June 5, 1956 J. E. MURREN 2,748,954

SHELVING

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Fig. 1.

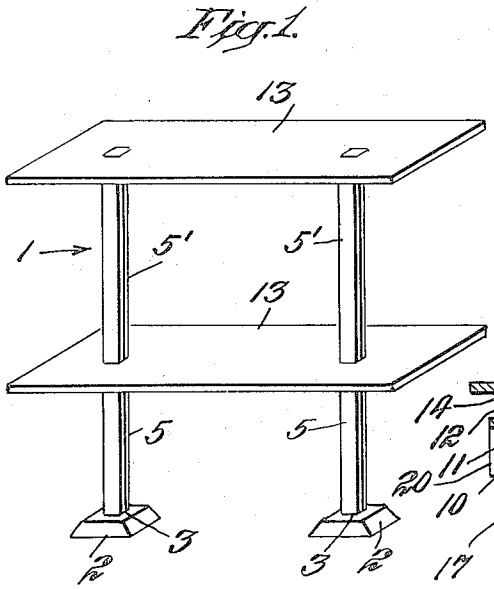
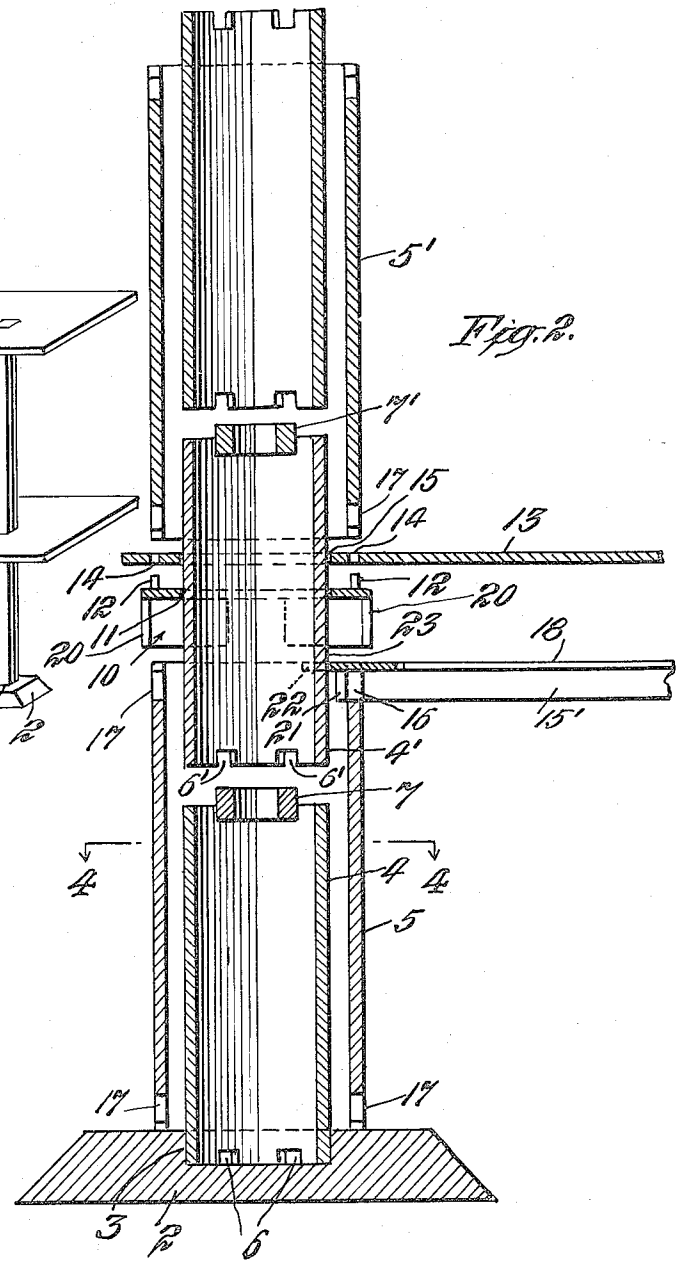


Fig. 2.



