

[54] EXPANDABLE SUPPORT

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[22] Filed: Nov. 1, 1971

[21] Appl. No.: 194,661

[30] Foreign Application Priority Data

Jan. 5, 1971 Great Britain 375/71

[52] U.S. Cl. 248/124, 211/107, 248/221, 248/230, 248/274

[51] Int. Cl. F16m 13/02

[58] Field of Search ... 248/124, 229, 158, 161, 230, 248/226 R, 226 D, 221, 279, 274; 211/107, 134, 177, 176, 182, 175; 108/28, 59, 149, 151, 65, 69; 174/45 R

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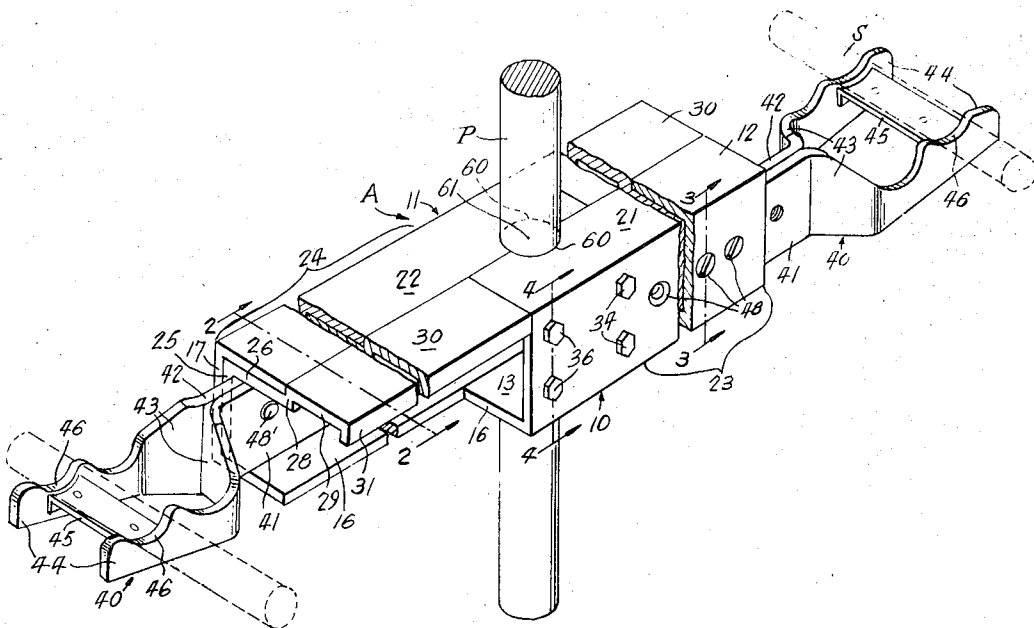
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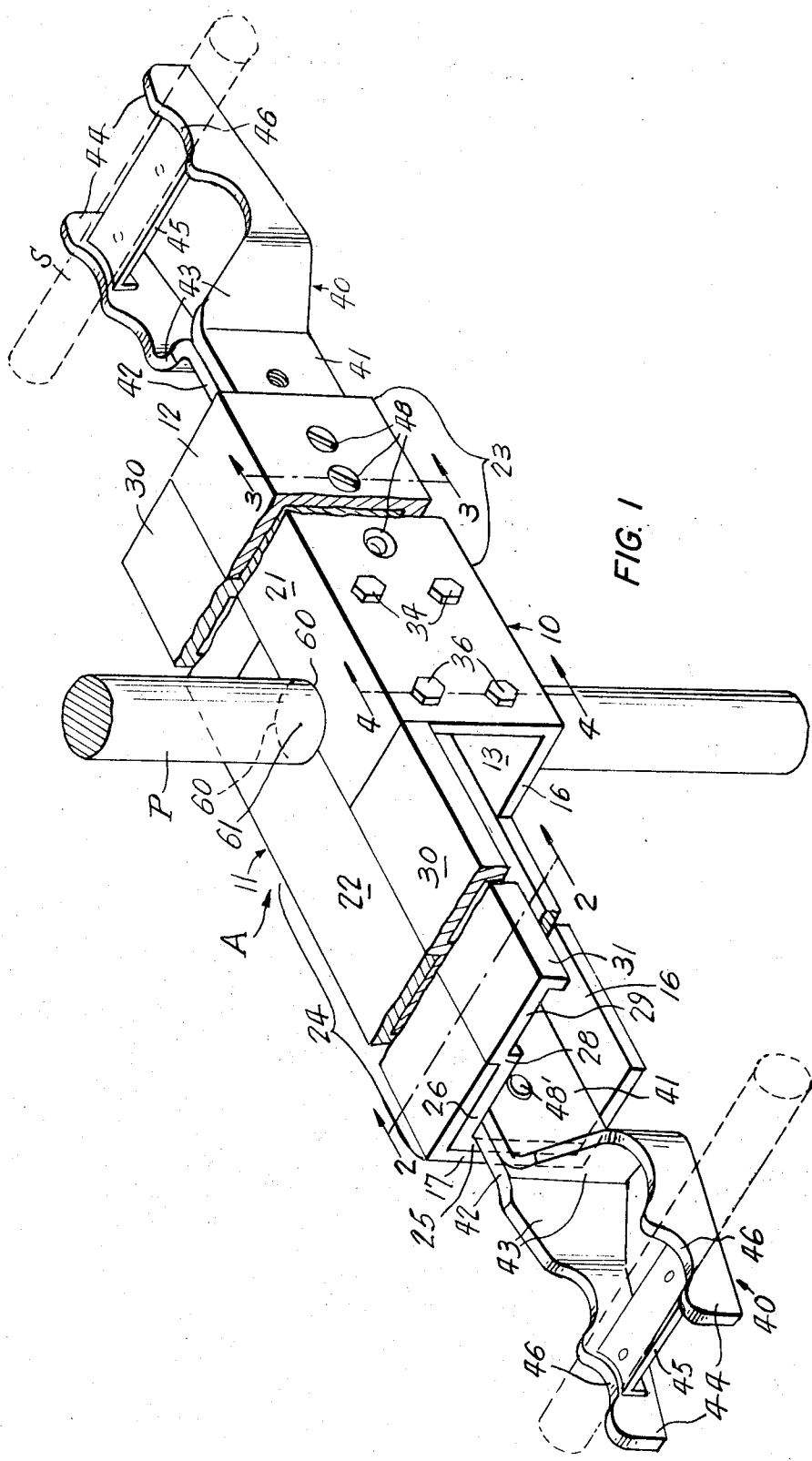
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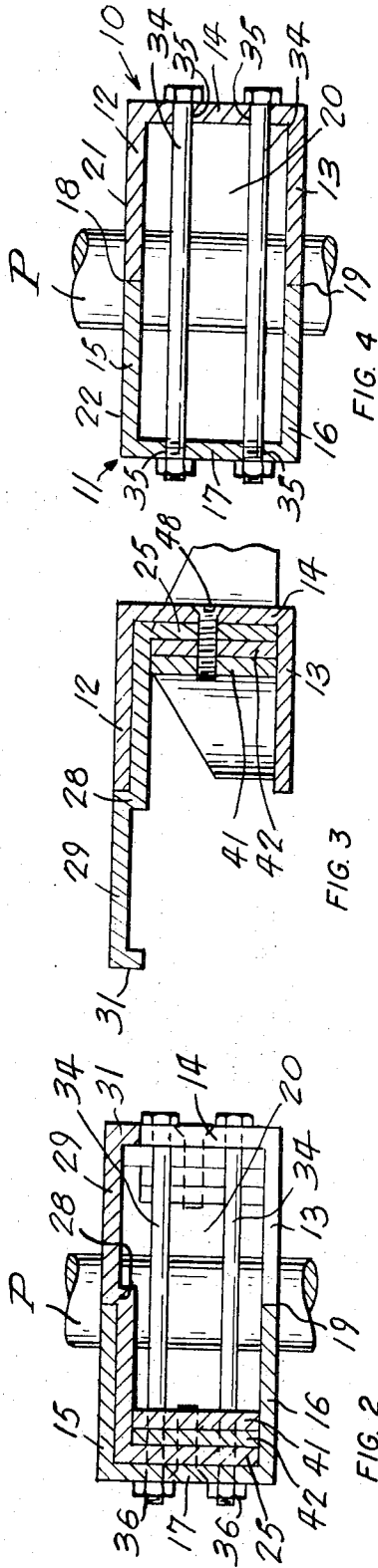
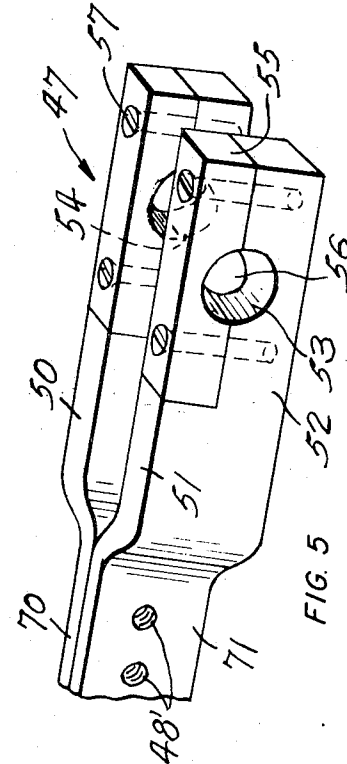
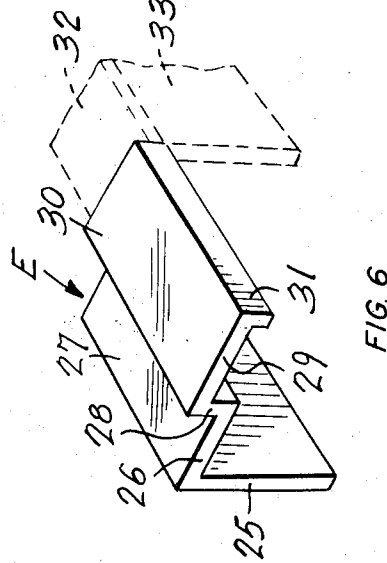
ABSTRACT

A supporting structure which is comprised of a pair of cooperating support members engageable with each other in abutting and staggered relationship and secured to form a unitary structure. The upwardly presented surfaces of each of the cooperating support members are presented in coplanar relationship to form a relatively flat surface for supporting shelves or other panel forming members. Extension members may be connected to each of the support members in order to complete the upwardly presented flat planar surface. A pair of oppositely located mounting arms which can be telescoped within the support member to a desired length may be secured to the support members and to an existing structural member. The support members may also be provided with an enlarged aperture for disposition about and securement to an existing pole, strut, or the like.

