Nov. 20, 1945. H. EASTMAN 2,389,349

SUPPORT OR BRACE

Filed March 31, 1943

FIG. 1.

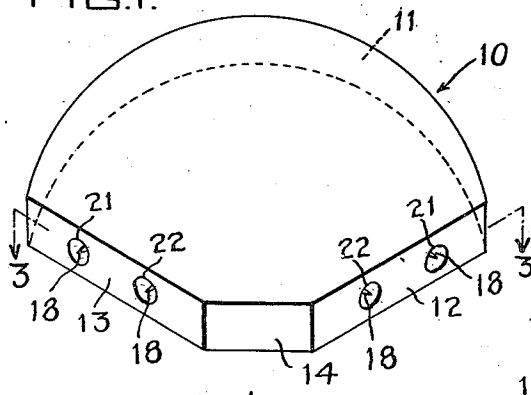


FIG. 2.

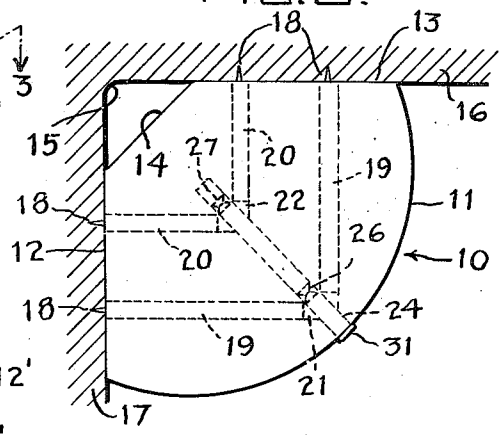


FIG. 4.

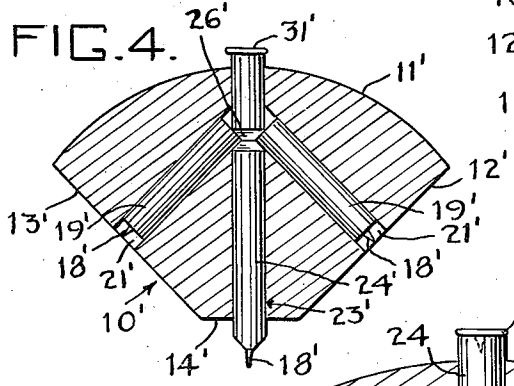
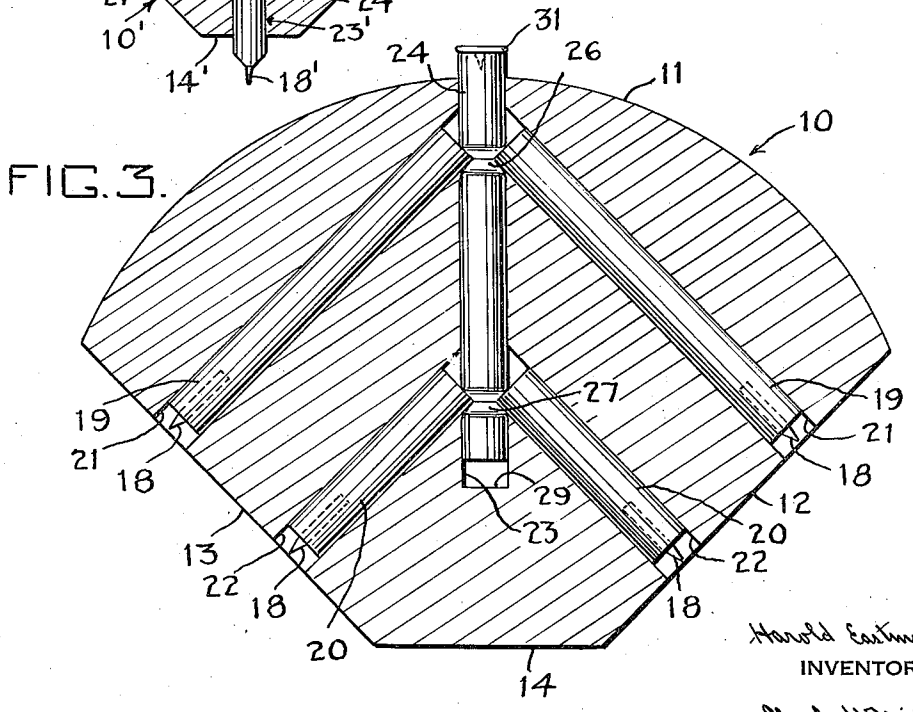


FIG. 3.



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SUPPORT OR BRACE

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7 Claims. (Cl. 211—134)

This invention relates to supports or braces, and it is especially suitable for shelves that are connected to the walls of a room.

One object of the invention is to provide a support or brace with improved facilities for attaching it in place on the structure with which it is to be used. In the preferred embodiment of the invention the fastening means for attaching the support or brace are contained within the body of the device itself and means are provided for causing them to be projected outwardly and into walls or other adjacent structure against which the support or brace is held.

