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ERECTIBLE SHELVING AND BRACKETS EMPLOYED THEREIN

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2 Sheets-Sheet 1

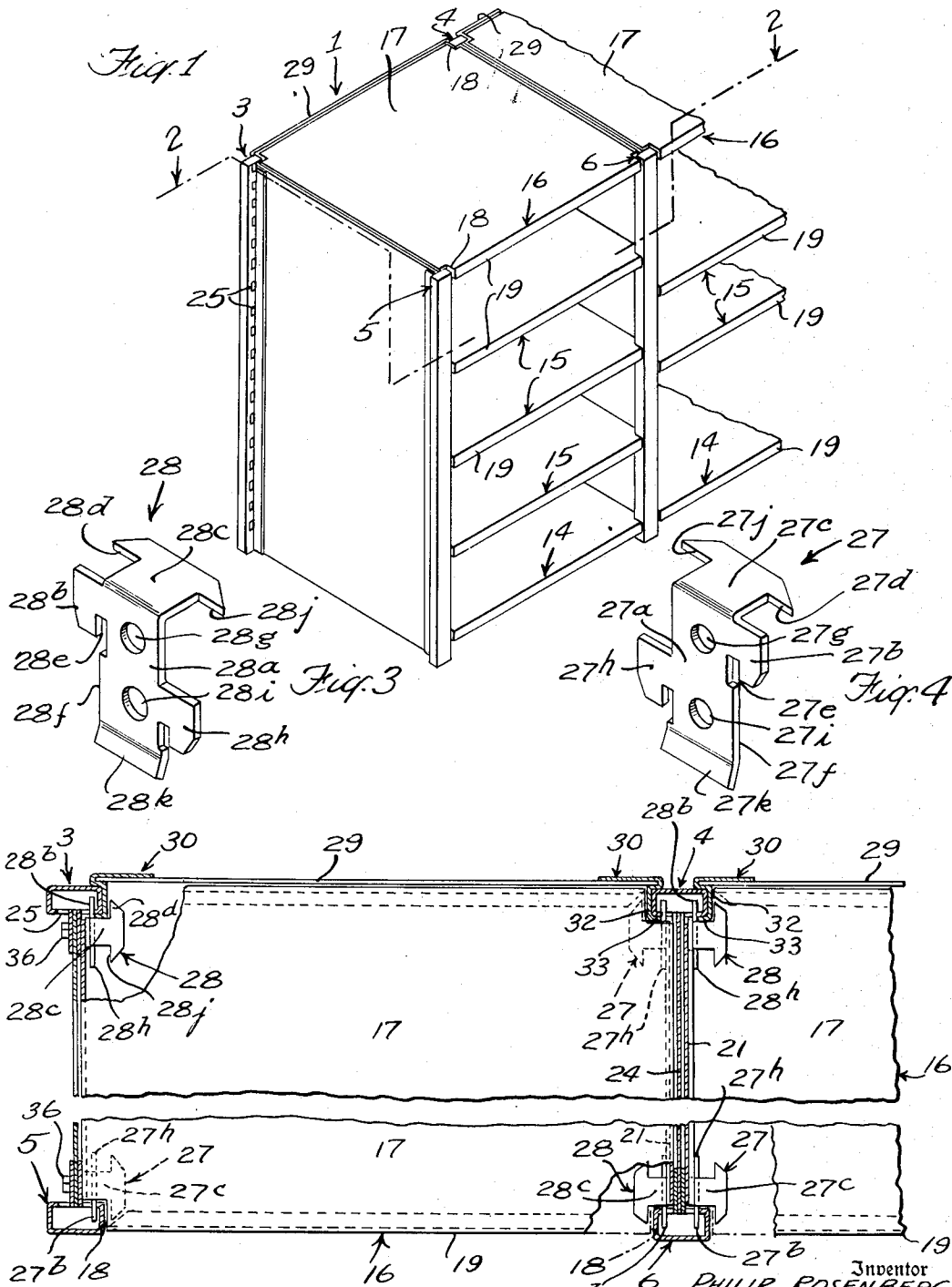


Fig. 2

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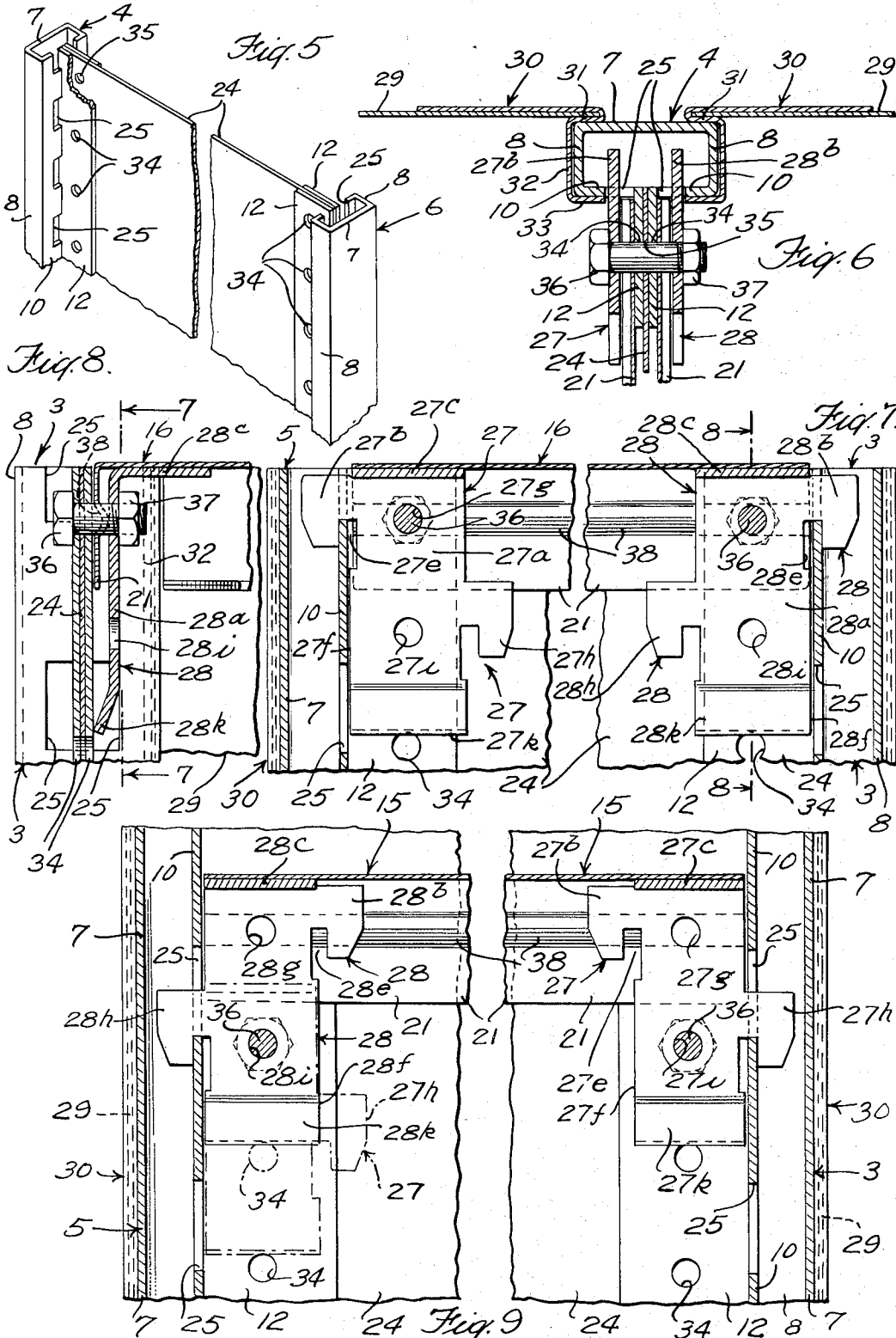
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ERECTIBLE SHELVING AND BRACKETS EMPLOYED THEREIN

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8 Claims. (Cl. 211—136)

This invention relates to erectible shelving and particularly to shelf supporting brackets usable therewith. The shelving referred to is desirably composed entirely of sheet metal parts which are adapted to be fitted together and fixed in place by simple shelf supporting brackets together with connecting bolts and nuts. Such shelving is exemplified in Mically Patent 1,814,090 and Rosenberg Patent 2,631,913. The present invention is particularly disclosed and explained in connection with the shelving disclosed in the latter patent, although it is of broader utility.

