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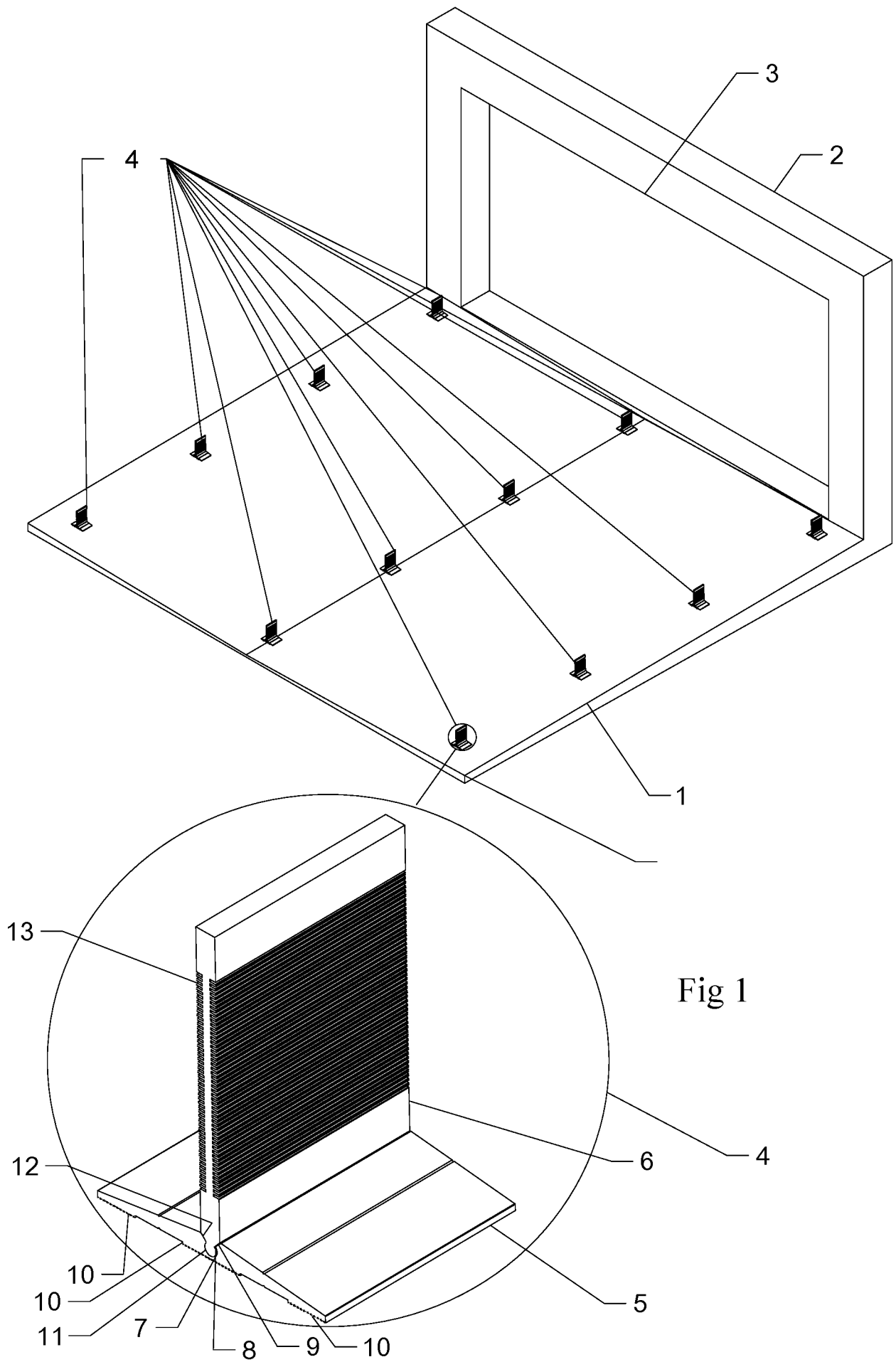
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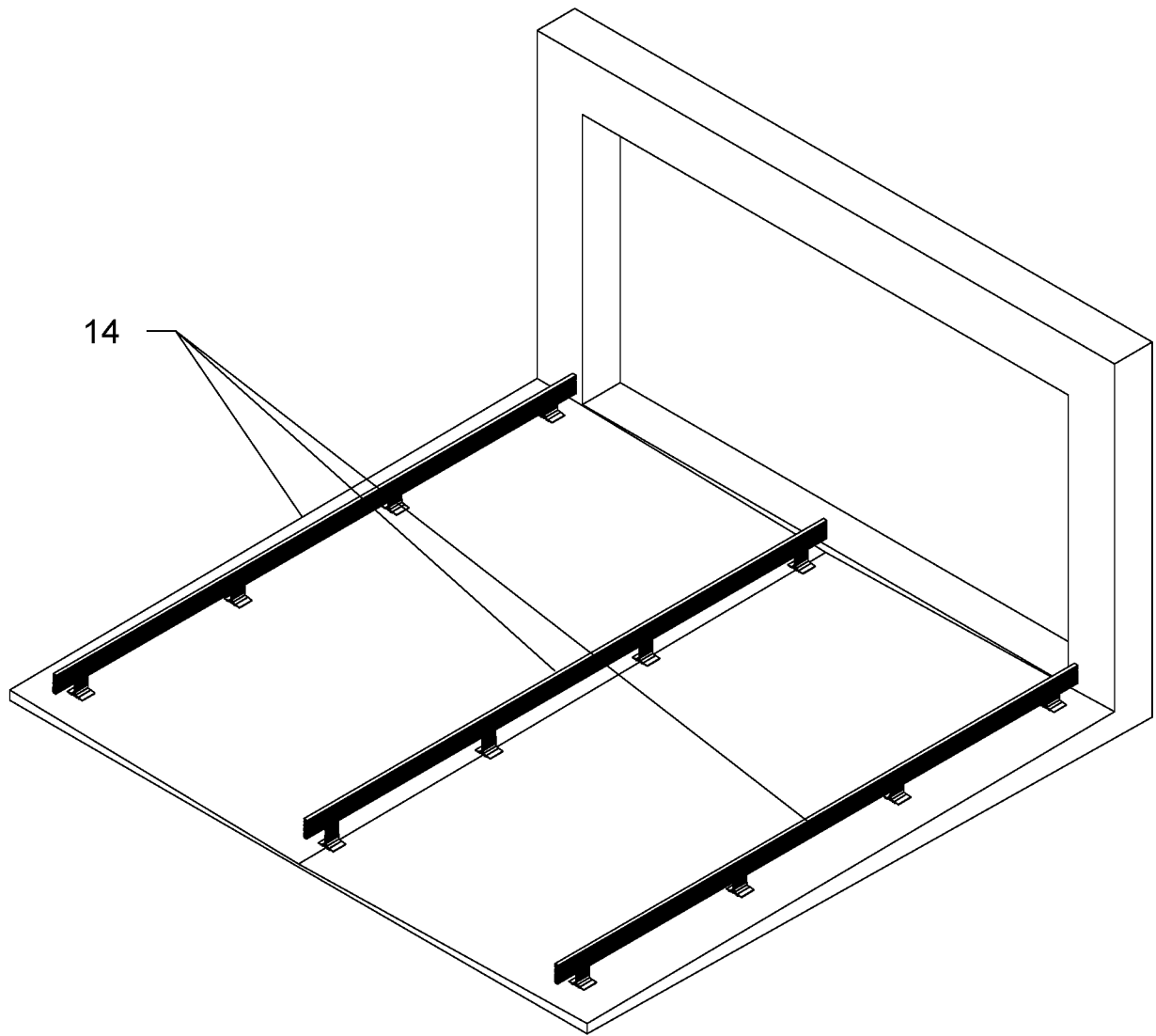


