

[54] **STRUCTURAL SUPPORT SYSTEM FOR
DRAWERS AND THE LIKE**

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[51] **Int. Cl.** **A47b 51/00**

[58] **Field of Search**.....312/351, 330, 334, 341, 342,
312/345, 350; 308/3.6; 5/299; 211/151

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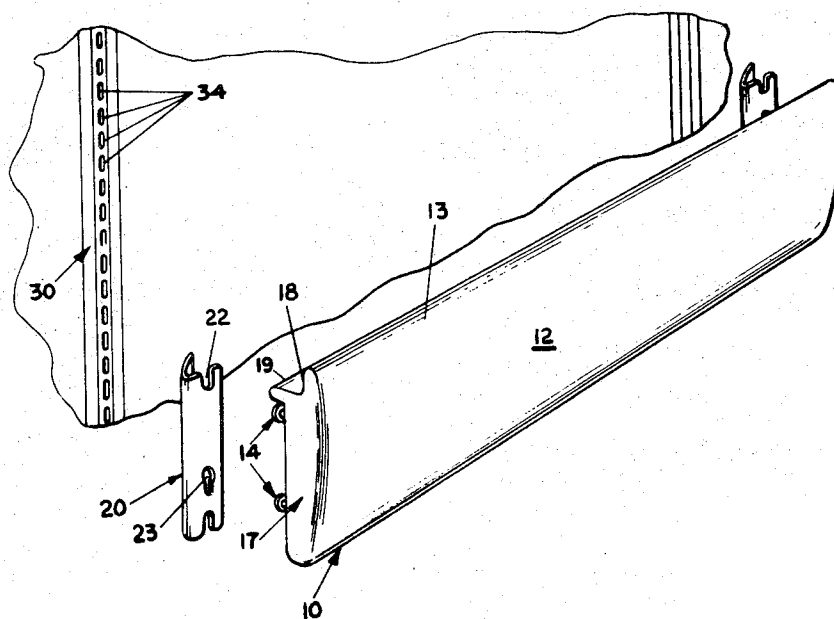
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[57] ABSTRACT

A horizontal rail upon which drawer supporting frames and the like can be removably hung is used in a vertical post supporting system by being releasably secured to clips which in turn can be releasably mounted on spaced, vertical posts. The rail is provided with spaced studs which key into slots in the clip. The studs at one end of the rail are spaced from those at the other end a distance slightly less than the operable distance between the spaced vertical posts such that the clips tend to bind slightly between the posts and the rail when the system is assembled. This insures a positive, tight fit between the rail and the vertical posts.

