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**STRUCTURAL DEVICE**

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5 Claims. (Cl. 211-147)

This invention relates in general to a connecting device for releasably securing one article upon another and, more particularly, to a type of such device which is especially adapted for securing upon a base structure, such as a table, an upright column upon which shelf-supporting brackets can be mounted above the table.

Merchandisers are keenly aware that periodic changes in the arrangement and content of displays tend to stimulate sales and attract repeat business. A very important factor in achieving these changes is the versatility of the store fixtures by which the goods are displayed. That is, in order to make noticeable changes in the displays, the fixtures themselves must often be rearranged or modified. Since it is uneconomical to maintain two or more sets of display fixtures, most proprietors try to obtain fixtures which can be converted for, or adapted to, a variety of different uses. Accordingly, manufacturers of store fixtures are continuously seeking new ways of increasing the versatility of their product while, at the same time, maintaining high standards of quality, appearance and strength, and without increasing the cost of the fixture. In one attempt to solve this problem, there is provided a base structure, often a table top cabinet, which can be converted into other types of fixtures by adding parts to the base structure.

The present invention arose out of the problems encountered in previous attempts to provide a shelf-supporting structure which can be easily, but rigidly, mounted upon a table or base structure and thereafter quickly dismantled and removed when its use is no longer required or when it will interfere with the desired use of the base structure.

Generally speaking, previous attempts to develop this type of shelf structure have involved sliding or threaded joints between the upper portion of the table and the lower ends of the two or more upright members upon and between which the shelves are usually supported. Sliding joints become loose with use and unsatisfactory, if not unsafe, for supporting weight. Threaded joints, to be completely satisfactory, usually require complicated and/or unsightly fixtures on the upper surface of the table. Moreover, threaded connections can not be quickly assembled or dismantled, and they often require careful alignment after assembly so that the shelf-supporting brackets thereon will be in the proper positions.

Accordingly, a primary object of this invention has been the provision of a device for removably and rigidly securing an upright, shelf-supporting column or standard upon a base cabinet or table, whereby said table can be quickly and easily converted into the support base for a shelving structure including said standard.

A further object of this invention has been the provision of a connecting device between a shelf standard and a base structure, such as a table, wherein a conventional, existing part of the base structure is utilized for engagement by the connecting device, thereby eliminating the need for special or inconvenient fixtures on the table, and wherein the shelf brackets supported by the standards will always be properly aligned.

A further object of this invention has been the provision of a connecting device, as aforesaid, which is easy to use, positive in operation, self adjusting for wear, capable of long and completely satisfactory operation

without maintenance and relatively inexpensive to produce.

Other objects and purposes of this invention will become apparent to persons familiar with this type of structure upon reading the following descriptive material and examining the accompanying drawings, in which:

FIGURE 1 is a fragmentary, broken perspective view of a portion of a base structure and shelving structure including a connecting device embodying the invention.

FIGURE 2 is an enlarged broken fragment of the structure shown in FIGURE 1 as viewed from a different angle.

FIGURE 3 is a sectional view taken along the line III-III in FIGURE 1.

FIGURE 4 is a sectional view substantially as taken along the line IV-IV in FIGURE 3.

FIGURE 5 is a broken fragment in perspective of the structure shown in FIGURE 1 with parts thereof removed.

For convenience in description, the terms "upper," "lower" and words of similar import will have reference to a structure embodying the invention as shown in FIGURES 1 and 2. The terms "inner," "outer" and derivatives thereof will have reference to the geometric center of said structure, the connecting device and associated parts.

*General description*

The objects and purposes of the invention, including those set forth above, have been met by providing a base structure, such as a table, having an upright frame including upright, tubular posts of substantially rectangular cross section. The upper ends of the tubular posts are provided with removable caps which disguise their alternative use, but which can be quickly removed when it becomes desirable to mount a shelving structure upon the table or base structure.

The shelving structure is comprised of two or more upright and preferably hollow standards or columns upon which shelf brackets are mounted in a substantially conventional manner, either removably or permanently. The connecting device of the invention includes a pair of similar wedge members, the first of which is rigidly secured to and within the lower end of each shelf standard and the second of which is adjustably supported upon the first. The two wedge members have engageable surfaces which are similarly sloped with respect to their lengthwise extents. Said wedge members are connected by screw means so that parts of both can be inserted into the upper end of a said upright post when said sloped surfaces are adjacent each other. The wedge members are then moved by said screw means in a lengthwise direction toward each other so that their sloped surfaces cause them to move laterally away from each other and thereby wedge themselves within the post.

