Aug. 14, 1934. F. M. ZIMMERMAN 1,969,957

SHELVING

Filed May 3, 1930 3 Sheets-Sheet 1

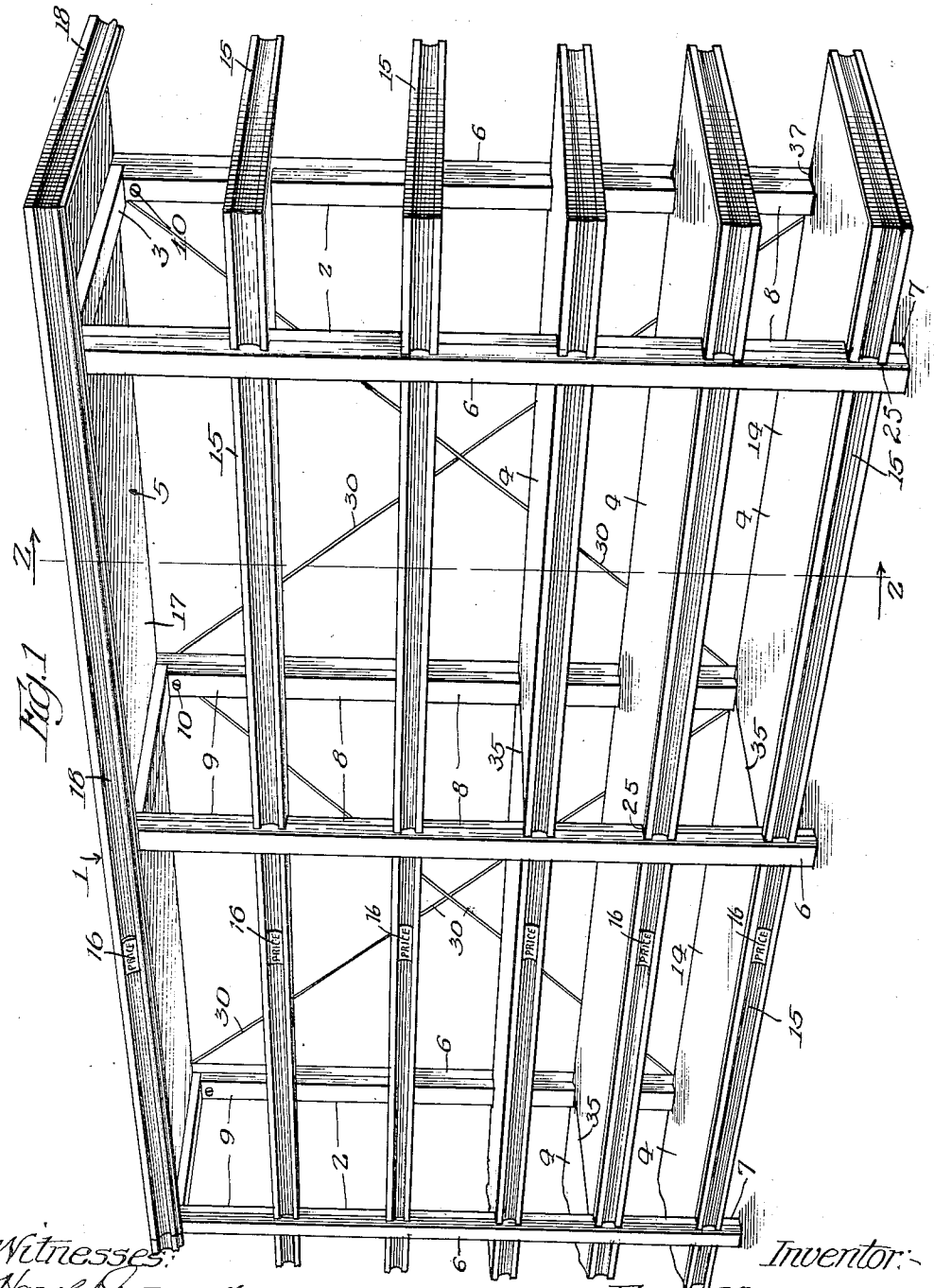

Fig. 1

