United States Patent

[11] 3,527,175

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[54] **SHELF**
14 Claims, 5 Drawing Figs.

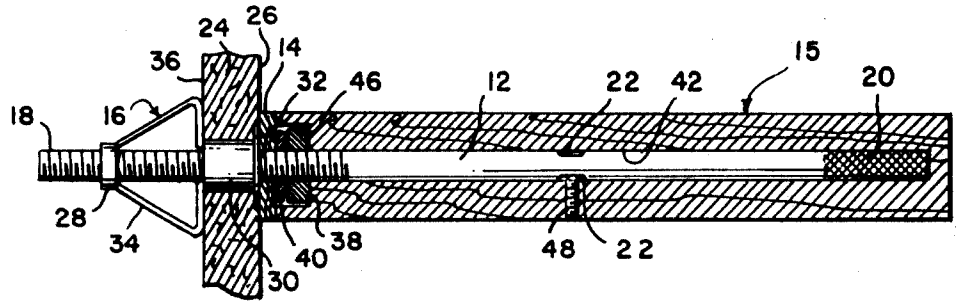
[52] **U.S. Cl.** **108/152**
[51] **Int. Cl.** **A47b 5/00**
[50] **Field of Search** 108/152, 42, 29, 108; 248/225, 239, 235, 250, 206A, 220.5; 287/20; 85/71; 52/36; 211/90

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ABSTRACT: A shelf assembly wherein a shelf is supported by a plurality of rods secured to a wall by load distributing means in the rear side of the wall. The rods are received within channels in the shelf and are completely hidden in use.



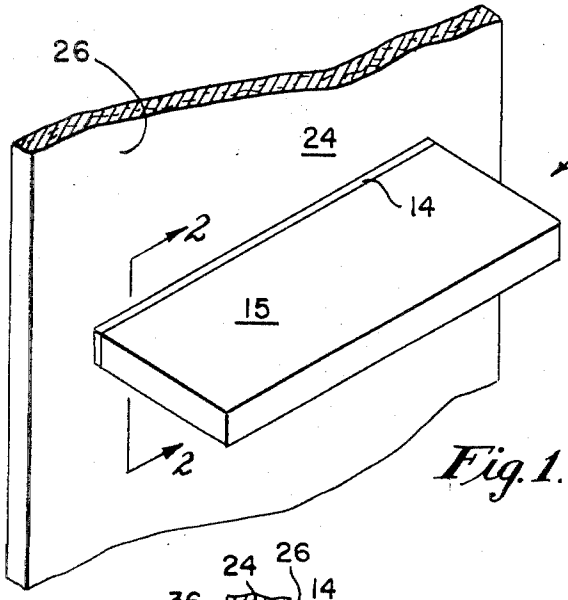


Fig. 1.

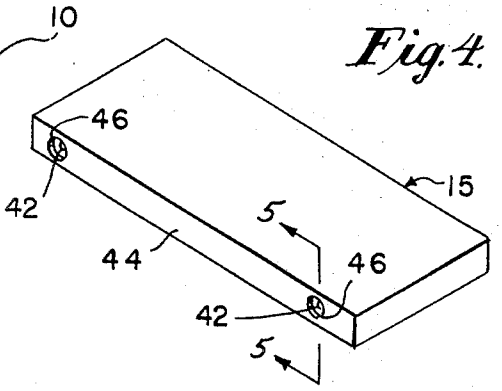


Fig. 4.

