Oct. 17, 1933. F. M. ZIMMERMAN 1,930,787

SHELVING

Filed March 11, 1932 3 Sheets-Sheet 1

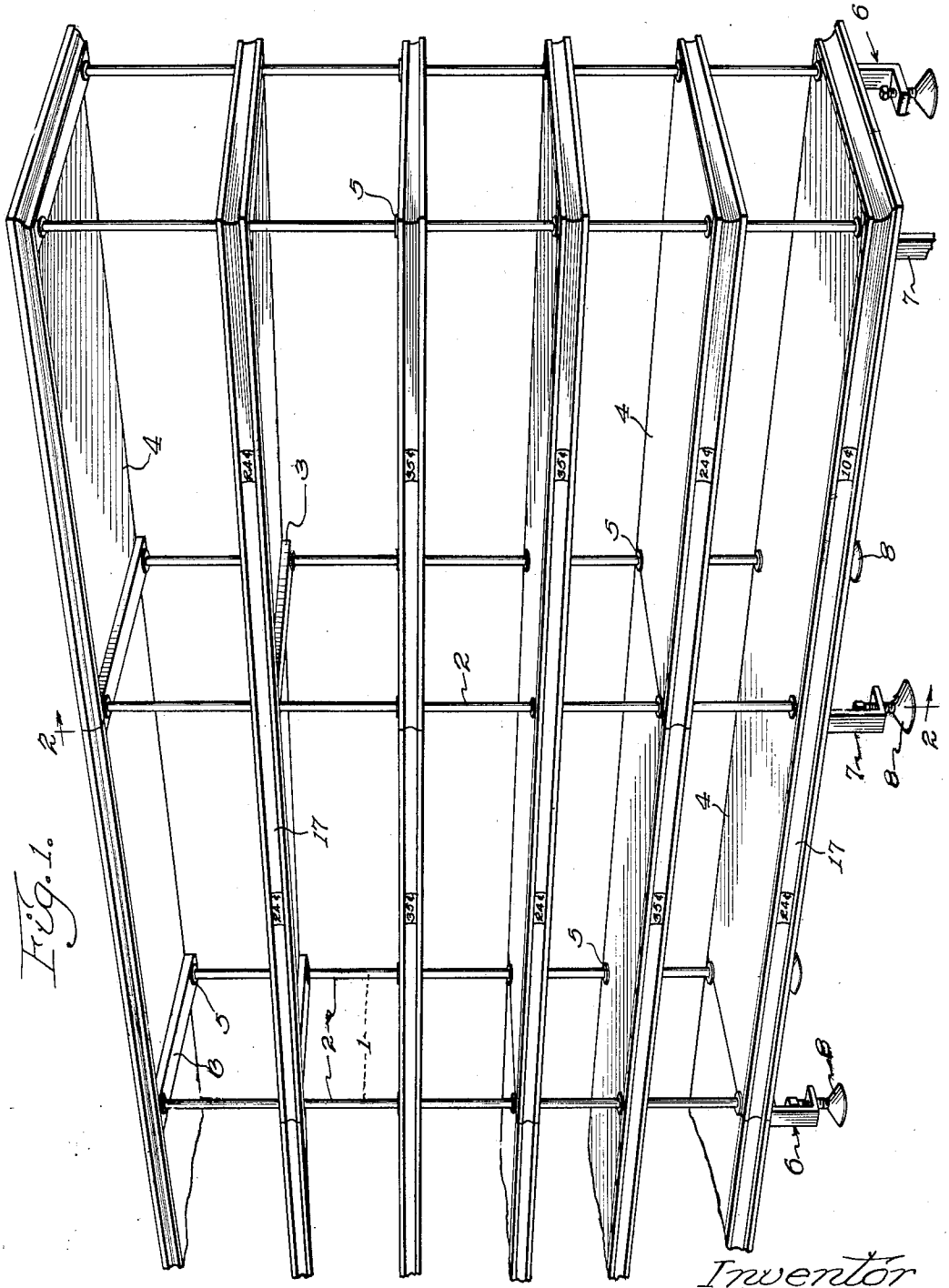

Fig. 1.

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SHELVING

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Fig. 2.

