Dec. 4, 1951 H. O. LUNDQVIST 2,577,138

VERTICALLY ADJUSTABLE SHELVING

Filed Feb. 27, 1948 2 SHEETS—SHEET 1

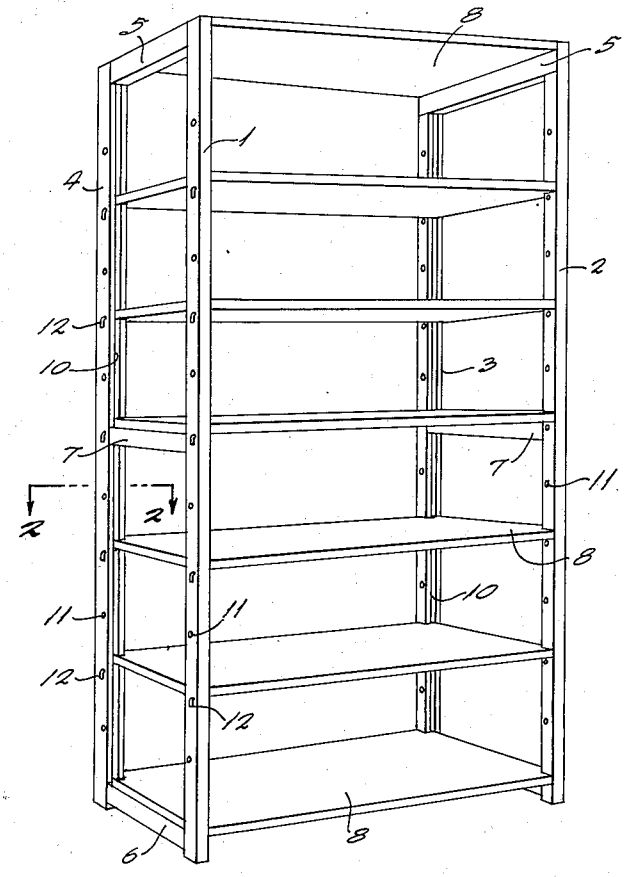


Fig. 1.

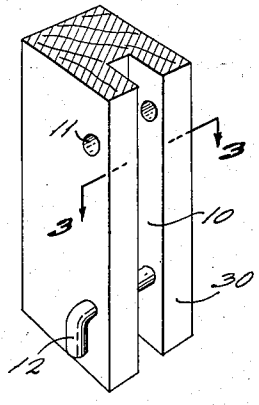


Fig. 2.

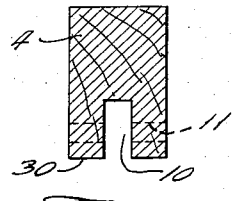


Fig. 3.

INVENTOR.
HARALD OSKAR LUNDQVIST
BY Haseltine Lake and Co.
AGENTS.

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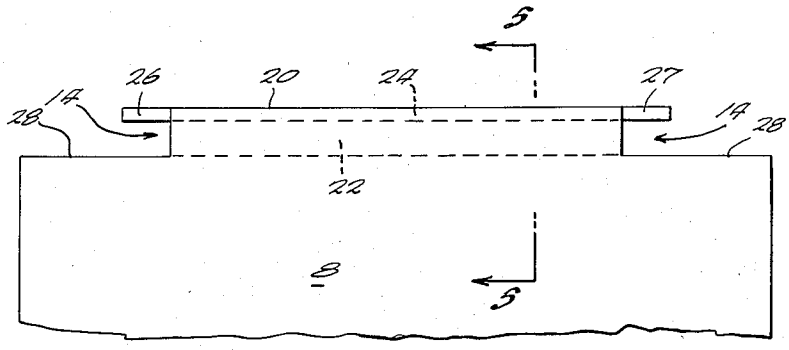


Fig. 4.

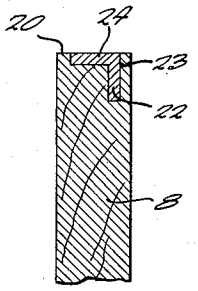


Fig. 5.