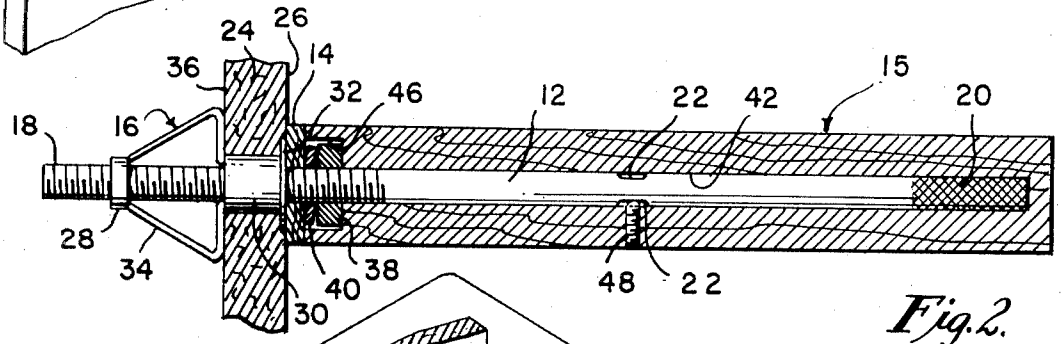


Fig. 2.

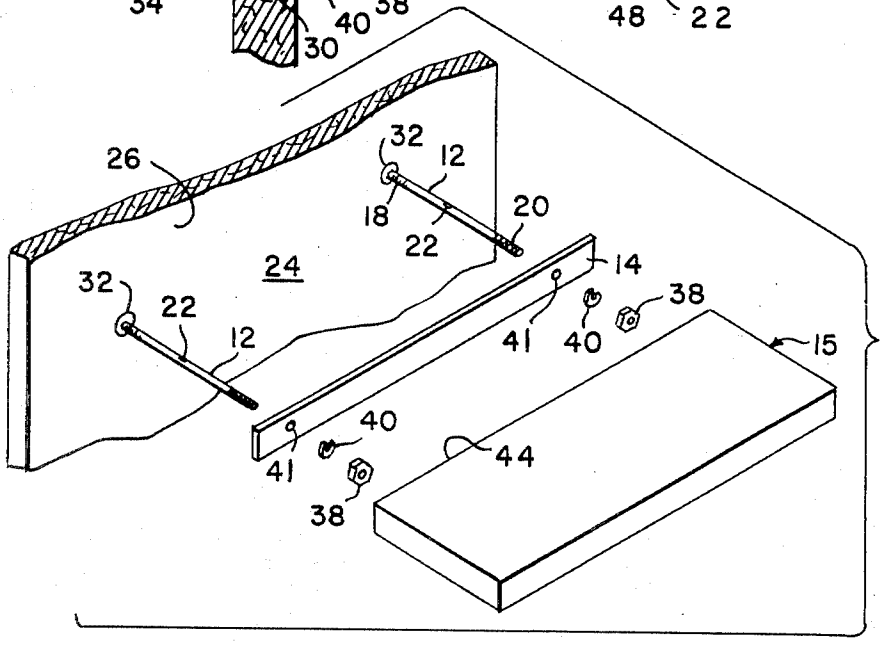


Fig. 3.

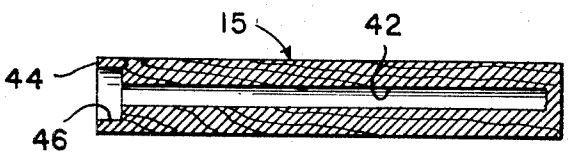


Fig. 5.

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SHELF

This invention relates to a shelf assembly, and more particularly, to shelving that is adapted to be mounted on hollow walls.

It is now a current practice to erect shelves directly on the walls of a building, such as a home. Various types of brackets have been developed for maintaining the shelves in place. One problem which is existent in substantially all of the shelves currently in use is that the brackets are visible. In most cases, these brackets will detract from the appearance of the shelf assembly.

Attempts have been made at concealing the supporting means for shelves. Thus, screws have been inserted directly into walls with an extended shank of the screws being received in rear recesses of shelving. However, these structures, although overcoming the problem of unsightliness, still suffer from the disadvantage that they were not load-bearing. Thus, they were adapted only to receive very light loads, such as soap or towels. In many instances, decorative brackets still had to be used to aid in supporting the shelves.

