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Wall panel support columns for modular transportable buildings

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(56) Related Art
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ABSTRACT

The present invention relates to a transportable building and wall panel support columns therefor, in particular, vertical structural frame elements for a transportable building which are designed to also receive and support internal and external wall panels.

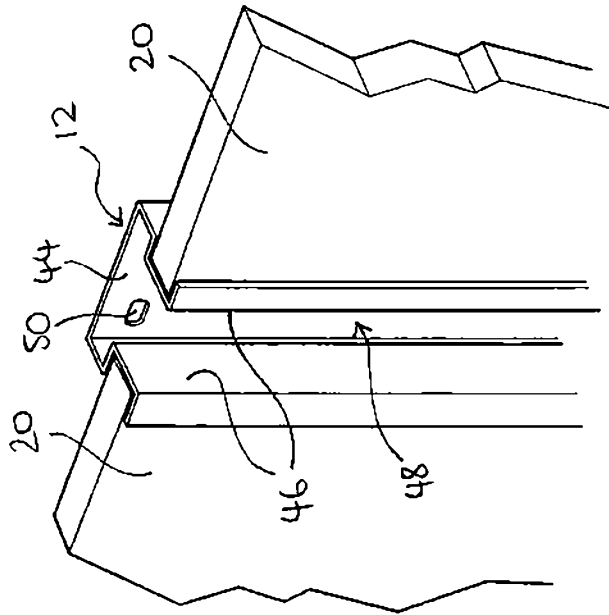


Fig 2a

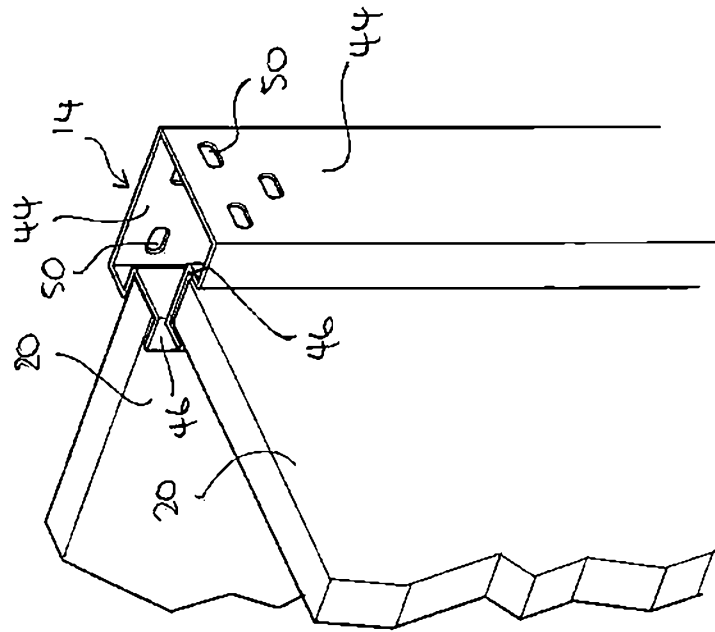


Fig 2b

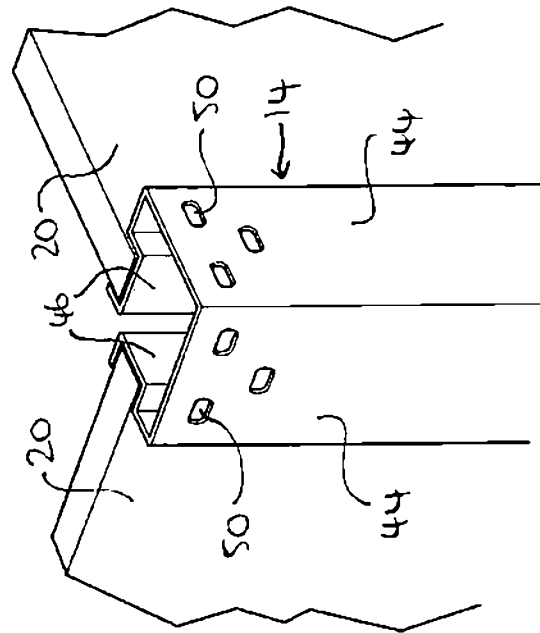


Fig 2c

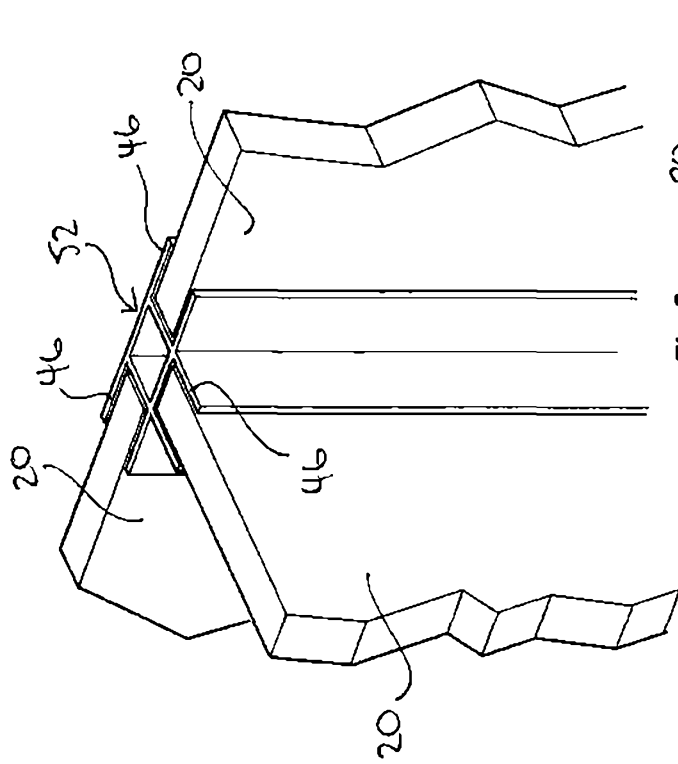


Fig 3a

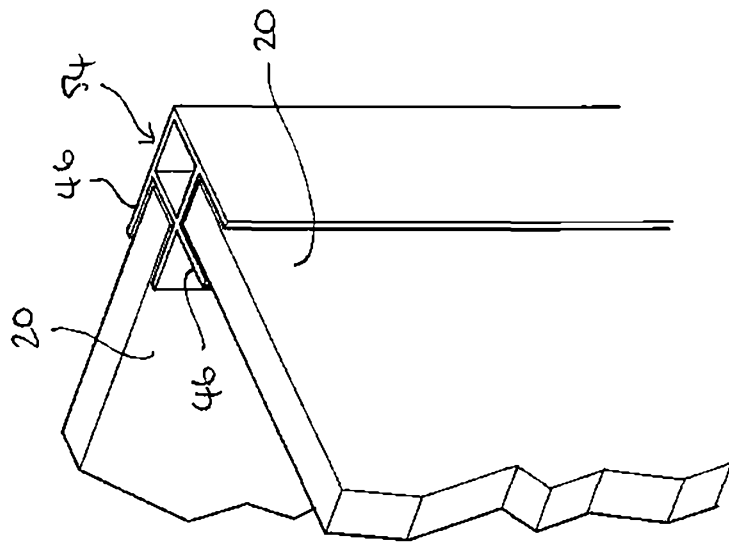


Fig 3b

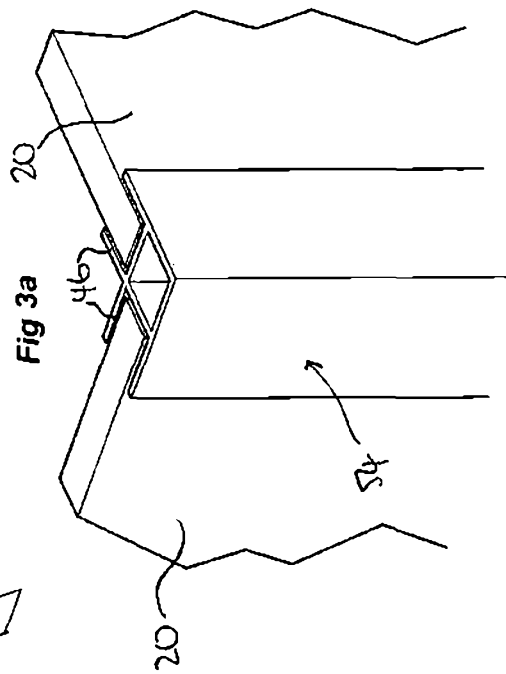


Fig 3c

2009202918 22 Jul 2009

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Complete Specification

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The following statement is a full description of this invention, including the best method of performing it known to me/us:

Wall panel support columns for modular transportable buildings

FIELD OF THE INVENTION

The present invention relates to wall panel support columns and, in particular, to vertical structural frame elements for a transportable building which are designed to also receive and support internal and external wall panels of the building.

BACKGROUND OF THE INVENTION

Camps have been used for many years to provide shelter and accommodation especially in remote areas. This is especially so in the case of remote camps that are assembled using a number of transportable buildings, some of the buildings used as sleeping quarters, others as the kitchen and dining room facility and others still as recreational areas. It is not uncommon for a camp to consist of sixty to eighty buildings that can accommodate several hundred people.

These camps are completely self-contained in that the transportable buildings provide all of the facilities for a small remote community that may be needed in a particular area. Accordingly these camps include all of the modern day facilities such as electrical power, water, sewerage, and communication. They therefore typically also include their own power generation systems, water distribution systems, sewerage treatment plants, and communication facilities such as satellite dishes. The camps typically require a considerable amount of skill, time, and effort to assemble and commission. Once constructed, these camps can however provide accommodation indefinitely if the infrastructure is maintained.