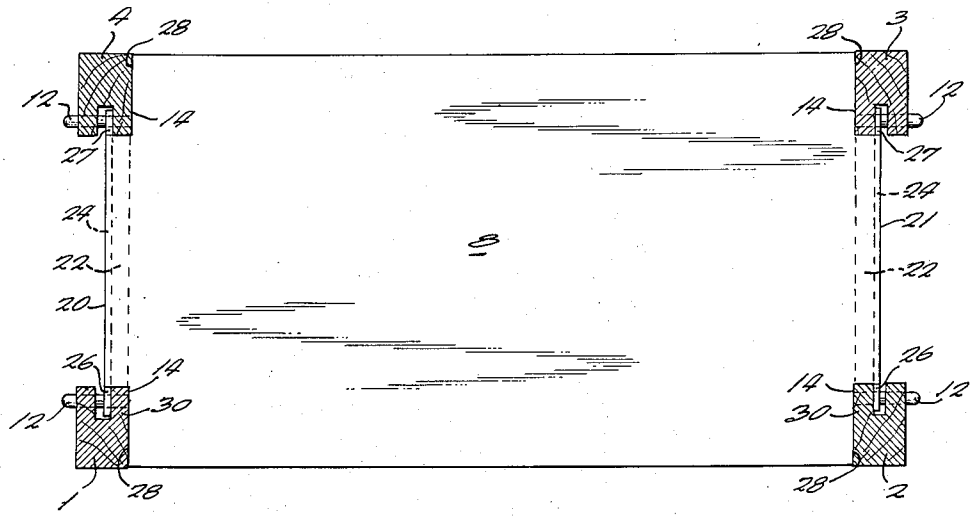


Fig. 6

INVENTOR.
HARALD OSKAR LUNDQVIST
BY Haseltine, Lake and Co.
AGENTS.

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UNITED STATES PATENT OFFICE

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VERTICALLY ADJUSTABLE SHELVING

Harald Oskar Lundqvist, Stockholm, Sweden

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Patent expires May 28, 1965

1 Claim. (Cl. 211—147)

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The present invention relates to such cupboards or shelving structures provided with movable shelves, especially shelving structures for storerooms, which consist of two side pieces, each including a pair of oppositely arranged corner standards or uprights braced by bracing members connecting the same. All or some of the shelves are provided with members projecting from the side ends of the shelves, transversely of the longitudinal extension of the shelves and entering into grooves of the uprights and resting therein on supporting pins traversing the grooves, the grooves of each pair of corner uprights of the side pieces facing each other.

The invention is substantially characterized by the fact that the shelves have notches cut at their corners so proportioned that the shelves may enter with each of their side ends between the uprights of the side pieces and fit there closely. An angle bar is secured to each side end of the shelves with its web flat therewith and extended between the corner notches of the respective side end and with its flange substantially covering the flank of the side end and projecting laterally thereabove and within the grooves of the uprights thus clamping the inner flanges of the upright grooves and the shelf together, against the edge of the corner notches parallel with the projecting ends of the angle bars.

The invention is specifically designed and useful for wooden shelving structure and wooden shelves, the word "wooden" being intended to include also other material having similar properties, as distinguished from metal shelving made for instance of steel. Wood, by its nature, has not the same strength as metal so that for wooden shelving heavier components must be employed than for metal shelving designed to carry the same load. It is, of course, undesirable from the viewpoint of costs, weight and appearance to employ a heavy shelving structure and shelves. Consequently, it is highly advantageous to use the load carrying capacity of the wood as fully as possible to reduce the required dimensions of the components of the shelving to a minimum. Furthermore, the problems of clamping and bracing the components of a wooden shelving are entirely different from those of a metal shelving. Various clamping and bracing means such as interlocking notches, hooks, etc., which are suitable for metal shelving, are not suitable at all for wooden shelving.

One of the objects of the present invention which are attained by the previously mentioned features is to provide a wooden shelving with

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wooden shelves which permits to reduce the dimensions of the components of the shelving to a minimum for a given load. In particular, the aforementioned use of angle bars has also the advantage that the grooves in the uprights may be kept small which in turn allows the utilization of more slender corner uprights.

Another object of the invention is to provide a novel and improved wooden shelving which can be set up and knocked down in a very simple and rapid manner without employing any tools.

Another object of the invention is to provide a wooden shelving in which the shelves, after insertion in the proper position between the uprights of the shelving, are safely locked to the uprights and secured against slipping. The shelving and the shelves are also so designed that the inserted shelves will brace the uprights and hold or stabilize the entire structure without requiring any additional clamping and bracing means or fastening the shelving to a supporting wall.

