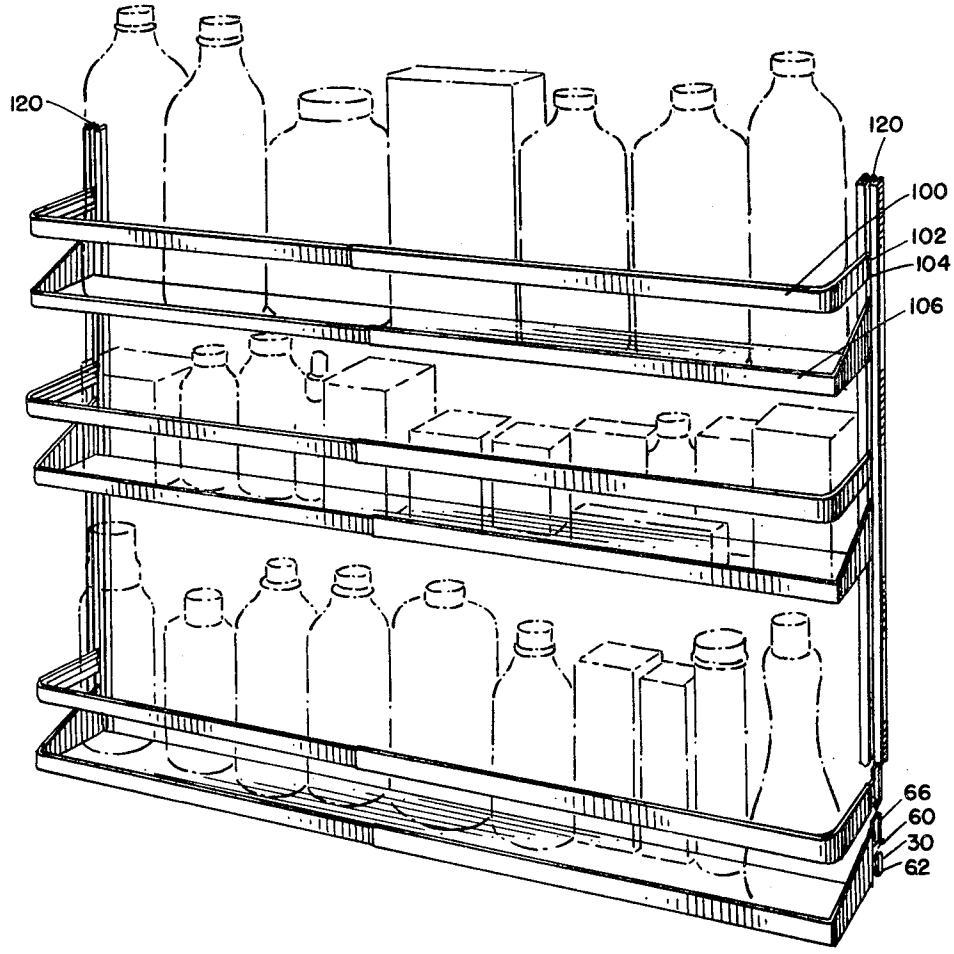
June 30, 1964 M. E. HANDLER ETAL 3,139,258

