United States Patent

Marks

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[54] COMBINED BRACKET MOUNTING AND SUPPORT AND METAL STUD STRUCTURE

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[52] **U.S. Cl.**.....**52/36,** 52/475, 211/148, 211/153

[51] **Int. Cl.**.....**A47g 29/02,** A47f 5/08

[58] **Field of Search**.....52/27, 36, 122, 127, 238, 475; 211/134, 148, 153

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[57] **ABSTRACT**

A bracket support and mounting system for use with metal channel-shaped studs. A slotted channel is positioned relative to and connected to the metal stud usually by another element which may be integral with a guide flange. A pair of guide flanges provide a corridor for a bracket to the slots of the slotted channel. Five embodiments of system designs are illustrated.

2 Claims, 8 Drawing Figures

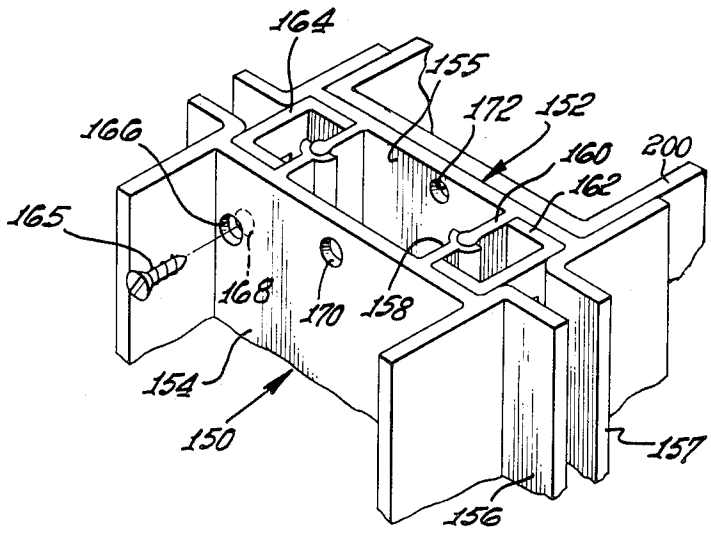


FIG. 1.