19 Claims, 9 Drawing Figures



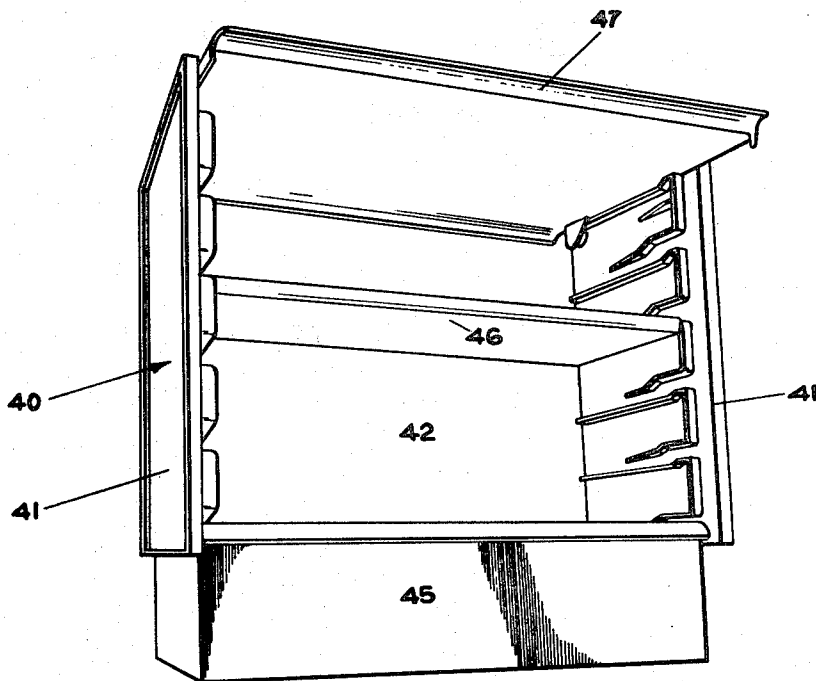


FIG. 5

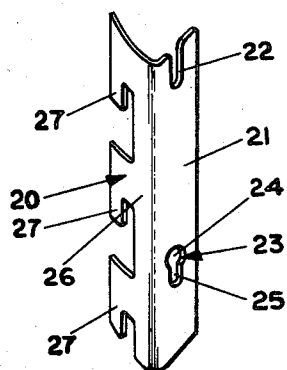


FIG. 4

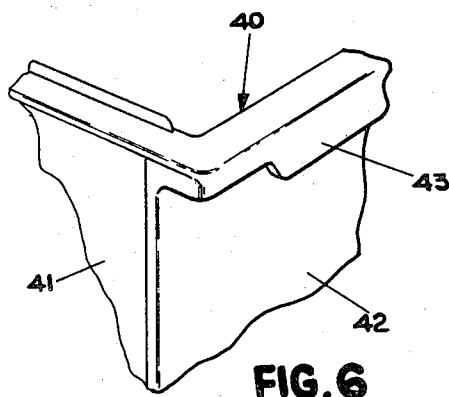


FIG. 6

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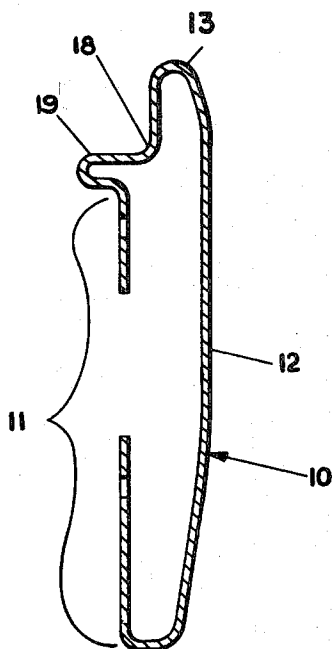


FIG. 7

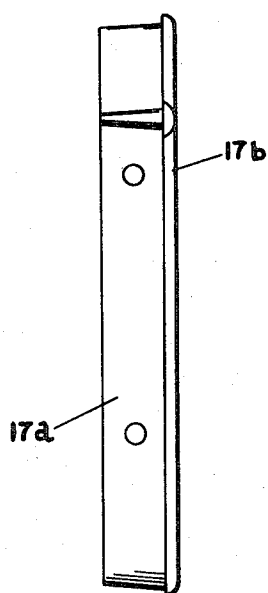


FIG. 8

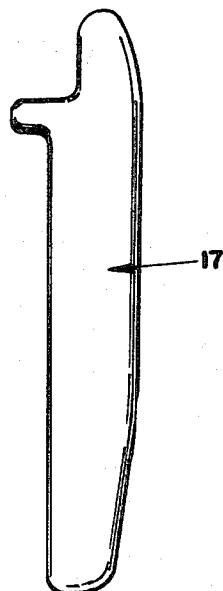


FIG. 9

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STRUCTURAL SUPPORT SYSTEM FOR DRAWERS AND THE LIKE

BACKGROUND OF THE INVENTION

This invention relates to supporting structures. It is particularly adapted for supporting mobile frames which in turn can support drawers, shelves and the like.

United States Pat. Nos. 3,212,646, 3,241,850 and 3,241,896 disclose a highly mobile drawer supporting system. Improvements on this system are disclosed in my co-pending U.S. patent application entitled DRAWER, TRAY SHELF AND SUPPORTING STRUCTURES THEREFOR. In this system, drawers can be loaded into mobile frames. These frames can then be hung on horizontal rails which are permanently fixed to the walls of a room. This provides a particular set of drawers with tremendous mobility and facilitates such operational systems as central filling and storage of drawers to be used later in a particular environment for a particular purpose.