Fig 2

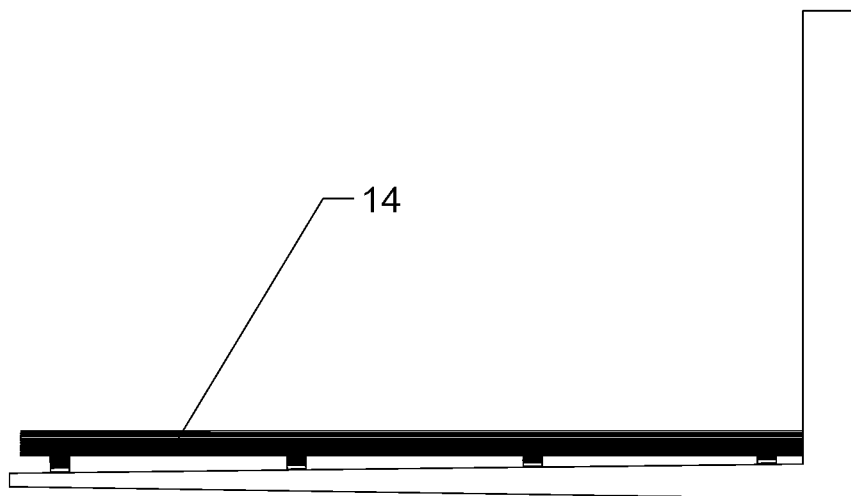


Fig 3

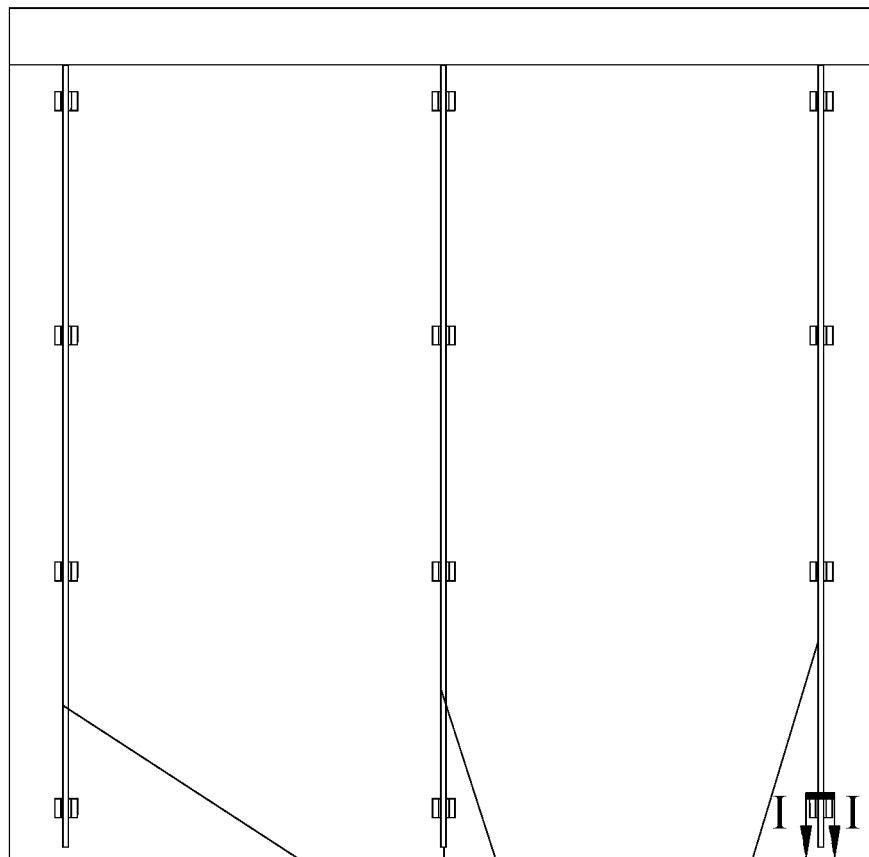


Fig 4

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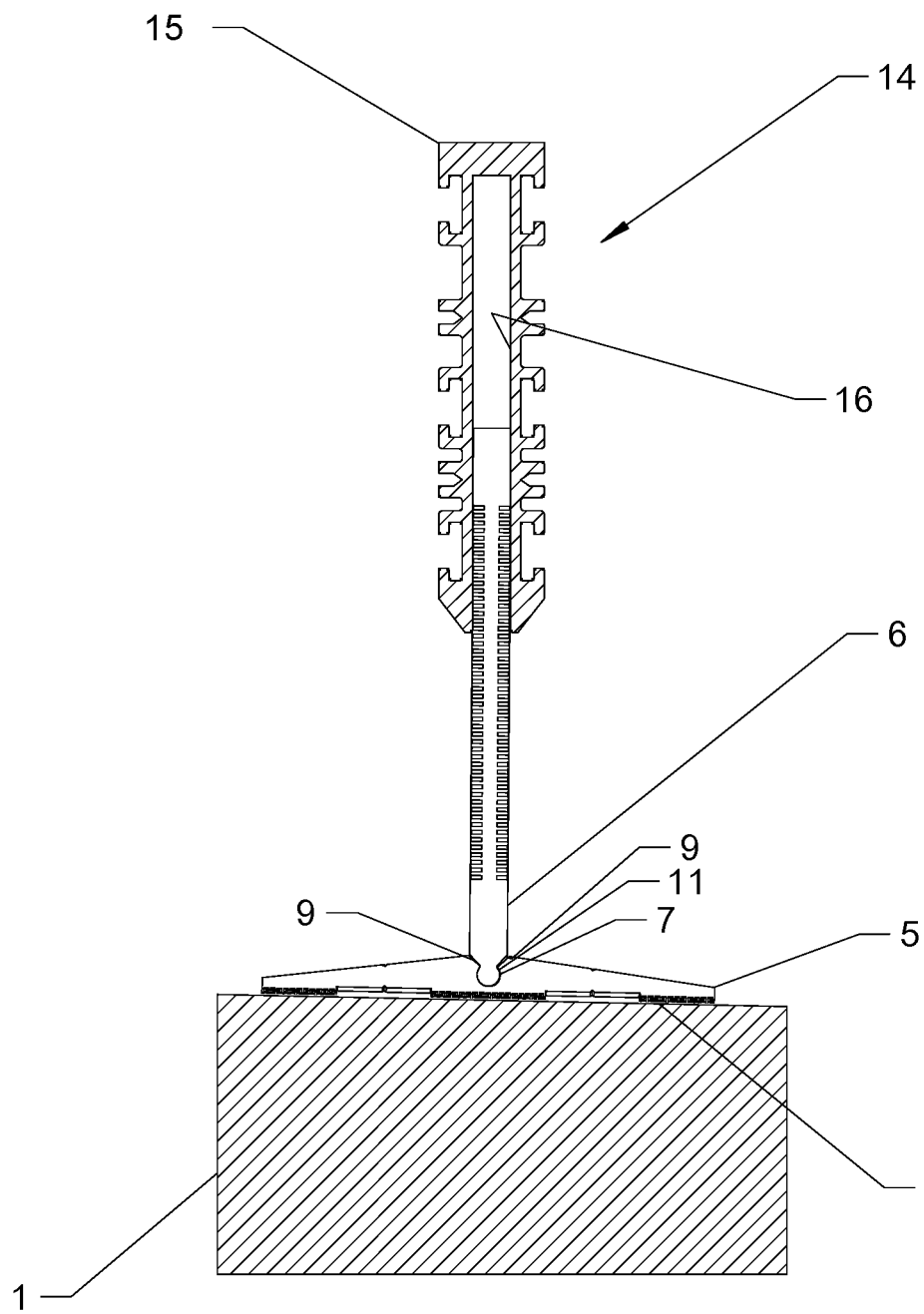