11 Claims, 6 Drawing Figures







EXPANDABLE SUPPORT

This invention relates in general to certain new and useful improvements in supporting structures, and more particularly to supporting structures which are capable of being readily attached to existing structural members.

In recent years, it has been recognized that point of sale display is one of the important factors in the marketing of a product. Most retail establishments employ various types of display cases, display shelves and the like, in order to present the goods in an appealing fashion to a potential purchaser. This marketing technique is effective for almost any type of product including food products, clothing, industrial supplies, and the like. In fact, there is often a frequent struggle among producers of competitive products to acquire shelf space for their particular product lines in the retail outlets.

Most retail establishments are limited in the amount of available floor space which can be used for display cases or other display devices. Frequently, a retail establishment will resort to the mounting of shelves on a wall or similar structural member for purposes of displaying certain products. These shelves which may be formed of wooden, metal or plastic planks are generally supported by means of conventional support brackets, such as L-shaped brackets which are, in turn, secured to the wall or similar structural member. In like manner the amount of wall space which is available for the mounting of these shelves is limited and furthermore, the support brackets in many cases may only be secured to the wall in areas where studs or other structural members are available for supporting the weight of the shelves and the objects which may be disposed thereon.

In accordance with this invention, there is provided an improved structure of the above type, which in general terms, comprises a supporting frame-work of a first supporting member having a supporting surface thereon, a second supporting member connected in a staggered relationship to said first member and similarly having a supporting surface and cooperating with the supporting surface of said first supporting member for supporting an object thereon, securement means for connecting said first and second members in said staggered relationship, and mounting means for mounting the first and second member in operative relationship to a structured member.

In greater detail, the structure of the present invention preferably comprises first and second supporting members of a substantially identical nature, arranged in a staggered relationship and connected in operative engagement to form a unitary structure. These members are preferably of a U-shaped construction and most desirably in the form of a "U-shaped" channel. In this U-shaped construction, each of the members comprise a first leg having an upwardly presented flat supporting surface, a second leg spaced downwardly from and parallel to the first leg, and an intermediate connecting arm or so-called "bight" preferably of a generally flat or planar nature and extending between and connected to the first and second legs. The intermediate arm is adapted to form a bearing surface against which a connecting arm of a rack-supporting member may be secured, as hereinafter described in greater detail.

As stated above, both of the supporting members are joined together in staggered relationship and to this end, a preferred arrangement comprises the joining of these members in a face-to-face relationship whereby an opening is formed by the engagement of opposed upper and lower legs of the U-shaped channel of each member and further, the upwardly presented flat surfaces of each member are horizontally disposed and coplanar to form a supporting surface for various types of objects. Still further, in joining the first and second members in staggered relationship, preferably the respective supporting members have an overlapping portion whereby the members are in a side-to-side relationship with the apertures defined by the respective U-shaped channels forming therebetween a generally rectangular channel by the engagement of the two members in the face-to-face relationship.

In the structure of the present invention, at least one of the supporting members is provided with a plurality of apertures therein adapted to receive securement means. To this end, preferably both members are provided with a plurality of apertures, most desirably located in the intermediate leg joining the two opposed legs of the U-shaped channel. These apertures provide a recess to receive or permit locking means to be inserted therein, for the purpose of connecting to the channels to the connecting arm of a mounting bracket which may be in the form of a rack-supporting member. To this end, the apertures are preferably spaced apart an equi-distance, and may extend for the length of the respective channels, or a portion thereof, to provide a plurality of adjustable positions for mounting the connecting arm of the rack-supporting member.

If desired, the respective supporting members may be provided with an extension to one of the leg members which is a preferably substantially co-extensive with and forms a coplanar surface with the leg of the other member when both members are mounted in the above described relationship. To this end, the extension to the supporting surface of each member may be co-extensive with the length of the supporting surface of the leg of the other member. In a preferred form, the width of the extension is preferably equal to the width of the supporting surface of the member from which it extends; however, there may be provided with an extension having a width corresponding to the width of the leg of the second member forming the supporting surface, whereby in this form, the extra width is preferably on a plane below the plane of the opposed leg so that this extra width may lie in juxtaposition with the underneath surface of the opposed leg. Still further, this extra width may include a further leg at right angles thereto, which further leg is adapted to lie in juxtaposition with the intermediate leg of the opposite supporting member.

The means for connecting, in operative relationship to at least one member, a mounting member, is adapted to secure the device of the present invention to a suitable structure, such as a post or pole, etc. Such connecting means, as may be employed, may be any suitable type of connecting means — for example, clamps, etc.

One of the features of the device of the present invention is a plurality of such units which may be mounted by, e.g., a supporting post or pole, with a plurality of such units aligned in planar relationship, forming a shelf-bearing surface and/or forming a device for

supporting racks by the addition of suitable rack-supporting means which may be adjustably mounted with respect to the device of the present invention.

Having thus described the invention in general terms, reference will now be made to the accompanying drawings which illustrate practical embodiments of the present invention, and in which:

FIG. 1 is a perspective view of a supporting structure which is constructed in accordance with and embodies the present invention;

FIGS. 2, 3 and 4 are vertical sectional views taken along the lines 2—2, 3—3 and 4—4 respectively, of FIG. 1;

FIG. 5 is a perspective view of an extension member used with the supporting structure of the present invention; and

FIG. 6 is a perspective view, partially broken away, of a modified form of mounting bracket which is used with the supporting structure of the present invention.

