June 18, 1968 E. IRISH 3,388,809

STORAGE RACK

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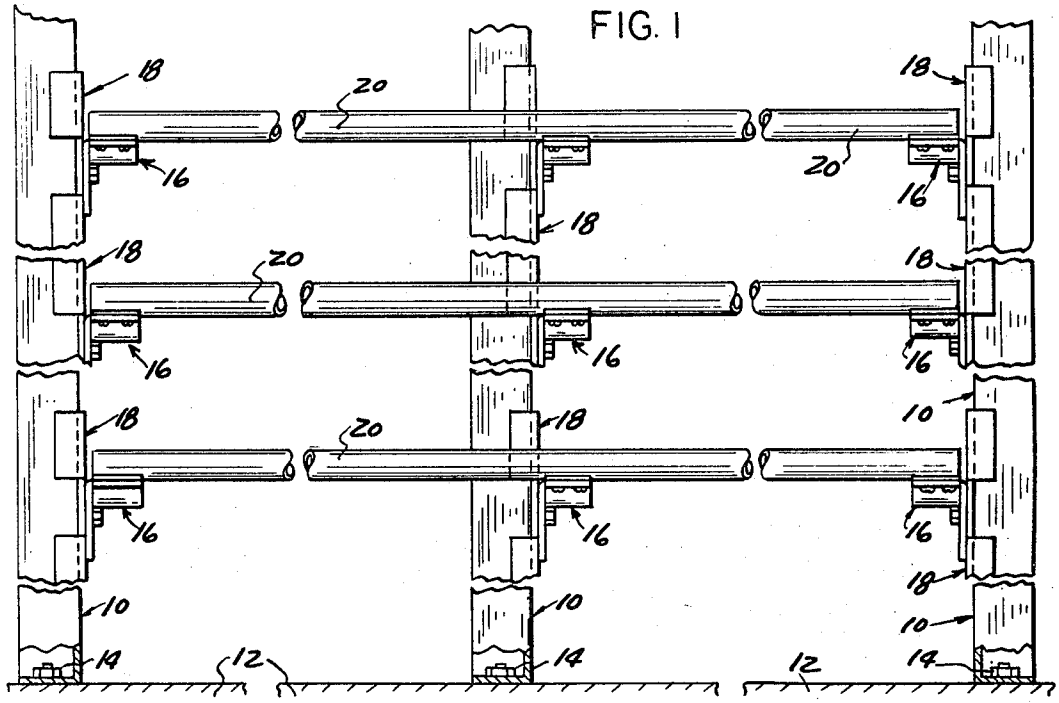
FIG. 1



