

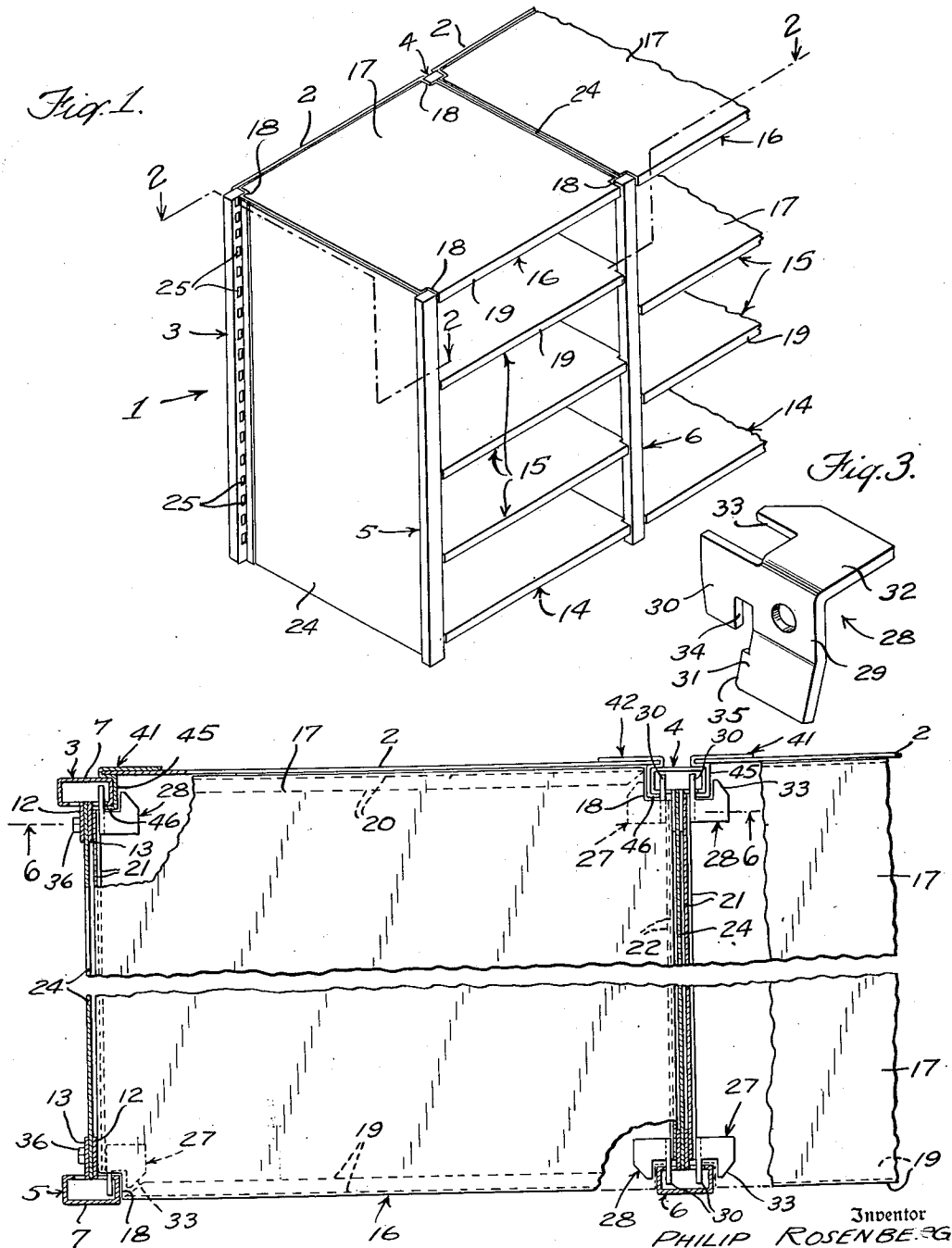
March 17, 1953

P. ROSENBERG
ERECTIBLE SHELVING

2,631,913

Filed March 21, 1949

2 SHEETS—SHEET 1



By

Moses, Nott, Crews + Berry
Attorneys

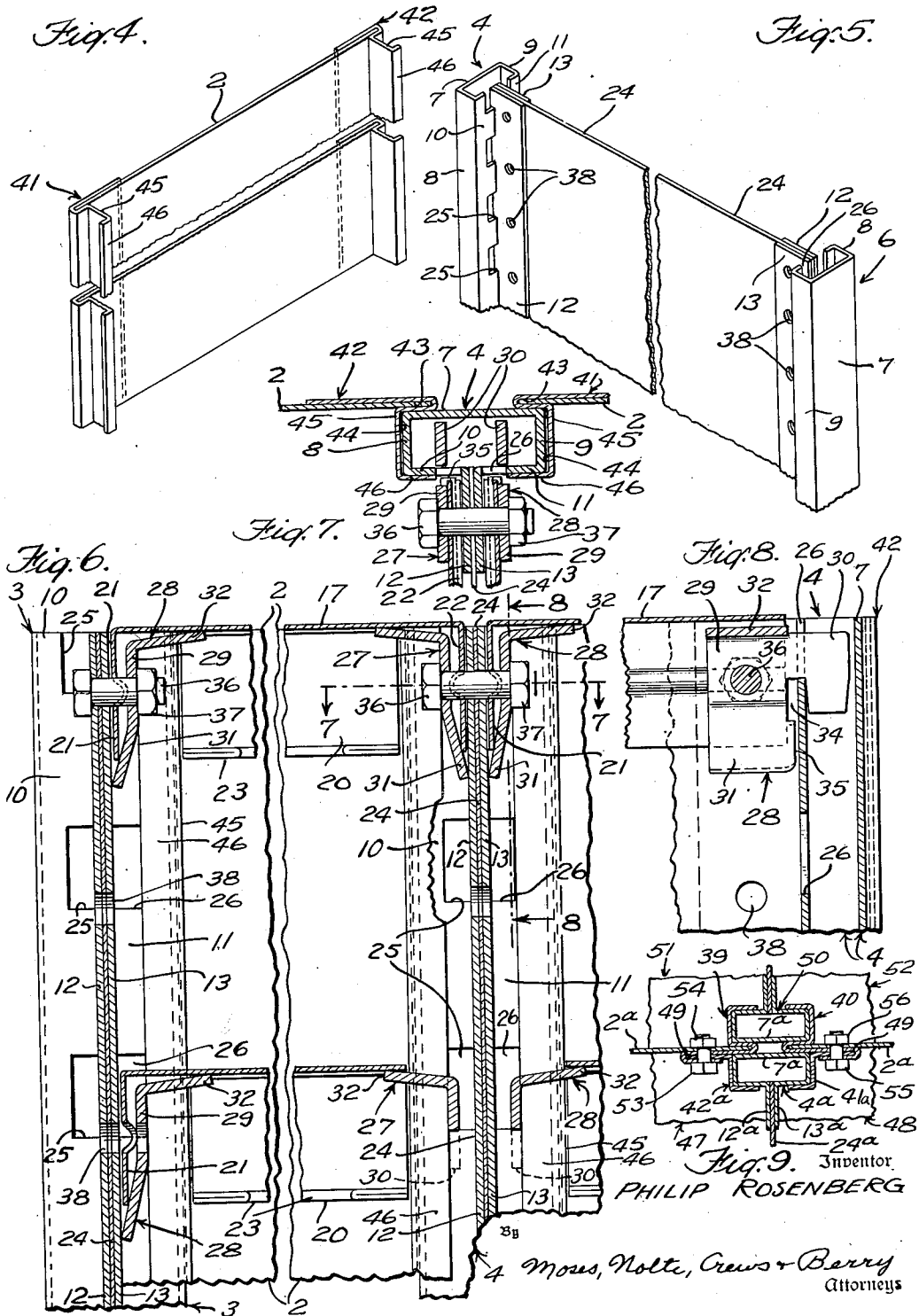
March 17, 1953

P. ROSENBERG
ERECTIBLE SHELVING

2,631,913

Filed March 21, 1949

2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

2,631,913

ERECTIBLE SHELVING

Philip Rosenberg, New York, N. Y., assignor to
Universal Steel Equipment Corporation, Long
Island City, N. Y., a corporation of New York

Application March 21, 1949, Serial No. 82,668.

10 Claims. (Cl. 312-257)

1

This invention relates to erectible shelving of the kind in which the shelves themselves, the upright posts, and the back and end walls are all formed of sheet metal, such as steel, and more particularly to means for effecting connection of the rear posts to the back wall.