Referring now in more detail and by reference characters to the drawings which illustrate practical embodiments of the present invention, A designates a supporting structure which is comprised of a pair of oppositely disposed cooperating support members 10, and 11 which are capable of being located in cooperative engagement in the manner illustrated in FIGS. 1—3. The support members are constructed in the form of U-shaped channel members and as such, may be hereinafter referred to as "channel members" or "U-shaped channel members."

The support member 10 generally comprises a pair of horizontally disposed upper and lower longitudinally extending walls or so-called "legs" 12 and 13, and which are located in vertically spaced parallel relationship. The legs 12 and 13 are integrally connected by a vertically disposed connecting wall or so-called "bight" 14 to render a generally U-shaped appearance in cross-section. The U-shaped channel support member 11 is similar to the support member 10 and also includes upper and lower horizontally disposed legs 15 and 16, respectively, which are integrally connected by vertically disposed connecting wall or bight 17. The horizontally disposed upper legs 12 and 15 each present engageable longitudinally extending vertically presented abutment surfaces 18 and in like manner, the horizontally disposed lower legs 13 and 16 each present engageable longitudinally extending vertically presented abutment surfaces 19 in the manner as illustrated in FIG. 4. When the support members are juxtaposed or in the engaged position in the manner illustrated in FIGS. 1 and 4, they form a rectangularly shaped elongated aperture 20 which opens at the transverse ends of the supporting structure A.

The support members 10 and 11 are preferably formed of a material which is light in weight, but which is nevertheless durable and capable of withstanding the necessary amount of weight. For example the support members 10 and 11 may be formed of a light-weight structural metal such as thin-gauge steel, aluminum, magnesium, or the like. Various known metal alloys or other metal containing compositions may be used in the formation of the U-shaped channel members 10 and 11. In like manner, the support members 10 and 11 may also be fabricated from a suitable wooden or heavy paperboard material. In this connection, the upper and lower legs of the channel members 10 and 11 would

probably be secured to the bight or vertically disposed walls by means of nails, screws, staples or other conventional fasteners. The support members 10 and 11 may also be formed of a suitable plastic material such as a high density polyethylene, polystyrene, polybutadiene, various vinyl compositions such as polyvinylchloride, various acrylic resins and the like. The support members 10 and 11 can be conveniently fabricated from these and other plastic materials by a number of known processes including extrusion, pulltrusion, thermoforming, or other forms of plastic molding. A number of the known reinforced plastic compositions such as fiberglass-resin or boron-resin compositions may also be used in the fabrication of the support members 10 and 11.

By reference to FIGS. 1 and 4, it can be seen that when the U-shaped channel support members 10 and 11 are located in abutting engagement and secured to each other, that the two upper legs 12 and 15 provided upwardly presented support surfaces 21 and 22 which are coplanar with each other and cooperate to provide an upwardly presented shelf supporting plane for receiving a conventional shelf or similar plate-member (not shown).

Generally, any number of conventionally known shelves (not shown) may be retained by the supporting structure A of the present invention. The shelves may be either longitudinally or laterally located upon the upwardly presented support surfaces 21 and 22 of the supporting structure A and these shelves may also be secured to the upwardly presented surfaces 21 and 22 by a number of well known commercial available fasteners. In this connection, the support members 10 and 11 may be of varying length which will depend upon the area in which the supporting structure A is to be located and upon the length of the shelves that the supporting structure A is adapted to support. In this manner, the support member 10 and 11 may range from several inches in length to several feet in length, as desired.

It also should be observed that the support members 10 and 11 have been referred to as U-shaped channel members inasmuch as U-shaped channel construction is the preferred form of construction for these support members. However, the support members 10 and 11 can be formed in any desired shape, the important criterion being that the two support members 10 and 11 are provided with some means of attachment and in this cooperative relationship, the support members 10 and 11 provide upwardly presented surfaces which are capable of receiving relatively flat shelves, planks, panels or other similar members capable of supporting various objects thereon. For example, the support members 10 and 11 could be constructed in the form of rectangular tubular members which may be adapted for side-by-side abutting securement, or the support members could be constructed in the form of I-beams, H-beams or T-bars which could be juxtaposed with respect to each other and secured together in such juxtaposition.

By further reference to FIG. 1, it can be seen that the support members 10 and 11 are located in staggered arrangement in such manner that the support member 10 has a terminal portion 23 which extends beyond the right-hand transverse margin of the support member 11. In like manner, the support member 11 has a terminal portion 24 which extends beyond the left-hand

transverse margin of the support member 10. Accordingly the operative supporting surface which is available from the upwardly presented supporting surfaces 21 and 22 is not rectangular in shape.

Identical extension members E may be used to fill the elongated gap or void which is laterally opposed to and created by the longitudinally extending terminal portion 23 of the support member 10 and the elongated gap or void which is laterally opposed to and created by the longitudinally extending terminal portion 24 on the support member 11. Each of these extension members E are identical in construction, and therefore, only one of such members E is more fully illustrated in FIG. 6.