TRAY SHELVING

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FIG. 1



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FIG. 2

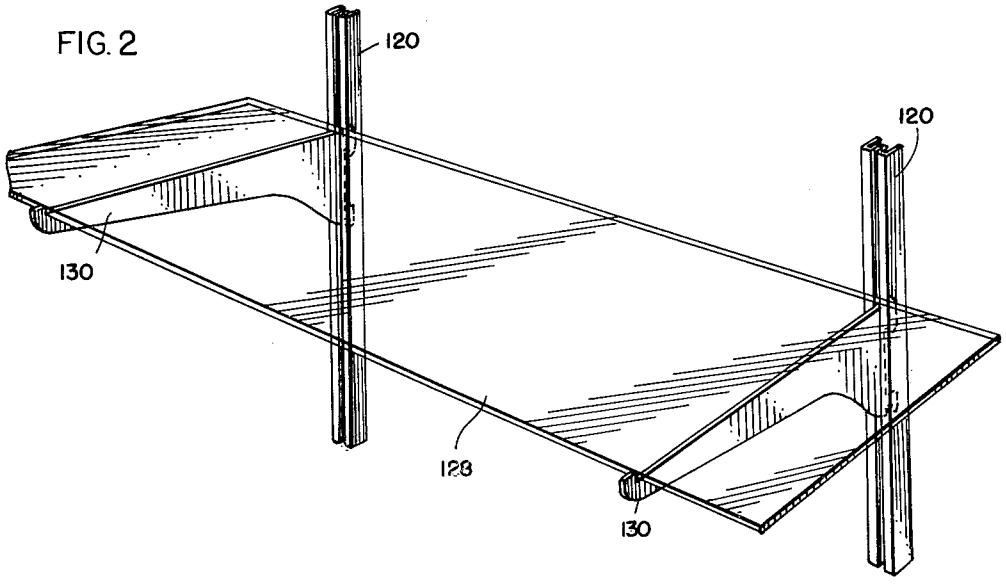


FIG. 3

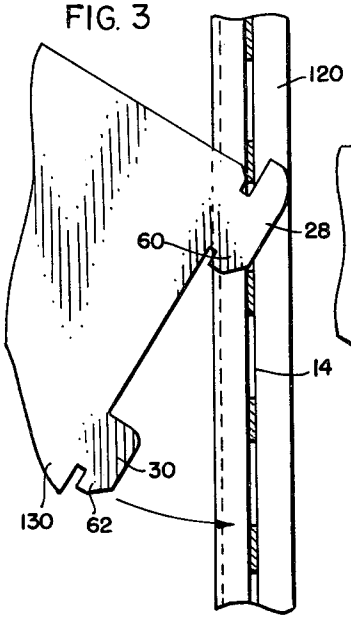


FIG. 4

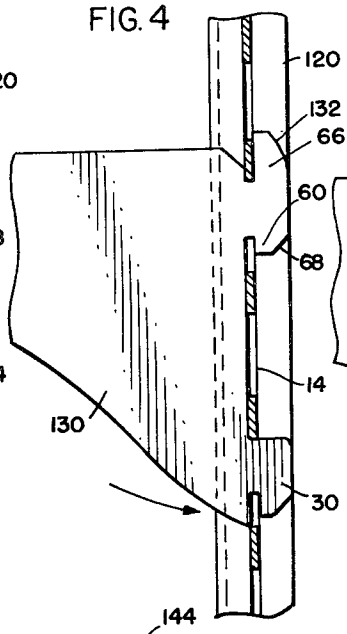


FIG. 5

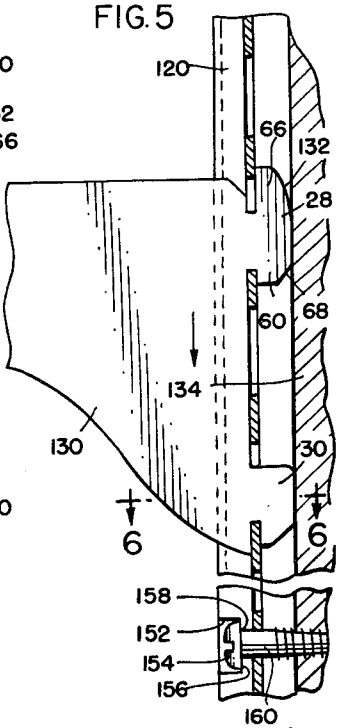
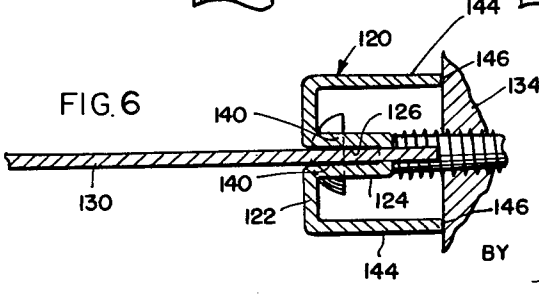


FIG. 6



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3,139,258
TRAY SHELVING

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8 Claims. (Cl. 248—243)

This invention relates to tray shelving, and more particularly to tray shelving which can be readily assembled and disassembled and which has internal and external reinforcing means to assure stability and longevity under conditions of heavy use. The present application is a continuation-in-part of our copending application Serial No. 666,952, filed June 20, 1957, now U.S. Patent No. 2,982,423, issued May 2, 1961, reference to which is hereby made.

