

[54] PARTITIONING SYSTEM

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[57] ABSTRACT

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 [51] Int. Cl..... E04b 2/60  
 [58] Field of Search ..... 52/127, 282, 281, 122, 52/280, 239, 240, 243, 241, 495

A series of rectangular wall panels are confined between vertical and horizontal frame members connected by clamping devices which attach individually to the frame members. Each clamping device includes a member which extends into a square center opening within one frame member and has a truncated head portion projecting into a dovetail groove within the adjacent frame member. In one embodiment, the head portion of the clamping member is locked to the frame member by an extendable pin which projects outwardly from the center of the head portion and presses the head portion against the sides of the groove. In another embodiment, the head portion is locked by a wedge element which is inserted into the groove to force the head portion against the sides of the groove.

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5 Claims, 4 Drawing Figures

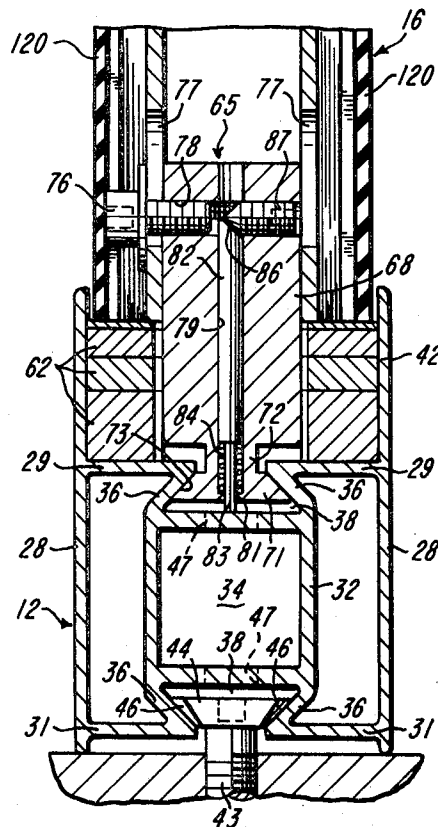


FIG-1

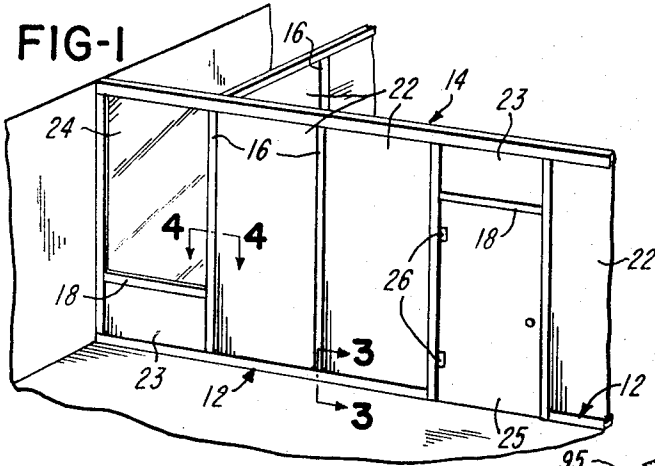


FIG-2

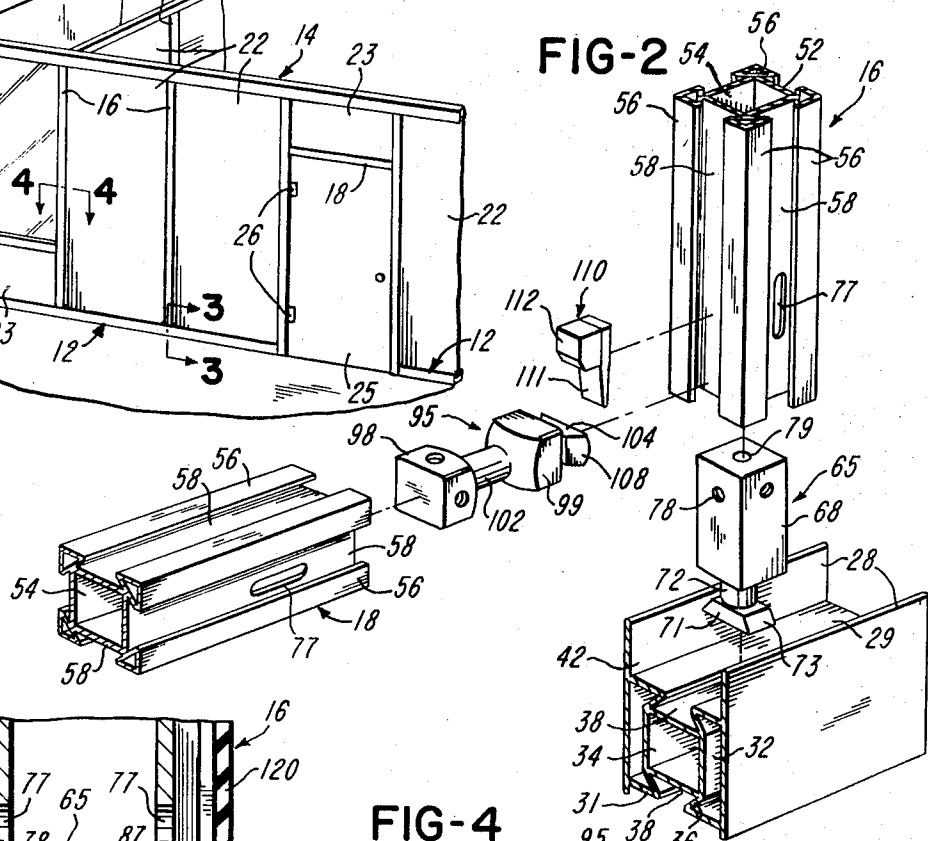


FIG-3

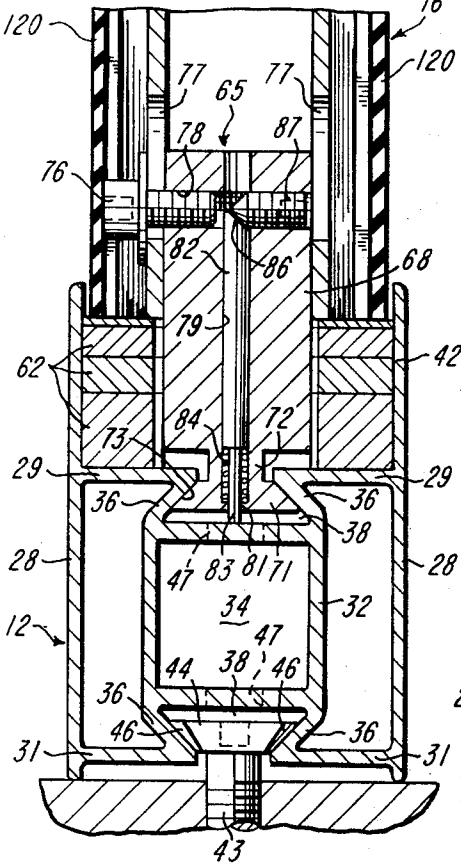
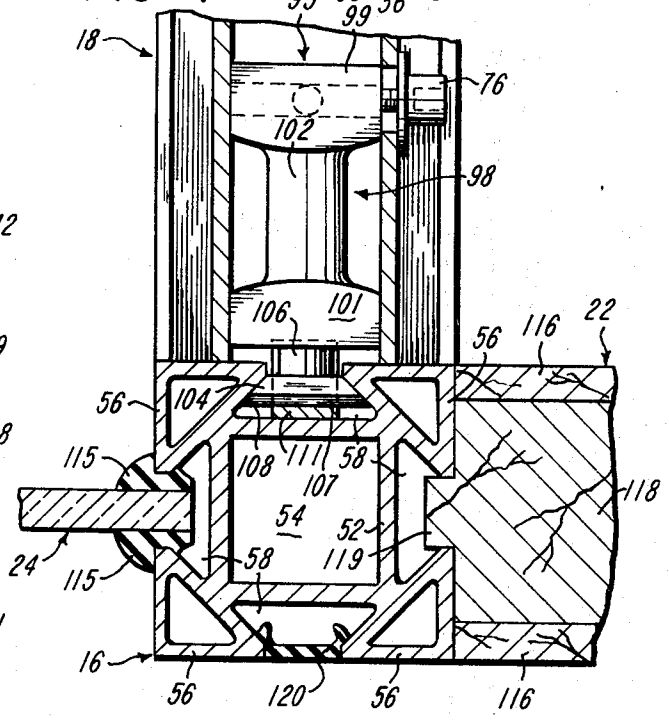


