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[54] **RELOCATABLE BUILDING STRUCTURE**

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[51] **Int. Cl.** **E04b 7/16**

[58] **Field of Search** 52/68–71, 66, 67, 122, 126, 127, 143

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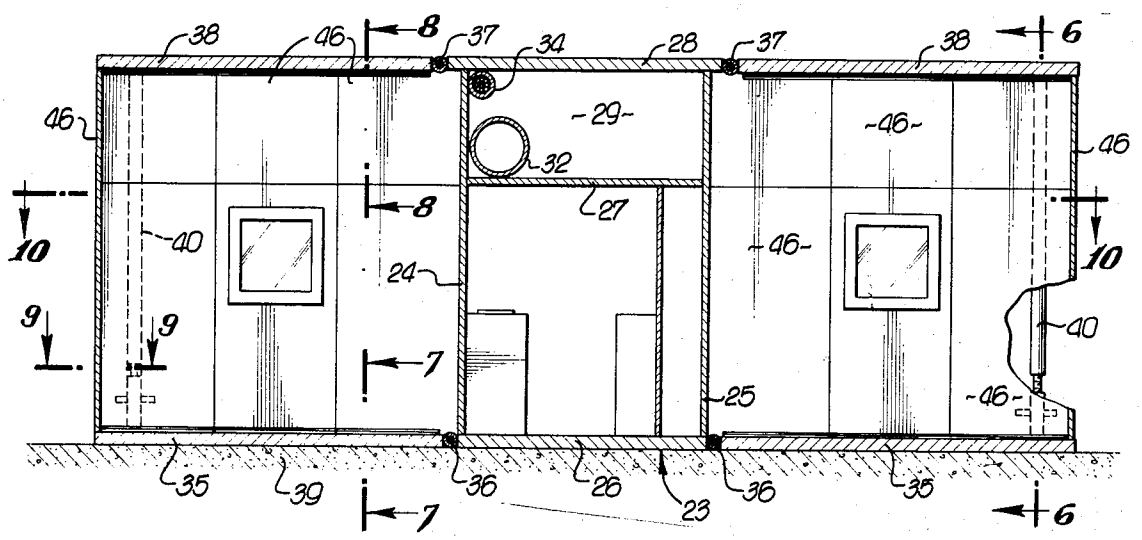
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[57] **ABSTRACT**

A fixed dimension central building core structure includes roof and floor panels which are retracted to lie closely against the core during transportation. On installation, the roof and floor panels are swung outwardly to a horizontal position and wall panels slidingly interrelate them.

2 Claims, 11 Drawing Figures



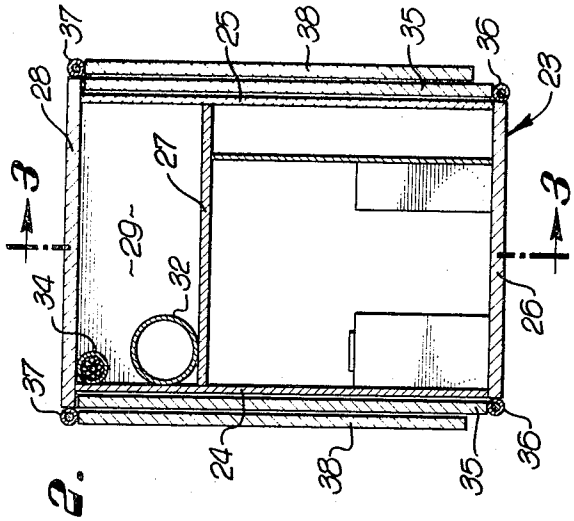


FIG. 2.