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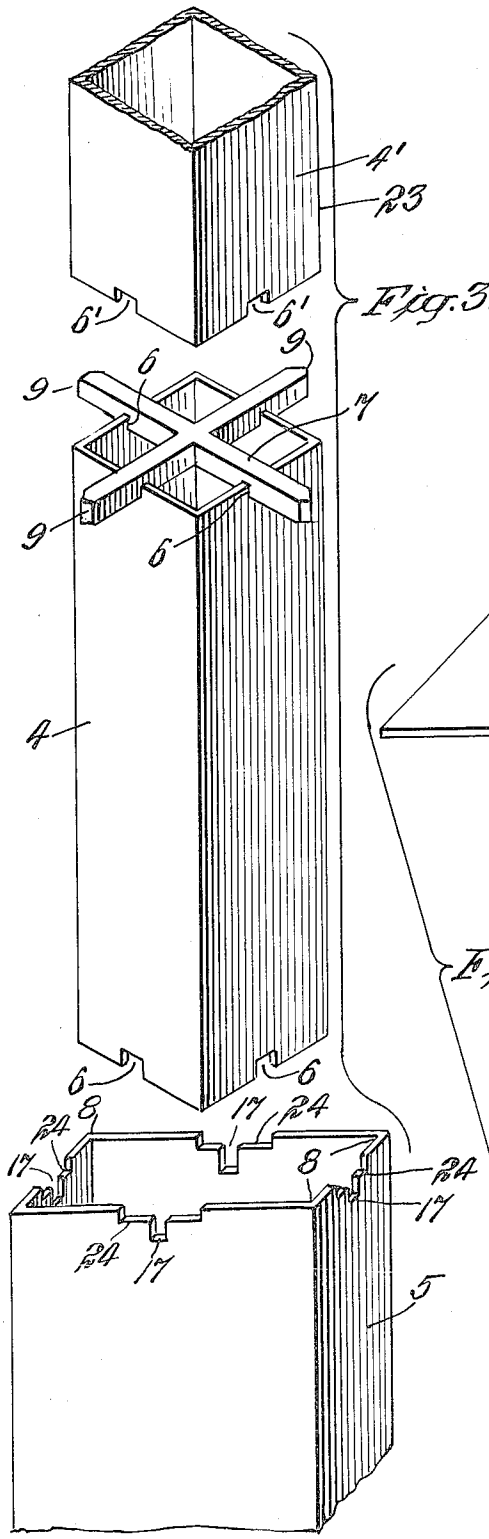


Fig. 3.

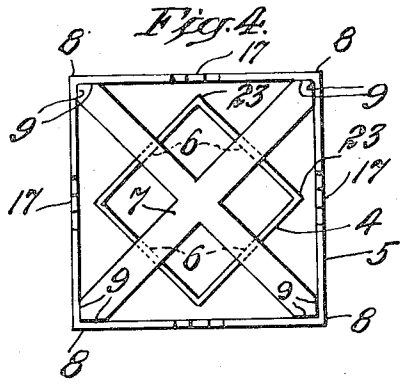


Fig. 4.