It has been conventional practice in erectible shelving to provide clamps or clips, each comprising an outer flange, to overlie a portion of a forward or outer face of an associated post and an inner flange adapted to extend in contact with the shelving back and to be clamped to the back by a bolt and nut combination. These clamps or clips in the conventional construction are provided at rather frequent intervals in order to hold the post and the back in continuous, rigid, reinforcing engagement with one another. Under the most favorable conditions the application of the clips is time consuming and expensive. The clips, together with the bolt and nut combinations by which they are attached to the back, also interfere with re-location of the shelves after the structure is installed, both because they are likely to be located exactly where it is desired to relocate a shelf and because they obstruct adjusting movement of the shelves.

The construction referred to also presents drawbacks in connection with shelving which is required to be installed in a confined space and backed up against a wall because of the difficulty of applying the attaching bolts and nuts for the clamps.

It is a primary object of the invention to provide a novel combination of parts so constructed and arranged that the back and corner posts will be fixedly and rigidly united in mutually reinforcing relation by the mere putting into place of the cover and shelves and the supporting brackets therefor.

It is another object of the invention to provide novel connecting means for the back and posts which will obviate the necessity for erecting the shelving in a position spaced substantially from a wall.

It is a further objects of the invention to provide novel connecting means in back-to-back shelving which will not interfere with the relocation of the shelves after the shelving has been erected and put into use.

It is accordingly a feature in connection with against-the-wall shelving that channel members are provided, each having a channel facing in one direction and formed to embrace a margin of the back and a second channel facing in the opposite direction and formed to embrace a portion of an

2

associated post, the latter channels themselves being received in recessed portions of conventional shelf supporting angle brackets and clamped against the associated posts by them.

It is a further feature of the invention in connection with back-to-back shelving that plural channel members are provided having similarly facing channels for embracing portions of posts disposed at opposite sides of the back and an intervening channel for embracing a margin of the back. The post embracing channel members are again received in notches of the conventional shelf supporting angle brackets, being pressed against the posts by the brackets.

In either case the back is held continuously by the channel members to the posts, and the channel members are held firmly to the posts at frequent intervals by the cover and shelves. The entire organization is made rigid by the mere application of the cover and shelves.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification,

Figure 1 is a fragmentary perspective view of a single row of shelving embodying features of the invention;

Figure 2 is a fragmentary plan view, broken away in part, the sectional parts being shown upon the line 2-2 of Figure 1, looking in the direction of the arrows;

Figure 3 is a perspective view of a conventional shelf supporting angle bracket which is employed;

Figure 4 is a perspective view of a sheet metal back associated with a pair of plural channel connecting members, the parts being broken away intermediate their ends for compactness of illustration;

Figure 5 is a view showing a partition or end wall in association with an aligned pair of front and back posts, the wall member being broken away intermediate its ends for compactness of illustration;

Figure 6 is a fragmentary sectional view taken upon the line 6-6 of Figure 2, looking in the direction of the arrows, the parts being broken away intermediate their ends for compactness of illustration;

Figure 7 is a fragmentary horizontal sectional view taken upon the line 7-7 of Figure 6, looking in the direction of the arrows;

Figure 8 is a fragmentary vertical sectional view taken upon the line 8-8 of Figure 6, looking in the direction of the arrows; and

3

Figure 9 is a fragmentary horizontal sectional view of a modified structure in which two rows of shelving are arranged back-to-back.

The shelving 1 of Figure 1 is a single line of shelving which, in accordance with the present invention, is adapted to be erected with the up-right sheet metal back members 2 substantially in engagement with a wall. Each section of the row has four hollow sheet metal posts 3, 4, 5 and 6 at its corners, all of the posts being constructed like the post 4, which is seen in Figures 6, 7 and 8. The intermediate posts are common to adjacent sections.

The post 4 comprises a rear wall 7, side walls 8 and 9, aligned front walls 10 and 11 which complete a hollow rectangular configuration, and forwardly extending juxtaposed flanges 12 and 13. In each section there are included a fixed bottom shelf 14, a series of intermediate adjustable shelves 15, and a fixed cover 16. All of the shelves and the cover are desirably of identical construction.