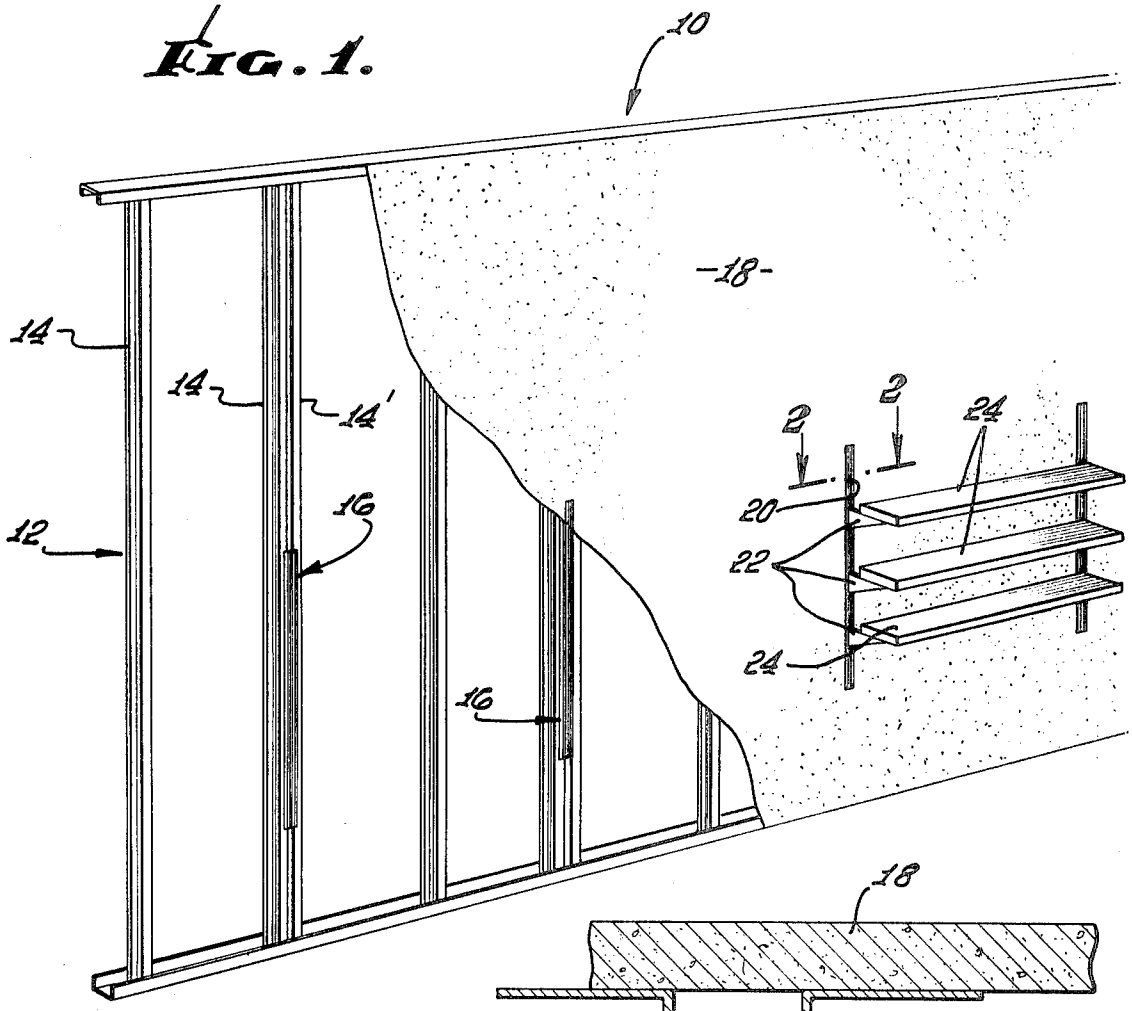
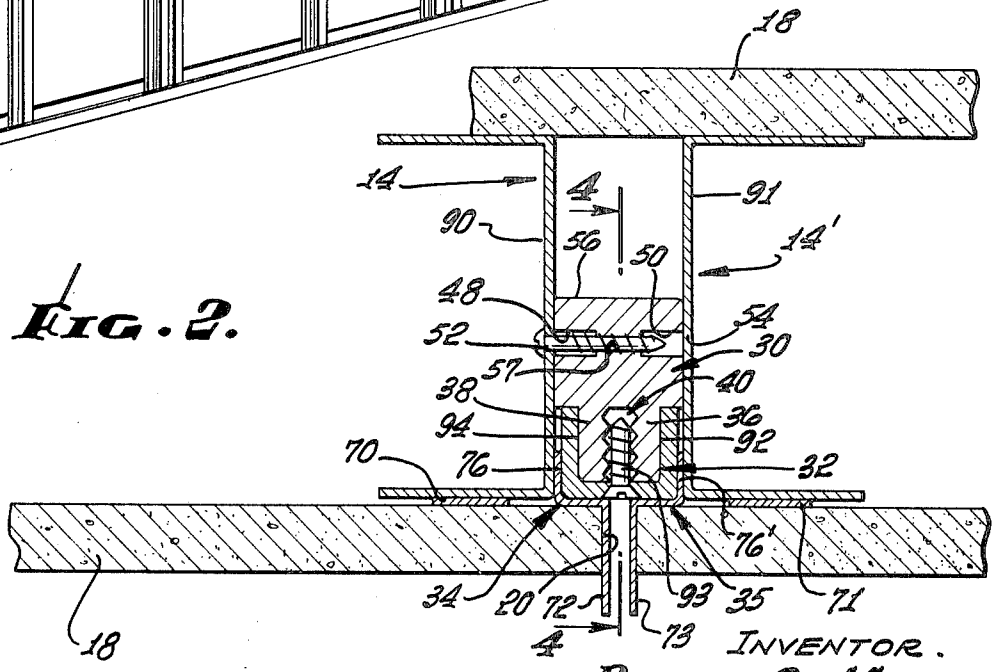
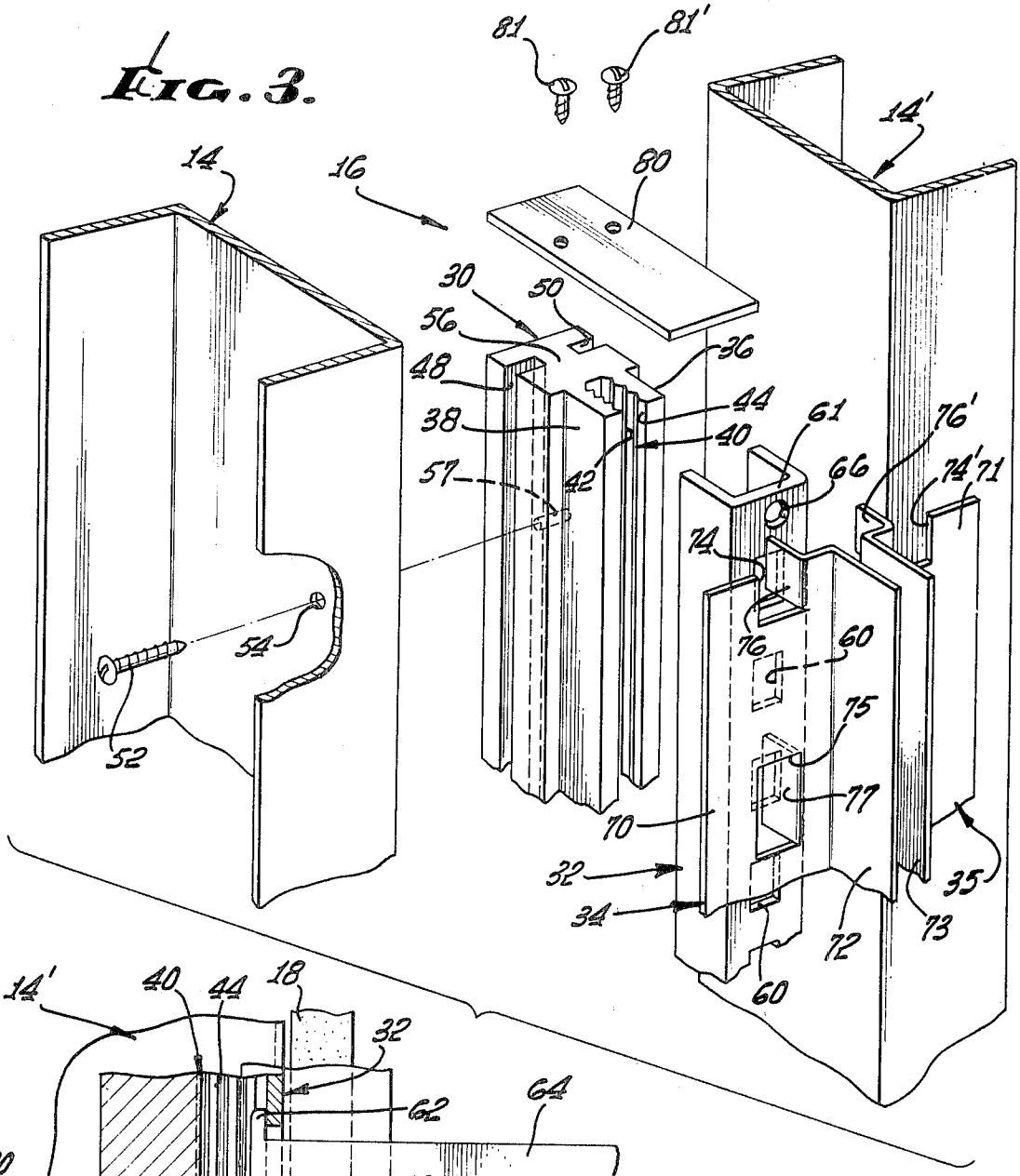