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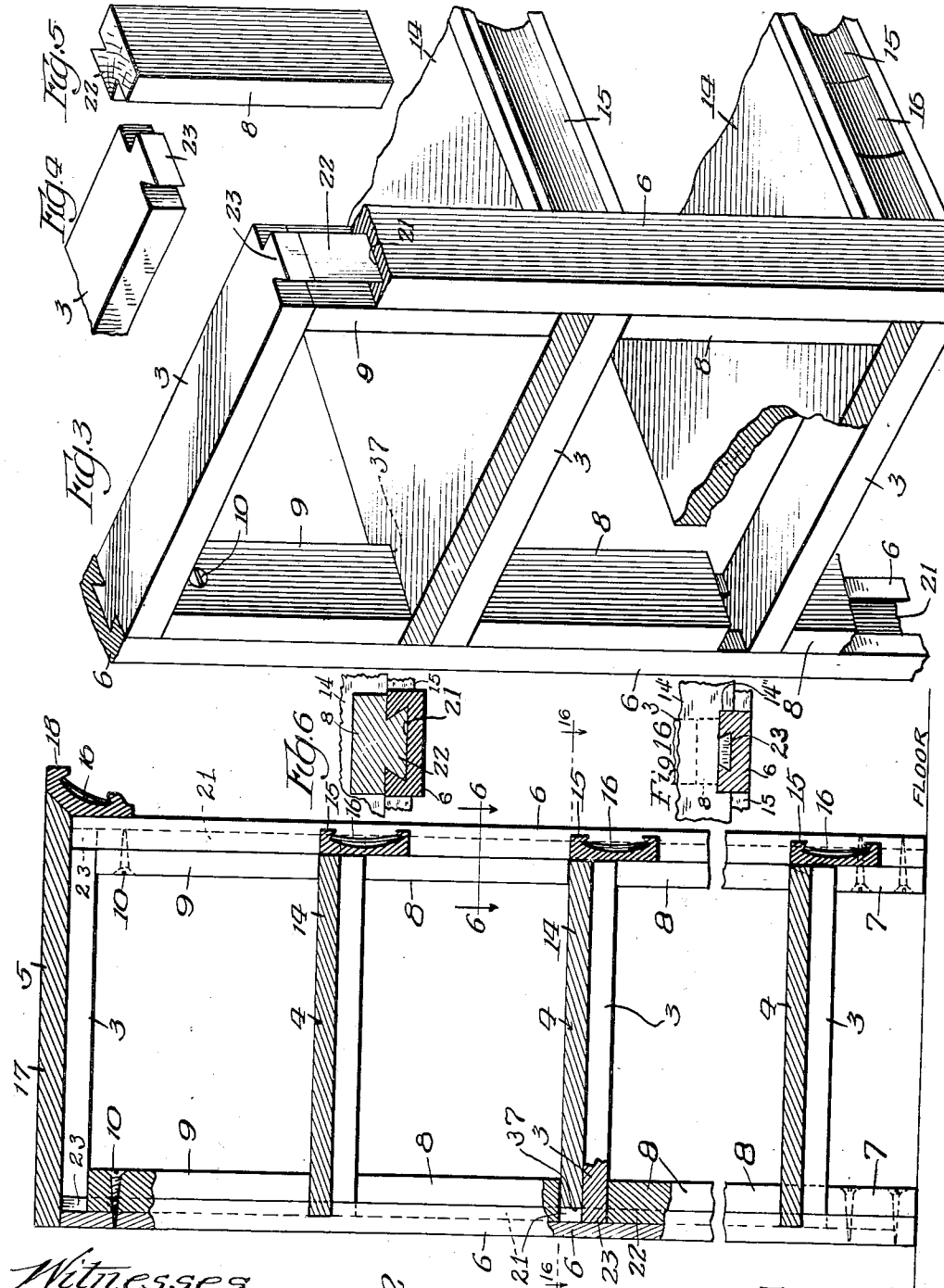
Filed May 3, 1930 3 Sheets-Sheet 2



