June 9, 1964 E. J. VON ARB ETAL 3,136,270

ADJUSTABLE SHELVING

Filed Oct. 24, 1962 2 Sheets-Sheet 1

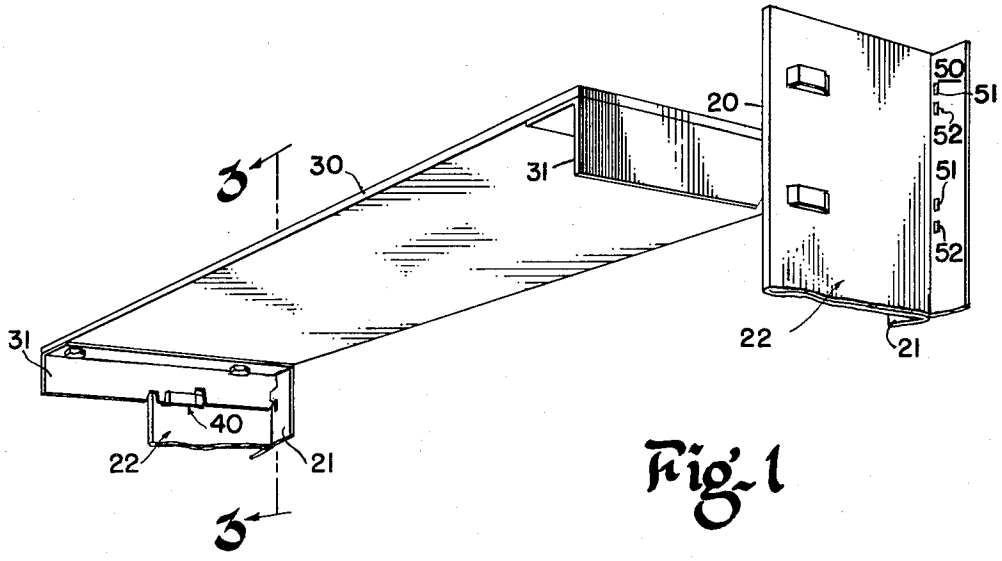

Fig. 1

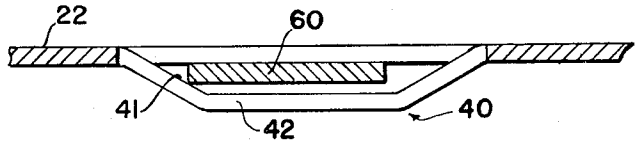

Fig. 2

INVENTORS.
EDWARD J. VON ARB
LOWELL W. DUNBAR
BY JACK M. CLEMENT
Marshall, Wilson, Click & Yeasting
ATTYS