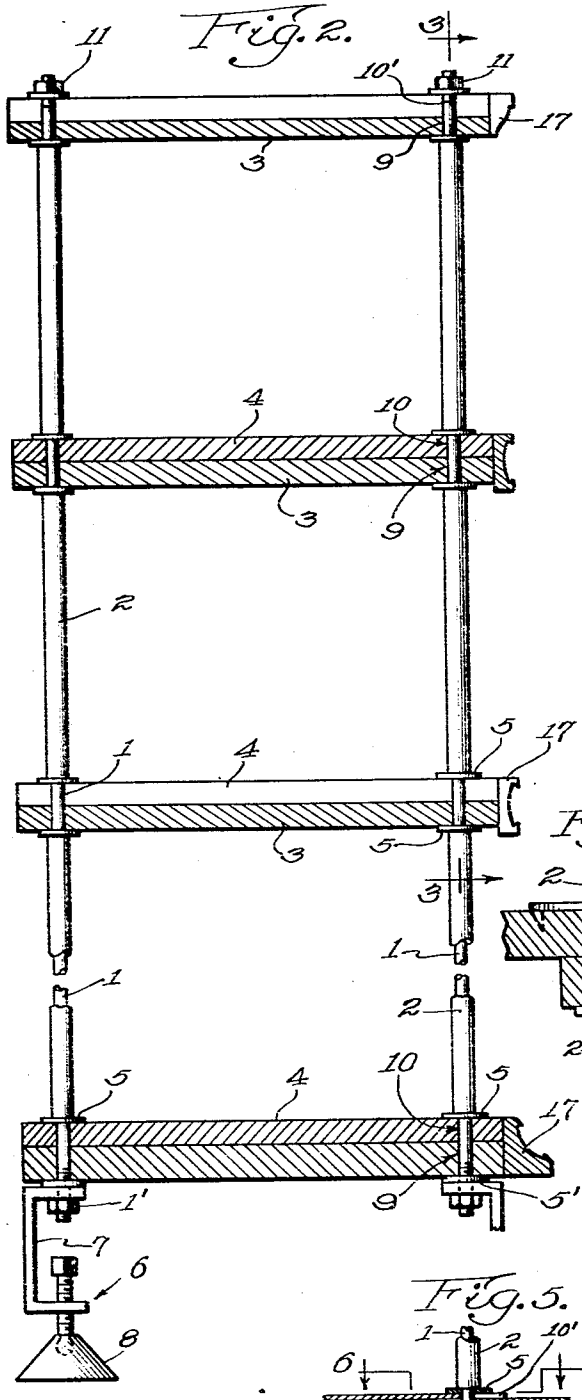


Fig. 3.

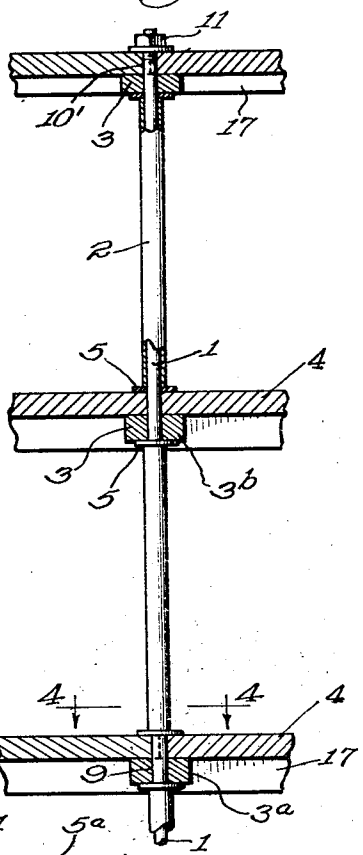


Fig. 11.

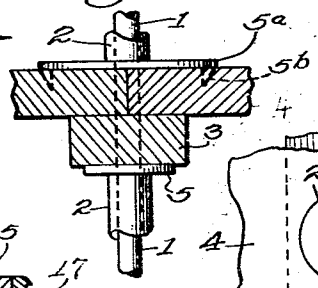


Fig. 4.

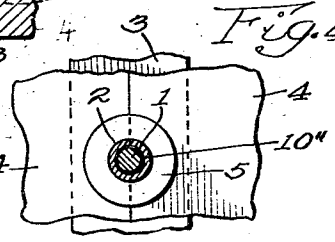


Fig. 5.