FIG-4



## PARTITIONING SYSTEM

## BACKGROUND OF THE INVENTION

There have been a number of demountable or movable partitioning systems which have been proposed or used to divide a room of a building into smaller rooms or offices. For example, U.S. Pat. No. 3,189,140 discloses one form of partitioning system, and another system is marketed by Syma Structures, Inc., New York City, N.Y., under the trademark Syma-System. These partitioning systems employ a series of rectangular glass or composite wood panels which are confined between a series of horizontal frame members connected to vertical frame members or studs. In each system, the studs are mounted on the floor, and the ends of the horizontal frame members are attached to the studs by devices which clamp or draw the ends of the horizontal frame members against the studs.

Commonly, the vertical and horizontal frame members are formed by aluminum extrusions and define undercut grooves or channels which receive the attaching devices. When the partitioning system is to be installed so that it extends from the floor to the ceiling of a room, the vertical frame members or studs are usually cut to length at the erection site so that the length of each stud corresponds precisely to the spacing between the floor and the ceiling at the position where the stud is to be located. The horizontal frame members, which commonly include a series of base members and ceiling members and sometimes one or more intermediate cross members, are then positioned between the vertical studs, and the ends of the horizontal frame members are secured to the studs.

It is highly desirable for a partitioning system to provide for accommodating floors and ceiling which are not precisely horizontal and parallel. Also, from an appearance standpoint, it has been found desirable for the horizontal base and ceiling frame members to extend continuously along the floor and ceiling to avoid the interrupted appearance which is produced when the vertical frame members or studs extend from the floor to the ceiling. However, to provide these features usually complicates the design and installation of the system and the manner by which the horizontal frame members are connected to the vertical frame members or studs.

## SUMMARY OF THE INVENTION

The present invention is directed to an improved partitioning system which provides the above-described features and which simplifies the installation of the vertical and horizontal frame members between non-parallel floor and ceiling surfaces. The invention also provides for using studs of precut uniform length and for quickly securing the end of each frame member to the perpendicular side of an adjacent frame member.

In accordance with one embodiment of the invention, the vertical and horizontal frame members each include a set of oppositely facing dovetail recesses or grooves which are adapted to receive a truncated head portion of a clamping member having a square cross-sectional configuration. The head portion of the clamping member is rigidly and positively secured to the corresponding frame member by an axially extending pin which projects from the head portion and engages the

bottom of the groove so that the end surfaces of the head portion are forced against the side faces of the groove. The actuating pin is shifted to its extended position by a pointed tip screw which extends laterally into the clamping member and engages a tapered surface on the inner end of the pin.

Each of the frame members also includes a longitudinally extending square passage or opening which is adapted to receive the clamping member and which is secured to the clamping member by a laterally extending screw. In another embodiment, the clamping member is rigidly secured to a frame member by a wedge element which is inserted into the dovetail groove and presses the head portion of the clamping member outwardly against the inner faces defining the groove.

Other features and advantages of the invention will be apparent from the following description, the accompanying drawing, and the appended claims.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a portion of a partitioning system constructed in accordance with the invention;

FIG. 2 is an enlarged exploded perspective view of portions of the frame and connecting members employed in the partitioning system of FIG. 1;

FIG. 3 is an enlarged vertical section taken generally on the line 3—3 of FIG. 1; and

FIG. 4 is an enlarged horizontal section taken generally on the line 4—4 of FIG. 1.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

The partitioning system illustrated in FIG. 1 generally includes a horizontal frame or base member 12 and a horizontal frame or ceiling member 14 which are identical in construction but are arranged in opposing or inverted relation. The horizontal frame members 12 and 14 are connected by a series of vertical frame members or studs 16, and some of the studs 16 are connected by horizontal frame members or dividers 18 which have the same cross-sectional configuration as the studs 16.

Preferably, all of the frame members 14, 16 and 18 are formed of aluminum extrusions and cooperate to retain therebetween a series of rectangular wall panels such as the wood panels 22 and 23, a glass panel 24 and a door panel 25 which is supported by hinges 26.

