

[54] COLLAPSIBLE, ADJUSTABLE SHELVING

[75] Inventor: William B. Sutherland, Gig Harbor, Wash.

[73] Assignee: Pickering Industries, Inc., Tacoma, Wash.

[22] Filed: Aug. 21, 1972

[21] Appl. No.: 279,283

[52] U.S. Cl. 108/108, 108/96, 108/101, 211/90, 248/243

[51] Int. Cl. A47b 57/08

[58] Field of Search 108/108, 110, 96, 101, 108/152; 211/90, 148, 176; 312/242; 248/243, 249; 52/36, 710

[56]

References Cited

UNITED STATES PATENTS

2,157,309	5/1939	Swedman et al.	248/239
2,208,234	7/1940	Welch	248/243
2,803,351	8/1957	Van Wiggeren	108/108
3,207,322	9/1965	Pedersen	211/148
3,604,669	9/1971	Asher	248/243

3,652,048	3/1972	Hartman	211/90
3,685,234	8/1972	Nelsson	248/243

FOREIGN PATENTS OR APPLICATIONS

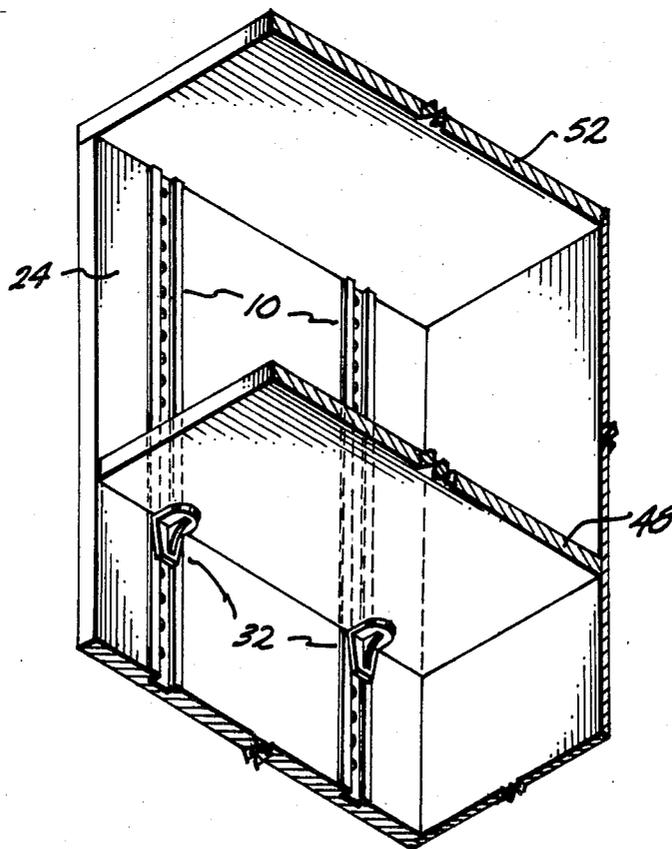
1,353,256	1/1964	France	248/239
-----------	--------	--------------	---------

