METHOD OF ERECTING A WALL PANEL SUPPORTING STRUCTURE

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Filed: Mar. 10, 1970

Appl. No.: 18,073

U.S. Cl. ..................................................52/741, 52/241
Int. Cl. ........................................... E04b 2/30, E04b 2/60,
Field of Search ...........................................52/122, 747, 241, 243, 238,
 ...........................................52/239, 741; 33/221; 160/113

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ABSTRACT

A method of erecting a wall panel supporting structure formed of horizontally and vertically extending panel connector assemblies by suspending the supporting structure from a ceiling for free lateral swinging movement thereof to automatically achieve self-plumbing prior to wall panel attachment. When correct plumb is achieved, an adjustable channel member connected to the lower horizontally extending panel connector assembly is lowered against the floor to provide a supporting structure accurately plumbed and positioned from ceiling to floor for receiving wall panel members.

7 Claims, 10 Drawing Figures
METHOD OF ERECTING A WALL PANEL SUPPORTING STRUCTURE

BACKGROUND OF THE INVENTION

This invention relates generally to the construction art and, more particularly, to certain useful and improved wall constructions and a new and improved method for erecting the same.

In erecting a wall panel supporting structure, it is customary to begin installation at the floor by affixing tracks or base members to such floor and then installing the framework upwardly from the floor to the ceiling. Since the floor surface often is not always in a true horizontal plane but rather, is irregular and uneven, a problem arises in accurately plumbing the wall panel supporting structure, which is connected to the floor tracks, in a true vertical plane. Considerable time in lost in precisely aligning the floor tracks so that the wall panel supporting structure is accurately plumbed for receiving modular wall panels. The labor involved adds substantially to the cost of such installations. Very often, the floor covering must be penetrated to anchor the floor tracks to the floor. Also, the wall panel supporting structure is sometimes affixed to ceilings, permanent walls and the like so that moving the walls to enlarge or reduce enclosed areas becomes very time consuming and expensive.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a rapid and more efficient method or erecting a wall panel supporting structure by initiating installation at the ceiling.

It is another object of this invention to provide a method of erecting a wall panel supporting structure in which such structure depends from the ceiling in a free “floating” condition and automatically assumes a true vertical, plumb attitude.

It is a further object of the present invention to provide a wall panel supporting structure free from permanent attachment to any support surface to permit easy shifting from one position to another.

In carrying out the present invention, a series of horizontally and vertically extending panel connector assemblies are connected together to form a wall panel supporting structure suspended from a ceiling for free lateral swinging movement relative to the ceiling to automatically assume a vertically plumbed position. When correct plumb is achieved, a channel member adjustably mounted on the lower horizontally extending connector assembly, is lowered into a position of rest against the floor to generally follow the contour of the floor without disturbing the orientation of the wall panel supporting structure. Thus, the wall panel supporting structure is accurately positioned and plumbed in a true vertical plane from the ceiling to the floor for receiving wall panel members.

The foregoing and other objects, advantages and characterizing features of this invention will become clearly apparent from the ensuing detailed description of an illustrative embodiment thereof, taken together with the accompanying drawings wherein like reference numerals denote like parts through the various views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary, perspective view illustrating the manner in which a horizontal connector assembly is attached to a ceiling in accordance with the method of this invention;

FIG. 1a is an enlarged fragmentary perspective view of the ceiling attaching means of FIG. 1;

FIG. 2 is a fragmentary, perspective view showing vertical connector assemblies suspended from the horizontal connector assembly;

FIG. 2a is a fragmentary, perspective view, on an enlarged scale, showing details of the corner interlocking means between the horizontal and vertical connector assemblies;

FIG. 3 is a perspective view of a wall panel supporting structure suspended from the ceiling of a room, illustrating the manner in which such structure is suspended for free lateral swinging movement;

FIG. 4 is a fragmentary, perspective view of the lower horizontal connector assembly and a floor channel member;

FIG. 5 is a fragmentary, perspective view showing the floor channel member adjustably secured to the lower horizontal connector assembly;

FIG. 6 is a fragmentary, perspective view similar to FIG. 5 showing the floor channel member lowered against the floor;

FIG. 7 is a perspective view of a portion of a wall panel member and attaching clip used in conjunction with this invention;

FIG. 8 is a fragmentary, perspective view of a double-wall panel construction erected in accordance with this invention.