Referring to FIGS. 2 and 3, the extruded base frame member 12 and the ceiling frame member 14 each includes a pair of flat parallel side walls 28 which are integrally connected by an inner wall structure including walls 29 and 31 and a tubular wall portion 32 defining a square passage or opening 34. The walls 29 and 31 cooperate with the tubular wall portion 32 and inwardly diverging walls 36 to define a pair of oppositely facing dovetail channels or grooves 38 which extend the entire length of the horizontal frame member. The inner walls 29 also cooperate with portions of the side walls 28 to define a longitudinally extending channel 42 which opens into the corresponding dovetail groove 38.

The lower frame or base member 12 is secured to the floor surface by a series of longitudinally spaced lags or machine screws 43 each of which has a rectangular head portion 44 adapted to fit within the lower dovetail groove 38. The head portion 44 of each screw 43 includes part conical end surfaces 46 which are adapted

to engage the inwardly diverging faces of the walls 36 when the screw is rotated and tightened. This is performed by means of a socket wrench (not shown) which is extended through vertically aligned holes 47 formed within the tubular wall portion 32 and into a recess formed within the head portion 44 of the screw. The horizontal frame or ceiling member 14 may be attached to the ceiling by a similar set of longitudinally spaced screws or clips each having a head portion which is the same as the head portion 44 of the screws 43.

As shown in FIGS. 2 and 4, each of the extruded vertical frame members or studs 16 and each of the horizontal frame members or dividers 18 is constructed with a square tubular center portion 52 which defines a longitudinally extending square passage or opening 54. The frame member also includes four triangular shaped corner portions 56 which are extruded integrally with the square tubular portion 52 and cooperate to define a set of four longitudinally extending dovetail-shaped grooves 58 within the four sides of the generally square frame member. Each of the grooves 58 has precisely the same cross-sectional configuration as the grooves 38, and the width of each stud 16 is slightly less than the spacing between the sidewalls 28 of the base frame member 12 and the ceiling frame member 14 so that the end portions of the studs interfit within the channels 42 of the frame members.

Referring to FIG. 3, the lower end of each stud 16 is adapted to rest upon either the walls 29 of the base frame member 12 or on one or more flat shim plates 62 which are confined within the channel 42 of the base frame member 12 to compensate for a floor surface which is not precisely horizontal. A clamping device 65 provides for securing or connecting the lower end portion of each stud 16 to the base frame 12 and for connecting the upper end portion of each stud to the ceiling frame member 14. Since the clamping device 65 for retaining the upper end portion of each stud 16 is identical to the clamping device 65 for retaining the lower end portion of the stud, only the clamping device 65 for the lower end portion of the stud 16 is illustrated in FIG. 3.

The clamping device 65 includes a clamping body or member 68 which has a square cross-sectional configuration to form a sliding fit within the passage 54 of a stud 16. The clamping member 68 also includes a rectangular head portion 71 connected by a cylindrical neck portion 72. The head portion 71 has tapered end surfaces 73 which mate with the sloping or tapered inner faces of the frame member walls 36. The width of the head portion 71 is slightly less than the throat or narrowest width of the dovetail groove 38 so that the head portion 71 may be inserted into the groove 38 at any longitudinal point and then rotated 90° so that the end surfaces 73 of the head portion 71 underlie the inwardly diverging faces of the walls 36 defining the groove 38.

The clamping member 68 is secured to the end portion of the stud 16 by a socket head cap screw 76 which projects through a slot 77 within the stud 16 and into a threaded hole 78 extending laterally within the upper end portion of the clamping member 68. A hole or bore 79 extends axially or longitudinally within the center of the clamping member 68 to a smaller diameter hole 81 within the lower end of the head portion 71. A cylindrical pin 82 extends within the bore 79 and includes a

smaller diameter cylindrical tip portion 83 which projects through the hole 81. The pin 82 is movable axially between a retracted position (not shown) and an extended position (FIG. 3) where the tip portion 83 engages the base surface of the dovetail groove 38. A compression coil spring 84 is confined within the lower end portion of the bore 79 and surrounds the tip portion 83 of the pin 82 to urge the pin 82 towards its retracted position within the clamping member 68. A sloping cam surface 86 is formed on the upper end of the pin 82 and is engaged by the pointed inner tip surface of a set screw 87 threaded into the opposite end portion of the hole 78.

