

June 27, 1961

A. R. BARTLETT

2,990,067

SHELF STRUCTURE

Filed Oct. 1, 1958

2 Sheets-Sheet 1

Fig. 1.

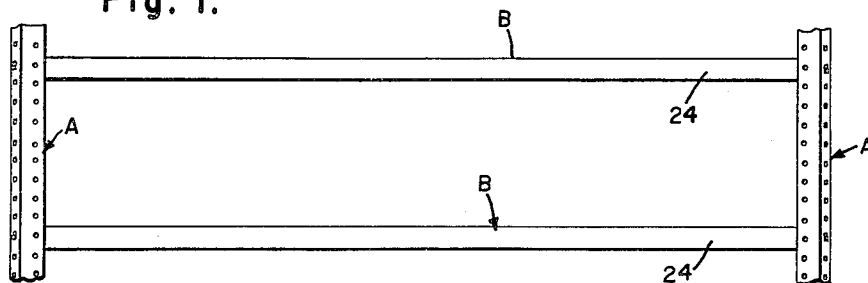


Fig. 2.

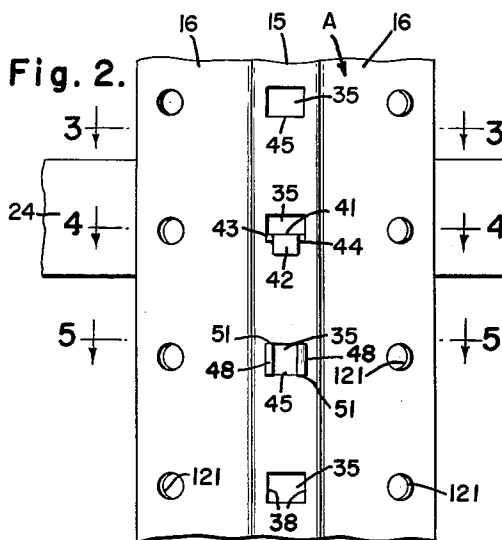


Fig. 3.

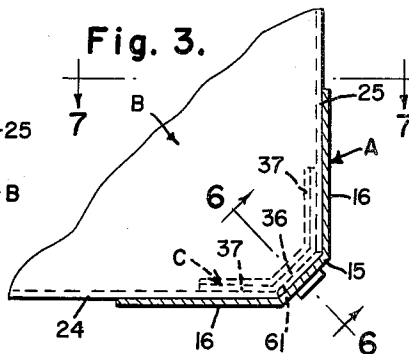


Fig. 6.

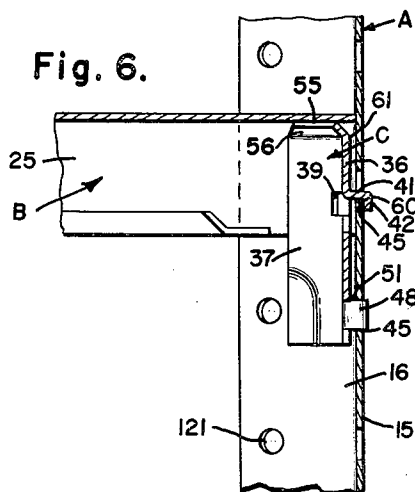
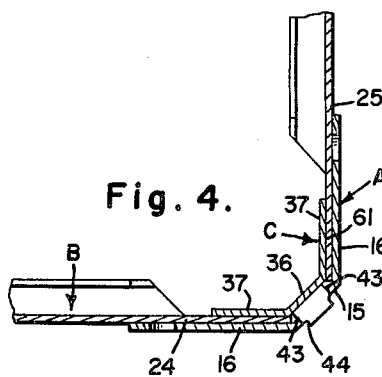


Fig. 4.



INVENTOR.

Allen R. Bartlett

BY

Townsend, Townsend and Caplan
attorneys

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Fig. 7.

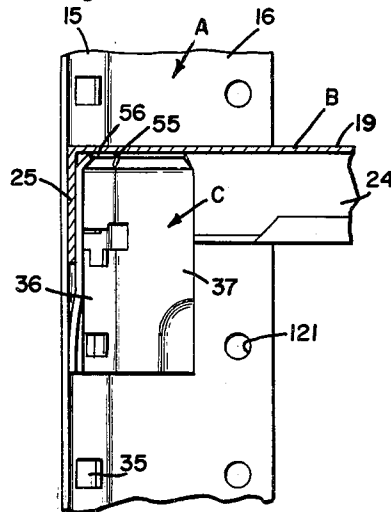


Fig. 5.