Fig 5

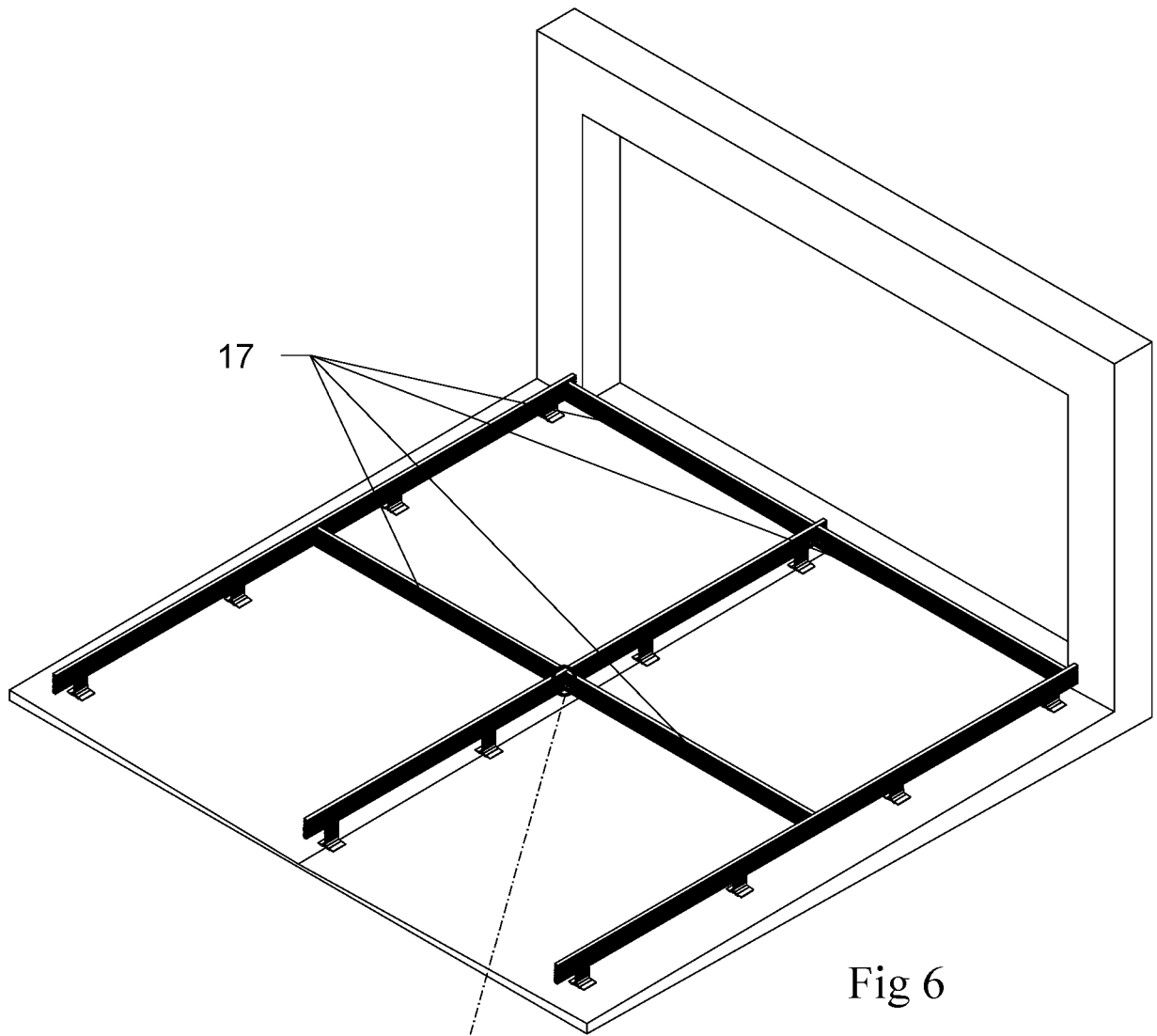
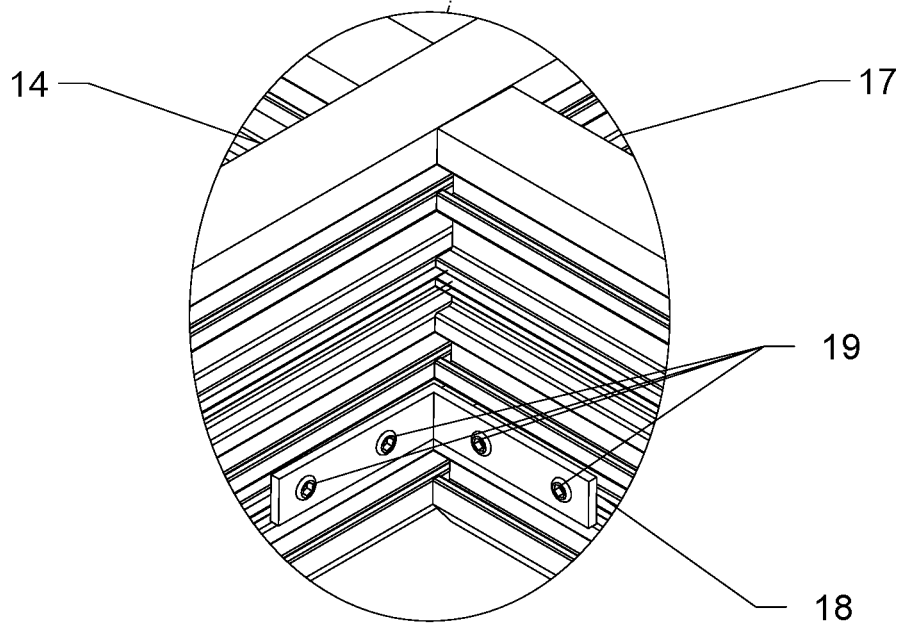


Fig 6



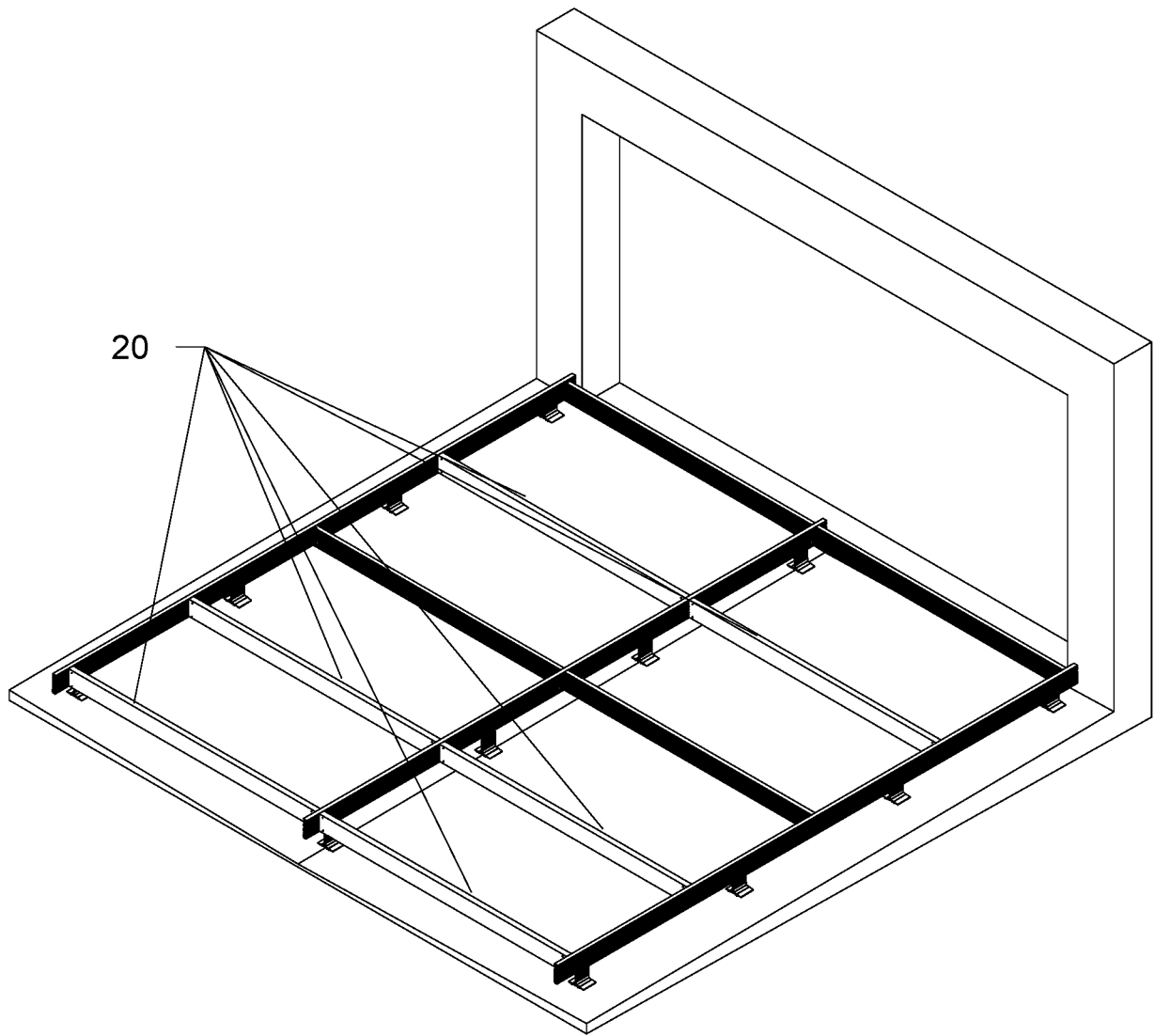


Fig 7

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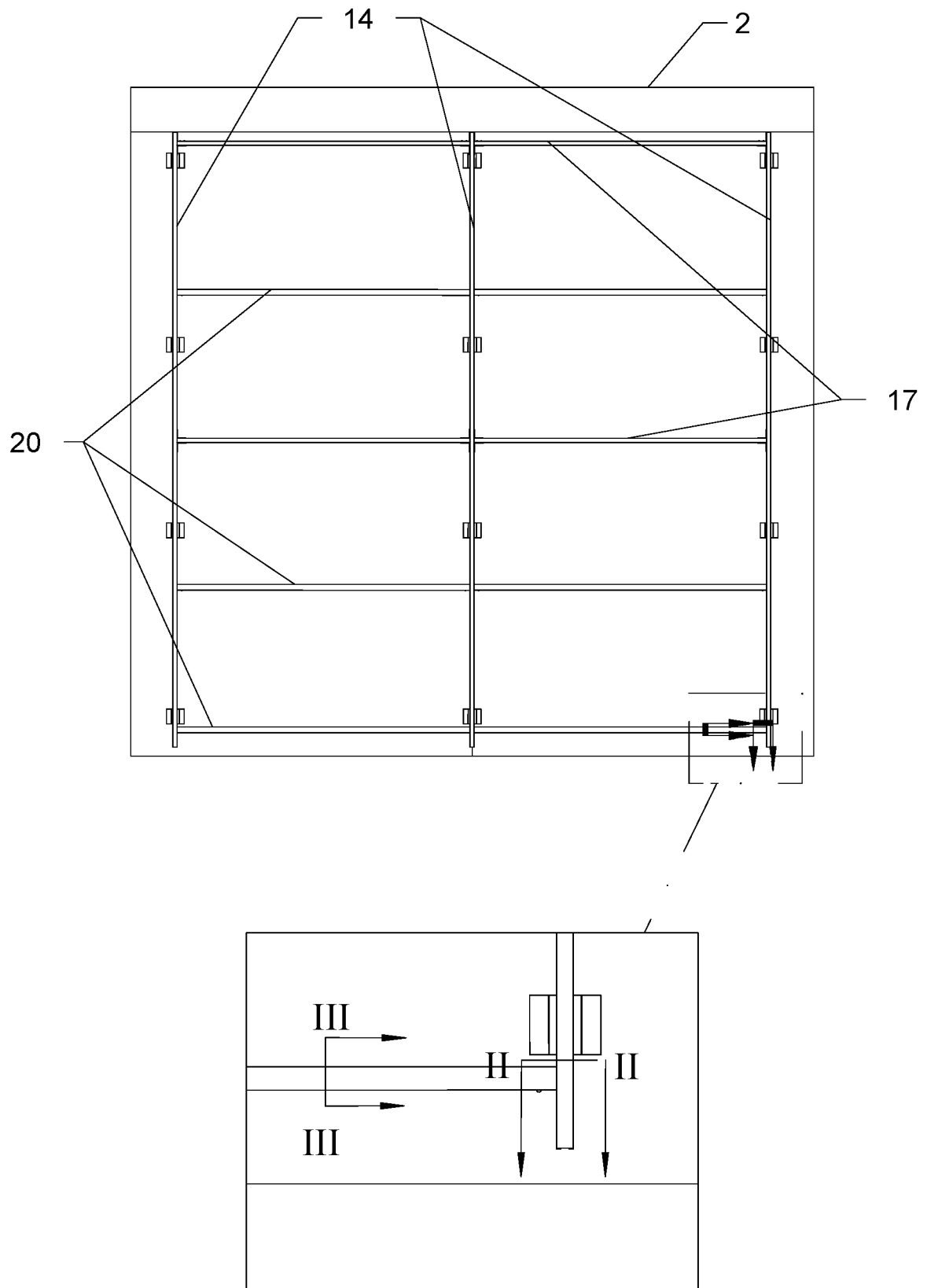


