C. B. ULRICH.

SHELVING.

APPLICATION FILED JAN. 11, 1915.

1,227,703.

Patented May 29, 1917.

2 SHEETS—SHEET 1.

FIG. 1

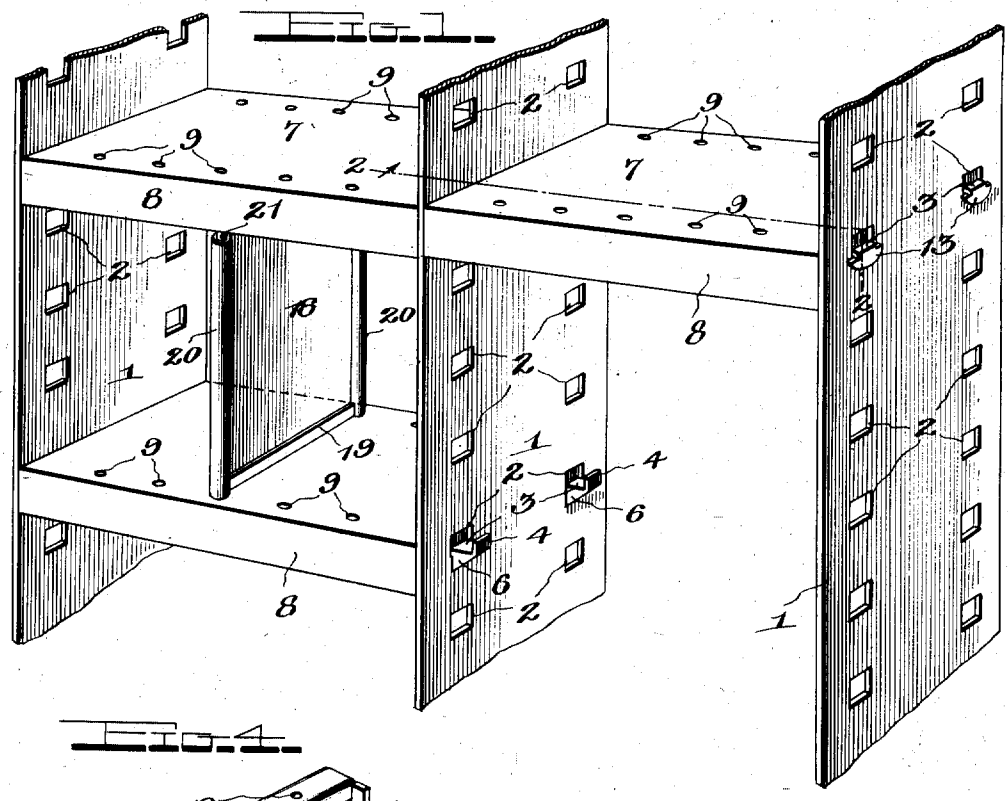


FIG. 4

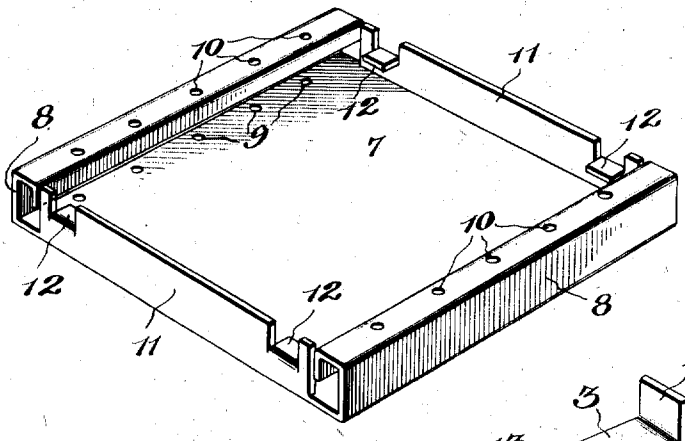


FIG. 5

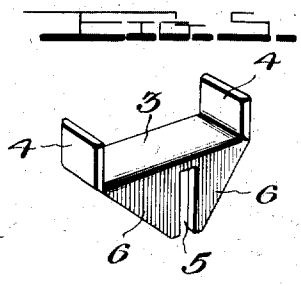
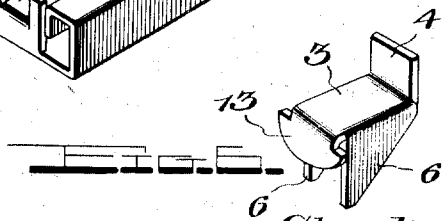


FIG. 6



Witnesses

Chas. L. Griebauer.