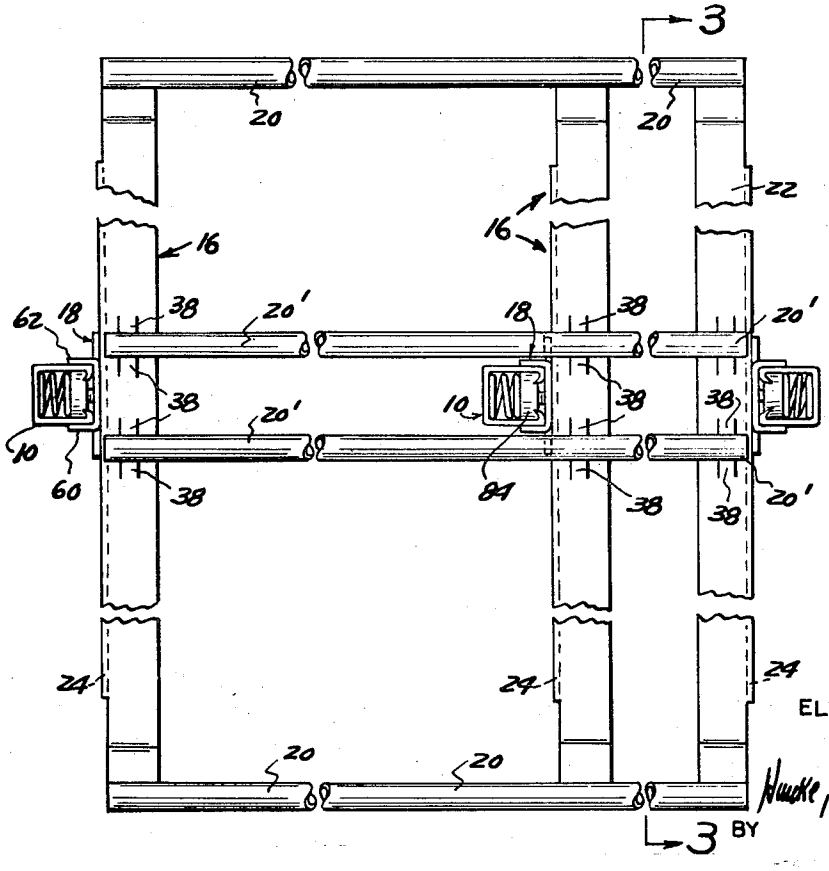


FIG. 2

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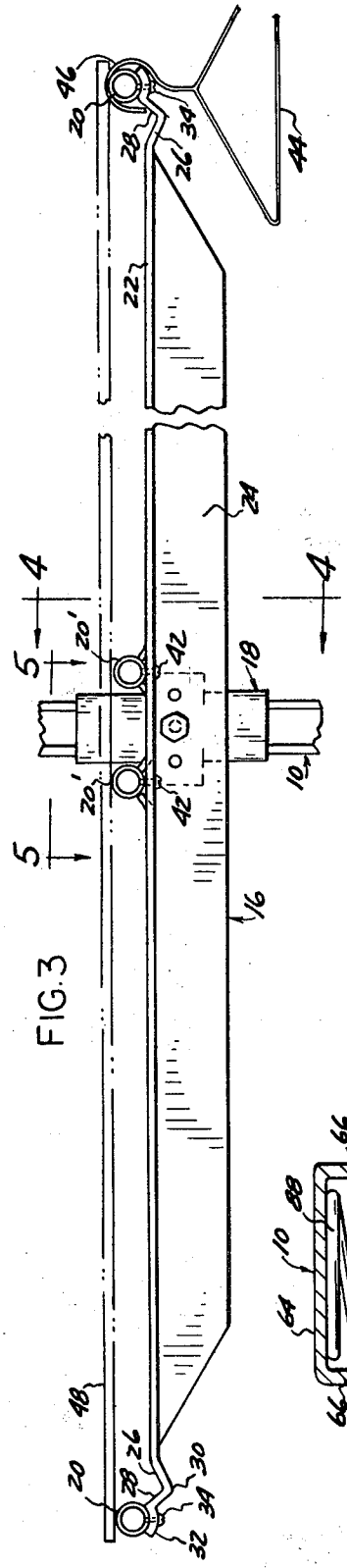