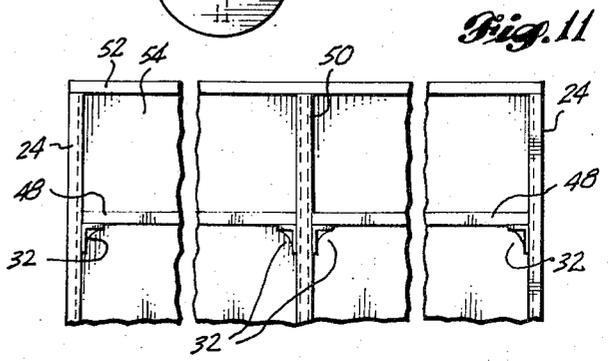
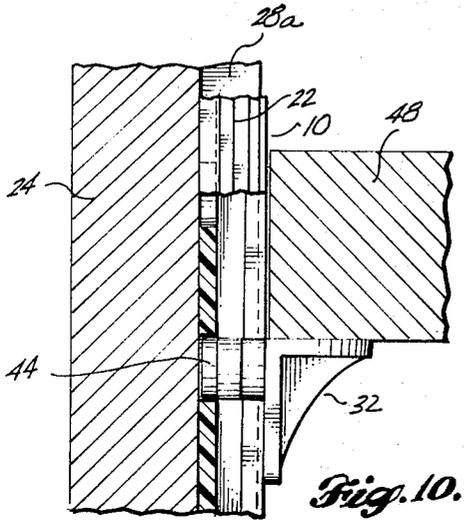
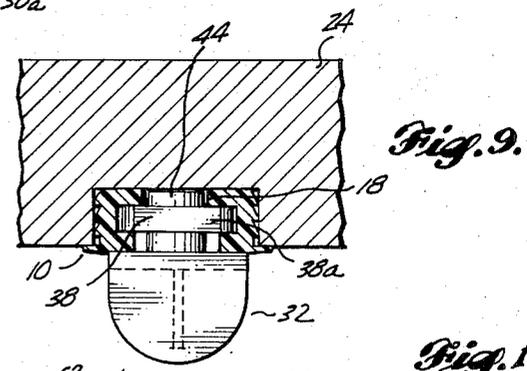
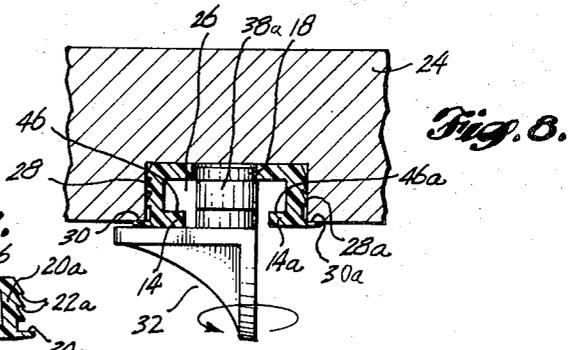
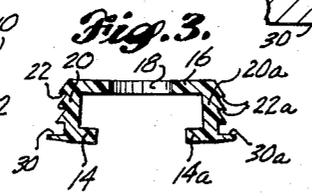
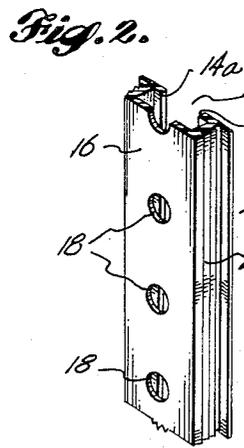
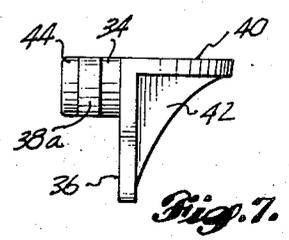
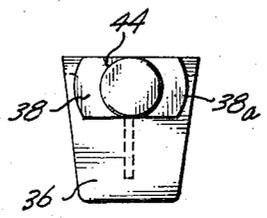
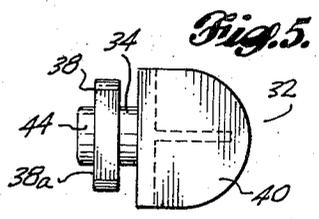
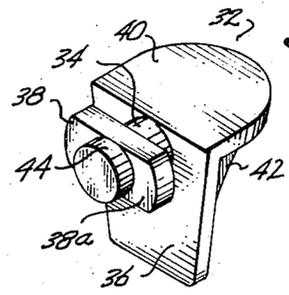
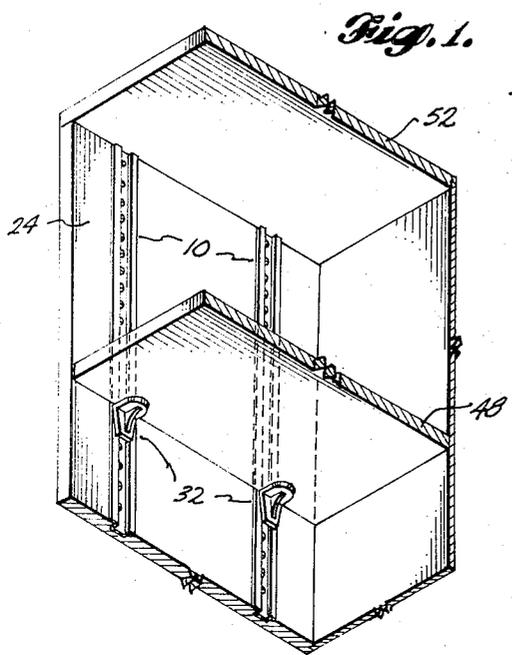
Primary Examiner—Paul R. Gilliam
 Assistant Examiner—Darrell Marquette
 Attorney, Agent, or Firm—Morris A. Case