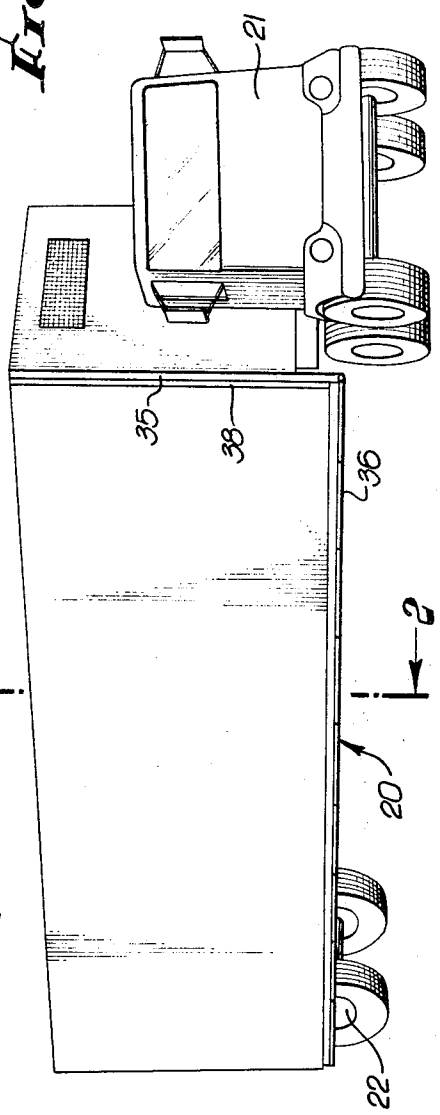


FIG. 1.

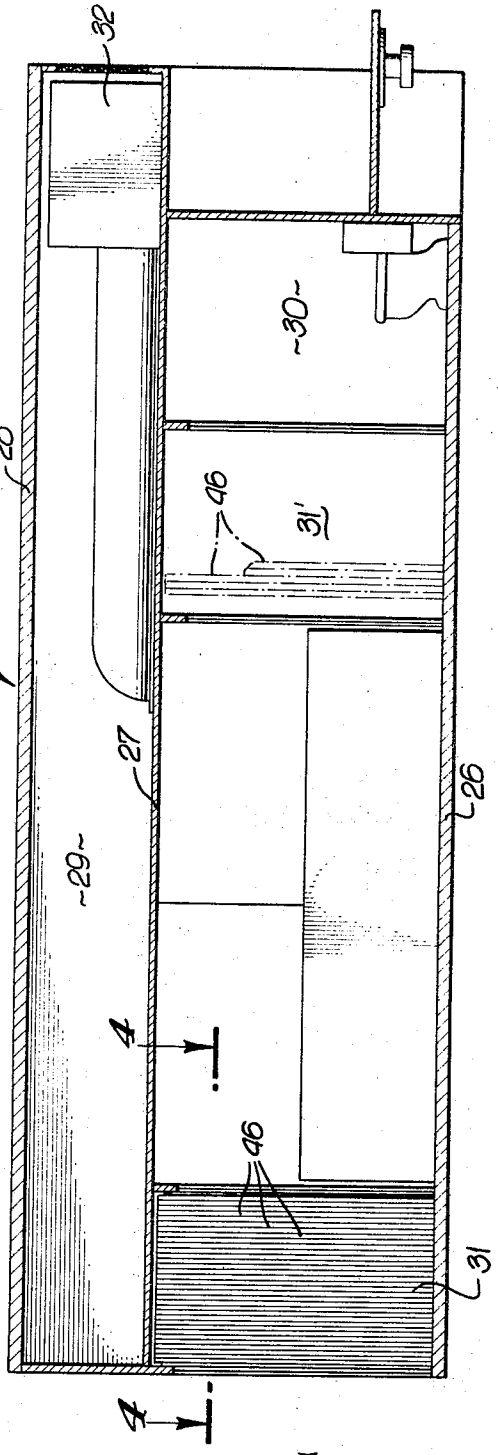


FIG. 3.

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FIG. 5.

FIG. 6.

FIG. 8.

FIG. 11.

FIG. 7.

FIG. 4.

FIG. 9.

