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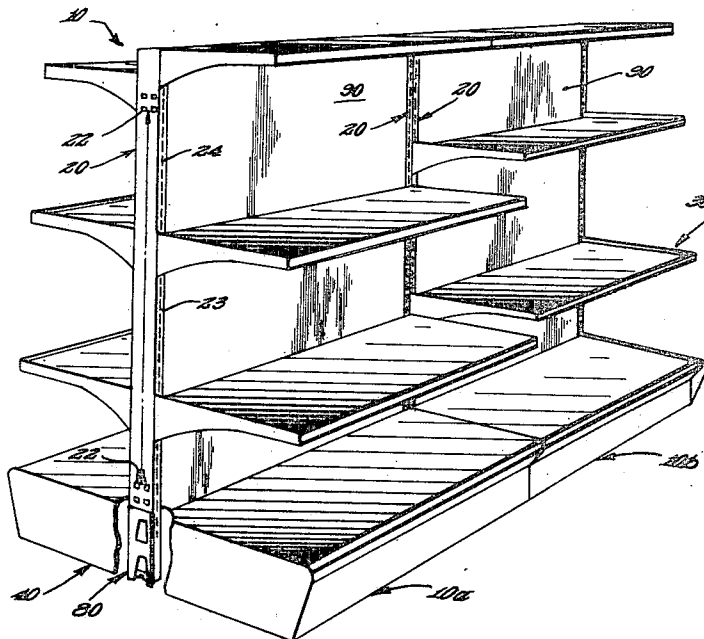
[54] **SHELVING CONSTRUCTION**
 8 Claims, 9 Drawing Figs.

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108/111, 211/148
 [51] Int. Cl..... **A47b 57/06**
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108, 111, 114, 64; 211/148, 177; 248/242, 248,
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ABSTRACT: A shelving construction of the type wherein long rows of shelving are assembled from shelving units connected end to end. The shelving construction is provided with apparatus for connecting shelves to upright columns wherein the shelf-supporting brackets are provided with extended lever arms and the columns are provided with embossments or lances for bearing against the extended lever arms for increasing the permissible moment of the shelf. The shelving unit is also provided with apparatus for securing and supporting the upright columns of the shelving units for connection on an end-to-end basis wherein the lower end of the upright columns are provided with stiffening plates for increasing the rigidity thereof and the transverse supporting gussets are provided with members for aligning the end columns of adjacent shelving units and for supporting the aligned columns.



