United States Patent

Block et al.

[15] **3,677,416**

[45] **July 18, 1972**

[54] SHELVING STRUCTURE

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[73] Assignee: **Quaker Industries Inc.**, Antioch, Ill.

[22] Filed: **June 1, 1970**

[21] Appl. No.: **41,976**

[52] U.S. Cl. **211/148**, 108/161, 312/140

[51] Int. Cl. **A47f 5/00**

[58] Field of Search 211/148, 177; 108/56, 155, 108/154, 161; 248/216, 221, 222, 241, 316; 312/111, 140

[56] **References Cited**

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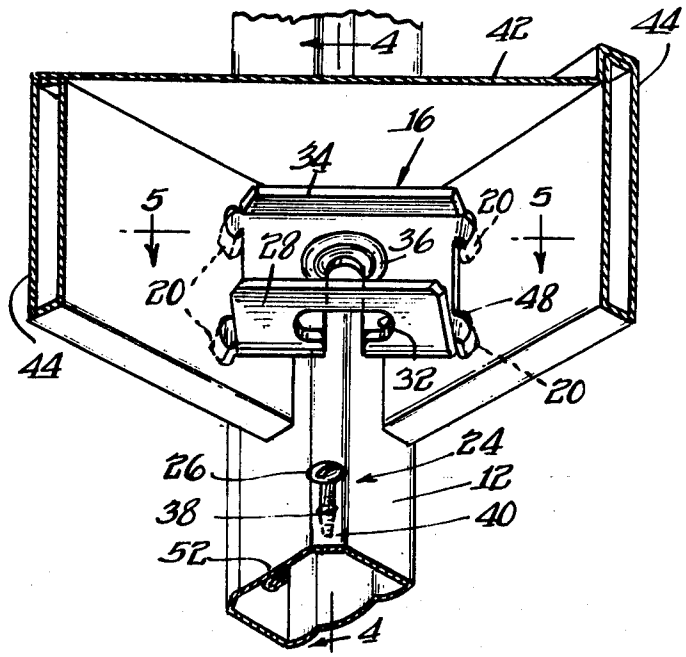
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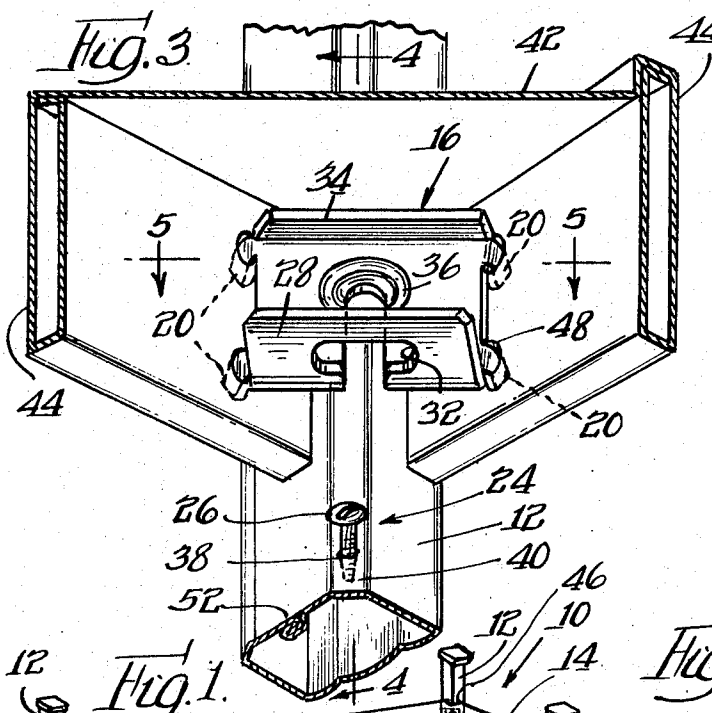
Primary Examiner—Nile C. Byers, Jr.
Attorney—Olson, Trexler, Wolters & Bushnell