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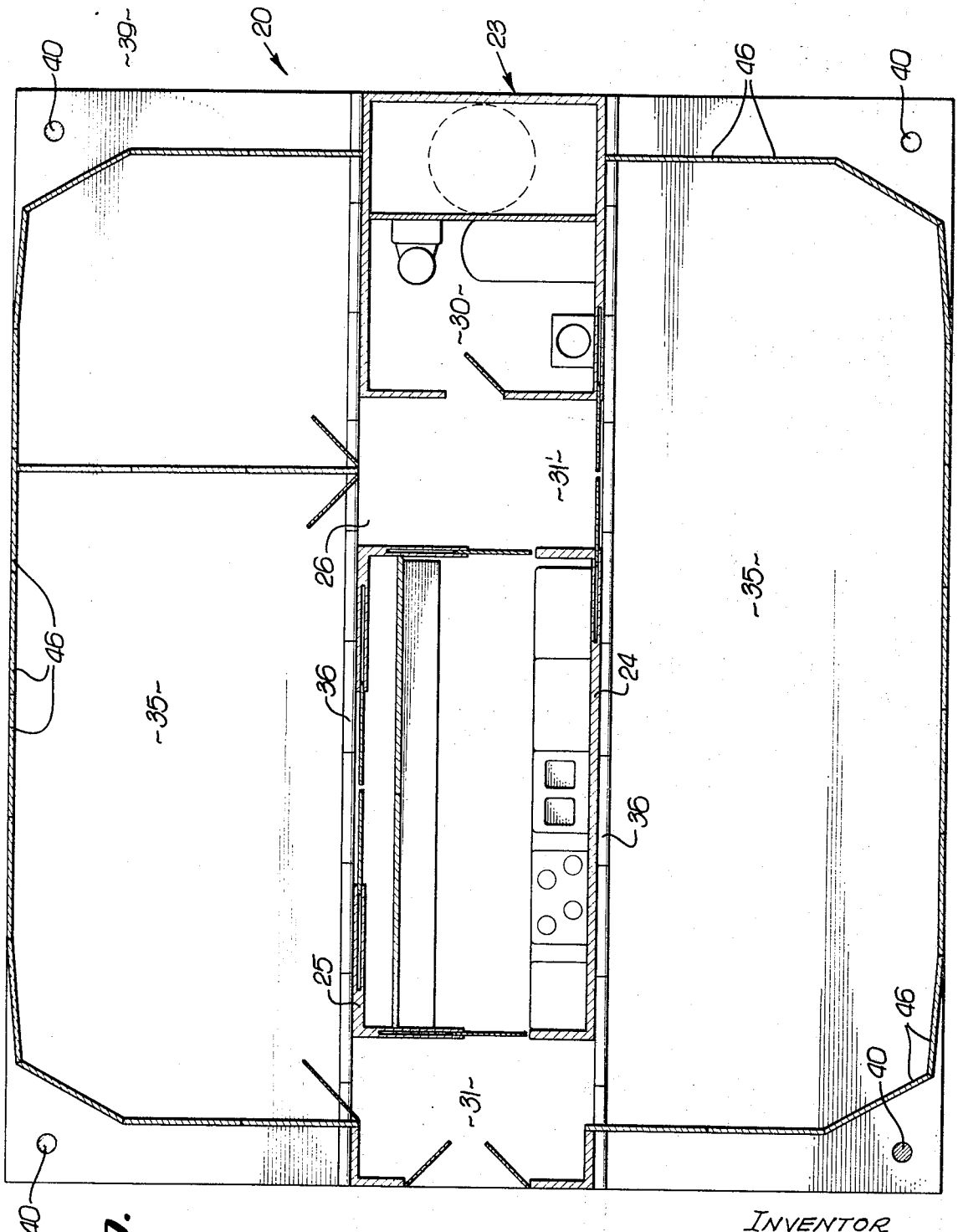


FIG. 10.