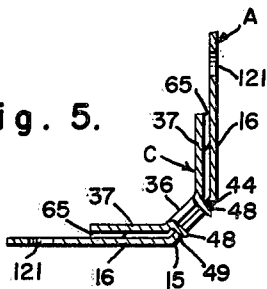


Fig. 10.

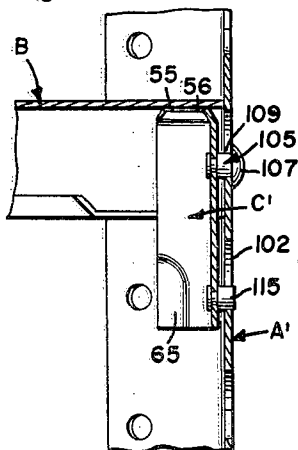


Fig. 11.

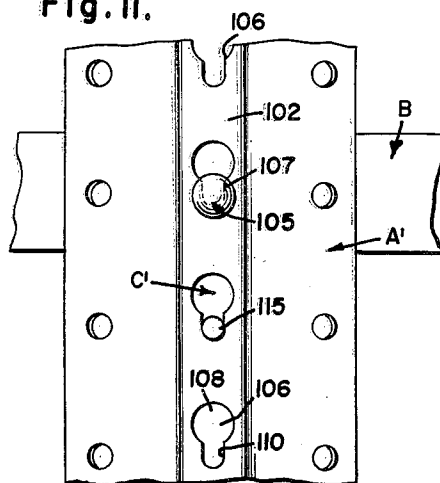


Fig. 9.

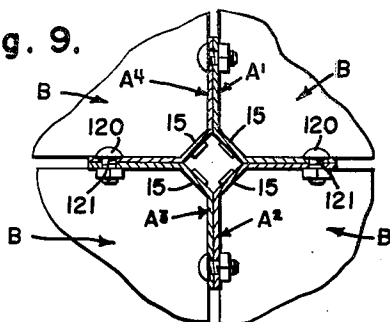
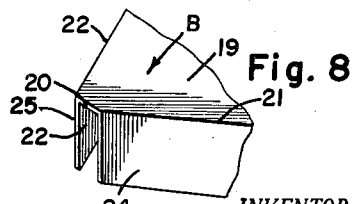


Fig. 8



INVENTOR.

Allen R. Bartlett

BY

Townsend, Townsend and Caplan
Attorneys

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SHELF STRUCTURE

Allen R. Bartlett, San Carlos, Calif., assignor to Harbor Metal Products Corporation, Belmont, Calif., a corporation of California

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2 Claims. (Cl. 211-147)

This invention relates to a new and improved shelf structure.

A principal object of this invention is to provide a metal shelf structure having among its features the ability of changing the relative elevation of the horizontal shelf members with clip means coacting with the shelf and legs to form a structural lateral support of the leg members and the further feature of having the shelves and the legs attached in a manner which is relatively easy to remove should it be desired.

Another object of this invention is to provide an apparatus for connecting horizontal shelves to vertical legs employing a clip of a novel type which is arranged to sandwich a portion of the shelf between the clip and the legs of the shelves, in tightly nested engagement so that the shelf laterally supports the legs.

A feature and advantage of the shelf structure of the invention is that the clip, even though holding the shelf in substantially rigid alignment with respect to the legs, allows the shelf to be easily and quickly removable by an upwardly directed force against the shelf.

Another object of this invention is to provide a novel arrangement for attaching a shelf to a vertical support member employing a support formed in a substantially U-shaped cross-section in which the outwardly extending legs of the U-shaped support extend outwardly from the web at an angle whereat the legs are substantially 90° with respect to each other and in which a clip is mounted on the web for supporting the horizontal shelf.

A further object of this invention is to provide means for removably connecting the clip to the web of the vertical support in spaced relation thereto and in providing the shelf with a pair of depending flanges formed coincident the inside face of the legs of the vertical member and arranged to be nested in the space between the vertical support member and clip.

Another feature and advantage of this invention is that the spacing between the clip and the vertical support member is substantially equal to the thickness of the depending flange of the shelf so that the clip member and shelf are held in substantially rigid alignment.

A still further object of this invention is to provide a novel means for mounting the clip member on the web of the vertical support member in which the web is provided with a plurality of apertures and the clip member is provided with a first member adapted to pass through the aperture of the web and depends over the wall of the web to limit inward movement of the clip beyond a predetermined limit and the clip is further provided with a second member arranged to pass through a second aperture in the web in such a manner as to engage both the vertical walls of the second aperture so as to hold the clip in substantially vertical registration with respect to the vertical support member.