A solution to the problem of concealing the supporting hardware for a shelf, while at the same time maintaining full load-bearing characteristics for the shelf, was made by the shelf disclosed and claimed in my prior U.S. Pat. No. 3,333,555. In the shelf covered by this patent, elongated rods were secured in the studs behind a wall and shelving was placed over the extended forward portions of the rods. The forward portions are received in channels formed in the shelving. In this way, the supporting hardware for the shelving is completely hidden in use. Furthermore, the securement of the rods in the studs gives extremely great load-bearing qualities to the finished shelving.

The shelf assembly covered by my prior patent has been found to be completely effective for its intended use. However, one of the problems of the shelf assembly of my patent is that it can be used only where studs are available for supporting the rods which in turn support the shelves. It has been found that quite often the shelving is to be placed on walls wherein studs are not readily accessible or wherein the studs are positioned in such a manner that it is not possible to take advantage of a pair of studs for supporting the shelving. In these cases, the shelf assembly of my prior patent cannot be used.

The shelf assembly of this invention is usable on any wall wherein the use of the studs is not possible or is inconvenient. Thus, this assembly enjoys all of the advantages of my prior assembly without requiring the use of the studs for supporting the shelf. Substantially the same load bearing qualities that were obtained when using the studs can be obtained using the shelf assembly of this invention.

It is therefore an object of this invention to provide a novel shelf assembly.

It is another object of this invention to provide a shelf assembly which includes a hidden supporting structure which possesses all of the load-bearing assets of the prior art visible supporting structures.

It is a further object of this invention to provide a shelf assembly which has sufficient inherent strength to support large and heavy loads.

These and other objects of this invention are accomplished by providing a shelf assembly comprising a vertical wall, a plurality of rods passing through the front face of the wall and being secured to load-distributing means on the rear side of said wall, said rods being adapted to support heavy loads, said rods having portions projecting horizontally outward from said wall, load-distributing means secured on said rods and abutting said front face of said wall, means covering the remainder of said portions, and said shelf being supported by said rods.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of the shelf assembly of this invention mounted on a wall;

FIG. 2 is an enlarged sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is an exploded perspective view of the elements making up the shelf assembly of FIG. 1;

FIG. 4 is a perspective view of the shelf of the assembly of this invention, and taken from the rear thereof; and

FIG. 5 is an enlarged sectional view taken along the line 5—5 of FIG. 4.

Referring now in greater detail to the various figures of the drawings wherein similar reference characters refer to similar parts, a shelf assembly embodying the present invention is generally shown at 10 in FIG. 1. Device 10 basically comprises a plurality of rods 12 (FIG.3), a load distributing bar 14, a shelf 15 and a plurality of load distributing anchors 16 (FIG. 2).

As seen in FIG. 2, each rod 12 is basically cylindrical and includes a threaded portion 18 at one end. The other end is provided with a knurled surface 20. A pair of flattened faces 22 is provided at an intermediate portion of rod 12.

The shelf assembly of this invention is mounted on a wall 24 by first drilling a hole through the front surface 26 of the wall. In the embodiment shown, a screw anchor 16 is inserted through the hole. Screw anchor 16 can be any of the screw anchors generally known to the art, such as those shown in U.S. Pat. Nos. 1,881,973, 2,559,281 or 2,610,013. The screw anchor shown includes an internally threaded rear sleeve 28, a non-threaded forward sleeve 30 having an outwardly projecting annular flange 32 and a plurality of ribs 34 formed from a deformable metal. In use, the screw anchor is originally in a tubular shape and is pushed through the hole made in wall 24. A screw having a head larger in diameter than the internal diameter of sleeve 30 is then rotated in a clockwise direction. When the screw head abuts flange 32, continued rotation of the screw will draw sleeve 28 toward sleeve 30. This will deform ribs 34 until the ribs abut the interior surface 36 of wall 24. If the wall 24 is made of a crushable material, such as gypsum board, continued rotation of the screw will embed flange 32 into the wall until the exterior surface of the flange is aligned with the exterior surface of the wall, as shown in FIG. 2.