FIG. 3

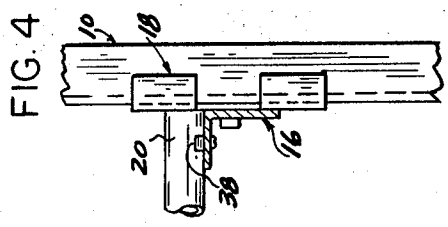

FIG. 4

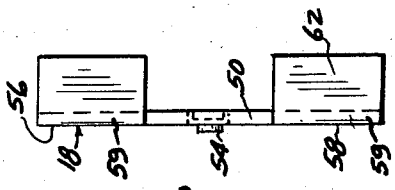

FIG. 12

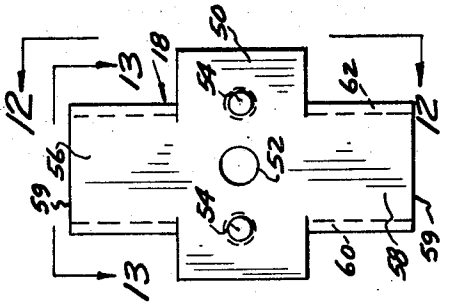

FIG. 11

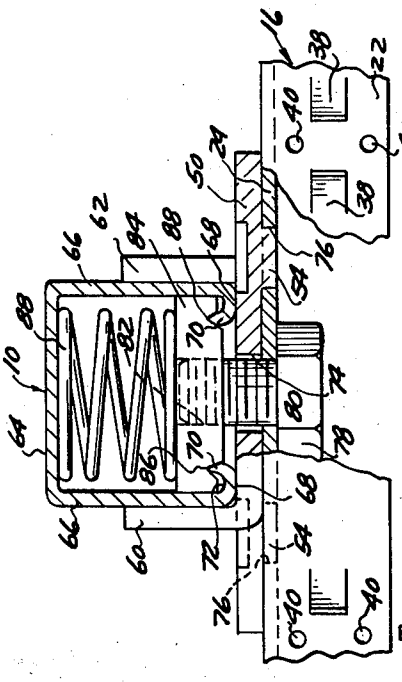

FIG. 5

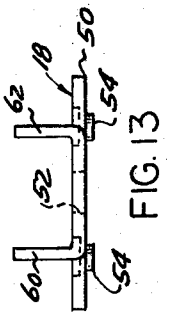

FIG. 13

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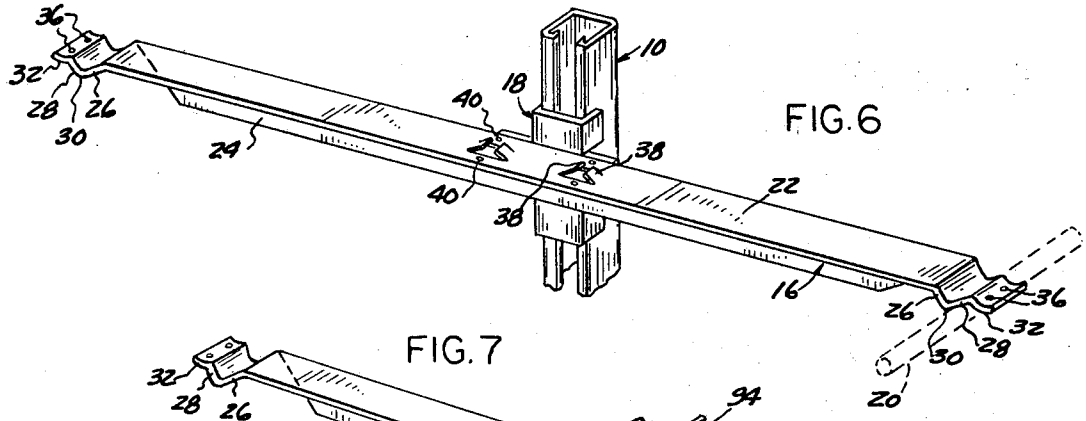

