Vertically Movable Bracket Assembly

FIELD OF THE INVENTION

The present invention relates to a vertically movable bracket assembly. The bracket assembly of the present invention has particular application to connecting a partition wall and / or related components (such as a ceiling grid) to an overhead structural component of a building. However, the invention may also have other applications.

BACKGROUND

Devices for attaching a non-structural component(s) of a building, such as a partition wall(s) and / or ceiling grid(s), to an overhead structural component(s) of the building, are known.

One such device is the bracket assembly disclosed in NZ631234, which comprises a generally V-shaped bracket mounted on a bearing member and a sleeve member. The sleeve member attaches to the non-structural components, while the arms of the bracket are connected via elongate linking members to the overhead structure.

The bracket assembly of NZ631234 provides an effective and user-friendly means for sturdily anchoring the non-structural components, helping to proof these against selected seismic and wind loadings. However, it is not specifically designed to accommodate vertical movement as between the non-structural components and the overhead structure (referred to as “vertical deflection”). In builds where it is necessary to account for vertical deflection, the bracket assembly of NZ631234 must be used in conjunction with extraneous components such as a deflection track. This adds to complexity of design and installation, and therefore also to cost.

Accordingly, it is an object of the present invention to provide a bracket assembly for sturdily and securely connecting non-structural components of a building to the overhead structure while also allowing a measure of vertical deflection. At the very least, it is an object of the present invention to provide the public with a useful choice.

STATEMENTS OF THE INVENTION

According to a first broad aspect of the invention, there is provided a substantially vertically movable bracket assembly for connecting a non-structural component of a building to an overhead structural component of the building, the bracket assembly comprising the following components:

a lower shaft member configured to, in use, be connectable to the non-structural component;

an upper shaft member configured to, in use, be movable substantially vertically relative to the lower shaft member; and

a bracket configured to, in use, be connectable to the overhead structural component, wherein the bracket is configured to, in use, be connectable to the upper shaft member and movable substantially vertically therewith relative to the lower shaft member.

Preferably, the non-structural component comprises a partition wall, and reference will be made accordingly throughout the remainder of this specification.

Preferably, the partition wall comprises a head track disposed at an upper end of the partition wall, to which the lower shaft member is connectable in use. Throughout the remainder of the present specification, reference to connecting the lower shaft member to the partition wall will be understood as meaning connecting the lower shaft member to the head track.

Preferably, the overhead structural component (hereinafter "overhead structure") comprises a roof structure of the building, or a floor structure of a storey of the building directly above a space where the temporary structural component is located.

Preferably, the lower shaft member is configured to, in use, be connectable to the partition wall proximate a first end of the lower shaft member.

Preferably, the bracket assembly is configured with a neutral position, being the position, in use, of the components of the bracket assembly relative to one another in the absence of applied forces acting on the bracket assembly (including on the overhead structure and / or the partition wall) in a substantially vertical direction ("vertical forces").

Accordingly, reference to the upper shaft member being “movable” substantially vertically relative to the lower shaft member in use relates to the upper and lower shaft members being displaceable relative to one another in response to an applied vertical force acting on the bracket assembly.

Preferably, the bracket assembly is configured to accommodate vertical movement of up to substantially 20mm to 30mm in either direction from the neutral position; and more preferably up to substantially 25mm in either direction from the neutral position.

Preferably, the upper shaft member is movable substantially vertically relative to the lower shaft member by being slidable relative to the lower shaft member.

Preferably, the lower shaft member is configured as a sleeve relative to the upper shaft member, such that the upper shaft member slides in a telescoping manner within an interior passageway in the lower shaft member.

Preferably, the bracket assembly comprises at least one vertical biasing means configured and dimensioned to, in use, retain the components of the bracket assembly in the neutral position in the absence of applied vertical forces and oppose applied vertical forces acting on the bracket assembly in at least one direction.

Preferably, the at least one vertical biasing means is disposed about the upper and / or lower shaft member.

Preferably, the at least one vertical biasing means is a spring.