In accordance with one feature of the invention a shelf has a chamber with an opening through the front edge face of the shelf, and branch chambers through the side edge faces of the shelf. Fastening means are slidable in the branch chambers and have their rearward ends in contact with a cam element that is housed in the main chamber. A portion of the cam element extends through the opening in the front edge face of the shelf, and pressure applied to this end portion, as with a hammer, causes the fastening means to be forced outwardly into walls or other supports against which the side faces of the shelf are pressed.

A shelf made in accordance with this invention can be attached to the intersecting walls at the corner of a room quickly and conveniently, and the fastening means are invisible, thus adding to the attractiveness of the appearance of the shelf.

Although the embodiment of the invention illustrated is for connecting shelves in the corner of a room, some features of the invention can be used for other supports or braces, not necessarily connected with walls. For example, the invention can be used as a brace for furniture by inserting it in corners where elements come together. One feature of the invention relates to the construction of the fastening means and the member by which the fastening means are operated in such a way as to automatically control their depth of penetration, and to prevent breaking of the plaster and paper on a supporting wall.

In its broadest aspects it may be said, therefore, that one object of the invention is to provide improved fastening means for connecting a device to a supporting structure, or to a structure that is to be braced.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, in which like reference characters indicate corresponding parts in all the views,

Figure 1 is a perspective view showing the top and side edges of a shelf embodying this invention;

Figure 2 is a top plan view of the shelf of Figure 1 connected with the intersecting walls at the corner of a room.

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a reduced scale, sectional view, similar to Figure 3, but showing a modified form of the invention.

Figure 1 shows a shelf 10 comprising a body which has a curved front edge face 11 and side edge faces 12 and 13. In the illustrated embodiment of the invention the side edge faces 12 and 13 lie in planes at right angles to one another so that the shelf will fit into a right angle corner formed by intersecting walls of a room. The side edge faces 12 and 13 may meet at the rearward end of the shelf 10, but because of the fillet 15 usually formed by the plaster at a room corner, the rearward corner of the shelf 10 is preferably cut off so as to leave a short back edge face 14. Figure 2 shows the shelf 10 located in the corner formed by the walls 16 and 17. The shelf is fastened to these walls by nails 18 which project from the ends of slides, comprising dowels 19 and 20.

These dowels 19 and 20 fit into branch chambers 21 and 22 that open through the side edge faces 12 and 13. The dowels 19 are a snug fit in the branch chambers 21 and 22 so that the dowels do not slide in the branch chambers unless considerable force is applied to the rearward ends of the dowels.

There is a center chamber 23 with which all of the branch chambers 21 and 22 communicate. One end of the center chamber 23 opens through the front edge face 11 of the shelf. A cylindrical cam element 24 is located in the center chamber 23 and comprises the operating member for the fastenings. The cam element 24 has annular notches 26 and 27 into which the rearward ends of the dowels 19 and 20 respectively extend. The back walls of these notches 26 and 27 serve as bearing surfaces or abutments for thrusting the dowels 19 and 20 outward when the cam element 24 is moved rearwardly in the center chamber 23.

The length of the cam element 24, and of the dowels 19 and 20, are so proportioned that when the nails 18 are in the retracted position, shown

in Figure 3, the cam element 24 extends from the front edge face 11. The distance that the cam element 24 extends is just sufficient to cause the dowels 19 and 20 to thrust outward to the ends of the branch chambers 21 and 22 when the cam element 24 is hammered in far enough to bring its outer end flush with the front edge face 11 of the shelf.

This arrangement automatically limits the extent to which the nails 18 can be driven into the wall, and provides an indication when the nails have been driven into the supporting walls for the correct distance. When the shelf 10 is attached to plaster walls 16 and 17, the edge faces 12 and 13 provide a flat surface against the plaster of the walls and prevent pieces of the plaster from being broken loose when the nails 18 are hammered into the walls. The flat ends of the dowels 19 and 20 provide additional surfaces against the plaster for preventing any of the plaster from breaking loose after the shelf has been installed and is loaded. It should be noted that the nails 18 are always driven into the walls at right angles to the wall surface and with plaster walls this reduces to a minimum the danger of breaking out pieces of plaster when the shelf is being installed. The construction and location of the nails 18 in plaster that is held against displacement by the side edge faces enables this shelf to hold remarkably heavy loads when fastened to ordinary household walls.

The center chamber 23 is preferably of such depth that the cam element 24 strikes the end 29 of the center chamber when the outer edge of the cam element 24 comes flush with the front edge face 11 of the shelf. When the shelf is made of wood and painted, the front edge face 11 and the outer end of the cam element 24 can be protected from marring by inserting a thumb tack 31 in the end of the cam element 24. Such a thumb tack may have a Celluloid head, such as are commonly used, and will not be damaged by the blows from the hammer that is used to force the cam element 24 inward when connecting the shelf with the walls 16 and 17.

