

[54] MODULAR WALL CONSTRUCTION

[76] Inventor: William G. Papsco, 145 Willowbrook Dr., Portola Valley, Calif. 94025

[22] Filed: Mar. 28, 1973

[21] Appl. No.: 345,494

Related U.S. Application Data

[62] Division of Ser. No. 151,053, June 8, 1971, Pat. No. 3,753,328.

[52] U.S. Cl. 52/241
[51] Int. Cl. E04b 2/82
[58] Field of Search 52/241, 173, 143, 122, 52/273, 242, 127, 29, 464, 281, 468; 49/453, 454, 455

[56] References Cited
UNITED STATES PATENTS

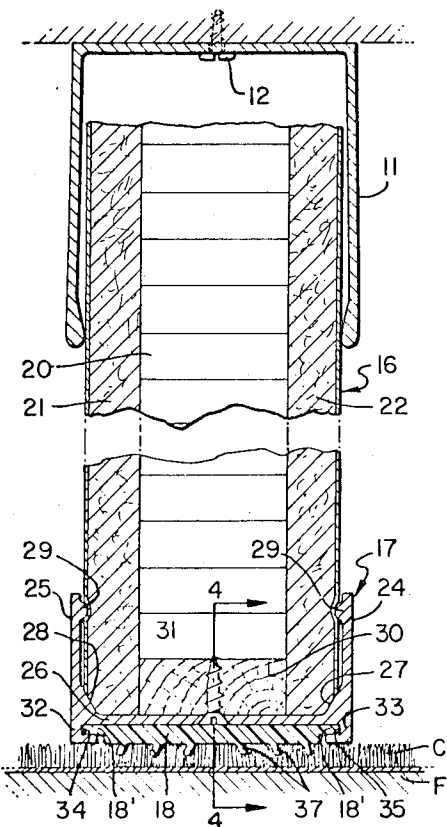
2,877,875	3/1959	Bolt	52/122 X
3,189,135	6/1965	Slowinski	52/241
3,340,655	9/1967	Darrah	52/143 X
3,349,528	10/1967	Salt	52/122 X
3,423,892	1/1969	Rimington	52/241
3,566,559	3/1971	Dickson	52/122

Primary Examiner—Price C. Faw, Jr.
Attorney, Agent, or Firm—John F. Lawler

[57] ABSTRACT

An interior modular wall for finished or existing rooms in which each module has a panel with an integral floor rail carrying a shorter floor gripper plate which projects from the floor rail and is longitudinally slidably interlocked therewith. The module is installed quickly and simply by manually lifting the module into the vertical plane of a prepositioned longitudinally extending ceiling rail, longitudinally spacing the vertically extending side edge of the module from the corresponding edge of the adjacent module or abutment, lowering the module while in that vertical plane onto the floor so that the gripper plate engages and grips the floor covering, and moving the panel and floor rail unit longitudinally relative to the ceiling, rail floor, and gripper plate into engagement with the adjacent preinstalled module. Both side edges of the panel are free to be gripped by the installer during the lifting and lowering operations, thereby greatly simplifying and reducing the time for erecting the wall.