FIG. 2.



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FIG. 3.



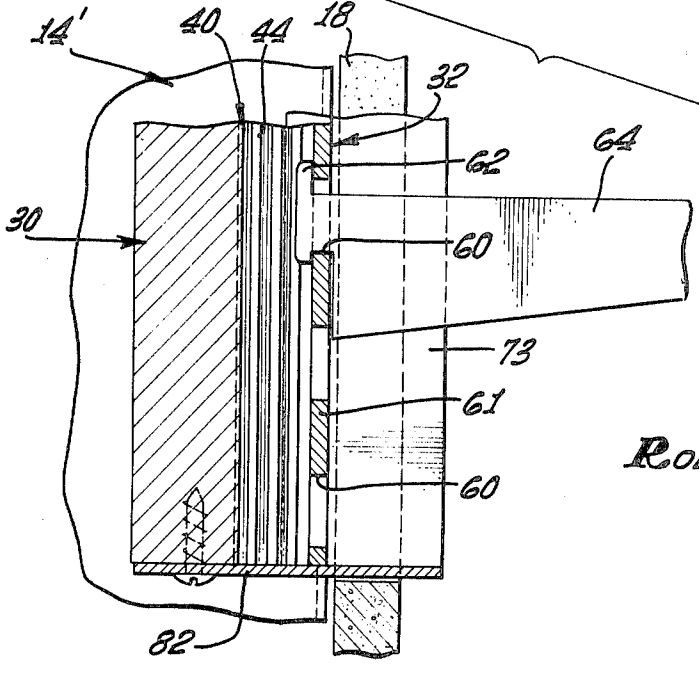


FIG. 4.

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FIG. 8.

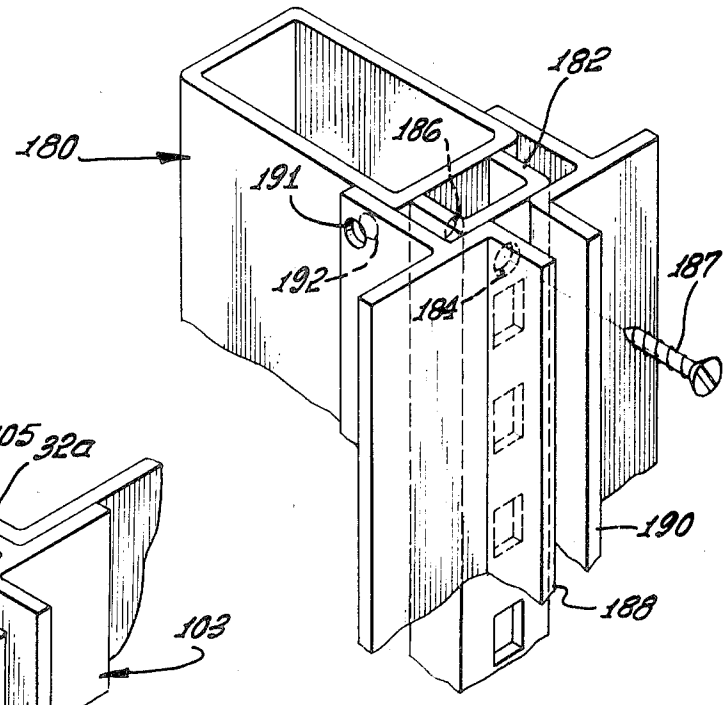


FIG. 5.