C. B. Shepard

Inventor

Charles B. Ulrich,

By C. B. Shepard.

his Attorney

C. B. ULRICH.

SHELVING.

APPLICATION FILED JAN. 11, 1915.

1,227,703.

Patented May 29, 1917.

2 SHEETS—SHEET 2.

Fig. 11.

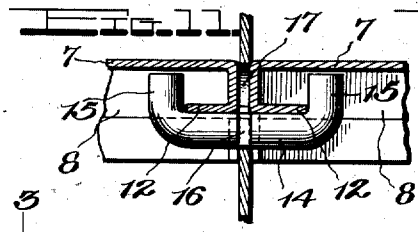


Fig. 12.

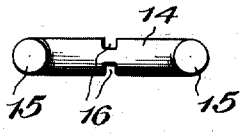


Fig. 2.

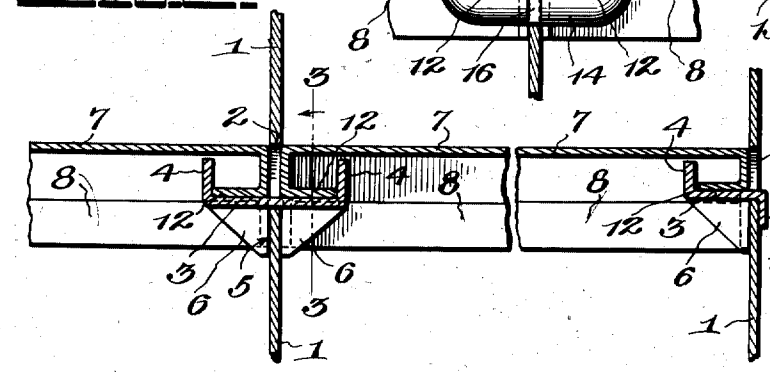


Fig. 13.

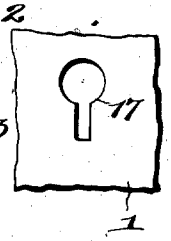


Fig. 9.

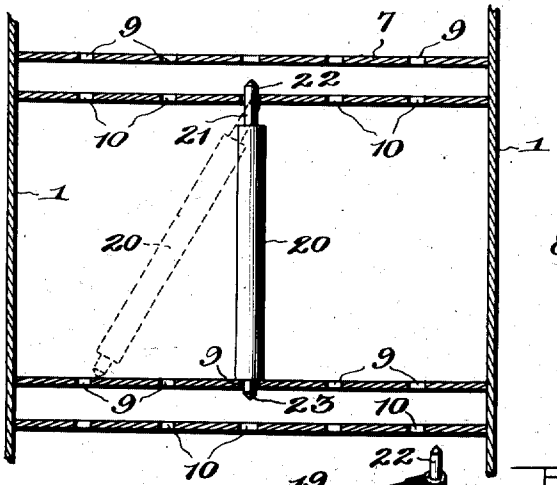


Fig. 3.

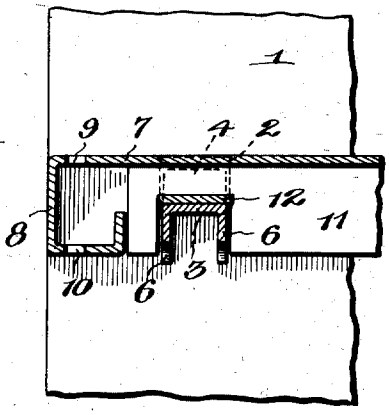


Fig. 10.

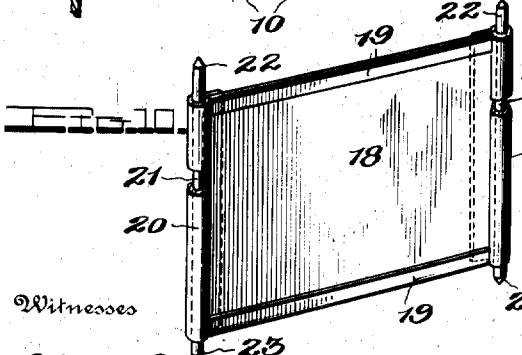


Fig. 7.