Heretofore, tray shelving has been available which could be assembled and dismantled with relative ease, but this shelving has been subject to the difficulty that the connection between the shelf structures and the supports has often required special care in adjustment, while special under-supports have often been required for the shelves themselves and the shelves after installation are not rigid in use and under inadvertent contacts.

Accordingly, it is an object of the present invention to provide an improved shelving assembly, wherein the shelf structure can be readily inserted in the support elements in laterally, as well as vertically, guided relationship without the necessity for accurate estimation of the relationship of the parts yet when installed will be rugged and steady with the supports clamped in place, if desired.

Another object of the invention is to provide tray shelving as described, wherein the shelving is substantially self-sustaining with respect to the upright supports therefor, and is provided with means for connection with the supports effective not only against both stress and tension forces at a plurality of points, but also against side sway or warping and prevents dislodgment when accidentally struck or moved.

Another object of this invention is to provide a shelving assembly having a rack and tray shelving in combination as described wherein the ends of the rack have inwardly configured reinforcing structure affording additional strength in retaining articles on the tray.

A still further object of this invention is to provide a shelving assembly having a rack and a tray in combination as described wherein the rack and tray have a bipartite structure providing telescoping expansion and retraction thereof selectively.

Another object of this invention is to provide a shelving assembly wherein the outwardly extending ends of the shelving side brackets in the form of cantilever beams are not rigidly interconnected and side sway of the assembly is restrained by the resilient gripping action of the shelving support interlocking with the other end of the side brackets.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings, in which:

FIG. 1 is a perspective view of a shelf according to the present invention, showing the trays in cooperative relationship with racks, and having the trays and racks telescopically adjustable;

FIG. 2 is a perspective view of a glass shelf supported by a shelving construction embodying a preferred form of the invention;

FIG. 3 is a vertical sectional view showing an end wall of the shelf as it is placed in guided relationship with respect to the improved vertical supports therefor upon introduction of the shelf into supported relationship with the supports;

FIG. 4 is a view corresponding to the view of FIG. 3 showing the shelf after it has been brought into proper angular relationship with the support for the shelf;

FIG. 5 is a further view corresponding to the views of FIGS. 3 and 4, and showing the shelf in assembled condition ready to carry weight;

FIG. 6 is a section taken on line 6—6 in FIG. 5 showing the improved fastening and clamping arrangement.

Referring now to the drawings, the shelf assembly according to the invention comprises a plurality of vertical support elements **120** (FIG. 6), which are preferably formed with a generally U-shaped cross-sectional configuration for strength with the cross element **122** of the U-shaped section provided with a control portion **124** defining a groove **126**. These supports are provided with a plurality of vertically spaced, rectangular aperture **14** at the bottom of the groove **126** for engagement with one or more trays or shelves **106** and **128** and brackets **130** as hereinafter further set forth in connection with FIGS. 1 and 2. Each of the shelves is provided with end walls or brackets **130** for shelf **128** and each of the end walls and brackets has formed axially thereon a pair of ears or legs, such as the ears **28** and **30**, it being seen that the vertically spaced apertures **14** in the supports including the groove **126** if desired are sufficiently wide to receive a pair of end walls or brackets **130** and their ears **28** and **30** therein in side-to-side abutting relationship if desired with the ears **28** and **30** being spaced apart a predetermined distance vertically sufficient to permit them to engage in immediately and vertically adjacent apertures **14**, as shown in FIG. 1 or spanning one or more as shown in FIGS. 2–6.