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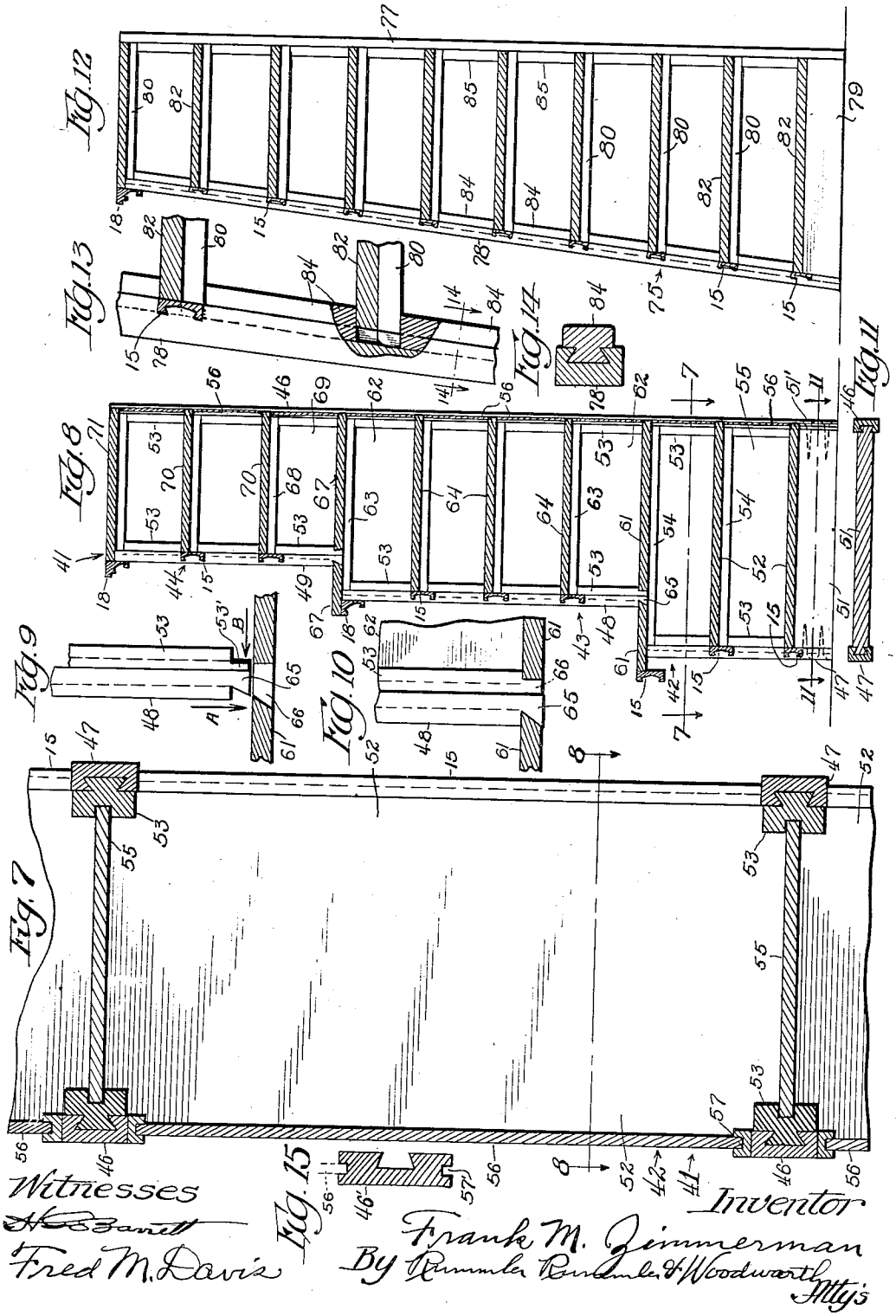
Filed May 3, 1930 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