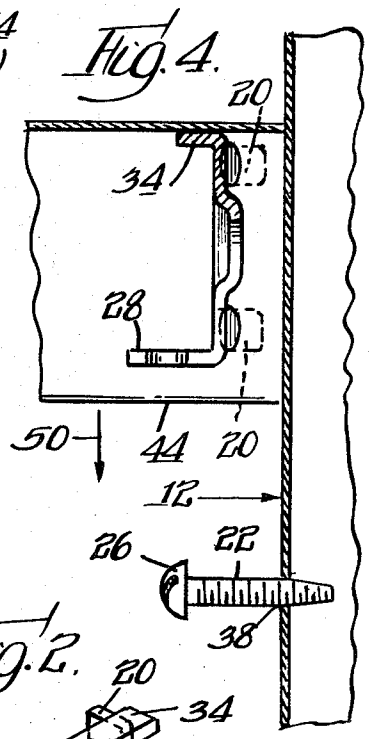
[57] **ABSTRACT**

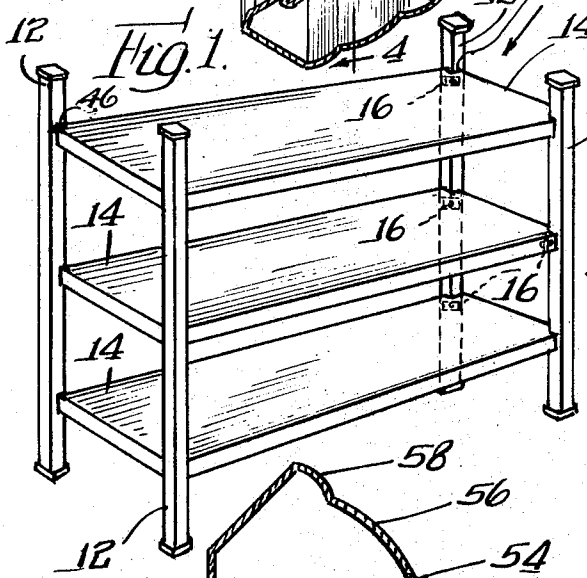
A shelving structure of the knock-down type which includes novel clip members for maintaining the individual shelf units and end standards in assembled relationship. Each of the clip members includes a body portion having tangs or prongs engageable with adjacent peripheral flanges on the individual shelf units and a slot opened at one edge of the body portion for receiving one of a plurality of fastening devices which is preferably pre-connected to an associated end standard, the fastening device being thereafter further secured to the end standard for drawing the shelf unit, clip member and end standard into a tight assembled relationship.