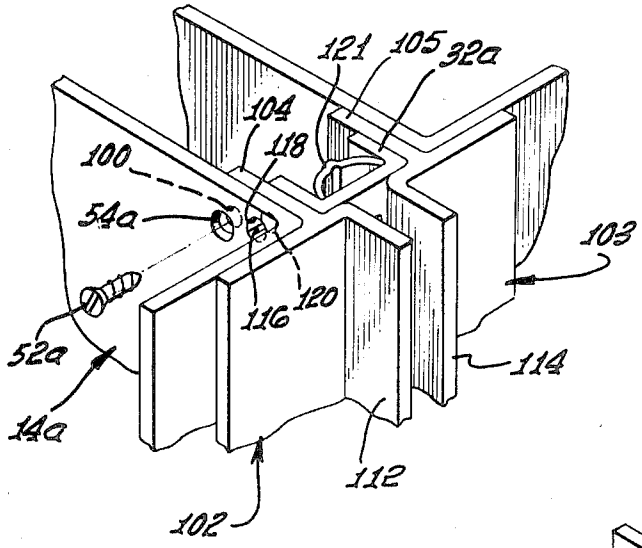


FIG. 7.

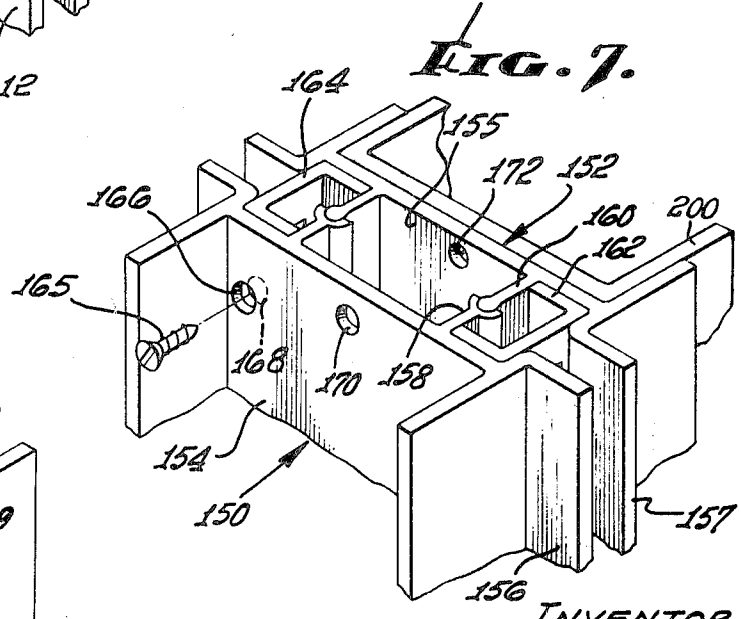
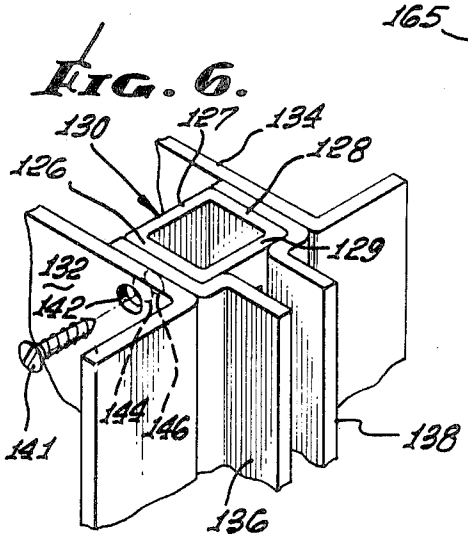


FIG. 6.



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COMBINED BRACKET MOUNTING AND SUPPORT AND METAL STUD STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a bracket support and more particularly to a bracket support to be combined with and directly supported by wall studs made of metal such as those used in commercial business construction where it is usually desirable for aesthetic reasons to have only an elongated slot visible in a wall for the purpose of mounting and supporting display brackets.

2. Description of the Prior Art

Originally most building frame construction other than major supporting elements consisted of wooden studs having a generally rectangular cross section to which wall boards were nailed and over which was applied a layer of plaster. Brackets for shelves or other display apparatus were generally supported by a channel-shaped element having a series of spaced slots which were adapted to accept a specially designed projection of the bracket. The slotted channel was then screwed into the wall and hopefully into the wooden stud behind the wall after a process of locating the wooden studs was completed. While this form of mounting and support was relatively inexpensive, the finished apparatus was not particularly aesthetic. In order to hide the slotted channel, notched paneling was developed which was mounted to the wallboard and which substantially covered the slotted channel leaving only a long narrow opening so that access to the slots was available. The drawback to this approach was the expense of having to provide what was in essence a second wall and the expense of cutting a properly dimensioned recess into the panels.