Fig 8

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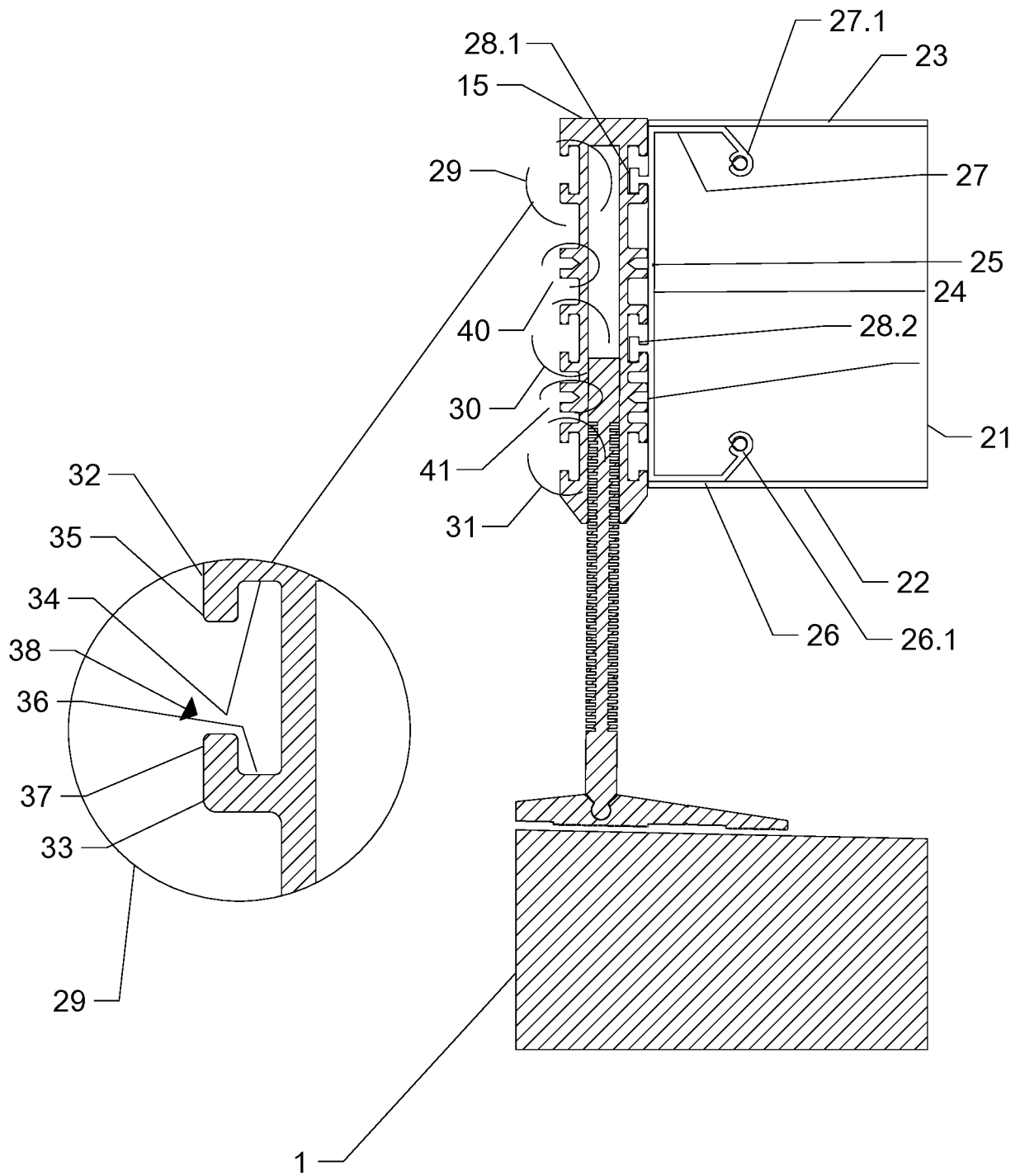


Fig 9

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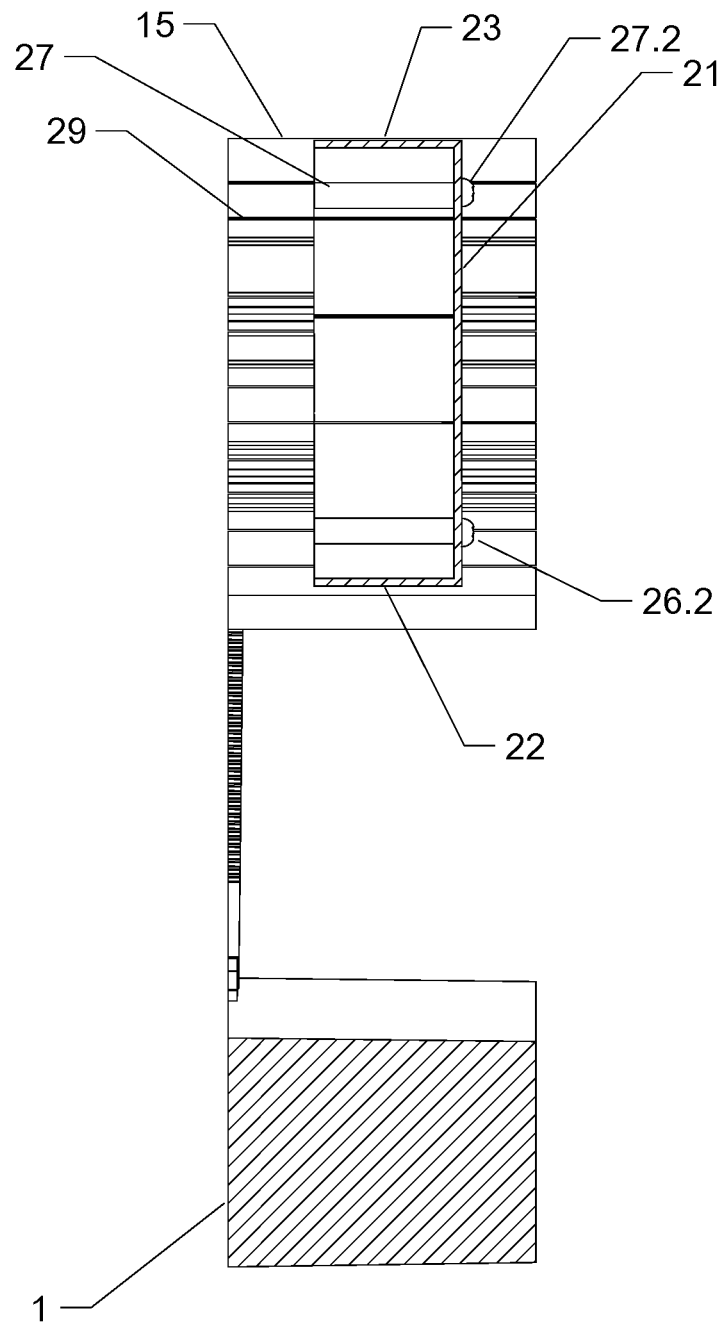
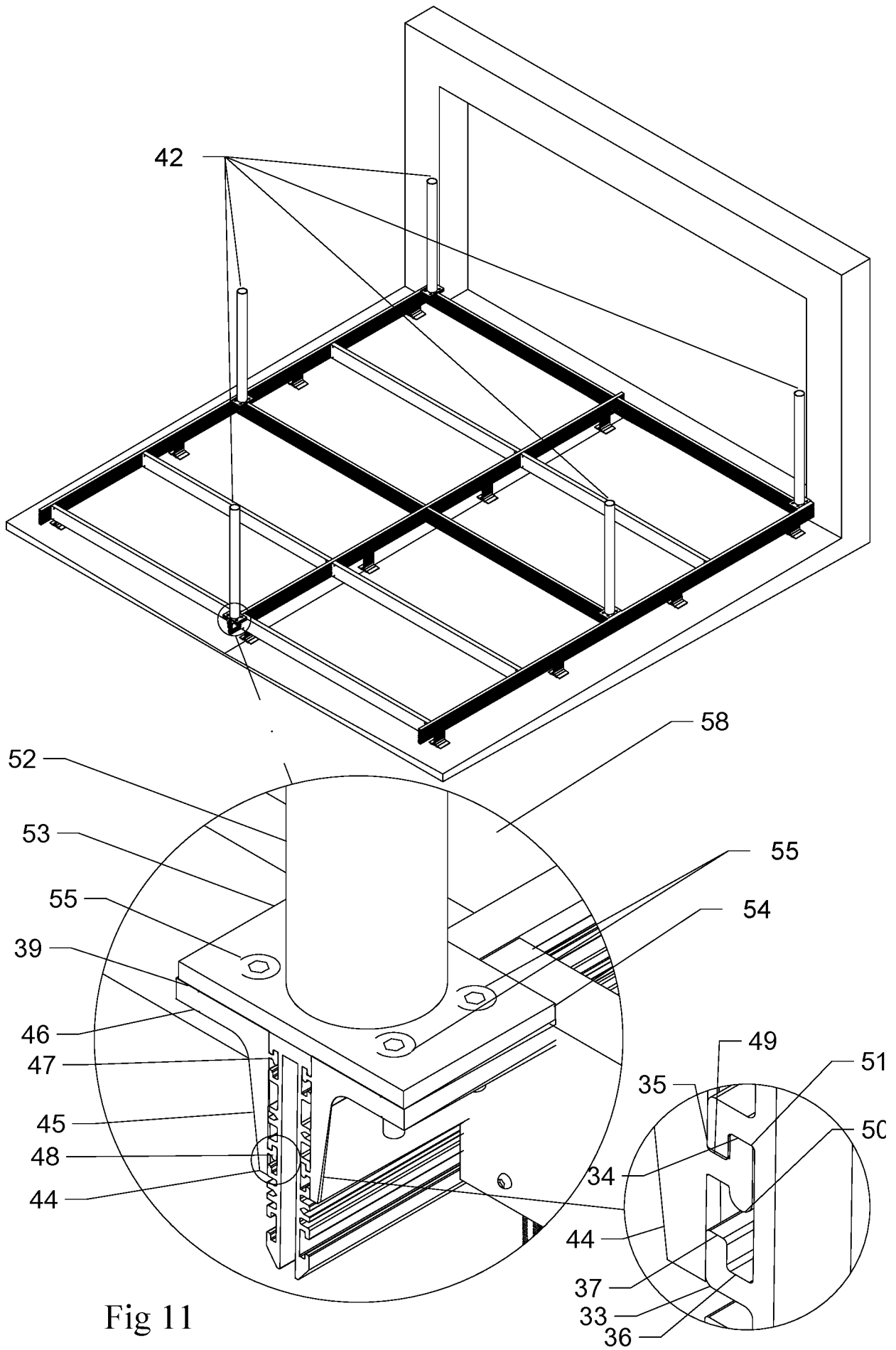