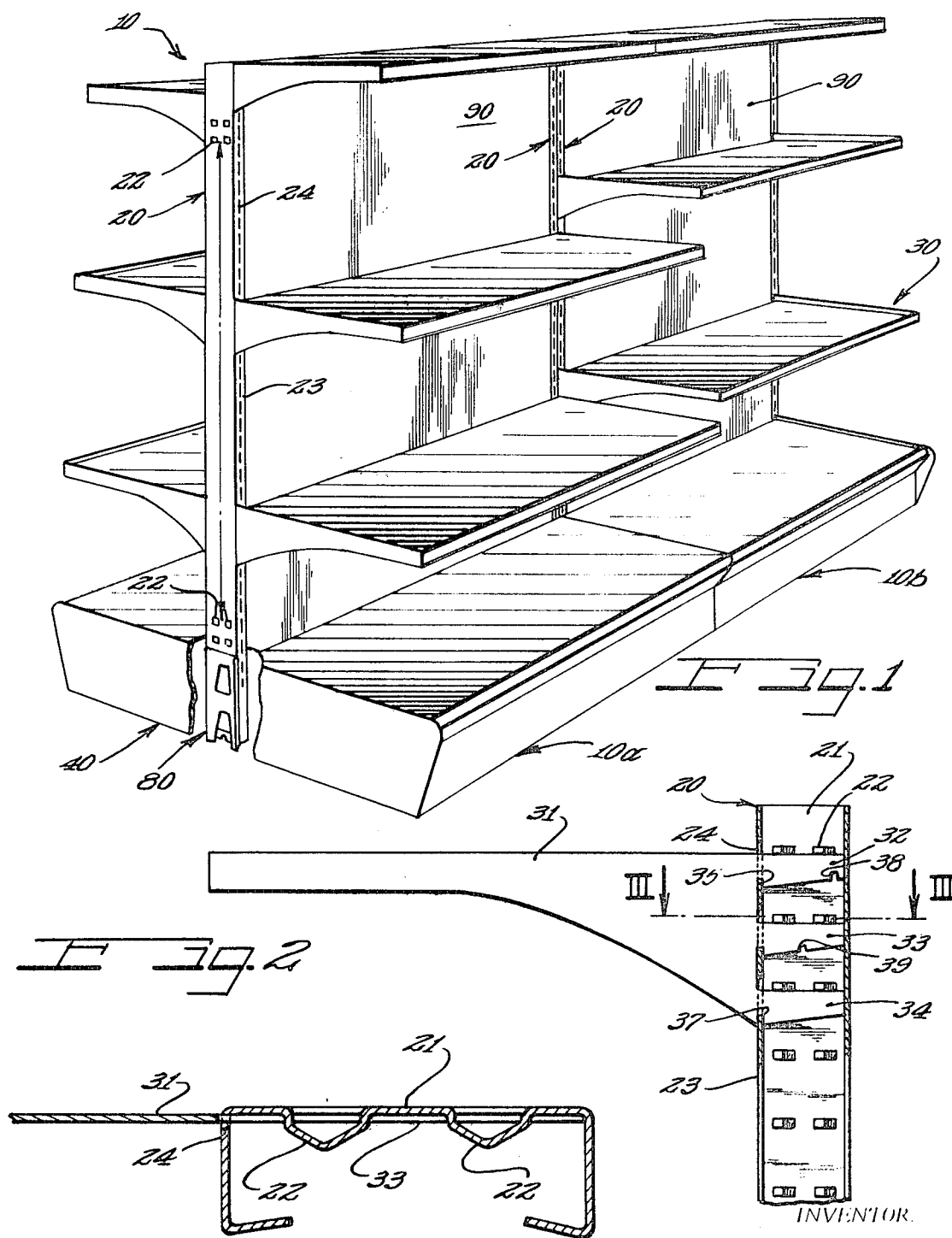
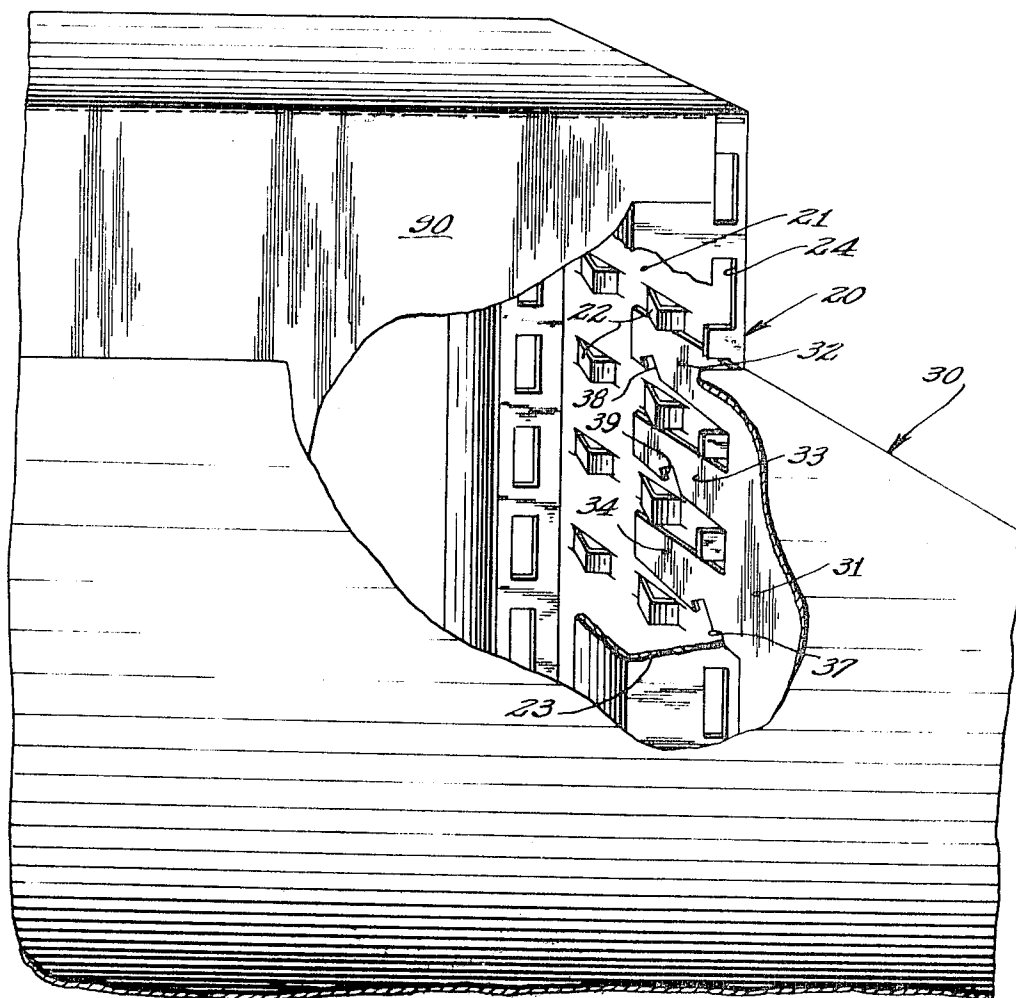