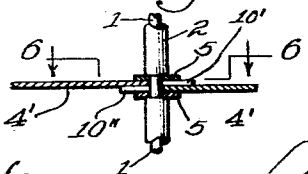
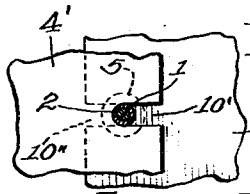


Fig. 6.



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SHELVING

Filed March 11, 1932 3 Sheets-Sheet 3

Fig. 7.

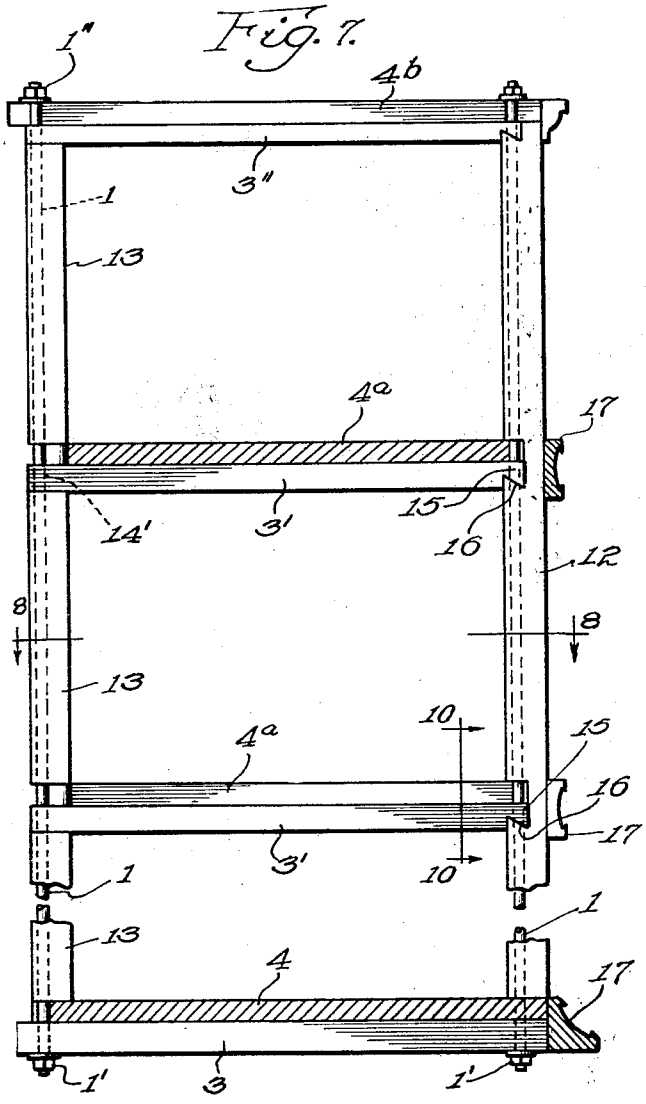


Fig. 9.

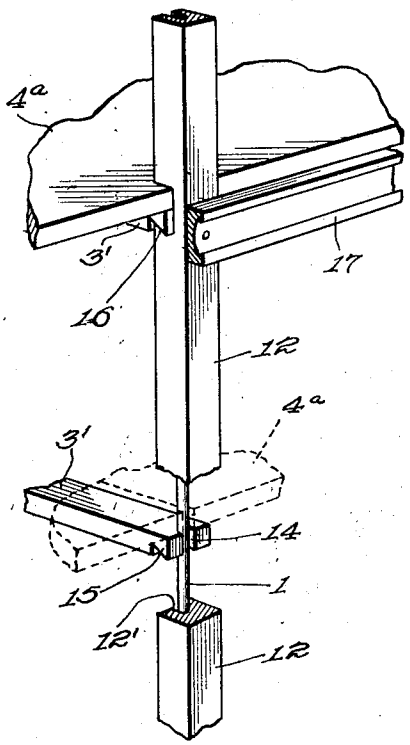


Fig. 10.