A solution to the double walled approach was achieved by providing a recess in the wooden stud into which the slotted channel was placed. The wallboard or paneling was then applied without added cutting adjacent the recessed stud and attached. Again a long narrow opening was left between adjacent panels or boards to allow access to the slots of the channel. Another problem that developed with the hidden placement of the slotted channel was the lack of an easy method of locating the panels of wallboard so that a sufficiently wide slot was available for the bracket but yet not excessively wide causing new aesthetic problems. A uniform slot or opening in the finished wall was desired. Additionally, the insertion and removal of brackets when accomplished without regard for the plasterboard or panel caused nicks in the edge of the board. If the panel had an overlaying layer of paper, there was difficulty in preventing the paper from rolling back and separating from the wall, again causing an aesthetic problem. In order to solve this problem oppositely disposed guide flanges were developed which would, when connected to the wooden stud or slotted channel, extend away from the stud usually to a distance of the expected wall thickness, which would depend upon the wallboard or panel used.

More recently, metal studs have been introduced due to fire codes requiring incombustible materials and to the relative ease to which metal studs can be handled and put together. Because the metal studs are generally channel-shaped with the wallboard or panel being attached to one of the legs of the U-shaped cross section, efforts were again required to devise a scheme to inexpensively allow the mounting of some sort of support for display brackets without causing unsightly appearances. Various devices have been developed and various methods have been provided for inexpensively attaching slotted members to the metal studs. Presently, some bracket mounting and supporting elements are welded to their respective metal studs at the site of construction after the studs have themselves been bolted or welded into position. While welding allows for the attachment of the slotted member to the metal stud, the process is time consuming and the heat generated by the welding process may cause the slotted member to become bent and distorted, introducing alignment problems.

The building industry is constantly searching for new and better means of providing bracket mounting and support elements. It would be desirable to have a mounting and supporting system which would incorporate the standard slotted channel because of the very low expense of the slotted channel. Secondly, it would be desirable to develop an apparatus and method which would allow either onsite assembly of the mounting and support system or assembly in a factory or shop with delivery to the site of a completely assembled unit. Most systems presently available are relatively expensive either to purchase or to use.

SUMMARY OF THE INVENTION

The above-mentioned drawbacks and problems in the prior art have been substantially reduced or eliminated by the present invention of a bracket mounting and support apparatus to be used with walls supported by metal studs comprising in combination a slotted bracket support element; means, connected to said slotted bracket support element, for positioning said slotted bracket support element relative a metal stud; and a pair of guide flanges, positioned adjacent to or integral with and extending away from said slotted bracket support element, for guiding brackets to said slotted bracket support element and for protecting an adjacent wall. Additionally, the invention includes a method of assembling a bracket mounting and support apparatus comprising the steps of providing a slotted bracket support element; providing a means for positioning said slotted bracket support element relative a metal stud; providing a pair of guide flanges for guiding brackets to said slotted bracket support element and for protecting an adjacent wall; and connecting said slotted bracket support element to said positioning means and said pair of guide flanges.

An object of the present invention is to provide a bracket mounting and support system to be used in conjunction with metal or wood studs and of such a construction as to be relatively inexpensive to produce and inexpensive to use.

Another object of the present invention is to provide a bracket mounting and support system which is easy to assemble either at a construction site or in a factory after which the finished assembly is shipped to the construction site.

Still another object of the present invention is to provide a bracket mounting and support system which conveniently incorporates the well-known slotted channel.

A still further object of the present invention is to provide a bracket mounting and support system integral with a metal stud.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front, partially cut away, perspective view of a wall portion, illustrating the placement and assembly of a bracket mounting and support system in conjunction with metal channel studs and illustrating installed brackets supporting three spaced apart shelves.

FIG. 2 is an enlarged fragmentary cross-sectional view taken along line 2—2 of FIG. 1.

FIG. 3 is an exploded perspective view of the embodiment illustrated in FIG. 2, excepting the wall panels.

FIG. 4 is a fragmentary side cross-sectional view taken along a portion of line 4—4 of FIG. 2.

FIG. 5 is a partially exploded perspective view of another embodiment of the present invention.

FIG. 6 is a perspective view of still another embodiment of the present invention.

FIG. 7 is a perspective view of yet another embodiment of the present invention.

FIG. 8 is a perspective view of another embodiment of the present invention.