In some instances the camps have to be portable or mobile. For example, during construction of infrastructure across a vast area, such as roads or pipelines supplying water or gas, a particular location for a camp housing the construction workers, may only be viable for several weeks or months. As the pipeline is progressively constructed, there is a balance between the economic cost of the travel time of workers housed in the camp to the current work site and time spent constructing the actual pipeline. It is therefore accepted in the industry that if the travel time between a camp and the work location is more than an hour, a new camp has to be constructed that is closer to the work location. At that time, a new camp is therefore constructed one hour ahead of the current construction location or generally up to several hundred kilometres away from the existing camp.

The present inventor is the owner of a number of patents in connection with transportable buildings, including Australian Letters Patent No. 2003227102, directed towards an improved transportable building chassis and its ability to be easily lifted and transported using a working vehicle such as a forklift. This enables the buildings to be transported with ease, and makes commissioning and decommissioning of camps a much more fast and efficient process.

2009202918 19 Mar 2013

3

The present inventor has realised that at any one time the demand for transportable buildings, particularly when larger pipeline construction projects arise, is far greater than the rate at which existing buildings such as those disclosed in the abovementioned Letters Patent can be manufactured and supplied. Even small improvements with respect to such buildings and their method of manufacture, particularly those which reduce the amount of time and skilled labour required for their assembly, can equate to significant cost savings. It is with these issues in mind that the wall panel support columns of the present invention have been conceived.

It is therefore an object of the present invention to overcome at least some of the abovementioned problems or provide the public with a useful alternative.

SUMMARY OF THE INVENTION

Therefore in one form of the invention there is proposed a wall panel support column assembly for a transportable building having a base chassis and a roof chassis, said support column assembly adapted to support said roof chassis a spaced apart distance above said base chassis, said support column assembly including vertically aligned mounting plates projecting from each of said base and roof chassis, and a column having at least two C-section channels for supporting at least two wall panels in different directions, and at least one mounting surface that is independent of surfaces of the C-section channels which contact the wall panel, the mounting surface extending the length of the column and configured to overlap and engage with the vertically aligned mounting plates.

In preference said mounting surfaces is a back plate of said column, and said C-section channels which extend along at least one elongate edge of said back plate, said C-section channels being of a size to receive and support a wall panel therein.