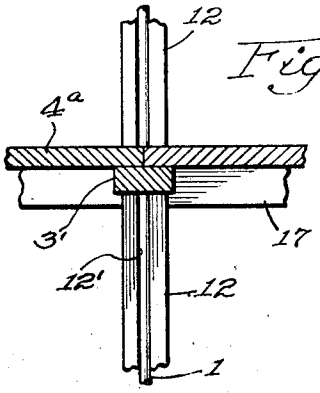
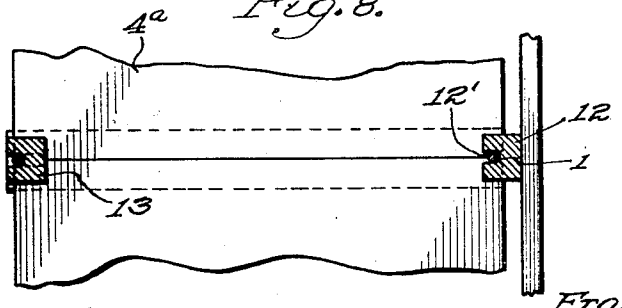


Fig. 8.



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UNITED STATES PATENT OFFICE

1,930,787

SHELVING

Frank M. Zimmerman, Aurora, Ill.

Application March 11, 1932. Serial No. 598,197

2 Claims. (Cl. 211—148)

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

In the general shelving practice heretofore, it has been customary, whenever changes were made, to salvage the old shelving, as in grocery stores, etc., as well as could be, as when the premises are vacated, or the store location moved. The shelving is then rebuilt again on the new premises and reused. The main objection to this procedure is the depreciation and waste encountered incident to taking out and dismantling the shelving. This is due to the substantial "permanency" with which the shelving is originally assembled. In the present invention such needless waste is avoided.

The main objects of this invention are to provide a system of shelving adapted for inexpensive manufacture, ready assemblage and convenient knockdown 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 from accessory fastenings, such as hooks, nails, screws and the like; to provide therefor a system of uprights, shelves, spacers and crossbars, etc., so formed and correlated as to enable ready assemblage, through unskilled labor, by dropping successive members into place in interlocking relation; and to provide for positively interlocking the elements all in rigid relation by tensional setting of the uprights in vertical stringer relation to the other members.

This invention is illustrated by the accompanying drawings in which:

Figure 1 is a perspective view of one embodiment of a system of knockdown shelving, adapted for indefinite horizontal extension, the view being broken away at the left.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1, the lower medial part of the view being broken away.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2 with parts broken away.

Fig. 4 is an enlarged sectional plan view taken on the line 4—4 of Fig. 3 with parts broken away.

Fig. 5 is a vertical sectional view of a modified form of construction embodying steel shelving and with overlap shelf joints instead of butt joints.

Fig. 6 is a sectional plan view taken on the line 6—6 of Fig. 5.

Fig. 7 is a vertical sectional view of a modified form of shelving, more nearly all wood, and taken about as in Fig. 2, but to one side of the uprights.

Fig. 8 is a sectional plan view taken on the line 8—8 of Fig. 7.

Fig. 9 is a fragmentary perspective view of an upright showing the mounting of the shelves and crossbars.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 7.

Fig. 11 is a sectional view of a slight modification taken substantially as in Figure 3, and illustrates substantial interlocking of the shelving, incident to the overlap washers, against possible separative endwise tension effects.

In the construction shown in Figures 1 to 4, the shelving system as a whole comprises upright posts or bolts 1, disposed in a series of pairs, one post behind the other, and being threaded at each end to serve as tension tie stringers, shelf-spacers 2 strung on said uprights, crossbars 3 arranged one above another on said spacers, vertically spaced shelves 4 as of wood, resting on said crossbars, apertured bearing plates or washers 5 arranged above and below and abutting against each spacer 2 as shown in Figure 2, and adjustable floor bearings 6.

These supports or feet 6 comprise each a U-shaped bar 7, disposed with one arm over the other and extending horizontally, the upper arm being secured to the lower end of a bolt 1 by a nut 1', and the lower arm being attached to a manually adjustable foot 8 as shown in Figures 1 and 2, for leveling the system as a whole.

The system is assembled by starting at the bottom and building it up. The bolts 1 are attached to the supports 6 in vertical position as shown. The lowermost washer 5' may be tight fitted on the threaded end of bolt 1. The crossbars 3 have end apertures 9 to receive said bolts on which they are assembled or strung. The shelves 4, in order to accommodate the bolts 1, are apertured medially as at 10, and are endwise slotted complementally as at 10'. The end apertures 10' are arranged thus so that the abutting shelves will accommodate the bolts 1 at the

joints. The shelves are now placed on top of the crossbars 3, the bolts 1 serving as tie stringers. Washers 5 are now placed on top of the shelves, one for each upright 1. Tubular spacing elements 2, preferably of metal, are next added, being strung on the uprights 1 and seated on the washers 5.