Preferably, the bracket assembly comprises at least one horizontal biasing means configured and dimensioned to, in use, oppose applied forces acting on the bracket assembly in at least one substantially horizontal direction.

Preferably, the bracket has a profile formed substantially as a truncated V-shape, comprising a central portion and a pair of angled wing portions. Preferably, the wing portions are configured to, in use, be connected to the overhead structure via linking components.

Preferably, the linking components comprise arm portions and connecting flanges, wherein the arm portions are configured to connect at a first end to the wing portions and at a second end to the connecting flanges and the connecting flanges are configured to connect to the overhead structure.

Preferably, the bracket is configured to, in use, be connectable proximate a first end of the upper shaft member, being the end of the upper shaft member which, in use, is distal from the lower shaft member.

Preferably, the bracket assembly comprises one or more stabilising members configured to, in use, be disposed above and / or below the central portion of the bracket to assist in preventing the bracket from tilting in use.

Preferably, the stabilising member(s) may have a width and be provided with a central passageway complementary to the upper shaft member, such that, in use, the stabilising member(s) act as a collar(s), helping to maintain the bracket at a level attitude.

The present invention provides a number of optional advantages, including at least:

- Providing a bracket assembly that allows connection between a non-structural component and an overhead structural component in a manner that is sturdy and robust while at the same time accommodating a measure of vertical deflection;

- At the same time, providing a bracket assembly that is effective in withstanding horizontal loading; more particularly, that offers an appropriate degree of resistance to horizontal loading while also optionally being configured to accommodate a measure of horizontal deflection;

- Providing a bracket assembly that is simple, cost-effective and convenient to manufacture and install; and

- At the very least, providing the public with a useful choice.

DESCRIPTION

Further aspects and advantages of the present invention will become apparent from the following description which is given by way of example only and with reference to the accompanying drawings in which:

FIGURE 1 is a schematic showing a substantially vertically movable bracket assembly according to a first exemplary preferred embodiment of the invention;

FIGURE 2 is a schematic showing a substantially vertically movable bracket assembly according to a second exemplary preferred embodiment of the invention; and

FIGURE 3 is a photograph showing a substantially vertically movable bracket assembly according to a third exemplary preferred embodiment of the invention.

Figure 1 is a schematic showing a substantially vertically movable bracket assembly (generally indicated by 100) according to a first exemplary preferred embodiment of the present invention. The bracket assembly (100) is shown here in connecting a partition wall (102) to an overhead structural component (104), although the bracket assembly (100) can be used to connect other types of non-structural components besides partition walls, for example ceiling grids, to overhead structural components of buildings.

The bracket assembly (100), which is shown in its neutral position, comprises the following components: a lower shaft member (106); an upper shaft member (110); and a bracket (116).

In this embodiment, the lower shaft member (106) is connected at its first (lower) end to the partition wall (102), and more particularly a head track (103) mounted at the top of the partition wall. The head track may be of any conventional kind known in the art. In this embodiment, connection between the lower shaft member (106) and the head track (103) is achieved via an intermediate component, namely a plinth (108), using conventional fastening means such as screws (not shown).

However, the skilled person will appreciate that many other connection configurations and / or means may be used to engage the lower shaft member (106) to the head track. For example, the first end of the lower shaft member may directly abut the head track and be connected thereto via a range of fastening means, for instance a screw, bolt or rivet passing upwardly through the head track into the lower shaft member. In another example, the lower shaft member may be configured to be vertically somewhat "offset" from the head track; for instance, an aperture in the head track may allow the lower shaft member to extend some distance into the "cavity" between the partition wall panels.

In this embodiment, the lower shaft member (106) is configured with an interior passageway (not shown) such that the lower shaft member forms a "sleeve" within which the upper shaft member (110) slides vertically in use, that is, when applied vertical forces displace it from its neutral position as indicated by arrow (114).