Fig. 3

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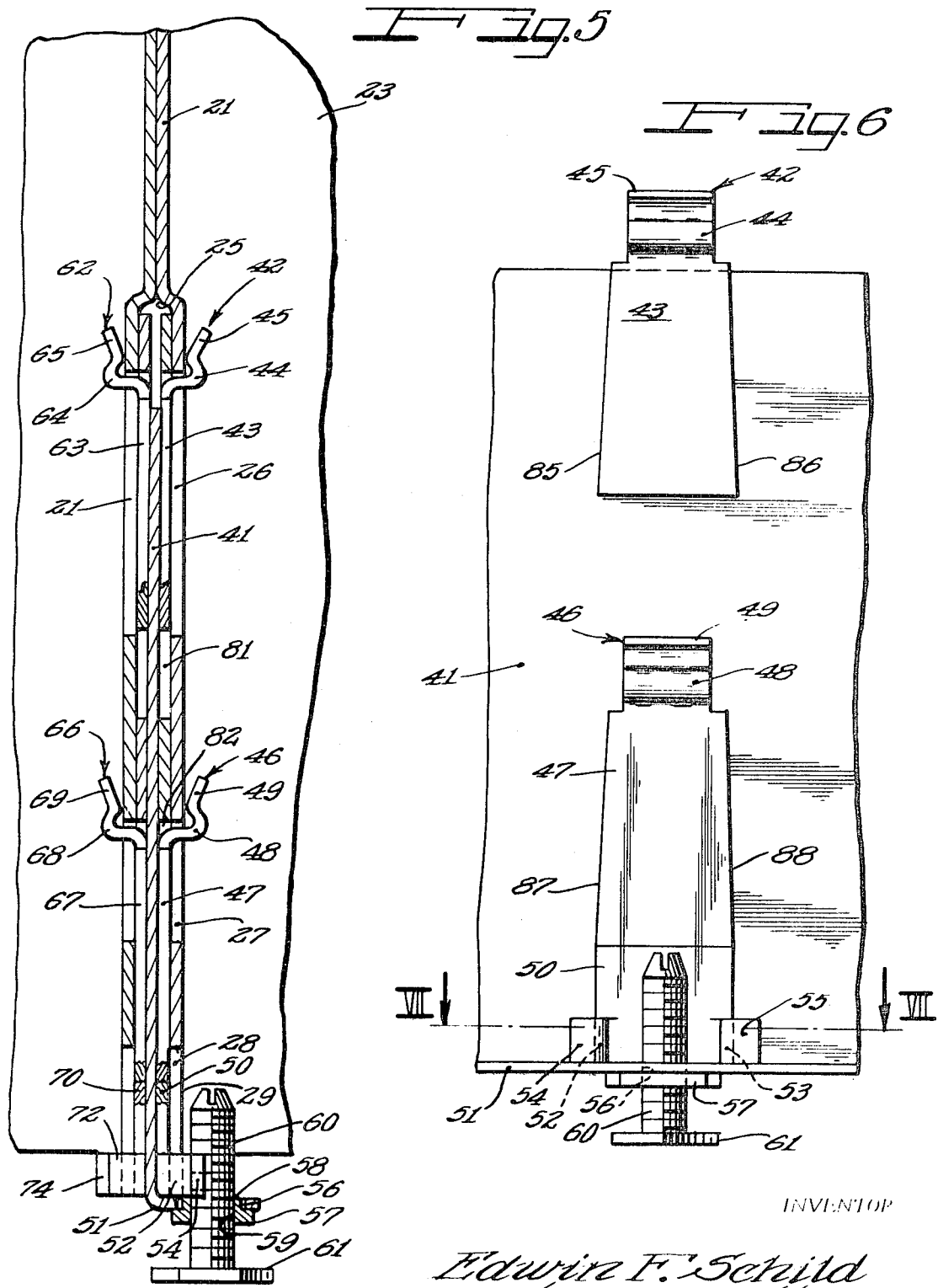
Fig. 4