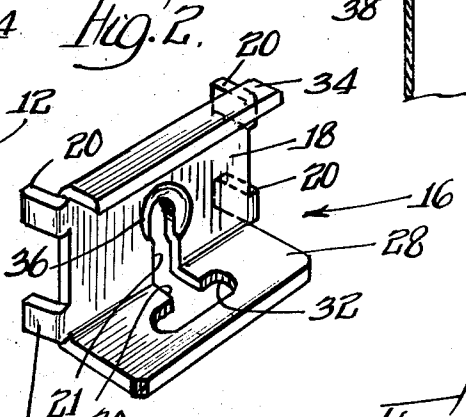
10 Claims, 6 Drawing Figures

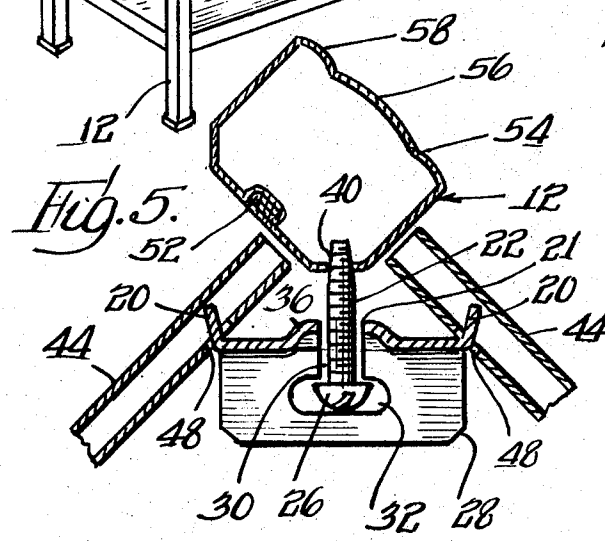


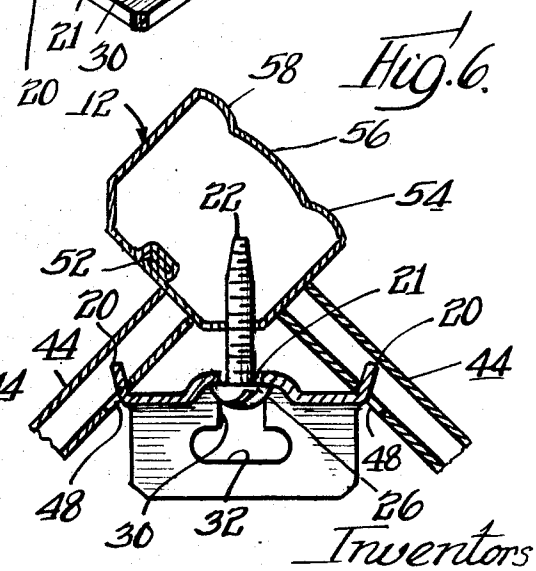












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SHELVING STRUCTURE

BACKGROUND OF THE INVENTION

This invention relates generally to shelving structures, and more particularly to shelving structures of the knock-down type which employ joint arrangements for connecting together the individual components thereof.

In general, shelving units of the type to which the present invention is directed, are designed so that they may be manufactured and shipped in a knocked-down condition. Accordingly, it is the user who must ultimately effect assembly thereof, which involves primarily the joining of the individual shelf units to the end standards. Thus, any improvement over the prior art joint arrangements which affords ease and rapidity of assembly constitutes an extremely desirable and important contribution to the art.

Accordingly, an important object of the present invention is to provide a shelving structure which includes a novel joint arrangement for maintaining the individual components of the shelving structure in assembled relation.

A more particular object of the present invention is to provide a new and improved clip member for use with a shelving structure, the clip member including a slot therein adapted to receive a fastening device which has been preconnected to one component of the shelving structure wherein rapidity and ease of assembly and disassembly is achieved.

Yet another object of the present invention is to provide a shelving structure of the above described type having new and improved end standards which are constructed to enhance the rigidity of the assembled structure.

These and other objects and features of the invention will become more apparent from a reading of the following descriptions.

DESCRIPTION OF THE DRAWINGS

In the Drawings:

FIG. 1 is a perspective view of a shelving assembly constructed in accordance with the present invention;

FIG. 2 is a perspective view of a clamp member constructed in accordance with the present invention and used with the above-stated shelving assembly;

FIG. 3 is a partial perspective view of the point of juncture of an individual shelf unit to an end standard, with the horizontal supporting surface of the shelf unit broken away;

FIG. 4 is a sectional view taken substantially along line 4—4 in FIG. 3;

FIG. 5 is a cross-sectional view taken generally along line 5—5 of FIG. 3; and

FIG. 6 is a cross-sectional view similar to that of FIG. 5, however with the shelving structure being shown in its assembled condition.

DETAILED DESCRIPTION

Referring now to the drawings, wherein like parts are designated by like reference numerals throughout the various figures, a shelving structure constructed according to the present invention is illustrated in FIG. 1, and generally designated by the reference numeral 10. The shelving structure is comprised essentially of a plurality of identical longitudinal end standards 12, a plurality of individual identical substantially rectangular shelf units 14, and a plurality of identical clip members 16 which connect the shelf units to the end standards.

In accordance with the present invention, each of the clip members 16, which is preferably stamped from sheet metal to form a completely unitary or integrated element, comprises a rectangular base or body portion 18, as seen best in FIG. 2. The base includes a plurality of prongs or tangs 20 which flare outwardly and at an angle from the shorter edges of the base for assembling the clip member to one of the shelf units 14 in a manner to be described hereinafter. The base or body portion further includes a longitudinal slot 21 which is opened at one longer edge of the base and which extends inwardly substantially to the center of the base for receiving the longitudinal body 22 of a screw or other suitable fastening device 24 (FIG. 3) having a head portion 26, the fastening device being preferably pre-connected to an associated end standard 12 in a manner to be described with respect to FIGS. 3 to 6. An indented circular seat 36 is embossed or otherwise suitably formed around the inwardly extending end of slot 21 and is adapted to receive head 26 of fastening device 24.