In accordance with the invention, each of the ears **28** and **30** has a depending locking extension designated by numbers **60** and **62**, spaced from the rear edges of the respective end walls of the trays a distance substantially corresponding to the distance of the apertures **14** are spaced from the front wall of the vertical supports **120**. However, in order that any possibility of shear or tension forces effecting ripping of the metal connection **64** between the ear **28** and the side wall **130** with which it is formed may be prevented, an upstanding extension **66** is provided on the ear **28** whose function will be hereinafter further described. At the same time, the depending element **60** is bevelled at its outer edge **68** for ease in inserting the ear **28** into the support and the upstanding extension **66** can be rounded as at **132** to clear the face of the wall **134** upon which the supports **120** are mounted.

The manner of inserting the elements into supported position on the upright supports **120**, may be seen by reference to FIGS. 3 through 5. First, the ear **28** is inserted into one of the apertures **14**, with the upstanding extension **66** pointed at an angle and the rounding **132** permitting admission. At such time, the bevelled lower edge **68** of the ear **28** permits the ear to pass freely over the lower edge of the aperture **14**, as shown in FIGS. 3–5. Thereupon, the tray is pivoted inwardly until the ears **28** and **30** are received behind the wall of the upright through the bottom of the groove **126** in which they are being inserted, and the ear **30** has its extension **62** still spaced above the lower edge of the aperture into which it has been inserted. This relationship is shown in FIG. 4.

The tray or bracket will thereupon of its own accord slide downwardly into supported relationship upon the vertical support herein designated by reference numeral **120**, and it will be appreciated that the upper extension of the ear **28** must have a length substantially greater than the length of the lower extension **62** on the ear **30**

so that it may be maintained in abutting engagement behind the support **120**, as shown in FIGS. 4 and 5, when the tray or bracket is in its working position.

The ear **28**, therefore, provides two stress-resisting engagements with the supports **120**, one afforded by the upstanding ear extension **66**, and the other afforded by the depending ear extension **60**, whereas in previously available constructions the tray, if engaged in a key-and-slot relationship, tended to pull away from the shelf due to the tearing of one of the keys used therefor. The present construction precludes any such possibility by virtue of the double engagement of the ear **28** with the vertical support. Because the ear **28** is spaced a predetermined distance above the ear **30**, it will be appreciated that the ear **30** in effect acts as a pivot point for forces tending to move the tray outwardly of the vertical support and, accordingly, a greater degree of stress and tension is placed upon the ear **28** than is placed upon the ear **30**. Thus, this double stress resistance afforded by the separate ears **66** and **60** is extremely advantageous in a construction as shown. On the other hand, the ears **30** when in engaged position (as seen in FIG. 5) must resist primarily forces of shear exerted by the bottom edge of the aperture **14** in which it is placed so that if the relative height above the said bottom edge of the aperture **14** is sufficiently great, there will be relatively little danger of tearing with respect to this ear.

Referring again to FIG. 1, it will be seen that trays **106** may be used which are adapted to telescope, and that racks **100** may be used in conjunction with the trays, here shown in telescopic form also. The racks **100**, which may be used for preventing bottles and the like from tumbling, and for holding such articles at a position above the bottom of the trays, have their end extensions **102** configured to be inserted within the slots **14** in the manner described. Preferably, such end extensions are dished as at **104** for additional strength.

The telescoping form of the shelving thus permits the trays to be adjusted to a predetermined alignment of the uprights without difficulty, and generally contributes to the ease of adjustment and assembly thereof, particularly where variations in shelf widths may be desired.

The embodiment shown is of particular interest in supporting brackets such as those shown at **130** in FIG. 2 which are free at their outer ends to move with respect to each other. In the embodiment shown in FIG. 6, side walls **140**, defining the groove **126**, are so arranged that they receive the brackets **130** therebetween in close relationship which prevents but very little freedom of movement at the outer end of the bracket.