1,969,957

SHELVING

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Application May 3, 1930, Serial No. 449,552

2 Claims. (Cl. 211—148)

This invention relates to a system of shelving of a variety adapted for general display and storage use and especially for use where conditions call for mobility of shelving and for ready adjustment thereof as to extent and capacity, as for instance in chain stores and the like.

The main objects of the invention are to provide such a system of shelving adapted for inexpensive manufacture, ready assemblage, and convenient knockdown for salvage, and which shall also be adapted for successive reassemblage and use; to provide such a system adapted for substantially unitary organization for any desired length; to provide for organizing and readily assembling the shelving elements in rigid and substantial relation by directly interfitting the various component parts substantially free of accessory fastenings, such as hooks, nails, screws or the like, except for securing certain top or finish members; to provide therefor a system of uprights, shelves, spacers and crossbars, etc., so formed and co-related as to enable ready assemblage, through unskilled labor, by dropping successive members into place in interlocking relation; and to provide such a system of shelving adapted to be made by simple milling processes from wood.

This invention is illustrated by the accompanying drawings in which:

Figure 1 is a perspective view of a system of knockdown shelving, adapted for indefinite horizontal extent, the left end being broken away.

Fig. 2 is a section on the line 2—2 of Figure 1.

Fig. 3 is a fragmentary perspective view with parts broken away appropriately to show various joint construction features of the device.

Fig. 4 is a perspective view of an end of one of the cross bars used to tie the front and rear uprights together and also support the shelves.

Fig. 5 is a perspective view of one of the vertically slidable upright spacer blocks to be interposed between the shelves.

Fig. 6 is a cross section on the line 6—6 of Fig. 2.

Fig. 7 is a horizontal section on the line 7—7 of Fig. 8, showing a modified form of shelving equipment having a stepped upwardly receding form.

Fig. 8 is a vertical section on the line 8—8 of Fig. 7.

Fig. 9 is a side view of one of the front uprights in position ready for lowering to fit its foot tenon into the mortise in the top face of the next lower shelf member.

Fig. 10 shows the upright of Fig. 9 with its foot tenon in place.

Fig. 11 is a section on the line 11—11 of Fig. 8.

Fig. 12 is a vertical section taken as in Fig. 8, except that the shelving here shown has an inclined front rather than stepped.

Fig. 13 is an enlarged detail partly in vertical section to show the front frame-joints of the device of Fig. 12.

Fig. 14 is a section at 14—14 on Fig. 13.

Fig. 15 shows, in section, a simplified form of mortised upright equivalent to those on the left side of Fig. 7.

Fig. 16 is mainly a horizontal section on the line 16—16 of Fig. 2, and shows a modified form of shelf with a notch to receive the front upright.

In the construction shown by Figures 1 to 6, the shelving system 1, as a whole, comprises a plurality of upright posts 2 disposed in a series of pairs, one post behind the other, crossbars 3 arranged one above another on said posts, a plurality of regular shelves 4 resting on part of said crossbars, and a top or cover shelf 5 resting on the topmost bars and on the upper ends of the uprights.

Each upright or post 2 comprises a full length bar 6 in combination with a foot spacer member 7 fastened permanently to its lower end as by means of glue, nails or the like, a vertical series of regular interchangeable shelf spacers 8 and a top spacer 9 detachably secured in any convenient manner as for instance, by means of a screw 10.

Each regular shelf 4 comprises a planar body member 14 in combination with a regular card molding 15, to receive interchangeable price labels 16, or the like, which molding is arranged in sections to fit between the uprights 2. This molding is or may be substantially such as shown in my Patent No. 1,600,382.