FIG. 6

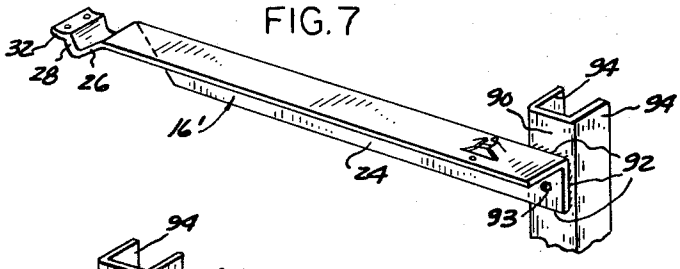

FIG. 7

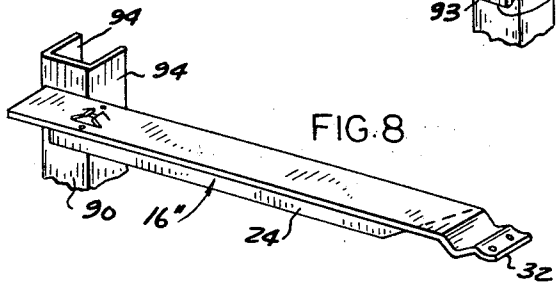

FIG. 8

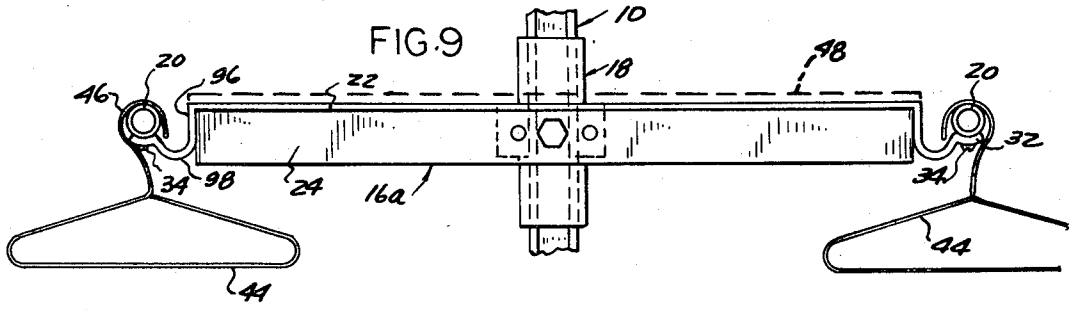

FIG. 9

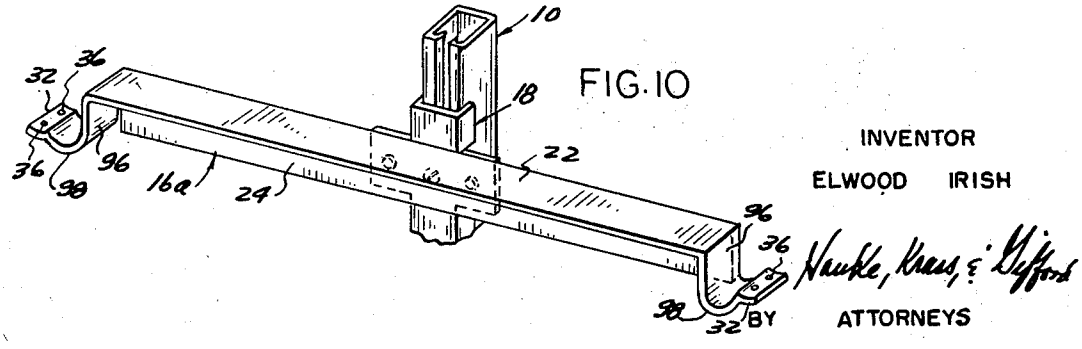

FIG. 10

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United States Patent Office 3,388,809 Patented June 18, 1968

3,388,809

STORAGE RACK

Elwood Irish, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich., a corporation of Michigan

Filed June 15, 1966, Ser. No. 557,814
10 Claims. (Cl. 211—176)

ABSTRACT OF THE DISCLOSURE

A storage rack especially suitable for supporting garment hangers or the like and including upright channel support members, bracket members adjustably mounted to the support members and in turn supporting rod or tubular members for holding the garment hangers. The bracket members are formed to permit the hangers to be slid off the ends of the rods without encountering an obstruction and the means for adjustably mounting the bracket members to the support members includes a connector having a pair of spaced lugs and an aperture therebetween with the lugs adapted to register in apertures in the support member and the aperture in the connector receiving a bolt to lock each of the bracket members in the desired position.

The present invention relates in general to storage racks and more specifically to storage racks including upright channel support members in combination with rack brackets and connectors permitting rapid erection and modification of a storage rack assembly.

In addition, the present invention provides for a storage rack assembly particularly well adapted for storing and displaying clothes and garments and having provision for shelving.

The present invention, consequently, has among its objects to provide a storage rack assembly, for the storage and display of clothes or garments, which utilizes a few numbers of standard and easily assembled parts.

Another object of the present invention is to provide such a storage rack including the added feature of using the storage rack brackets as a means for supporting shelving.

A further object of the present invention is to provide a storage rack which can be easily modified and expanded through the use of a few standard channel and strut members, connectors, brackets and rods, according to a building block principle.

A further object of the invention is to provide a storage rack of the character indicated that provides steady, although adjustable, connections between the bracket members and the upright channel support members.