4 Claims, 9 Drawing Figures



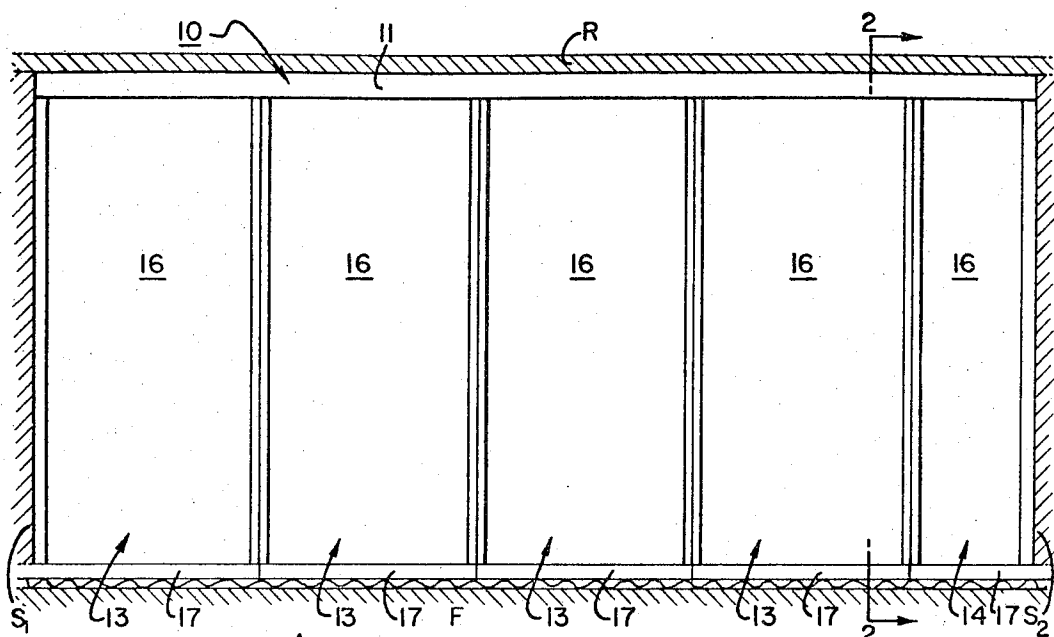


FIG-1

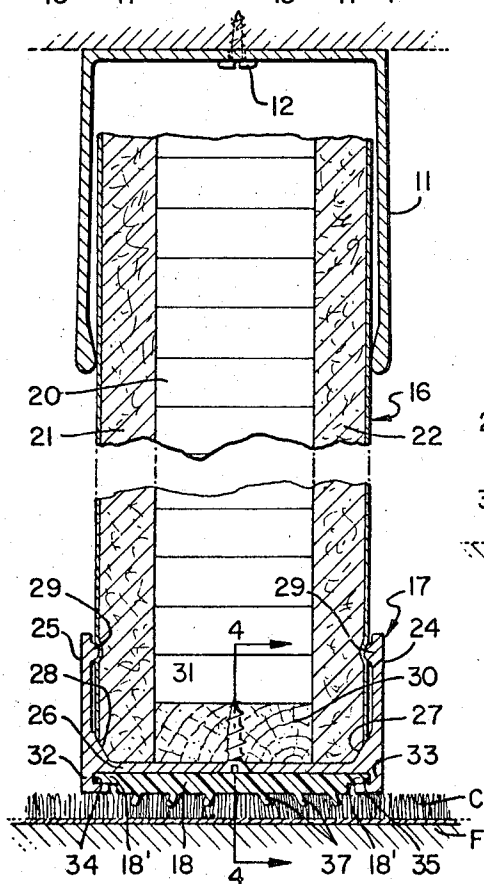


FIG-2