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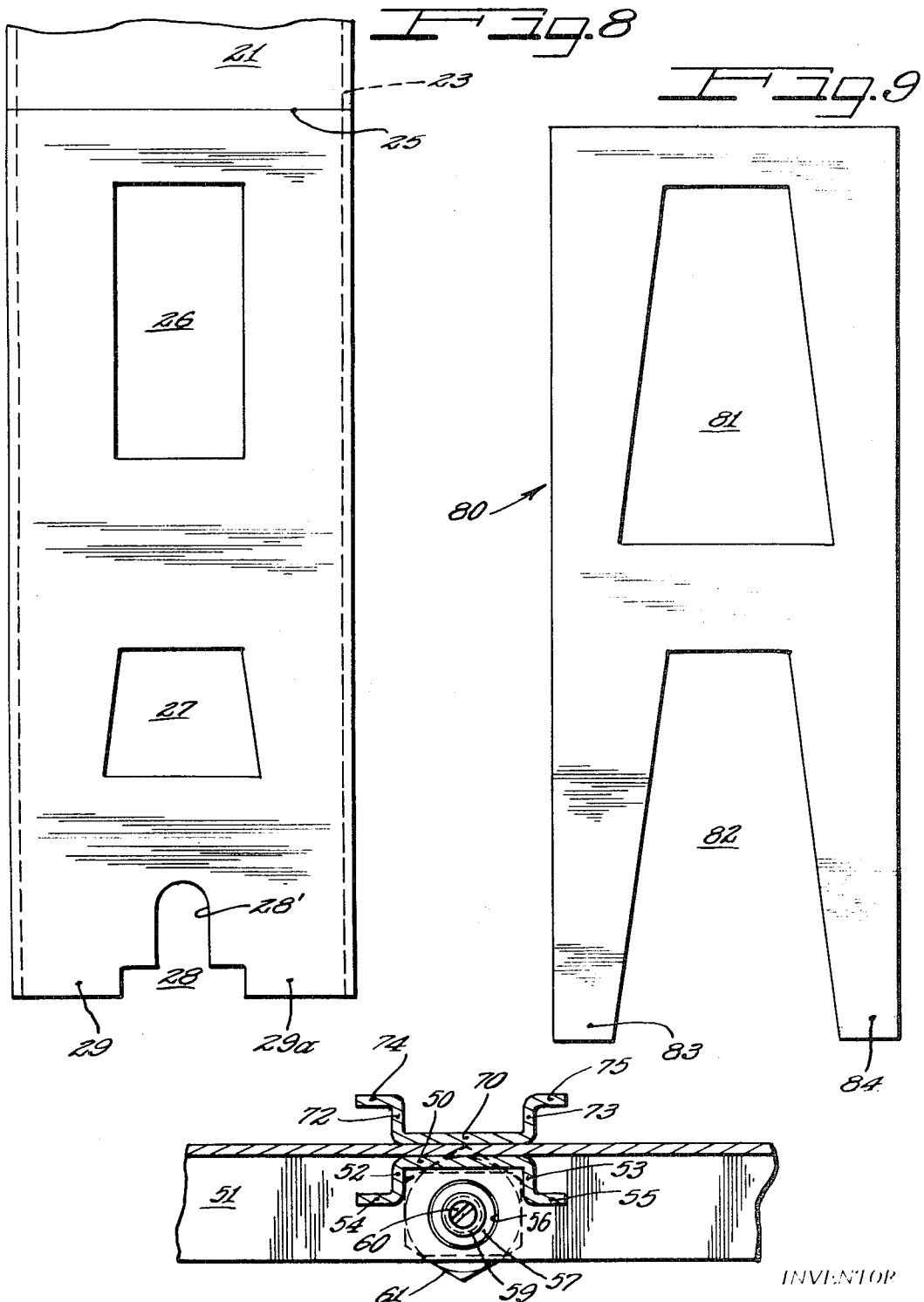