The extension member E generally comprises a longitudinally extending vertical wall 25 which is capable of being face-wise disposed against the interiorly presented surface of the vertically disposed connecting wall 17. By further reference to FIG. 1, it can be seen that the lower margin of the vertical wall 25 is engageable with the upwardly presented surface of the longitudinally extending leg 16. Integrally formed with the vertical wall 25 is a horizontally struck wall 26 which is provided with an upwardly presented surface 27 engageable with the underside of the upper leg 15 of the support member 11, in the manner as illustrated in FIGS. 1 and 2. The horizontally struck wall 26 integrally merges into an upwardly struck longitudinally extending connecting plate 28 which is, in turn, integrally formed with a horizontally disposed outwardly struck leg 29, and having an upwardly presented supporting surface 30. Integrally formed with the outer margin of the leg 29 is a relatively short downwardly struck flange 31 which extends longitudinally with the leg 29. According to a modified embodiment, the horizontally disposed leg 29 may be integrally provided with a rearwardly extending horizontally disposed retaining plate 32 and e.g., welded or otherwise rigidly secured thereto, a vertically disposed retaining plate 33, in the manner as illustrated in FIG. 6.

By further reference to FIG. 6, if this alternate embodiment is included, the retaining plate 32 will be located below the upwardly presented supporting surface 30 by a distance equivalent to the thickness of the leg 12 and the retaining plate 33 is located inwardly from the exterior surface of the downwardly struck flange 31 by a distance equivalent to the thickness of the connecting wall 14. By means of this construction, the horizontally disposed retaining plate 32 will snugly engage the downwardly presented surface of the leg 12 and the vertically disposed retaining plate 33 will snugly engage the inwardly presented surface of the connecting wall 14 when the extension member is fitted into place in the manner illustrated in FIG. 6.

The retaining plates 32 and 33 if included, are generally provided for added structured stability and could be eliminated if desired; if included, the vertical wall 25 could be eliminated from the extension member E. These retaining plates 32 and 33 may be provided on the extension member E when the supporting structure A is to support a considerable load. However, where a smaller load is anticipated, only the wall 25 is usually employed.

The extension members E are preferably though not necessarily formed of the same material used in the formation of the support members 10 and 11. These members E may be suitable cast from a number of known

metals, metal alloys or metal compositions as an integral structure or the various components may be cut from plate stock and molded together. This type of structure may also be extruded and trimmed where necessary to produce the member illustrated in FIG. 6. Furthermore, the various components forming part of the extension members E may be stamped from plastic sheets or otherwise formed by any known plastic article producing process and adhesively secured or fused together.

It can be seen that when the extension member E is located in the elongated gap created by and laterally opposed to the terminal portion 24, the upwardly presented support surface 22 of the support member 11 is coplanar with the upwardly presented support surface 30 on the extension member E. Furthermore, this support surface 30 is coplanar with the upwardly presented support surface 21 of the support member 10. As indicated previously, when the extension member E is located in this position, the outwardly presented surface of the vertically disposed retaining wall 33 (if included) would engage the inwardly presented surface of the connecting wall 14 and the upwardly presented surface of the horizontally disposed retaining plate 32 engages the downwardly presented surface of the leg 12 in the manner illustrated in FIG. 6. The upwardly presented surface 27 of the horizontally struck wall 26 is engageable with the underside of the upper leg 15 of the support member 11 and the vertically presented margin of this leg 15 will be in engagement with the upwardly struck connecting plate 28, in the manner illustrated in FIG. 2. The exterior face of the vertical wall 25 will also be in snug engagement with the interiorly presented surface of the connecting wall 17. The extension member E which is used to fill the elongated gap which is laterally opposed to and created by the longitudinally extending terminal portion 23 of the support member 10 is essentially identical to the thus described extension member E. Furthermore this other extension member cooperates with the support members 10 and 11 in like manner, and this cooperative arrangement is more fully illustrated in FIG. 3.

Each of the aforementioned components, namely the two support members 10 and 11 are secured together to form a unitary rigid structure by means of any of a number of available fastening means for joining them together such as bolts 34 which extend through horizontally and transversely aligned apertures 35 formed in the respective connecting walls 14 and 17. At their opposite ends, the bolts 34 are provided with nuts 36. It should be recognized that other types of fasteners, other than the described bolt and nut fastener, could be employed as well. For example, rods could be inserted through the apertures 35 formed in these components and secured on each of the transverse ends with removable pins, spring clips, or the like. In like manner, clamps could be used to secure the various members in position to form a unitary support structure. The particular form of securing these various components into a unitary structure is not critical and any suitable means may be employed for purposes of joining these members into a unitary structure.

It can be observed that the two support members 10 and 11 can be fastened in juxtaposition to each other at various positions along their common length, (that portion which overlaps), in order to achieve a desired overall longitudinal dimension; in the embodiment

shown, they are only joined centrally which is usually sufficient for most purposes. For this purpose, the support members are provided with a plurality of longitudinally spaced horizontally aligned apertures 35 in each of members 10 and 11 which are sized to receive the employed fastening means. In the embodiment shown, the extensions E (without the plate 32 and wall 33) are fastened in place by means of e.g., screws or bolts (not shown) in conjunction with the respective side walls 14 and 16 with which the vertical walls 25 of the member E lie in juxtaposition with. To this end, the walls 25 and 14 and 16 of the members E and members 10 and 11, are provided with registering holes 48 therein; preferably (as shown) the apertures 48 extend in a horizontally aligned row throughout the major length of the members E, and 10 and 11, to permit adjustment of the mounting relationship of the members. Normally only two or three screws or bolts are required to mount the members E; the balance of the apertures being provided to permit adjustment if desired.