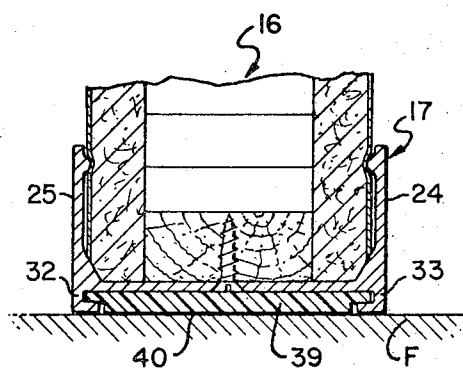
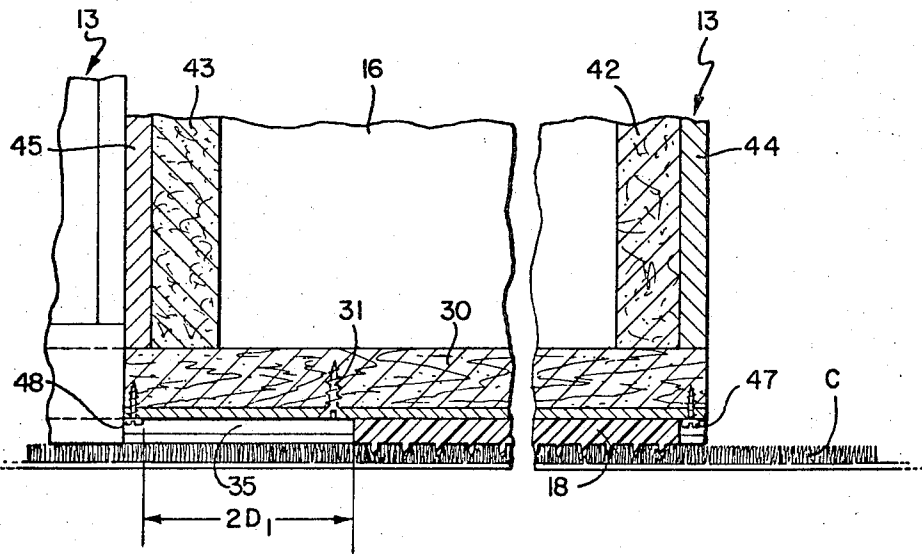
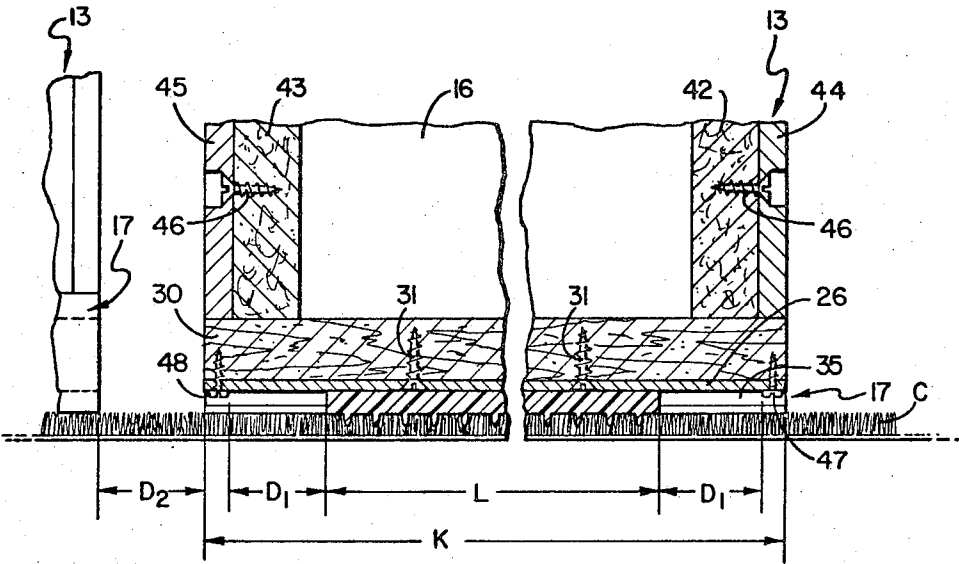