[57] ABSTRACT

A pair of box shaped shelf support strips embedded in the face of upright support members resiliently urges serrated sides of the support strips against the support members. The outermost sides of the strips are slotted and the back sides have spaced holes to accept a projecting insert from a support bracket. The bracket is rotated after insertion and lugs on the projection hold to the forward sides of the strip. A pin extends upward from each bracket to enter a recess in shelving to hold the support members and shelving in relation to each other.

10 Claims, 16 Drawing Figures





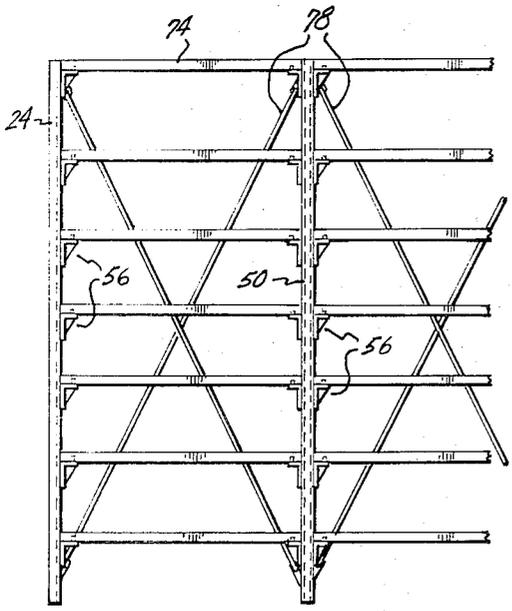
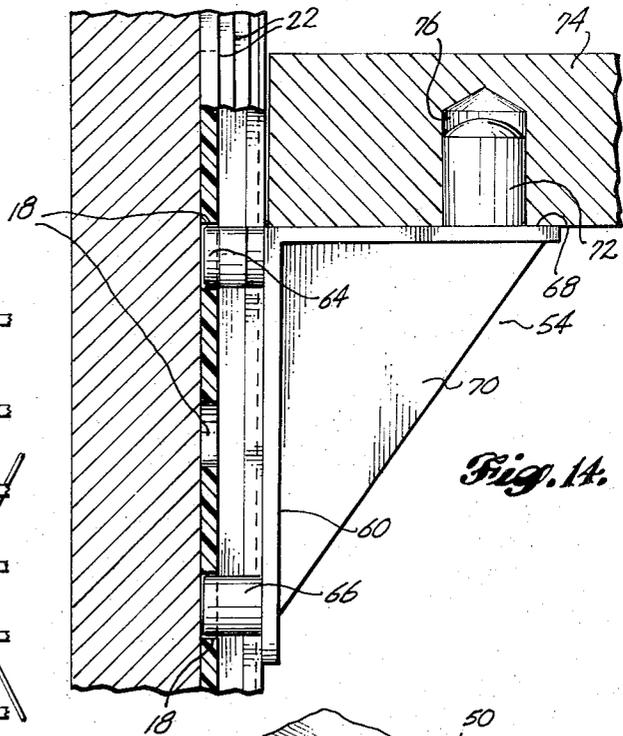