On the other hand, U.S. Pat. Nos. 3,517,467 and 3,496,889 disclose a vertical support system which provides considerable flexibility in the design of offices. Shelves, desks, cabinets and the like can be secured to vertical support posts by means of brackets and clips. Once fixed to these posts, the cabinets or the like can be removed, but their installation is intended to be at least semi-permanent. This vertical support system has been widely received and has met with considerable commercial success.

In the present invention, the mobility of the horizontal rail system has been combined with the versatility of design of the vertical support system, in spite of the fact that the first system relies upon horizontal rail hanging for hanging objects therefrom, while the second system relies upon vertical support hanging. In the present invention, means are provided for hanging horizontal rail supported objects on a pair of spaced, vertical supports, thus creating a marriage of the two systems set forth above. A pair of hanger clips, including means for releasably securing them to vertical supports, are joined to an elongated rail, whereby the elongated rail can be supported by the spaced vertical supports. Then, a drawer supporting frame or the like can be removably hung on the rail.

As a result of this invention, one can achieve both versatility of office design and the tremendous mobility offered by the mobile drawer supporting frame system. Since the drawer supporting frames are designed for frequent removal from the elongated horizontal rail, it is another object of the invention to provide a means for positively and firmly affixing the horizontal rail to the vertical supports, in spite of the fact that the horizontal rail is removable from the clips and the clips are releasable from the vertical supports. The rail includes rearwardly projecting posts which key into slots on the clips. The rearwardly projecting posts at one end of the rail are spaced from those at the other end a distance which is slightly less than the effective distance between the spaced vertical supports. Thus, when the rail is secured to the clips, and the clips are releasably mounted on the vertical supports, the clips are placed in tension between the rail and the vertical supports. Consequently, a tight, positive mounting of the rail on the vertical supports is achieved.

It is another object of this invention to provide a rail which is capable of spanning a distance of 4 feet, yet which is economical of construction. Thus, the rail is roll formed of sheet metal, and is provided with a curvilinear front face to provide structural strength to the rail as well as to provide an eye pleasing contoured surface.

DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will be seen and understood by reference to the specification and appended drawings in which:

FIG. 1 is a perspective view of the rail exploded away from the vertical supports and a wall;

FIG. 2 is a side view of the system with a drawer supporting structure in place thereon;

FIG. 3 is a plan view, partially cross sectional, showing a pair of rails secured to the same vertical support;

FIG. 4 is a perspective view of a hanger clip;

FIG. 5 is a perspective view of a drawer supporting structure;

FIG. 6 is a fragmentary, rear perspective view of a drawer supporting structure;

FIG. 7 is a cross section of the rail;

FIG. 8 is a side view of the end cap; and,

FIG. 9 is an end view of the end cap.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the preferred embodiment, a drawer supporting structure 40 is hung on a rail 10 which in turn is secured to wall supports 30 by means of hanger clips 20 (FIG. 2). The vertical supports 30 are secured to a wall 1 and are embedded, in effect, in paneling 2 which is against wall 1 (FIG. 3). The vertical supports 30 could just as well be integral members of free-standing vertical panels, or they could simply be wall mounted supports.

Rail 10 is roll formed out of sheet metal (FIG. 7) and is coated with protective vinyl. It comprises a main body 11 which defines a curved front face 12 (FIGS. 1 and 2). The curved front face 12 extends upwardly to a lip 13 which runs along the length of rail 10 at the top front edge thereof. The lip 13 is narrower than the main body 11 of rail 10 (FIGS. 1 and 7). This allows one to provide a thin line hanging intelligence means while maintaining a main body 11 of substantial thickness to allow enough space for threading screws 14 into the ends thereof. Further, the L corner 18 (FIGS. 1 and 7) defined by the junction of lip 13 with main body 11 acts to reinforce and rigidify rail 10. A rearwardly projecting ledge 19 (FIGS. 1 and 7), projecting rearwardly from the top of main body 11, provides structural rigidity to rail 10 and prevents objects from falling down behind rail 10 and getting stuck between panel 2 and rail 10.

