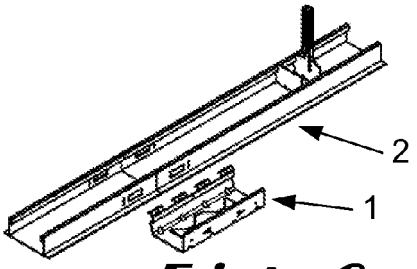

Fig. 6a

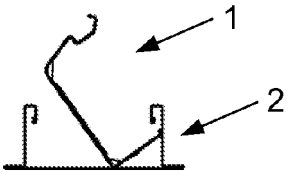

Fig. 5b

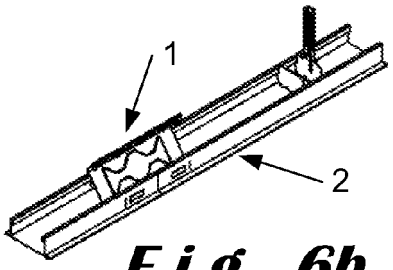

Fig. 6b

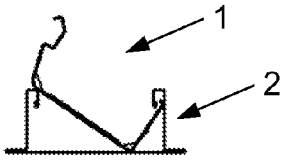

Fig. 5c

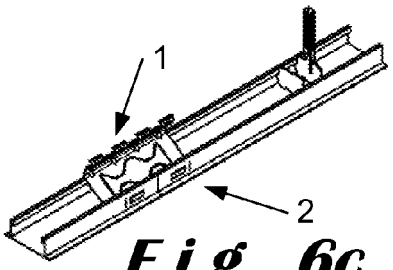

Fig. 6c

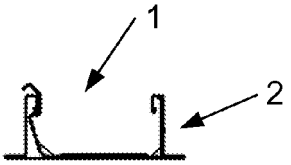

Fig. 5d

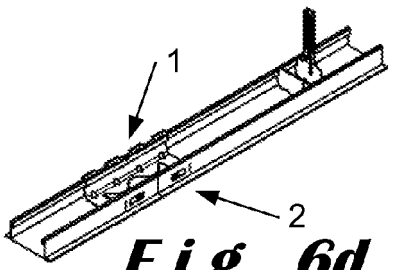

Fig. 6d

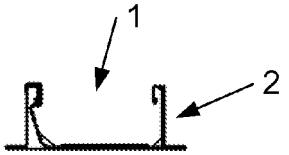

Fig. 5e

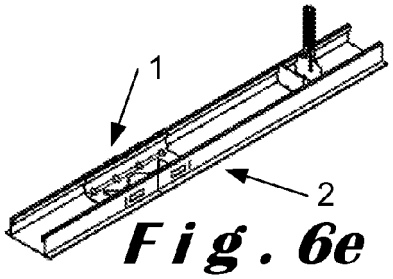

Fig. 6e

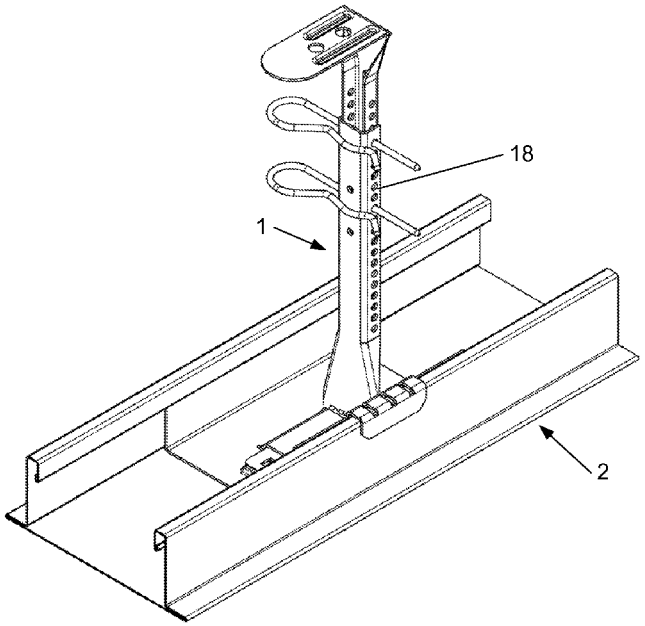

Fig. 7b