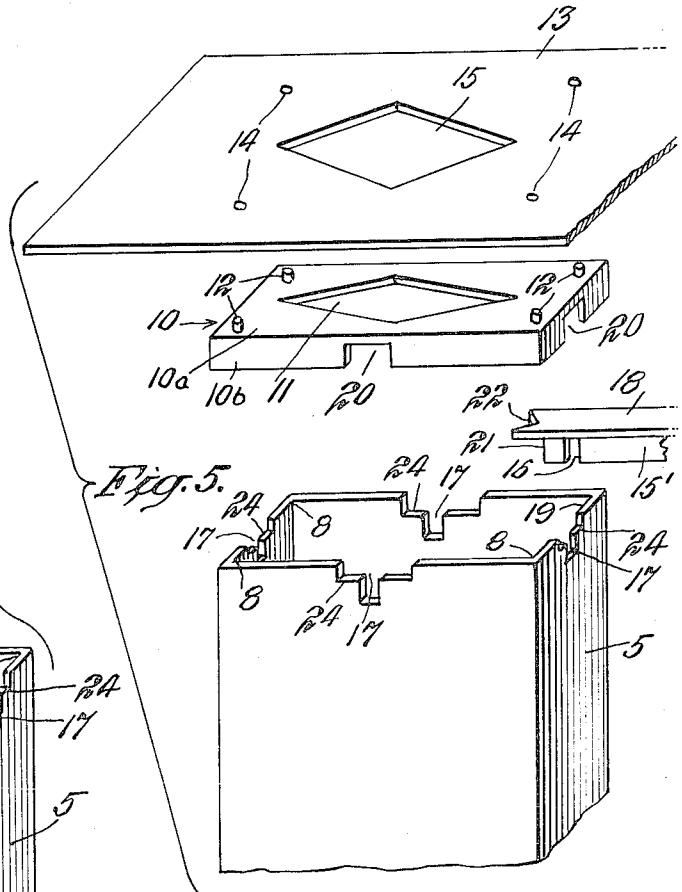


Fig. 5.

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SHELVING

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9 Claims. (Cl. 211—148)

This invention relates to shelving structures and more particularly to shelving structures which do not require nails, bolts, screws or the like for its assembly and which can be assembled or disassembled without the use of tools.

It is an object of this invention to provide a shelving structure comprised of a few simple components which can be manufactured from readily available standard materials, such as sheet metal or plastic, and which can be quickly and easily assembled and disassembled.

It is an additional object of this invention to provide a shelving structure which can be packaged as a unit and which, when assembled, forms a shelving unit to which additional units may be added.

It is a further object of this invention to provide a shelving structure which can be expanded vertically or horizontally.

It is a still further object of this invention to provide a shelving structure of interlocking elements which can be rigidly and securely engaged.

These and other objects of the invention will become apparent from an examination of accompanying drawings and the following specifications, wherein, for illustrative purposes, a preferred embodiment is shown.

In the drawings, wherein like numerals refer to like parts,

Fig. 1 is an isometric view of a shelving unit embodying the invention,

Fig. 2 is a partially exploded fragmentary vertical sectional view of the structure illustrating the manner in which various components of the shelving unit are assembled,

Fig. 3 is a fragmentary exploded view of certain components of the structure, illustrating the manner in which they interlock,

Fig. 4 is a view of Fig. 2, taken along lines 4—4, and

Fig. 5 is a fragmentary isometric exploded view of various elements of the structure shown in spaced apart relationship and in their positions relative to each other.

In the drawings, there is shown a shelving unit **1** having base member **2** with centrally located recess **3** within which hollow lower inner standards or post **4**, preferably square or rectangular in cross-section have its lower end snugly fitted. Outer square or rectangular post **5** resting on the top surface of base member **2** encases inner post **4** in a telescopic fashion. Inner post **4** extends upwardly within outer post **5** and preferably terminates about half way up the interior of the outer post. The inner post is preferably so disposed within the outer post that each side of the inner post is at a right angle to the diagonals of the outer post **5**, as best seen in Fig. 4.

At the ends of inner post **4**, each side is formed with notches or slots **6**, best seen in Fig. 3, which, in conjunction with crossed interlocking member **7**, permits interlocking engagement of lower inner post **4** to an adjacent identical upper inner post **4'**. Crossed interlocking member **7** consists of square or rectangular bars

secured at their center portions and are sufficiently long, when seated within the notches **6** at the ends of inner post **4** to engage the inside corners **8** of the outer post **5**, to impart rigidity to the structure as will be explained below. Crossed interlocking member **7** is made approximately twice as deep as the depth of the notches **6** at the ends of lower inner post **4** within which it seats so that when in position, approximately one-half of the crossed interlocking member extends upwardly beyond the upper end of the lower inner post **4** for engagement with notches **6'** on the bottom edge of an adjacent upper inner post **4'**.