Preferably said column is adapted for use at a perpendicular corner of said building, said corner column including an open, substantially square cross section comprising two perpendicular back plates having free elongate edges which are turned perpendicularly inwards and which terminate in two perpendicularly offset C-section channels, whereby the web portion of each channel extends parallel to each back plate.

Alternatively said column is adapted for use at a junction between a straight external wall, and a perpendicular internal wall, said column including an open, substantially rectangular cross section comprising one back plate having free elongate edges which are turned perpendicularly inwards and which terminate in two aligned but opposed C-section channels, whereby the web portion of each channel extends perpendicularly to said back plate.

2009202918 19 Mar 2013

4

In preference the web portion of each of the C-section channels is separated by a distance which enables the internal wall panel to be received and supported therebetween.

In preference, said mounting surface is configured to co-align with mounting surfaces extending upwardly from said base chassis and downwardly from said roof chassis, each surface including co-aligned apertures for receiving fastening means.

Preferably said wall panels are composite wall panels including a core of fire resistant insulation material sandwiched between planar rigid faces.

In preference said wall panels are rectangular in shape and are mounted vertically between the base chassis and roof chassis, each panel including an elongate male edge and an elongate female edge, whereby said male edge is adapted to engage the female edge of a second panel, and the female edge of the second panel is adapted to engage the male edge of a third panel, and so on, to form a flat wall of panels.

Preferably at least one of said wall panels includes a window of said building. In preference at least one of said wall panels includes a doorway.

In a further form of the invention there is proposed a transportable building for use in a portable camp including:
a base chassis having upwardly mounting plates at least at each corner of the base chassis;
a corresponding roof chassis having downwardly extending mounting plates at least at each corner of the roof chassis; and
a plurality of support columns extending between said base chassis and roof chassis, said support columns adapted to support said roof chassis above said base chassis, each said support columns including, at least two C-section channels for supporting at least two wall panels in different directions, at least once mounting surface that is independent of surfaces of said C-section channels which contact the wall panel, the mounting surface extending the length of the column and configured to overlap and engage with vertically aligned mounting plates.

Preferably said base chassis and roof chassis are of a substantially perpendicular construction and includes internal and external walls, said support columns being located at perpendicular corners of the building, and also at the junctions between internal and external walls.

In preference each said mounting surface is a back plate of said column extending the length of the column and including apertures at ends thereof which co-align with apertures in said mounting plates for receiving fastening bolts.

Preferably each said column includes C-section channels which extend along at least one elongate edge of said back plate, said C-section channels being of a size to receive and support a wall panel therein.

In preference said column is adapted for use at a perpendicular corner of said building, said corner column including an open, substantially square cross section comprising two perpendicular back plates having free elongate edges which are turned perpendicularly inwards and which terminate in two perpendicularly offset C-section channels, whereby the web portion of each channel extends parallel to each back plate.

Alternatively said column is adapted for use at a junction between a straight external wall, and a perpendicular internal wall, said column including an open, substantially rectangular cross section comprising one back plate having free elongate edges which are turned perpendicularly inwards and which terminate in two aligned but opposed C-section channels, whereby the web portion of each channel extends perpendicularly to said back plate.

In preference the web portion of each of the C-section channels is separated by a distance which enables the internal wall panel to be received and supported therebetween.

In a further form of the invention there is proposed a portable camp including a plurality of transportable buildings as described above.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several implementations of the invention and, together with the description, serve to explain the advantages and principles of the invention.

In the drawings;

Figure 1 illustrates a perspective view of a modular transportable building including wall panel support columns in accordance with the present invention;

Figure 2a illustrates a perspective view of a top end of a support column in accordance with a first and preferred embodiment of the invention, adapted for use along a side of the building to support two external wall panels at 180 degrees, and one intermediate internal wall panel extending perpendicularly thereto;

2009202918 19 Mar 2013

5a

Figure 2b illustrates a front perspective view of a top end of a support column in accordance with a first and preferred embodiment of the invention, adapted for use at a corner of the building to support two external wall panels only at 90 degrees;

5 Figure 2c illustrates a rear perspective view of a top end of the support column and wall panels of Figure 2b;

Figure 3a illustrates a perspective view of a top end of a support column in accordance with a second embodiment of the invention, adapted for use along a side of the building to support two external wall panels at 180 degrees, and one intermediate internal wall panel extending perpendicularly thereto;

10 Figure 3b illustrates a front perspective view of a top end of a support column in accordance with a second embodiment of the invention, adapted for use at a corner of the building to support two external wall panels only at 90 degrees;

- Figure 4 illustrates a perspective view of the base chassis of the building of Figure 1 including support columns in accordance with the first embodiment mounted at corners and along front and rear sides of the chassis;
- Figure 5 illustrates a perspective view of the internal and external composite wall panels being inserted and supported between the support columns in accordance with the invention;
- Figures 6 illustrates a perspective view of a roof chassis being lowered onto the vertical support columns of the present invention to substantially complete the assembly of the building of Figure 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following detailed description of the invention refers to the accompanying drawings. Although the description includes exemplary embodiments, other embodiments are possible, and changes may be made to the embodiments described without departing from the spirit and scope of the invention. Wherever possible, the same reference numbers will be used throughout the drawings and the following description to refer to the same and like parts.

Referring to Figure 1, there is illustrated a modular transportable building 10 including a plurality of vertical support columns 12 and 14 in accordance with a first embodiment of the present invention. The transportable building 10 includes a base chassis 16, a roof chassis 18, and a plurality of wall panels 20 defining an elongate box-shaped building having a front side 22 and a rear side 24 extending parallel to a central longitudinal axis of the building, and ends 26 and 28 extending perpendicularly thereto. The modular transportable building 10 includes four internal walls made up of the same panels 20 as the external walls, which divide the building into four separate compartments, hence the four doors 30 on the front side 18 of the building. Of course, the geometry of the building 10 and the number of rooms may vary and the present invention is not intended to be limited to any one arrangement.