June 9, 1964 E. J. VON ARB ETAL 3,136,270

ADJUSTABLE SHELVING

Filed Oct. 24, 1962 2 Sheets-Sheet 2

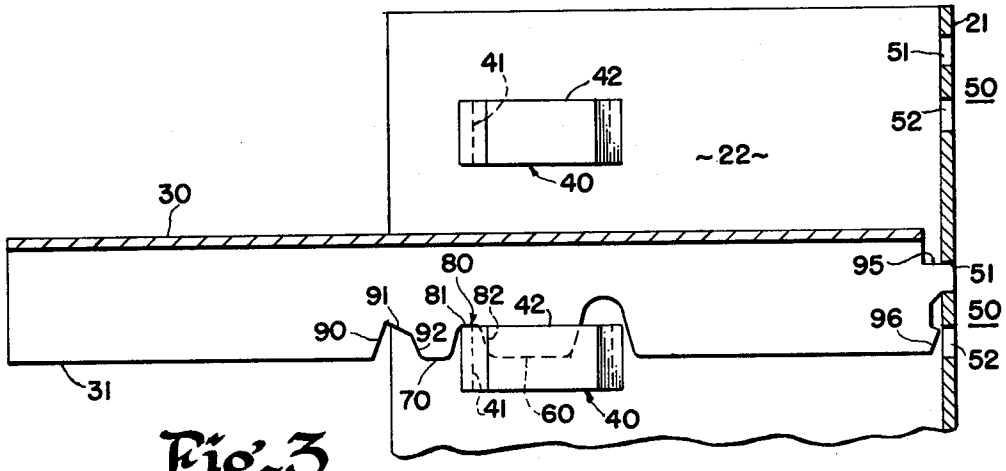

Fig-3

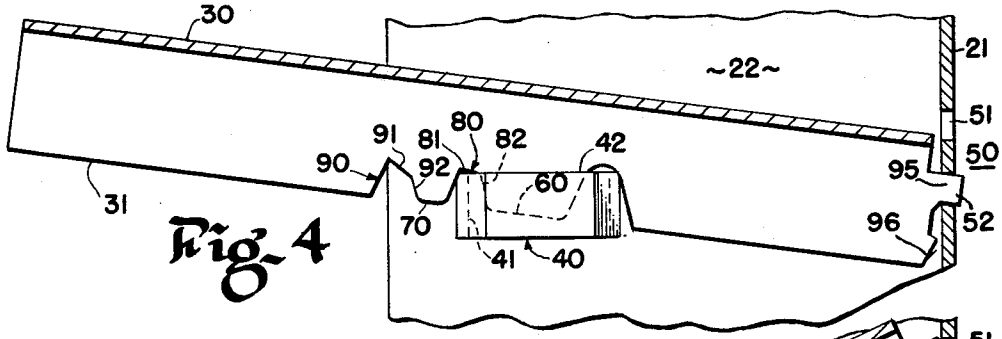

Fig-4

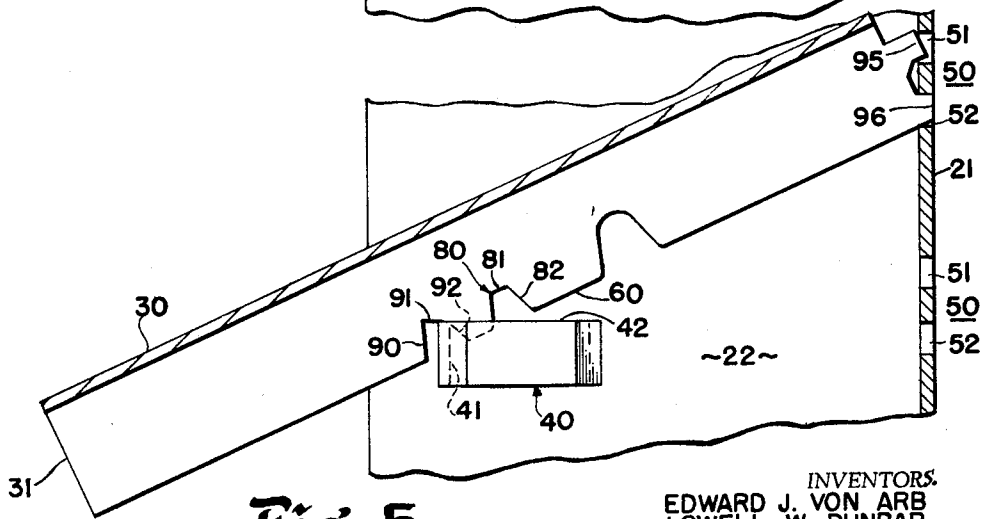

Fig-5

INVENTORS.
EDWARD J. VON ARB
LOWELL W. DUNBAR
BY JACK M. CLEMENT

Marshall, Wilson, Click & Yeasting
ATT'YS

United States Patent Office 3,136,270 Patented June 9, 1964

3,136,270

ADJUSTABLE SHELVING

Edward J. Von Arb, Adrian, Lowell W. Dunbar, Britton, and Jack M. Clement, Adrian, Mich., assignors to Revco, Inc., Deerfield, Mich., a corporation of Michigan

Filed Oct. 24, 1962, Ser. No. 232,844
6 Claims. (Cl. 108—8)

This invention relates to adjustable shelving apparatus in general and, in particular, to adjustable shelving apparatus having shelves which may be disposed in any one of three positions.