FIG-3



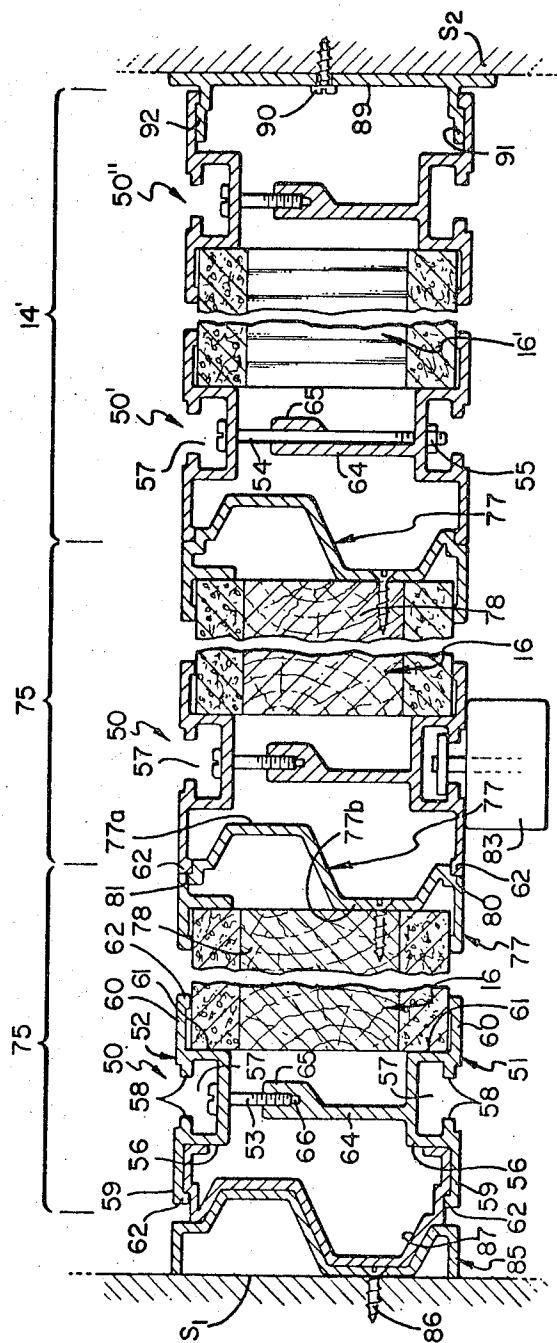


FIG. 15

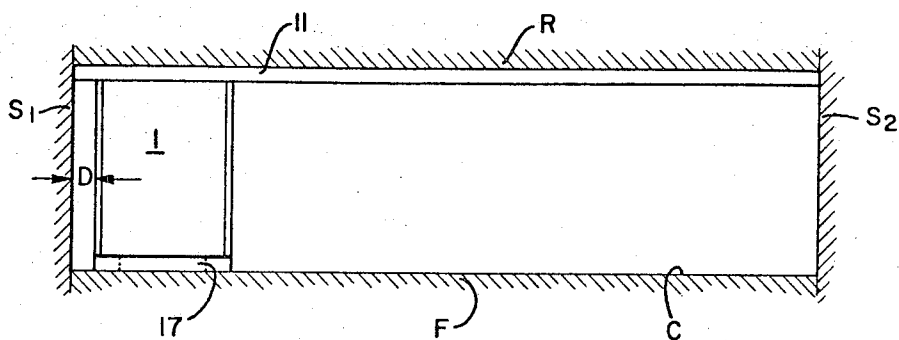


FIG - 7

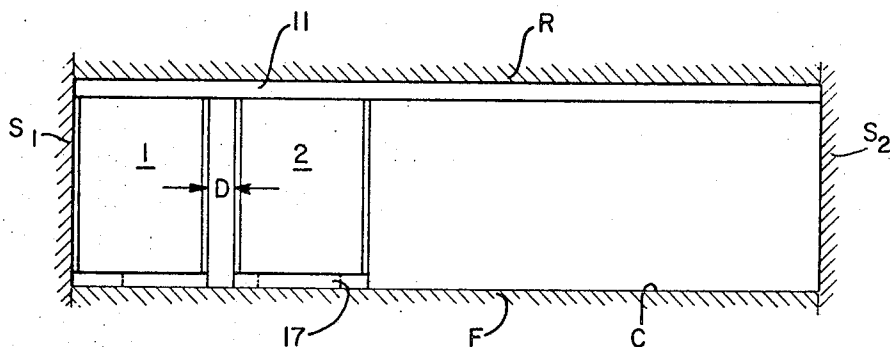


FIG - 8

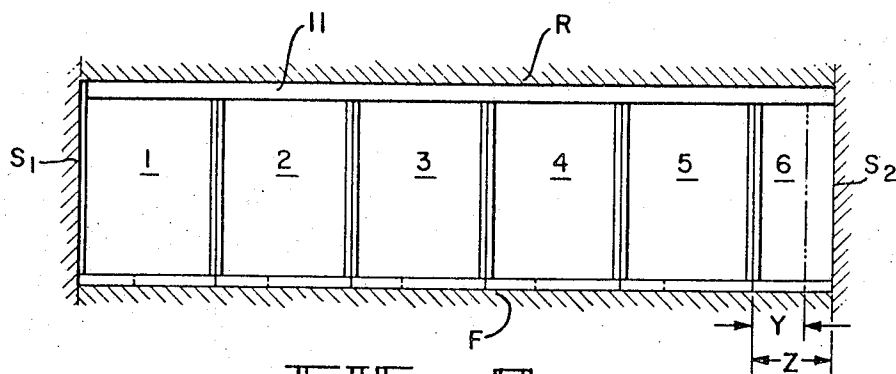


FIG - 9

MODULAR WALL CONSTRUCTION

BACKGROUND OF THE INVENTION

This is a division of application Ser. No. 151,053 filed June 8, 1971, now U.S. Pat. No. 3,753,328.

This invention relates to interior wall construction and more particularly to a removable modular wall for completed rooms and the method of installing same.

The efficient use of room space in schools, libraries, hospitals, auditoriums, gymnasiums, cafeterias and convention halls may be greatly enhanced by the use of removable easily installed walls or partitions. The utility of such walls is related to the skill required of the installer, the structural rigidity of the unit, and the facility with which appurtenances, such as shelves, work tops and the like may be supported on the structure. With the increasing use of carpets and fabric coverings for floors, provision must be made for removably attaching such walls to the carpeting without ripping or otherwise damaging it. In addition, the walls should accommodate unevenness in the floor or ceiling without undue modification of the prefabricated panels. Moreover, structural simplicity is needed in such wall construction so as to permit fabrication of low cost units that provide an economically equivalent alternative to permanent or semi-permanent wall structures.

These criteria are achievable with a prefabricated wall module comprising a base or floor rail and floor gripper plate integrated with the panel as unitary assembly. There is difficulty, however, in manipulating such a module into final position in the vertical plane of the wall and in end-to-end abutment with the installed adjacent panel due to the availability of only one free edge of the panel to be manually gripped by the workman in the final assembly stage. Jacks or special panel gripping fixtures might be employed to finally position the module but this complicates the installation procedure, requires additional tools and tends to slow down the entire process. Alternatively, two or more workmen may be used to manipulate the panels with attendant increases in installation costs.