The clip member further includes a first rectangular stiffening flange 28 having one longer edge integral with the slotted edge of body portion 18 such that the flange and body portion are preferably perpendicular to each other. The stiffening flange defines a longitudinal slot 30 which is opened at the connected edge of the flange and which extends towards the center thereof, where it joins a substantially elliptical transverse slot 32. Slot 30 is positioned adjacent slot 21 so that these two slots in conjunction with elliptical slot 32 provide a single continuous bent T-shaped opening, as seen in FIG. 2, for receiving fastening device is connected to an end standard 12 and the clip member 16 is assembled to the shelf unit 14. A second rectangular stiffening flange 34 is provided on the otherwise free edge of body portion 18 opposite to that of flange 28.

Referring now to FIG. 3, each end standard 12, which is constructed in a manner to be described hereinafter, is provided with a plurality of vertically spaced apertures 38, which are positioned along a corner 40 of the standard for receiving fastening devices 24, the position of each aperture determining the location of a corresponding shelf unit 14 on the end standard. Also, as illustrated, the individual shelf units 14 include a flat horizontal body portion 42 and peripheral flange formations 44 depending therefrom. A notch 46 located at the corners of the horizontal body portion cooperates with the edge flanges 44 to provide a recess for reception of corner 40 of the end standard 12. A plurality of vertically spaced apertures 48 are appropriately dimensioned and positioned at the ends of each flange formation for receiving prongs or tangs 20 of an individual clip member 16 for supporting the latter, as can best be seen in FIGS. 3, 5 and 6.

Turning now to the preferred manner of assembling shelving structure 10, reference is initially made to FIGS. 4 and 5. While this description will only refer to the operational steps required for connecting one corner of an individual shelf unit 14 to one end standard 12, it is to be understood that the preferred assemblage thereof contemplates that identical steps, which are required for assembling the entire shelving structure, are to be performed before going to subsequent steps.

With the above in mind, a fastening device 24 is initially inserted into a cooperating aperture 38 so that the longitudinal body 22 of the fastening device extends only partially into end standard 12, a substantially greater portion of body 22 extending outwardly therefrom, as can best be seen in FIG. 5. Thereafter, or simultaneously therewith, clip member 16 is assembled rather loosely to one corner of an individual shelf unit 14 by inserting prongs or tangs 10 into cooperating apertures 48 of flange formations 44. The clip member is positioned so that stiffening flange 28 remains below the remaining structure of clip member 16 and extends outward from the corner of the shelf unit.

With the sub-assembly comprising shelf unit 14 and clip member 16 and the sub-assembly comprising end standard 12 and fastening device 24 connected in the aforesaid manner, the first mentioned sub-assembly is positioned against the end standard slightly above fastening device 24, as seen best in FIGS. 3 and 4. Thereafter, the shelf unit and clip member are moved downward, as indicated by arrow 50 in FIG. 4, so that the fastening device initially passes through slots 30 and 32, and then slot 21. This sub-assembly comes to rest when the outwardly extending portion of longitudinal body 22 engages the inwardly extending end of slot 21. With the sub-assemblies positioned in this manner, a screw driver or other suitable means is utilized for tightening fastening device 24 so that its

head **26** firmly engages indented seat **36** of clip **16**, this being shown best in FIG. **6**. Simultaneously therewith, the prongs or tangs **20** are caused to wedge against one side of the apertures **48** so as to firmly hold flange formations **44** against adjacent sides of the end standard.

With the shelving structure **10** constructed and assembled in the aforementioned manner, it is readily apparent that certain more difficult operational steps are eliminated, the most obvious one being that of attempting to initially insert a screw or other type of fastening device through a plurality of unconnected components. It is to be understood, however, that other suitable assembly methods are contemplated by the invention.

