

[72] Inventor **Bernard E. Featherman**
Philadelphia, Pa.
[21] Appl No. **813,654**
[22] Filed **Apr. 4, 1969**
[45] Patented **July 13, 1971**
[73] Assignee **Bernard Franklin Company, Inc.**
Philadelphia, Pa.

[54] **ERECTIBLE METAL SHELVING**
4 Claims, 8 Drawing Figs.

[52] U.S. Cl. 211/176,
108/107, 211/148, 287/189.36
[51] Int. Cl. A47b 9/14,
A47f 5/10
[50] Field of Search 211/176,
177, 148, 134, 149; 108/107, 110, 144, 106;
248/243, 224, 220.5, 245, 106; 5/296, 304, 282,
285, 292; 287/54 C, 189.36 C, 92.7; 292/302,
342-343

[56] **References Cited**
UNITED STATES PATENTS
1,554,011 9/1925 Lehman 108/107

1,871,972	8/1932	Fenstermaker	248/243 X
2,227,704	1/1941	Collins	5/296 X
2,644,591	7/1953	McMahan	211/148 X
2,648,074	8/1953	Jonas	5/296
2,958,427	11/1960	Bianchi	211/148
3,106,297	10/1963	Schroeder	211/148
3,195,735	7/1965	Jay	211/148
3,305,880	2/1967	Cloutier	5/296 X
3,273,847	9/1966	Berman	211/148 X

Primary Examiner—Ramon S. Britts
Attorney—Donald S. Cohen

ABSTRACT: Erectible metal shelving having bracing members which extend horizontally between the supporting posts of the shelving and are relatively narrow so that the shelves of the shelving are accessible from all sides of the shelving. In addition, the bracing members can be secured to the posts without any special tool so that the shelving can be easily assembled and disassembled.