SUMMARY OF THE INVENTION

An object of the invention is the provision of a modular wall construction with an integrated panel and floor gripper module that facilitates rapid wall erection without special tools and with relatively unskilled workmen.

This and other objects are achieved with an integrated panel, base rail and floor gripper plate module in which the gripper plate is shorter than the base rail and is longitudinally slidably interlocked to the underside of that rail. Such a module construction permits a workman to set each module in the plane of the wall while longitudinally spaced from the adjacent module and while the gripper plate frictionally engages the floor covering. Thereafter the panel and floor rail subassembly are moved longitudinally into abutment with the adjacent module or side wall while the gripper plate remains anchored to the floor and interlocked with the floor rail.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of a wall embodying this invention and installed in a carpeted room;

FIG. 2 is a section taken on line 2—2 of FIG. 1;

FIG. 3 is a section similar to the lower part of FIG. 2 illustrating a gripper plate for hard floors;

FIG. 4 is a longitudinal section taken on line 4—4 of FIG. 2 showing the relative positions of the gripper plate and base rail when a module is placed in the plane of the wall in an intermediate position spaced from the adjacent module;

FIG. 5 is a view similar to FIG. 4 showing the relative positions of the gripper plate and base rail when the just installed module is in its final position in abutment with the adjacent module;

FIG. 6 is a longitudinal horizontal section of a part of a modified form of a modular wall embodying this invention; and

FIGS. 7, 8 and 9 are schematic elevational views of the modular wall in various stages of its construction.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to FIG. 1 of the drawings, a wall 10 embodying the invention comprises a channel-shaped top or ceiling rail 11 secured by screws 12 to ceiling R of the room and a plurality of substantially identical modules 13 and an end module 14 resting on a carpet C on floor F in vertical alignment with the ceiling rail. Sidewalls S₁ and S₂ define the opposite ends of the modular wall.