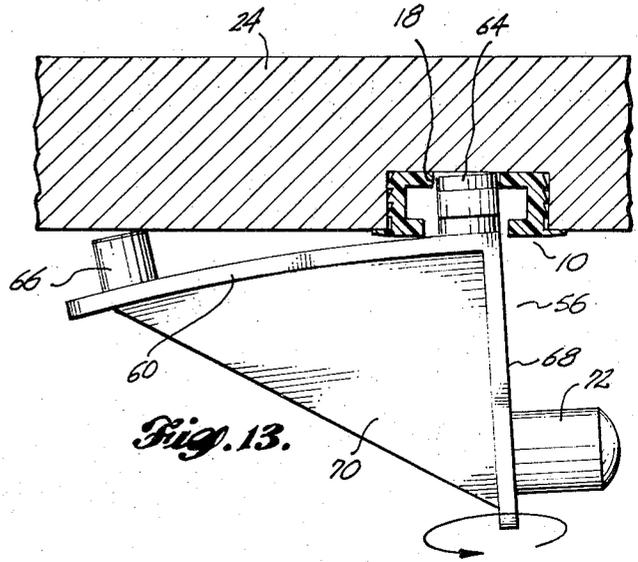
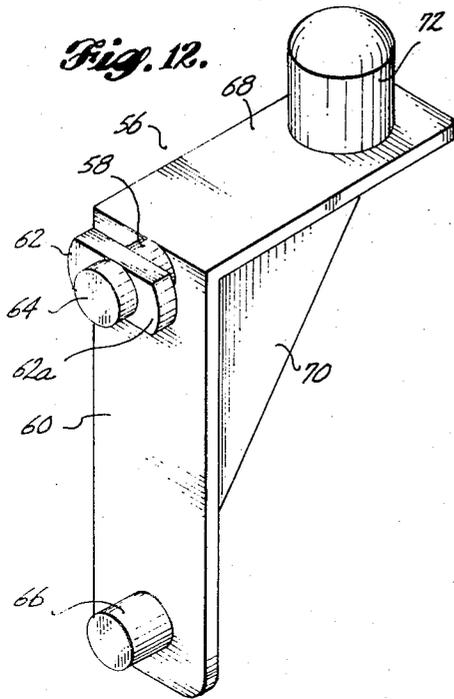


Fig. 15.

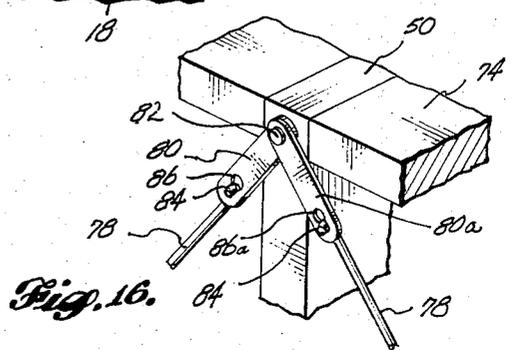


Fig. 16.

COLLAPSIBLE, ADJUSTABLE SHELVING

BACKGROUND

There are numerous combinations of shelf support strips with adjustable support brackets to be used to support shelving. Many of the combinations work well where upright structural support members to which the support strips are mounted are maintained in relation to each other, and the strips and brackets merely support the shelving. The disclosed invention will not only support the shelving, but will also rigidly maintain the structural support members in place.