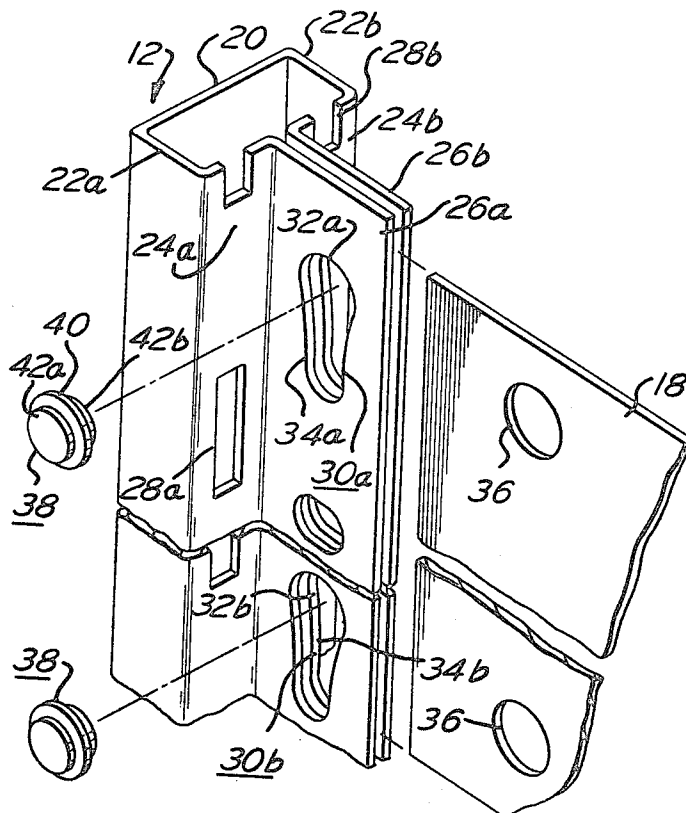


FIG. 5

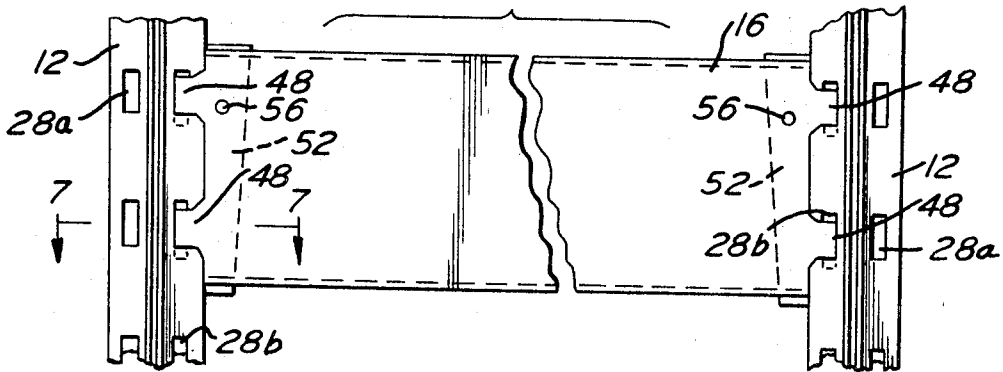


FIG. 6

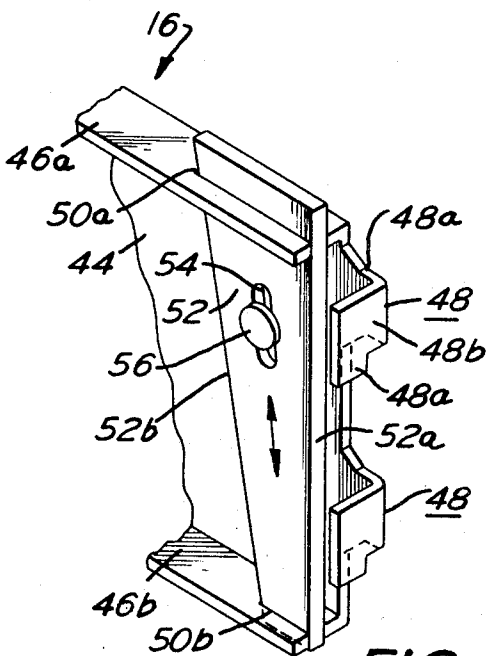
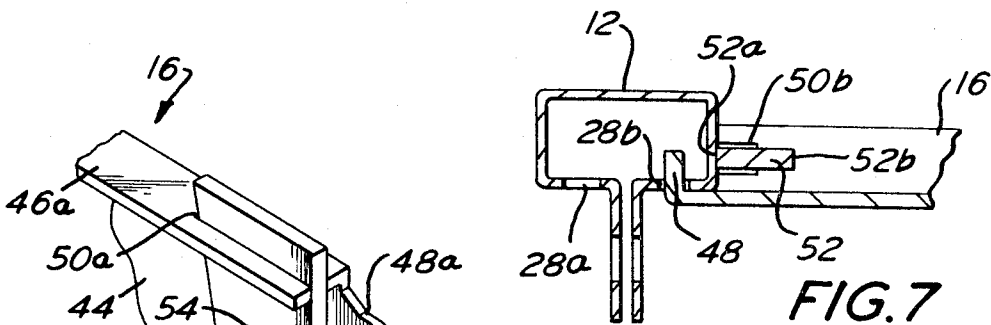
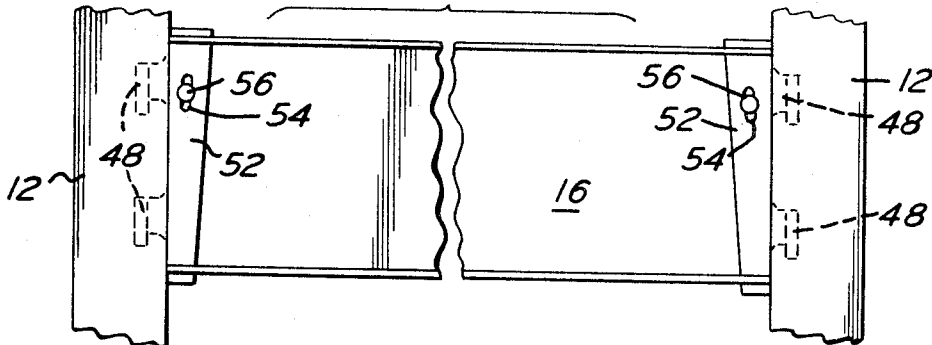


FIG. 8

INVENTOR
BERNARD E. FEATHERMAN
BY

[Signature]

ATTORNEY

ERECTIBLE METAL SHELVING

BACKGROUND

Erectible metal shelving generally comprises a set of at least four upright metal posts and a plurality of horizontally extending metal shelves mounted between the posts with the posts being at the corners of the shelves. One type of such shelving is shown in the patent to Rosenberg, U.S. Pat. No. 2,631,913, issued Mar. 17, 1953, entitled "Erectible shelving," and the patent to Rosenberg, U.S. Pat. No. 2,719,633, issued Oct. 5, 1955, entitled "Erectible Shelving and Brackets Employed Therein." In such shelving it is necessary to brace the upright posts to support them in the upright position. Heretofore such bracing of the upright posts has been achieved either by metal sheets secured between the upright posts along the sides and back of the shelving, or by crossing metal strips extending diagonally between the upright posts at the sides and back of the shelving. Such means for bracing the shelving has the disadvantage that the bracing members block the sides and back of the shelving so that articles can only be placed on the shelves from the front of the shelving. However, there are many uses for shelving where it is desirable to be able to place articles on the shelves from both the front and back as well as the sides.