Other objects and advantages of the invention will become apparent to those skilled in the art when the following description is considered in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic side elevation view of an example of a storage rack according to the invention;

FIG. 2 is a top plan view of the storage rack of FIG. 1, as seen from line 2—2 thereof;

FIG. 3 is an elevation view of a bracket member of the storage rack of FIGS. 1–2, as seen from line 3—3 of FIG. 2;

FIG. 4 is a view from line 4—4 of FIG. 3;

FIG. 5 is a detailed view, from line 5—5 of FIG. 3, with portions broken away for the sake of clarity;

FIG. 6 is a perspective view of the bracket member of FIG. 3;

FIG. 7 is a perspective view of a modification of the bracket of the invention;

FIG. 8 is another perspective view of another modification;

FIG. 9 is an elevation view of a further modified bracket according to the invention;

FIG. 10 is a perspective view of the bracket of FIG. 9;

FIG. 11 is a front elevation view of an example of a connector according to the present invention;

FIG. 12 is a side elevation view thereof, as seen from line 12—12 of FIG. 11; and

FIG. 13 is a top plan view, as seen from line 13—13 of FIG. 11.

As shown in FIGS. 1–6, a storage rack assembly according to one aspect of the present invention comprises a plurality of upright channel support members or posts 10 disposed substantially in a regular fashion and in parallel relationship to each other, and anchored to a floor 12 by any convenient means such as anchoring means shown at 14. Each upright channel member 10 supports a plurality of bracket members designated generally at 16, at least one of which is adjustably mounted on each upright channel member by means such as connector 18. On at least one end of each bracket is mounted a continuous tubular member 20, as will be hereinafter explained in further detail.

As best seen in FIGS. 2–6, each support bracket member 16 comprises a substantially horizontal flat portion 22 and a vertically disposed flange portion 24 substantially at right angle with the horizontal portion, thus forming a substantially L-shaped member. Both ends of the horizontal portion 22 of each support bracket member 16 has a downwardly turned projection 26 connected to an integral outwardly projecting portion 28 by an elbow like portion 30. Integral with the upwardly bent projection portion 28 is an arcuate projecting portion 32 adapted to accept on the upper surface thereof a tubular member 20 affixed thereon by means such as screws 34 passing through apertures 36.

Proximate the center of each bracket member 16, and separated by a distance at least slightly larger than the width of each upright channel member 10, may be arranged means for supporting additional tubular members, as shown at 20', such means consisting preferably of a pair of cutout upwardly bent tongues 38 having a space therebetween adapted to receive the body of each tubular member 20', the horizontal portion 22 of the bracket being further provided with aperture 40 adapted to accept means such as screws 42 for fastening the tubular members 20' in appropriate position.

It is evident that the storage rack assembly of FIGS. 1–4 may consist of several levels of storage elements as defined by the assembly of an individual bracket member 16 and the associated tubular members 20 and 20', the brackets 16 on one level being mounted on consecutive upright channel members 10 substantially parallel to each other, and each bracket member in the next consecutive level being substantially at equidistant distance from the bracket member in the preceding level mounted on the same upright channel member. The tubular members 20 and 20' are adapted to accept cloth or garment hangers such as shown at 44, and the particular configuration of the projecting end of each bracket member formed by downwardly projecting portion 26, elbow 30 and upwardly projecting integral portion 28 affords clearance for the end of the support wire loop 46 of the hangers 44, so that each hanger can be slid end to end of the tubular member 20, if necessary, without the wire loop 46 encountering any obstruction. In order to provide storage space facilities for miscellaneous goods, shelves such as 48 may be disposed upon the top of the tubular members 20 and 20' where so required.

The connection between each upright support channel member 10 and each bracket member 16 is effected preferably by means of a connector such as connector 18, which is shown in detail in FIGS. 11–13, and which

is shown in combination with the upright channel and horizontal bracket members in FIGS. 1–6, with particular reference to FIG. 5, and in FIGS. 9 and 10. Each connector **18**, as best seen in FIGS. 11–13, comprises a substantially flat portion or plate **50** having a substantially centrally located round aperture **52**, and two symmetrically disopsed outwardly projecting coined lugs **54**, arranged according to the principles well known to those skilled in the art familiar with the "Unistrut" structural system. Connector **18** is further provided with gusset-like extensions **56** and **58**, having a bottom wall **59** disposed in the same plane as plate **50**, the gusset-like extensions each having symmetrically disposed integral projecting side members **60** and **62**, bent substantially at right angles with respect to the plane of plate **50** and bottom wall **59** and equidistant from each other in a spatial relationship designed to normally embrace the sidewalls of the upright U-channel members **10**.

