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C. W. ATTWOOD

2,329,815

ADJUSTABLE SHELVING

Filed Nov. 4, 1942

FIG. 3.

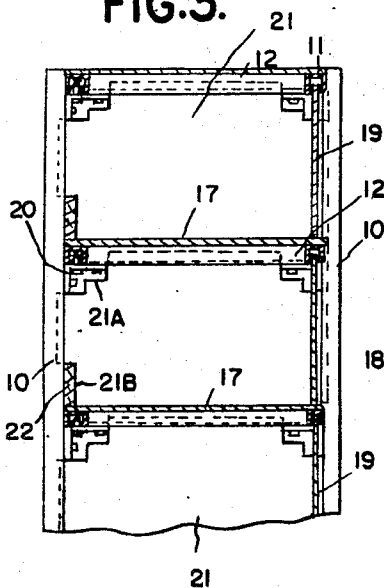


FIG. 1.

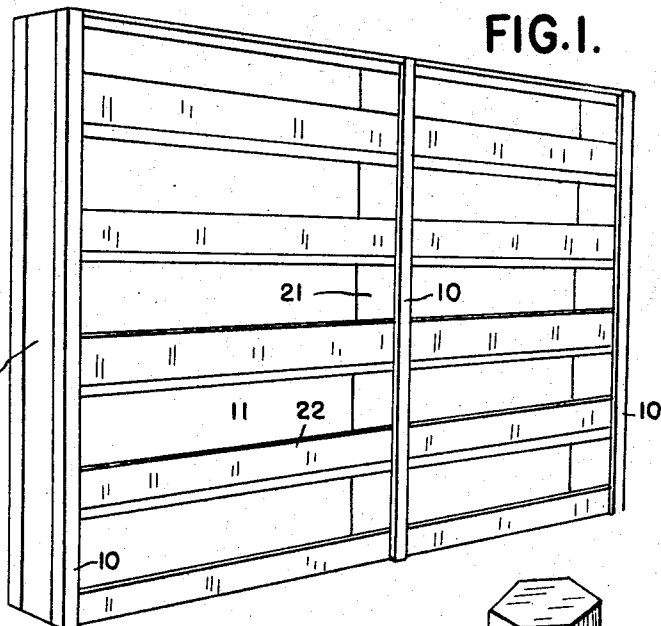


FIG. 2.

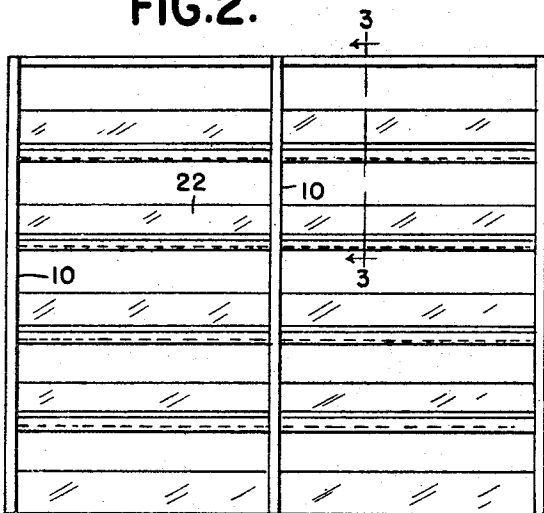


FIG. 6.

FIG. 5.

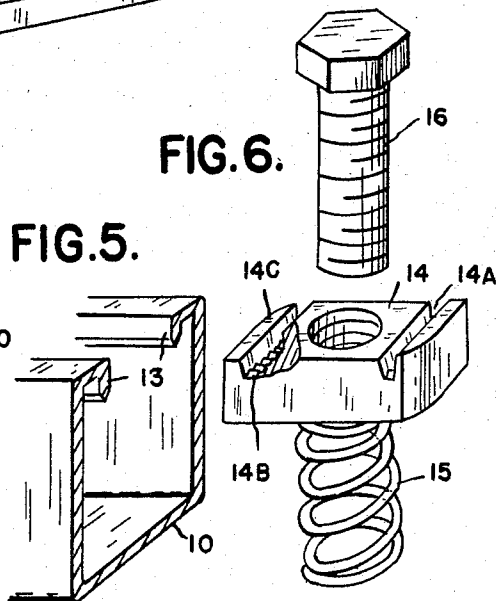


FIG. 7.