*Detailed construction*

The structure herein selected to illustrate a preferred embodiment of the invention includes a table or base structure 10 upon which a shelf structure 11 is supported. The table 10 (FIGURE 1) includes a pair of spaced, parallel and upright posts 12 and 13 which are preferably tubular and rectangular in cross section and comprise part of the frame of the table 10. A horizontal frame element 14 is secured to and extends between the upper ends of the posts 12 and 13 and has sidewardly extending flanges 16 and 17 for supporting the adjacent edges of the surface panels 18 and 19. Additional frame elements 22, 23, 24 and 25 extend horizontally and respectively in pairs from the opposite sides of the posts 12 and 13, perpendicularly with respect to the frame element 14. The frame elements 23 and 25 have inwardly

extending horizontal flanges 27 and 28, respectively, for supporting the panel 19, and the frame elements 22 and 24 have similar flanges (not shown) for supporting the surface panel 18. The post 12 (FIGURES 2, 3 and 4) has a pair of substantially parallel, opposing walls 36 and 37 against which the frame elements 23 and 22, respectively, abut. The upper end of the post 13 is constructed in a similar manner.

The upper ends of the walls 35, 36 and 37 (FIGURE 2) on the post 12 are, if desired, slightly below the upper surfaces of the adjacent ends of the frame elements 14, 22 and 23, respectively, in order to receive the cap plate 31 of a plug 32 for closing the open upper end of the post 12 when the shelf structure 11 is not in use. The plug 32 has a diagonally disposed downwardly extending fin 33 which extends into the opening 34 in the upper end of the post 12.

The shelf structure 11 (FIGURE 1) includes a pair of preferably identical, shelf standards or columns 41 and 42 which in this embodiment are of approximately the same thickness as the posts 12 and 13, respectively. The standard 41, for example, is fabricated from a pair of channel-shaped, substantially identical members 43 and 44, the webs 46 and 47 of which are spaced and parallel. The edge portions of the flanges on the channel members 43 and 44 are folded inwardly toward each other and the edge portions are respectively secured to each other as by welding to provide inwardly projecting brace ridges 48 and 49 which extend the full length of the standard 41.

The adjacent flanges 52 and 53 (FIGURE 1) on the channel members 43 and 44, respectively, have a plurality of uniformly spaced openings 54 and 55, respectively, which are aligned transversely of the lengthwise extent of said standard 41. The openings 54 and 55 are arranged to receive portions of the shelf brackets 57 in a substantially conventional manner, whereby said brackets are mounted upon the standard.

The connecting device 61 (FIGURES 2 and 4) of the invention includes upper and lower wedge members 62 and 63 which are preferably substantially identical and which are connected by screw means including the bolts 64 and the nut 66. The upper wedge member 62 is some what channel shaped in that it has a web 67 (FIGURES 3 and 4) and a pair of substantially parallel flanges 68 and 69 integral with and extending lengthwise of the web 67. The outer free edges of the flanges 68 and 69 have similarly sloped portions 72 and 73 which define a plane converging downwardly with respect to the web 67 at an angle of less than 30 degrees. The remote surfaces of the flanges 68 and 69 (FIGURE 3) are rigidly and respectively held against the inner surfaces of the webs 46 and 47 on the standard 41, as by spot welding at points 65, so that the web 67 of the wedge member 62 extends lengthwise of the standard 41 and projects below the lower end of said standard.

An end plate 74 (FIGURES 2 and 4) is secured to and extends across the upper ends of the web 67 and the flanges 68 and 69 and is preferably perpendicular thereon. Said end plate 74 (FIGURE 4) has a bolt opening 76 through which the upper end of the bolt 64 can extend for engagement by the nut 66. A wrench opening 77 is provided through the web 46 adjacent the end plate 74 for access to and adjustment of the nut 66, which is located upon the upper surface of plate 74.

The wedge member 63 (FIGURES 2 and 4) may be substantially identical to the wedge member 62, in which case it has a web 81, a pair of flanges 82 and 83, and an end plate 84. The flanges 82 and 83 have similarly sloped edge portions 86 and 87 which converge upwardly with the web 81 and are slidably engageable with the sloped edges 72 and 73, respectively. The flanges 82 and 83 are adjacent to and slidably engaged with the webs 46 and 47, respectively, to maintain the engagement of the edges 86 and 87 with the edges 72 and 73. The end plate 84 has a central opening 85 through which the

bolt 64 extends, the head 88 of the bolt 64 being rigidly secured to the end plate 84, as by spot welding at points, one of which appears at 90. The lower wedge member 63 is, therefore, entirely supported upon the upper wedge member 62 by the bolt 64 extending therebetween.

#### Operation

In order to use the connecting device 61 for the purpose of mounting the shelf structure 11 upon the table 10, the plug 32 is removed from the upper end of the post 12. The nut 66 is loosened on the bolt 64 by inserting a wrench through the opening 77, so that the lower wedge member 63 can move downwardly from, hence sidewardly toward, the upper wedge member 62 with their sloping edges engaged. When the distance between the outer surfaces of the webs 67 and 81 is less than the distance between the inner surfaces of the walls 36 and 37, the lower ends of the wedge members 62 and 63 are inserted into the opening 34 at the upper end of the post 12 until the lower end of the standard 41 rests upon the upper surfaces of the frame elements 22 and 23 which are adjacent the post 12. The nut 66 is then tightened upon the bolt 64 until, by inclined plane action, the wedge members 62 and 63 have been moved into relative positions wherein their webs 67 and 81 are rigidly pressed against the walls 36 and 37, respectively. In a similar manner, and by means of a similar connecting device, the standard 42 can be mounted upon the table 10 above the upper end of the post 13. Thereafter, shelf brackets 57 are mounted upon the standards 41 and 42 in the usual manner.