Each of the shelf and cover members 14, 15 and 16 comprises a body portion 17 which is formed with cutouts 18 at its four corners to fit around portions of the corner posts. Each body member 17 is formed with downturned front and rear flanges 19 and 20 and with downturned end flanges 21 and 22. The front and rear flanges terminate at their lower ends in short inturned flanges 23. The flanges 19, 20 and 23 are desirably made of double thickness, the metal being folded back upon itself at the inner edges of the flanges 23.

Each end and partition wall is disposed to extend between aligned front and rear posts, the construction common to all being illustrated for the partition wall 24 and the posts 4 and 6 in Figure 5. The rear margin of the partition wall 24 is interposed between the flanges 12 and 13 of the rear post 4 and between corresponding flanges 12 and 13 of the front post 6. Since the wall 24 is a partition wall rather than an end wall, cover and shelf members are disposed at opposite sides of the wall and of the associated posts 4 and 6. The post 4 has formed in its forward faces 10 and 11 pairs of rectangular openings 25 and 26 for receiving, respectively, right hand and left hand shelf or top supporting angle brackets 27 and 28.

The angle brackets 27 and 28 are mirror images of one another, the former being adapted to be disposed at the rear right hand boundary of a shelf section and the latter at the rear left hand boundary of a shelf section. One of the brackets 28 is illustrated in detail in Figure 3.

The bracket 28 comprises a vertical body portion 29 having a co-planar hook portion 30 extending rearwardly therefrom. A lower end extension 31 of the body portion is inclined slightly to the left, as clearly seen in Figures 3 and 6. A shelf engaging portion 32, substantially at right angles to the body portion 29, extends toward the right from the body portion and is formed at its rear with a notch 33 which is adapted to extend around the forward and side walls 11 and 9 of the post 4. The hook 30 is adapted to be passed through one of the openings 26 of the post 4, and in the case of the cover supporting hook it is passed through the uppermost opening. A notch portion 34 embraces the forward wall 11 just below the opening and a rear face 35 of the portion 31 bears rearwardly against the wall member 11.

With the right and left hand angle brackets

4

27 and 28 in place, the cover members 17 of adjacent sections in place, and the partition wall 24 in place between the flanges 12 and 13, a bolt 36 is passed successively through the body portion of angle bracket 27 and end flange 22 of the first cover section 17, the flange 12 of post 4, the rear margin of wall 24, the flange 13 of post 4, the flange 21 of the second cover section, and the body portion of bracket 28. All of the parts referred to are drawn tightly and permanently together by the threading of a nut 37 upon the threaded end of the bolt 36.

All of the posts are similarly connected to adjacent cover members and their supporting brackets, save that in the case of each end post there is only one cover member and one supporting bracket to be connected to it. In connection with each section a right hand bracket is employed at the right rear corner and the forward left corner, while a left hand bracket is employed at the right forward corner and the left rear corner. The bottom shelf 14 is connected to the corner posts in exactly the same manner described for the cover 17.

In the conventional construction the top shelf or cover 16 is similarly connected to the corner posts, its flanges and supporting brackets being fixed in place by bolt and nut combinations similar to the bolt 36 and the nut 37. In the case of the intermediate shelves, the shelves of adjacent sections are not necessarily located at the same elevation. Once these intermediate shelves have been put in place, however, they cannot be re-located on account of the back clips and the bolts that hold the back wall in place.

In order to afford a wide range of selection in the location of the intermediate shelves the flanges 12 and 13 of the posts, as illustrated in Figure 5, and the intervening front and rear margins of the end and partition walls, as illustrated in the case of the wall 24 in Figure 5, are formed with a multiplicity of aligned openings 38.

Up to this point the description which has been given would apply equally to the conventional construction or to the improved construction of the present invention. Nothing has been said, however, as to how the back walls 2 are connected to the rear posts 3 and 4. In the conventional construction the shelves and the shelf supporting brackets have nothing to do with the joining of the posts to the back, nor with the securing to the posts of back connecting members. In the prior construction a series of clips or clamps corresponding in cross-sectional configuration to angle bars marked 41a and 42a illustrated in Figure 9 (which will be described at a subsequent point) are utilized for effecting connection of the back plate to the posts. Each of the clips includes a forward flange adapted to bear against one of the faces 10 or 11 of the associated post, an intermediate body portion adapted to bear against a side of the associated post, and a rear flange adapted to bear against the front face of the sheet metal back member. The last mentioned flange is clamped firmly to the back member by a bolt and nut combination. These clamping members are desirably put into place and secured after the cover and the shelves have been secured to the posts so that spaces between the cover and shelf members can be utilized for the clamps. A number of the clamps must be provided in order to form a rigid structure in which the back and posts are held firmly together in mutually reinforcing relation.

