Dec. 19, 1944. W. A. BOCKIUS 2,365,622

SHELF CONSTRUCTION

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Fig. 2

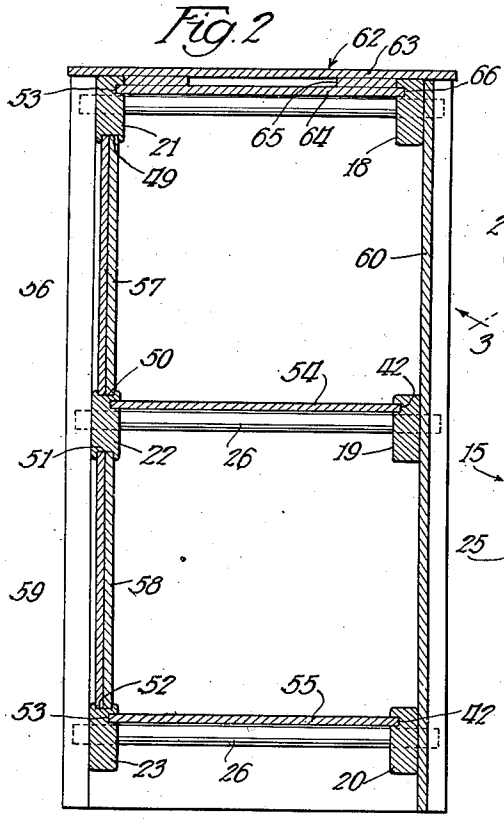


Fig. 1

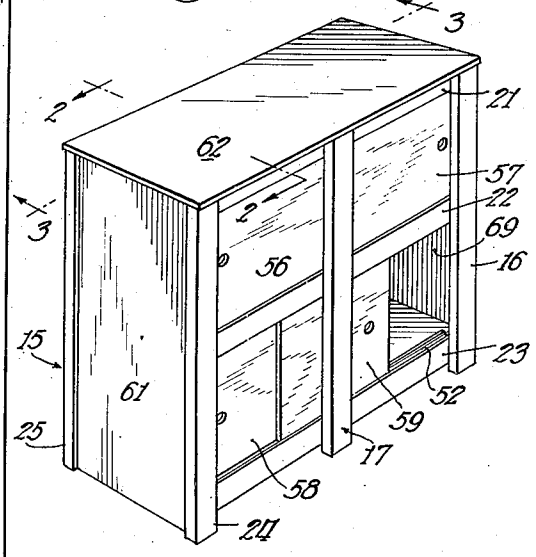


Fig. 5

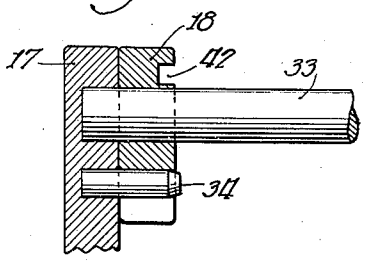


Fig. 6

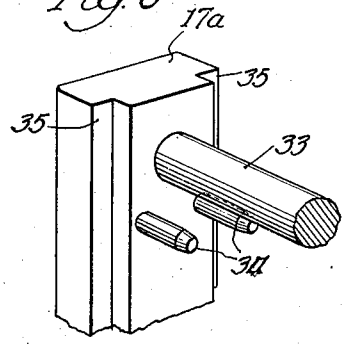
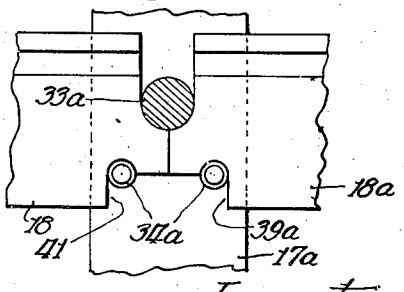


Fig. 13.



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SHELF CONSTRUCTION

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Fig. 4.