The passageway in the lower shaft member may extend along an entire length of the lower shaft member; or partway along its length. It is even possible for the passageway to be open at the first (lower) end of the lower shaft member, such that, in use, the upper shaft member can slide downwardly past this point and into the cavity between the partition wall panels.

Equally, vertical movability of the upper shaft member relative to the lower shaft member can be achieved via alternative configurations. For example, it is possible for the upper shaft member to provide the sleeve, with the lower shaft member being slidable within the upper shaft member. Vertical movability might also be achieved by a configuration other than a telescoping arrangement, such as for instance a ratchet or articulated mechanism.

In this embodiment, the bracket (116) has a V-shaped profile with a central portion (116b) and a pair of angled wing portions (116a). However, variations on this shape are possible and will be readily envisaged by the skilled person.

The bracket (116) is connected to the overhead structure (104) via linking components comprising arm portions (118) connected at one end to the wings (116a) and at the other end to connecting flanges (120), which in turn are connected to the overhead structure (104). All these connections may be of a conventional type, such as screws, nails, or welding.

In this embodiment, the bracket (116) is connected to the first (upper) end of the upper shaft member (110) via a conventional fastening means such as a screw (122). However, it is within the scope of the invention for the bracket to be somewhat offset from the upper end of the upper shaft member, such that a portion of the upper shaft member protrudes above it.

Figure 2 is a schematic showing a substantially vertically movable bracket assembly (generally indicated by 200) according to a second preferred exemplary embodiment of the present invention. The bracket assembly (200) of Figure 2 is substantially similar to that of Figure 1, but with several additional components.

The additional components comprise a vertical biasing means (204), in this embodiment provided by a spring, disposed about the upper shaft member (110); and a flange (202), in this embodiment provided by a circular disc, disposed about a second (upper) end of the lower shaft member (106) to support the spring (204).

The spring (204) is advantageous in that it retains the components of the bracket assembly (200) in the neutral position relative to one another in the absence of applied vertical forces. It also opposes vertical forces when applied to the bracket assembly (200), urging the components back towards the neutral position. In the depicted embodiment, downward movement of the bracket (116) will compress the spring (204), causing it to urge the bracket (116) upwardly again. If the spring (204) is also connected to the bracket (116) and flange (202), upward movement of the bracket (116) will place the spring (204) in tension, urging the bracket downwardly again.

The spring also facilitates convenient installation by maintaining the upper (110) and lower (106) shaft members in the neutral position relative to one another, meaning they do not need to be manually held in place or otherwise be temporarily fixed during installation.

It will be understood that the vertical biasing means (204) may be provided by a range of other configurations. For instance, it may be disposed within the interior passageway of the lower shaft member (106). It may also be provided by alternative materials, such as a resilient rubber material. There may also be more than one vertical biasing means.

Figure 3 is a photograph showing a substantially vertically movable bracket assembly (generally indicated by 300) according to a third preferred exemplary embodiment of the present invention. Once again, the bracket assembly (300) of Figure 3 is in many respects similar to those of Figures 1 and 2, but with additional components.

The bracket assembly (300) of this embodiment includes a horizontal biasing means (306) configured to oppose applied horizontal forces acting on the bracket assembly. The horizontal biasing means (306) is clamped between the central portion (216b) of the bracket and a flange (308), in this embodiment provided by a circular disc, provided at the first (upper) end of the upper shaft member (110). In this embodiment, the horizontal biasing means (306) is provided by a bearing formed from resilient rubber material, although it will be appreciated that a range of suitable alternative configurations are possible, both in terms of the material from which the horizontal biasing means is formed and in terms of its location and attachment within the bracket assembly.

It is notable that the substantially vertically movable bracket assembly of this embodiment is configured by modifying the components of the bracket assembly of NZ631234 (and the corresponding TRACKLOK® product).

In particular, the lower shaft member (106) is provided by the existing sleeve member of the TRACKLOK® product, and is connected to the partition wall using the plinth (108) of the TRACKLOK® product. The bracket (116) and fastener (122) are likewise those of the TRACKLOK® product; as are the rubber bearing (306) and flange (308).