In most cases, it is not necessary to employ components 32 and 33 of the extension members E and in this case the supporting structure A would be comprised of the support members 10 and 11 which are secured together in juxtaposed relationship by the fastening means employed. When the extension members E are employed, the supporting structure A would then be comprised of the support members 10 and 11 and either one or both of the extension members E secured together in the manner as illustrated in FIG. 1 by the fastening means employed.

It should also be observed that the various components which form part of the supporting structure A would be formed of a material and/or a thickness which is suitable for the intended use of the supporting structure A. Thus, if the supporting structure was to be used for ultimate support of substantial loads the various components would be formed of a structural metal with the desired degree of thickness. If the anticipated loads were fairly light, the components of the supporting structure A would be formed of a light-weight plastic material or the like.

In a further embodiment of the invention, a pair of mounting brackets 40 may be provided for using the supporting structure A also as a rack or other like member. Inasmuch as each of these mounting brackets 40 are identical in their construction, only one such mounting bracket 40 will be described in detail herein. Each of the brackets 40 are provided with a pair of vertically disposed mounting plates 41 and 42 which are located in facewise engagement and welded or otherwise secured to each other in the manner as illustrated in FIGS. 1-3.

These mounting plates 41 and 42 are longitudinally disposed within the rectangularly shaped elongated aperture 20 and are located at a desired position, which is adjustable, to achieve the necessary overall length for using the device as a supporting rack. Thus, for example, hangers for suspending commodities may be supported on a bar or pole S. The mounting plates 41 and 42 are each provided with a registering series of longitudinally spaced horizontally aligned apertures 48' with the same longitudinal spacing and at the same vertical placement as the apertures 35 so that the mounting plates 41 and 42 can be slidably longitudinally located within the elongated rectangular aperture 20 at substantially any desired position and retained in these de-

sired positions by use of the same fasteners e.g., screws as is used for joining members E to members 10 and 11.

The mounting plates 41 and 42 are also each provided with obliquely struck connecting portions 43 which integrally merge into a pair of laterally spaced horizontally located fingers 44, in the manner as illustrated in FIG. 1. A reinforcing member 45 extends between and is secured to the interiorly presented faces of each of the fingers 44, also in the manner as illustrated in FIG. 1. The support fingers 44 are provided with arcuately shaped rod-receiving grooves 46 on their upwardly presented surface and which are sized to receive a conventional pole, rod, strut or similar structural member S which is illustrated in dotted lines in FIG. 1. In this connection, a reinforcing bar 45 between each pair of fingers 44 may be provided with an arcuately shaped upwardly presented surface to accommodate the structural member S. It should be observed that each of the brackets 40 extend from opposite laterally presented openings formed by the enlarged rectangular aperture 20 and can be telescoped within the supporting structure A to the desired length, and secured at the desired length.

The mounting plates 41 and 42 of one of the brackets 40 are located in juxtaposition to the interiorly presented flat surface of the connecting wall 14 for securement thereto. In like manner, the vertically disposed mounting plates 41 and 42 of the opposed bracket 40 is located in juxtaposition to the interiorly presented surface of the connecting wall 17 and secured thereto by means of the aforesaid fasteners.

It should be observed that the fingers 44 could be provided with any type of upwardly presented surface for receiving a pole, rod or the like. In like manner, the downwardly presented surfaces of the fingers 44 could also be provided with the necessary means such as grooves, which may also be arcuately shaped in order to be disposed over an existing rod-like structure or other structural member. In this connection it should be understood that the fingers 44 are only one form of means for receiving and supporting a pole S and other forms of retaining means could be employed. For example the fingers 44 could be replaced with or provided with clamping members, screw type fasteners, or the like.

The mounting brackets 40 of the present invention are not limited to the type of structure which is illustrated in FIG. 1 and as described herein and other structural forms may be adopted by the brackets 40. While the bracket structure is illustrated and described in the preferred structural form, it can be observed that the bracket 40 could be constructed in such manner that a rectangularly shaped member, or a pair of U-shaped channel members juxtaposed to form a rectangularly shaped member in vertical cross-section, is sized to be slidably and telescopically fitted within elongated aperture 20 and secured in any desired position. In like manner, an I-beam type structure may also be provided for slidable disposition within the elongated aperture 20. Furthermore, it should be observed that the two plates 41, 42 could be formed as a unitary member which is integrally provided with a bifurcated outer end to provide the pair of cooperating fingers 44. The exact form adopted by the mounting brackets 40 will be predicated primarily upon the type of structural member to which the supporting structure A is adapted to be used with.

The mounting brackets 40 are preferably, though not necessarily formed of the same material used in the formation of the support members 10 and 11 and/or the extension members E. The mounting brackets 40 may also be fabricated by any of the processes described in connection with the fabrication of the support members 10 and 11 and the extension members E. Again, the material selected for use in fabrication of the brackets E and the thickness of the components will be predicated largely upon the intended end use of the supporting structure A.