The rapidly increasing need for store fixtures in the ever expanding commercial system of the United States, particularly with reference to drug and grocery stores which are expanding not only in size but in the variety and quantities of products carried in open display, has brought a demand for shelving that is easily disassembled, reassembled, and adjustable as to inclination for displaying the goods. It is particularly important that these shelves when reassembled be as sturdy and solid as shelves of the older types which were connected at all joints with nuts and bolts in order to carry the weight of the items displayed thereon and to be able to stand steadily by themselves when they are utilized away from the support of a side wall. Many types of shelving have been advanced to solve this problem with each of the shelvings thus far advanced still having difficulties in overcoming one or more of the problems of instability, easy and quick disassembly, quick reassembly, etc.

It is, accordingly, an object of this invention to provide an improved adjustable shelving apparatus.

It is a further object of this invention to provide improved adjustable shelving apparatus which may be quickly assembled and disassembled, is stable, and has means for adjusting each of the shelves to any one of three positions with no more effort than the assembly of the shelves.

In accordance with the above objects, the invention features adjustable shelving apparatus comprising a pair of upright standards. Each of the standards includes a first upwardly extending plate, a second upwardly extending plate, and means for joining said upwardly extending plates to form an upwardly extending corner post. The first plates of the standards extend toward each other in preferably substantially the same plane. A shelf extends between the second plates. At least one of the second plates has a vertical row of brackets extending inwardly toward the shelf, each bracket having an inwardly facing surface and an upwardly facing surface. The first plate associated with the one second plate having the vertical row of brackets has formed therein a vertical row of pairs of vertically displaced slots, there being one pair of slots associated with each bracket formed in the second plate. A downwardly extending flange adapted to support and secure the end of the shelf is attached to or integral with the shelf. A projection extends from the rear of the shelf. The flange has a first downwardly opening recess with a downwardly facing and an outwardly facing surface, the outwardly facing surface being inclined downwardly and inwardly toward the first plate. The projection is received by an upper one of a pair of slots to bear against upper and lower limits of the slot while the surfaces of the recess and the surfaces of the associated bracket cooperate to maintain the shelf in a substantially horizontal position. The projection also is receivable by a lower one of the pair of slots to bear against upper and lower limits of the slot while the surfaces of the recess and the surfaces of the associated bracket cooperate to maintain a shelf in an upwardly slanting position.

In this embodiment any one of a number of other means may be utilized for supporting the other end of the shelf on the other standard. The flange also has formed therein a second downwardly opening recess spaced forward from the first recess and also having a downwardly facing surface and an outwardly facing surface. A second projection extends from the rear of the shelf and is displaced vertically below the first mentioned projection. The second projection is receivable by a lower one of a next pair of slots above the first-mentioned pair of slots to bear against upper and lower limits of the slot while surfaces of the second recess and surfaces of the bracket associated with the first-mentioned pair of slots cooperate to maintain the shelf in a downwardly inclined position. It is preferable in this modification that each recess be spaced from the rear of the shelf and the projections thereon to provide a wedging action by the engagement of the outwardly facing surface of the recesses against the bracket to insure the projection bearing against the upper and lower limits of the slot in which it is inserted.

The invention herein further discloses a pair of upright standards wherein each of the standards includes first and second plates joined at substantially right angles. The first plates of each standard extend toward each other. A shelf extends between the second plates. Each of the second plates has a vertical row of uniformly spaced pocket means attached thereto or integral therewith and extending inwardly toward the shelf. Each of the first plates has formed therein a vertical row of pairs of vertically displaced slots, there being a pair of slots formed in each first plate for each pocket means of the respective second plate joined thereto.

Each shelf end has a downwardly extending tongue adapted to be inserted in the pocket means. A projection is formed on the rear of the shelf at each end thereof, each projection being receivable by an upper one of a pair of slots to bear against upper and lower limits of said slot while each of said tongues is inserted into an associated pocket means to maintain the shelf in a horizontal position. Each of the said projections is also receivable by a lower one of said pair of slots to bear against upper and lower limits of the slot while each of the tongues is still inserted into the associated pocket means to maintain the shelf in an upwardly inclined position.