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RELOCATABLE BUILDING STRUCTURE

The present invention relates generally to a relocatable building structure, and, more particularly, to such a building structure that is transported in a compacted form and expandable at a use site.

BACKGROUND OF THE INVENTION

Recent years have shown a continuously increasing acceptance of relocatable mobile building structures for use as homes, offices, schools, and the like. That is, as the terms are used herein, a relocatable or mobile building is one which can be readily transported to a desired location and set up for relatively permanent use. Many such known building structures have been of fixed dimensions which limited their maximum practical size in order that they would not exceed permissible width on public roads and highways. Certain other structures had an exceptionally high length to width ratio which made them difficult to fabricate and transport, and which were found not to be fully satisfactory in living use.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore a primary object and aim of the present invention to provide an improved relocatable building structure that is collapsible to a reduced size for transport.

A further object is the provision of an expandable, relocatable building having a fixed dimension central section including kitchen-laundry facilities, plumbing, heating, shop or laboratory facilities, or the like.

A still further object is the provision of an expandable housing structure having pivotable roof and floor panels.

Yet another object is the provision of a structure as in the above objects having sliding wall panels which are readily interchanged or replaced.

A further object is the provision of a relocatable, expandable building unit that can be located on various foundations and terrain and which is relatively inexpensive to fabricate, install and maintain.

In the practice of the present invention a prefabricated central core of fixed dimensions includes such things as plumbing, electrical apparatus, laundry equipment, shop and laboratory equipment, or other such things dependent upon the ultimate use of the building unit. Integrally related with the core are floor and roof panels which are pivotable about a longitudinal axis to a substantially vertical condition when the entire unit is in its collapsed state for transport, for example. Side walls of standardized dimensions are slidingly received in tracks which define the external building unit geometry.

Roof, floor and side panels are constructed of a high strength, relatively light weight material such as spaced thin metal sheets including honeycomb space elements or foamed plastic.

Internal partitions for subdividing the living space into rooms are folded or expandable and integrally related with the central unit for self containment therein.

In transit to a desired installation site the floor and roof panels are pivoted to the upright condition and the overall width is reduced to the minimum so that it may be readily mounted on the trailer or flatcar or the like to present an unobjectionable width on the highway or railway as the case may be.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the building structure of this invention shown during transport.

FIG. 2 is a transverse sectional view of the building structure shown compacted and taken along the line 2—2 of FIG. 1.

FIG. 3 is a longitudinal sectional view of the building structure taken along the line 3—3 of FIG. 2.

FIG. 4 is a plan, sectional, partially fragmentary view of the panel storage compartment.

FIG. 5 is an end elevational, sectional view of the building structure of this invention shown expanded to full size.

FIG. 6 is an elevational view of a roof panel positioning jack viewing along line 6—6 of FIG. 5.

FIG. 7 is an elevational, sectional, partially fragmentary view of the lower end of a sliding end wall taken along line 7—7 in FIG. 5.

FIG. 8 is an elevational, sectional, partially fragmentary view of a sliding end wall upper end taken along line 8—8 of FIG. 5.

FIG. 9 is a plan, sectional view through a seal between adjacent side walls.

FIG. 10 is a plan, sectional overall view of an expanded building structure of this invention as installed.

FIG. 11 is an enlarged, sectional view similar to FIG. 8 shown during initial assembly stage.

DESCRIPTION OF A PREFERRED EMBODIMENT

With reference to FIG. 1, the building structure of the invention, enumerated generally as at 20, is depicted in compacted or nonexpanded form while being conveyed to an installation site by a conventional truck 21. More particularly, during such transport, axle and wheels 22 are mounted to the underside of the structure 10 toward the rear and a standard hauling hitch (not shown) interconnects the structure and truck in the usual manner.