Still another object of this invention is to provide a shelf structure employing clips to mount the shelf on vertical support members in which the vertical support members are formed of a diagonal web and two outwardly extending legs in cross-section in which the legs are disposed at substantially 90° relationship with respect to each other so that the legs form the front and side walls of the vertical support and in which the diagonal web

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portion forms the structural surface for mounting a clip for supporting the shelf.

A further feature and advantage of this structure is that all the supporting surfaces from the shelf are on the diagonal web portion thus leaving the front and side surfaces free from any projecting members so that a plurality of legs may be connected side by side or nested in clusters of four without effecting the ability to mount or change the mounting of the shelves to the vertical support members.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is an elevation view of the shelf structure of the invention showing two shelves and a fragmentary portion of the vertical support member.

FIG. 2 is an enlarged elevation of a fragmentary portion of the vertical support member taken from the outside corner.

FIG. 3 is a cross-sectional view of FIG. 2 taken at line 3-3.

FIG. 4 is a cross-sectional view of FIG. 2 taken at line 4-4.

FIG. 5 is a cross-sectional view of FIG. 2 taken at line 5-5.

FIG. 6 is a sectional view of FIG. 3 taken at line 6-6.

FIG. 7 is a sectional view of FIG. 3 taken at line 7-7.

FIG. 8 is a fragmentary perspective of a corner portion of the shelf structure.

FIG. 9 is a fragmentary plan view showing four vertical support members of the shelf structure of the invention mounted together in a unitary structure.

FIG. 10 is a cross-sectional view taken through the center of the web portion of the vertical support member showing a modification of the invention.

FIG. 11 is a fragmentary portion of the vertical support member of the embodiment of FIG. 10 taken from the outside corner of the vertical support member.

The principal embodiment of the invention comprises a shelf structure having a plurality of vertical support members A which are arranged to carry one or more horizontal shelves B by virtue of clips C which are mounted on the vertical support members in such a way as to form supporting means for the shelves.

Vertical support members A are formed in cross-section with a web 15 and two legs 16 extending outwardly from the web at an angle of approximately 90° with respect to each other. Legs 16 are substantially longer than the web portion.

Shelves B are formed of a single piece of sheet metal material forming a top face 19 and having the corner portion of the material cut on a diagonal as indicated at 20 so that shelf B in plan is coincident in shape with the inside wall of vertical support members A thereby providing a front edge 21 and a side edge 22.

Shelf B is provided further with two downwardly depending flanges 24 and 25 mounted on edges 21 and 22 respectively. The flanges terminate at the diagonal corner 20.

Clip C is mounted on the vertical support members in rectangular apertures 35 which are arranged in a vertical column equidistantly spaced along the entire face of web 15. Clip C is formed in cross-section with a clip web 36 and two clip legs 37. Clip legs 37 are arranged at respective angles so that they lie substantially parallel with the two legs 16. Clip web 36 is arranged in width so as to be coincident in the inside dimension with web 15.

Web 36 of clip C is deformed, by the provision of a cutout 39, to provide an outwardly projecting bead 41 having an end flange or locking member 42 which depends downwardly from bead 41. Bead 41 is formed with a base of sufficient width so that the side edges 43 are substantially equal in their spacing to apertures 35 and end portions 44 of bead 41 and flange 42 are smaller than the vertical edge dimension of apertures 35. Thus clip C is adaptable for mounting in apertures 35 with the bead resting on the bottom horizontal edge 45 of apertures 35 and flange 42 overlying the wall of web 15 immediately below lower edge 45.

Clip C is further formed with two outwardly projecting locking members 48 which project outwardly with their outer faces 49 spaced a distance substantially equal to vertical edges 38 of apertures 35 and with the spacing between the top edge 51 of the locking members 48 and the bottom of bead 41 being spaced a distance equal to the center to center spacing of adjacent apertures 35.

The top edge 55 of clip C is bent inwardly to form three inwardly projecting flanges 56 on the top of the two legs and web.

Bead 41 is constructed of such a length that the inside face 60 of flange 42 is spaced a distance sufficient to allow the vertical support facing face 61 of the clip to be spaced a distance equal to the thickness of flanges 24 and 25 from the vertical support member.

In operation of the device the vertical support members A are assembled in substantially vertical relation and clips C are mounted on each support by placing the bead and flange members 41 and 42 through an aperture 35 so that the bead rests on the bottom edge 45 of the aperture whereat locking member 48 is disposed within an aperture 35 immediately below the aperture mounting the bead and flange. Shelf B is then installed by fitting the corner of the shelf over the clip so that the two flanges 24 and 25 are nested between the clip and vertical support member so that top face 19 of shelf B rests directly on flange member 56 of clip C.