As shown best in FIGS. 2, 5 and 6 each upright U-channel member **10**, as is well known to those familiar with the "Unistrut" system, comprises an end wall **64** forming with two symmetrically disposed integral sidewalls **66** an open box structural strut of high rigidity, strength and of light weight. The end of each sidewall **66** is inwardly turned at right angle as shown at **68**, and the edge is once more turned in at right angle as shown at **70**, thus forming between each side wall inner surface and the inwardly turned edge **70** a continuous groove as shown at **72**.

As more clearly illustrated in FIGS. 2 and 5, each bracket member **16** has, substantially at the center thereof, an aperture **74** through the upright flange **24**, and two symmetrically disposed apertures **76** adapted to accept the projecting lugs **54** of connector **18**. Bracket members **16** are thus mounted upon the upright channel members **10** each by means of a connector **18**, with projecting coined lugs **54** engaging apertures **76** of the bracket flange **24**, as shown in detail in FIG. 5, and a bolt **78** is passed through aligned apertures **74** in the vertical flange **24** of the bracket member and **52** in the connector, the threaded end **80** of the bolt being adapted to thread into the tapped bore **82** of a square nut **84** placed within the U-channel member **10**, the nut **84** having grooves such as **86** and **88** adapted to engage the edges of the inwardly turned portions **70** of the sidewalls **66** of the U-channel member **10**. A spring member **88** disposed behind each nut **84** normally holds the nut with its grooves **86** in engagement with the edges of the channel, in the manner disclosed more particularly in U.S. Patent 2,696,139, issued Dec. 7, 1954, in the name of Charles W. Attwood.

Through the above described means of connecting each bracket member **16** with its associated upright channel support member **10** by means of connector **18**, projecting members **60** and **62** of the connector being adapted to embrace the exterior of sidewalls **66** of the upright channel member, it is possible to slide each connector up and down along each channel to any appropriate position and to clamp and fixedly connect each bracket member to the upright channel member by tightening bolt **78**. Projecting lugs **54** engaging openings **76** in the flange portion **24** of each bracket member, in combination with the projecting portions **60** and **62** of the connector embracing the exterior of the sidewalls **66** of the upright channel member insure a perfect connection between the elements with the bracket member axis substantially at right angle to the axis of the upright channel member, thus permitting a strong connection between the elements in a correct position by means of only one bolt and nut.

When it is desired to have a support bracket member extending only in one direction from an upright support member **10**, instead of a bracket member extending in both directions therefrom as hereinafter explained, a bracket member as illustrated in FIG. 7 or 8 may be used. Bracket member **16'**, shown in FIG. 7, is

in every point similar to bracket member **16** precedently described, and is actually the equivalent of such a bracket member being cut in half substantially at its center. In the configuration shown in FIG. 7 the upright flange **24** of bracket member **16'** is welded to a substantially U-shaped gusset member **90**, as shown at **92**, and the welded assembly is provided with a mounting aperture **93** allowing passage for the threaded body of a mounting bolt for the purpose of mounting the bracket member to an upright U-channel member in a manner substantially similar to the one illustrated at FIG. 5, with the sidewalls **94** of the mounting gusset **90** embracing the exterior of the sidewalls **66** of the upright U-channel member **10**. FIG. 8 illustrates a symmetrical arrangement, wherein the bracket **16''** is arranged to extend in a direction opposite to the direction in which the bracket **16'** of FIG. 7 is extended. It is evident that the mounting gusset **90** of FIGS. 7 and 8 can also be used with the other bracket member embodiments illustrated and described with respect to the present invention and that a connector **18** as hereinbefore described in detail can be used in combination with the brackets **16'** and **16''** of FIGS. 7 and 8 respectively, on the condition that the flange portion **24** of the bracket member be provided with apertures adapted to register with and accept the projecting coined lugs **54** of the connector, and with a mounting hole adapted to be aligned with the round aperture **52** in the connector.