DESCRIPTION OF SEVERAL EMBODIMENTS

Referring now to the drawings, there is illustrated in FIG. 1 a section of a wall which is partially cut away to illustrate the

frame structure 12 comprising a matrix of metal studs 14 and 14'. At selected intervals two metal studs have been positioned and connected back-to-back so as to provide a support for a bracket mounting and support system 16. It is readily seen that a portion of the wall is covered with a wall panel 18 (or wallboard and plaster) and that the mounting and support system 16 presents only a relatively narrow elongated opening or slot 20 to a viewer of the wall, thereby creating an aesthetically pleasing appearance. As illustrated, a series of three brackets 22 have been positioned through the opening 20 attached to the mounting and support system 16. The brackets 22 are aligned with another series of three brackets (not viewable in FIG. 1) so as to support three spaced apart shelves 24. Such shelves could be used for displaying merchandise or advertising material, for example. Other uses contemplated for the bracket include, for example, attaching a rod to one set of aligned brackets. The rod may be used for clothes hangers or other hanging type articles as frequently found in clothing stores. Again, it is contemplated that the brackets may just be used individually to support individual items, such as for window displays. It is apparent that there are numerous ways in which the bracket mounting and support system can be used with brackets and with other mateable elements.

Referring now to FIG. 3, there is illustrated in an exploded view the bracket mounting and support system 16 and two adjacent channel-shaped metal studs 14 and 14'. Disposed between and attachable to the studs is a positioning means, such as a mounting support element 30, preferably formed of an extrudable metal, such as aluminum. The element 30 acts as a means or frame for the positioning of a bracket supporting slotted channel 32 and a pair of guide flanges 34 and 35. The mounting support element 30 is shown to have a generally "H" cross section with the addition of two parallel protruding arms 36 and 38. The arms 36 and 38 form between them an elongated recess 40 which has two sidewalls 42 and 44. The sidewalls 42 and 44 are serrated with the serrations extending parallel to the longitudinal axis of the recess 40, which, in turn, extend parallel to the longitudinal axis of the element 30. The advantage of having the serrations is that a fastener, such as a screw, can be inserted into the recess 40 anywhere along the recess without having to tap the walls 42 and 44. Thus, the slotted channel 32 can be attached anywhere along the mounting support element 30, as will be explained below.

Two additional recesses, 48 and 50, are formed in the mounting support element 30, each of the recesses extending in a direction parallel to the longitudinal axis of the element 30. As illustrated, the element 30 may be attached to the stud 14 by having a fastener, such as screw 52, inserted through an aperture, such as drilled hole 54, in the metal stud 14, into recess 48 and through an aperture, such as hole 57, in a bridge portion 56 located between the two recesses 48 and 50. Another view of the location of the screw 52 in relationship to the recesses 48 and 50 is shown in FIG. 2.

The slotted channel 32, FIG. 3, is an elongated structure having a U-shaped cross section and having spaced apart slots 60 in the base 61 of the "U" for receiving a flange 62, FIG. 4, of a bracket 64. Commonly, there is a hole 66 every 12 inches, through which a screw may be placed for the securing of the slotted channel 32.

Mounted so as to extend beyond the metal studs 14 and 14', usually to at least the thickness of the finished wall, are the pair of guide flanges 34 and 35. These are generally L-shaped members with legs 70 and 71 (respectively of guide flanges 34 and 35) of the "L" extending essentially parallel to the slotted base 61 of the slotted channel 32 and with the legs 72 and 73 (respectively) extending essentially perpendicular to the legs 70 and 71 away from the slotted channel 32. The guide flanges 34 and 35 are punched intermittently, such as indicated at 74, 74' and 75 so that tabs 76, 76' and 77 are formed respectively which act to position and support the guide flanges. Guide flange 34 and corresponding guide flange 35 straddle the slotted channel 32 in a properly spaced relationship so that the spacing between the legs 72 and 73 is kept to fairly close tolerance.

A top fire safety plate 80 is attached to the mounting support element 30 with screws 81 and 81'. A bottom fire safety plate 82, FIG. 4, is also attached to the element 30. The plates 80 and 82 are for the purpose of preventing the recesses in the mounting support element 30 from acting as conduits to a fire, thus helping to retard the spread of any fire which may accidentally start.

Referring now to FIGS. 2 and 4, there is illustrated the bracket mounting and support system connected in its usual operative arrangement. Several screws like the screw 52 may be used along the longitudinal length of the mounting support element 30 to secure the element 30 to base portions 90 and 91 of the studs 14 and 14', respectively.

The two arms 36 and 38 are spaced from the base portions 90 and 91 so as to form two additional recesses or indentations 92 and 94 providing a spacing for a snug fit of the slotted channel 32 and the tabs 76 and 76' of the guide flanges 34 and 35 respectively. The perpendicular wall sections 72 and 73 are shown extending away from the slotted channel 32 so as to project slightly beyond the wall section 18. A fastener, such as screw 93, attaches the slotted channel 32 to the mounting support element 30 by being secured to the serrated recess 40. The bracket 64, FIG. 4, is positioned in one of the slots 60 of the slotted channel 32 and is retained by the flange 62 which is positioned within the recess 40 of the mounting support element 30.