Fig 10



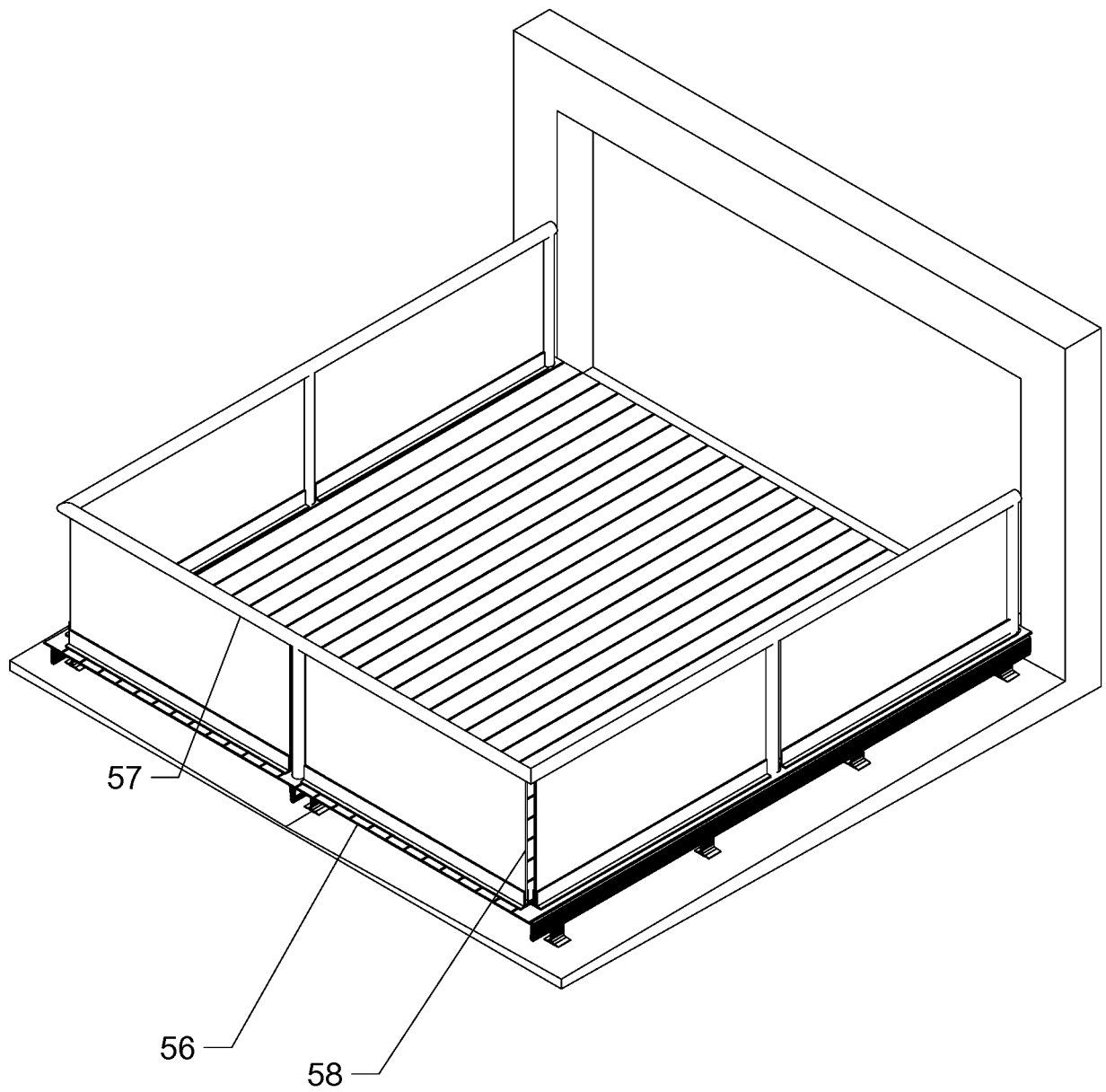


Fig 12

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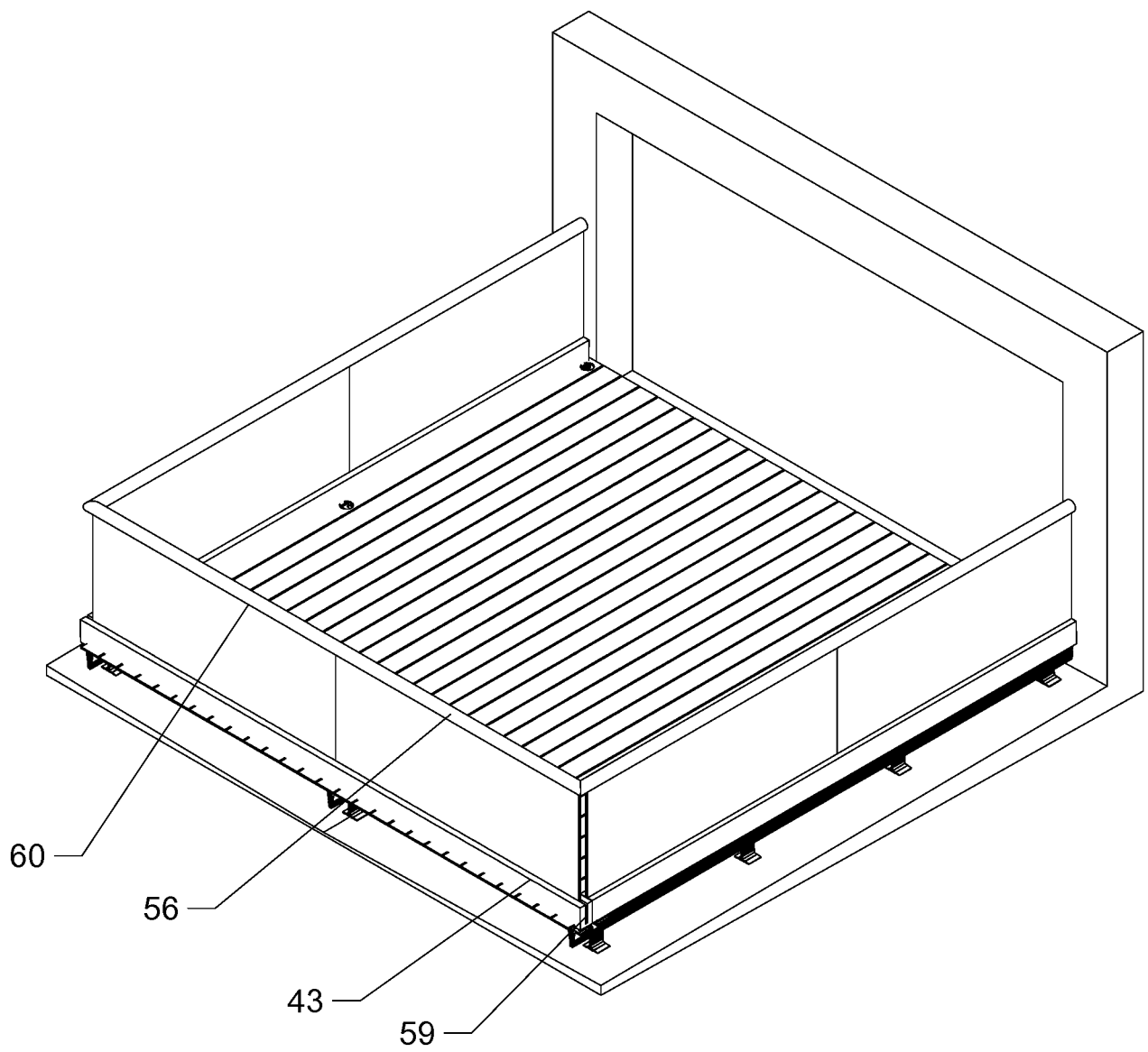


Fig 13

A DECK AND METHOD OF DECK ASSEMBLY FOR FLAT ROOFS

Technical field

[0001]. There is a demand for a deck, especially a deck with a balustrade disposed on a flat roof. Such structures comprise a deck suitable to be safely walked upon and support furniture and other apparatus without damaging the underlying roof. For the purposes of this specification the term balustrade is used to indicate a rail or wall. Because the balcony is provided on a roof, or possibly other elevated locations where there is a falling hazard at the edge of the deck, the balustrade serves to mitigate the risk of anything, particularly persons, on the deck, falling from the deck. Balustrades are commonly formed from substantially solid panels, often of transparent material such as glass, which present significant resistance to impinging wind and, in some instances, may serve as a wind-brake. Building regulations will specify the quality of mounting between the balustrade and the foundation in order to ensure the immediate and long term safety of the deck and balustrade. Such regulations will aim to ensure that any foreseeable toppling moment imposed on the balustrade can be supported, even after prolonged exposure to fatigue loading on the balustrade as well as high peak loads.

[0002]. It is important to maintain the integrity of the roof when the deck and balustrade is installed. To this end it is undesirable for any part of the deck or balustrade supports to penetrate a waterproof membrane of the roof. Roofs are commonly formed from roofing elements such as a combination of beams and joists which will be intended to support large loads, which support panels and waterproofing membranes are suited to support large loads. It is important that the weight of the deck and balustrade is applied to elements of the roof fit to support it.

Prior art

[0003]. DE202020101634 teaches an apparatus and method for constructing a deck and balustrade with the object of facilitating the installation of a balustrade. D1 provides an elongate profile which has a single groove formed in the top of the profile by two opposing "L" shaped features. Several profiles can be connected together by means of a connector. The connector has a thin flat projection which slides into the groove from one open end where it can be secured by means of

screws passed through through holes in the projection into holes formed in a top web of the profile. Post support connectors must be disposed in locations where a balustrade support post is required. Balustrade support connectors are fabricated with tabs which project up from a central portion of the connector from which the projections project horizontally. For the purposes of this specification horizontally refers to the orientation of the components in normal use and vertically should be similarly construed. A hollow rectangular section post can then be lowered over the vertical tabs. The tabs are provided with threaded inserts wherein machine screws passed through corresponding holes in the post can be secured to secure the post. The profiles and connectors can be used to form a horizontally extending frame onto which decking boards can be secured. The frame is levelled by means of multiple adjustable feet having a flat horizontal disk like ground engaging part supporting a vertically extending leg. The leg is threaded and received into a through hole formed in the connector. The threaded leg allows the effective height of the leg to be adjusted in order to bring the frame to a horizontal condition.

[0004]. WO2022087728 teaches a decking system wherein a frame is formed from a first layer of parallel beams having a first hollow profile. The beams rest on height adjustable foot assemblies comprising a load spreader part which engages the ground, or foundation and a threaded shaft with an adapter to locate in a groove formed in an underside of the beam profile. The threaded shaft allows the height of the foot assembly to be adjusted and thereby level the beam. A plurality of spaced parallel joist profiles are rested on top of the beams and may be secured with screws. Decking boards can be secured to rest on the joists to form the deck. A balustrade post is secured between two adjacent joists by means of a railing post assembly. The railing post assembly has a clamp formed by a plate, an upper horizontal web of the beam and machine screws fastened through the edges of the plate and the upper web. A "U" section shaft extends up from the clamp to a similar clamp formed by a flange which sits above an upper web of the joist and a plate which sits below the upper web of the joist and clamps the web via the action of machine screws. The post has a horizontal base plate incorporating a single axial screw hole with a threaded fastener such as a welded nut whereby the post is secured by a single machine screw driven up through the flange into the screw hole to secure the post.