The modification resides in the insertion of the upper shaft member (110) into the lower shaft member (106) such that the upper shaft member (110) slides vertically within the lower shaft member (106). The bracket (116) is then affixed to the upper shaft member (110) using the fastening means (122), such that the bracket (116) slides vertically together with the upper shaft member (110). Equally, the ancillary components of this embodiment (rubber bearing (306); flange (308)) are affixed to the upper shaft member (110); and the spring (206) coiled about the upper shaft member (110).

It will of course be realized that while the foregoing has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would

be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as is hereinbefore described.

If any reference numeral(s) is/are used in a claim or claims then such reference numeral(s) should not be considered as limiting the scope of that respective claim or claims(s) to any particular embodiment of the drawings.

It is acknowledged that the term ‘comprise’ may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term ‘comprise’ shall have an inclusive meaning - i.e. it will be taken to mean an inclusion of not only the listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term ‘comprised’ or 'comprising' is used in relation to one or more steps in a method or process.

PROVISIONAL CLAIM 1:

A substantially vertically movable bracket assembly for connecting a non-structural component of a building to an overhead structural component of the building, the bracket assembly comprising:

a lower shaft member configured to, in use, be connectable to the non-structural component;

an upper shaft member configured to, in use, be movable substantially vertically relative to the lower shaft member; and

a bracket configured to, in use, be connectable to the overhead structural component, wherein the bracket is configured to, in use, be connectable to the upper shaft member and movable substantially vertically therewith.

ABSTRACT:

Conventional bracket assemblies for connecting a non-structural component (such as a partition wall) of a building to an overhead structural component thereof may tend to lack the ability to accommodate vertical deflection as between the non-structural component and the overhead structural component. The present invention comprises a substantially vertically movable bracket assembly for connecting a non-structural component of a building to an overhead structural component of the building, the bracket assembly comprising a lower shaft member configured to, in use, be connectable to the non-structural component; an upper shaft member configured to, in use, be movable substantially vertically relative to the lower shaft member; and a bracket configured to, in use, be connectable to the overhead structural component, wherein the bracket is configured to, in use, be connectable to the upper shaft member and movable substantially vertically therewith. The bracket assembly of the present invention thereby enables connection between the non-structural component and the overhead structural component that accommodates a measure of vertical movement.