Removal of the standards 41 and 42 can be quickly effected simply by loosening a single nut on the connecting device associated therewith, such as the nut shown at 66 in FIGURE 2, which releases the wedge members 62 and 63. The standards are then lifted away from the table 10 and the openings in the upper ends of the posts 12 and 13 are covered by plugs 32.

Although a particular preferred embodiment of the invention has been disclosed in detail hereinabove for illustrative purposes, it will be understood that variations and modifications of such disclosure, which lie within the scope of the appended claims, are fully contemplated.

What is claimed is:

1. A device for rigidly mounting a hollow, upright column upon a base structure, the combination comprising: wall means defining a substantially rectangular chamber having a pair of spaced, parallel and substantially vertical wall surfaces adjacent the upper side of said base structure; a channel-shaped, upper member rigidly secured within the lower end of said column and extending below the lower end thereof, said upper member having a vertical web and a pair of lengthwise, vertical flanges, the outer edges of said flanges having similarly sloping portions defining a plane converging downwardly with said web at an angle of less than 30 degrees; a channel-shaped lower member having a web parallel with the web of said upper member and a pair of lengthwise, vertical flanges, the outer edges of said flanges having similarly sloping portions defining a plane converging upwardly with said web at an angle substantially identical to the angle of convergence in said upper member, the sloping edges on said lower member being engaged with the sloping edges on said upper member; screw means supporting said lower member upon and below said upper member, said screw means being disposed between and substantially parallel with planes defined by said webs, the lower member and the lower end of said upper member being simultaneously, receivable into said chamber, whereby upward movement of said lower member with respect to said upper member in response to operation of said screw means causes said webs to press firmly and rigidly against said wall surfaces.

2. The structure of claim 1 wherein said base structure is a table having tubular frame elements and said rec-

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tangular chamber is defined by the upper end of an upright frame element; wherein the upright column has a plurality of openings therein disposed uniformly therealong; and including shelf brackets having gripping means receivable into said openings in said column for support thereon.

3. In a structural device, the combination comprising: a hollow, upright column; a base structure and means defining a chamber having a pair of spaced, opposed wall surfaces adjacent the upper side of said base structure; an upper member rigidly secured to and disposed within said column adjacent the lower end thereof, said upper member extending below the lower end of said column into said chamber and having means defining an inclined surface sloping downwardly toward one of said wall surfaces of said chamber, said upper member also having a second surface adjacent, opposed to and adapted for contact with said one wall surface of said chamber; a lower member disposed within said base structure and screw means secured to said lower member and said upper member for moving same toward and away from each other, said lower member having an inclined surface sloping upwardly toward the other of said wall surfaces of said chamber, said inclined surfaces of said upper and lower members being opposed and engaged with each other, said lower member also having a second surface adjacent, opposed to and adapted for contact with said other wall surface of said chamber, whereby movement of said lower member toward said upper member in response to operation of said screw means causes said second surfaces of said upper and lower members to press firmly and rigidly against said wall surfaces of said chambers.

4. A device according to claim 3 wherein said screw means includes a bolt having a nut threaded thereon, said nut being located at the upper end of said upper member, and means defining an opening in said column adjacent said nut whereby a tool may be inserted there-through to rotate said nut with respect to said bolt.

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5. A device for rigidly mounting a hollow, upright column upon a base structure, the combination comprising: wall means defining a substantially rectangular chamber having a pair of spaced, parallel and substantially vertical wall surfaces adjacent the upper side of said base structure; a channel-shaped, upper member rigidly secured within the lower end of said column and extending below the lower end thereof, said upper member having a vertical web and a pair of lengthwise, vertical flanges, the outer edges of said flanges having similarly sloping portions defining a plane converging downwardly toward said web; a channel-shaped lower member having a web parallel with the web of said upper member and a pair of lengthwise, vertical flanges, the outer edges of said flanges having similarly sloping portions defining a plane converging upwardly toward said web at an angle substantially identical to the angle of convergence in said upper member, the sloping edges on said lower member being engaged with the sloping edges of said upper member; screw means supporting said lower member upon and below said upper member, said screw means being disposed between and substantially parallel with planes defined by said webs, the lower member and the lower end of said upper member being simultaneously receivable into said chamber, whereby upward movement of said lower member with respect to said upper member in response to operation of said screw means causes said webs to press firmly and rigidly against said wall surfaces.

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