Another embodiment of the present invention somewhat modified from that illustrated in FIGS. 2, 3, and 4, is shown by referring to FIG. 5 where, for simplicity, only one metal stud 14*a* is shown. Stud 14*a* has a hole 54*a* through which a screw 52a is positionable to secure an integral mounting support and guide flange element 102. A hole 100 is provided in the element 102 to receive the screw 52*a*. A corresponding integral mounting support and guide flange element 103 is also provided. Elements 102 and 103 have "L" cross sections with arms 104 and 105 extending oppositely to the legs 112 and 114, which correspond to legs 72 and 73 of FIG. 3. The arms 104 and 105 of elements 102 and 103, respectively, serve generally the same function as the extruded element 30, FIG. 3. A slotted channel 32a is connected to the element 102 by fastener, such as screw 116, positioned within an aperture or hole 118 in the element 102 and an aligned aperture or hole 120 in the slotted channel 32a. It is evident that more holes similar to hole 54*a* in the stud, holes 100 and 118 in the element 102 and hole 120 in the channel 32a may be used to securely attach the mounting support system together and to the metal studs. A fire channel 121 is press-fitted to the channel.

Referring now to FIG. 6, another embodiment is shown featuring a slotted support element in the form of a slotted rectangular tube 130 positioned between two metal studs 132 and 134. In the FIG. 6 configuration the three nonslotted surfaces 126, 127, and 128 of the slotted tube 130 provide the means for positioning the slotted surface 129 relative to the metal studs 132 and 134. Additionally, a pair of guide flanges 136 and 138 are positioned to provide a corridor to the slots in the surface 129. Each flange is sandwiched between the slotted tube 130 and one of the metal studs 132 and 134. The entire unit is attached by having a fastener, such as screw 141, inserted through aligned holes 142, 144, and 146 of the metal stud 132, the guide flange 136 and the slotted tube 130, respectively. Another fastener (not shown) may be inserted through corresponding aligned holes in the stud 134, flange 138 and tube 130.

Referring now to FIG. 7, the means for positioning the slotted bracket support element is an extruded pair of members 150 and 152. Each of the members 150, 152 includes as an integral part a channel-shaped metal stud 154 and 155 and one of the pair of guide flanges 156 and 157. In addition, the member 150 includes a fire retarding flange 158 which cooperates with a second fire retarding flange 160 of the member 152 so as to form a fire retarding wall behind the slotted bracket support element, such as slotted channel 162. As illustrated, the FIG. 7 embodiment provides in a four piece

unit, the two members 150 and 152 and the slotted channels 162 and 164 a double sided mounting and support system so that brackets may be located on both sides of the wall which completes the assembly. The slotted channels are attached to the integral members 150 and 152 by a suitable fastener, such as exemplified by the screw 165 positionable through aligned drilled holes 166 and 168 in the member 150 and the slotted channel 164, respectively. Additional holes 170 and 172 are provided to receive a bolt (not shown) which may be secured to additionally attach the two members 150 and 152 together.

In order to lower costs of manufacture and assembly it is contemplated that the guide flange 136 and 138, FIG. 6, and the members 150 and 152, FIG. 7, are extruded from a material such as aluminum. Other inexpensive manufacturing techniques may be used, however, even those developed at a later date, since the structure disclosed herein is uniquely suitable to manufacturing processes where single elements function in several capacities.

Referring now to FIG. 8, still another embodiment of the present invention is illustrated. A rectangular tubular metal stud 180 is the major wall support element to which is connected a slotted channel 182. Attachment is conveniently achieved by having two aligned holes 184 and 186 in the slotted channel 182 and the metal stud 180, respectively. A suitable fastener, such as screw 187, may be inserted through the holes 184 and 186 prior to the positioning of a pair of guide flanges 188 and 190. The pair of guide flanges 188 and 190 are provided for the same purpose as mentioned above in the previous embodiments and are connected to the tubular metal stud 180 by a fastener (not shown) which may be inserted through the aligned holes 190 and 192 in the guide flange 188 and tubular metal stud 180, respectively.

There are generally two schemes for assembling a bracket mounting and support system. Assembly can be done at the construction site or can be done in a shop or factory. If the assembly is done in a shop, it is necessary that a slotted bracket support element, a pair of flange guides, a positioning means, and metal studs be provided (except for the FIG. 7 embodiment). The positioning means, such as mounting support element 30, FIG. 3, is located between two metal studs 14 and 14' by any convenient means, such as by clamping and using jigs to properly locate the element 30 to a desired position. Next, two holes are drilled, one through the metal stud 14, such as hole 54, and another hole 57 through the bridge portion 56 of the element 30. The screw 52 is inserted to secure the element 30. The clamps and jig features may now be removed and the slotted channel 32 may be positioned having the slotted base 61 abutting the end of the arms 36 and 38 of the element 30. The slotted channel is then fastened into place by a screw (not shown) positioned through the hole 66 into the serrated recess 40. Next, the guide flanges 34 and 35 are pressed into the space between the legs of the slotted channel and the base portion 90 and 91 of the metal studs 14 and 14', respectively. The full assembled configuration is best seen in FIG. 2. The finished assembly may now be transported to the construction site where the metal studs are positioned and connected in preselected locations. Thereafter, the wallboard is placed over the studs and is finished with a coat of plaster in the usual case. If the bracket mounting and support system is to be attached to an existing frame of metal studs, then the mounting support element 30, the slotted channel 32 and the guide flanges 34 and 35 are provided. The slotted channel may be attached to the mounting support element 30 before the element 30 is attached to the metal studs 14 and 14', or the element 30 may be attached to the metal studs first and then the slotted channel is connected to the element 30. In either case, once the element 30 is connected to the metal studs and the slotted channel is connected to the element 30, the guide flanges may be located in the space remaining between the base portions 90 and 91 of the metal studs 14 and 14' and the slotted channel 32.