In Patent 2,631,913 a line of shelving comprises hollow sheet metal corner posts, each having spaced outwardly projecting flanges located substantially midway of one of its longer faces. Each flange is formed with a vertical column of aligned bolt holes, the holes being provided at two inch intervals in commercial practice and the holes of one flange aligning with the holes of the other. Each post has two vertical columns of slots formed in it, one adjacent each flange. The slots are also provided at two inch intervals or "upon two inch centers." Front to rear partition and end members of sheet metal are adapted to have their margins inserted between the flanges of the corresponding front and rear posts. The margins of the partition and end members are also provided with vertical columns of bolt holes on two inch centers, which holes are adapted to be aligned with the holes in the flanges. Shelf and cover members are provided having corner notches to receive the posts, these members being formed with downturned front, rear and end flanges. Each end flange is formed with front and rear bolt holes for alignment with selected bolt holes of the front and rear columns of holes formed in the post flanges and in the end and partition members. A back panel is provided for each section of shelving, and two channeled connectors are provided for each back panel, each connector including a broad channel for embracing a post and an oppositely facing narrow channel for embracing a margin of the back panel.

The several members thus far referred to are constructed and arranged to fit together accurately and to form a sturdy assembly when finally united. Such union is effected through bolt and nut combinations and through shelf supporting brackets, with the latter of which the present invention is particularly concerned.

In Patent 2,631,913 right hand and left hand angle brackets are provided, each having a substantially vertical body formed with a hook portion to enter a selected one of the corner post slots and a substantially horizontal shelf supporting portion to engage the lower face of a shelf corner. Each horizontal bracket portion is formed with a notch to receive a corner of the associated post and, in the case of a rear post, to extend along two sides of the post engaging channel of an associated back panel connector, for fixing the relationship of the connector to the post.

Shelving of the kind referred to, connected through brackets of the kind referred to, is useful and practical

and has proved commercially successful. It is, however, subject to an important limitation which it is the purpose of the present invention to obviate. The post slots for receiving the bracket hooks, as has been mentioned, are provided on two inch centers, that being a practical minimum spacing in view of the heights of the slots and the necessity for providing a broad, strong, unbroken area of metal between the slots. The distance between centers could be reduced somewhat but then the inconvenience of dealing with fractions would be introduced.

With two inch centers, available shelf support is provided only at two inch intervals in the prior art arrangement, so that shelves must be spaced from one another an even number of inches. Thus shelf spacings of four, six, eight, etc. inches are available, but spacings of three, five, seven, nine, etc. inches are not available. It frequently happens that these spacings involving an odd number of inches are extremely desirable. This is strikingly illustrated in the case wherein the shelves are required to provide sliding support for drawers whose height is such that three inch spacing of the shelves would be most suitable. With four inch spacings for such drawers an unsightly gap of one inch appears above the drawers, and this gap permits the entrance and accumulation of dirt, and represents an important waste of space.

With three inch spacing available a section of shelving can support thirty-three and one-third per cent more drawers of the size referred to, thereby greatly increasing the capacity and therefore the efficiency of a section. This may result in a very considerable saving of floor space, since the number of sections required for a setup of this kind can be reduced by twenty-five per cent.

It is the primary object of the present invention to cut the minimum increment of shelf spacing in half in a structure of the kind referred to, and this by a simple modification of the shelf supporting brackets without changing the structure of any of the other parts.

It has been mentioned that the shelf supporting brackets are of right and left hand construction, two forms of brackets being required which may be mirror images of one another. It is a further feature of the present invention that the increased number of available spacings is made possible without increasing the number of bracket variations. The same pairs of the new brackets which would be used side by side for securing a spacing of an even number of inches between the fixed cover and a shelf would simply be interchanged in location to secure a spacing of an odd number of inches between the fixed cover and the same shelf.

It is a further feature that shelving which has been erected to provide shelf spacing at even inch intervals is susceptible of rearrangement to provide odd inch spacing where desired simply by rearrangement of the parts, that is to say, by mere re-disposition of the brackets which are present.

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 line of shelving employing and embodying the present invention;

Figure 2 is a horizontal sectional view taken upon irregular section line 2—2 of Figure 1, looking in the direction of the arrows;

Figure 3 is a perspective view of one of two complementary brackets embodying, and used in, the invention;

Figure 4 is a perspective view of the other bracket, complementary to the bracket of Figure 3;

Figure 5 is a detail, fragmentary, perspective view showing two corner posts in loose association with a partition member;

Figure 6 is a fragmentary, horizontal, sectional view through a corner post and associated parts;

Figure 7 is a fragmentary, vertical, sectional view with the parts broken away intermediate their ends for compactness of illustration, the section being taken on the line 7—7 of Figure 8, looking in the direction of the arrows;

Figure 8 is a vertical sectional view taken upon the line 8—8 of Figure 7 looking in the direction of the arrows; and

Figure 9 is a view similar to Figure 7 but with the brackets of Figure 7 interchanged to provide a shelf level differing from that of Figure 7 by an odd number of inches.

The shelving shown in the drawing is the same as that of Patent 2,631,913, except that different shelf supporting brackets are employed. The shelving 1 of Figure 1 is a single line of shelving composed of sheet metal members and adapted to be erected in any number of sections and in any suitable location. Each section of the line has four hollow sheet metal posts 3, 4, 5 and 6 at its corners, all of its posts being constructed like the post 4 which is seen in Figures 1, 2, 5, 6, 7 and 9. The intermediate posts are common to adjacent sections.

The post 4 comprises a rear wall 7, side walls 8, aligned front walls 10 which complete a hollow rectangular configuration, and forwardly extending juxtaposed flanges 12. 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 and are supported by identical means.

Each of the shelf and cover members 14, 15 and 16 comprises a body portion 17 which is formed with cut-outs 18 at its four corners to fit around portions of the corner posts. Each body portion 17 is formed with downturned front and rear flanges 19 and with downturned end flanges 21. The front and rear flanges terminate at their lower ends in inturned flanges (not shown). The flanges 19 are desirably made of double thickness, the metal being folded back upon itself at the inner edges of the inturned flanges.

Each end and partition wall 24 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 of the rear post 4, and the front margin is interposed between the corresponding flanges 12 of the front post 6. When 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 at opposite sides of the posts. The post 4 has formed in its forward walls 10 columns of rectangular openings 25 for receiving hook portions of right hand and left hand shelf and cover supporting angle brackets 27 and 28.

Angle brackets 27 and 28 are mirror images of one another. If all the shelf and cover spacings involved even numbers of inches the brackets 27 would be invariably disposed at the rear right hand corner and the front left hand corner of a shelf section and the brackets 28 would be invariably disposed at the rear left hand corner and the front right hand corner of a shelf section. The brackets 27 and 28 are respectively illustrated in detail in Figures 4 and 3. The upper portions of the brackets 27 and 28 are substantial duplicates, respectively, of the brackets 27 and 28 of Patent 2,631,913.

The bracket 28 comprises a vertical body portion 28a having a co-planar hook portion 28b extending rearwardly therefrom. A shelf supporting portion 28c, substantially at right angles to the body portion 28a, extends toward the right from the body portion and is formed at its rear end with a notch 28d which is adapted to extend around the front and side walls 10 and 8 of the post 4. The hook 28b is adapted to be passed through one of the

slots 25 of the post 4, and in the case of the cover supporting hook it is passed through the uppermost slot. A notched portion 28e embraces the forward wall 10 just below the slot, and a rear face 28f of the portion 28a bears rearwardly against the wall member 10. A bolt hole 28g is provided in the body portion 28a at the level of the hook 28b.

The description of the bracket 28 contained in the preceding paragraph would apply equally to the bracket 28 of Patent 2,631,913. The present bracket 28, however, includes additional structure. The body portion 28a of the bracket 28 has a further hook 28h which is of the same dimensions and construction as the hook 28b, but which extends from the opposite edge of the body 28a and (on the assumption of two inch centers for the slots 25) at exactly one inch below the hook 28b. The body portion 28a is also provided with a second bolt hole 28i in vertical alignment with, and just one inch below, the bolt hole 28g. The horizontal shelf supporting portion 28c is formed with a second notch 28j opposite the notch 28d which is of the same dimensions and shape as the notch 28d. When the hook 28b is used the hook 28h performs no function, and when the hook 28h is used the hook 28b performs no function. The lower margin 28k of the body 28a is slightly inclined to the left.

Since the bracket 27 is a mirror image of the bracket 28 all of the foregoing description is equally applicable to the bracket 27. The reference numeral 27 with corresponding letters added have been applied to corresponding parts, and no detailed description will be given of the bracket 27.

Each shelving section includes a back panel 29 whose end margins are embraced by narrow channels formed in sheet metal channel connectors 30. Each connector 30 includes a channel for partly embracing an associated corner post, said channel being bounded by a rear wall 31, a forwardly extending wall 32 and a forward wall 33.

With the corner posts 3, 4, 5 and 6, the walls 24, the back panels 29 and the channel connectors 30 in place, brackets 27 and 28 are put in place for supporting the cover 16, with their upper hooks 27b and 28b inserted in the uppermost slots 25 of the corner posts, as shown in Figure 7 for the corner posts 3 and 5. The notch 28d extends around the walls 32 and 33 of the connector 30, holding the connectors to the corner posts. The cover 16 is put in place with its notched portions engaging the corner posts and with its downturned end flanges 21 extending downward between the end walls 24 on the one hand and the body portions 27a and 28a of the brackets 27 and 28 on the other. The upper bracket openings 27g and 28g align with the uppermost bolt holes 34 of a series of bolt holes formed at two inch intervals in the flanges 12 of the corner posts, and with the uppermost openings 35 of the series of vertical aligned openings formed at two inch intervals in front and rear margins of the wall 34.

In the case of the end wall 24 (Fig. 8) a headed bolt 36 is passed successively through a corner post flange 12, wall 24, the second corner post flange 12, top flange 21, and body 27a or 28a of bracket 27 or 28 as the case may be. A nut 37 is threaded on the bolt 36 to hold the parts assembled and firmly clamped together. In the case of a partition wall 24 (Fig. 6) a headed bolt 36 is passed successively through the body 27a or 28a of the bracket 27 or 28 as the case may be, a top flange 21, a corner post flange 12, partition wall 24, a second corner post flange 12, a second cover flange 21, and body 27a or 28a of the next bracket 27 or 28 as the case may be. A nut 37 is threaded on the bolt 36 to hold the parts assembled and firmly clamped together.

The shelves may be spaced at any whole number of inches from the cover 16, subject to the limitation that the minimum spacing is three inches. If the space is to be an even number of inches from the cover 16, the

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top hooks 27b and 28b of the brackets 27 and 28 would be used as was done in providing support for the cover 16. If the spacing is to be an odd number of inches from the cover 16, the lower hooks 27h and 28h would be used as shown in Figure 9. In Figure 2 the top hooks are assumed to be used as shown in Figure 7. When the lower hooks are used as shown in full lines in Figure 9, the disposal of the hooks 27 and 28 would be exactly the opposite of that illustrated in Figure 2. The same brackets would be used but they would be interchanged in position.

When the lower hooks 27h and 28h are used as shown in Figure 9, the bolts 36 do not pass through the downturned flanges 21 and 22 of the shelves but pass beneath such flanges. This is not objectionable. The flanges 21 and 22 have ribs 38 in line with the upper openings 27g and 28g. Because of the offset lower end portions 27k and 28k of the brackets pressure exerted through the lower holes 27i and 28i presses the bracket body against the ribs 38, causing the flanges to be firmly clamped.

In Figure 9 a bracket 27 is shown in dot and dash lines just one inch below the bracket 28 in full line. This illustrates particularly well how shelf locations differing by just one inch are made available. The same slot 25 can be used by inserting the hook 28h of a bracket 28 in it or the hook 27b of a bracket 27 in it. In the former case the shelf body would rest upon the portion 28c of the bracket 28, and in the latter case it would rest upon the portion 27c of the bracket 27. Since the bolt would pass through the same holes of the flanges 12 of the corner posts in both instances but would pass through the lower hole 28i in one instance and the upper hole 27g in the other, it is evident that the bracket 28 would support the shelf just one inch higher than the bracket 27 would support it.

The same combination of two brackets 27 and two brackets 28 employed in the Figure 9 arrangement could be used to support the shelf 16 at either of two levels differing by an odd number of inches from one another.

It is to be understood, of course, that the invention is not confined to any such narrow dimensional limitation as two inch centers and that inches have simply been used as a convenient unit for illustrative purposes. More broadly expressed, if the corner post slots and bolt holes are arranged on two unit centers, shelf spacings differing from one another by either odd or even numbers of units are made available by virtue of the present invention.

It is not essential that the difference in height of the hooks be just one-half the difference in level of the corner post slots, since useful new arrangements can be obtained with any fractional spacing of the hooks relative to the slots.

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

What I claim is:

1. A sheet metal shelf supporting bracket for use in erectible sheet metal shelving comprising, in combination, a body portion adapted for vertical disposition and having alternatively usable supporting hooks in co-planar relation with itself, the first being a solitary, downwardly facing, upper hook which projects beyond one lateral edge of the body and the second being a solitary, downwardly facing, lower hook which projects beyond the opposite lateral edge of the body at a predetermined distance below the first, each lateral edge of the body below the associated hook being continuously spaced inward horizontally a substantial distance from the outer boundary of the hook opening, and a shelf supporting portion integral with the body and extending substantially at right angles to the body at the upper extremity thereof.

2. A sheet metal shelf supporting bracket for use in erectible sheet metal shelving comprising, in combination, a body portion adapted for vertical disposition and

having alternatively usable supporting hooks in co-planar relation with itself, the first being an upper hook which projects beyond one lateral edge of the body and the second being a lower hook which projects beyond the opposite lateral edge of the body at a predetermined distance below the first, and a shelf supporting portion integral with the body and extending substantially at right angles to the body at the upper extremity thereof, said shelf supporting portion being formed with opposed corner post engaging notches, usable with the respective supporting hooks.

3. A sheet metal shelf supporting bracket for use in erectible sheet metal shelving comprising, in combination, a body portion adapted for vertical disposition and having alternatively usable supporting hooks in co-planar relation with itself, the first being an upper hook which projects beyond one lateral edge of the body and the second being a lower hook which projects beyond the opposite lateral edge of the body at a predetermined distance below the first, and a shelf supporting portion integral with the body and extending substantially at right angles to the body at the upper extremity thereof, said body portion being provided with two bolt holes disposed in vertical alignment and differing in level to the same extent as the supporting hooks.

4. A unitary sheet metal shelf supporting bracket for use in erectible sheet metal shelving comprising, in combination, a body portion adapted for vertical disposition and having alternatively usable supporting hooks in co-planar relation with itself, the first being an upper hook which projects beyond one lateral edge of the body and the second being a lower hook which projects beyond the opposite lateral edge of the body at a predetermined distance below the first, and a shelf supporting portion integral with the body and extending substantially at right angles to the body at the upper extremity thereof, said shelf supporting portion being formed with oppositely facing corner post engaging notches, usable with the respective supporting hooks, said body portion being provided with two bolt holes disposed in vertical alignment and differing in level to the same extent as the supporting hooks differ in level, the lower end of the body portion being offset from the main body plane to a slight extent and in the direction opposite to that in which the shelf supporting portion is offset.

5. A section of erectible shelving comprising, in combination, a set of four corner posts having vertical lines of slots with the slots spaced vertically at regular and equal intervals, said posts also including juxtaposed flanges formed with vertical rows of aligned bolt holes, with the holes spaced at intervals equal to those between the successive slots, end members extending between the flanges of aligned front and rear corner posts and having vertically arranged bolt holes in alignment with the bolt holes of said flanges, a shelf fitted between the corner posts, shelf supporting brackets supporting the corners of the shelf from the corner posts, said brackets consisting of complementary mirror image pairs of brackets, each bracket including a body portion with an upper hook extending beyond one lateral edge and a lower hook extending beyond the opposite lateral edge, and each including a shelf supporting portion which extends at substantially right angles to the body portion of the bracket, the difference in level of the upper and lower hooks being equal to one-half the space between successive corner post slots, corresponding hooks of all the brackets being lodged in corresponding corner post slots, and bolts passed through aligned bolt holes of the brackets, the post flanges, and the end members, said shelf supporting brackets being reversible and interchangeable to cause all the inactive corresponding hooks to be lodged instead in the same slots of the corner posts, and thereby to change the level of the supported shelf by an amount equal to one-half the interval between the successive corner post slots,

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6. A section of erectible shelving comprising, in combination, a set of four corner posts having vertical lines of slots provided at regular and equal intervals, a shelf fitted between the corner posts, and shelf supporting brackets supporting the corners of the shelf from the corner posts, said brackets consisting of complementary mirror image pairs of brackets, each bracket including a body portion with an upper hook extending beyond one lateral edge and a lower hook extending beyond the opposite lateral edge, and each including a shelf supporting portion which extends substantially at right angles to the body portion of the bracket, the difference in level of the upper and lower hooks being equal to one-half the difference of level of successive corner post slots, corresponding hooks of all the brackets being lodged in corresponding corner post slots, said shelf supporting brackets being reversible and interchangeable to cause all the inactive corresponding hooks to be lodged instead in the same slots of the corner posts, and thereby to change the level of the supported shelf by an amount equal to one-half the difference of level of successive corner post slots.

7. A section of erectible shelving comprising, in combination, a set of four corner posts having vertical lines of slots with the slots spaced at regular and equal intervals, two shelves fitted between the corner posts one above the other, and sets of shelf supporting brackets supporting the corners of the respective shelves from the corner posts, each set consisting of two pairs of mirror image brackets, and the two sets being duplicates of one another, each bracket including a body portion with an upper hook extending beyond one lateral edge and a lower hook extending beyond the opposite lateral edge, and each including a shelf supporting portion which extends substantially at right angles to the body portion of the bracket, the difference in level of the upper and lower hooks being equal to one-half the difference of level of

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successive corner post slots, the upper hooks of one set of brackets being lodged in one set of corresponding corner post slots and the lower hooks of the other set of brackets being lodged in another set of corresponding corner post slots, whereby the difference in level of the supported shelves is caused to be a whole number of slot spaces plus one-half a slot space.

8. A section of erectible shelving comprising, in combination, a set of four corner posts having vertical lines of slots with the slots spaced at regular and equal intervals, two shelves fitted between the corner posts one above the other, and sets of shelf supporting brackets supporting the corners of the respective shelves from the corner posts, each set consisting of two pairs of mirror image brackets, and the two sets being duplicates of one another, each bracket including a body portion with an upper hook extending beyond one lateral edge and a lower hook extending beyond the opposite lateral edge, and each including a shelf supporting portion which extends substantially at right angles to the body portion of the bracket, the difference in level of the upper and lower hooks being equal to a fractional part of the difference of level of successive corner post slots, the upper hooks of one set of brackets being lodged in one set of corresponding corner post slots and the lower hooks of the other set of brackets being lodged in another set of corresponding corner post slots, whereby the difference in level of the supported shelves is caused to be a whole number of slot spaces plus or minus a fractional part of a slot space.

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