The front face 12 of rail 10 is curvilinear in cross section (FIG. 7). This further acts to rigidify rail 10 and thereby render it more structurally sound. Additionally, it provides a surface which is much more modern and eye pleasing in appearance than would be a squared off, planar front face. The ends of rail 10 are closed off by means of end caps 17 (FIG. 9) which include a plug portion 17a for insertion into the open ends of rail 10 and a cap portion 17b which properly

covers the ends of rail 10 (FIG. 8). The sides of plug portion 17b are slanted inwardly to facilitate insertion.

A pair of hanger clips 20 are secured, one at each end, to rail 10 by means of the screws 14 (FIGS. 1 and 3). There are two vertically spaced screws 14 at each end of rail 10 (FIG. 1). Each screw 14 includes a post portion 15 and a head 16 (FIG. 3). Each hanger clip 20 comprises an elongated face flange 21 which includes a top slot 22 opening at the top of flange 21 and an aperture 23 spaced downwardly from top slot 22 (FIG. 4). Aperture 23 includes a head portion 24 which narrows into a downwardly extending slot 25. By keying the head 16 of screw 14 through the head portion 24 of aperture 23, and then by sliding rail 10 downwardly with respect to hanger clip 20, the hanger clip 20 and rail 10 are releasably joined together, since the head 16 of screw 14 is too large to fit through top slot 22 or downwardly extending slot 25.

Hanger clip 20 also includes a hook flange 26 which extends rearwardly from front flange 21 (FIG. 4). Hook flange 26 defines three hooks 27 which facilitate the releasable mounting of hanger clip 20 to a vertical support 30.

Each vertical support 30 comprises a channel portion 31 and a slotted insert 32 (FIG. 3). The insert 32 is v-shaped in cross section, having a left wing 32a and a right wing 32b. Each wing 32a and 32b includes a plurality of vertically spaced slots 34 into which the hooks 27 of hanger clip 20 can be inserted (FIGS. 1 and 3). Once slotted insert 32 is slid into channel 31, it is held in place with respect thereto by a bolt 33 which simultaneously secures vertical support 30 to wall 1. Since supports 30 are embedded in paneling 2, this also secures paneling 2 to wall 1.

While other types of vertical supports might be used in this invention, the vertical supports 30 are far preferable because they have two rows of slots. One row is provided by left wing 32a and the other by right wing 32b. Consequently, by erecting three or four supports 30, a plurality of four foot rails 10 can be aligned to provide a generally continuous rail structure.

Similarly, the vertical supports 30 do not have to be embedded in panel 2, but could merely be wall supported. However, the former system is preferable since the panel 2 provides a surface against which the feet 44 of drawer support 40 can abut. This relieves rail 10 of some torsional stress, which is placed thereon if the feet 44 hang free.

The mounted vertical supports 30 are positioned approximately four feet from center to center. The particular vertical supports 30 disclosed herein, however, have an effective or operable spacing which is somewhat less than four feet. In hanging rail 10 on spaced vertical supports 30, one would hook hanger clips 20 into the right wing 32b at one end of the rail 10 and into the left wing 32a at the other end. Thus, the slotted portions of supports 30 being used to support rail 10 would be slightly more close together than 4 feet. This distance is referred to herein as the effective or operable distance between vertical supports 30. With some types of supports 30, this distance would no doubt be from center to center of the vertical supports, since many such supports are centrally slotted.

The relative spacing of the screws 14 at one end from those at the other end of rail 10, with respect to the ef-

fective or operable distance between vertical supports 30, is very important. If the distance were the same, then rail 10 would hang relatively loosely on vertical supports 30. Since it is contemplated that drawer supporting structure 40 would frequently be removed from and replaced on rail 10, there would be a danger that rail 10 could be slipped up and out of hanger clip 20 or that hanger clip 20 could be slipped up and out of vertical support 30, or both. Thus, the distance between the screws 14 at one end of rail 10 and those at the other end of rail 10 is slightly less than the effective or operable distance between vertical supports 30. This places hanger clips 20 in tension between vertical supports 30 and rail 10. Because of this bind, a frictional force is created which positively holds rail 10 in place on vertical supports 30. Rail 10 and hanger clips 20 can only be properly seated in vertical supports 30 through the application of a sharp downward blow on rail 10. Similarly, they can be removed only by the application of a sharp blow in an upward direction. Thus, rail 10 will not readily disengage from vertical supports 30 during the removal of a drawer supporting structure 40 therefrom.