SUMMARY OF THE INVENTION

Expandable low cost shelving that may be erected in sections, added to, adjusted, or removed without the use of tools, and with a minimum of time and labor may be obtained when practicing this invention. A box shaped channel is screwed or pressed into a rectangular shaped recess in a structural support member. In a preferred embodiment the channel is pressed in and no additional fastening devices are required as the two outwardly extending sides of the channel each form an obtuse angle with respect to the back side of the channel. This imparts an outwardly extending resilient force to these sides when inserted into the recess in the support member; to force serrations running along the outside length of these sides into the support member to retain the box channel. The outermost side of the box shaped channel is slotted to leave two arms directed toward each other and being separated by the slot. The back side of the channel has a series of centrally located equally spaced holes extending the length of said channel. These holes may accept an insert passing by the slot.

A quickly insertable or removable bracket cooperates with the channel to provide an angled support for shelving when at least two channels with brackets are used per each inside face of adjacent support members. The brackets contain a projection, having a pair of transverse lugs, which projection may be inserted past the slot and into holes in the back side of the box channel. Once the projection is inserted the bracket is rotated ninety degrees to the final or mounted position. In this position the projection is engaging one of the holes in the back side of the box channel, and the lugs essentially fill the inside of the channel and firmly press against the back side of the arms of the box channel which are separated by the slot to hold the bracket firmly in place.

In another preferred embodiment the bracket has an additional projection, without lugs, which also passes through the slot and enters into a second hole in the back side of the channel. This embodiment requires a flexible material be used for the bracket or the channel as the second projection must be held out when rotating the bracket and snapped in when in final position.

In yet another embodiment a pin integral with the bracket extends upward to engage a recess in a shelf; which then holds the support members and shelves in relation to each other.

An object of this invention is to provide sectionalized adjustable shelving that may be readily erected, added to or taken down.

Another object of this invention is to provide a support for shelving by use of a channel member easily fastened to a support member and said channel member cooperates with a quickly insertable bracket.

Another object of this invention is to provide channels embedded in upright structural members to cooperate with quickly mounted brackets to rigidly support shelving.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1, is an isometric view from below, looking upward into shelving.

FIG. 2, is an isometric view of a box channel.

FIG. 3, is an end view of the box channel of FIG. 2.

FIG. 4, is an isometric view of a bracket to be used in conjunction with the box channel of FIG. 2.

FIG. 5 is a plan view of the bracket.

FIG. 6, is an end view of the bracket.

FIG. 7, is a side elevation of the bracket.

FIG. 8, shows a top view of the box channel mounted in a support member, both in section, with the bracket of FIG. 4, inserted into the channel.

FIG. 9, shows the bracket of FIG. 8, rotated into the mounted or locked position.

FIG. 10, shows a side elevation partially in section of the view set out in FIG. 9, wherein the bracket is supporting a shelf.

FIG. 11, shows a side elevation of mounted shelving.

FIG. 12, is an isometric view of an alternate embodiment of a bracket.

FIG. 13, shows a top view of a box channel mounted in a support member, both in section, with the alternate bracket of FIG. 12, inserted into the channel prior to rotating the bracket into the mounted position.

FIG. 14, is a side elevation partially in section of the view set out in FIG. 13, wherein the bracket is rotated into the mounted position and supports a shelf.

FIG. 15, is a side elevation of assembled shelving using the bracket as shown in FIG. 12.

FIG. 16, is an isometric view of a method of fastening sway bracing to a support member.

DETAILED DESCRIPTION

A four sided box channel 10, as best shown in FIGS. 2 and 3, is a four sided channel, the front side of which has a centrally located slot 12, running the length of the channel to separate inwardly extending arms 14 and 14a. The opposite or back side 16, has a series of centrally located equally spaced holes 18, extending the length of the channel. Sides 20 and 20a, extend outwardly from the ends of the back side 16, at an angle such that each of these sides in relation to side 16, forms an obtuse angle. Serrated outer surface 22, extends the length of side 20, and serrated outer surface 22a, extends the length of side 20a.

A structural member 24, see FIGS. 8 and 9, is recessed 26, to accept box channel 10. The channel is pressed into the recess with the slot 12, outward. The angle between the back side 16, and the outwardly extending sides 20 and 20a, resiliently force serrations 22 and 22a, against the respective sides 28 and 28a, of the recess in the support member to secure the box channel in said recess. The box channel may have ears 30 and 30a, as shown to cover the junctures between the box

channel and the support member; or these ears may be dispensed with.