The cover shelf 5 comprises an extra wide body member 17 in combination with a special inclined card molding 18 extending continuously from end to end of the shelving. This gives a neat and finished appearance to the shelving and also provides for carrying labels to designate goods resting on the body part 17.

Each bar 6 is rectangular in cross section and is provided with a groove 21 to accommodate interlocking engagement with the crossbars 3. For this purpose the groove is preferably of dovetail shape. Each spacer 7, 8 and 9 is also rectangular in cross section and provided with a medial longitudinal tongue 22 of dovetail shape

to correspond with the groove 21 in bar 6. The resultant dovetail tongue and groove construction is so designed as to provide appreciable clearance to accommodate ready endwise assemblage by dropping the spacers in place from above, in the course of assembling the shelving system.

Each crossbar is formed with a dovetail tenon 23 on each end to slidably engage the groove 21 on the corresponding bar 6.

The spacing of the molding sections on shelves 4 provides rectangular notches 25 on the front edge of each shelf to snugly receive the bar 6 of the corresponding front posts 2 respectively. The molding 15 is preferably of appreciably greater vertical depth than the thickness of the shelves 4 and serves effectually to brace the shelving against endwise distortion or swaying. If desired this bracing may be supplemented by diagonal members, as for instance tension wires 30, on the back of the shelving. (See Figure 1.)

Whenever the shelving is of greater length than the length of integral shelf members or sections, the shelves are cut and arranged to break joints. That is to say a joint 35 where two shelf sections meet opposite one pair of uprights will be overlapped by a section which is continuous at that point along the length of the shelving.

Whenever a shelving system such as herein described is to be assembled, the workman arranges first one pair of uprights 2 and then another, with the bottom crossbars 3 in place, and then he applies the bottom shelf member 4. He then applies a set of spacers 8, then a set of crossbars 3, and on these he places the next shelf, and so on until the top spacers are in place. He then inserts the locking screws 10 and finally sets the top crossbars in place and places the cover member thereon. If the shelving is very tall, or seems for any reason to need supplemental support to prevent tipping, any desired or convenient fastening means may be applied whereby it may be secured for instance to an adjacent wall, as will be understood without further explanation.

If or whenever for any reason it is desired to dismantle the shelving, as for instance if it is to be put in storage or moved or set up in a different place, the reverse operation is followed. Whenever the shelving capacity needs change, the shelving may be either lengthened or shortened by adding or removing longitudinal sections or bays at one end or the other.

In short, this ready set-up and knock-down shelving is adapted for use and reuse successively from time to time, or in different places, according to local needs and current shelving requirements, and for various kinds of articles or merchandise.

It may be noted that the shelf boards 14 are preferably notched on their rear edge, as at 37 to receive the back uprights and so assure proper spacing of the latter and also assist in the bracing.

This notching feature may also well be used on the front side, as shown by the modification view, Fig. 16. Here the shelf 14' has a notch 14'' to receive the back edge of post bar 6.

Referring to the embodiment shown by Figs. 7 to 11, the purpose of this specific design is to provide for extra tall shelving consistent with self-contained stability, this object here being attained by utilizing a stepped construction. More in detail, the stepped shelving system 41 comprises a plurality of steps or stages, namely, a bottom stage 42, a middle stage 43, and a top stage 44, diminishing in depth from back to front in the order enumerated.

Taken as a whole this embodiment comprises a mutually spaced series of back uprights 46 common to all three stages. These stages are mainly similar and differ appreciably only in dimensions. The bottom stage or section 42 comprises a series of mutually spaced uprights 47, the middle stage a similar series of uprights 48 and the top stage a series of uprights 49.