DETAILED DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

Referring now in detail to the illustrative embodiment depicted in the accompanying drawings, the method of this invention is particularly adapted for erecting double wall partitions such as shown for example in FIG. 8 and comprising opposed panel members 10 defining opposite wall surfaces depending from the ceiling 12 to the floor 14. It will be apparent that the double-wall construction can be used in perimeter walls as well as interior partitions and the method can be practiced in erecting single wall panel constructions, if desired.

The wall panel supporting structure, erected in accordance with this invention, incorporates a series of panel connector assemblies in lieu of the conventional stud construction, such panel connector assemblies serving as ceiling tracks, floor tracks, and wall furring members. Each panel connector assembly comprises a pair of spaced apart panel connectors, generally designated 18, which can extend both vertically and horizontally and which are maintained in properly spaced relation by spacer clips, generally designated 20, which extend therebetween as seen for example in FIGS. 2 and 3.

As best shown in FIGS. 4, 5, and 6, each panel connector 18 comprises a sheet metal fabrication of a unitary, one-piece construction formed to provide a rectangular body portion having front face portions 22 and a rear face 24 joined and spaced apart by opposite side faces 26. Face portions 22 and rear face 24 are generally parallel and a pair of flange portions 28 extend outwardly from face portions 22 in a direction generally normal thereto, away from face 24. Face portions 22 and flange portions 28 thereby define a pair of corners adapted to receive the side edge portions of adjacent panel members 10 or the top or bottom edge portions of adjacent members 10, with panel members 10 resting against face portions 22. The metal or sheet material of which connectors 18 are fabricated also is folded over at the outer end of flange portions 28 to provide cam surfaces 30 leading to opposed shoulder portions 32, the opposite edges of the sheet material terminating within the opening provided between flange portions 28, as clearly shown for example in FIGS. 4, 5 and 6.

Connector 18 also is formed to provide an internal channel having inwardly diverging sidewalks 34 leading to a rear wall 36 and providing a restricted inlet opening 38 through rear face 24. Channel 34-38 extends the full length of connector 18 in alignment with the opening between flange portions 28, the channel proper being confined within the rectangular body portion 22-26 of connector 18. Panel connectors of this type are shown in application Ser. No. 703,955 filed Feb. 8, 1968 and are provided with internal channels as described above, which are particularly useful in double wall constructions.

It should be appreciated that channels 34-38 can be eliminated in connectors for single paneled wall constructions, if desired. However, it does not harm, and it also will be appreciated that panel members 10 can be used interchangeably in either single or double wall constructions.

Each panel member 10 can be of the type shown in application Ser. No. 703,955 and includes a body 40 of gypsum, wallboard or any other suitable material, covered with a skin 42 of
metal or other thin sheet material which can be painted or decorated to provide any desired effect. Skin 42 extends beyond panel body 40 at its top and bottom edge portions and opposite side edge portions and is formed to provide an internal skirt 44 (FIGS. 5 and 6) adapted to be interlocking between the flange portions 28 of connectors 18. Skirts 44 are formed to provide turned shoulders engaging behind connector shoulders 32 with a snap fit. Such snap-fit skirts are provided along the top, bottom and opposite side edge portions of each panel member 10.

Spacer clips 20 are provided at spaced intervals lengthwise of opposed panel connectors 18 for interlocking the same together and for maintaining the same in properly spaced relation. Each spacer clip 20 comprises a web body 50 spanning the space between a pair of opposed panel connectors 18 as shown in FIGS. 4, 5 and 6 and having at opposite sides thereof locking heads 52 joined to body 50 (FIG. 1a) by reduced width neck portions. Spacer clips 20 are conveniently fabricated by punching the same from a sheet of steel, aluminum or other suitable material, and preferably have a material thickness less than the width of inlet openings 38 to the connector channels 34-38. Heads 52 fit within channels 34-38 with the neck portions thereof extending through openings 60 in the panel member. Such panel connectors 18 at opposite sides of spacer clips 20.

Each clip 20 is of a generally Z-shaped configuration having legs 56 and 58 formed at opposite ends of web body 50 and extending in opposite directions normal to the plane of body 50. An opening 60 is provided in leg 56 and a threaded opening 62 is provided in leg 58 for reasons hereinafter apparent. Such spacer clips are shown and described in application Ser. No. 777,438, filed Nov. 20, 1968.