A second projection is provided on the rear of each end of the shelf displaced vertically below each of the first-mentioned projections. Each end of the shelf has a second downwardly extending tongue spaced forward from the first mentioned tongue. Each of the second projections is receivable by a lower one of a next pair of slots above the first-mentioned pair of slots to bear against upper and lower limits of the slots while the second tongue is inserted into the first-mentioned associated pocket means to maintain the shelf in a downwardly inclined position. It is preferable that each of the tongues has an outwardly facing surface which is inclined downwardly and back toward the first plates whereby the outwardly facing surfaces engage the front of the pocket means in each of the above defined positions of the shelf to provide a wedging action to seat the projections in the slot in question for each position of the shelf and insure the stability, rigidity, and strength of the easily assembled shelves.

Other objects, advantages and features of this invention will become apparent when the following description is taken into conjunction with the accompanying drawings, in which:

FIG. 1 is a view in perspective taken from below to more clearly show the features of the invention;

FIG. 2 is an enlarged plan view of the pocket or bracket means with a cross section taken at the top of the pocket;

FIG. 3 is a cross sectional view of FIG. 1 taken along the lines 3—3 of FIG. 1 that shows the operation of the features of this invention with the shelf in horizontal position;

FIG. 4 shows the upwardly inclined position of the shelf; and

FIG. 5 shows the downwardly inclined position of the shelf.

Referring now to the drawings the invention will be discussed with respect to the preferred embodiment.

There is shown a pair of upright standards **20**. Each of the standards **20** includes a first upwardly extending plate **21**, a second upwardly extending plate **22** and means for joining the upwardly extending plates to form an upwardly extending corner post (shown as integral in the drawing, but any other suitable means will be satisfactory). The first plates **21** of the standards **20** extend toward each other and are preferably in substantially the same plane. A shelf **30** extends between the second plates **22**. At least one of the second plates **22** has a vertical row of brackets **40** extending inwardly toward the shelf **30**, each bracket **40** having an inwardly facing surface **41** and an upwardly facing surface **42**. The first plate **21** associated with the second plate **22**, having the brackets **40** formed therein, also has formed therein a vertical row of pairs **50** of vertically displaced slots **51**, **52**, there being one pair of slots **50** associated with each bracket **40** on the second plate.

The shelf **30** has a downwardly extending flange **31** which is adapted to support and secure the end of the shelf **30** adjacent the second plate **22**. The flange **31** may be formed integral with the shelf **30** as shown in FIGS. 3, 4 and 5, or may be a separate angle iron which is suitably attached to the shelf as shown in FIG. 1. All longitudinal and depth bracing that normally are associated with the bottom of the shelf **30** have been omitted from the drawings in order to simplify and clarify the presentation of the invention. The rear of the shelf has a first projection **95** extending therefrom. The flange **31** has a first downwardly opening recess **80** with an outwardly facing surface **82** and a downwardly facing surface **81**. The outwardly facing surface **82** is inclined downwardly and inwardly toward the first plate **21**. The projection **95** is receivable by the upper one **51** of the pair **50** of slots to bear against both the upper and lower limits of the slot **51** (as best seen in FIG. 3) while the surfaces of the recess **81** and **82** and the surfaces **41**, **42** of the associated bracket cooperate to maintain the shelf **30** in a substantially horizontal position. The projection **95** is also receivable by the lower one **52** of the pair **50** of slots to again bear against upper and lower limits of the slot **52** while the surfaces **81**, **82** of the recess and the surfaces **41**, **42** of the associated bracket cooperate to maintain the shelf **30** in an upwardly slanting position (best seen in FIG. 4).