In the following the invention will be further described with reference to the constructions illustrated in the accompanying drawings in which:

Fig. 1 illustrates in perspective a wooden shelf structure according to the invention, while Figs. 2 and 3, on an enlarged scale, illustrate a part of a corner upright in perspective and in section along the line 3—3 of Fig. 2 respectively.

Fig. 4 illustrates a plan view of one end of a wooden shelf, while Fig. 5 is a section along the line 5—5 of Fig. 4.

Fig. 6, finally, is a horizontal section, likewise on an enlarged scale relatively to Fig. 1, of the shelving structure showing the shelf in position between and upon the uprights.

In the drawings the two pairs of wooden uprights which constitute the side pieces of the shelving structure are designated by 4 and 1, and 3 and 2, respectively. At their top and bottom ends these uprights are connected to one another by cross-connection or bracing members 5 and 6 and one or more intermediate bracing members 7. The side pieces are held in position entirely by wooden shelves 8 as will be more fully explained hereinafter.

The corner uprights of each side piece are provided with longitudinal grooves 10, the grooves of each pair of uprights facing each other. A number of holes 11 are bored equidistantly, one above the other, and traversing the side flanges of the grooves. Through these perforations, supporting pins 12 acting as stops or abutments may be inserted for holding the shelves 8.

As shown in Figs. 4 and 6 each of these shelves has corner notches 14 cut at its corners. Angle bars are secured to the side ends 20, 21 of the shelves with their webs 22 flat therewith, for instance by being inserted into grooves 23 of the shelves. The flanges 24 of the angle bars substantially cover the end flanks of the shelves and project, parallel with the lateral edges 28 of the corner notches, with their ends 26, 27 above the webs 22 into the corner notches 14. The flange ends are so formed that their spacing from the lateral edges 28 substantially equal the width of the inner side flange 30 of the grooves 10. When the shelves are in position, the projecting ends 26, 27 of the angle bars will rest on the supporting pins 12, inserted into the proper perforations 11 and traversing the grooves 10. The projecting ends of the angle bars will then firmly clamp together inner groove flanges and shelf.

The width of the groove 10 in a corner upright should preferably allow two projecting flange ends of the angle bars to be lodged side by side, whereby the shelf structures easily may be extended by adding another set of shelves to the other side of the uprights.

The shelves will thus rest entirely on the projecting vertical flange ends 26, 27 of the angle bars. At the same time the whole structure will be braced by a part of the corner uprights which is filling the space embraced by the projecting ends of the angle bars and both edges of the corner notches. The angle bars are each preferably set into the shelf (Fig. 5) in such a manner that its web, parallel with the plane of the shelf will be located in or near to the under side of the shelf, thus weakening the shelf as little as possible with regard to a vertical load.

The invention may also be varied in several other ways within the scope of the invention.

Having now particularly described the nature of my invention and the manner of its operation what I claim is:

A shelving structure including in combination two side pieces and at least two wooden shelves, each side piece comprising a pair of oppositely arranged wooden corner uprights, bracing members rigidly connecting the said two uprights, each of said corner uprights having a longitudinal groove therein forming two side flanges of equal cross-section and spaced perforations traversing

the said side flanges, support pins insertable in said perforations so as to traverse the respective grooves for supporting said shelves adjustably in height, the respective grooves of said pairs of oppositely arranged corner uprights facing each other, each of said wooden shelves having a notch cut out at each corner, two angle bars each fastened to one of the two side edges of the shelf facing the respective pair of uprights when the shelf is in position, each of said angle bars having a first flange and a second flange, said first flange being disposed parallel to the plane of the shelf, thereby re-enforcing the respective end flanks of the shelf, said second flange being perpendicular to the plane of the shelf and protruding at both ends beyond the respective notch, the portions of the first flange adjacent to the respective protruding portions of the second flange being removed so as to form at each corner of the shelf a recess defined on two sides by the two side walls of the respective notch and on a third side by the respective protruding portion of the second flange, the cross-section of each of said recesses corresponding to the cross-section of each of said side flanges of the uprights so that one of the two side flanges of each upright fills substantially completely the respective recess and the protruding flange portion of the respective angle bar extends into the corresponding groove in a vertical plane when a shelf is placed in position between the two side pieces and is supported on said support pins, whereby the shelves are clamped to the uprights and the shelving structure is stabilized by the inserted shelves only.

HARALD OSKAR LUNDQVIST.

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