SUMMARY OF INVENTION

The shelving of the present invention includes four upright posts, a back brace extending horizontally between and secured to two of the posts, and a separate side brace extending horizontally between and secured to each of the other two posts and a separate one of the two posts which are secured together by the back brace. The brace members firmly secure the posts together in an upright position so that shelves can be mounted between the posts. The back brace is secured to each of its posts by hooks on the ends of the brace which fit into openings in the posts, and camming members which engage the posts to prevent the hooks from coming out of the openings in the posts. The side braces fit between flanges on the posts and are supported on the posts by pins which extend through the brace and keyhole-shaped openings in the flanges which lock the pins in place.

BRIEF DESCRIPTION OF DRAWINGS

For the purpose of illustrating the invention there is shown in the drawings forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIG. 1 is a perspective view of the erectible shelving of the present invention.

FIG. 2 is a plan view showing a side brace mounted on a post of the shelving.

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

FIG. 4 is an exploded perspective view showing the manner of mounting a side brace on a post of the shelving of the present invention.

FIG. 5 is a plan view of the back of a portion of the shelving showing the back brace mounted on the upright posts.

FIG. 6 is a plan view from the front of the shelving showing the back brace mounted on the upright posts.

FIG. 7 is a sectional view taken along line 7-7 of FIG. 5.

FIG. 8 is a perspective view of one end of a back brace.

DESCRIPTION OF INVENTION

Referring initially to FIG. 1, the shelving of the present invention is generally designated as 10. Shelving 10 comprises a plurality of upright metal posts 12, at least four posts are required, and a plurality of rectangular metal shelves 14 extending between and supported on the posts 12 with the posts being at the corners of the shelves. A back brace 16 extends between and is secured to two of the posts 12. In the construction shown, the back brace 16 is a brace extending along the

long edge of the shelves 14. Side braces 18 extend along the short edges of the shelves 14, and are secured to a pair of the posts 12. The braces 16 and 18 are positioned directly under a shelf 14. Generally, a set of the braces 16 and 18 are provided under the uppermost shelf and a set under the lowermost shelf so as to properly brace the shelving 10. However, in a tall shelving 10, additional sets of the braces 16 and 18 may be provided at one or more of the intermediate shelves.

Referring to FIG. 4, each of the posts 12 is of a hollow sheet metal construction having a rear wall 20, a pair of sidewalls 22a and 22b, and a pair of aligned front walls 24a and 24b, all of which form a hollow rectangular configuration. A pair of juxtaposed, parallel flanges 26a and 26b extend forwardly from the adjacent edges of the front walls 24a and 24b respectively. The front walls 24a and 24b have a plurality of spaced, elongated rectangular openings 28a and 28b respectively therein. The openings 28a and 28b are arranged with their longest edges extending longitudinally along the front walls 24a and 24b. The flanges 26a and 26b are provided with a plurality of longitudinally spaced keyhole-shaped openings 30a and 30b respectively with each of the openings 30a in the flange 26a being in alignment with a separate opening 30b in the flange 26b. The keyhole-shaped openings 30a and 30b have circular upper portions 32a and 32b, and an elongated lower portions 34a and 34b extending downwardly from the upper portions and being narrower than the diameter of the upper portions.