With outer post **5** having its lower end resting upon the upper surface of the base member **2** and lower inner post **4** telescoped within the outer post and snugly fitted within the recess in base member **2**, crossed interlocking member **7** is seated within the notches **6** provided on the ends of inner post **4**. Since the inner and outer posts normally do not provide a secure fit with each other, crossed interlocking member **7** has ends sufficiently long to extend beyond the walls of the lower inner post to snugly engage the inner corners **8** of outer post **5**. The ends of the crossed interlocking member are tapered as at **9** to conform with the angular configuration of the inner corners **8** of outer post **5**, in this case in the form of a right angle, thus holding inner and outer posts **4** and **5** respectively securely in position.

With the above elements positioned in this manner, a second upper inner post **4'**, which is identical with lower inner post **4**, is placed above lower inner post **4** with notches **6'** on the lower end of second inner post **4'** securely engaged with that portion of the crossed interlocking member **7** which extends beyond the upper end of the lower inner post, thus securing the posts together. Approximately one-half of the total length of second inner post **4'** extends beyond the upper end of outer post **5**.

To provide for engagement of a shelf with the parts so assembled, a cap **10** is provided having a flat top surface **10***a* and a depending peripheral skirt **10***b*. The cap is fitted over the upper end of the outer post **5** with the depending peripheral skirt in snug contact with the outer surfaces of the post.

The center portion of the top of cap **10** is formed with an opening **11** of the same shape as the cross-sectional configuration as the upper inner post **6'** which extends upwardly through the opening and beyond. Forming cap **10** with such an opening and snugly fitting the cap to the upper end of the outer post **4** also serves to fix the components securely in position.

The top surface of the cap has upwardly projecting lugs **12** which may be formed by partially cutting out the top surface of the cap in the shape of a square or rectangle having one uncut side and bending the cut-out portion upwardly along the uncut side. The lugs may also be separately attached to the cap or otherwise formed. The cap lugs engage shelf **13** which is formed with openings **14** to receive cap lugs **12** and secure the shelf to the structure in interlocking arrangement. The cap lugs **12** are preferably made sufficiently long to extend a short distance beyond the upper surface of the shelf **13** and are so positioned on the cap that the terminal portions of the cap securely engage the sides of second outer post **5'** which is placed upon shelf **13**. Preferably, the lugs **12** are so positioned on the cap to engage the second outer post **5'** at the inner corners thereof. The shelf is also formed with an opening **15** of the same cross-sectional configuration as inner post **6'** which extends upwardly through the opening. The shelf is secured in position by placing the shelf on top of the cap, snugly fitted on the upper end of the outer post,

with projection **12** on the cap fitting within openings **14** in the shelf.

With the shelf in position, a second outer post **5'** is slid downwardly in a telescopic fashion over the upwardly extending portion of the second inner post **4'** until the lower end of the second outer post rests on the top surface of shelf **13**. A second crossed interlocking member **7'** is seated within the notches on the upper end of upper inner post **4'**, with the ends of the interlocking member fitted securely within the corners of upper outer post **5'** in the manner described above. As many additional components and shelves may be added as desired.

In the preferred form of the invention, the assembled upright components are secured to adjacent assembled upright components by employing a brace or stringer **15'** which is interlocked with the outer posts. The brace also serves to support the shelf **13** which is positioned above. The brace may be a T iron having slots **16** adjacent its ends which engage similar slots **17** on the upper edges of outer post **5**. The upper edges of outer post **5** are suitably recessed as at **24** so that when the brace slots **16** engage slots **17** in the outer post, top portion **18** of the brace seats within recess **24** on the top edge **19** of outer post **5** and is flush with the upper end of the post. The cap skirt **10***b* is suitably recessed as at **20** to receive top **18** of brace **15**. End **21** of brace **15** extends into the interior of outer post **5** and is provided with notched ends **22** to engage corner **23** of the inner post **4'** adjacent the notched end of the brace and thereby further hold the structure securely together. The other end of the brace, which is similarly formed, engages in a similar manner a second standard thereby connecting the two standards securely.