Each module comprises a rigid generally rectangular panel 16, a channel-shaped floor rail 17 secured to the bottom edge of the panel, and a carpet gripper plate 18 slidably interlocked with the underside of floor rail 17 and frictionally engaging carpet C under the weight of the module. Panel 16 is a moderately light-weight laminar structure comprising a honeycomb center layer 20, see FIG. 2, cemented to outer layers 21 and 22 of porous composition board or tackboard. A suitable fabric or decorative finish may be applied to the exterior of the composition boards which preferably have a density suitable to receive and hold thumb tacks and similar fastening means.

Floor rail 17 has sidewalls 24 and 25 and a bottom wall 26 joined by beveled or inclined surfaces 27 and 28. Sidewalls 24 and 25 are formed with inwardly extending rounded ribs 29 spaced slightly below the upper edges of these sidewalls and tend to snugly engage the sides of the panels to prevent any lateral play thereof. The lowermost edges of panel 16 engage inclined surfaces 27 and 28 which tend to align the panel symmetrically within the rail. A framing strip 30, preferably made of wood, is cemented along the bottom of center panel layer 20 between outer layers 21 and 22 as shown and the bottom wall 26 of floor rail 17 is secured to this strip 29 by a plurality of longitudinally spaced screws 31. Thus, floor rail 17 is permanently secured to panel 16.

The underside of rail 17 has laterally spaced longitudinally extending side extensions 32 and 33 which define opposed inner slots 34 and 35, respectively, for slidably receiving and interlocking with tongues 18' of gripper plate 18. For wall installations on carpets C, plate 18 is formed with a plurality of downwardly extending integral prongs or projections 37 which are adapted to penetrate the nap of the carpet and hold the module in a fixed position on the floor. Alternatively, for adapting the module for mounting on hard surface floors, the modified gripper plate 39, see FIG. 3, is provided with a plane pressure sensitive adhesive surface

40 projecting below side extensions 32 and 33 of the floor rail 17 for engaging and adhering to the hard floor surface. In other respects, gripper plates 18 and 39 are the same.

In order to finish the vertical side edges of panel 16, vertically extending framing strips 42 and 43, see FIGS. 4 and 5, preferably made of wood, are cemented between and at the opposite outer edges of tackboard layers 21 and 22, and metallic end plates 44 and 45 are secured to strips 42 and 43, respectively, by screws 46 or the like.

In accordance with this invention, the length L of gripper plate 18 (or plate 39) is substantially less than the length K of rail 17 so that the gripper plate is able to move longitudinally relative to the rail while interlocked with it. Screws 47 and 48 secured in opposite ends of rail wall 26 after insertion of plate 18 in the rail project below wall 26 and serve to limit such relative movement. When modules are assembled at the factory and prior to delivery to the construction site, each gripper plate 18 preferably is positioned in the associated floor rail so as to be equally spaced by a distance D_1 from movement limiting screws 47 and 48. The fit of plate 18 in rail slots 34 and 35 is sufficiently snug to prevent relative movement during transportation and handling. The distance D_1 is selected to be equal to or greater than the spacing D_2 desired between adjacent modules to permit a workman's hand to be comfortably positioned therebetween while gripping the side edge 45 of the module being installed. By way of example, the spacing D_2 may be 3 inches and in such case the length L of gripper plate 18 would be approximately 6 inches or more shorter than the length K of the rail; typically $K=48$ inches and $L=42$ inches. Thus the space between modules shown in FIG. 4 permits a workman to grasp the panel edge defined by end plate 45 as he positions the module into the vertical plane of the intended wall; when the module is so positioned and gripper plate 18 frictionally engages the carpet, the entire module except for the gripper plate is moved to the left as viewed into abutment with the adjacent module as shown in FIG. 5.

The module described above is symmetrical about its vertical line and therefore may be installed with either side edge facing the module last installed. By prepositioning gripper plate 18 so as to be equally spaced from screws 47 and 48 such versatility in installation is accommodated. If the panel is not so symmetrical or if for other reasons it must be installed with a prescribed edgewise orientation, plate 18 obviously must be spaced by a distance D_2 or greater from screw 47 remote from the previously installed module.