After the screw anchor 16 has been secured in place, the screw used for securing the anchor is removed. Rods 12 are threadedly secured in sleeve 28 of the screw anchors. Prior to securing the rods in place, nuts 38 and associated lock washers 40 are threadedly secured on rods 12. Thereafter, load distributing bar 14 having holes 41 which are spaced the same distance as the holes in the wall is then telescoped over the rods. With the nuts, lock washers and bar 14 in place, the rods 12 are threadedly secured in sleeves 28 of anchors 16. After the rods have been secured in the sleeves 28, nuts 38 are rotated in order to mount the bar 14 tightly against the front surface 26 of wall 24. Lock washers 40 aid in maintaining a permanent securement of the nuts in place.

In actual assembly, bar 14 will serve as a template for positioning and spacing rods 12 on the wall. Bar 14 can be made sufficiently thick to enable the installer of the shelf assembly to place a spirit level on top of the bar, thereby insuring that the installed shelf will be horizontally mounted. Thus, the bar 14 will be placed against the wall and the positioning for the rods 12 is accomplished by using holes 41 as guides for making the holes in the wall.

Shelf 15 is basically rectangular and includes a pair of channels 42 extending inwardly from the rear face 44 thereof. Each channel 42 is approximately equal in diameter to the outer diameter of rod 12. An enlarged portion 46 is provided at the entrance to each channel 42.

In use, shelf 15 is telescoped over the portions of rods 12 which project from the front face of wall 24. Knurled portion 20 of the rods aids in securing the shelf in place. If desired, an adhesive coating can be placed over the knurling 20 to aid as additional securement. However, in doing this, later removal of the shelf would be difficult. In most instances, the shelf

should be releasably secured to the rods **12**. An additional or alternative means of securing the shelf in place is the use of set screws **48**. In most instances, the set screws will not be necessary, but where they are needed, they can be used. The set screw is threadedly secured in the underside of the shelf and the forward end abuts one of the flattened faces **22**. The flattened faces will thus serve a dual function. One is to receive the set screw; the other is to provide an area for reception of a wrench for threadedly advancing rods **12** in anchors **16**.

With the shelf assembly installed as shown in FIG. **2**, substantially all of the load bearing qualities which could be obtained using the studs, as described in my prior U.S. Pat. No. 3,333,555, are obtainable using the shelf assembly of this invention. Furthermore, the advantage of having concealed hardware is also obtainable. Thus, the rods **12** provide the sole load support for the shelves, and all of the load is transmitted to the wall through the rods. Anchors **16** distribute the load over the rear face of the wall. The load is distributed over the front face of the wall through bar **14**. Where exceptionally heavy loads are placed on the shelf **15**, the bar **14** is critical. Thus, without the bar, all of the forward load on the wall would be against the flange **32** of the screw anchor. When the wall is made of a crushable material, such as gypsum board, eventually the load will force the flange into the wall and the shelf will tilt or fall. When using the bar **14** to distribute the load, there is no fear of this happening since the load is distributed across the entire width of the bar. This is accomplished by tightly securing the rods to the bar through the use of nuts **38**. As seen in FIG. **2**, the nuts **38** are completely hidden in use since they are received in enlarged openings **46** of channels **42**.

The shelf assembly of this invention is also usable for any of the purposes of the shelf assembly described in my aforementioned patent. Thus, it can be used as a cornice for supporting draperies or for providing indirect lighting. Likewise, when placed at a low level it can be used for supporting people.

The embodiment of the invention shown is used primarily for hollow walls where the rear of the wall is not readily accessible. In instances where the rear of the wall is accessible, or where the shelving is to be used on vertical boards, such as display panels wherein the rear of the panel is accessible, means other than screw anchor **16** for distributing the load can be used. Thus, wing nuts can be placed over the threaded end of rods **12**. Alternatively, conventional nuts and washers can be used for distributing the load. The remainder of the assembly will be the same as that shown.

Although a specific screw anchor **16** has been shown, other load distributing means can be used with equal effect. Thus, toggle bolts can be used in place of the screw anchors.