Drawer supporting structure 40 is designed to support a drawer 45, or a shelf 46 (FIG. 5). Additionally, it can be provided with a flipper door 47 and a cover 48 (FIGS. 1 and 5).

It comprises a pair of spaced sides 41 and a back 42 (FIG. 5). A hanger 43 projects rearwardly and downwardly from back 42 such that it can be slipped over lip 13 of rail 10 (FIGS. 2 and 6). Projecting rearwardly from the base of drawer supporting structure 40 are a pair of feet 44. Each foot 44 comprises an extension of side 41. As has heretofore been mentioned, the purpose of feet 44 is to abut paneling 2 when drawer supporting structure 40 is hung on rail 10. This prevents drawer supporting structure 40 from tilting forwardly and placing additional torsional stress on rail 10. However, rail 10 is sufficiently wide that it will provide support for the back 42 of drawer supporting structure 40 even when vertical supports 30 are secured to a bare wall, allowing feet 44 to hang freely.

In operation, rail 10 is secured to hanger clips 20 which in turn are hooked into the slots 34 of vertical supports 30. A sharp, positive force is applied to the top of rail 10 to insure that the hooks 27 of hanger clip 20 are forced downwardly into slots 34 and to insure that posts 15 are forced downwardly into slots 22 and 25 of hanger clip 20. Once rail 10 is fixed in place, drawer supporting structure 40 can be placed thereon or removed therefrom at will.

Drawer supporting structure 40 can be transported from one place to another without removing any drawers 45 or shelves 46. Cover 48 on drawer supporting structure 40 provides a convenient storage surface when drawer supporting structure 40 is hung in place.

Indeed, it will be appreciated by those skilled in the art that the present invention opens up new vistas in versatility and mobility of storage. This marriage of a horizontal support system with a vertical support system will reap important benefits in many types of office and storage installations. Of course, it is understood that the above is merely a preferred embodiment of this invention and that many variations and alterations can be made thereof without departing from its spirit and broader aspects.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

1. A system for removably supporting drawer or shelf supporting frames and the like such that their position can be varied both horizontally and vertically comprising:

- A pair of spaced, elongated vertical supports each including clip receiving means allowing positioning of clips at various vertical levels;
- a pair of clips each including means for releasably securing each of said clips to one of said vertical supports;
- a rail for supporting drawer supporting frames and the like; said rail and each of said clips including means cooperating to releasably fasten said rail to said clips; and
- a supporting frame for drawers or the like, said frame including a rearwardly and downwardly projecting hanger for removable mating engagement with said rail, whereby said frame can be positioned at different points along the length of said rail, said rail being movable to different vertical positions by relocating said clips in said vertical supports.

2. The system of claim 1 in which said rail comprises a lip projecting upwardly from the front edge thereof and extending the length thereof, the main body of said rail being thicker than said lip, and a ledge projecting rearwardly from the main body of said rail at the top thereof; said supporting frame hanger projecting rearwardly and downwardly over only said lip of said rail.

3. The system of claim 1 in which means are provided for placing said clips in tension between said rail and said vertical supports to thereby positively hold said rail in position between said vertical supports.

4. The system of claim 3 in which said clip tension means comprises spacing said clips on said rail a distance slightly less than the operable distance between said vertical supports.

5. The system of claim 1 in which said clips comprise an elongated flange for abutment with the back of said rail; said flange including at least one aperture therein having a wide head portion narrowing down to a downwardly extending slot; said rail including a rearwardly projecting post having a head thereon which will fit through said head portion of said aperture, but which is sufficiently large that it will not fit through said slot portion of said aperture; at least one of said rearwardly projecting posts being positioned at each end of said rail and being spaced a distance slightly less than the operable distance between said vertical supports whereby when said clips are joined to said rail, and said clips are then releasably secured to said vertical supports, said clips are placed in tension between said rail and said vertical supports to thereby positively hold said rail in position between said vertical supports.