Fig. 7

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SHELVING CONSTRUCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to shelving assemblies and is particularly concerned with shelving assemblies formed from parts which are shipped unassembled and assembled as shelving units on an end-to-end connected basis to form continuous shelving of the type generally used in self-service stores.

2. Background of the Prior Art

Shelving assemblies for installations in self-service type of stores are generally known and widely used in the field of retail sales. Generally such shelving assemblies are manufactured and shipped in an unassembled form for assembly on a unit basis. Attachment of the units end-to-end forms the desired length of continuous shelving. It is also known in the art to provide such shelving with shelf brackets which may be releasably secured to upright columns of the shelving assemblies at any desired elevation in order to accommodate various heights of products to be carried on the shelf.

It is most desirable from a material handling, manufacturing, transportation and assembly standpoints to provide the shelving apparatus from material that is of a light gauge as possible while maintaining sufficient structural rigidity to carry the desired type of merchandise. Invariably, however, such constructions are misused in that the user is generally concerned with shelf space rather than product weight. For various reasons the shelves are overloaded to the extent that, not only do the structures become distorted, but may also suffer shear. These reasons stem from basic proven marketing principles which say, in effect, that increased sales result from displaying as much of a product as possible in a pleasing manner and as far forward on the shelf as possible so that the product is within easy reach of the customer. Accordingly, one reason for these adversities lies in the desire for a complete and pleasing display of a product which is heavier than the type originally considered. The total movement of shelf and product may exceed design specifications. This condition is aggravated in installations wherein the shelves are adjustable in height permitting the display of taller, and consequently heavier, products which increases the total moment of the shelf.

It is accordingly desirable, and a primary object of the present invention to provide shelving of the foregoing character in which the strength and rigidity of the apparatus is improved so that an increased product weight may be carried by the shelves without increasing the dimensions, material and gauge of the supporting structure.

Another object of the invention is to provide an improved shelving construction wherein increased product weight may be carried by the shelves and increased total weight may be carried by the shelf-supporting structure.

SUMMARY OF THE INVENTION

Briefly, according to the invention there is provided an increased lever arm for shelf-supporting brackets which are adjustably positioned at desired levels in slots of a supporting column. The supporting column includes means for engaging the lever arm to provide an opposing moment to the moment established by the weight of the shelf combined with the weight of the product carried by the shelf. The upright columns at the end of each shelving unit are connected together and supported by a transverse gusset including apparatus which releasably engages the columns and attached stiffening plates which add rigidity to the lower ends of the columns. This apparatus is also effective to guide the columns into desired positions during assembly and to support the weight of the shelving construction and the products carried on the shelves.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects and features of the invention, its organization and construction, will be best understood

from the following detailed description of an exemplary embodiment thereof taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of shelving under construction being formed in an assembly of individual shelf units in accordance with the principles of the present invention;