In the embodiment shown, nuts **38** and their associated lock washers **40** are received in a channel within shelf **15**. This is a preferred embodiment because nuts **38** are readily accessible to an open end wrench when the shelf is being installed. However, as an alternate embodiment, load distributing bar **14** can be made thicker and provided with a recess on the front surface for reception of nuts **38** and washers **40**. In this instance, socket wrenches will be needed for tightening the nuts. However, it will no longer be necessary to provide enlarged recesses in shelf **15** for reception of the nuts since they will be received in the bar **14**.

As pointed out above, one of the features of the rods of this invention is that they are adapted for bearing heavy loads. A preferred material for the rods is therefore steel. The shelf and bar **14** can be made of any shelving materials such as wood, plastic or composition board. Plastic surface sheeting, such as Formica, can be placed over the bar and shelf. In most installations, the bar and shelf will be made of the same material and have the same surface finish in order to give the appearance of a continuous shelf.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current or future knowledge, adopt the same for use under various conditions of service.

I claim:

1. A shelf assembly comprising a vertical wall, a plurality of rods passing through the front face of said wall and being secured to load-distributing means on the rear face of said wall, said rods being adapted to support heavy loads, said rods having portions projecting horizontally outward from the front face of said wall, load-distributing means secured on the front face of said wall, said load-distributing means on the front face of said wall comprising a bar having a plurality of holes passing therethrough, with said rods passing through said holes, means securing said bar in place against said front face of said wall, said securing means comprising nuts threadedly secured on said portions of said rods, means covering said portions of said rods extending from said front face, and a shelf supported by said rods.

2. A shelf assembly comprising a vertical wall, a plurality of rods passing through the front face of said wall and being secured to load-distributing means on the rear face of said wall, said rods being adapted to support heavy loads, said rods having portions projecting horizontally outward from the front face of said wall, load-distributing means secured on the front face of said wall, means covering the portions of said rods extending from said front face and a shelf supported by said rods, said means covering said portions comprising a plurality of channels projecting inwardly from the edge of said shelf, said portions being received in said channels.

3. A shelf assembly comprising a vertical wall, load-distributing means secured on the front face of said wall by means passing through the front face of said wall and being secured to load-distributing means on the rear face of said wall, a plurality of rods in said load-distributing means on the front face of said wall having forward portions projecting horizontally outward from said load-distributing means on the front face of said wall, said rods being adapted to support heavy loads, means covering said horizontally projecting portions of said rods, and a shelf supported by said rods, said means covering said portions of said rods comprising horizontally extending channels within said shelf with said portions being received in said channels.

4. The shelf assembly of claim **3** wherein said load-distributing means on the front face of said wall comprises at least one bar.

5. The shelf assembly of claim **2** wherein said rods are threadedly secured to said load-distributing means on the rear face of said wall.

6. The shelf assembly of claim **5** wherein each of said rods is secured to a screw anchor, said screw anchors comprising the load-distributing means on the rear face of said wall.

7. The shelf assembly of claim **1** wherein said rods are received within horizontally extending channels within said shelf, said channels being enlarged to receive said nuts therein.

8. The shelf assembly of claim **1** wherein said shelf and said bar have the same finish and are coextensive in width and height whereby said bar and said shelf give the appearance of a continuous shelf.

9. The shelf assembly of claim **8** wherein said shelf and bar comprise the same material.

10. The shelf assembly of claim **9** wherein said shelf and said bar comprise wood.

11. The shelf assembly of claim **2** and further including means for maintaining said shelf on said rods.

12. The shelf assembly of claim **11** wherein said maintaining means comprises at least one member inserted through said shelf and into contact with at least one of said rods, said inserted member adapted to contact said one of said rods in such a manner as to prevent longitudinal removal of said shelf from said rod.

13. The shelf assembly of claim **12** wherein said maintaining means comprises at least one set screw which is threadedly secured in said shelf.

14. The shelf assembly of claim **2** wherein said rods provide the sole means of support for said shelf.