The exact configuration of the base chassis 16 and roof chassis 18 are described in a co-pending patent application owned by the present inventor, and so will not be described here in any great detail. In any event, their configurations are not essential to the working of the present invention. In brief, both the base chassis 16 and roof chassis 18 are rectangular in shape and include longitudinal side beams 32 and 34 respectively. The side beams of each chassis are approximately of the same length, and both include a plurality of respective cross members 36 and 38 extending transversely there between, many of which are hidden from view in the drawings.

The side beams 32 and 34 of each chassis 16 and 18 include a plurality of mounting plates 40 and 42 at positions around the perimeter of the chassis, whereby mounting plate 42 is a perpendicular-plane

mounting plate adapted for each point around the chassis where only two wall panels 20 meet at a perpendicular angle, for example, at the corners of the building, and mounting plate 40 is a single-plane mounting plate for where there is an internal wall. Thus, for the building 10 shown in Figure 1 which has four main compartments, the base chassis 16 and the roof chassis 18 will each include ten such mounting plates around the perimeter of each chassis. The mounting plates associated with the roof chassis 18 extend downwardly and the mounting plates associated with the base chassis 16 extend upwardly and are aligned along the same vertical axes. As will become apparent, the mounting plates 40 and 42 provide a locating means for the vertical support columns, as well as a surface to which the columns can be fastened at opposed ends.

Although the mounting plates 40 and 42 are shown on the outside of the columns, this is for the purpose of demonstrating where they are located. Preferably, the plates 40 and 42 are positioned to extend inside the columns 12 and 14 respectively.

Figure 2a illustrates a vertical support column 12 which is adapted for use at each point along the length of the building 10 where there is an internal wall, whilst Figures 2b-2c illustrate a vertical support column 14 adapted for use at the corners of the building 10.

The cross section of column 12 is substantially rectangular and includes a single, elongate back plate 44 adapted to extend on the outside of, and abut with, the single-plane mounting plates 40 of the base and roof chassis'. The back plate 44 turns inwardly a short distance at ends thereof, and then terminates in oppositely directed C-section channels 46 for receiving external wall panels at 180 degrees from one another. The gap 48 between the two C-section channels is approximately the same as the internal width of each channel 46, which means that an internal wall panel 20 can be inserted into the gap 48 and extend perpendicularly to the external panels. This third panel is not shown in Figure 2a. The back plate 44 includes at ends of the column 12 a plurality of apertures 50 which become coaxially aligned with correspondingly positioned apertures (not shown) of the base and roof chassis mounting plates 40. Any suitable fastening means such as bolts can then be inserted through the coaxially aligned apertures to connect the columns 12 to the plates 40.

The cross section of column 14 is substantially square and includes two perpendicular back plates 44 adapted to extend on the outside of, and abut with, the perpendicular-plane mounting plates 42 of the base and roof chassis'. The same reference numerals are used to describe similar features in each of the columns 12 and 14. Each plate 44 of column 14 similarly turn inwardly a short distance, however rather than terminating in opposed C-section channels, they terminate in two perpendicularly offset C-section channels 46. These channels are for receiving external wall panels at 90 degrees from one another, for example, at the corners of the building. The perpendicular back plates 46 also include apertures 50 which become coaxially aligned with apertures (not shown) of mounting plate 42. Again, any suitable fastening

means such as bolts can be inserted through the coaxially aligned apertures to connect the columns 14 to the plates 42.

In the first and preferred embodiment shown, both wall panel support columns 12 and 14 are open hollow structures. It is to be understood however that the support columns 12 and 14 of the present invention could be designed differently whilst still performing the same function. For example, Figures 3a-3c illustrate "side" and "corner" support columns 52 and 54 respectively which are of a closed square shaped construction having wall panel receiving C-section channels 46 extending outwardly from two or three sides thereof depending on the location of the columns.

The C-section receiving channels 46 are of a size to allow for the snug fit of the wall panels 20. The panels 20 are preferably rectangular shaped, composite panels comprising a fire resistant core of insulation material with a metallic outer skin on either side. Although not shown in detail, the outer skin has male and female elongate edges (not shown) to allow for panels to be coupled together by way of engagement between the male and female portions of two adjacent panels. Erection of each wall of the building 10 could be done any number of ways. For example, an entire wall of the building including columns, wall panels, doors, etc, could be erected and then the whole structure lifted into place so that the vertical support columns 12 and 14 can then be fastened to the base chassis 12 as described above. Alternatively, the vertical columns 12 and 14 could each be fastened to the base chassis 12 first, and then the wall panels, doors, etc, simply inserted in place.

The skilled addressee should now realise the ease at which the wall panel support columns 12 and 14, and the wall panels 20, can be erected during the assembly of the transportable building 10. Figure 4 illustrates the support columns 12 and 14 of the first embodiment after having being connected at their lower ends to the base chassis mounting plates 40 and 42 after floor panels 56 and bathroom floor mouldings 58 have been laid. Figure 5 illustrates the step of inserting the wall panels 20 between the columns 12 and 14 prior to placement of the roof chassis 18 there above as shown in Figure 6. Obviously when the roof chassis 18 is being lowered onto the columns 12 and 14, the mounting plates 40 and 42 associated therewith are inserted into the ends of columns 12 and 14 for attachment to the back plates 44. The result is an extremely robust building frame which is quickly and easily erectable without the need for skilled labour, and capable of remaining intact even when the entire building is raised using a forklift (not shown) through receiving channels 60 associated with the base chassis 16.

Further advantages and improvements may very well be made to the present invention without deviating from its scope. Although the invention has been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

In any claims that follow and in the summary of the invention, except where the context requires otherwise due to express language or necessary implication, the word “comprising” is used in the sense of “including”, i.e. the features specified may be associated with further features in various embodiments of the invention.