Returning briefly to FIGS. **3**, **5** and **6**, it is to be noted that end standard **12**, which is preferably constructed of sheet metal, is rolled or otherwise formed so as to display a substantially rectangular cross-section which is longitudinally sealed together on one side by a locking seam **52**. In addition, the opposite side of the end standard displays three longitudinally extending adjacent arcuate sections **54**, **56** and **58**. It has been found that this unique design enhances the rigidity of the shelving structure by preventing the substantial force which is applied to the end standard by flange formations **44** and fastening device **24** from deflecting or otherwise twisting the end standard.

While a particular embodiment of the invention has been shown, it should be understood, of course, that the invention is not limited thereto, since many modifications may be made. It is, therefore, contemplated to cover by the present application any such modifications as fall within the true spirit and scope of the appended claims.

The Invention is claimed as follows:

1. A clip member for securing a shelf unit to an end standard comprising an upstanding body portion, means for connecting said body portion to said shelf unit, upwardly extending slot means in said body portion including a lower end portion opened at a lower edge of the body portion for receiving a fastening device preconnected to the end standard, a stiffening flange having one edge connected to said lower edge of said body portion, said stiffening flange including second slot means opened at the connected edge of said stiffening flange and extending inwardly therefrom, the open end of said second slot communicating with the open end of said first mentioned slot means for forming one continuous slot.

2. A clip member according to claim **1** including a second flange having one edge thereof connected to a second edge of said body portion.

3. A shelving structure comprising a plurality of upstanding end standards respectively having a plurality of vertically spaced apertures formed therein, a plurality of sets of fastening devices respectively having shank portions inserted into certain of said apertures and end portions with enlarged heads projecting from the end standards, the fastening devices of each set being at the same level, a plurality of shelf units assembled with the standards at levels corresponding to the levels of the sets of fastening devices, and clip members joining said shelf units to said end standards, each of said clip members including a body portion connected to a shelf unit, each of said body portions including upwardly extending slot means having an opening at a lower edge of the body portion for receiving through said opening the shank of a fastening device with said enlarged head overlapping the edges of an associated slot at the side of the clip member body portion opposite to the side facing said apertures for enabling the shelf units and the clip members to be assembled with the fastening devices after the fastening devices have been connected to the end standards.

4. A shelving structure according to claim **3** wherein said shelf units includes a horizontal portion and depending peripheral flanges, each of said clip members being assembled to a pair of adjacent flanges.

5. A shelving structure according to claim **4** wherein said adjacent depending flanges are apertured, and each said clip member is provided with tangs which are received in said apertures to effect assembly between the clip members and the flanges.

6. A shelving structure according to claim **1** wherein each of said fastening devices is a screw member, and the body portion of each said clip member includes an indented seat substantially surrounding an inner end portion of said slot means for receiving and retaining the head of said screw upon tightening of the screw.

7. A shelving structure according to claim **3** wherein each of said end standards is constructed of sheet metal and formed into an elongated hollow member having a substantially rectangular cross-section, said member including a longitudinal locking seam securing opposite longitudinal edges thereof together.

8. A shelving structure according to claim **7** wherein one side of said member includes a plurality of adjacent arcuate sections extending longitudinally thereof.

9. A shelving structure comprising a plurality of end standards having at least one aperture formed therein for receiving a fastening device, at least one shelf unit adapted to be assembled with said standards, and clip members for joining said shelf units to said end standards, each of said clip members including a body portion having means for assembling the clip member to a shelf unit, and slot means opened at one edge of said body portion and extending inwardly therefrom, said slot means being provided for receiving said fastening device whereby said end standards and said shelf unit are held together, said clip member including a stiffening flange having one edge thereof connected to said one edge of said body portion, said stiffening flange including second slot means opened at the connected edge of said stiffening flange and extending inwardly therefrom, the open end of said last-mentioned slot means communicating with the open end of said first-mentioned slot means for forming one continuous slot.

10. A shelving structure according to claim **9** wherein each of said clip members includes a second flange having one edge thereof integrally connected to a second edge of said body portion.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,677,416 Dated July 18, 1972

Inventor(s) Leonard A. Block and William J. Dunn

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 2, line 19, after "device" insert --24 preferably after the fastening device--

Col. 2, line 58, change "tangs 10" to --tangs 20--

Signed and sealed this 20th day of February 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334