Each side brace 18 is a rectangular metal sheet of a thickness equal to the spacing between the flanges 26a and 26b of a post 12. The side brace 18 has a pair of spaced circular holes 36 therethrough at each end thereof. The holes 36 are of the same diameter as the upper portions 32a and 32b of the keyhole-shaped openings 30a and 30b, and are spaced apart the same distance as the spacing between the upper portions of a pair of the keyhole-shaped openings. Pins 38 are used to secure the side brace 18 to the post 12. Each pin 38 comprises a cylindrical center portion 40 and smaller diameter cylindrical end portions 42a and 42b. The center portion 40 is of the same diameter as the hole 36 in the side brace 18 and is of a thickness equal to the thickness of the side brace. The end portions 42a and 42b are of a diameter equal to the width of the lower portions 34a and 34b of the keyhole-shaped openings 30a and 30b, and are of a thickness not less than the thickness of the flanges 26a and 26b. The side brace 18 is mounted on the post 12 by inserting the end of the side brace between the flanges 26a and 26b of the post until the holes 36 in the side brace are in alignment with the upper portions 32a and 32b of the keyhole-shaped openings 30a and 30b. A separate pin 38 is inserted into each set of aligned keyhole openings 32a and 32b and hole 36 until the center portion 40 of the pin is within the hole 36. The side brace 18 is then forced downwardly moving the end portions 42a and 42b of the pins 38 into the lower portions 34a and 34b of the keyhole-shaped openings 32a and 32b as shown in FIG. 2. As shown in FIG. 3, since the center portions 40 of the pins 38 are larger than the width of the lower portions 34a and 34b of the keyhole-shaped openings 32a and 32b, the pins 38 cannot move axially. Thus, the pins 38 are locked in place so as to secure the side brace 18 to the post 12.

Referring to FIGS. 5-8, the back brace 16 comprises an elongated, rectangular metal sheet 44 having a pair of parallel flanges 46a and 46b extending along the elongated upper and lower edges thereof and projecting perpendicularly in the same direction therefrom. At each end of the metal sheet 44 are a pair of spaced mounting hooks 48. As shown in FIG. 8, each mounting hook 48 comprises a first portion 48a extending from the edge of the metal sheet 44 in the same plane as the metal sheet, a second portion 48b extending perpendicularly from the end of the first portion 48a in the same direction as the flanges 46a and 46b, and a third portion 48c extending downwardly from the end of the second portion 48b. The length of the first portion 48a of the hook 48 is substantially equal to the distance between the rectangular openings 28a and 28b in the front walls 24a and 24b of the post 12 and the

adjacent sidewalls 22a and 22b of the post. The length of the second portion 48b of the hook 48 is substantially equal to the thickness of the front walls 24a and 24b of the post 12. The height of the hook 48 at its free end is no greater than the length of the rectangular openings 28a and 28b in the front walls 24a and 24b of the post 12. The hooks 48 at each end of the metal sheet 44 are spaced apart a distance equal to the spacing between the rectangular openings in each of the front walls of the post.

The flanges 46a and 46b have elongated slots 50a and 50b at each end thereof. The slots 50a in the flange 46a are longer than the slots 50b in the flange 46b. A separate wedge-shaped camming member 52 extends across each end of the metal sheet 44 and extends through the slots 50a and 50b in the flanges 46a and 46b. The edge 52a of the camming member 52 which is adjacent the ends of the flanges 46a and 46b is parallel to the end edge of the metal sheet 44, and the opposite edge 52b of the camming member 52 extends at an angle to the edge 52a so that the upper end of the camming member is wider than its lower end. The camming member 52 has an elongated opening 54 therethrough which extends parallel to the angled edge 52b of the camming member. A headed pin 56 extends through the opening 54 and is secured to the metal sheet 44 so as to secure the camming member 52 to the metal sheet 44 but allowing relative movement between the camming member and the metal sheet in the directions of the double-headed arrow in FIG. 8. The pin 56 is positioned so that when the bottom of the opening 54 engages the pin, the edge 52a of the camming member 52 does not extend beyond the ends of the flanges 46a and 46b. However, when the top of the opening 54 engages the pin 56, the edge 52a of the camming member 52 does extend beyond the ends of the flanges 46a and 46b.

To secure a back brace 16 to a pair of posts 12 as shown in FIGS. 5 and 6, the back brace 16 is placed between the posts 12 with the mounting hooks 48 extending toward the front walls 24a and 24b of the posts. With the camming members 52 being in their uppermost position, the mounting hooks 48 are inserted through the rectangular openings 28a and 28b of the posts 12 until the first portions 48a of the mounting hooks 48 engage the front walls 24a and 24b of the posts. In this position the third portions 48c of the mounting hooks 48 extend beyond the inner surfaces of the front walls 24a and 24b of the posts 12. The back brace 16 is then moved downwardly with respect to the posts 12 until the second portions 48b of the mounting hooks 48 are seated on the bottom edges of the rectangular openings 28a and 28b. In this position the bottom ends of the third portions 48c of the mounting hooks 48 are behind the inner surfaces of the front walls 24a and 24b of the posts so that the back brace 16 cannot be moved back away from the posts 12. The camming members 52 are then moved downwardly until their edges 52a engage the sidewalls 22a and 22b of the posts so as to firmly secure the back brace 16 to the posts 12. By striking the tops of the camming members 52 a blow with a hammer or a like instrument, the camming members 52 can be wedged more tightly against the posts 12 so as to more firmly secure the back brace 16 to the posts.