Additional washers 5 are next placed on top of the spacers 2, then similar crossbars, shelves, etc., until the construction reaches the predetermined height for which it is to be built. Washers 5 and top nuts 11 are now placed on the tips of the uprights 1 and tightly set, making the construction rigid and obviating the need of nails or screws, etc.

This stringer bolt feature of construction, it may be seen, enables ready assembly and salvage without any loss whatsoever.

The crossbars 3 may be secured to the shelves 4 before assemblage of the shelving if desired, for greater convenience, especially for all wood shelving. For instance, referring to Figure 3, the bar 3*a* may be pre-fastened to an end of one of the shelf boards, as by glue or nails, and the bar 3*b* may be pre-fastened likewise to a medial part of a shelf board.

In the modified construction shown in Figures 5 and 6, steel shelving is used instead of the thicker material wood, and the only substantial difference is that the ends of the shelves 4' overlap and no crossbars are ordinarily necessary, but such may be added wherever extra strength is necessary. As will be apparent from the drawings, the ends have relatively deep slots 10'', so that when the shelves overlap they combine to form a round aperture. Holes may be used in place of the end slots 10'', as will be apparent, whenever preferred or where a more secure fastening is desired, adapted to more positively resist endwise separation of shelving sections.

With a view to providing for an appearance of simple, all-wood construction, a further modified form is shown in Figures 7 to 10, in which the stringer bolts are concealed in wooden shelf spacer casing members. Here are shown rearwardly facing U-shaped wood pilasters or channel members 12, which extend from the lower shelf to the top shelf in front, with the bolts 1 extending through the troughs 12' thereof. These uprights 12 are secured to the upper and lower shelves (and also to feet members) in the same manner as hereinbefore described, that is to say, by the bolt and nut setting feature. The rear spacers 13 are of the same general description as the pilasters 12, but are cut in predetermined short lengths according to the height of the space between the shelves 4*a*.

The ends of the crossbars 3' are slotted as at 14 and 14' and have semi-dovetail tongues 15 formed thereon in front. The pilasters 12 are provided with corresponding semi-dovetail grooves 16 to admit the crossbar tongues 15.

The top bar 3'' is perforated rather than slotted at its ends. The top shelf or cover 4*b* is wider than shelves 4*a* and is perforated for the tie bolts 1 at its front and back.

In assembling this form of shelving, the bolts 1 are set in place on the bottom bars 3 and then shelf 4 is applied. The pilasters 12 are added and the lower spacers 13 are inserted. Then tongued bars 3' are set in place, left end first and then moving to the right as viewed in Figure 7. Then shelf 4*a* is added, left edge first and then by rightward movement it seats in the upper part of notch 16 and locks the bar 3' in place, and so on. Then the top bars 3'' are added and the top board 4*b* set in place. Then the top nuts are applied to bolts 1 and the assemblage is thus set rigidly as an interlocked structure.

Indicia holding means or label holders 17 are provided at the front side of each shelf in all embodiments for receiving price tags and the like.

Whenever the system of shelving, whatever length of shelf sections is used, is so long as to require an endwise series of shelf sections, the upwardly successive shelf sections are mutually staggered so as to break joints. This is illustrated in Figure 1.

Although several specific embodiments of this invention are herein shown and described, it is to be understood that details of the constructions shown may be altered or omitted without departing from the spirit of the invention as defined in the following claims.

I claim:

1. In a knockdown system of vertically multiple shelving, an upright having an inwardly facing semidovetail notch, the lower side of which is inclined, a crossbar having a semidovetailed end fitting downwardly in the said upright notch with a superjacent part of said notch unoccupied by said crossbar, and a shelf resting on said crossbar and extending into and substantially occupying said superjacent notch part and securing the crossbar in its semidovetail joint position.

2. In a system of shelving of the class described, an upright having an inwardly facing semidovetail notch, the lower side of which is inclined, a crossbar having a semidovetailed end fitting downwardly in the said upright notch with a superjacent part of said notch unoccupied by said crossbar, a shelf resting on said crossbar and extending into and substantially occupying said superjacent notch part, and means securing said shelf against receding from its said position of occupancy.

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