A bracket 32, best shown in FIGS. 4 through 7, has a projection 34, extending outward from the base or face 36, of the bracket. The projection has transversely extending lugs 38 and 38a. The bracket also has an arm with support surface 40, and strut 42.

The bracket 32, detachably mounts on the box channel 10, best shown in FIGS. 8 and 9, to form a support. The bracket is rotated 90° from its final or mounted position, and the end 44, of the projection 34, is inserted into one of the holes 18, in the back side 16, of the channel. While inserted, the bracket is counterrotated 90° to become firmly mounted into the channel with the end 44, of the projection remaining in the hole 18, and lugs 38 and 38a, essentially filling the inside of the box channel, and firmly engaging the respective inside surfaces 46 and 46a, of inwardly extending arms 14 and 14a. To remove the bracket one again rotates the bracket 90 degrees and it may then be lifted out of the box channel. The box channels with mounted brackets are used in pairs as shown in FIG. 1, to support the ends of shelving 48. A long span of shelving may be broken into two or more sections, see FIG. 11, by introducing one or more intermediate support members 50, having box channels and brackets located on both sides. With this bracket the support members are securely fastened to member 52, and back panel 54, to maintain spacing between support members.

In another preferred embodiment, best shown in FIGS. 12 through 14, a bracket 56, has projection 58, extending outward from its base 60. Said projection having transversely extending lugs 62 and 62a, and projection end 64. The projection with transverse lugs part of the bracket of this embodiment is identical to the projection with lugs as discussed in the prior bracket. A second projection 66, without lugs, extends outwardly from base 60. The bracket also has arm or support surface 68, and strut 70. A pin 72, extends upwardly from the support surface. This bracket is readily mounted to the box channel 10. The bracket is rotated 90° from its mounted position and the projection with lugs is inserted into the box channel with projection end 64, engaging one of the holes 18, of the back side 16. The bracket is then counter rotated 90° and the second projection pushed into another one of the holes in the back of the channel. The bracket may be quickly removed from the box channel by reversing the mounting steps. The bracket, the channel or both must have enough resilience to allow the second projection to clear while the inserted bracket is being counter rotated. Various materials may be used to obtain the required resilience such as polyvinylchloride, polyamide, polyethylene and polyurethane to name a few. In one preferred embodiment polyvinylchloride is used for the box channel and polyethylene for the bracket. Shelving 74, must be recessed 76, to accept the pin extending upwardly from the support surface.

When using this bracket the shelving is not only supported, but it is securely held in place. Expandable, adjustable shelving may be quickly built up or taken down, without the use of tools, with the length of the shelving being limited only by the number of intermediate support members used. When two or more shelves are mounted between adjacent support members, said members, are maintained in relation to each other by the pins of the brackets to give sturdy usable shelving.

One may also add sway bracing 78, if desired. The sway bracing may be fastened to the support members in any convenient manner. In one method a pair of straps 80 and 80a, are fastened to an intermediate support member by a screw 82, driven into said member. The sway bracing has a hook 84, on the end of each brace member, and the straps have holes 86 and 86a, respectively to accept the hook. No tools are required to assemble or disassemble the shelving and it can all be done from the front. A back panel is not required, however, if one wishes such a panel the shelves are assembled by putting up sway bracing, pushing a sized panel, not shown, back against the sway bracing and installing shelving having its width controlled to allow for the thickness of the back panel.

Having specifically described my invention, it should be noted that various modifications may be resorted to by one skilled in the art without departing from the broad principles of the invention.