The front and back uprights of the bottom stage are connected in pairs at their lower end by crossbars 51. This stage includes shelves 52 separated by upright spacers 53. Crossbars 54 are provided for the middle and top shelf of this stage, the bottom shelf resting on the deep floor bars 51 which are secured by screws 51'. Upright partitions 55 are mounted interchangeably between the front and back spacers 53, the latter being longitudinally grooved therefor, as shown in Fig. 7. Back closure panels 56 are also provided, as shown in Figs. 7 and 8, the back uprights 46 being laterally grooved longitudinally at 57 to accommodate interchangeable mounting of said panels. The members 46 though shown composite may be formed integrally as in Fig. 15 where the back upright 46' has lateral grooves 57' and a front mortise for the crossbar ends and spacers. The top shelf member 61 of the bottom stage projects forwardly somewhat and is provided with a card molding 15, as are the lower shelves 52.

The middle stage 43 comprises partitions 62, upright spacers 53, crossbars 63, shelves and back closure panels 56 arranged substantially as in the bottom stage. The lower ends of the front uprights 48 are provided with semi-dovetail tenons 65 to fit in corresponding mortises 66 in the shelf 61. The mortises are large enough to admit the tenons freely and are so positioned that when the upright is pushed forward horizontally, it is eventually locked in place by the partition 62 and spacer extensions 53'.

The top shelf 67 of the middle stage also projects forward somewhat and is provided with an inclined card molding 18. It is also formed with a mortise, substantially as in shelf 61, to receive the front post 49 of the top stage.

The said top stage includes crossbars 68, partition 69, uprights 53 and shelves 70. The top shelf 71 is provided on its front edge with an inclined card molding 18.

This embodiment is assembled, one stage at a time, beginning at the bottom. The crossbars, spacers and shelves are dropped into place in due order as the work progresses, as will be apparent.

Referring to the further modification, shown by Figures 12, 13 and 14, stability is imparted to a tall system of shelving by uniformly inclining its front side backwardly somewhat toward the top, instead of stepping the same as in Figure 8.

In this construction, the system of shelving 75 is of somewhat simpler design than that in Fig. 8 and comprises mainly a series of mutually spaced back uprights 77 and a corresponding series of inclined front uprights 78 in combination with the bottom crossbars 79 and a set of crossbars 80 ranging from long at the bottom to short at the top, together with corresponding shelves 82 ranging upwardly from wide to narrow, and appropriate front and rear spacers 84 and 85 to support the crossbars 80. This embodiment 75 may be made either with or without partitions and back walls.

This embodiment may be assembled flat on its back and then raised to its normal position. The back uprights are first set in place and then the crossbars, shelves and spacers are arranged. Finally the front bars are threaded into place endwise, from the foot toward the top.

Although this invention is variously illustrated, it is to be understood that some of the details set forth may be altered or omitted without departing from the spirit of the invention as defined by the following claims. Although a true dovetail joint is considered preferable for general use, it is to be understood that this term as herein used is to be construed broadly to include any form of interlocking tongue and groove adapted for the purpose indicated.

I claim:

1. A system of knockdown shelving comprising a series of pairs of back and front uprights, crossbars connecting the uprights of each of said pairs, shelves resting on said crossbars of corresponding elevation respectively, vertical spacers interposed between said crossbars at their ends, partitions disposed connectively between corresponding back and front spacers, and back panels disposed connectively between adjacent back uprights and between adjacent shelves, said partitions and uprights being tongue and slot connected slidably to said spacers, said uprights being likewise connected to the crossbars in mutual tie relation and said back panels being tongue and groove connected slidably to the back uprights.

2. A system of shelving of stepped upwardly receding design including a vertical series of stages, each of less depth from back to front than the next inferior stage; said system comprising spaced back uprights extending from top to bottom; and each stage comprising a set of spaced front uprights, crossbars connecting same to said back uprights, shelves resting on said crossbars and front and back vertical spacers between crossbars to support the superior shelves, said uprights, crossbars and spacers having vertical tongue and slot engagement for assemblage and knockdown facility; and each front upright having tenon and mortise engagement with the next inferior stage and means to lock engagement thereof releasably.

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