CLAIMS

1. A wall panel support column assembly for a transportable building having a base chassis and a roof chassis, said support column assembly adapted to support said roof chassis a spaced apart distance above said base chassis, said support column assembly including;
5 vertically aligned mounting plates projecting from each of said base and roof chassis; and

 a column having at least two C-section channels for supporting at least two wall panels in different directions, and at least one mounting surface that is independent of surfaces of the C-section channels which contact the wall panel, the mounting surface extending the length of the column and configured to overlap and engage with the vertically aligned mounting plates.
- 10 2. A wall panel support column assembly according to claim 1 wherein said mounting surface is a back plate of said column, and said C-section channels extend along at least one elongate edge of said back plate, said C-section channels being of a size to receive and support a wall panel therein.
- 5 3. A wall panel support column assembly according to claim 2 wherein said column is adapted for use at a perpendicular corner of said building, said corner column including an open, substantially square cross section comprising two perpendicular back plates having free elongate edges which are turned perpendicularly inwards and which terminate in two perpendicularly offset C-section channels, whereby the web portion of each channel extends parallel to each back plate.
- 20 4. A wall panel support column assembly according to claim 2 wherein said column is adapted for use at a junction between a straight external wall, and a perpendicular internal wall, said column including an open, substantially rectangular cross section comprising one back plate having free elongate edges which are turned perpendicularly inwards and which terminate in two aligned but opposed C-section channels, whereby the web portion of each channel extends perpendicularly to said back plate.
- 25 5. A wall panel support column assembly according to claim 4 wherein the web portion of each of the C-section channels is separated by a distance which enables the internal wall panel to be received and supported therebetween.
- 30 6. A wall panel support column assembly according to any one of the above claims wherein each of the mounting surface and mounting plates include co-aligned apertures for receiving fastening means.

2009202918 19 Mar 2013

11

7. A wall panel support column assembly according to any one of the above claims wherein said wall panels are composite wall panels including a core of fire resistant insulation material sandwiched between planar rigid faces.
8. A wall panel support column assembly according to claim 7 wherein said wall panels are rectangular in shape and are mounted vertically between the base chassis and roof chassis, each panel including an elongate male edge and an elongate female edge, whereby said male edge is adapted to engage the female edge of a second panel, and the female edge of the second panel is adapted to engage the male edge of a third panel, and so on, to form a flat wall of panels.
9. A wall panel support column assembly according to claim 7 or claim 8 wherein at least one of said wall panels includes a window of said building.
10. A wall panel support column assembly according to claim 7 or claim 8 wherein at least one of said wall panels includes a doorway.
11. A transportable building for use in a portable camp including:
a base chassis having upwardly extending mounting plates at least at each corner of the base chassis;
a corresponding roof chassis having downwardly extending mounting plates at least at each corner of the roof chassis; and
a plurality of support columns extending between said base chassis and roof chassis, said support columns adapted to support said roof chassis above said base chassis, each said support columns including:
at least two C-section channels for supporting at least two wall panels in different directions;
at least one mounting surface that is independent of surfaces of said C-section channels which contact the wall panel, the mounting surface extending the length of the column and configured to overlap and engage with vertically aligned mounting plates.
12. A transportable building according to claim 11 wherein said base chassis and roof chassis are of a substantially perpendicular construction and includes internal and external walls, said support columns being located at perpendicular corners of the building, and also at junctions between internal and external walls.

2009202918 19 Mar 2013

12

13. A transportable building according to claim 11 or claim 12 wherein each said mounting surface is a back plate of said column extending the length of the column and including apertures at ends thereof which co-align with apertures in said mounting plates for receiving fastening bolts.
14. A transportable building according to claim 13 wherein each said column includes C-section channels which extend along at least one elongate edge of said back plate, said C-section channels being of a size to receive and support a wall panel therein.
15. A transportable building according to claim 14 wherein said column is adapted for use at a perpendicular corner of said building, said corner column including an open, substantially square cross section comprising two perpendicular back plates having free elongate edges which are turned perpendicularly inwards and which terminate in two perpendicularly offset C-section channels, whereby the web portion of each channel extends parallel to each back plate.
16. A transportable building according to claim 14 wherein said column is adapted for use at a junction between a straight external wall, and a perpendicular internal wall, said column including an open, substantially rectangular cross section comprising one back plate having free elongate edges which are turned perpendicularly inwards and which terminate in two aligned but opposed C-section channels, whereby the web portion of each channel extends perpendicularly to said back plate.
17. A transportable building according to claim 16 wherein the web portion of each of the C-section channels is separated by a distance which enables the internal wall panel to be received and supported therebetween.
18. A portable camp including a plurality of transportable buildings according to any one of claims 11-17.
19. A wall panel support column assembly for a transportable building according to claim 1 substantially as hereinbefore described with reference to the drawings.
20. A transportable building according to claim 11 substantially as hereinbefore described with reference to the drawings.