Referring to FIGS. 2 and 4, the end portions of the horizontal frame members or dividers 18 are secured to the adjacent studs 16 by clamping devices 95 which are interchangeable with the clamping devices 65 and thus may also be used to secure the upper and lower end portions of the studs 16 to the frame member 12 and 14. The clamping device 95 includes a clamping member 98 having an inner square end portion 99 integrally connected to an outer square end portion 101 by a cylindrical neck portion 102. The clamping member 98 also includes a generally rectangular head portion 104 which is integrally connected by a cylindrical neck portion 106. The head portion 104 has a curved or part cylindrical outer surface 107 and flat tapered end surfaces 108 which oppose the inwardly diverging faces of the corresponding dovetail groove 58.

The clamping member 98 is attached to the frame member 16 by inserting the head portion 104 within the groove 58 and then rotating the clamping member 90° so that the end surfaces 108 of the head portion 104 underlie the inner opposing faces defining the groove 58. The head portion 104 of the clamping member 98 is then forced outwardly against the faces of the groove 58 by a wedge member 110 (FIG. 2) adapted to fit within the groove 58. The wedge member 110 includes a tapered tongue or wedge portion 111 which is inserted between the curved outer surface 107 of the clamping member head portion 104 and the inner base surface of the groove 58.

A block-like element 112 projects outwardly from the tapered wedge portion 111 and is adapted to be tapped with a hammer or other tool for driving the wedge portion 111 against the outer surface 107 of the head portion 104 to secure the clamping member 98 to the vertical frame member or stud 16. It is apparent that the clamping devices 95 may be used in place of the clamping devices 65 and that the entire partitioning system may be erected or assembled by using only the clamping devices 65 or the clamping devices 95.

As shown in FIG. 4, each edge portion of the glass panel 24 is secured to the adjacent frame member by a pair of resilient gasket strips 115 which are pressed into the dovetail grooves 38 and 58 on opposite sides of the glass panel. As also shown in FIG. 4, the composite wall panels 22 include a set of outer plywood skins 116 which are secured to opposite sides of an inner rectangular wood core frame 118. Each wall panel 22 has an overall thickness which is the same as the thickness of the vertical frame members or studs 16, and the core frame 118 includes a tongue portion 119 which projects into the adjacent dovetail groove 58 of the stud 16.

When the face of a stud 16 is exposed and does not receive an edge portion of a wall panel, the correspond-

ing dovetail groove 58 is closed by a filler strip 120 extruded of a semi-rigid plastics material. The strip 120 snap fits within the groove 58 and has an outer surface which extends substantially flush with the adjacent outer surfaces of the triangular corner portions 56 of the stud 16. The enclosed groove 58 may be used for extending electrical power supply and telephone lines (not shown), or the lines may be extended through the center passages or openings 34 or 54 of the base frame member 12 or stud 16.

The installation of the partitioning system is commenced by securing the base and ceiling frame members 12 and 14 to the floor and ceiling. The panels 22, 23 and 24, the dividers 18 and the studs 16 are then progressively assembled starting at one end of the base frame 12. Each of the studs 16 is installed by first inserting a set of clamping members 68 into the dovetail grooves 38 within the frame members 12 and 14 while the corresponding pins 82 are in their retracted positions. Each clamping member 68 is then rotated 90° as mentioned above and is tilted in a longitudinal direction within the corresponding channel 42.

The set of upper and lower clamping members 68 are inserted into the upper and lower ends of the opening 54 within the stud 16 by positioning the stud on an incline between the base frame member 12 and the ceiling frame member 14. The stud 16 is then uprighted to a vertical position where it engages either a permanent wall or receives the edge of a glass panel 24 or the tongue 119 of a wall panel 22. The screws 87 within the upper and lower clamping members 68 are tightened with a suitable wrench so that each pin 82 is shifted axially within the corresponding clamping member 68.

When the tip portion 83 of each pin 82 presses against the inner base surface of the corresponding dovetail groove 38, the head portion 71 is urged outwardly against the inwardly diverging faces of the groove 38 thereby rigidly securing each clamping member 68 to the corresponding frame member. The screw 76 is inserted through the slot 77 and tightened into the threaded hole 78 so that the corresponding end portion of the stud 66 is secured to the rigidly positioned clamping member 68. The clamping devices 95 and the dividers 18 are installed in a similar manner except that the clamping members 98 are secured to the studs 16 by inserting the wedge members 110 in place of actuating the pins 82.