Flange **31** has formed therein a second downwardly opening recess **90** spaced forwardly from the first recess **80** and also having a downwardly facing surface **91** and an outwardly facing surface **92**. A second projection **96** extends from the rear of the shelf and is displaced vertically below the projection **95**. The second projection **96** is receivable by a lower one **52** of a next pair of slots above the first mentioned pair (best seen in FIG. 5) to again bear against upper and lower limits of the slot while the surfaces **91**, **92** of the second recess **90** and the surfaces **41**, **42** of the bracket **40** associated with the previously utilized pair of slots cooperate to maintain the shelf **30** in a downwardly inclined position.

It is to be noted that each recess is spaced from the rear of the shelf and the projections thereon to provide a wedging action by the engagement of their inclined surfaces against the rearwardly facing surface of the bracket means. This insures that the projection will fully be inserted in the appropriate slot and bear against the upper and lower limits of the slot.

It is to be noted that the invention has been described with reference to utilizing the adjusting means at only one end of a shelf apparatus. While it is most preferable to use the same adjusting apparatus for both ends of the shelf it is possible to utilize other means of positioning the far end of the shelf since the connections made in the adjustable apparatus shown are so rigid and stable that the shelf may be properly held in position without repeating the apparatus at the other end. For example, a simple dowel extension from either the shelf flange or the plate **22** into an aperture formed in the other would be sufficient to support the shelf to hold merchandise properly displayed. It is to be further noted that when the adjustable arrangement is utilized only on one end, then means should be provided to maintain the pair of standards in an upright position and properly space one from another. For example, back support or base support means could be added in the manner well known to those skilled in the art as shown in United States Patent No. 3,044,631. However, if the adjustable apparatus as shown and described herein is utilized for both ends of the shelf and for both standards, a shelving unit is obtained which is sufficiently rigid, stable, and strong to stand by itself without the use of a back or an enlarged base. Obviously, a base or a back may be utilized for decorative purposes even in such instances. However, they are not necessary for the purposes of strength and stability.

To be more specific in the description, the first plate **21** and the second plate **22** is shown joined at a substantially right angle. Each of the second plates **22** has a vertical row of uniformly spaced pocket means **40** attached thereto or formed integral therewith and extending inwardly toward the shelf **30**. Each end of the shelf **30** has a downwardly extending tongue **60** adapted to be inserted in a pocket means **40**. The projection **95** is receivable by an upper one **51** of a pair of slots **50** to bear against the upper and lower limits of the slot while each of the tongues **60** are inserted into associated pocket means **40** to maintain the shelf in a horizontal position (best shown in FIG. 3). Each of the projections **95** at the end of the shelf is also receivable by a lower one of **52** of said pair of slots to bear against upper and lower limits of said slot **52** while the tongue **60** is inserted into the associated pocket means **40** to maintain the shelf in an upwardly inclined position (best shown in FIG. 4).

Each end of the shelf **30** has a second downwardly extending tongue **70** spaced forward from the first tongue **60**. This tongue is utilized when second projections **96** at each end of the shelf are inserted into the lower one of the next pair of slots above the pair utilized for the previous two positions. Then the second tongue **70** is inserted into the same pocket means **40** to maintain the shelf **30** in a downwardly inclined position. It is to be noted that each of the tongues **60** and **70** has an outwardly facing surface **82**, **92** which is inclined downwardly and back toward the first plates **21** whereby the outwardly facing surfaces **82**, **92** engage the front **41** of the pocket means **40** in each of the above-defined positions of the shelf **30** to provide the wedging action to insure that the projections are seated in the slot in question for each of the positions of the shelf.

There has thus been disclosed and described a preferred embodiment of the invention which enables the use of a positive locking action in each of the positions of the adjustable shelf thereby insuring a stable, steady load-bearing along with the requisite case of assembly and disassembly. That the positive locking is an advance over the art is evidenced in that only the upright standards are needed for supporting the shelf structure without depending on additional back and base means.

In conclusion it is to be noted that the embodiments disclosed and described herein are meant to be illustrative only and not limiting in any sense. The embodiments described serve merely to illustrate the spirit and scope of the invention.