In erecting a wall panel supporting structure in accordance with this invention, a panel connector assembly comprised of a pair of panel connectors 18 having spacer clips 20 interlocked therebetween at spaced intervals lengthwise of the panel connectors is positioned horizontally against a ceiling 12 in the manner of ceiling tracks. Prior to securing the horizontal panel connector assembly 18-20 to ceiling 12, a plurality of conventional clips 64 are attached at longitudinally spaced intervals along ceiling support members 66 which form a support structure for a paneled ceiling as is well known in the art. Clips 64 also are attached to conventional structural beams used for supporting ceiling structure. Clips 64 have longitudinal channels 68 defined by diametrically opposed attaching tabs 70 which, are adapted to engage behind the upper surfaces of flanges 72 of support members 66 as shown in FIG. 1a. Each clip 64 is provided with an opening for loosely receiving a threaded stud 74 therethrough, the head of stud 74 (not shown) being disposed in channel 68 between the body of clip 64 and the lower surface of support flange 72. Stud 74 extends downwardly through clip 64 and through opening 60 of Z-shaped spacer clip 20 and receives a nut 76 for securing spacer clips 20 and thereby the connector assembly 18-20 firmly to ceiling 12. The head of stud 74 fits loosely in channel 68 and the loose fit of stud 74 in the opening of clip 64 permits some lateral play of stud 74 prior to threading nut 76 tightly thereon.

A vertically extending panel connector assembly is then secured to one end of the horizontal panel connector assembly by means of a panel connector friction clip, generally designated 80, as shown in FIG. 2a. Clip 80 has an elongated body portion 82 adapted to be inserted along portions of its lateral edges into inlet openings 38 of opposed vertically extending panel connectors 18. An angular extension 88 extending in a direction normal to body portion 82 and formed integrally therewith is adapted to be inserted along portions of its lateral edges into inlet openings 38 of opposed horizontally extending panel connectors 18. The lateral edges of clip 80 have a series of alternate depressions and projections comprising oppositely offset portions for effecting a friction fit between sidewalls 34 of channels 34-38 in both the vertically and horizontally extending panel connectors 18. Such panel connector friction clips are disclosed in application Ser. No. 777,437 filed Nov. 20, 1968.

In a similar manner, a second vertically extending panel connector assembly is attached to the ceiling panel connector assembly 18-20 and spaced from the first vertically extending panel connector assembly to form part of a basic wall support frame section (FIG. 2). The lower ends of the vertically depending panel connector assemblies are then interlocked with a horizontally extending panel connector assembly by means of panel connector friction clips 80 in the manner described above (FIG. 3). The lower horizontally extending connector assembly closes the basic panel wall support frame section and forms a generally rectangular perimeter frame supporting structure to which horizontally spaced, vertically depending intermediate panel connector assemblies, indicated in phantom in FIG. 3, can be secured at the proper, modular spacing for the particular panels 10, being used.

At the lower end of the frame construction, an elongated horizontally extending floor channel member 100 is adjustably secured to the lower horizontally extending connector assembly (FIG. 5) by jack screws 102 threadably received in openings 62 of clips 20. Prior to assembly, channel member 100 is positioned adjacent the lower panel connector assembly as shown in FIG. 5, said support member 100 having heads 104 slidably confined within channel member 100 for selective positioning therealong. The bottom surface of channel member 100 is provided with a nylon fabric strip 106 having a pile of closely spaced J-hooks for attachment to a strip of material mounted on the floor surface, such strip having a pile of closely spaced U-shaped hooks cooperative with the J-hooks of strip 106 to releasably secure the same thereto. The foregoing nylon hook construction is known per se and can be of the type illustrated in U.S. Pat. No. 3,009,235 dated Nov. 21, 1961 and commercially available under the trade name Velcro.

Channel member 100 is initially spaced from floor 14 so that the wall panel supporting structure is free to swing laterally (FIG. 3) before being locked in place by tightening nuts 76 against spacer clips 20 of the upper horizontal panel connector assembly. In this "floating" condition, the wall panel supporting structure will automatically assume a true vertical plumb and module precision prior to panel attachment. When correct plumb is achieved, jack screws 102 are threaded into openings 62 of clips 20 to lower channel member 100 against floor 14 as shown in FIG. 6. Jackscrews 102 can be manipulated to orient channel member 100 to follow any irregularity to floor 14 completely independently of and not disturbing the orientation of the wall panel supporting structure. The bottom side of channel member 100 which supports stop 106 bears against any flooring surface such as a concrete slab, a resilient floor, tiles or carpeting and strip 106 firmly secures the panel connector supporting structure in place. The above process is repeated for extending the length of the wall panel supporting structure. In a similar manner, wall panel supporting structures may be erected in a direction extending at right angles to the above-described construction to form corners and intersections for perimeter or partition walls, as desired.