Turning now to FIGS. 2 and 3, the building structure 20 is seen to include a central core portion 23 having sidewalls 24 and 25, a floor 26, a ceiling 27 and roof 28. All of the various walls of the core 23 are fixedly related to form a set of rooms, compartments, attic regions, and other regions for equipment of predetermined configuration. Although not limitative in this respect, the core shown includes an attic region 29, a bathroom 30 and panel storage compartments 31 and 31', among other things.

By way of example, the attic 29 can include heating or air-conditioning equipment 32 with associated ductwork leading to the different rooms of the structure. Electric cabling 34 will usually be run through the attic space to the various outlets.

As shown best in FIG. 2, at each side of the core an expansion floor panel 35 is pivotally secured as at 36 to the outer side edges of the floor panel 26. The expansion floor panels are of such dimensions that when pivoted to their maximum vertical position they are substantially coextensive with the respective core sidewalls 24. The pivotal securement comprises a hinge which extends throughout the full length of the structure 20 (FIG. 1).

A further pair of hinges 37 affixed to the outer side edges of the core roof 28 provide pivoting for expansion roof panels 38. More particularly, in non-extended condition the expansion roof panels hang vertically

downwardly and overlie the respective expansion floor panels with which they are substantially coextensive. panels

When the compacted building structure (FIG. 2) arrives at the installation it is usually unloaded with its floor panel resting on a firm base such as a concrete foundation 39, for example. The expansion floor and roof panels 35 and 38 are pivoted away from the core sidewalls 24 and 25 to a somewhat horizontal position. An adjustable support post 40 has its extremities received within accommodating openings 41, 42 in the surfaces of the expansion roof panel and expansion floor panel, respectively. Adjustment of the support post 40 is initially made to locate the roof panels at a position slightly above horizontal for a purpose which will be explained later herein. In the usual case there will be at least four such adjustable supports 40, two at each side, although the exact number will depend upon the length of roof to be supported, with a sufficient number of such supports being used to maintain the roof panels in a relatively flat condition free from substantial sag.

The marginal edges along the inwardly facing surfaces of the expansion roof panels 38 include a U-shaped channel 44 and the edge margins of the floor panels 35 include a grooved guide 45 generally lying in the same vertical plane with the channels 44, when the floor and roof panels are finally arranged in parallelism.

A plurality of outer wall panels 46 of generally rectangular sheet-like construction, and, as described before, carried in compartments 31 and 31' of the central core, are arranged initially with their lower edges in the grooved guide 45 in an upstanding condition. Between adjacent wall panels there is provided an interlocking generally H-shaped strip 47 which secures the panels to one another. As previously noted, the roof panel 38 is held above the horizontal plane by the supports 40, which at this time provides a clearance from the upper edge of the wall panels 46 and the channel 44 carried by the roof panels.

More particularly, as shown in FIGS. 7 and 11, each panel 46 includes along its lower edge a generally C-shaped edge member 48 opening downwardly and including a plurality of bearings 49 arranged along the center line thereof. The dimensions of the member 48 and bearings 49 are such that the bearing surface will extend slightly beyond the legs of the member. The guide 45 is an elongated continuous strip including a central raised portion 50 and groove 51 to provide fitting engagement with the member 48. The bearings 49 reside in the groove when the panels are fully installed.

During assembly, C-shaped slide members 52 are positioned over the guide 45 as shown in FIG. 11 and the side panels to be installed are slidingly received thereover. In this manner each panel is slid into position with the slide member being removed as the panel is located at its final installation point leaving the panel mounted on the guide 45 as shown in FIG. 7. Consecutively adjacent panels are added and interlocked as shown in FIG. 9 and already described above. It also may be necessary at this time to provide additional lateral support (not shown) for the various panels 46 as they are located on the guide 45 to maintain their vertical orientation.

After all side panels 46 have been vertically located on the guide 45, the supports 40 are adjusted to bring the roof panels downwardly to receive the upper edges of the panels within the U-shaped channel 44 as depicted in FIG. 8. The supports 40 may now be removed as well as any lateral supporting means.