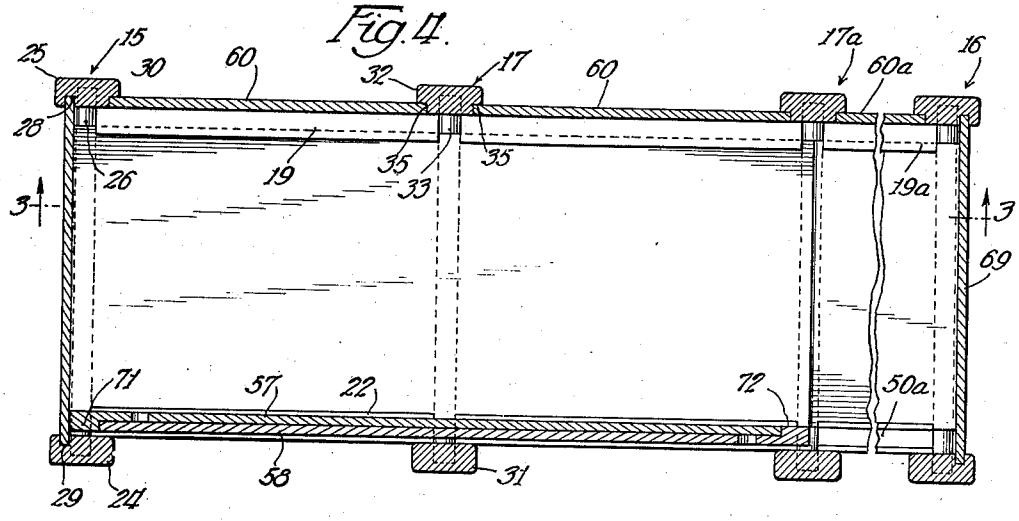
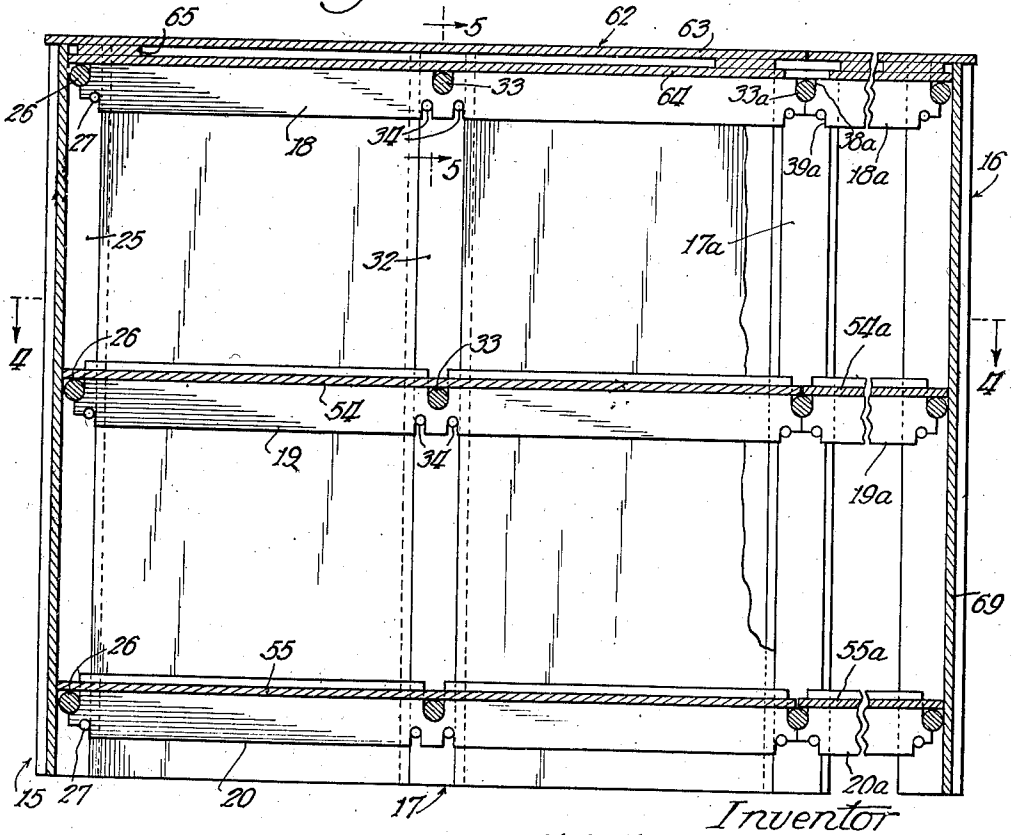