End module 14 may have the same width as the other modules or may be narrower as shown in FIG. 1 depending on the overall desired length of the wall. If the installed wall is to extend between the two sidewalls S_1 and S_2 , module 14 is cut to size of the opening either on site or preferably at the factory and is installed in the conventional manner in the remaining space, i.e., it is simply fitted snugly into the opening with little or no longitudinal play.

In the modified wall construction shown in FIG. 6, provision is made for attaching appurtenances such as shelves, fixtures, etc. to the wall. For this purpose, the junction of preferably each module with another module or with the sidewall has an elongated vertical post 50 with a generally H-shaped cross-sectional configura-

tion. Post 50 extends the height of a panel and comprises a pair of channel-shaped elongated bars 51 and 52 secured together by securing means such as screws 53 in a direction transversely of the plane of the wall panels. Alternatively, bolt 54 and nut 55 may be used. Each bar has a channelshaped body 56 defining a vertical slot 57 and having inwardly extending lips 58 at the outer end of the slot. Flanges 59 and 60 extend in opposite directions from the outer edges of the bar body 56 and each defines with the latter an inner shoulder 61 adapted to engage a vertically extending edge of one of the wall panels 16. The outer ends of the flanges are formed with continuously inwardly projecting ribs 62 which may snugly engage adjacent parts of the panel.

In order to provide an anchor means for screws 53, an integrally formed web 64 extends inwardly from body 56 of post bar 51 and has at its inner end an enlarged anchoring head 65 with a vertically extending channel-shaped recess 66 that is slightly narrower than the diameter of the screw 53. Head 65 is symmetrical about the center plane of bar 51 and is formed on one side of web 64 as shown. A hole drilled in the back wall of bar 52 receives the screw which engages the sides of recess 66 in head 65 in a self-tapping manner to draw the two bars together to form a unitary type post. The two bars 51 and 52 may be more positively secured together by substituting bolts 54 for the screws; each bolt extending through the back wall of bar 52, through head 65 and through the back wall of bar 51 for engagement with nut 55 in slot 57. Such two-piece post construction permits the wall panels to be clamped in a tight grip afforded by a plurality of vertically spaced screws 53 or bolts 54.

A module 75 according to the invention comprises panel 16 having end plate 77 nailed or otherwise secured to framing strip 78 along one panel side edge and post 50 clamped to the other side edge. Plate 77 is formed with a trapezoidally shaped projection 77a and recess 77b and has shoulders 80 and 81 for receiving ribs 62 of post flanges 59. Thus each junction of adjacent modules has a post 50 in whose outer slot 57, for example, a bracket 83 may be connected as shown. In other respects, including floor rail and gripper plate, the module of FIG. 6 is the same as the modules of FIG. 1.

In order to provide an effective interlock between side wall S_1 and the adjacent module 75, an elongated vertically extending trapezoidally shaped terminal plate 85 similar to module end plate 77 is secured to wall S_1 by a plurality of vertically spaced screws, one of which is shown at 86. A correspondingly though reversely shaped adapter plate 87 is fitted or clamped between post flanges 59 of the adjacent or first module, and plates 85 and 87 abut each other as shown when the module is moved into final position against the wall. Plate 87 may also be used to abut plate 77.

The final module 14' of the wall between sidewall S_2 and the last complete module 75 corresponds to module 14 of FIG. 1 and comprises post 50' clamped to panel 16' and post 50'' clamped to an elongated vertically extending terminal plate 89, the latter being secured to wall S_2 by screws 90. Posts 50' and 50'' are substantially identical to posts 50 and panel 16' may be rough cut to size on the site to fill in the remaining space. Plate 89 has sidewalls 91 and 92 designed to be

gripped by the post flanges for completing the connection between the installed and permanent walls.