FIG. 2 is a fragmentary view, shown partially in cross section, illustrating the assembled relationship between the shelf brackets and the vertically upstanding shelf-supporting columns;

FIG. 3 is a cross section view taken along the line III—III of FIG. 2 showing the above assembled relationship in greater detail, in particular illustrating the extended lever arms of the shelf bracket tabs and the cooperable lances of the end columns;

FIG. 4 is a fragmentary isometric sectional view of a shelf and a supporting column illustrating the mated relationship therebetween;

FIG. 5 is a fragmentary view, shown partially in cross section, illustrating the assembled relationship between two upstanding shelf-supporting columns at the point of attachment to a transverse base supporting gusset;

FIG. 6 is an elevation of a fragmentary portion of the transverse supporting gusset illustrating the column supporting members and the apparatus for varying the elevation of the transverse gusset above the floor for leveling the assembled construction;

FIG. 7 is a cross-sectional view of a portion of the column supporting apparatus and the elevation varying or leveling apparatus taken along the line VII—VII of FIG. 6; and

FIGS. 8 and 9 are elevational views of cooperating portions of the column and a stiffening member for adding rigidity to the column in the area of its attachment to the transverse base gusset, FIG. 8 specifically illustrating an inwardly offset portion of the column for receiving the rigidity member of FIG. 9 and for receiving a portion of the thickness of the transverse base gusset so that the opposed facing surfaces of adjacent columns may be intimately or very closely disposed for the remainder of the vertically upwardly extent thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings a partially assembled shelving construction is shown generally at 10 formed by connecting shelving units 10a and 10b together on an end-to-end basis. Each unit generally comprises a plurality of vertically standing columns 20 for mounting a plurality of shelf assemblies 30. The columns 20 are disposed in a spaced-apart relation and have surface plates 90 secured therebetween to form shelving back members. The shelving back members are connected together and supported to form a free standing shelving construction by a plurality of transverse supporting base gussets 40.

As shown particularly in FIGS. 1, 2, 3 and 4 each upstanding column 20 is a generally U-shaped member including a base portion 21 and a pair of extending leg portions 23. The base portion 21 includes a plurality of aligned spaced-apart lances 22 extending inwardly between the leg portions 23. At least one of the leg portions includes a plurality of aligned spaced-apart vertically oriented slots 24 for receiving tabs 32, 33 and 34 of shelf bracket 31 at any desired elevation. The other leg portion may also be provided with slots for mounting and extending shelves in the opposite direction, as indicated in FIG. 1.

Inasmuch as it is well known in the art that the end mounting brackets may be either integral with the shelves, or may be affixed to, or in any other manner supporting the shelves, reference will only be made hereinafter to the brackets, it being understood that the term may also include a shelf or an entire shelf assembly.

For horizontal extension of bracket 31, tabs 32, 33 and 34 are fully inserted into desired ones of slots 24 at a slight downwardly directed angle and then moved and pivoted downwardly for an amount equal to the depth of slots 35 and

37 of bracket 31. The areas between slots 24 along forward edge of and between the slots of the tabs become the points of leverage against total shelf weight. Attention is invited, however, that as the upper edge of bracket 31 is positioned at a level whereat its tabs 32, 33 and 34 are accordingly positioned so as to be under and in contact with the lower edge of corresponding ones of lances 22, an extended lever arm is provided at each of the contacting tabs and lances for resisting downward movement of the extended end of shelf bracket 31.

Products carried on the upper shelves of a construction may be more fully displayed if the shelf is lowered at its forward end and secured at an angle to the horizontal. Therefore, to orient shelf bracket 31 at a downwardly extending angle from horizontal, tabs 32 and 33 are provided with additional slots 38 and 39, respectively. Insertion of the tabs is performed in a similar manner; however, the bracket 31 is, in this instance, supported by tabs 32, 33 and 34 in the areas of slots 37, 38 and 39 instead of slots 35 and 37.