Fig. 3



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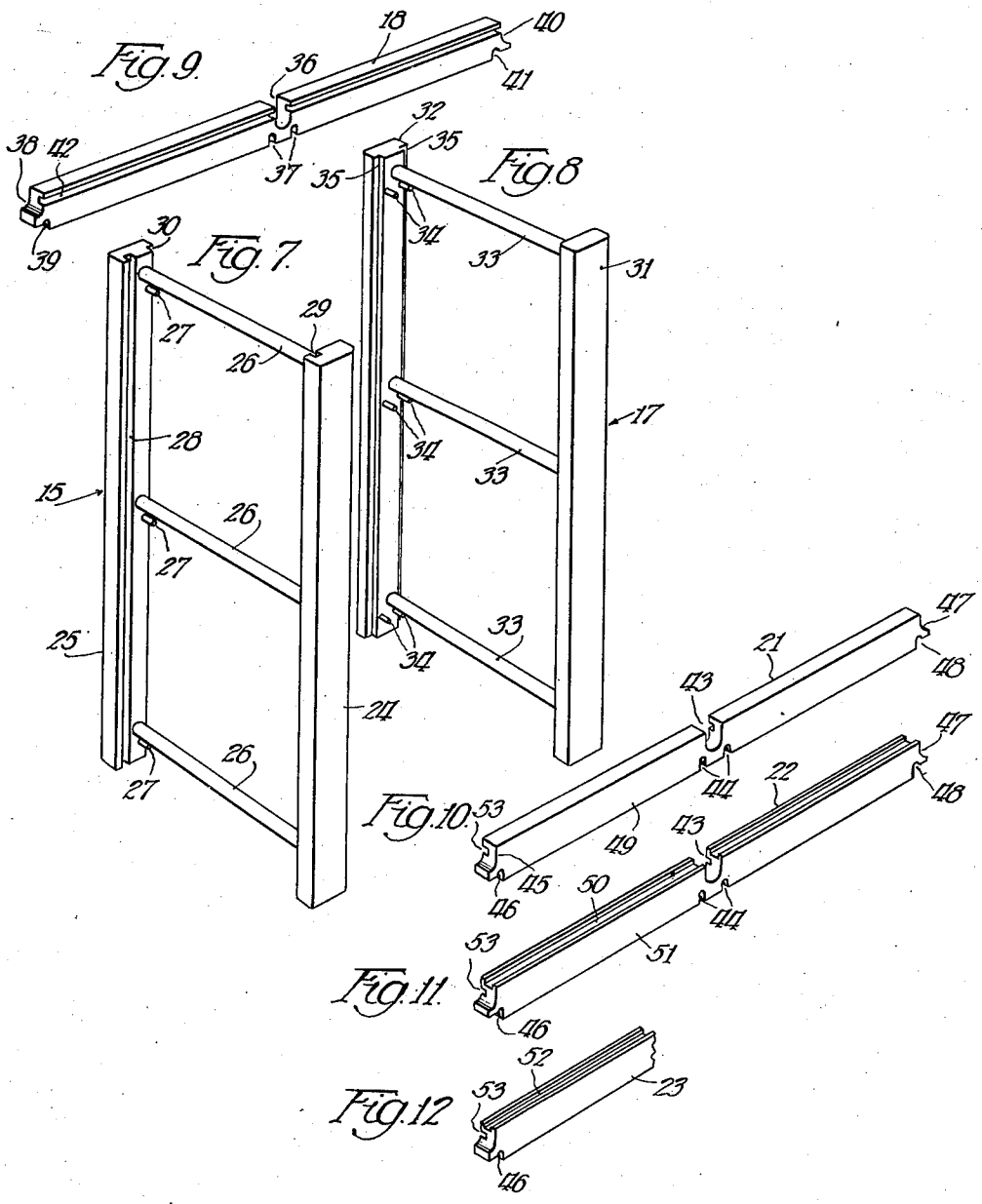
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SHELF CONSTRUCTION

Filed Jan. 7, 1944 3 Sheets-Sheet 3



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2,365,622

UNITED STATES PATENT OFFICE

2,365,622

SHELF CONSTRUCTION

Walter Allan Bockius, Glenview, Ill.