It will be apparent that the bolt and nut combinations referred to cannot be applied with the back disposed adjacent to the wall. It will also be apparent that when the shelving has been erected and located it would be extremely awkward to attempt to re-locate the shelves because the bolt and nut combinations interfere with such re-location and the bolt and nut combinations could not themselves be re-located without disassembling the entire structure.

In accordance with the present invention the clamping members and the bolt and nut combinations associated with them are dispensed with and a novel connecting means is employed. This novel structure has the dual advantage that the shelving can be erected directly in its final position with its back close to any wall that forms part of any building and the re-location of the intermediate shelves can be freely made after the erection.

Novel elements which are utilized in novel combination with the conventional parts for achieving these important advantages are illustrated clearly in Figure 4. Here a rear wall section 2 is shown as having applied to its opposite ends plural channel members 41 and 42. The channel members are used as right and left hand members but they are of identical construction, the members being simply inverted with relation to one another.

Each of the members 41 and 42 has a first channel portion 43 facing in one direction and into which an adjacent margin of one of the back members 2 is fitted, and a second channel portion 44 which partially embraces an associated post such as the post 4 illustrated in Figure 7. The channel portion 44 includes a side wall 45 which forms the base of the channel and a front wall 46. In the case of the connector 42, as seen in Figure 7, the side wall 45 extends along the wall 8 of the post 4, and the front wall 46 extends along the wall 10 of the post 4. In the case of the connecting member 41, as seen in Figure 7, the side wall 45 extends along the wall 9 of the post 4, and the front wall 46 extends along the wall 11 of the post 4. The notches 33 of the brackets 27 and 28 embrace the walls 46 and 45 of the associated channel members 42 and 41.

The construction which has been described for the post 4 as shown in Figure 7 is the same for all of the rear posts save, of course, that in the case of end posts such as the post 3, only one of the channel members, in this case 41, is associated with it. Each channel member is substantially co-extensive in height with the associated post. The channel members are permanently held to the associated posts by the angle brackets which support the covers and the bottom shelves and which are themselves permanently secured to the posts by bolt and nut combinations such as 36 and 37.

Until at least the rear cover and bottom shelf supporting brackets associated with a connector are put in place the connector is freely separable from the associated post. Even with the brackets in place the connector is freely separable from the back and has limited freedom to move relative to the post.

The cover and shelves, however, in cooperation with the connectors, serve to fix the relative positions of the parts and to make the entire structure rigid. The cut out margin and the flange 19 at the rear of the cover and of each shelf extend between the connectors at opposite ends of a section, spacing the connectors from one another.

The end flanges 21 and 22 extend between the body portions 29 of the supporting brackets and the forwardly extending flanges of the associated posts. The flanges 21 and 22, by their engagement with the posts limit approach of the posts, and by their engagement with the brackets prevent separation of the posts, so that the spacing of the posts from one another is fixed within narrow limits. The consequence is that the posts, drawn toward one another by the action of the cover and shelves upon the supporting brackets, force and maintain the connectors in engagement with the rear cover and shelf portions and with the vertical edges of the back section.

The action of the intermediate shelves is similar to that of the cover and the bottom shelf. Each cooperates with the posts, the supporting brackets, the connectors and the back sections in the manner described. The connectors are caused by the shelves to bear continuously against the posts, and the back sections are caused by the connectors to extend continuously parallel to the posts and in mutually reinforcing relation to them. The necessity for the employment of intermediate clamps to secure the back sections to the posts is therefore obviated.