Having described the invention, we claim:

1. Adjustable shelving apparatus, comprising; a pair of upright standards; each of said standards includes a first upwardly extending plate, a second upwardly extending plate, and means for joining said upwardly extending plates to form an upwardly extending corner post; said first plates of said standards extending toward each other; a shelf extending between said second plates; one of said second plates having a vertical row of brackets extending inwardly toward said shelf, each bracket having an inwardly facing surface and an upwardly facing surface; the first plate associated with said one second plate having formed therein a vertical row of pairs of vertically displaced slots, there being one pair of slots associated with each bracket of said one second plate; a downwardly extending flange adapted to support and secure the end of said shelf adjacent said one second plate; a projection extending from the rear of said shelf; said flange having a first downwardly opening recess with an outwardly facing surface and a downwardly facing surface, said outwardly facing surface being inclined downwardly toward said first plate; said projection being receivable by an upper one of a pair of slots to bear against upper and lower limits of said slot while said surfaces of said recess and said surfaces of an associated bracket cooperate to maintain said shelf in a substantially horizontal position; said projection also being receivable by a lower one of said one pair of slots to bear against upper and lower limits of said slot while said surfaces of said recess and said surfaces of said associated bracket cooperate to maintain said shelf in an upwardly slanting position; and means for supporting the other end of said shelf on the other standard.

2. Apparatus as defined in claim 1 in which said flange has formed therein a second downwardly opening recess spaced forward from said first recess and also having a downwardly facing surface and an outwardly facing surface; a second projection extending from the rear of said shelf and displaced vertically below said first-mentioned projection; said second projection being receivable by a lower one of a next pair of slots above said first-mentioned pair to bear against upper and lower limits of said slot while said surfaces of said second recess and said surfaces of said bracket associated with said one pair of slots cooperate to maintain said shelf in a downwardly inclined position.

3. Apparatus as defined in claim 1 wherein each recess is spaced from the rear of said shelf and the projection thereon to provide a wedging action with said outwardly facing surface to insure said projection bearing against said upper and lower limits of said slots.

4. Adjustable shelving apparatus, comprising; a pair of upright standards; each of said standards including first and second plates joined at substantially right angles; said first plates of each standard extending toward each other; a shelf extending between said second plates; each of said second plates having a vertical row of uniformly spaced pocket means attached thereto and extending inwardly toward said shelf; each of said first plates having formed therein a vertical row of pairs of vertically displaced slots, there being a pair of slots formed in each first plate for each pocket means of the respective second plate joined thereto; each shelf end having a downwardly extending tongue adapted to be inserted in a pocket means; a projection on the rear of said shelf at each end thereof; each projection being receivable by an upper one of a pair of slots to bear against upper and lower limits of said slot while each of said tongues is inserted into an associated pocket means to maintain said shelf in a horizontal position; each said projection also being receivable by a lower one of said pair of slots to bear against upper and lower limits of said slot while each of said tongues is inserted into said associated pocket means to maintain said shelf in an upwardly inclined position.

5. Apparatus as defined in claim 4 in which there is a second projection on the rear of each end of said shelf displaced vertically below each of said first-mentioned projections; each end of said shelf having a second downwardly extending tongue spaced forward from said first-mentioned tongue; each of said second projections being receivable by a lower one of a next pair of slots above said first-mentioned pair to bear against upper and lower limits of said slot while said second tongue is inserted into said first-mentioned associated pocket means to maintain said shelf in a downwardly inclined position.

6. Apparatus as defined in claim 5 in which each of said tongues has an outwardly facing surface which is inclined back toward said first plates whereby said outwardly facing surfaces engage the front of said pocket means in each of the above-defined positions of said shelf to provide a wedging action to seat said projections in the slot in question for each position of said shelf.

References Cited in the file of this patent

UNITED STATES PATENTS

772,837	Siersdorfer	Oct. 18, 1904
1,554,137	Slifkin	Sept. 15, 1925
1,963,721	Smith	June 19, 1934
2,305,629	Magnuson	Dec. 22, 1942
2,963,170	Lori	Dec. 6, 1960
3,089,675	Lozier	May 14, 1963