When the erection of the wall panel supporting structure is completed, panel members 10 can be secured in position with skirts 44 of panel members 10 snap-fitted into engagement behind shoulder portions 32 of the horizontally and vertically extending panel connectors 18. The upper half of front face portions 22 of ceiling connectors 18 can be left exposed, providing a reveal, or they can be filled with a cushioning material, 108 (FIG. 2a) which provides a decorative surface and snaps into place to cover the exposed surface as shown at the top of FIGS. 2 and 8. Cushion 108 will deaden sound transmission between the wall and ceiling 12 and can be employed as a decorative strip if left exposed.

The space between connectors 18 and adjacent connectors 18 can be closed by means of generally L-shaped baseplates 110 (FIG. 7) having a lower horizontal flange adapted to seal on floor 14 and a larger, vertical flange formed with vertically
elongated slots 112 therethrough, at spaced intervals therealong. Attaching clips 114 are provided for securing plate 110 in position against panel connector 18. Each clip 114 is of a generally U-shaped configuration having opposite sidewalls 116 at least one of which is provided with a shoulder forming head 118 therein. The web of clip 114 has a pair of outwardly offset, oppositely directed ears 120 adapted to be inserted through baseplate slots 112 when clip 114 is oriented in the position shown in FIG. 7. Then, upon rotating clip 114 90° to the position shown in FIG. 6, plate 110 will be interlocked with clip 114 by ears 120. The head 118 of clip 114 then is snap-fitted into place behind the lowermost shouldered flange 28 of connector 18, thereby securing baseplate 110 in place. Plate 110 and ears 120 can be covered by a decorative shoe 112 (FIGS. 6 and 8) of a size to extend from floor 14 above the upper edge of plate 110. Shoe 122 can be formed of plastic or other suitable material, adhesively bonded or otherwise secured in place against the lower end of the wall. Such bottom trim arrangement is disclosed in application Ser. No. 703,995.

From the foregoing, it is seen that the present invention fully accomplishes its intended objects and provides a simple and expedient method for erecting a wall panel supporting structure in an improved and more efficient manner whereby the vertically depending support structure is free to swing laterally from the ceiling connector assembly to automatically assume plumb in a true vertical plane. This “floating” condition permits installation over any flooring surface and enables flooring crews to install complete floor covering or carpeting prior to partition or perimeter wall installation. The ceiling module determines partition layout, eliminating need for floor layout. The wall panel supporting structure need not be attached to any permanent or temporary wall structure to provide flexibility, and the entire partition can be easily moved, as desired or required. By the provision of a floor channel member adjustable relative to the panel supporting structure, the channel member can follow the regularity of the floor independent of the panel supporting structure and without effecting the integrity thereof thereby insuring satisfactory installation regardless of floor condition or surface. Also, the bottom side of the channel member rests on the floor eliminating mechanical penetration of any type.

A preferred embodiment having been disclosed in detail, it is to be understood that this has been done by way of illustration only.

We claim:

1. The method of erecting a wall panel supporting structure comprising: securing an upper horizontally extending connector assembly to a ceiling; attaching at least two laterally spaced-apart vertically depending connector assemblies at their upper ends to said horizontally extending connector assembly; attaching a lower horizontally extending connector assembly to the lower ends of said vertically depending connector assemblies to form a generally rectangularly shaped frame supporting structure; said second horizontally extending connector assembly being spaced from a floor surface so that said frame supporting structure is suspended from said ceiling for free lateral swinging movement to assume a self-plumbed position.

2. The method of claim 1 including mounting a floor engaging means to said lower horizontally extending connector assembly.

3. The method of claim 2 wherein said generally rectangularly shaped frame supporting structure is self-plumbed in a true vertical plane prior to urging said floor engaging means against a floor surface.

4. The method of claim 3 including adjustably lowering said floor-engaging means into engagement with said floor surface.

5. The method of claim 2 wherein said floor-engaging means comprises a channel member adjustably secured to said lower horizontal connector assembly by jackscrews.

6. The method according to claim 5 wherein said channel member is provided with a strip of floor-adhering material.

7. The method of claim 1 including securing at least one intermediate vertically extending connected assembly to said frame supporting structure between said two laterally spaced-apart vertically depending connector assemblies.

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