In the erection of the shelving all of the vertically disposed parts, including the posts, the rear walls, the channeled connectors, and the end and partition walls, are loosely assembled and erected, after which the covers and the bottom shelves are put in place as described and permanently connected by bolt and nut combinations such as 36 and 37 as described. During the connection of the covers and the bottom shelves the upright members are readjusted as required to their final positions. Since the channeled connectors 41 and 42 extend substantially the full height of the post 3 and have no projections formed upon them and no projecting fasteners associated with them, they oppose no obstruction to the re-location of the brackets 27 and 28 and hence no obstruction to the relocation of the intermediate shelves whenever such relocation is desired. The weight of the intermediate shelves and their contents bearing against the shelf engaging portions 32 of the brackets also holds the intermediate portions of the connectors 41 and 42 firmly against the side faces of the rear posts and makes the employment of conventional intermediate clamps unnecessary.

In Figure 9 a modified construction is illustrated which is adapted to be employed when rows of shelving are to be erected back-to-back. A first row of shelving comprising sections 47 and 48 is identical in construction with the novel shelving of Figures 1-8, inclusive. Corresponding reference characters have accordingly been applied to corresponding parts with the subscript "a" added in each instance, and no detailed description will be given.

The connecting members 41a and 42a are, however, modified, being formed as mere angle members to provide outturned flanges which bear against back members 2, and flanges which bear against the forward faces of the post 4a. The outturned flanges are received in channels 49 of connectors 39 and 40. The connectors 39 and 40 are associated with a post 50 which is in all respects identical with the post 4a. The post 50 forms an element of a second row of shelving comprising sections 51 and 52. This row of shelving is also identical with the shelving already described in connection with Figures 1-8, except for the connector features which have been already

7

described and which are about to be described. The connectors 39 and 40 are modified by having their rear walls extended and folded inward to form the channels 49. The inturned flanges of the connectors 39 and 40 extend partway across the faces of the post 50.

One of the back members 2a, shown in Figure 9, is clamped to the connector 42a and to the angle member 39 immediately beneath the cover and immediately beneath the bottom shelf by a bolt and nut combination such as the bolt 53 and the nut 54 shown in Figure 9. The other back member 2a is similarly clamped to the connector 41a and the angle member 40 immediately beneath the cover and the bottom shelf by bolt and nut combinations such as the bolt 55 and the nut 56. The angle members 41a and 42a are embraced by notches of the cover and the shelves, and by notches 33 of the cover and shelf supporting brackets, being held against the posts by the cover, the shelves and the brackets. The end flanges of the cover and shelves cooperate with the posts and the shelf supporting brackets in the manner previously described. Since the parts are held thus correctly associated by the intermediate shelves and their brackets, there is no need for intermediate bolt and nut combinations to retain the angle members 41a and 42a in their assigned positions. The intermediate shelves may accordingly be freely re-located at both sides of the common back members 2a after the shelving has been fully erected.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. Erectible shelving comprising, in combination, a sheet metal back, a hollow post having openings in the forward face thereof, a connecting sheet metal member having a channel facing in one direction to embrace and fit upon a margin of the back and a second channel facing in the opposite direction to embrace and fit around a portion of the post, and a shelf supporting angle bracket having a hook portion engageable in an opening of the post and a shelf engaging portion disposed substantially at right angles to the hook portion and having a notch adapted to fit around the front and side walls of the post embracing channel.

2. Erectible shelving as set forth in claim 1, in which the connecting sheet metal member is substantially coextensive in height with the post.

3. Erectible shelving comprising, in combination, a sheet metal back, hollow front and rear posts, and wall members adapted to be secured to and extended between corresponding front and rear posts, rectangular top and bottom members adapted to be connected to the upper and lower ends of the posts for securing the posts in rectangular relation to one another, the posts having corresponding openings in the confronting faces thereof, connecting sheet metal members adapted to be associated with the respective rear posts and each having a channel facing in one direction to embrace and fit upon a margin of the back and a second channel facing in the opposite direction to embrace and fit around a portion of the associated post, and shelf supporting angle brackets, each having a hook portion engageable in an opening of the post and a shelf engaging portion disposed substantially at right angles to the hook portion and having a notch

8

adapted, when the bracket is applied to a rear post, to fit around the external front and side walls of the associated post embracing channel.

4. Erectible back-to-back shelving comprising, in combination, a sheet metal back, a pair of hollow posts adapted to be placed at opposite sides of the back in overlapping relation thereto, and a sheet metal connecting structure forming similarly facing channels for embracing portions of the respective posts, and also forming walls of an intervening oppositely facing channel for embracing a margin of the back, and a flange for attachment to the back, having a back engaging portion extending from and in line with a back engaging wall of said intervening channel.