[0005]. It is an object of the present invention to provide an apparatus and method of providing a decking and balustrade for disposal on a flat roof.

Summary of the Invention

First aspect

[0006]. According to the first aspect of the present invention there is provided a deck according to claim 1.

[0007]. Herein the term foundation is used in a most general sense to include a flat roof top as well as a more conventional foundation structure in, or on the ground used to support an overlying construction.

[0008]. The beam profiles may be rigidly connected together by conventional “L” shaped corner brackets or angle brackets secured by fastenings such as screws to each beam profile at the junction of two beam profiles.

[0009]. Each beam profile has a longitudinally uniform profile. Preferably the profile is symmetric about a vertical medial longitudinal plane. The beam profile engagement feature is preferably provided on a vertical side of the beam. Preferably the engagement feature is in the form of one or more projecting ribs, although a groove may also serve the engagement function.

[0010]. Preferably the balustrade support profile engagement feature is complementary to the beam engagement feature. Preferably the beam engagement feature is provided with a down facing surface to engage a complementary to and preferably conforms to the up facing surface of the balustrade support profile. Preferably the beam and balustrade support profile engagement surfaces are shaped to hook together to facilitate assembly and discourage lateral movement. Preferably the engagement surfaces are shaped to provide a large contact bearing surface in order to prevent point loading and create a stiff joint. Preferably the beam profile engagement feature has a profile corresponding to an inverted balustrade support profile engagement feature. Conveniently the balustrade support profile engagement feature extends for the length of the balustrade support profile. In a preferred embodiment the beam profile may provide two or more vertically spaced engagement features to cooperate with a corresponding number of vertically spaced balustrade support profile engagement features. Preferably two balustrade

support profiles are disposed one on each opposite side of a beam to further facilitate distribution and transfer the load from the balustrade support member to the beam.

[0011]. The beam profile engagement feature may comprise a lower projecting rib which is L shaped and has a first projecting horizontal limb supporting an ascending limb at the end distal from a body of the beam profile, and an upper L shaped rib spaced above the lower L shaped rib and having a horizontal limb supporting a descending limb distal from the body of the beam profile. The balustrade support profile may have an engagement feature in the form of a T shaped rib having a first limb projecting horizontally from a body of the balustrade support profile and supporting each of an ascending limb and a descending limb distal from the body of the balustrade support profile whereby during assembly the descending limb of the T shaped rib hooks onto the ascending limb of the lower rib, and when the balustrade support member is connected by tensioning fasteners overlying the balustrade support profile the balustrade support profile is pulled up so that the upper limb of the T shaped rib hooks into the upper L shaped rib.

[0012]. The balustrade support member may be either of a post or a channel profile provided with a base plate configured to engage with the top of the balustrade support profile. Preferably engagement with the balustrade support profile is by means of one or more machine screws acting in tension between the balustrade support member base plate and the balustrade support profile whereby the base plate is pulled down onto the top of the beam profile, or onto a shim between the top of the beam profile and base plate. Where the balustrade support member is a post, it is provided with means such as a groove or brackets to secure and support the vertical edges of an upright panel. Where the balustrade support member is a horizontally extending channel, the bottom horizontal edge of the panel is secured in the channel to be held upright. In either case the panels cooperate with the balustrade support member to provide a fence around the periphery of the frame and potentially at intermediate locations where a fence, windbreak or privacy screen may be desired.

Second Aspect

[0013]. According to a second aspect of the present invention there is provided a method of constructing a deck with a balustrade according to claim 15.