To assemble the shelving 10, two posts 12 are secured together by a pair of back braces 16 in the manner previously described. One of the back braces 16 is mounted adjacent the top ends of the posts 12, and the other back brace 16 is mounted adjacent the bottom ends of the posts. Two additional posts 12 are then each secured to a separate one of the first-named posts by a pair of side braces 18 in the manner previously described. The four posts 12 are thus firmly secured together in an upright position and are ready to have the shelves 14 mounted thereon. Of course the assembling of the shelving 10 can be reversed with two sets of the posts 12 being first secured together by the side braces 18, and then secured together by back braces 16. If the posts 12 are very tall, additional back braces 16 and side braces 18 can be provided. The construction of the shelves 14 and the manner of mounting the shelves 14 on the posts 14 form no part of the

present invention. However, the shelves 14 can be of the construction shown in the Rosenberg U.S. Pat. Nos. 2,631,913 and 2,719,633 and can be mounted on the posts by the hooks shown in the Rosenberg patents.

Thus, there is provided by the present invention a metal shelving having bracing members which extend horizontally between the posts of the shelving and are relatively narrow so that they leave the shelves accessible from all sides of the shelves. In addition, the bracing members firmly secure the posts of the shelving together, and can be secured to the posts without any special tools so that the shelving can be easily assembled and disassembled.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and accordingly, reference should be made to the appended claims rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. An erectible shelving comprising:

a. a pair of spaced upright metal posts, each of said posts having a pair of parallel flanges projecting therefrom with the flanges on each of said posts extending toward the other post, each of said pair of flanges having aligned keyhole-shaped openings therethrough, each of said openings having an upper portion and an elongated portion extending downwardly from the upper portion and being narrower than the width of the upper portion;

b. a flat sheet metal brace extending between said posts with each end of the brace fitting between the flanges of a separate one of the posts, said brace having an opening through each end thereof of the same size and shape as the upper portion of the keyhole-shaped openings in the flanges; and

c. a separate pin extending through each of the aligned openings in the flanges and the opening in the brace to secure the brace to the posts, each of said pins having a central portion fitting in the opening in the brace and end portions projecting from the central portion and fitting in the lower portions of the keyhole-shaped openings in the flanges, the central portion of each pin having a transverse shape and size corresponding to the shape and size of the openings in the brace and an axial dimension equal to the thickness of the brace, and the end portions have a transverse area smaller than the transverse area of the central portion and one transverse dimension equal to the width of the lower portion of the keyhole-shaped openings.

2. An erectible shelving in accordance with claim 1 in which the flanges of each of said posts have a plurality of the keyhole-shaped openings longitudinally spaced along the flanges, the brace has a pair of openings therethrough at each end thereof with each of the openings in the brace being in alignment with a separate set of the keyhole-shaped openings and a separate pin extends through each of the sets of openings.

3. An erectible shelving comprising:

a pair of spaced upright posts, each of said posts having vertical walls and an opening through one of the vertical walls;

a rectangular sheet metal brace extending horizontally between said posts;

a separate hook integral with each end of said brace, each of said hooks including a first portion extending from its respective end of the metal sheet in the same plane as the metal sheet, a second portion extending from the end of the first portion and perpendicular to the plane of the metal sheet, and a third portion extending downwardly from the end of the second portion, the second portion of each hook extending through an opening in the wall of a post and resting on the bottom edge of the opening, and the third portion extending downwardly along the wall of the post; and

5

a separate camming member slidably supported on the brace at each end thereof and extending along the entire height of the end, each of said camming members having an edge which is juxtaposed to and parallel with an end edge of the metal sheet and an elongated opening therethrough which extends at an angle to said edge of the camming member, and a separate headed pin extending through the opening in each of the camming members and secured to said metal sheet so as to secure the camming members to the metal sheet but allow relative movement between the camming members and the metal

6

sheet, each of said camming members engaging a wall of its respective post to lock the brace to the posts.

4. An erectible shelving in accordance with claim 3 in which the brace has parallel flanges extending perpendicularly from the top and bottom edges of the metal sheet, each of said flanges has a separate slot therein extending longitudinally from each end thereof, and each of the camming members extends across the metal sheet and through the slots in the flanges at its respective end of the brace.

15

20

25

30

35

40

45

50

55

60

65

70

75