Application January 7, 1944, Serial No. 517,315

15 Claims. (Cl. 211—148)

This invention relates to improvements in knockdown shelf construction and more particularly to one which may be extended laterally section by section.

It is an object of this invention to provide a set of shelves which can be assembled without the use of nails and in which the parts interlock each other so as to provide a sturdy and rigid construction.

A further object of this invention is to provide an improved joint between the uprights and the longitudinally extending rails of a shelf construction.

Another object is to provide an improved shelf construction wherein the shelf is supported at its front and rear edges, and is disposed above a transverse member so as to prevent any tendency of the shelf to flex when it is loaded.

Still another object is to provide an improved shelf construction in unit form which can be put up and taken down easily and to which can be added like units to form a continuous shelf.

Other objects, features and advantages of this invention will become apparent as the description proceeds.

With reference now to the drawings, in which like reference numerals designate like parts:

Fig. 1 is a perspective view of a preferred embodiment of this invention;

Fig. 2 is a section taken along the plane designated by the line 2—2 of Fig. 1;

Fig. 3 is a sectional elevation taken along line 3—3 of Fig. 4, showing the embodiment of Fig. 1 with an additional unit added;

Fig. 4 is a section taken along line 4—4 of Fig. 3;

Fig. 5 is an enlarged sectional detail taken along the line 5 of Fig. 3;

Fig. 6 is a perspective view of a detail;

Figs. 7 to 12, inclusive, are perspective views of several types of structural members entering into the construction of the embodiment shown in the preceding figures; and

Fig. 13 is an enlarged elevation of a detail.

With reference now to Figs. 1 and 2, the preferred embodiment of this invention therein illustrated constitutes a demountable shelf construction which includes vertically disposed end frames designated by the reference numerals 15 and 16 and a center frame 17. These frames are connected together by longitudinally extending rear rails 18, 19 and 20, and by correspondingly disposed front rails 21, 22 and 23.

The end frame 15 is shown in detail in Fig. 7 and comprises a front corner member 24 and a rear corner member 25, the two being secured to each other by rounds 26. Dowel pins 27 project from the inner surfaces of the corner members 24 and 25, each pin being disposed below and slightly to one side of each of the rounds. The corner members 24 and 25 are provided with grooves 28 and 29 which are oppositely disposed from one another so as to receive an end panel 61. The corner groove 30 is provided in the rear corner member 24 for a purpose which will hereinafter appear.

The right end frame 16 is identical to the left end frame 15 except for the fact that the position of the dowels and the grooves are reversed from right to left, and vice versa.

The center frame 17 is shown in detail in Fig. 8 and comprises front and rear members 31 and 32 which are rigidly secured to each other by rounds 33. Dowel pins 34 project from the inner surfaces of the front and rear members, and in this instance they are set in pairs, each pair being disposed slightly below the round, and the members of the pair being aligned with each other in horizontal direction, and aligned horizontally with the dowel pins 27 of the end frame members. The rear member 32 is provided with corner grooves 35 at its two inner corners, and these grooves cooperate with the corner grooves 30 of the end members to hold back panels 60 in place, as will be hereinafter pointed out.

These frames, of which there are three in the embodiment of Fig. 1, are maintained in upright position and secured to each other by the rails 18 to 23 inclusive. The rail 18 is shown in detail in Fig. 9 and is provided with a center notch 36, the bottom of which is rounded so that it will fit about a round 33. A pair of dowel notches 37 are formed beneath the center notch 36 which cooperate with a pair of the dowel pins 34 of the center frame 17. The left end of the rail 18 is provided with a half notch 38 and with a dowel notch 39 for cooperation with a round 26 and a dowel pin 27. The right end of the rail 18 is similarly provided with a half notch 40 and a dowel notch 41. A shelf groove 42 is provided in the rail 18 which runs longitudinally thereof, this shelf groove being adapted to receive the top panel 62, as will be hereinafter pointed out.

The middle and bottom rails 19 and 20 are identical to the rail 18 and need not be described in detail.