If the FIG. 5 embodiment is used, then the method would include providing the integral mounting support guide flange element 102 and the slotted channel 32a and connecting the slotted channel 32a to the integral mounting support guide flange element 102 and then connecting the element 102 to the stud 14a.

In the FIG. 6 embodiment, all the elements are aligned and are simply connected by the fastener 141 through the holes 142, 144, and 146.

In the FIG. 7 embodiment, since the metal stud, positioning means, and guide flange are integral, the members 150 and 152 may first be connected by a fastener (not shown) through the holes 170 and 172, and the slotted channel 162 and 164 slid into place to be fastened, such as by the screw 165 through holes 166 and 168. Or fastening through the holes 170 and 172 may be deleted if the attachment of the members 150 and 152 to the slotted channels 162 and 164 is deemed sufficient to hold the entire system together.

In the FIG. 8 embodiment, the slotted channel 182 is fastened to the stud 180 by screw 187 through holes 184 and 186. The guide flanges are then attached using the holes 190 and 192.

While the invention has herein been shown and described in what has been conceived to be several practical and effective embodiments, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein; for example, it is quite clear that the element 30, FIG. 2, may have a different cross-sectional configuration than that shown and yet still provide the function of supporting the slotted channel 32 and the pair of guide flanges 72 and 73, and being attached to the metal stud 14. An equivalent element may have a cross-sectional configuration of two back-to-back "U"s with two legs of one "U" extending parallel to and adjacent the base portions 90 and 91 of the studs 14 and 14'. A fastener in aligned apertures in one of the metal studs and one of the legs will attach the element to the stud. The legs of the second "U" may be identical to legs 36 and 38, FIG. 2, as shown. The FIG. 5 embodiment can easily be modified slightly to accept, instead of the slotted channel 32a, a flat slotted elongated plate. The plate may be connected to the guide flange 102 by a fastener placed within a hole drilled through the flange guide and a hole drilled through the elongated slotted plate. The FIG. 6 embodiment can be easily changed by extending the slotted rectangular tube 130 so that it may be slotted and used as a bracket support on both sides of the wall structure that is eventually put in place. The FIG. 7 embodiment can easily be altered so that there is only one slotted channel for use through only one side of the wall which will eventually be incorporated with the apparatus; or the apparatus, as shown in FIG. 7, could be attached to metal studs, such as the stud 200, if added strength is deemed necessary, or if building codes require; or the two changes just suggested may be incorporated into still another embodiment that has only one slotted channel, and the apparatus is to be attached to metal studs. The FIG. 8 embodiment can be altered by having a slotted channel and a pair of guide flanges attached to that part of the tubular metal stud 180 which is opposite the side to which the slotted channel 182 is attached, thereby allowing the apparatus to support brackets on both sides of the wall which is part of the finished unit. It is understood many combinations and variations in design can be accomplished and that the above equivalent structures are not to be considered the only equivalent structures coming within the scope of the claims.

What is claimed is:

1. A bracket support structure comprising in combination:

a first element receiving a U-shaped slotted bracket support and connecting to a metal stud, said first element having a wall portion for abutting said support, an integral rear flange having a recessed end portion, said rear flange extending perpendicularly from said wall portion, an integral laterally extending flange positioned to abut a portion of said metal stud, said laterally extending flange being perpendicular to said wall portion, and a guide flange extending in a direction perpendicular to said laterally extending flange;

a second element receiving said U-shaped slotted bracket support and for connecting to another metal stud, said second element having a wall portion abutting said support, an integral rear flange having an end portion received by the recessed end portion of said first element, said rear flange extending perpendicularly from said second element wall portion, an integral laterally extending flange positioned to abut portion of said metal stud, said laterally extending flange being perpendicular to said second element wall portion, and a guide flange extending in a direction perpendicular to said second laterally extending flange; and

at least one fastener positioned through openings in said first element wall portion and in said U-shaped slotted bracket support for attaching said element and said support.

2. A bracket support structure, as claimed in claim 1, wherein:

said recessed end portion comprises a groove and said end portion of said second element rear flange comprises a tongue.

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