Moreover, the side walls are cut away as at **152** in FIG. 5 to provide a recess receiving the round head of the wood screw **154** to a counter-sunk depth indicated by shoulder **156**, below the level of which the counter-sunk is reduced in dimension as at **158** to merely receive the shank **160** of the screw **154** therein. When the screw is tightened downwardly it presses the walls **144** inwardly against the wall **134** and when the sides **144** of the support **120** rest against the surface of the wall as at **146**, further tightening of this screw forces the central portion **124** inwardly towards wall **134** with the resulting action that the side walls **140** are drawn into clamping or pressing relationship against opposite faces of the bracket **130** thereby further rigidifying the support of the outer end of the bracket against side sway.

Accordingly, there has been provided a shelf construction which is easy to assemble and disassemble, the guide ears **28** serving to guide the tray as a whole during the initial stages of insertion into the supports. After the ear **28** has thus guided and aligned the tray relative to the supports, the ears **30** automatically will be in registration with their apertures immediately subjacent the apertures receiving the ears **28** and with further tightening of the screw **140** shown in FIGS. 5 and 6 the shelf supports are held rigidly in place. Thus, the entire assembly will take place substantially automatically, and where a telescoping construction is used, as stated, any desired adjustment may be made without difficulty and once made the rigidity provided for the shelf supports will prevent relative movement or separation of the telescoped parts.

Although we have herein set forth and described our invention with respect to certain principles and details thereof, it will be understood by those skilled in the art that these may be varied without departing from the spirit and scope of the invention as set forth in the hereunto appended claims.

What is claimed is:

1. A shelving support comprising an elongated channel-like support element having two side walls interconnected along adjacent edges by an inverted channel portion having at its bottom a plurality of axially spaced slots each having a predetermined axial length, a bracket element received in said inverted channel portion and engaging side walls thereof and said slots, said bracket element including an upper ear and a lower ear in coplanar relationship with the bracket element, each of the ears having a depending extension and the upper ear having an upstanding extension, the slots being dimensioned to receive the upper and lower ears therein, said upstanding extension being slidable upwardly past the upper end of the slot into which it may be introduced, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, said inverted channel having openings therethrough to receive support mounting elements which transmit a securing force in a direction from said adjacent edges towards the bottom of the inverted channel to flex the side walls of said inverted channel in clamping relation against the sides of said bracket element.

2. A shelving support comprising an elongated channel-like support element having two side walls providing parallel wall engaging edges along one edge and interconnected along their other edges by an inverted channel portion having a bottom portion spaced a substantial distance from the plane of said wall engaging edges, said bottom portion having a plurality of axially spaced slots each having a predetermined axial length, a bracket element received in said inverted channel portion and engaging said slots, said bracket element including an upper ear and a lower ear in coplanar relationship with the bracket element, each of the ears having a depending extension and the upper ear having an upstanding extension rounded at its upper remote corner, the slots being dimensioned to receive the upper and lower ears therein, said upstanding extension being slidable inwardly and upwardly behind the upper end of the receiving slot within the space defined between said bottom portion and said plane, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, and the side walls of said inverted channel portion engaging the sides of the bracket element in lateral supporting relationship over an area spaced from said ears.

3. A shelving support comprising an elongated channel-like support element having two side walls providing parallel wall engaging edges along one edge and interconnected along their other edges by an inverted channel portion having a bottom portion spaced a substantial distance from the plane of said wall engaging edges, said bottom portion having a plurality of axially spaced slots each having a predetermined axial length, a bracket element received in said inverted channel portion and engaging said slots, said bracket element including an upper ear and a lower ear in coplanar relationship with the bracket element, each of the ears having a depending extension and the upper ear having an upstanding extension, the slots being dimensioned to receive the upper and lower ears therein, said upstanding extension being slidable inwardly and upwardly behind the upper end of the receiv-

ing slot within the space defined between said bottom portion and said plane, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, and means engaging said side walls of said inverted channel portion and passing between said parallel edges for supporting the support element with said parallel edges against a flat wall surface.