207

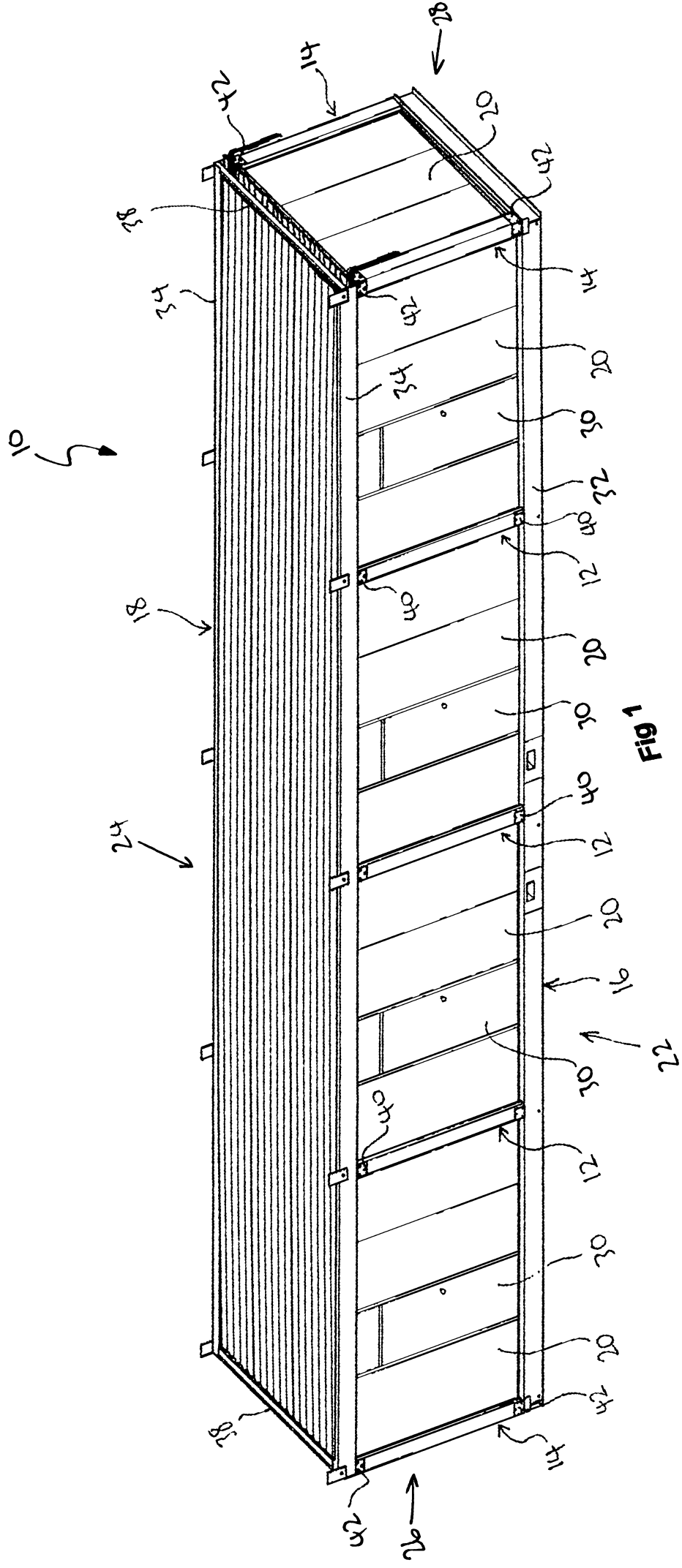


Fig. 1

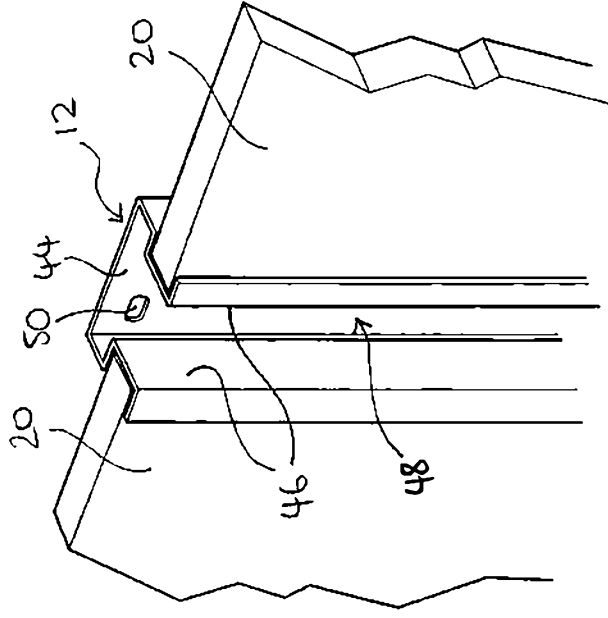


Fig 2a

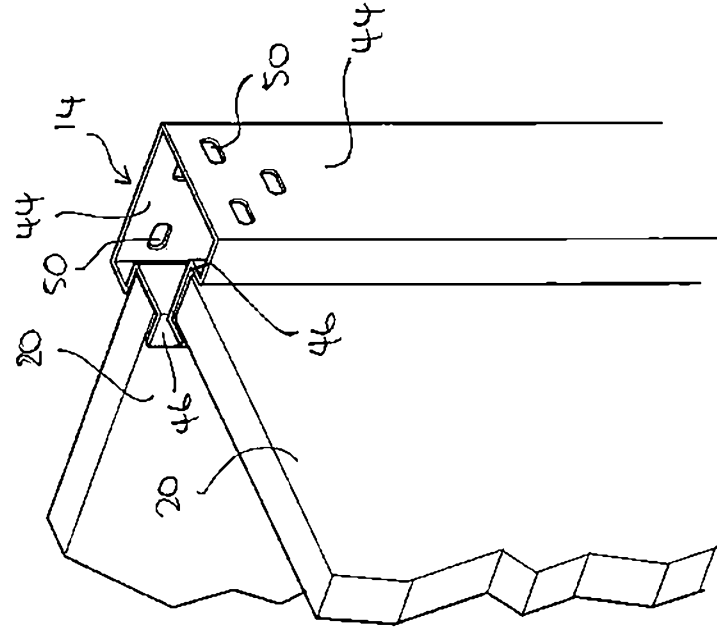