- [0014]. Preferably two balustrade support profiles are engaged one each on opposite sides of the beam and a base plate of the balustrade support member is located to span the beam and is secured by fasteners at least one each in each balustrade support profile and the base plate. Preferably the fasteners are machine screws driven through holes in the base plate and through holes formed in the balustrade support profile to be secured by nuts.
- [0015]. The apparatus and method enable a strong stiff join between the balustrade support member and the beam, at substantially any position desired along the length of the beam. The beam itself will be overlaid by decking boards which mechanically connects the beam to every other frame member to strongly resist toppling the balustrade support member in any direction.
- [0016]. Conveniently each of the beam profile and balustrade support profile may be extruded from aluminium alloy.
- [0017]. While in some cases the frame may be formed from beams resting directly onto the foundation surface, it is possible to deploy the frame on legs which allow the frame to be levelled on an inclined or uneven surface as is common on flat rooftops where the roof inclines for the purpose of drainage.
- [0018]. The beam profiles are relatively expensive. To mitigate the expense, it is preferable to use a relatively inexpensive "C" section profile spanning between the beam profiles where no balustrade support member is required.

Brief description of figures

- [0019]. An embodiment of an apparatus for and method of constructing a deck will now be described, by way of example only, with reference to the accompanying figures, in which:
- Figure 1 is an isometric SE view of a flat rooftop adjacent a building showing foot assemblies and an enlarged detail of a foot assembly;
- Figure 2 is an isometric SE view of the rooftop of figure 1 showing a longitudinal beam profiles installed;
- Figure 3 is a side elevation from the right of the beam profiles horizontal;
- Figure 4 is a plan view of the assembly in figure 3;
- Figure 5 is an enlarged sectional view on the line I-I in figure 4;
- Figure 6 is an isometric SE view of the assembly with lateral beam profiles installed

and an enlarged detail showing the connection between lateral and longitudinal beam profiles;

Figure 7 is an isometric SE view of the assembly with lateral joists installed between the longitudinal beams;

Figure 8 is a plan view of the assembly of figure 7 with an enlarged detail of the front right hand corner;

Figure 9 is an enlarged section on the line II-II showing an adapter and joist;

Figure 10 is an enlarged elevation on the line III-III showing the adapter and joist;

Figure 11 is an isometric SE view of the assembly of figure 8 with an enlarged detail of a balustrade support profile supporting a balustrade support member;

Figure 12 is an isometric SE view of a completed deck with a balustrade supported by posts; and

Figure 13 is an isometric SE view of a completed deck with a balustrade supported by channel profiles.

Detailed description of figures

[0020]. Figure 1 shows a rooftop 1 adjacent a building wall 2 including a doorway 3. The rooftop slopes down from the wall to the front edge and from the left and right side edges to a centre line. The planned deck is to cover the whole of the rooftop and the underlying structure of the roof is determined in order to ascertain where load can be applied safely. In this case the resulting plan determines that three longitudinally extending beam profiles 14 each of similar length will extend longitudinally from the wall 2 to the front of the roof 1. The longitudinal beam profiles are to be equally spaced. Foot assemblies 4 are disposed onto the roof top to underly the intended location of the longitudinal beam profiles and to site above underlying load bearing structural members of the roof.

[0021]. Each foot assembly is formed from a foot plate 5 and an upright 6. The foot plate 5 is formed from an aluminium extrusion having a generally flat rectangular base and a top which slopes up from the side edges to the longitudinal axis to provide a sufficient thickness to accommodate a longitudinally extending cylindrical groove 7. The key hole shaped groove 7 is open at the top where the width of the opening is less than the diameter of the groove to form a neck 8. The sides 9 of the groove above the neck 8 incline away from the central vertical axis of the groove forming

groove shoulders at a groove shoulder angle with respect to the vertical axis of the groove.

- [0022]. The base of the foot plate has three spaced longitudinally extending regions 10 which include serrations intended to discourage the footplate from moving over the roof surface. In some applications the footplate may be bonded adhesively to the roof surface to prevent movement and improve load dispersal and the serrations facilitate engagement with the bonding material.
- [0023]. The upright has a generally rectangular section with a cylindrical feature provided by a cylindrical rib 11 sized to fit closely into the cylindrical groove 7. The rib 11 connects to the body of the upright by inclined shoulders 12 which are inclined at an angle less than the angle of the groove shoulder. Each leg assembly is assembled by sliding the rib 11 into the groove 7. The upright can then rotate around the axis of the cylindrical groove until a shoulder of the groove engages a shoulder of the upright.
- [0024]. The footplate and upright of the leg assemblies can be formed by extrusion with little or no subsequent machining. Either of the foot plate or upright can be of indefinite length. Can readily be cut to a desired length on site if desired and may be flat packed for transport and quickly assembled on site.
- [0025]. A region of the side of the upright is formed with a plurality of equispaced grooves 13.
- [0026]. Once the first step in construction is completed the longitudinal beam profiles 14 are installed over the leg assemblies.
- [0027]. Each longitudinal beam profile 14 has a longitudinally uniform cross section as shown in figure 5. Generally, the beam profile is rectangular and symmetrical about a vertical axis. The profile provides a flat top 15. A channel 16 extends through the bottom to a location close to the top 15 to closely receive the upright 6. As shown in figure 3 the upright 6 can project from the channel 16 by an amount to accommodate the inclination of the underlying roof when the beam is set to a horizontal condition. The upright may be inclined relative to the beam profile to accommodate the pitch of the roof as shown in figure 3, while the articulation provided between the upright and the footplate can accommodate the roof inclination in the direction into the page as shown in figure 3.

- [0028]. In this example the beam profiles are levelled to the horizontal as shown in figure 3 before other components are assembled to the frame. However, it is possible to assemble lateral beams and joists to the longitudinal beam profiles before levelling the frame. The beam profiles 14 are levelled to the horizontal using conventional techniques well known to the person skilled in the art, for example by using a screw jack at the front end of each beam. Screws (not shown) are then driven through the sides of the beam into each upright. The grooves 13 may facilitate the engagement of self-tapping screws driven through the sides of the beam profiles in order to pin the beam profiles in place relative to the uprights.
- [0029]. Laterally extending beam profiles 17 are secured to extend perpendicular to the longitudinal beam profiles wherever a balustrade support member 54 will be required. Lateral beam profiles have the same cross section as the longitudinal beam profiles. The lateral beam profiles are secured to the longitudinal beam profiles by means of conventional “L” shaped brackets 18 and self-tapping screws 19.
- [0030]. Laterally extending joists 20 are provided by means of an elongate “C” section formed by folding sheet aluminium to have an upright web 21 supporting a horizontally extending bottom web 22 and a parallel spaced top web 23. The joist 20 is attached to extend perpendicularly between parallel spaced longitudinal beams 14 by means of an adapter 24.
- [0031]. The adapter 24 is formed by extrusion with a uniform cross section to have an upright web 25, a bottom web 26 projects from the bottom of the upright web 25 and a mirror image top web 27 projects from the top edge of the web 25. The bottom and top web are spaced to fit tightly into the space between the bottom and top webs 22, 23 of the C section joist profile 20. Each of the top and bottom webs 26, 27 is formed with a tubular pin receiving feature 26.1.1 and 27.1 respectively. Corresponding holes are formed in the upright web 21 and self-tapping screws 26.2 and 27.2 are driven through the holes to engage in the features 26.1, 27.1 respectively to secure the adapter 24 to the joist. On the opposite side of the upright web 25, first 28.1 and second 28.2, vertically spaced, adapter engagement features are provided by “T” section ribs extruded to extend horizontally. The “T” section ribs are vertically spaced so that each will engage in a beam engagement feature and are asymmetrically disposed on the upright web 21

so that the adapter can be used in the condition shown, a joist supporting condition in one case and inverted.

- [0032]. The beam profile has an upper engagement feature 29, an intermediate engagement feature 30 and a lower engagement feature 31. Each engagement feature is vertically spaced from the adjacent engagement features and is otherwise similar so that only the upper engagement feature will be described. The beam profiles being symmetric about the vertical axis also means the engagement features and all other features of the profiles are replicated on each side of the vertical longitudinal axis.
- [0033]. Upper engagement feature 29 is formed by an upper L shaped rib 32 and a lower L shaped rib 33. The upper L shaped rib 32 has a down facing horizontal bearing surface formed by a horizontally extending limb 34 with a descending vertical limb 35. The lower L shaped rib 33 presents an upwardly facing bearing surface on a horizontally extending rib 36 and an ascending vertical limb 37. A gap 38 is provided between the vertical limbs of the ribs.
- [0034]. The “T” shaped ribs 27 and 28 of the adapter 24 are spaced similarly to the vertical spacing between the respective engagement features 29, 30, 31 whereby the T shaped ribs can be passed through the gaps of any adjacent pair of engagement features to locate against the up facing bearing surfaces and be hooked by the ascending limbs. When a C section joist is attached to the adapter any weight applied to the adapter will be transferred to the beams at each of the up facing bearing surface of the engagement features.
- [0035]. As shown the adapter supports that C section joist so that the upper surface is flush with the top of the beam.
- [0036]. In some cases, particularly where the deck is small, the weight of the deck may be considered insufficient to provide the required security. In such cases two or more adapters can be used to attach a pair of C section joists so that the horizontal webs are facing. Weights can then be added to span between the joists, supported primarily on the facing lower webs.
- [0037]. The beam profile also presents upper and lower screw accommodating features 40, 41. The upper screw accommodating feature 40 is located between the upper 29 and intermediate 30 engagement features, and the lower screw accommodating

feature is located between the intermediate 30 and lower 31 engagement features. The screw accommodating features are each provided by two longitudinally extending ribs spaced by a groove about 4mm wide and 6mm deep with a V section bottom. The groove facilitates the installation of self-tapping screws of appropriate size, for example to secure the L shaped brackets when joining the beam profiles.