The bottom corners of the two legs 37 are bent toward vertical support members A to form spacer members 65. Spacer members 65 hold the bottom portion of clip C from the leg members a distance substantially equal to the thickness of flanges 24 and 25 of shelf B. Normally the flanges of the shelf member are dimensioned to depend downwardly a distance somewhat less than one-half of the vertical dimension of clip C.

The shelf structure in assembled form forms a rigid joinder between vertical support members A and shelf structure B by virtue of the tight joinder between clip C, the shelf and the vertical support. It is further noted that the shelf may be easily removed by forcing the shelf upwardly thus freeing the clip so that the clip may be removed from aperture 35 for either permanent removal of the shelf or shifting of the shelf to another elevation.

Referring now to FIGS. 10 and 11 there is provided a modification of the invention in which clip C¹ is mounted on a web portion 102 of a vertical support member A¹ by means of a flanged key 105 which is adapted to fit into one of a plurality of key holes 106 mounted in a vertical column along web 102. Key 105 works in substantially the same manner as bead 41 and flange 42 as shown in the embodiments in FIGS. 1 through 5.

The flanged portion 107 of key 105 is formed in a diameter slightly smaller than the largest diameter portion 108 of key hole 106 and the shank 109 of the key is formed of a diameter slightly smaller than the narrowest portion 110 of key hole 106 with the flange 107 being substantially larger than the narrowest portion 110. Thus the clip is inserted into locking engagement on web 102 by inserting key 105 into key hole 106 and then positioning the shank downwardly in engagement with the smaller portion 110 of the key hole. Shank 109 is formed of sufficiently long dimension so that the clip is spaced a distance substantially equal to the depending flanges on the shelves to be supported thereby.

The bottom portion of the clip is provided with an outwardly projecting guide member 115 which is arranged to have a side wall in vertical alignment with the next lowest key hole 116 and with the side walls arranged to mate with the side walls of the smallest dimension portion 110 of the key hole.

It is believed obvious that other means may be employed to mount the clip on the web portion of the vertical support member it being understood, however, that the clip should be spaced a distance at least substantially equal to the thickness of the depending flange of the shelves to be supported. In the completed structure the leg portions may be joined one to the other by joining the legs of adjoining vertical supports together. It is to be noted that when the leg portions are joined together the webs are sufficiently spaced so as not to interfere with the mounting means for mounting the clips to the webs. Thus with the structure of this invention four vertical support members may be joined together as seen in FIG. 9.

Support members A¹, A², A³ and A⁴ are joined together with their legs connected in juxtaposition by nuts and bolts 120 which join the legs at apertures 121. The webs 15 of each of the legs are spaced from the webs of the adjacent legs sufficiently to allow ample room for the connection of clips C to the web.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention as limited only by the scope of the appended claims.

What is claimed is:

1. In a shelf structure of the type having a vertical support member; a clip removably mountable on said support member to support the shelf on the support member the combination of: the vertical support member being formed in a generally U-shaped configuration having two legs disposed at substantially 90° with reference to each other and a web between the two legs and bearing approximately the same angular relationship to each of the legs; means joining the clip to the support members at the web; the clip having two walls each being in substantially parallel juxtaposed relation to the legs of the vertical support member; means on each of the two walls of said clips to space the clips in spaced parallel relationship relative to said support member and the shelf formed with flanges depending from the edges of the shelf; one said flange being nested between the side walls of the clip and each of the respective legs of said vertical support member.

2. In a shelf structure the combination of a plurality of vertical support members each said support member being formed in cross-section with a web and two outwardly extending legs disposed at substantially 90° with respect to each other; said web formed to define a plurality of apertures disposed in a vertical column along said web; a clip; means mounted on said clip and engageable with the apertures of said web to mount said clip on said web between the outwardly extending legs of said support member, said mounting means having means to space said clip in spaced relation with the vertical support member; a shelf; said shelf in top plane having a corner section cut at a diagonal in a shape corresponding with the cross-sectional dimension of said vertical support; said horizontal shelf having flanges depending from the top edge of said shelf; said shelf mounted on said clip with the adjacent flanges of the shelf sandwiched between said clip and said vertical support; said clip being formed with two outwardly extending legs disposed at substantially 90° relative to each other; and means mounted, on the bottom edge of each leg of said clip, to space the bottom edge of the clip from said vertical support member a distance substantially equal to the thickness of said flange member.

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