FIGS. 9 and 10 represent a further modification of the bracket members heretofore described. Each bracket member, as shown, comprises an L-shaped bracket member **16***a*, having a horizontally disposed flat portion **22** and an integral bent-down vertically disposed flange portion **24**. Each ends of the horizontal portion **22** of the bracket member is provided with a downwardly turned portion **96** having at the bottom thereof an integral arcuate substantially U-shaped portion **98** ending with a second horizontally arcuate portion **100** adapted to accept tubular members such as **20** affixed thereon by means such as screws **34** passing through apertures **36** in the arcuate end portion **32**. In this manner, a clothes or garment hanger **44** having a support wire hook **46** adapted to be hooked over the tubular member **20** can be slid to any position along the tubular member without encountering any obstruction due to the end of the support bracket. The brackets of FIGS. 9 and 10 have been shown mounted on the upright channel members **10** by means of connectors **18**, in a manner entirely similar to the manner herein previously described in detail, and it is evident that shelving or platforms for storage of miscellaneous goods may be disposed directly upon the upper surface of the bracket member horizontal portion **22** as shown at **48** without causing interference with the hanger hooks.

Having thus described the present invention, by way of several illustrative examples incorporating the principles, modifications of which will be apparent to those skilled in the art, what is sought to be protected by U.S. Letters Patent is:

1. A storage rack assembly comprising:

vertically disposed floor anchored posts substantially regularly and parallel arrayed;

each one of said posts being a substantially U-shaped channel member having an end wall and two opposed sidewalls each provided with an inwardly doubly bent edge;

at least one substantially horizontally disposed bracket member clamped on each one of said posts at a predetermined distance from the floor;

each bracket member comprising essentially an L-shaped member having a substantially horizontal portion and an integral substantially vertical flange portion adapted for clamping to a portion of said post, horizontally disposed portion of each said bracket member having at least one end provided with a projection;

at least one rod attached to said projection of each said bracket, said rod being adapted to support garment hangers and the like; and

connecting means for connecting each said bracket member to each said post.

2. The storage assembly of claim 1 wherein each bracket member has a projection on each end thereof and a rod is attached to each said projection.

3. The storage assembly of claim 1 wherein said connecting means comprises:

a U-shaped channel gusset having a bottom wall mounted on the outer side of the vertical flange portion of the bracket member and a pair of sidewalls adapted to surround and embrace the opposed sidewalls of said U-shaped channel post;

a mounting bolt passing through aligned apertures in said vertical portion of the bracket and the bottom wall of said gusset;

a nut in the U-shaped channel post cooperating with said bolt, said nut having a face disposed toward the inwardly turned edges of the side walls of said post and provided with a groove adapted to engage each of said edges; and

a spring disposed between the other face of said nut and the bottom wall of the post for constantly urging said nut in engagement with said edges.

4. The storage assembly of claim 3 wherein said gusset comprises:

a flat portion provided integral with said bottom wall, said flat portion having an aperture and a pair of outwardly projecting coined lugs symmetrically disposed on both sides of said aperture.

5. The storage rack assembly of claim 1 wherein said projection on the end of said bracket member forms a downward arcuate bend defining a clearance for sliding of said garment hanger past said projection without causing interference therebetween and the hooks of said hangers.

6. The storage rack assembly of claim 1 wherein a storage platform is disposed on the top of the horizontal portion of said bracket member.

7. The storage rack assembly of claim 1 wherein means are provided on each said bracket member for attachment of at least one rod at a predetermined position intermediate the ends of said bracket member.

8. The storage rack assembly of claim 7 further wherein a storage platform is disposed above said rods in engagement therewith.

9. A connector for use in assembling a first structural member having a flat portion provided with a mounting aperture and two symmetrically disposed apertures on either side of said mounting aperture with a U-channel second structural member having an open side provided with doubly inwardly bent edge portions, said connector comprising:

a substantially flat portion having an aperture adapted to register with the mounting aperture in said first structural member and two outwardly projecting coined lugs symmetrically disposed on either side of said aperture and adapted to engage the symmetrically disposed apertures in the flat portion of said first structural member;

at least one projecting portion substantially coplanar with said flat portion of said connector;

said projecting portion being provided with projecting integral bifurcated substantially parallel flange portions adapted to embrace the extension of the sidewalls of said second structural member.

10. The connector of claim 9 wherein the planes of said flange portions are substantially perpendicular to an imaginary line connecting the centers of said coined lugs.

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