The shelving construction illustrated in FIG. 1 is shown incomplete in that the construction may be extended by the connection of additional shelving units, or it may be capped by finishing strips as is well known in the art.

When the shelf is in a horizontal position, normally it carries a heavier load than when it is in a downward sloping position. Therefore, it is important to have enough strength built into the shelf to handle this heavier load. We do this by using both the slots at the front edge of the upright and the lances at the center of the upright.

Attention is now invited to FIGS. 5-9 which illustrate the apparatus for supporting the columns 20 in an upright position. Reference numeral 40 generally indicates the transverse supporting base gusset, the base gusset being particularly illustrated in detail in the area of attachment of the columns. It will be appreciated that the lower end of each column is offset inwardly, as particularly illustrated in FIGS. 5 and 8, the offset being given the reference numeral 25 and being of sufficient dimension to accommodate the thickness of the rigid member 80 (FIG. 9) and a portion of the thickness of the vertical web 41 of the base gusset 40 so that adjacent columns 20 may be supported by the base gussets so as to be as near to one another as possible over substantially their entire lengths.

Each of the base gussets 40 includes a vertically disposed web or plate 41 which has a pair of supporting members 42, 46 and 62, 66 attached on each side thereof by any suitable technique, such as riveting or welding. These supporting members, releasably engage and support columns 20. For example, supporting member 42 includes base portion 43 secured to web 41, a cup-shaped portion 44 for receiving the portion 21 of column 20 and associate rigid plate 80, and an outwardly directed portion 45 for guiding the column into the cup-shaped portion 44. Together with supporting member 62, member 42 forms a clamp for adjacent columns. The same is also true for members 46 and 66.

To better understand the relationship between the elements for securing the columns to the gusset, consider the rigid plate 80 of FIG. 9 to be welded to the outside of the base portion 21 of a column 20 below the offset 25 illustrated in FIG. 8 so that the trapezoidal aperture 81 provides access to the rectangular aperture 26 and the trapezoidal-shaped slot 82 provides access to the corresponding aperture 27 and a formed slot 28 of column 20. In order to secure the columns as closely together as possible and maintain the offset 25 at a minimum, aperture 81 and slot 82 are given the particular trapezoidal shape which corresponds to the trapezoidal shape of the corresponding supporting members, for example member 42. Of course, other shapes could be employed; however, the shape of the aperture and slot in rigid plate 80 should, of course, be such to accommodate and receive the supporting members, and it is preferred that the supporting members, and accordingly the apertures and slots in the rigid plate, have lateral edges which define individual points of convergence thereabove. Therefore, the edges of the apertures and slots of plate 80 may embrace the corresponding edges (e.g. edges 85-88 of FIG. 6) of

the supporting members as the former are moved downwardly during assembly so that the support members do not support the column at the upper edge defined by, for example, aperture 26 and aperture 81, but that the supporting members guide the columns during assembly, and preferably a component of the weight of the column is distributed along the lateral edges of the individual clamp members.

In FIGS. 8 and 9, the column is illustrated as having a pair of feet 29 and 29a and the rigid plate 80 as having a corresponding pair of feet 80 and 84 as defined by the slots 28 and 82, respectively. Slot 28 includes an open space 28' to accommodate and pass the threaded portion 60 of an elevational adjusting screw during assembly. The bottom edges of feet 29 and 29a rest on and the column 20 is supported by extended arms 52, 53, 54 and 55 of another type of supporting member 50 which is attached to web 41, the portions 54 and 55 extending parallel to web 41 and being integral with arms 52 and 53.

FIGS. 8 and 9 illustrate the direct dimensional relationships between the column 20 and the rigid plate 80; therefore, it is evident that feet 83 and 84 of plate 80 extend below feet 29 and 29a of column 20. Feet 83 and 84, upon assembly, are directed behind fingers 54 and 55 which prevents a "walkout" or movement of the lower end of the column away from the gusset structure.