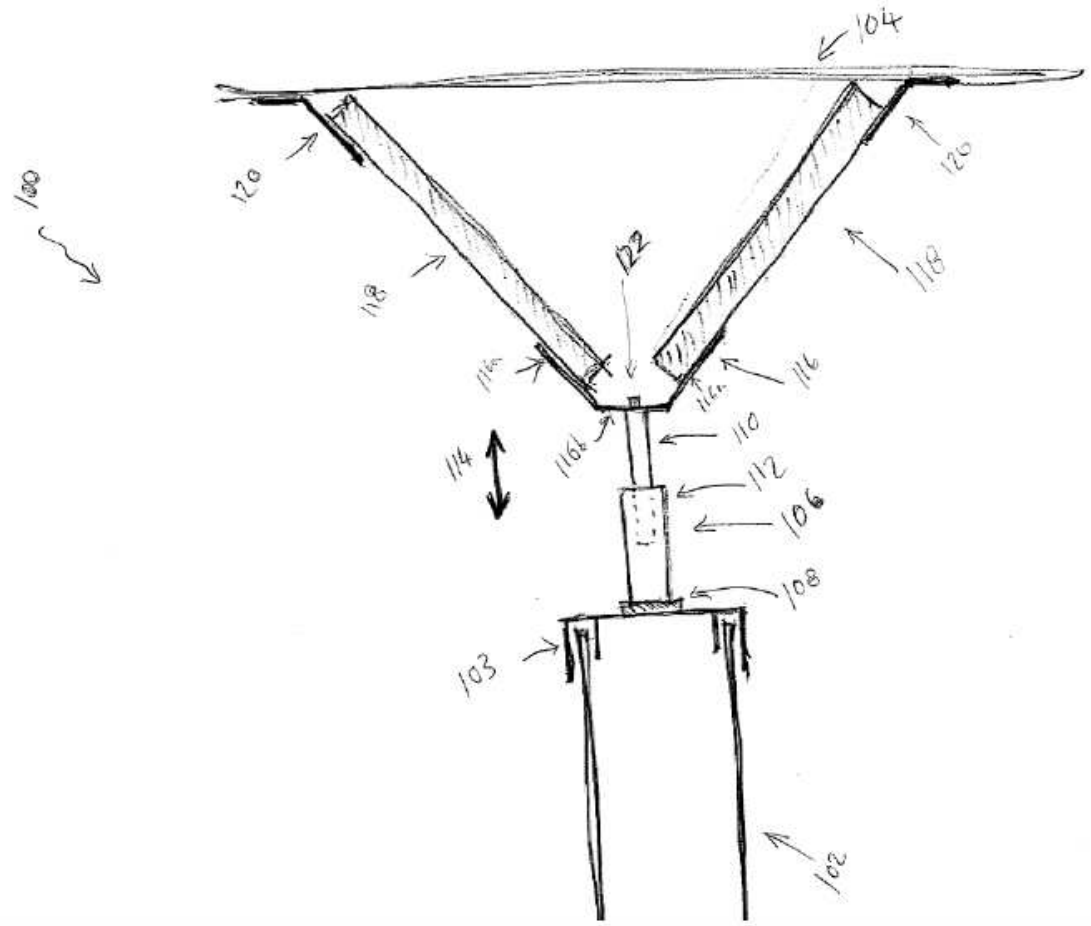
100
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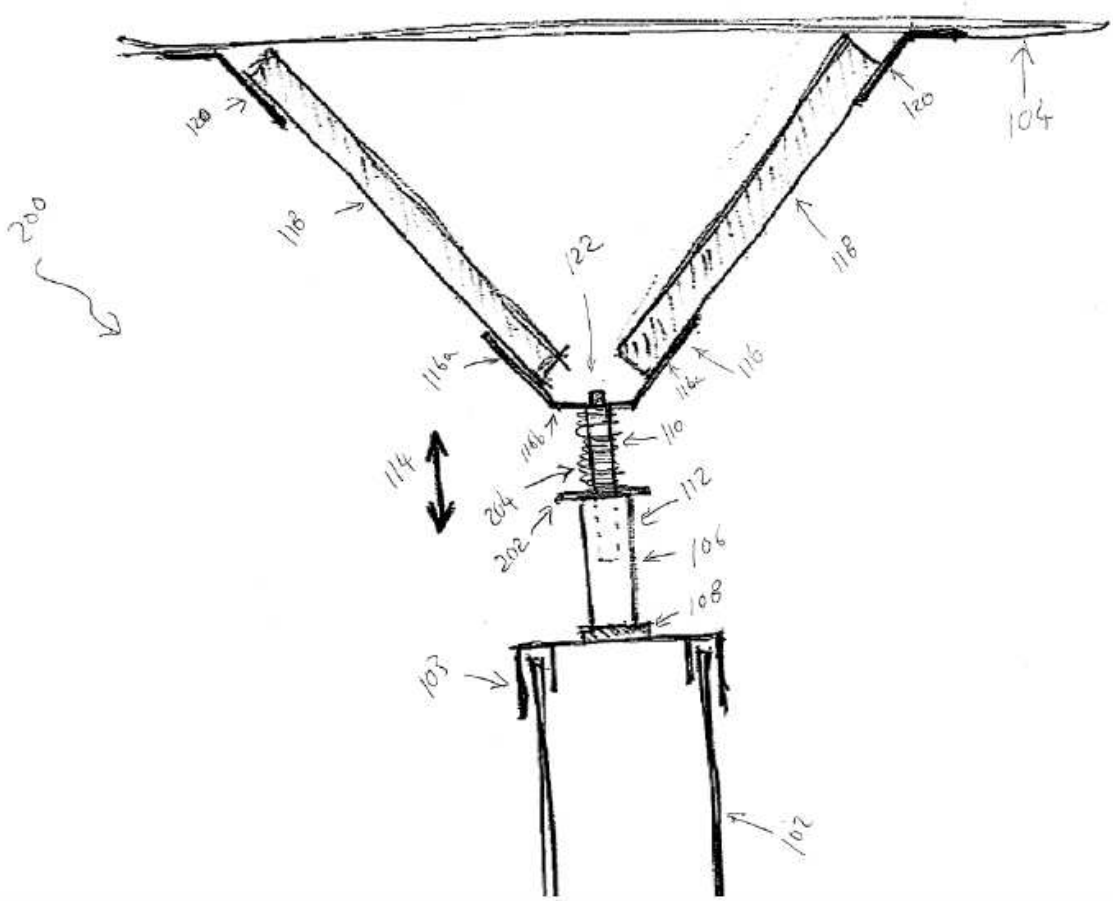
Figure 1