Fig 2b

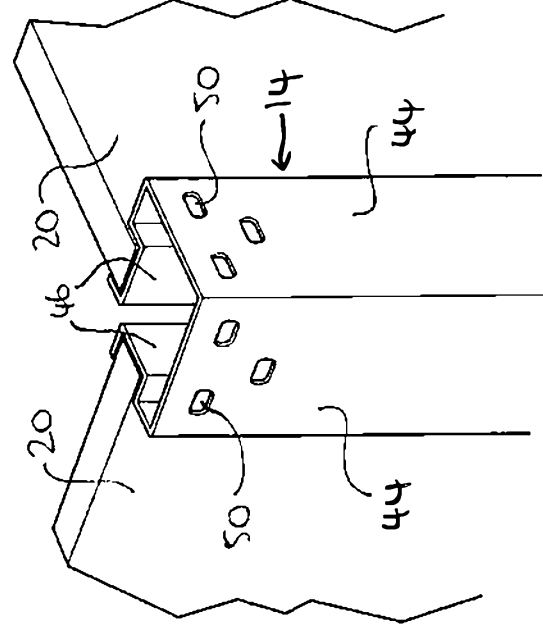


Fig 2c

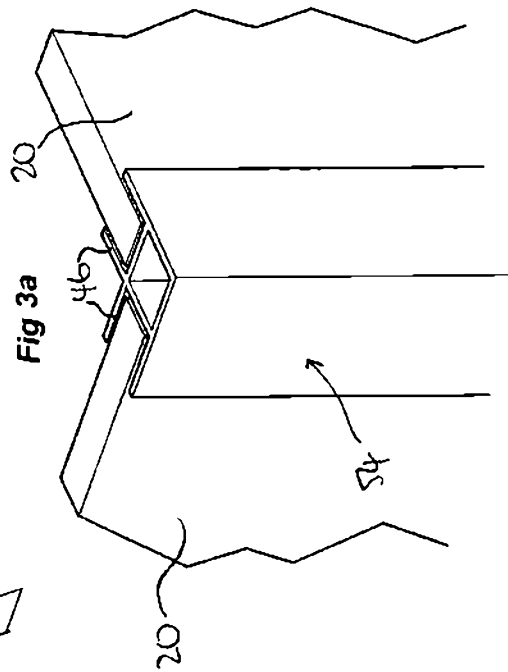
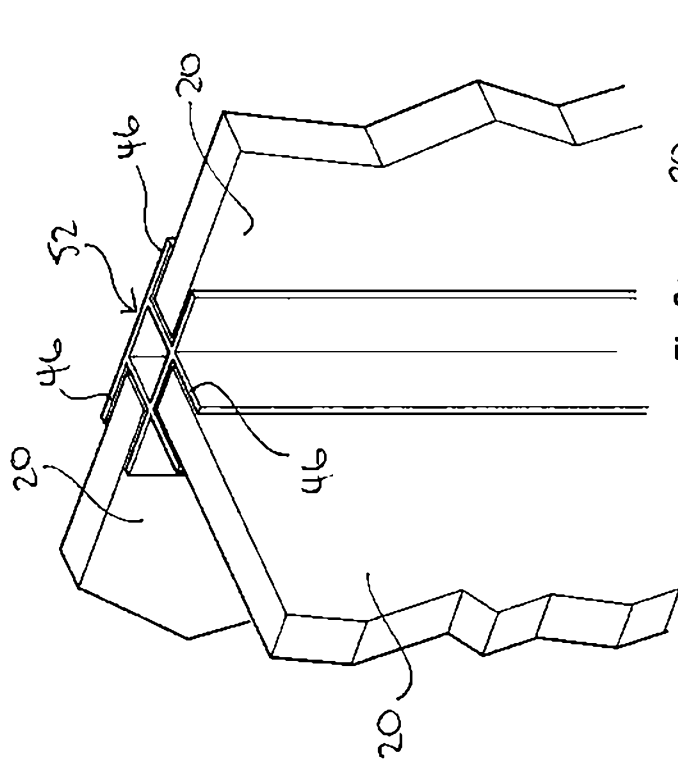