From the drawing and the above description, it is apparent that a partitioning system constructed in accordance with the present invention, provides desirable features and advantages. For example, the locking or clamping devices 65 and 95 provide for quickly and conveniently assembling or disassembling a partitioning system. The clamping members 68 or 98 are adapted to be tilted relative to the frame members after they are inserted into the dovetail grooves 38 or 58 so that each stud 16 may be simply tilted into position after it receives the aligned tilted clamping members.

Furthermore, the clamping members 68 and 98 form independent rigid connections between the studs 16 and the frame members 12 and 14 so that studs 16 of uniform length may be used even when the floor and ceiling are not precisely parallel. The channels 42 within the base frame member 12 and the ceiling frame member 14 provide for concealing any gaps between the ends of each stud 16 and the inner walls 29 of the

frame member and also provide for retaining one or more shims 62 under the lower end of a stud 16 or under a portion of a wall panel 22 when the floor is not precisely horizontal. In addition, the frame members 12 and 14 may be quickly and positively attached to the floor and ceiling, respectively, by use of screws having heads which fit within the grooves 38.

While the forms of partitioning system herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms, and that changes may be made therein without departing from the scope and spirit of the invention.

The invention having thus been described, the following is claimed:

1. In a partitioning system including at least one upright rectangular panel, at least one elongate horizontal frame member disposed adjacent a horizontal edge of said panel, and at least one elongate vertical frame member disposed adjacent a vertical edge of said panel, the improvement wherein one of said frame members includes a longitudinally extending groove defined by a pair of inwardly facing opposite side surfaces connected by a base surface, a clamping member including a head portion projecting into said groove and underlying said side surfaces, means for rigidly securing said head portion of said clamping member to said one frame member to effect a rigid support of said clamping member, said means for rigidly securing said head portion to said one frame member including a separate pressure member positioned between said head portion and the base surface of said groove and urging said head portion outwardly within said groove and against said side surfaces thereof, means defining a longitudinally extending center opening within the other of said frame members, said clamping member projecting into said opening, means for securing said clamping member to said other frame member, said clamping member having a hole extending axially through said head portion, said pressure member comprising an elongate pin supported for axial movement within said hole between a retracted position and an extended position, and means for urging said pin axially toward said extended position for engaging said base surface of said groove to effect pressing of said head portion against said side surfaces of said groove.

2. A partitioning system as defined in claim 1 wherein said latter means for urging said pin axially, comprises a tapered surface formed on the inner end of said pin, means defining a laterally extending threaded opening within said clamping member and intersecting said hole, and a screw extending within said threaded opening and having a pointed tip for engaging said tapered end surface on said pin.

3. A partitioning system as defined in claim 1 wherein said side surfaces of said groove diverge inwardly toward said base surface, said head portion of said clamping member includes opposite tapering end surfaces for engaging said side surfaces of said groove, said head portion has a width no greater than the narrowest width of said groove to facilitate inserting said head portion into said groove, and a reduced neck portion supporting said head portion to provide for rotating said head portion within said groove after said head portion is inserted into said groove and to provide for tilting said clamping member longitudinally relative to said groove.

7

4. A partitioning system as defined in claim 3 wherein said end surfaces of said head portion are disposed at an angle corresponding to the angle between said faces of said groove.

5. In a partitioning system including a series of upright rectangular panel, at least one elongated horizontal base frame member adapted to be positioned on a floor adjacent a lower horizontal edge of said panel, and at least one elongated vertical frame member disposed adjacent a vertical edge of said panel, the improvement wherein said base frame member includes an upwardly facing channel and a longitudinally extending dovetail groove within the bottom of said channel defined by a pair of inwardly diverging side faces connected by a base surface, a clamping member including a rectangular head portion projecting into said

8

groove and having tapering end surfaces, said head portion being rotatable within said groove for positioning said end surfaces under said side faces, means for rigidly securing said head portion of said clamping member to said frame member to effect a rigid support of said clamping member, including a pressure member positioned between the head portion and the base surface and urging said head portion outwardly within said groove and against said side faces, means defining a longitudinally extending substantially square center opening within said vertical frame member, said clamping member having a substantially square body portion projecting into said opening, and means for securing said clamping member to said vertical frame member.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,837,128 Dated September 24, 1974

Inventor(s) William R. O'Brien

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The name of the Assignee should be correctly spelled Feury.

Signed and sealed this 3rd day of December 1974.

(SEAL)  
Attest:

McCOY M. GIBSON JR.  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents