

Jan. 28, 1969

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3,424,111

READILY ASSEMBLABLE AND ADJUSTABLE SHELVING

Filed March 30, 1967

Sheet 1 of 2

FIG. 1

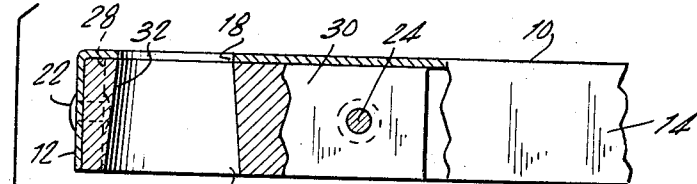


FIG. 2

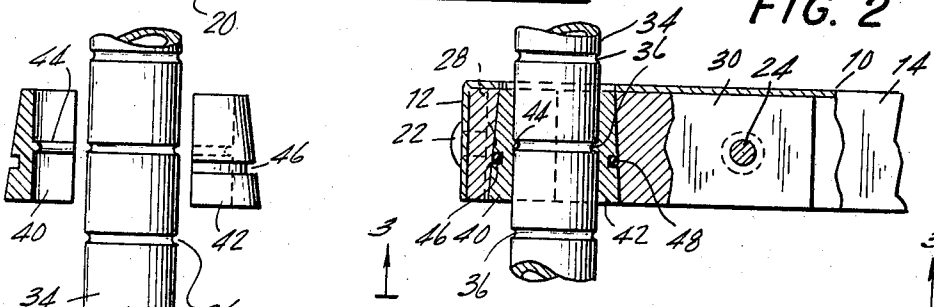


FIG. 3

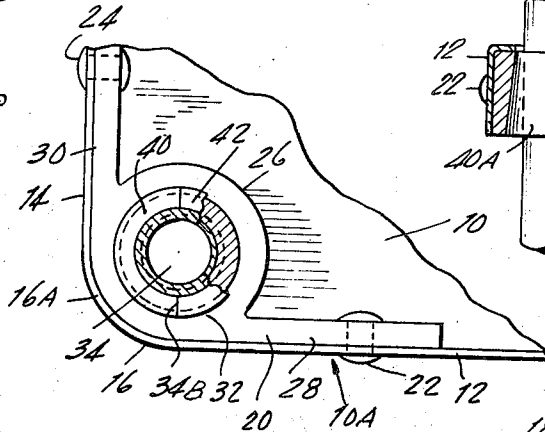


FIG. II

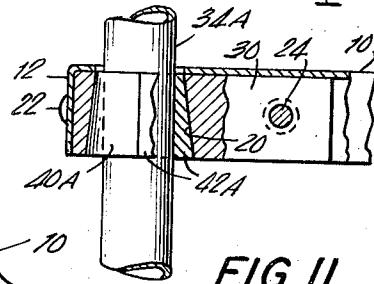


FIG. 4

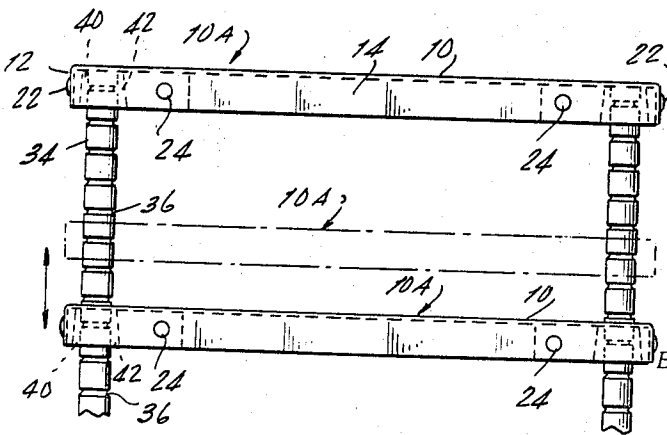
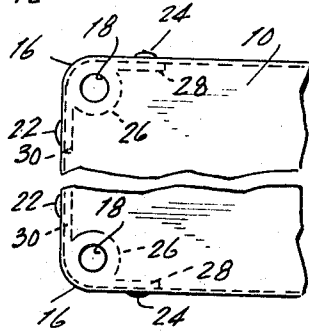


FIG. 5



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Sheet 2 of 2

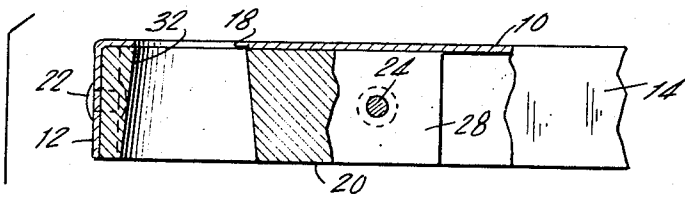


FIG. 6

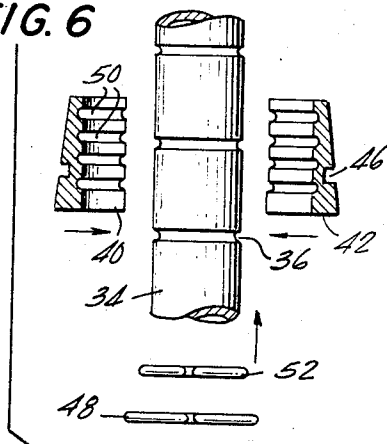


FIG. 7

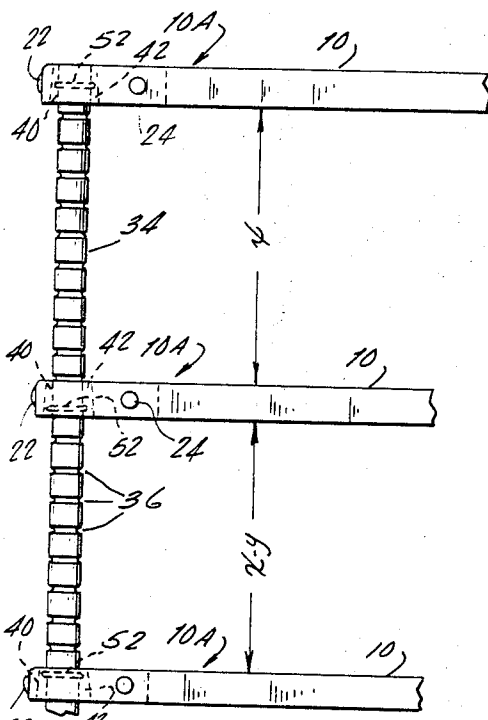
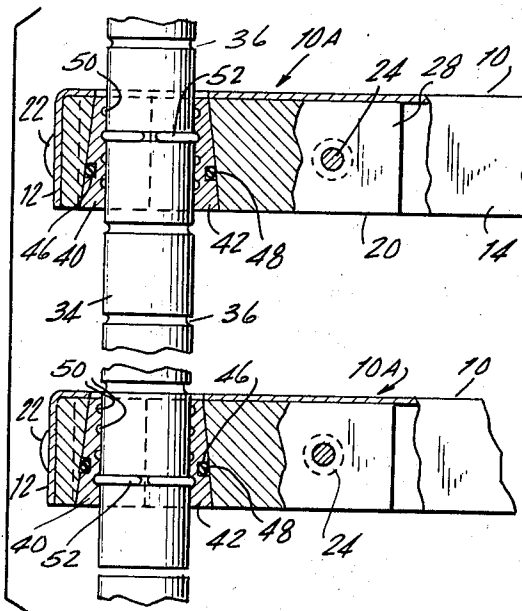


FIG. 8

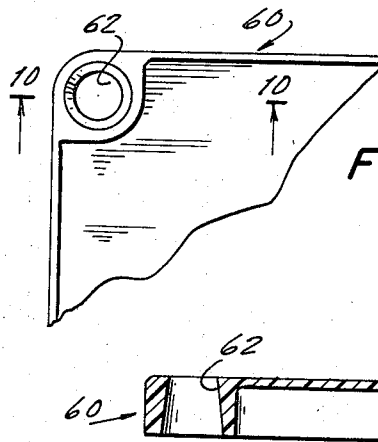


FIG. 9

FIG. 10

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**READILY ASSEMBLABLE AND ADJUSTABLE  
SHELVING**

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10 Claims

Int. Cl. A47b 9/08; A47f 5/10

**ABSTRACT OF THE DISCLOSURE**

This invention is concerned with devising readily assemblable and adjustable shelving. Briefly, the corner posts of the shelving are provided with graduated circular recesses or slots along their vertical dimension, and, additionally, the posts are fitted with suitable post supports in relation thereto. Coordinated thereto also are provided shelf members with corner supports, which corner supports are adapted to receive and securely hold the corner posts and their respective supports. The spacing of the shelving is adjusted by varying the position of the post supports along the height of the corner posts.

**BACKGROUND OF THE INVENTION**

*Field of the invention*

This invention relates generally to shelving. More particularly, the invention relates to improved adjustable shelving which may be readily adjusted to various desired heights or readily assembled and disassembled.

*Description of the prior art*

Adjustable metal shelving is known. So-called, "knock-down" metal shelving is also known. However, it is a distinct disadvantage, among others, in the aforementioned prior art shelving that the corner supports therefor, through which the corner posts extend are provided with set screws or set bolts which proceed through threaded apertures, by means of which the corner support is affixed to each corner post. Thus, in order to adjust the height of the shelf, or to assemble it or disassemble it, the set screws must be loosened or tightened, as the circumstance may require, by suitable tools before such action can be accomplished. As mentioned, in order to assemble the posts and shelves a tool, such as a screw driver, is required. Often times, in attempting to assure a tight fit of corner support to corner post, the set screw or bolt is turned for an excessive number of revolutions, and the post is thereby caused to be dented or similarly damaged; or, additionally, the threads of the set screw become stripped requiring its replacement. On the other hand, if the screw is threaded too loosely into the threaded aperture to prevent damage to the post or screw, then the shelf, loaded with goods may collapse. Still further, if the set screw is lost the shelving is useless until the proper size set screw is obtained.

**SUMMARY OF THE INVENTION**

It is, therefore, among one of the principal objectives of this invention to overcome the aforementioned prior art disadvantages by providing shelving requiring no set screws or set bolts, or the use of tools in conjunction therewith.

In accordance with the present invention readily assemblable shelving is provided comprising a shelf member having corner supports secured thereto at each corner of said shelf member, said corner supports being adapted to receive and securely hold corner posts provided with graduated recesses along their vertical dimension, and said corner posts also being fitted with post supports for holding said corner support and corner post in

secured relation. The spacing of the shelving, relative to each other, is adjusted by varying the positions of the post supports along the height of the corner posts.

**BRIEF DESCRIPTION OF THE DRAWING**

The invention will be hereinafter more fully described with reference to the accompanying drawing, in which: FIGURE 1 shows a front view looking along a right angle side, partially in cross-section, of a corner support in detached relationship with a corner post and its post support, said corner post and post support being in exploded relationship to each other and to said corner support.

FIGURE 2 shows a front view looking along a right angle side, similar to FIGURE 1, partially in cross-section, with the corner support, corner post and post support in secured relationship.

FIGURE 3 is a bottom plan view, partially in cross-section, taken along line 3—3 of FIGURE 2 in the direction of the arrows under the reference numeral.

FIGURE 4 is a front view of the shelving as assembled, with one shelf member, shown by phantom lines at an adjusted height, being movable up or down in the direction of the arrows, with the corner posts partially cut-away.

FIGURE 5 is a top plan view of a shelf member with corner supports secured at two corners thereof, said shelf member being partially cut-away.

FIGURE 6 is a view similar to FIGURE 1 of another embodiment of the invention.

FIGURE 7 is a view similar to FIGURE 2 of the embodiment as shown by FIGURE 6, except that two shelf members are shown assembled to a corner post, partially cut-away.

FIGURE 8 is a partial front view of the shelving as assembled according to the embodiment of FIGURE 6.

FIGURE 9 is still another embodiment of the invention and shows a bottom plan view of one corner section of the shelving, with the balance cut-away.

FIGURE 10 is a side view of the embodiment of FIGURE 9, in cross-section, taken along line 10—10 thereof in the direction of the arrows at the top of the reference numeral.

FIGURE 11 is a view similar to FIGURE 2 showing another form of the invention.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring now to the figures of the drawing, each shelf member has a flat panel 10 of generally rectangular shape and integrally connected therewith are right angularly disposed downwardly extending end flanges 12 and side flanges 14. The shelves shown herein are composed of sheet metal, such as stainless steel, steel, aluminum, aluminumized steel or the like. As will be seen subsequently in a separate embodiment of the invention the shelves may also be made of plastic. Each corner 16 of panel 10 is rounded substantially to conform to an arc of a circle. A flange 16A conforming therewith is integral with said corner 16 and with end flange 12 and side flange 14. At said rounded corners 16, inwardly disposed therefrom, are provided circular apertures 18, which apertures would be in concentric relation to an imaginary circle drawn from the arc of said rounded corner 16. Secured at each corner of panel 10 is a corner support 20, by means of rivets 22 and 24 through flanges 12 and 14, respectively. Although rivets are preferred, other fasteners or securing means may be used. Each corner support 20, best illustrated in FIGURE 3, comprises a central body portion 26 having integrally connected therewith, right angularly disposed arms 28 and 30. The depth of each corner support 20 is equal to that of flanges 12, 14 and

16A, less one thickness of the material which forms the panel 10. The corner supports 20 may be of cast or formed metal or formed in any other manner of a suitable material. It will be seen from FIGURES 1 and 2, for example, that when corner support 20 is secured to flanges 12 and 14, at its arms 28 and 30, respectively, as by means of rivets 22 and 24, respectively, to the underside of corner 16 and panel 10, the corner support 20 will be flush with the lower edges of flanges 12, 14 and 16A. By referring to FIGURE 3 it will also be seen that central body portion 26 is adapted to be in concentric relation with rounded corner 16 and its flange 16A, that is as if an imaginary circle were to be drawn in conformity thereto, so that it can be seen that corner support 20 fits in abutting smooth relation with flanges 12, 14 and 16A. A central bore 32 is provided in central body 26, said central bore 32 being in a generally frusto-conical shape, with the narrow end of said bore 32 being in registry with aperture 18 of panel 10.

A corner post 34, usually metal as above, is provided for each corner support 20, each of said corner posts being provided in turn with circular slots 36, graduated 1" apart along the vertical dimension. Although the circular slots 36 are described as 1" apart, it is clear that they may be graduated in larger spacings as may be desired. Post supports 40 and 42, preferably metal as above, although other materials may be employed, are adapted to wrap around corner posts 34. Post supports 40 and 42 are semi-annular shaped in cross-section fitting snugly around each corner post 34 as shown in FIGURES 2 and 3, for example; when joined at juncture 34B around corner post 34 so that an annular shape is provided in cross-section, the said supports 40 and 42 become generally frusto-conical in form, as seen best in FIGURE 1 and FIGURE 2. Thus it can be observed by referring to FIGURE 2, that when the corner support 20 is brought down over corner post 34 with its post supports 40 and 42 encircled therearound, that the frusto-conical aperture 32 is adapted to receive and hold securely frusto-conical shaped post supports 40 and 42 joined together around corner post 34. The said frusto-conical aperture 32 substantially coincides in shape to the frusto-conical shape formed by post supports 40 and 42 and by varying its size it can be made to fit in tight and secured relation with post supports 40 and 42, and in so doing it holds said post supports in tight and secured relation with corner post 34.

In a preferred embodiment, a semi-circular rib 44 runs midway up along the inside surface of each post support, so that said post support may be positioned along the desired graduated slot 36, FIGURES 1 and 2. Also provided therewith is a semi-circular slot 46 around the outside surface of each post support 40 and 42, about 1/2 of the way up, and into which a ring 48 is slipped to hold said post supports in ribbed relation to corner post 34 until corner support 20 and panel 10 are slipped down thereover. It can be seen that by varying the height of the post supports along the graduated slots 36 that various heights for the shelf members 10A may be obtained. The ring 48 is not completely closed and acts as a spring clip so that it can be readily removed, being of a spring-like material. Ring 48 can be metal or plastic so long as it is readily removable. FIGURE 4 shows how shelf members 10A may be moved up or down in the direction of the arrows as may be required. All that need be done is lift off shelf member 10A, remove the ring 48, adjust the post supports 40 and 42 to a new location, replace the ring 48 and slip the shelf member back down on the corner post 42, a very simple and quick operation requiring no tools whatsoever. Moreover, shelf member 10A need not be lifted clear off the corner post 42, it need only be lifted off and held until the required adjustment is made.

FIGURES 6 and 7 show still another embodiment of the invention. For example, if it is desired to move the shelf member 10A in increments of 1/4", it would weaken the corner posts 34 substantially to slot them every 1/4". The adjustment of said shelf members in 1/4" increments

is accomplished by providing semi-circular slots 50 in the inside surface of corner posts 40 and 42 in 1/4" increments. Thus when it is desired to adjust the shelf height by 1/4" an inside ring 52 acting as a rib is placed in slot 36 of corner post 34 and the slot 50 is placed over it in ribbed relationship in the desired 1/4" increment. Ring 28 is thereafter similarly, as previously described, placed over post supports 40 and 42 in slot 46 and the shelf member 10A is slipped thereover, as shown by FIGURE 7. It will also be noted in FIGURE 7 that rings 52 are in different slots 50, so that it can be seen that very fine adjustments can be made with this embodiment of the invention. For example, in FIGURE 8, the difference in height between the middle and lower shelf 10A is the same as the distance between the middle and upper shelf 10A, less an increment "Y," which can be 1/4", 1/2", 3/4", etc.

Illustrated by FIGURES 9 and 10 is yet still another embodiment of the invention. According to this embodiment, the shelf member and corner support are cast as an integral plastic unit 60 having a frusto-conical shaped aperture 62, as in 32 above, and serving the same function as also described above. The cast plastic unit 60 is adapted to the corner posts and post supports in the identical manner as the metal shelf member 10A and each corner support 20. FIGURE 8 is also applicable to this embodiment, as is FIGURE 4.

It will be realized that the ribs 44 on supports 40 and 42 or the notches 50 with the rings 52 may under certain circumstances be dispensed with varying degree of advantage. Under such conditions the graduated slots need not be provided on the corner posts although they may serve to mark off the desired shelf level or height. When the ribs, notches and rings are eliminated a less positive retention results but the frictional engagement of the interior surfaces of the shelf supports with the surfaces of the corner posts is adequate in many applications. An arrangement of this type is illustrated in FIGURE 11 wherein the post supports 40A and 42A when assembled provide a cylindrical bore having an unmodified inner surface in surface contact with the unmodified surface of the corner post 34A. The wedging action resulting from the engagement of the frusto-conical wall of the central bore 32 in the corner support 20 with the complementary frusto-conical surfaces of the post supports provides a gripping force against the surface of the posts which increases as the shelf is loaded within the limits of its capacity. In this connection the post supports 40A and 42A are made slightly less than semi-annular so that their confronting surfaces do not make actual contact thereby permitting full pressure to be exerted against the surface of each corner post. Thus, many of the advantages of the invention are realized in a simple and economical manner.

Having thus described the invention as applied to specific embodiments, it is to be understood that various changes may be made by those skilled in the art without departing from the spirit and scope thereof.

I claim:

1. Shelving comprising a flat shelf member having corner supports secured thereto at each corner of said shelf member, said corner supports being adapted to receive and securely hold corner posts, said corner posts being fitted with post supports for holding said corner supports and corner posts in wedgingly secured relation.
2. Shelving according to claim 1, wherein each of said corner supports comprise a body portion, a central bore being provided in said body portion, said central bore being of a generally frusto-conical shape, said shelf member being provided with an aperture in each corner thereof, the narrow end of said bore being in registry with an aperture at each of the shelf corners.
3. Shelving according to claim 2, wherein each of said post supports comprises a pair of generally slightly less than semi-annular shaped bodies in cross-section, which

5

when placed around said corner post form an almost generally annular shaped body in cross-section and a generally frusto-conical form, said corner support and post support being in frusto-conical relation, so that said corner posts will be securely held by said corner support by the wedging action resulting from the frusto-conical relation of said corner support and post support.

4. Shelving comprising a flat shelf member having corner supports secured thereto at each corner of said shelf member, said corner supports being adapted to receive and securely hold corner posts, said corner posts being fitted with post supports for holding said corner supports and corner posts in secured relation, each of said corner supports comprising a body portion, a central bore being provided in said body portion, said central bore being of a generally frusto-conical shape, said shelf member being provided with an aperture in each corner thereof, the narrow end of said bore being in registry with an aperture at each of the shelf corners, and wherein said corner posts are provided with graduated recesses spaced at predetermined increments along their vertical dimension.

5. Shelving according to claim 4, wherein the height of said shelf member is adjusted by varying the position of the said post supports along the vertical dimension of said corner posts with respect to said graduated recesses.

6. Shelving according to claim 4, wherein said shelf member comprises a flat panel of generally rectangular shape and having integrally connected therewith right angularly disposed downwardly extending end flanges and side flanges, each corner of said panel being rounded, with a flange integrally conforming therewith downwardly extending and also being integrally connected with said end and side flanges, an aperture being provided at each of said rounded corners.

7. Shelving according to claim 5, wherein each of said semi-annular shaped bodies has a semi-circular rib extending along the inner surface of said semi-annular shaped body, so that it may be placed in ribbed relation with said graduated recess.

6

8. Shelving according to claim 5, wherein each of said semi-annular shaped bodies is provided with semi-circular slots spaced at lesser increments extending along the inside surface thereof, and a ring-like band is provided to fit around a graduated recess of said corner post, said slot on said semi-annular shaped body being placed in registry therewith and resulting in a ribbed engagement therewith.

9. Shelving according to claim 8, wherein the height of said shelf member is adjusted in accordance with said lesser increments by varying the position of said slots with respect to said ring-like band, said band also being variably positioned along the said graduated recesses of said corner posts.

10. Shelving comprising a flat shelf member having corner supports secured thereto at each corner of said shelf member, said corner supports being adapted to receive and securely hold corner posts, said corner posts being fitted with post supports for holding said corner supports and corner posts in secured relation, and wherein said flat shelf member and corner supports therefor are formed as an integral plastic unit.

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JAMES T. McCALL, *Primary Examiner.*

U.S. Cl. X.R.

248—412

**Disclaimer**

3,424,111.—*Louis Maslow*, Dallas, Pa. READILY ASSEMBLABLE AND ADJUSTABLE SHELVING. Patent dated Jan. 28, 1969. Disclaimer filed July 13, 1983, by the assignee, *Metropolitan Wire Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

[*Official Gazette September 6, 1983.*]