FIG. 8.

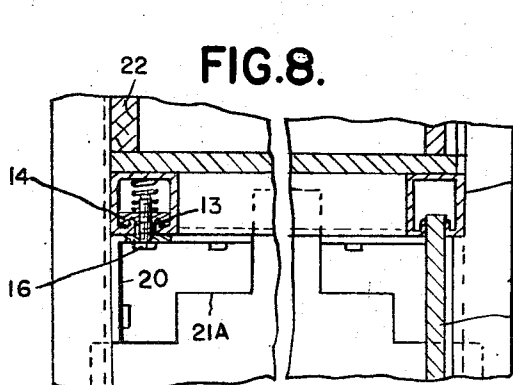
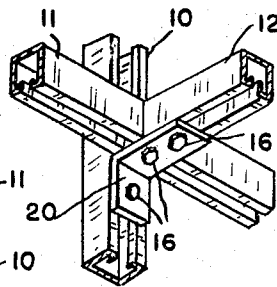


FIG. 4.



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ADJUSTABLE SHELVING

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Application November 4, 1942, Serial No. 464,497

7 Claims. (Cl. 211-147)

This invention relates to adjustable shelving for uses such as stock bins, display racks, and the like. One object of my invention is the provision of light, strong, skeleton framework for adjustable shelving, with ready fastening of the framing and supporting members in desired positions, where they reinforce each other and provide means for positioning the horizontal shelves as well as vertical partitions and front and rear wall members as desired.

Another object of my invention is the formation of the skeleton framework for adjustable shelving with its vertical and horizontal framing members of identical square-formed channel members having one side open to form a continuous slot, with means adjustably mounted in the slotted face for securing the component members to each other permanently if desired, but with ready adjustability and accurate alignment of joined parts without the necessity of any welding or drilling operations.

A further object of my invention is the provision of adjustable shelving framework of novel hollow rectangular all metal material, preferably square-formed with rounded corners having one side open to form a continuous slot throughout the entire length of each piece, the side walls of the slot being formed of turned flanges forming clamping ridges to provide grips for tying together and bridging the opposite sides of the slot by a grooved nut, thereby completing the hollow square at points where bolting is done and concentrated load is applied.

A further object of my invention is the arrangement of screw-threaded holding means for gripping the clamping ridges of such hollow rectangular members at any point along their entire lengths, with provision for readily introducing such holding means into the interior of the hollow rectangular members through such slots, quickly adjusting the positions of the holding members within the slots whenever desired, and maintenance of the holding members in selected positions as long as desired.

Other objects and advantages will be apparent from the following description, wherein reference is made to the accompanying drawing illustrating the preferred embodiment of the invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawing:

Figure 1 is a perspective view of my improved adjustable shelving positioned to form a stock bin.

Figure 2 is a front view thereof.

Figure 3 is a vertical detail sectional view taken substantially on the line 3-3 of Figure 2.

Figure 4 is a detail perspective view showing a preferred corner fastening arrangement whereby two horizontal members at right angles to each other are secured to a vertical member.

Figure 5 is a detail perspective view showing in enlarged section one of the hollow rectangular metal framing members.

Figure 6 is a perspective view of the bolt.

Figure 7 is a perspective view of the slotted nut cooperating with the bolt of Figure 6, as well as with the clamping ridges of Figure 5.

Figure 8 is an enlarged detail vertical cross section showing the positioning of horizontal shelving and vertical partition and wall members with relation to the metal framing members.

Referring now to the drawing, reference numeral 10 designates the vertical framing supports for my improved shelving and the numerals 11 and 12 designate horizontal framing members adapted to be secured to the vertical members 10 in various adjusted positions, substantially as shown in Figure 4. These members 10, 11 and 12 are of identical hollow rectangular material, preferably metal, and herein shown as square-formed with rounded corners and with one face thereof slotted throughout the entire length of the material. Such hollow rectangular members are best shown in perspective in Figures 4 and 5.

The side walls of the slot are formed of turned flanges 13, herein termed "clamping ridges," with their free edges beveled to impart a sharpened or pointed cross section to facilitate securing of clamping nuts 14 in various selected positions along the flanges 13. One of clamping nuts 14, shown in perspective in Figure 7, with parts broken away, and such nut is narrower than the slot in the hollow rectangular members to permit ready insertion of the nut through the slot when properly turned. The length of the nut 14, however, is greater than the distance between the clamping ridges 13, so that after the nut is inserted in the hollow member, it can be maintained in position by simply turning the nut at right angles to the slot, where its ends underhang and are retained by the clamping ridges 13. The face of the nut which engages the clamping ridges 13 is provided with slots 14A to receive the clamping ridges 13 when the nut is tightened into place as shown in Figure 8, and when the nut is so tightened, the flanges on opposite sides of the slot are rigidly tied together, whereby the hollow rectangular member is reinforced at the point

of load, completing the hollow square at the position of the nut. The bottoms of the slots 14A are provided with hardened teeth or serrations 14B which, when the nut is drawn up tight, bite into the beveled extremities of the flanges 13 to assist in retaining the nut in desired position by positively locking it against longitudinal sliding movement along the flanges.

A spring 15 is preferably secured to and projects from the bottom face of the nut 14, being large enough in diameter to allow the stem of the bolt 16 to pass freely therethrough, as shown in Figure 8. The spring is compressed against the wall of the channel member opposite the slotted wall thereof when the nut is inserted through the slot and turned into place, friction being thus imposed on the nut to temporarily hold it against sliding in the hollow member due to its own weight, or as the result of vibration prior to its secular in selective position by turning the bolt 16 home. This arrangement enables the placing of the nuts in advance, even in vertically arranged hollow rectangular members, without danger of displacement, while the parts to be attached may be secured in place at any time thereafter simply by thrusting the complementary bolt portions 16 into the previously positioned nuts and tightening the same. While the springs serve to hold the nuts in desired location before the bolts are inserted therein, it will be seen that these nuts can be moved at will within the hollow member by pushing the nut against the spring to release it from engagement with the clamping ridges and then moving it along the channel in either direction. In this manner a plurality of nuts may be preliminarily placed at desired spacing, to enable accurate alignment of the opposite ends of shelf and partition supports, or any one or several such supports can be shifted to new positions by releasing the bolts and replacing the nuts to the desired new locations, whereupon the bolts are again turned home.

The length of the nut 14 is substantially equal to the distance between the side webs of the hollow members 10, 11 and 12. Diagonally opposite corners of the nuts are rounded, substantially as shown at 14C, so that the nut may be readily turned from the initial position of insertion through the slot to its position of use, as by a quarter turn clockwise. At this point further rotation of the nut is prevented by the engagement of the unreduced corners with the side walls of the hollow members, which thus assist in holding the nut against turning as the bolt is being tightened, and also insure proper alignment of the slots 14A with the clamping ridges 13 during the positioning of the nuts. The bolt 16 may be of conventional or any desired type.

As best shown in Figures 1-4, the vertical supports 10 are arranged in spaced pairs with the horizontal supports 11 extending from end to end of the several pairs of upright supports 10, and the horizontal supports 12 extending from front to back between aligned pairs of the horizontal supports 11. The slotted faces of each pair of upright supports 10 face inwardly, or toward each other, while the slotted faces of the horizontal supports 11 and 12 face downwardly, substantially as shown in Figure 4.

To secure the horizontal supports 11 and 12 at various heights along the upright supports 10, I preferably provide brackets 20 substantially as shown in Figure 4. These brackets 20 are formed of right-angled material with one arm apertured

to receive a bolt 16 threading into a nut 14 arranged within the upright support 10 and the other bracket arm provided with a plurality of apertures to receive bolts 16 extending respectively into the slots in the horizontal supports 11 and 12 and engaging nuts 14 properly positioned in each of the horizontal supports 11 and 12. When the bolts are tightened, the horizontal support 12 is positioned with its upper face aligned with the upper face of the horizontal supports 11 and both horizontal supports are firmly secured to the upright supports 10.

The shelves 17 may be of plywood or other suitable material and rest on the upper faces of the horizontal supports 11 and 12, being held against forward or backward movement by the upright supports 10 and against endwise movement by vertical end pieces 18, also of plywood or other suitable material, which close the ends of the display rack or stock bin, etc. Backboards 19 preferably extend from end to end of the display rack, etc. and have their upper edges extending into the slots of the horizontal supports 11 adjacent the rear of the display rack, as best shown in Figures 3 and 8. Notches may be cut in the upper edges of the backboards to clear the brackets 20 at each upright support 10, or the backboards 19 may be made of lengths corresponding to the distance between the upright supports 10 and their upper corners notched to clear adjacent brackets 20.

Partitions 21 are preferably arranged between aligned pairs of upright supports 10 with their lower edges resting on the shelving 17, their front and rear edges extending into the slots of aligned upright supports 10, and their upper edges extending into the slot of the horizontal support 12 arranged between aligned pairs of upright supports, as best shown in Figure 3.

The upper corners of each partition is notched, substantially as shown at 21A to clear the brackets 20. Adjacent the lower front corners of each partition may also be arranged notches 21B for the reception of front boards 22, which are of lesser height than the backboards 19 and extend from end to end of the display rack. The front boards 22 are preferably slid into position from one end of the display rack just before one end piece 18 is secured in place, and by passing through the slots 21B of each partition at that level, each front board 22 acts as a sort of key to position the shelving parts and prevent accidental displacement.

It will be obvious that my improved shelving may be arranged without a front board or without a back board, and that partitions may be omitted between certain of the aligned pairs of upright supports 10 without departing from the spirit of my invention. Also the shelves may be arranged at various heights along the upright supports 10 and any particular shelf can be raised or lowered by simply loosening the bolts 16 threading into the nuts in the upright slots 10 carrying that particular shelf. When moved to a new position, such nuts are again tightened.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. Shelving comprising spaced vertical supports, horizontal supports arranged at right angles to each other secured to each vertical support, each support being formed of hollow substantially rectangular members with continuous slots in one of their faces and inwardly projecting clamping ridges at the sides of the slots, and securing means consisting of apertured brackets, bolts passing through the apertures in said brackets and through the slots of the supports, and slotted nuts arranged within the hollow substantially rectangular members with their slots fitting over the clamping ridges, whereby tightening of the bolts will serve to clamp the nuts firmly upon the clamping ridges of the supports, and shelves resting on the horizontal supports.
2. Shelving as recited in claim 1 wherein backboards rest on the shelves and extend into the slots of one of said horizontal supports.
3. Shelving as recited in claim 1 wherein partitions rest on the shelves and extend into slots of aligned vertical supports and one of said horizontal supports.
4. Shelving as recited in claim 1 wherein partitions rest on the shelves and extend into slots of aligned vertical supports and one of said horizontal supports, said partitions having cut out notches at their upper corners to clear said apertured brackets.
5. Shelving as recited in claim 1 wherein partitions rest on the shelves and extend into slots of aligned vertical supports and one of said horizontal supports, said partitions having cut out notches at their upper corners to clear said apertured brackets, said partitions also having slots arranged near their lower front face, and front boards resting on said shelves and extending through said slots in said partitions.
6. Shelving comprising spaced pairs of upright supports of hollow square-formed material slotted throughout their entire lengths and arranged

with their slotted faces facing each other, longitudinally arranged horizontal supports and laterally arranged horizontal supports secured to said upright supports, said horizontal supports being similarly formed of hollow square-formed material slotted throughout their lengths and with their slotted faces facing downwardly, means for securing the horizontal supports at various positions upon said vertical supports including bolts extending through the slots of the supports and engaging said supports interiorly thereof, shelves resting upon said horizontal supports, backboards resting upon said shelves and with their upper edges extending into the slots of the rearmost longitudinally arranged horizontal supports, and partitions resting on said shelves with their upper edges extending into the slots of the laterally arranged horizontal supports and their side edges extending into the slots of aligned vertical supports.

7. Adjustable shelving comprising spaced pairs of upright supports of hollow square-formed material slotted throughout their entire lengths and arranged with their slotted faces facing each other, longitudinally arranged horizontal supports and laterally arranged horizontal supports, said horizontal supports being similarly formed of hollow square-formed material and slotted throughout their lengths and with their slotted faces facing downwardly, said upright and horizontal supports having inwardly projecting clamping ridges at the sides of the slots, securing means consisting of apertured brackets, bolts passing through the apertures in said brackets and through the slots of the supports, slotted nuts arranged within the hollow members with their slots fitting over the clamping ridges whereby tightening of the bolts will serve to clamp the nuts firmly upon the clamping ridges of the supports, and shelves resting on the horizontal supports.

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