[0038]. With the deck disposed on a rooftop it is necessary to securely connect balustrade support members in the form of vertical posts 42 or horizontal channels 43. To achieve this a balustrade support profile 44 is provided. The balustrade support profile has a longitudinally uniform cross section to be formed by extrusion. The cross section is generally an inverted "L" shape with a vertical stem 45 descending from a horizontal head 46. The vertical stem 45 presents upper and lower vertically space engagement features 47, 48 in the form of T shaped ribs. The upper and lower T shaped ribs are similar and the lower T shaped rib is shown in the enlarged detail.

[0039]. Each T shaped rib has a horizontal limb 49, and distal of the stem a descending limb 50 and ascending limb 51. When the balustrade support profile is being installed the upper and lower ribs are fed through the gaps 38 in the upper and lower engagement features and the descending limbs hook over the ascending limbs 37 to temporarily hold the balustrade support profile in place. The head 46 presents a substantially flat rectangular bearing surface 39 and includes two through holes (not shown).

[0040]. A second balustrade support profile is attached to the opposite side of the beam profile.

[0041]. The vertical posts 42 have a vertical cylindrical tube 52 and a horizontally extending rectangular base plate 53 welded to the base of the tube 52. The base plate includes two pairs of through holes spaced to coincide with each pair of through holes presented in each balustrade support profile. Machine screws 55 are fed through the base plate 53 and the balustrade support profile and secured using nuts (not shown). Tightening the screws causes the base plate to bear against the top15 so that the balustrade support profile is pulled up to the condition shown in figure 11. As the screws are tightened the upper limb 51 engages with the upper L shaped rib bearing surface 34. The resulting joint is very stiff and strong allowing

any loads applied to the post to be transferred to the attached beam profile and hence to substantially the whole frame. The contact area of the ribs extends over substantially the same length as the dimensions of the base plate and for each post assembly it is dispersed over four engagement features, two for each balustrade support profile.

[0042]. The deck is finished by mounting deck boards 56 onto the frame. Rails 57 are supported on top of the posts 42. Balustrade panels 58 are supported between the rails 57 and the deck.

[0043]. Where the balustrade support member is a channel profile 43, the channel profile is provided with screw holes similarly configured as for the base plate 53 to be screwed down onto the balustrade support profile with similar effect to secure the base plate. The panels are then secured into a channel 59 formed in the section 43. A rail 60 is then supported on the top edge of the panels.

Claims

1.

A deck comprising:

a generally planar frame comprising a plurality of beam profile members (14) extending parallel and perpendicular to each other to form a grid disposed horizontally and resting on a foundation,

a balustrade support profile (44), and a balustrade support member (42, 43)

wherein the balustrade support profile has an engagement feature (47, 48) which engages with an engagement feature (29, 30, 31) of the beam profile (12) whereby a fastening (55) acting between the balustrade support member and the balustrade support profile draws the respective engagement features together to form a rigid joint which distributes a load applied to the balustrade support member

characterised in that the beam profile engagement feature is in the form of a projecting rib comprising a lower projecting rib (33) which is L shaped and has a first projecting horizontal limb (36) supporting an ascending limb (37) at the end distal from a body of the beam profile, and an upper L shaped rib (32) spaced above the lower L shaped rib and having a horizontal limb (34) supporting a descending limb (35) distal from the body of the beam profile, said balustrade support profile having an engagement feature in the form of a T shaped rib having a first limb (49) projecting horizontally from a body of the balustrade support profile and supporting each of an ascending limb (51) and a descending limb (50) distal from the body of the balustrade support profile whereby, during assembly, the descending limb of the T shaped rib hooks onto the ascending limb of the lower rib, and when the balustrade support member is connected by the tensioning fasteners (55) overlying the balustrade support profile the balustrade support profile is pulled up so that the upper limb of the T shaped rib hooks into the upper L shaped rib.

2.

A deck according to claim 1 wherein the beam profile engagement feature is provided on a vertical side of the beam.

3.
A deck according to any one of the preceding claims wherein the beam profile is symmetric about a vertical longitudinally extending plane.
4.
A deck according to any one of the preceding claims wherein two or more vertically spaced beam profile engagement features are provided to engage with a corresponding number of vertically spaced balustrade support profile engagement features.
5.
A deck according to any one of the preceding claims wherein the beam profile and the balustrade support profile have a longitudinally uniform cross section to be formed by extrusion.
6.
A deck according to any one of the preceding claims wherein the beam profile engagement feature engages with an engagement feature of an adapter, said adapter engagement feature engaging with a joist to enable the joist to be suspended between two parallel spaced beam profiles.
7.
A deck according to claim 6 wherein the adapter comprises an upright web supporting a lower horizontal web and an upper horizontal web which projects from a first face of the upright web, a pair of vertically spaced engagement features projecting from the opposite face of the upright web, wherein the upper and lower horizontal webs engage with the joist.
8.
A deck according to claim 7 wherein the vertical spacing of the engagement features is asymmetric to enable the adapter to be hung from the beam profile in either one of two positions.

9.

A deck according to claim 7 or 8 wherein the cross section of the adapter is longitudinally uniform whereby the adapter can be made by extrusion.

10.

A deck according to claim 7 or 8 wherein the joist is a C section having an upright web and horizontally extending lower and upper webs extending from the upright web to engage with the adapter.

11.

A deck according to any one of claims 7 to 10 wherein each C section defines a side opening between the lower and upper webs, a pair of C sections are suspended between adjacent parallel beam profiles arranged with facing openings and weights are disposed between the openings supported on the lower webs.

12.

A deck according to any one of the preceding claims wherein the beam profiles are supported on a plurality of leg assemblies, each leg assembly comprising a footplate having a uniform cross section with one of a groove or a projecting rib formation, and an upright of uniform cross section having the complementary other of the groove or rib formation, whereby the upright can be joined to the footplate by engaging the rib in the groove, said rib and groove being cylindrical to enable the upright to articulate in one vertical plane.

13.

A deck assembly according to claim 12 wherein a longitudinally extending channel is formed in one of the beam profile or the upright and the other of the beam profile or the upright locates in the channel, whereby the height of the beam profile above the foundation is adjusted by the amount of the upright or beam profile projecting from the channel and the inclination of the foot plate can be adjusted in the vertical plane perpendicular to the groove so that the foot plate can sit squarely on the surface of the foundation.

14.

A deck according to one of claims 12 or 13 wherein the foot plate and upright are of uniform cross section to be formed by extrusion.

15.

A method of constructing a deck comprising a generally planar frame with a plurality of beam profile members extending parallel and perpendicular to each other to form a grid disposed horizontally and resting on a foundation, comprising the steps of attaching an engagement feature of a balustrade support profile to an engagement feature of a beam profile;
disposing a balustrade support member above the balustrade support profile;
tightening a fastening between the balustrade support member and the balustrade support profile to form a rigid join between the balustrade support member and the beam profile characterized by the steps of engaging a T-shaped rib providing the engagement feature of the balustrade support profile with a lower L-shaped rib providing part of the engagement feature of the beam profile in order to suspend the balustrade support profile from the outside of the beam profile, whereby tightening the fastening displaces the T-shaped rib to engage in an upper L-shaped rib forming a second part of the beam profile engagement feature.

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16.

A method of constructing a deck according to claim 15 comprising attaching an adapter to the beam profile by engaging an engagement feature of the adapter with an engagement feature of the beam profile;
attaching a joist to the adapter to span between two parallel beam profiles.

17.

A method of constructing a deck according to claim 16 comprising suspending two joists between two parallel adjacent spaced beam profiles so that an open side formed by the lower and upper webs of each respective joists is facing and inserting weights to span between, and be suspended from the joists.

17.

A method according to any one of claims 15 to 17 comprising deploying a plurality of leg assemblies on the foundation each at a location underlying the intended location of a beam profile;
said leg assembly having an upright joined to a foot plate by an articulating joint;
one of said upright or said beam assembly including a through channel;
assembling the beam assembly to the foot assembly by inserting the other of the beam profile or the upright into the channel;
adjusting each beam profile to a horizontal condition;
locking the relative position of the upright and the beam profile so that the leg assembly supports the beam profile with the foot plate flush against the foundation.

18.

A method according to claim 17 wherein the relative position of the upright and beam profile is locked by driving a pin or screw through at least one of the upright or the beam profile.

19.

A method according to any one of the claims 15 to 18 wherein the foundation is a flat roof.