FIG. 5 illustrates another form of mounting bracket 47 which can be used with supporting structure A of the present invention. The mounting bracket 47 generally comprises a pair of vertically disposed mounting plates 70 and 71 located in facewise engagement and which are welded or otherwise secured together in the manner as illustrated in FIG. 5. Each of the mounting plates 70 and 71 are integrally provided with outwardly struck laterally spaced parallel arms 50 and 51 which are integrally provided with longitudinally struck horizontally extending fingers 52. Each of the fingers 52 are provided with arcuately shaped upwardly presented grooves 53 which cooperate with similar arcuately shaped grooves 54 of the same radius in retaining blocks 55, the latter capable of being secured to the fingers 52 in the manner as illustrated in FIG. 5. Thus, it can be observed that when the retaining blocks 55 are vertically disposed upon and in facewise engagement with the upwardly presented surface of the fingers 52, the arcuately shaped grooves 53 and 54 formed aligned apertures 56 which are sized to accommodate a suitable support rod or other structural member similar to the structural member S previously described.

The retaining blocks 55 can be conveniently secured to the fingers 52 by means of screws 57 or other conventional form of fasteners of the type previously described. The remaining portions of the mounting bracket 47 similar to the previously described mounting bracket 40 and are therefore neither illustrated nor described in any further detail herein. However, it should be observed that the mounting bracket 47 could adopt a wide variety of structural forms, such as those described in connection with the mounting bracket 40. Thus, the bracket 47 could be formed with a single vertically disposed mounting plate having a bifurcated end as described in connection with the mounting bracket 40. Furthermore, the mounting bracket 47 would preferably be formed of the same material used in the formation of the mounting bracket 40.

A preferred form of the device of this invention includes means for mounting the supporting structure by providing the support members 10, 11, each with an arcuately shaped cooperating opposed grooves 60 of the same radius in the upper legs 12, 15 and vertically registered arcuately shaped cooperating opposed grooves (not shown) in the lower legs 13, 16 and of the same radius as the grooves 60 and which cooperate to provide enlarged vertically disposed apertures 61 which are sized to accommodate a supporting post or similar pole P in the manner as illustrated in FIG. 1. The pole P is adapted to place the structure A at a desired level in a room or the like; the pole (being adjustable or otherwise), extending between e.g., the ceiling and floor. Furthermore, the size of the apertures 61 would be normally determined by the intended overall diametral size of a pole P upon which the supporting structure A is to

be mounted or retained. The size of the apertures 61 are generally determined by the end user of the supporting structure A and can be drilled or widened as desired in order to receive any suitable pole or rod-like structure or other type of structural member. It should be understood that the apertures 61 are not necessarily limited to that of a circular shape as illustrated, but can be provided in the form of rectangularly shaped apertures, triangularly shaped apertures, or otherwise, as desired.

When the supporting structure A is to be secured to a pole P, the two support members 10 and 11 would be located on opposite sides of the pole P at a desired level and brought into facewise engagement for securement with respect to the pole P when the latter was snugly fitted within the enlarged apertures 61. In this embodiment, the bolts 34 and nuts 36 passing between the support members 10 and 11 will secure the pole P in fixed engagement. However, other types of clamps or locking mechanisms could also be employed for this purpose.

It can be observed that the supporting structure A of the present invention can be readily disassembled for shipment as a small, compact unit and can be rapidly assembled by the ultimate user. Furthermore, the supporting structure A can be fabricated of various materials selected to comply with a particular end use. For example, if the supporting structure A was to be used in a corrosive environment the structure A would be formed of a plastic material which is capable of withstanding such environments. It should also be understood that the supporting structure A can be fabricated in any of a wide variety of shapes in order to present a desired aesthetic appearance.

The supporting structure of the present invention is uniquely designed to be fabricated on a mass production basis at a relatively low unit cost. As indicated above, the various components which form the supporting structure A are designed so that they can be easily cast, or welded from metal stampings, or extruded or pulltruded with various synthetic resins.

Many changes, modifications, variations and other uses and applications of the supporting structure of the present invention, including the components forming part of the structure and other necessary components, will however, become apparent to those skilled in the art after considering this specification and the accompanying drawings. All such changes, modifications, variations and other uses and applications which do not depart from the spirit and scope of the invention are deemed to be covered by the invention which is limited only by the claims which follow.

I claim:

1. A supporting structure presenting a relatively flat planar surface for supporting objects thereon, said structure comprising an elongated first member of U-shaped construction and an elongated second member of U-shaped construction engageable with said first member, in staggered juxtaposed relationship, said members being substantially rectangular when in said staggered juxtaposed relationship and providing an elongated aperture therebetween, each of said members having upwardly presented relatively flat cooperating supporting surfaces and each having relatively vertically struck portions which are abutable with each other when said members are located in said staggered relationship, said relatively flat upwardly presented sur-

faces forming a continuous upper planar surface capable of supporting an object disposed thereon when said members are located in said staggered relationship, securement means extendable between said first and second members for connecting said first and second members in said staggered juxtaposed relationship, mounting means operatively associated with said first and second members for mounting said first and second members in secured operative relationship to a fixed structural member.

2. The supporting structure of claim 1 further characterized in that said supporting structure further comprises oppositely disposed outwardly extending members capable of being mounted to a further structural member, said extending members capable of being mounted on said supporting structure in any of a plurality of extended positions.

3. The supporting structure of claim 1 further characterized in that the first and second members are constructed so as to provide an elongated rectangularly shaped aperture therebetween when engageable with each other, and that there is included oppositely disposed adjustable outwardly extending members, each having a portion thereof attachable to at least one of said elongated first and second members.