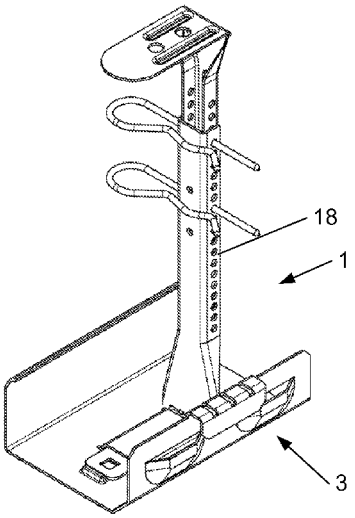

Fig. 7a

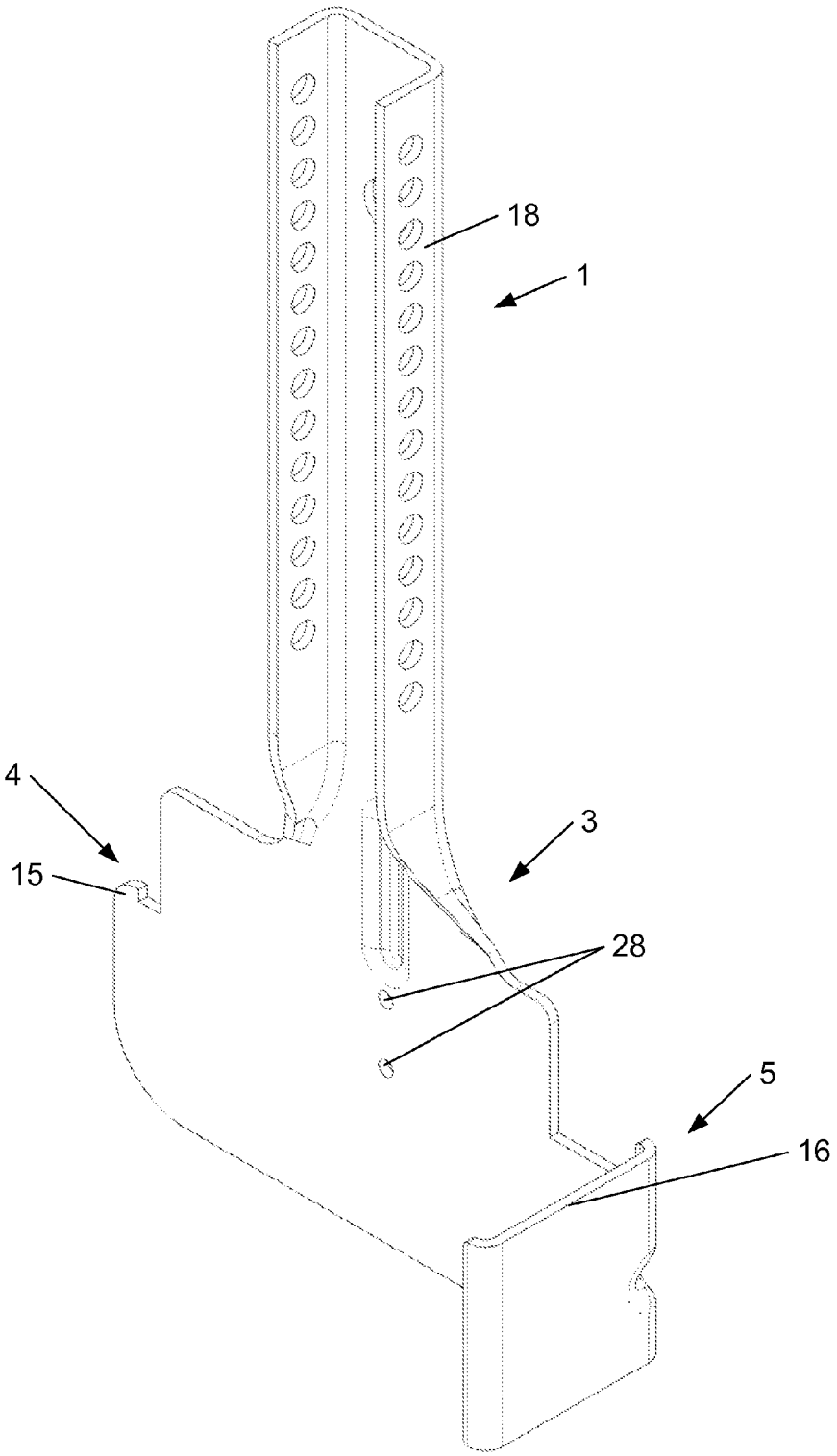

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 10 16 5845

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 94 01 416 U1 (VOGL ERICH R [DE]) 10 March 1994 (1994-03-10) * page 4, line 1 - page 5, line 7 * * figures 1-3 *	1-3,5,7,9	INV. E04B9/10
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E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 January 2011	Beucher, Stefan

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