In the description of the wall panels 46 given above they are contemplated as being of a one-piece, unitary construction. It may be advisable, however, particularly where the panel height-to-width ratio is large, to make the panels in two parts. Exemplary of such a form is that shown in FIG. 8 including a lower panel half 53 and an upper panel half 54. The lower edge of panel half 53 has an H-shaped channel 55 providing a recess within which is received the upper edge of lower panel half 53. The member 48 used with panel 46 can also be used on the lower panel 53.

There is provided, in accordance with the practice of the present invention, a building structure which can be easily and quickly shipped in a collapsed form via truck and trailer, railroad flatcar or the like, to the desired installation site. By merely pivoting the floor and roof expansion panels to their horizontal position and inserting sliding wall panels into groove and guide means, an expanded building unit is obtained having a total plan area several times that of the same unit in its collapsed or transported form. As a direct result of this expansibility of the subject invention the elongated boxlike look which prior known mobile buildings have customarily taken and which have been found not only displeasing to the eye but also inconvenient in use, can be avoided and substantially any desired length to width ratio or modification from a rectangular base may be adopted. That is, as shown in FIG. 10, the overall housing structure has a polygonal aspect in plan view.

Furthermore, each of the various elements comprising the subject invention, e.g., outer wall panels, expansion roof and floor panels, can be readily fabricated for use in a number of different kinds of ultimate use buildings. That is, the construction is sufficiently modularized so that regardless of the end use for the building or its configuration, the same panels can be used. Partitions and the like to be used within the core, or for that matter, within the expanded room areas, may be of any desired arrangement with that shown in FIG. 10 being merely illustrative of one such arrangement.

The various wall panels, core walls and expansion floor and roof panels can be constructed in any known manner, or of a number of different materials having sufficient rigidity and strength. For example, an excellent wall construction for the subject invention would be the provision of a honeycomb type of separator between a pair of sheetlike metal outer members. An alternative form of wall having superior strength and insulative qualities is that comprising a pair of metal or other material sheets separated by a layer of glass fibers. A still further wall member, particularly useful for the outer panels, would be so-called "window-walls" or "glass-walls" comprising single or double sheets of glass in a suitable frame.

What is claimed is:

1. In a building structure: a core including opposed vertical side walls, end walls at the forward and rearward ends of said side walls, a roof between and secured to the upper ends of said side walls, a floor between and secured to the lower ends of said side walls, the horizontal distance between said side walls being substantially the same as the width of said roof and floor, whereby said core is suitable for conveyance along a public highway; a pair of extension roof members at opposite sides of said core and substantially co-

extensive with said roof; a pair of extension floor members at opposite sides of said core and substantially coextensive with said floor; means pivotally securing said floor members to said core adjacent the sides of said floor; means pivotally securing said roof members to said core adjacent the sides of said roof, whereby said floor member and roof member at each side wall are swingable from a vertical position overlapping each other adjacent a side wall to a substantially horizontal position vertically spaced from each other, and with said floor members extending in opposite directions from said floor and said roof members extending in opposite directions from said roof; downwardly facing upper guide members on each roof member; upwardly facing lower guide members on each floor member opposed to said upper guide members; separate wall panels storable in said core between said side walls and movable into position between and connected to said upper and lower guide members of each floor member and each roof member to provide one or more enclosed spaces between each floor member and each roof member; and means securing adjacent wall panels to each other; spaced supporting posts extending between each floor member and each roof member on opposite sides of said core to support said roof members in their substantially horizontal positions to facilitate mounting of said wall panels between said upper and lower guide members; said supporting posts including means for adjusting their effective length to initially locate said roof members above their final positions to permit placement of said panels between said upper and lower guide members and then effect lowering of said roof members to their final positions with said panels secured between said upper and lower guide members.

2. In a building structure as defined in claim **1**; each of said wall panels having lower rollable means thereon adapted to ride along said lower guide members to facilitate horizontal movement of each wall panel to its predetermined location between said upper and lower guide members.

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