The method of installing a modular wall in accordance with the invention will be better understood with reference to FIGS. 7, 8 and 9 in which the modules are designated by numbers indicating the order of installation. A workman lifts module 1 by grasping both vertical edges and telescoping its top edge into ceiling rail 11. The lower portion of the module is then swung into the vertical plane of the ceiling rail and is lowered to rest on the floor with the gripper plate 18 or 39 frictionally engaging the floor covering and the module side edge spaced a distance D from sidewall S₁ sufficiently to provide clearance for the workman's hand. The position of module at this point is shown in FIG. 7. Next the panel 16 and floor rail 17 of module 1 are moved longitudinally over the floor into abutment with sidewall S₁ and the gripper plate remains stationary as the floor rail slides over it.

These steps are repeated for installing module 2 which again is spaced a distance D from module 1 as shown in FIG. 8 prior to final longitudinal movement into abutment with the adjacent side edge of module 1. This process is repeated for modules 3, 4 and 5, leaving a final opening between module 5 and sidewall S₂ which may be narrower than the width of each of the other modules as shown in FIG. 9. Whether narrower or not, the final opening is filled with module 6 cut to size on the site or at the factory and installed as described above but without providing the spacing D.

In constructing a wall according to the FIG. 6 embodiment terminal plate 85 is first secured to sidewall S₁. The first preassembled module 75 with adapter plate 87 added is then lifted into telescoping relation with the ceiling rail, is swung into the vertical plane of the ceiling rail and is then lowered to rest on the floor with adapter plate 87 spaced a distance D (FIG. 7) from the terminal plate 85. The gripper plate associated with the floor rail of module 75 is thus frictionally locked to the floor covering. Panel 16 together with end plate 77, post 50 and the associated floor rail are then moved longitudinally as a unit over the floor (and gripper plate) until adapter plate 87 engages and interlocks with terminal plate 85. This establishes a firm connection between the sidewall S₁ and the wall being installed. These steps are repeated for successive modules 75 until space for the final unit 14' remains.

Terminal plate 89 is then connected to sidewall S₂ by screws 90 in the vertical plane of the wall being installed. Post 50'' is next loosely assembled and positioned so that its flanges overlay the sidewalls of terminal plate 89. Panel 16' of module 14' is then rough or saw-cut on site to a width corresponding to the space between posts 50' and 50''; this panel is then lifted into

the ceiling rail and within the flanges of post 50'', is rested on the floor, and post 50'' is then tightened. Post 50' is next assembled and clamped on the exposed edge of panel 16' and plate 77 of the adjacent module 75 to complete the installation.

Alternatively, final module 6, see FIG. 9, may be constructed to provide limited spring-loaded longitudinal movement between a minimum width Y and an expanded width Z. In this form, the final module is manually contracted while being installed in the plane of the wall and thereafter is permitted to expand under the force of its springs into the final position against sidewall S₂. In a similar vein, a spring-loaded terminal plate fastened to sidewall S₂ may be provided to expand and contract in the plane of the wall to facilitate quick installation of the final module.

What is claimed is:

1. In a modular wall for a room with a floor, a module comprising

a panel having side edges,

a floor rail secured in fixed relationship to the underside of said panel,

a gripper plate disposed under and interlocked with said floor rail and adapted to be frictionally coupled to said floor,

said plate having a longitudinally slidable engagement with said rail and having a length substantially less than the length of said rail whereby the module is movable longitudinally relative to said plate and floor, and

means for limiting relative movement of the plate and rail.

2. The module according to claim 1 including an H-shaped post telescoped over one of the side edges of said panel, said post having an elongated slot opening outwardly from the plane of the panel.

3. The module according to claim 2 with an end plate secured to the other of the panel side edges, said end plate having a cross-section configured with projecting and recessed portions.

4. In a modular wall for a room with a floor, a module comprising

a panel having side edges,

a floor rail secured in fixed relationship to the underside of said panel, and

a gripper plate disposed under and interlocked with said floor rail and adapted to be frictionally coupled to said floor,

said plate having a length substantially less than the length of said rail and having a longitudinally slidable engagement with said rail whereby the module is movable longitudinally relative to said plate and floor.

* * * * *