5. Erectible back-to-back shelving comprising, in combination, a sheet metal back, a pair of hollow posts adapted to be placed at opposite sides of the back in overlapping relation thereto, and a sheet metal connecting structure consisting of two members, said members together defining similarly facing channels for embracing portions of the respective posts, and an intervening channel bounding and channel-dividing projection integral with one of the members and adapted to extend between the posts and itself defining an oppositely facing channel for receiving and fitting a margin of the back, and an attaching flange formed jointly by the members and through which the members are united to one another and to the back, said flange extending outwardly from the similarly facing channels and having a back engaging portion substantially in line with a back engaging portion of said projection.

6. Erectible back-to-back shelving comprising, in combination, a sheet metal back, a pair of hollow posts adapted to be placed at opposite sides of the back and formed with openings in their outer faces, a connecting structure comprising a pair of sheet metal members associated with the respective posts, the first connecting member being a clamp formed with outer and inner flanges, the first flange for overlying in part the outer face of one of the posts and the second flange for attachment to the back, and the second connecting member being a channel member having a first channel facing in a first direction for receiving and fitting the second flange of the clamp, a second channel facing in the opposite direction for receiving and fitting a margin of the back, and a third channel facing in the first direction to embrace and fit around a portion of the other post, and shelf supporting angle brackets having hook portions engageable in openings of the respective posts and each having a shelf engaging portion disposed substantially at right angles to the hook portion and having a notch adapted to fit around the front and side walls of the associated connecting member.

7. Erectible shelving comprising, in combination, a sheet metal back, a pair of hollow posts at opposite ends of the back, connecting sheet metal members having channels that face away from one another to embrace the respective posts and channels that face toward one another to embrace the opposite vertical margins of the back, shelf supporting angle brackets hooked into the respective posts and each having vertically disposed body and hook portions and a horizontally disposed shelf supporting portion, and a shelf having a notched rear margin to fit between the connecting members and space them from one another and end flanges to fit outside the body portions of the hooks to hold them against sep-

9

aration, whereby the posts are caused to press the connecting members against the cutout portions of the shelves and toward the vertical edges of the back.

8. Erectible shelving comprising, in combination, a sheet metal back, a pair of posts, shelf supporting brackets secured to the posts, channeled connecting members embracing the respective posts and also embracing the opposite margins of the back, and a shelf having a portion that fits between the channeled connecting members to space them from one another and other portions that extend outside the shelf supporting brackets to limit separation of the posts, the construction and arrangement being such that the channeled connecting members are clamped to their respective posts by the shelf at a predetermined distance from one another.

9. Erectible shelving comprising, in combination, a sheet metal back, a pair of hollow posts, shelf supporting brackets hooked into the posts, channeled connecting members embracing the respective posts and also embracing the opposite margins of the back, and shelves having portions that fit between the channeled connecting members to space them from one another and other portions that extend outside the shelf supporting brackets to limit separation of the posts, the construction and arrangement being such that the channeled connecting members are clamped to their respective posts by the shelves at predetermined distances from one another, the connect-

10

ing members extending continuously and smoothly substantially from the bottom to the top of the shelving so that the shelves can be unobstructedly re-located.

10. Erectible shelving comprising, in combination, a sheet metal back, a pair of hollow posts, shelf supporting brackets secured to the posts, channeled connecting members embracing the respective posts and also embracing the opposite margins of the back, and a shelf having portions that engage outside the shelf supporting brackets to limit separation of the posts, the shelf serving to hold the posts near enough together to maintain the connecting members in embracing relation to the margins of the back.

PHILIP ROSENBERG.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
868,310	White	Oct. 15, 1907
1,050,154	Martin	Jan. 14, 1913
1,667,534	Carpenter	Apr. 24, 1928
1,729,475	Brainard et al.	Sept. 24, 1929
1,782,344	Gourley	Nov. 18, 1930
1,814,090	Mically	July 14, 1931
1,952,111	Bales	Mar. 27, 1934
1,962,396	Katz	June 12, 1934
2,097,484	Winslow	Nov. 2, 1937