The shelf 11 and dowels 19 and 20 as well as the cam element 24 are preferably made of wood, and such material has provided very satisfactory in actual service. The nails 18 have no heads and are inserted into drilled holes in the ends of the dowels 19 and 20. These holes are drilled to a measured depth calculated to leave the ends of the nails 18 projecting for the desired distance beyond the outer ends of the dowels 19 and 20. The reason for having the dowels a snug fit in the branch chambers 21 and 22 is to prevent the dowels from sliding and allowing the nails 18 to project beyond the ends of the branch chambers 21 and 22 when the shelf is being handled prior to its connection with the wall.

It will be understood that this invention can be constructed from materials other than wood, and that the shelf need not have the shape shown in the drawing. It is not necessary, for example, that the side edge faces of the shelf contact the walls 16 and 17 along their entire length since the shelf can have a scalloped or other decorative edge if desired. The shelf may be constructed of plastic material or metal.

Figure 4 shows a modified form of the invention. Parts corresponding to those shown in Figure 3 are designated by the same reference characters, but with a prime appended. The cam element 24' extends all the way through the shelf 10' and has its rearward end shaped to fit the corner. There is a nail 18' in the end of the cam element 24'. With this construction using the rearward end of the cam element 24' as one of the supports for the shelf, it is sufficient to have only the two dowels 19', and no dowels corresponding to the dowels 20 of Figure 3.

Some features of the invention, such as the indication by the cam element 24 of the depth of penetration of the nails 18, and the feature of the flat surfaces that press against a plaster wall around the fastening means or nails, are not limited to shelf constructions, but can be incorporated in other supports or braces that are to be connected with walls, bulkheads or other structures.

Various changes and modifications of the invention can be made, and some features used without others without departing from the invention as defined in the claims.

I claim as my invention:

1. A support comprising a wooden shelf with side edge faces that lie in planes at right angles to one another, and front and rear edge faces, a center bore extending through the front edge face and for a substantial distance within the shelf, other bores opening through the respective side edge faces and opening into the center bore, a dowel that fits snugly in each of said other bores, each dowel having a length equal to the length of the bore in which it is located, a nail held in the outer end of each dowel with the pointed end of the nail extending beyond the end of the dowel, a cylindrical member that fits the center bore and that has annular grooves into which the inner ends of the dowels extend when the cylindrical member has its end portion extending from the front edge face of the shelf, the walls of said grooves serving as cam surfaces for displacing the dowels outwardly when the end of the extending portion of the cylindrical member is driven in flush with the front edge face of the shelf, and a wall against which the cylindrical member strikes at the end of the chamber when the forward end of said cylindrical member is driven in flush with the front edge face of the shelf.

2. A support for attachment to the intersecting walls at a corner of a room, said support comprising a shelf portion with edge faces, two of which converge at the same angle as the walls at the corner of the room, a chamber within the shelf, openings that communicate with the chamber and open through the converging edge faces, fastening means slidable in said openings, an element within the chamber, and bearing surfaces on said element for forcing the fastening means outward through the openings in the edge faces of the shelf.

3. A shelf having edge faces including a front face, and converging side faces that fit against the walls at a corner of a room, a chamber within the shelf, said chamber opening through the front face of the shelf, and branch chambers opening through the side faces of the shelf, a cam element in the chamber, an end portion on the cam element projecting through the opening in the front face of the shelf, a slide in each of the branch chambers, a rearward face on each slide in contact with the cam element, and a fastening projecting from the forward end of each slide.

4. The combination in a support or brace comprising a body that has a front face and that has

converging side faces for contact with the structure to which the body is to be connected, there being openings through the side faces, of fastenings within the body and in line with the openings through said faces, means for holding the fastenings in a retracted position within the body, an operating member with abutments movable to force the fastenings outward through the openings and into the structure to which the body is to be attached, and an end portion of the operating member extending through the front face of the body and to which force is applied for moving the operating member to force the fastenings outward.

5. The combination with a shelf that fits into a corner of a room and that has bores opening through side edge faces that bear against the walls that converge to form the corner, of dowels that are a snug fit within the bores and held against movement by friction with the sides of said bores, fastenings projecting from the ends of the dowels, and an operating member held by the shelf and having means engaging the dowels and to which force is applied to move the dowels outward and drive the fastenings into the walls adjacent the side edge faces of the shelf.

6. A support or brace comprising a body that has a front face and converging side faces that contact with surfaces to which the body is to be connected, openings in the faces that contact with said surfaces, fastenings housed within the body and movable to project through said openings and into the surfaces to which the body is to be connected, and operating means in the body with abutments for thrusting the fastenings through said openings.

7. A support adapted for attachment to a plaster wall, said support having a front face, and converging side faces with flat surfaces that bear against the wall in the region to which the support is to be fastened, fastenings within the support and movable outward through openings in the flat surfaces of the side faces that bear against the wall, an operating member within the support, and bearing surfaces on the operating member for thrusting the fastenings outward.

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