200
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104
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116b
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102

Figure 2

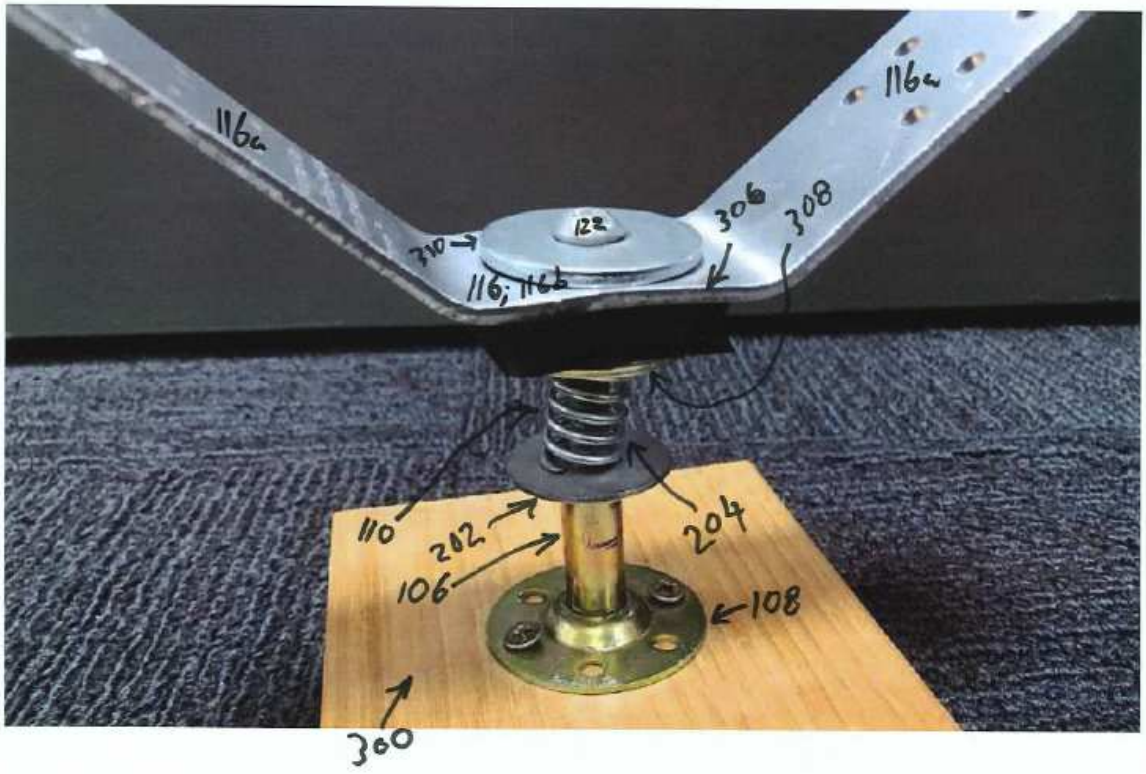

Figure 3