The front rails 21, 22 and 23 are disclosed in detail in Figs. 10, 11 and 12 and are each provided with the center notch 43 and a pair of

dowel notches 44, together with a half notch 45 and a dowel notch 46 at the left end of each and a half notch 47 and a dowel notch 48 at the right end of each, for the same purpose as pointed out in connection with the rear rail 18. Each of the front rails is also provided with shelf grooves 53.

The lower edge of the top rail 21 is provided with an edge groove 49 which cooperates with an edge groove 50 in the upper edge of the middle rail 22 to receive a pair of sliding doors 56 and 57. Similarly the lower surface of the middle rail 22 and the upper surface of the bottom rail 23 are provided with edge grooves 51 and 52 which accommodate a pair of sliding doors 58 and 59.

The frames and rails may be assembled to form the underlying structure of the shelves shown in Fig. 1. This is done by fitting the center notches and dowel notches 36 and 37 of the rear rails over the rounds and dowel pins 33 and 34 of the center frame members 17, and by similarly fitting the front rails to the center frame 17. The end frames are then secured to the ends of the rails, and the result is an upstanding lattice.

Shelves 54 and 55, which are preferably in the form of plywood panels, are then slid into the shelf grooves 42 and 53 of the middle and bottom rails. The shelves are not only supported by these rails, but they also prevent inward movement of the rails, thereby providing interlocking arrangement which prevents the rails from moving off the dowel pins. It will be noted that the shelf grooves 42 and 53 are formed in the upper portions of the rails so that the shelves 54 and 55 are disposed above their corresponding rounds. The shelves are disposed above and preferably are in contact with the corresponding rounds. By means of this construction, any tendency of the heavily loaded shelves to buckle to an extent wherein the edges of the shelves would slip out of the shelf grooves 42 and 53, is prevented.

The doors 56 and 57 are then inserted longitudinally between the top and middle front rails 21 and 22, and the doors 58 and 59 are also inserted between the middle and bottom front rails 22 and 23, the doors being held in place by means of grooves but also being free for longitudinal movement. It will be noted in the embodiment of Fig. 1 that each door is slightly more than half of the length of the section and the grooves are twice the thickness of the doors, so that one door can overlap the other door when it is slid to open position.

The back panels 60 are then slid downwardly into place, these panels being held in place by the corner grooves 30 and 35 on the rear members of the frames. The left end panel 61 is then fitted into the grooves 28 and 29 in the left frame 15, and the right end panel 69 is fitted into corresponding grooves in the right frame 16. These end panels lock the shelves in position and prevent their withdrawal. The top panels 62 comprising upper and lower members 63 and 64 which are separated by means of spacers 65 to form tongues 66, are then slid into place, the tongues 66 fitting in the shelf grooves 42 and 53 of the top rear rail 18 and the top front rail 21. The upper member 63 of the top panel overhangs the back panels 60 and the end panels 61 and 69 and prevents their removal, so that all of the parts of the assembly are securely locked in position.

If desired, certain parts identical to those just described may be added at one or both ends of the Fig. 1 construction in order to extend the same laterally. In other words, Fig. 1 can be considered as a single section or a unit, and the construction herein described permits additional sections or units to be added in lateral directions. The Fig. 1 unit with an additional unit added to it is shown in Figs. 3 and 4, the additional parts which make up the second unit being designated by the same reference numerals, followed by an *a*, as those applied to the identical parts which make up the first unit.

The addition of a unit involves the removal of one of the end frames such as the right end frame 16, together with its end panel 69, and the substiution therefor of another middle frame 17*a*. Since the width of each additional section is preferably identical with the width of the original section, actually there will be added two additional center frames 17*a*, together with certain associated parts such as rails 18*a* to 23*a* inclusive, shelves 54*a*, 55*a*, top panel 62*a* and rear panel 60*a*. The right end frame 16 and the end panel 69 of the Figs. 3 and 4 construction are the identical parts formerly embodied in the Fig. 1 construction.

In adding another section, the shelves 54 and 55 of the adjacent section must be removed in order to permit inward movement of the rails so as to disengage them from the dowel pins 27 of the end frame. In assembling the frames and rails of the additional section, the half notches 38*a* and the dowel notches 39*a* of the back rails are fitted around the rounds 33 and the right hand one of each pair of dowel pins 34 of a center frame 17*a*, as shown in Fig. 3. The right hand ends of the back rails 18, 19 and 20 cooperate with the frame 17*a* in a similar manner. The front rails obviously cooperate with frame 17*a* in a like manner.