Fig 3c

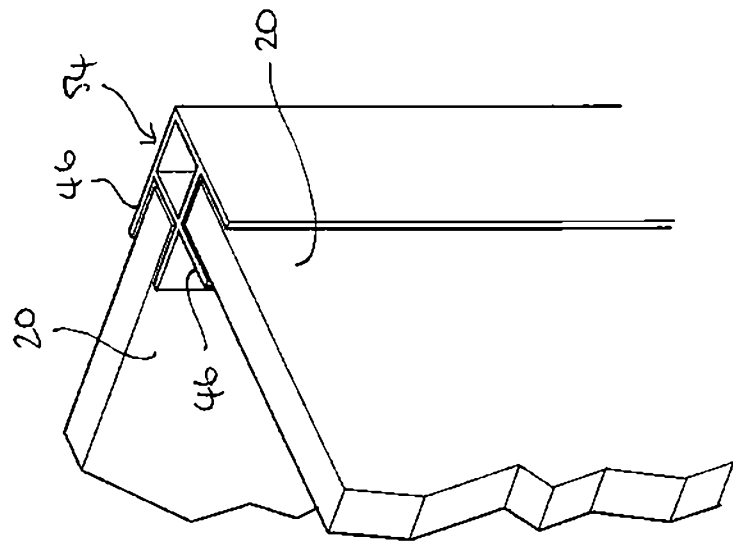


Fig 3b

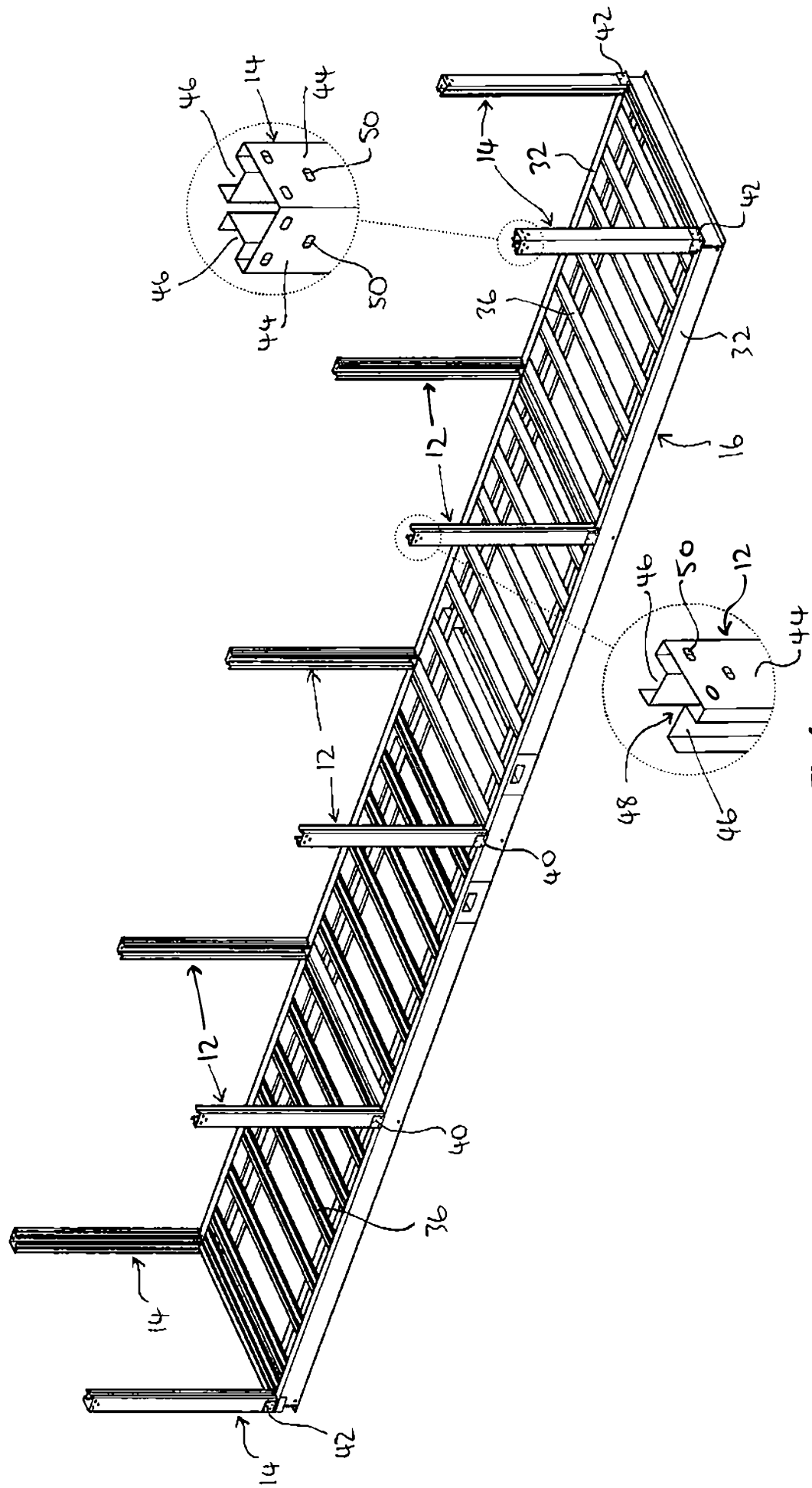


Fig 4

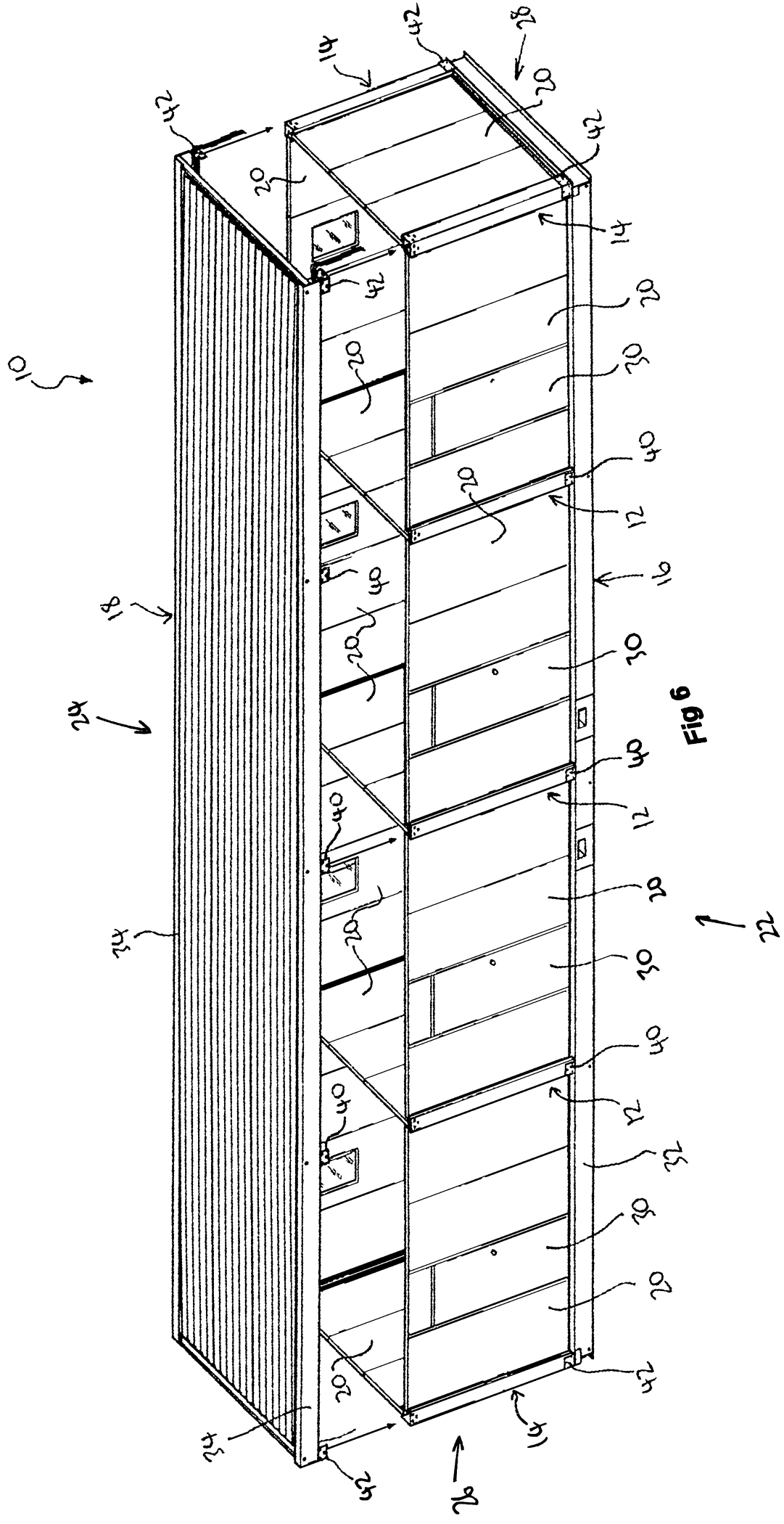


Fig 6

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22