4. The supporting structure of claim 1 further characterized in that said elongated first member extends beyond said elongated second member at one end thereof thereby forming an elongated open area opposite the supporting surface of said first member when said first and second members are juxtaposed in staggered relationship, said elongated second member also extending beyond said elongated first member at the other end thereof thereby forming an elongated open area opposite the supporting surface of said second member and being diagonally located with respect to said first named open area when said first and second members are juxtaposed in staggered relationship, and first and second extension means are provided for operative securement to said first and second members, each said extension means having a supporting surface which is coplanar to and forms a continuation of said above named supporting surfaces to fill in said open areas and thereby form a substantially rectangular continuous upper planar surface.

5. A supporting structure adapted for supported attachment to an existing structural member and capable of supporting objects thereon, said supporting structure comprising first and second cooperating members, each being U-shaped in construction and having spaced apart upper and lower walls with inwardly presented vertically located abutable margins and a vertically disposed connecting wall extending between each of said upper and lower walls, each of said upper walls having relatively flat upwardly presented planar surfaces, securement means extendable between said connecting walls to connect said first and second members together in staggered juxtaposed relationship so that portions of the vertically located abutable margins of the respective upper and lower walls abut each other and so that said upper walls are coplanar to form a somewhat continuous relatively flat planar surface for supporting objects disposed thereon, said first and second cooperating members being substantially rectangular in cross section when in said staggered juxtaposed relationship and providing an elongated aperture therebetween, and mounting means operatively associated

with each of said cooperating members for mounting said first and second members in supported relationship to a fixed structural member when secured together in operative relationship to said fixed structural member, said mounting means presenting a surface which is conformable to and engageable with said fixed structural member.

6. The supporting structure of claim 5 further characterized in said supporting structure further comprises oppositely disposed outwardly extending members capable of being mounted to a further structural member, said extending members capable of being mounted on said supporting structure if any of a plurality of extended positions.

7. The supporting structure of claim 23 further characterized in that said elongated first member extends beyond said elongated second member at one end thereof thereby forming an elongated open area opposite the supporting surface of said first member when said first and second members are juxtaposed in staggered relationship, said elongated second member also extending beyond said elongated first member at the other end thereof thereby forming an elongated open area opposite the supporting surface of said second member and being diagonally located with respect to said first named open area when said first and second members are juxtaposed in staggered relationship, and first and second extension means are provided for operative securement to said first and second members, each said extension means having a supporting surface which is coplanar to and form a continuation of said above named supporting surfaces to fill in said open areas and thereby form a substantially rectangular continuous upper planar surface.

8. The supporting structure of claim 7 further characterized in that each said extension means is provided with at least one element which extends into said elongated aperture when secured to one of said first and second members.

9. A supporting structure adapted for supported attachment to an existing fixed structural member and capable of supporting objects thereon, said supporting structure comprising a pair of cooperating substantially U-shaped members capable of being placed in staggered juxtaposed relationship, each of said substantially U-shaped members having spaced apart upper and lower walls and which are connected by a relatively flat vertical wall, each of said upper walls having relatively flat upwardly presented planar surfaces which are substantially coplanar to form a somewhat continuous relatively flat plan surface for supporting objects thereon when said cooperating U-shaped members are located in said staggered juxtaposed relationship, said U-shaped members also forming an elongated substantially rectangularly shaped aperture therebetween when in said juxtaposed staggered relationship, each of said relatively flat vertical walls having a plurality of apertures which are alignable for receiving locking means in any of said alignable apertures to secure said pair of cooperating U-shaped members together in said staggered relationship in such manner that each of said cooperating U-shaped members has a terminal portion extending beyond the other of said cooperating U-shaped members, and mounting means forming aligned openings in said upper and lower walls and being sized to snugly receive said fixed structural member to

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thereby retentively hold said supporting structure on said fixed structural member.

10. The supporting structure of claim 9 further characterized in that at least one extension member having a horizontal wall and a vertical wall is provided for attachment to one of said cooperating U-shaped members, said horizontal wall having a relatively flat top wall which is coplanar with the flat planar walls of said upper walls and which is of substantially the same size and shape of at least one of the terminal portions, said vertical wall having at least one aperture which is alignable with the aperture in at least one of said relatively flat vertical walls on said cooperating U-shaped members to receive said locking members and thereby secure said extension member to said supporting structure.

11. The supporting structure of claim 9 further characterized in that a pair of mounting brackets are provided for operative attachment to said supporting structure for mounting said supporting structure to at least one other fixed structural member, each said mounting bracket comprising an elongated arm extendable outwardly from said supporting structure and from opposite ends of said supporting structure, a mounting member on the outer end of each of said arms and having a surface somewhat conformable to said other fixed structural member, each of said elongated arms having at least one aperture alignable with the apertures in said relatively flat vertical walls on said cooperating U-shaped members to receive said locking means and thereby secure said mounting brackets to said supporting structure.

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acterized in that a pair of mounting brackets are provided for operative attachment to said supporting structure for mounting said supporting structure to at least one other fixed structural member, each said mounting bracket comprising an elongated arm extendable outwardly from said supporting structure and from opposite ends of said supporting structure, a mounting member on the outer end of each of said arms and having a surface somewhat conformable to said other fixed structural member, each of said elongated arms having at least one aperture alignable with the apertures in said relatively flat vertical walls on said cooperating U-shaped members to receive said locking means and thereby secure said mounting brackets to said supporting structure.

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