4. A shelving support comprising an elongated channel-like support element having two side walls providing parallel wall engaging edges along one edge and interconnected along their other edges by an inverted channel portion having a bottom portion spaced a substantial distance from the plane of said wall engaging edges, said bottom portion having a plurality of axially spaced slots each having a predetermined axial length, a bracket element received in said inverted channel portion and engaging said slots, said bracket element including an upper ear and a lower ear in coplanar relationship with the bracket element, each of the ears having a depending extension and the upper ear having an upstanding extension, the slots being dimensioned to receive the upper and lower ears therein, said upstanding extension being slidable inwardly and upwardly behind the upper end of the receiving slot within the space defined between said bottom portion and said plane, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, the side walls of said inverted channel portion engaging the sides of the bracket element in lateral supporting relationship over an area spaced from said ears, and means engaging said side walls of said inverted channel portion and passing between said parallel edges for supporting the support element with said parallel edges against a flat wall surface.

5. A shelving support comprising an elongated channel-like support element having two side walls interconnected along adjacent edges by an inverted channel portion having at its bottom a plurality of axially spaced slots each having a predetermined axial length, a bracket element received in said inverted channel portion and engaging side walls thereof and said slots, said bracket element including an upper ear and a lower ear in coplanar relationship with the bracket element, the slots being dimensioned to receive the upper and lower ears therein through the inverted channel for engagement therewith in interlocking relationship to provide stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, said inverted channel having openings therethrough to receive support mounting elements engaging the side walls of the inverted channel to transmit a securing force in a direction from said adjacent edges towards the bottom of the inverted channel to drive the side walls of said inverted channel towards each other in clamping relation against the opposite faces of said bracket element over areas spaced from said ears.

6. In a shelving structure the combination of an upright support having a substantially channel-shaped cross-sectional configuration with an inverted channel in the front wall thereof with the bottom portion thereof defining a plurality of axially aligned, evenly spaced slots of uniform dimensions, and means having a bracket portion defining an upper ear and a lower ear in coplanar relationship therewith, said ears being spaced apart a distance substantially corresponding to the distance between said slots, each of said ears having a depending extension, each of said end extensions having a keying ear adapted to be received in spaced slots receiving said end bracket portion ears, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, said inverted channel having openings therethrough to receive support mounting elements which transmit a securing force in a direction from said adjacent edges towards the bottom of the inverted channel to flex the side walls of said inverted channel in clamping relation against the sides of said bracket element.

7. In a shelving structure the combination of a plurality of spaced upright supports each having a substantially channel-shaped cross-sectional configuration having an inverted channel in the front wall thereof with the bottom portion thereof defining a plurality of axially aligned, evenly spaced slots of uniform dimensions, a bracket for each support having an upper ear and a lower ear in coplanar relationship therewith, said ears being spaced apart a distance substantially corresponding to the distance between said slots, each of said ears having a depending extension received through said slots and behind said bottom portion, and means for depressing said inverted channel to clamp the sides thereof against the opposite faces of said bracket over areas thereof spaced from said ears.

8. Spaced vertically disposed shelving supports comprising a pair of elongated channel-like support elements each defining two sides and a face wall between them and an inverted channel in the face wall having at the bottom thereof a plurality of vertically spaced slots each having a predetermined axial length and being correspondingly spaced identical distances for both elements at the same level, a pair of bracket elements received in said inverted channel in engagement with the respective side walls thereof, each of the bracket elements defining an upper ear and a lower ear in coplanar relationship with the wall, each of the ears having a depending extension and the upper ear having an upstanding extension, the slots being dimensioned to receive the upper and lower ears therein in spaced slots, the upper ear serving as a guide for the lower ear and the upper extension thereon being slidable upwardly and behind the upper end of the slot into which it is introduced, said upper extension on said each upper ear having a length sufficient to engage the bottom of said inverted channels respectively into which it may be introduced after the lower ear has been pivoted into the slot below the slot receiving the upper ear, said lower ear providing a support point on which the weight of the tray exerted through the end wall is supported, the upper and lower extensions on the upper ear serving to provide a pair of stress-resistance points to resist pivotal movement of the tray outwardly about the said support point, and support securing means engaging the side walls of the respective inverted channels below said face wall for applying pressure on said respective brackets to maintain them in supported parallel relationship.

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