6. The system of claim 5 in which said clip receiving means of said vertical supports comprise a plurality of vertically spaced slots and said hanger clips comprise a hook flange projecting rearwardly from said elongated flange and defining at least two hooks for insertion into said slots.

7. The system of claim 1 in which at least three of said vertical supports are spaced a distance from one another approximately equal to the length of one of said rails; at least the center one of said three supports

including fastening intelligence for releasably holding a pair of said clips, side by side such that two of said rails can be placed on said three vertical supports to provide one generally continuous rail.

8. The system of claim 7 in which said vertical supports comprise a plurality of vertically spaced slots and said central vertical support comprises a pair of adjacent, vertically slotted flanges; said hanger clips include at least one hook for insertion into said slots.

9. The system of claim 1 in which said supporting frame comprises a foot projecting rearwardly from the back thereof, spaced below said hanger, for engaging the wall to which said supports are secured.

10. The system of claim 1 in which said rail is formed of sheet metal and comprises a curvilinear front face to thereby reinforce said rail and simultaneously provide an attractive appearance therefor; and in which the ends of said rail are capped by means of plastic end plugs.

11. A mounting system for detachably securing cabinets or the like to a wall comprising:

- a pair of spaced elongated vertical support members each including a plurality of clip receiving apertures;

- at least two clips including means for releasably securing said clips to said vertical support members;

- an elongated rail roll formed of sheet material and having a curvilinear front face to reinforce said rail and including a lip projecting upwardly from the front edge thereof and extending the length thereof, and a ledge projecting rearwardly from the main body of said rail at the top thereof, and means for releasably securing said clips to said rail at opposite ends thereof.

12. The system of claim 11 in which means are provided for placing said clips in tension between said rail and said vertical supports to thereby positively hold said rail in position between said vertical supports.

13. The system of claim 12 in which said clip tension means comprises spacing said clips on said rail a distance slightly less than the operable distance between said vertical supports.

14. The system of claim 11 in which said clips comprise an elongated flange for abutment with the back of said rail; said flange including at least one aperture therein having a wide head portion narrowing down to a downwardly extending slot; said rail including a rearwardly projecting post having a head thereon which will fit through said head portion of said aperture, but which is sufficiently large that it will not fit through said slot portion of said aperture; at least one of said rearwardly projecting posts being positioned at each end of said rail and being spaced a distance slightly less than the operable distance between said vertical supports whereby when said clips are joined to said rail, and said clips are then releasably secured to said vertical supports, said clips are placed in tension between said rail and said vertical supports to thereby positively hold said rail in position between said vertical supports.

15. The system of claim 11 in which the ends of said rail are capped by means of plastic end plugs.

16. A system for detachably mounting frames for shelves, drawers or the like to vertical supports by means of horizontal supporting structure such that the

mounted position of said frames can be vertically and horizontally selected and changed easily, said system comprising:

- elongated vertical support means fixedly positioned on a wall and extending vertically therealong, said vertical support means including receiving means at a plurality of vertically spaced positions;
- an elongated, narrow horizontal support rail including means for detachably securing said rail to said receiving means of said vertical support means at a desired vertical height relative to the wall and horizontally; and
- a frame for shelves, drawers or the like, said frame including rail engaging means for detachably positioning said frame onto said horizontally extending rail to suspend said frame from the wall in a cantilevered manner and to permit said frame to be slidably positioned at a selected position along said rail.

17. The system as defined in claim 16 in which said vertical support means comprises a pair of horizontally spaced support members and wherein said receiving means comprises a plurality of vertically spaced apertures in each of said support members.

18. The system as defined in claim 17 wherein said means for detachably securing said rail to said vertical support means includes a pair of vertically spaced fastening means horizontally spaced in predetermined alignment with the horizontal spacing of said pair of vertical support means.

19. The system as defined in claim 18 wherein said means for detachably securing said rail to said vertical support means further includes a pair of clips having rearwardly extending hooks adapted to fit within said apertures of said vertical support means, and means cooperating to releasably hold said fastening means of said rail.

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