I claim:

1. A combination channel and bracket, to be mounted to a structural member, for supporting shelves comprising: a four sided box channel formed of resilient material, the front side having a slot separating inwardly extending arms, the back side having a series of equally spaced holes, and means to enable the box channel to be flush mounted to a structural member including a rectangular recess provided in a structural member, the outer surface of each of two outwardly extending sides of the box channel having serrations, an obtuse angle being formed between the back side and each of the two outwardly extending sides of the box channel, such that when the box channel is pressed into said rectangular recess of said structural member, the combination of the resilience due to the obtuse angles and the serrations secures the box channel to said structural member; and a bracket with means for fastening the bracket to the box channel to prevent vertical or lateral movement of the bracket, and a horizontal surface for supporting shelving.

2. A combination channel and bracket as claimed in claim 1, wherein the box channel further comprises: a pair of ears as outward extensions of the front side of the box channel to cover any junctures between the channel and a structural member.

3. A combination channel and bracket, to be mounted to a structural member, to support shelving comprising: a four sided channel formed of resilient material with a front side having a slot separating inwardly extending arms, a back side having a series of equally spaced holes, and means to enable the four sided channel to be flush mounted to a structural member including a rectangular recess provided in a structural member, the outer surface of each of two outwardly extending sides of the four sided channel having serrations, an obtuse angle being formed between the back side and each of the two outwardly extending sides of the four sided channel, such that when the four sided channel is pressed into said rectangular recess of said structural member, the combination of the resilience due to the obtuse angles and the serrations secures the four sided channel to said structural member; and a bracket with a base, a projection having a pair of lugs extending outwardly from the base with the projection being dimensioned such that with the bracket rotated ninety degrees from a mounted position the end of the projection may be inserted into one of the holes

5

6

in the back side of the four sided channel and upon counter rotation, while inserted, the lugs essentially fill the inside of the four sided channel and firmly hold to the back side of the inwardly extending arms of the front side of the four sided channel, an arm for supporting a shelf, and a strut between the base and the arm.

4. A combination channel and bracket, as claimed in claim 3, wherein the four sided channel has a pair of ears extending outwardly from the front side of the four sided channel to cover any junctures between the four sided channel and a structural support member.

5. A combination channel and bracket, as claimed in claim 1, wherein the bracket has an upstanding structural member, projecting above the horizontal surface of the bracket, to be received in an accommodating recess of a shelf.

6. A combination channel and bracket, as claimed in claim 3, wherein the bracket has an upstanding structural pin, on the arm, to be received in a hold in a shelf to be supported.

7. Adjustable knock-down shelving comprising: a plurality of upright parallel structural support members each having a pair of spaced lengthwise rectangular shaped recesses from each facing surface of the structural members; a box channel pressed into each recess comprising: an outermost side having two arms extending toward each other and separated by a slot, an innermost back side having a plurality of centrally located holes spaced along the length of the channel for accepting an insert entering through the slot, serrations extending along the outer sides of each of the two out-

wardly extending sides of the channel each side forming an obtuse angle with the innermost back side to retain the pressed in box shaped channel in the recess of the support member; a bracket comprising: a base, a projection from the base having a pair of transverse lugs insertable through the slot in the channel and into one of the holes in the back side with the bracket turned ninety degrees, upon counter rotating the inserted bracket the lugs essentially fill the inside of the channel and engage the backside of the arms adjacent the slot to fasten the bracket, and a projection extending upward from a fastened bracket; a plurality of shelves extending between adjacent upright support members and having holes positioned on the lower sides to accept the upwardly extending projections from the brackets.

8. Adjustable knock-down shelving as set out in claim 7, wherein the support bracket further comprises: a projection extending from the base into a second hole in the back side of the box channel, and a resilient material is used to form the bracket.

9. Adjustable knock-down shelving as in claim 8, wherein the box channels are polyvinylchloride and the support brackets are of polyethylene.

10. Adjustable knock-down shelving as set out in claim 8, further comprising diagonally crossed tension members extending from top to bottom and along the back side of adjacent structural support members, and means for detachably mounting the ends of the tension members to the upright structural members.

* * * * *

35

40

45

50

55

60

65