The use of a pair of dowel pins on the center frames, as shown in detail in Fig. 6, permits a center frame to be used either as the middle frame of a given section or as a part of the joint between two adjacent sections. This construction, when used at the middle of a given section, is shown in detail in Fig. 5.

The joint formed when the frame is used to join adjacent sections, is shown in detail in Fig. 13, the center frame 17*a* cooperating with the rails 18 and 18*a* in the manner shown. It will be noted that the end dowel notches 41 and 39*a*, as well as the end dowel notches of the rails 19 to 23, inclusive, are cut away at the outer wall to facilitate somewhat the fitting of the rail on the dowel pins. This special type of notch is shown in detail in Fig. 13.

In the double sections as shown in Figs. 3 and 4, double doors 57 and 58 may be used, each door being approximately the length of a whole section, rather than the single length doors shown in Fig. 1. It will be noted that the sliding door 57 which is adapted to close the left-hand section is spaced in the rearward half of the groove 50 by means of a spacer 71 glued to the left-hand end thereof. The door 58, which normally closes the right-hand section, but which is shown in Fig. 4 as being slid over to the left-hand section, is maintained in the front half of the groove 50*a* by means of a spacer 72 glued to the right-hand end thereof. Due to the provision of these spacers, the doors are always offset one from the other so as to be ready for opening at any time.

It is understood, of course, that whereas the sections herein shown are of a height equal to two shelves, they may be constructed in any height

so as to accommodate five or six shelves if desired, the only difference being that the frames are of greater height, and the end and back panels may be of greater height. The rails and shelves are of standard dimensions for all heights.

Although only a preferred embodiment of this invention has been shown and described herein, it will be apparent that numerous variations and changes may be made therein without departing from the spirit of this invention. The foregoing description and drawings are deemed to be illustrative only and the invention is to be limited only by the appended claims.

I claim:

1. A shelf construction comprising a group of front uprights and a corresponding group of rear uprights, crossbars uniting the corresponding uprights of each group, a longitudinally extending grooved shelf support removably associated with each group of uprights, the grooves in said shelf supports facing inwardly, a shelf removably fitted in said grooved shelf supports, and means on said uprights on which said shelf support rests.

2. A shelf construction comprising a group of front uprights and a corresponding group of rear uprights, crossbars uniting the corresponding uprights of each group, a longitudinally extending grooved shelf support associated with each group of uprights, the grooves in said shelf supports facing inwardly, a shelf removably fitted in said grooved shelf supports, and dowel pins mounted on said uprights and cooperating with recessed portions of said shelf supports for removably securing each of said shelf supports with its corresponding group of uprights.

3. A shelf construction comprising a plurality of front uprights and a corresponding number of rear uprights, crossbars uniting the corresponding uprights of each group, longitudinally extending front and rear shelf supports detachably secured to said front uprights and to said rear uprights and provided with inwardly disposed shelf grooves, shelves disposed between said front and rear shelf supports, the front and rear edges fitting in said shelf grooves, said rear uprights being vertically grooved, back panels removably fitted between said grooved rear uprights, the front and rear uprights at each end being vertically grooved, and end panels removably fitted therebetween.

4. A shelf construction comprising a front upright, a rear upright, a cross member secured to and being disposed between said two uprights, a front rail disposed adjacent said front upright and a rear rail disposed adjacent said rear upright, each of said rails being notched so as to fit around said cross members and being provided with inwardly facing grooves, means for securing said rails to said uprights, and a shelf supported by said grooved rails along its front and rear edges in a position wherein it may rest on said transversely disposed cross member.

5. A shelf construction comprising a front upright, a rear upright, cross members secured to and disposed between said two uprights, a front rail disposed adjacent said front upright and a rear rail disposed adjacent said rear upright, each of said rails being notched so as to fit around said cross members, inwardly projecting dowel pins on said uprights for securing said rails to said uprights, and a shelf fitted between and supported by said rails along its front and rear edges in a position whereby removal of said rails from said dowel pins is prevented, said rails being constructed with notches in the lower edge thereof to receive said dowel pins, and with grooves on the inner sides to receive the edges of said shelf.

6. A shelf construction comprising a front upright, a rear upright, a cross member secured to and disposed between said two uprights, a grooved front rail disposed adjacent said front upright and a grooved rear rail disposed adjacent said rear upright, each of said rails being notched in its upper surface so as to fit around said cross members, and the grooves being disposed inwardly facing and immediately above said cross members, and a shelf fitted in said grooves along its front and rear edges whereby the open ends of the notches are closed by said shelf, and said shelf may rest on said transversely disposed cross member.

7. A shelf construction comprising a plurality of frames, each frame including a front and rear upright and rounds disposed therebetween, rails provided with notches at their upper edges to fit around said rounds, said rails being provided with longitudinally extending grooves at their inner surfaces and located above said rounds, and shelves fitting in said grooves.

8. A shelf construction comprising a plurality of frames, each frame including a front and rear upright and rounds disposed therebetween, rails provided with notches to fit around said rounds, said rails being provided with longitudinally extending grooves at their inner surfaces, shelves fitting in said grooves, and dowel pins associated with said frames at the inner sides of said uprights and cooperating with recessed portions formed in the lower sides of said rails so as to support said rails, said shelves serving to prevent inward movement of said rails off said dowel pins.

9. A unit shelf construction comprising three frames, each frame including a front and rear upright and rounds disposed therebetween, rails provided with notches in their upper edges to fit around said rounds, said rails being provided with longitudinally extending grooves at their inner surfaces, shelves fitting in said grooves, and a pair of horizontally aligned dowel pins set into the inner surfaces of the uprights of the center frame just below a round and received within recesses formed in the lower edges of said rails for supporting the same, and cooperating with said round to provide a rigid joint.

10. A joint for shelf construction comprising an upright having a round projecting perpendicularly from a surface thereof, two dowel pins disposed adjacent and below said perpendicular round, and a notched rail fitted around said round and provided with dowel notches in its lower edge for cooperation with said dowel pins.

11. A joint for shelf construction comprising an upright having a member projecting perpendicularly from a surface thereof, two horizontally aligned dowel pins set in said upright just beneath said perpendicular member, and a notched cross member fitted around said perpendicular member and provided with dowel notches in its lower edge for cooperation with said dowel pins.

12. A structural member for shelving being adapted equally well for use as a center member of a section or as a member disposed at the joint between two adjacent sections, comprising a frame in the form of a front and rear upright joined together by one or more rounds, a pair of dowel pins disposed adjacent and below said

rounds, one dowel pin of each pair being disposed at one side of the vertical center line through said rounds, and the other dowel pin of each pair being disposed on the opposite side of said vertical center line, the dowel pins of each pair being aligned horizontally so that each dowel pin may cooperate with correspondingly disposed apertures formed in the ends of adjacent rails or cooperate with one of a pair of correspondingly disposed apertures formed in the center portion of a single rail.

13. A sectional shelving structure comprising a plurality of vertical supporting members each in the form of a frame, rails detachably supported by said frames and provided with grooves on their inner surfaces, and a shelf removably disposed in said grooves and supported thereby, said shelf being also supported by cross members forming a part of and connected to each frame.

14. A sectional shelving structure comprising a plurality of vertical supporting members each in the form of a frame, rails detachably supported by said frames and provided with grooves on their inner surfaces, and a shelf removably disposed in said grooves and supported thereby, said shelf being also supported by cross members forming a part of and connected to each frame, each rail extending throughout a distance equal to the span between alternate frames, and each shelf being of like length.

15. A sectional shelving structure comprising a plurality of vertical supporting members each in the form of a frame, and all frames, except the end frames, being identical to each other and being provided with a pair of horizontally aligned dowel pins on an inwardly facing vertical surface, front and rear rails each having a pair of notches at the center at the lower edge thereof and a notch at each end at the lower edge thereof for cooperation with said dowel pins so as to be supported thereby, and a shelf disposed between said rails and supported thereby, each rail extending throughout a distance equal to the distance between alternate frames, the abutting notched ends of abutting rails each being engaged by one dowel pin of a pair, and the center notched portion of each of said rails being engaged by a pair of dowel pins.

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