Gusset 40 includes a horizontally disposed portion 51 which is integral with the web portion 41 and which has an aperture 56 therein in the area of the feet-supporting members 50-55. A member 57 including a threaded aperture 59 is secured to the bottom of gusset portion 51 and extends through aperture 56. The threaded member 57 engages an elevational adjusting or leveling screw having a threaded portion 60 and a head portion 61. The shelf unit may therefore be leveled by adjusting screw heads 61 which also serve as supporting feet for the assembled shelving units. As previously noted, the threaded screw portion 60 is prevented from interfering with the column 20 during assembly by the provision of slot 28' in the lower edge of the column.

Generally then there has been described a shelving construction of the type wherein shelving units are assembled and the units are then connected together on an end-to-end basis to form continuous shelving of a desired length. The shelf-supporting brackets are structurally improved over similar shelving constructions in that greater weight may be carried by the shelves due to the provision of greater moment opposition through an extended lever arm and a greater lever arm bearing than heretofore known. Further, the construction is provided with added strength and rigidity without a change of material or material characteristics and the increase in the product weight carrying capability is accounted for by the provision of increase strength and rigidity in the supporting structure.

Many other changes and modifications of my invention may become apparent to those versed in the art without departing from the spirit and scope of my invention as defined in the appended claims.

I claim:

1. A shelving assembly comprising

a vertical back member for arrangement in an aligned row with the other back members, said back member including a pair of spaced-apart plates and a pair of end columns disposed between and connected to said pair plates, each of said columns including a first portion having a plurality of aligned slots therein and a second portion having a plurality of aligned lances therein,

means for supporting said back member in a freestanding vertical position including a gusset disposed transversely of said spaced-apart plates including a vertically disposed web, first supporting members secured to said web, each of said first supporting members including a flat portion partially defined by lateral edges, each of said columns including a lower end and means at said lower end defining openings in said second portions, which openings are partially defined by lateral edges which bear on the lateral edges of said flat portions to support said columns, and

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each of said columns including a plate portion secured to said second portion at the lower end thereof, said second portion being offset in the area of said plate portion to accommodate the thickness of said plate portion and at least a portion of the thickness of said web, said plate portion having openings therein which are generally aligned with the openings in said second portion and of a shape to accommodate said flat portions in the same plane therewith, and

shelf means including a pair of shelf-supporting brackets for mounting on said end columns, each of said brackets including rearwardly extending tab means for insertion into the slots of said first portion and for bearing against the lances of said second portion.

2. The shelving assembly set forth in claim 1, wherein said columns are U-shaped and each of said second portion thereof is the base portion of the U, and said lances are directed inwardly of the U.

3. The shelving assembly set forth in claim 1, wherein said tab means includes a plurality of tabs at least some of said tabs including an upper edge for bearing against said lances and a lower edge including a slot therein vertically aligned with similar slots of the other tabs for receiving the edges of the slots in said first portion of said columns when said tabs are inserted therein.

4. The shelving assembly set forth in claim 3, wherein said plurality of tabs includes a plurality of angularly aligned slots in said lower edges thereof for receiving the edges of the slots

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in said first portion when said tabs are inserted therein at an angle to the horizontal.

5. The shelving assembly set forth in claim 1, wherein said means defining openings includes upper edges which partially define the openings and wherein each of said outwardly extending portions of said supporting members include a horizontally disposed cup-shaped segment for receiving said upper edges of said openings in said columns, and an angularly directed segment for guiding said upper edges into said cup-shaped segment.

6. The shelving assembly set forth in claim 1, wherein said supporting means includes leveling screw means threadedly engaging said gusset, said screw means including a head portion for contacting a supporting surface and an elongate threaded portion engaging said gusset, and each said column includes a slot in the lower edge thereof to prevent interference between said screw and said column.

7. The shelving assembly set forth in claim 1, wherein said lateral edges of said flat portions of said first supporting members are disposed to define a point of convergence thereabove and guide said column during assembly to the supporting means.

8. The shelving assembly set forth in claim 7, wherein the openings in each of said plates are partially defined by edges which conform to and bear against the guiding edges of said flat portions of said supporting members.

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