It is apparent from the foregoing illustration that the respective components may be readily assembled or disassembled without the necessity for screws, bolts, tools or special equipment. It is to be understood that the foregoing embodiment of the invention is intended for illustrative purposes only and that numerous modifications, substitutions and variations may be made without departing from the spirit of the invention. For example, the inner posts may be tubular rather than square in cross-section and other components of the structure may be similarly modified.

What I claim is:

1. In a shelving structure, the combination comprising a plurality of horizontally spaced hollow upright outer members, upright lower inner members telescoped therein, upper inner members above the lower inner members and in abutting relationship therewith, said inner members having notches at the ends thereof, crossed interlocking members seated within the notches at the abutting ends of said inner members and holding said inner members in interlocked relationship, caps fitting the upper end of said outer members, said caps having an opening through which said upper inner members extend, a shelf positioned on said caps and having openings through which said upper inner members extend, said shelf and said caps having means thereon for securing them in interlocking engagement.

2. In a shelving structure the combination comprising a pair of horizontally spaced hollow upright outer posts, lower upright inner posts telescoped therein, upper inner posts above said lower inner posts and in abutting relationship therewith, said upper and lower inner posts having notches at the ends thereof, crossed interlocking members seated within the notches at the abutting ends of said inner posts and holding said inner posts in interlocked relationship, the ends of said crossed interlocking members engaging the inner walls of said outer posts, caps securely fitting the upper end of said outer posts, said caps having openings through which said upper inner posts extend, a shelf positioned on said caps and having an opening through which said upper inner posts extend, said caps having raised projections on the top surface thereof, said shelf having apertures receiving said projections.

3. The combination according to claim 2 wherein said posts are rectangular and said inner posts are disposed within said outer posts with the side of said inner posts substantially perpendicular to the diagonal of said outer posts.

4. The combination according to the claim 3 wherein the ends of said crossed interlocking members engage the inner corners of said outer posts.

5. In a shelving structure, the combination comprising a pair of horizontally spaced hollow upright rectangular outer posts, lower upright inner posts telescoped therein, upper inner posts above said lower inner posts and in abutting relationship therewith, said upper and lower inner posts having notches at the ends thereof, crossed interlocking members seated within the notches at the abutting ends of said inner posts and holding said inner posts in interlocked relationship, the ends of said crossed interlocking members engaging the inner corners of said outer posts, caps securely fitting the upper ends of said outer posts, said caps having openings through which said upper inner posts extend, a brace connecting said spaced apart outer posts, means on said brace and on the top portions of said outer posts for securing said brace and said outer posts, a shelf positioned on said caps and having an opening through which said upper inner posts extend, said cap having projections on the top surface thereof, said shelf having apertures receiving said projections.

6. In a shelving structure, the combination comprising a pair of horizontally spaced hollow upright rectangular outer posts, lower upright rectangular inner posts telescoped therein, upper rectangular inner posts above said inner posts and in abutting relationship therewith, said upper and lower inner posts having notches at the ends thereof, crossed interlocking members seated within the notches at the abutting ends of said inner posts and holding said inner posts in interlocked relationship, the ends of said interlocking member engaging inner corners of said outer posts, caps securely fitting the upper end of said outer posts, said caps having openings through which said upper inner posts extend, a brace connecting said spaced apart outer posts, slots adjacent the end of said brace and on the top portion of said outer posts for securing said posts and said brace, a shelf positioned on said caps and having an opening through which said upper inner posts extend, said caps having projections on the top surface thereof, said shelf having apertures receiving said projections.

7. The combination according to claim 6 wherein said inner posts are disposed within said outer posts with the sides of said inner posts substantially perpendicular to a diagonal of said outer posts.

8. The combination according to claim 7 wherein the ends of the brace extend into the interior of the outer posts and are notched to engage a corner of said inner posts.

9. The combination according to claim 8 wherein the cap projections extend beyond the upper surface of said shelf and engage the inner corner of a second upright outer post disposed above said shelf.

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