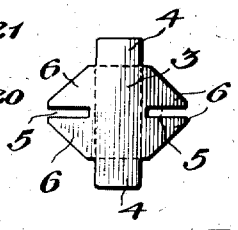
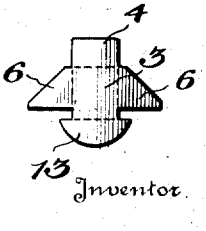


Fig. 8.



Witnesses

Chas. L. Griesbauer.

E. W. Shepard

Inventor

Charles B. Ulrich,

By E. W. Shepard.

his Attorney

UNITED STATES PATENT OFFICE.

CHARLES B. ULRICH, OF HOUGHTON, MICHIGAN, ASSIGNOR TO ART METAL CONSTRUCTION COMPANY, OF JAMESTOWN, NEW YORK, A CORPORATION OF MASSACHUSETTS.

SHELVING.

1,227,703. Specification of Letters Patent. Patented May 29, 1917.

Application filed January 11, 1915. Serial No. 1,593.

To all whom it may concern:

Be it known that I, CHARLES B. ULRICH, a citizen of the United States, residing at Houghton, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Shelving, of which the following is a specification.

This invention relates to shelving and more particularly to metallic shelving.

It is an object of the present invention to provide for the convenient assemblage of uprights and shelves in such a manner that the structure is braced and tied together through the instrumentality of the uprights, the shelves and the connections therebetween.

It is a further object of the present invention to entirely obviate the use of bolts, screws, rivets and the like, but at the same time to maintain a strong, rigid and durable structure that can be conveniently put up and as conveniently taken down for the purpose of transportation or storage.

A further object of the invention is to provide for supporting the shelves at different intervals so as to vary the distance between shelves almost at will, and to do this in a very simple and efficient manner.

A still further object of the invention is to provide for sub-dividing the space between adjacent shelves after the shelves have been put in place and without requiring the removal or shifting of the shelves.

With these and other objects in view, the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the drawings, and particularly set forth in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made, within the scope of the claims, without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings,

Figure 1 is a fragmentary perspective view of shelving embodying the features of the present invention.

Fig. 2 is a detail sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is an inverted perspective view of one of the shelves of the present invention.

Fig. 5 is a detail perspective view of one of the shelf-supporting brackets.

Fig. 6 is a detail perspective view of a form of shelf-supporting bracket employed at one end of the shelving.

Fig. 7 is a plan view of a blank from which the bracket shown in Fig. 5 is made.

Fig. 8 is a plan view of the blank from which the bracket of Fig. 6 is made.

Fig. 9 is a detail cross-sectional view illustrating the manner of inserting and withdrawing a partition.

Fig. 10 is a detail perspective view of a partition.

Fig. 11 is a detail sectional view taken through one end of a shelf and an adjacent upright showing a modified form of shelf-supporting bracket.

Fig. 12 is a detail view of the form of shelf-supporting bracket shown in Fig. 11.

Fig. 13 is a detail fragmentary view showing the keyhole form of opening employed in Fig. 11.

Like reference characters designate corresponding parts in each of the several figures of the drawings.

The present shelving includes uprights, such as shown at 1 in Figs. 1 and 2 of the drawings, each upright being in the form of a metal plate extending throughout the height and depth of the shelving, there being as many uprights as may be desired. Each upright is provided with a series of pairs of openings 2, each opening being rectangular in shape and preferably square in the embodiment shown in Figs. 1, 2 and 3 of the drawings. The openings of each pair are in horizontal alinement and the successive pairs are spaced at regular and preferably standard intervals, so that the pairs of openings in one upright will lie in horizontal alinement with the corresponding openings in the other uprights.

For the support of the shelves, I employ shelf-supporting brackets such as shown in detail in Figs. 5, 6, 7 and 8. Figs. 5 and 7 disclose a double form of bracket, said bracket consisting of a flat base or body 3 having its ends turned upwardly to form upstanding ears 4, the sides of the body being bent downwardly and bifurcated, as at 5, so as to divide each side into two webs 6, which are preferably triangular in shape. This bracket is bent from a metal blank,

such blank being shown in Fig. 7 on a slightly smaller scale from that of Fig. 5. One such bracket is provided for each of the openings in the uprights, which is to be employed in connection with the shelves. The bracket is placed in position in its opening by first passing one of its ears 4 through the opening, then lifting the bracket up until the body 3 is in substantial engagement with the top wall of the opening, whereupon the bracket can be moved endwise through the opening and then dropped down so that the webs 6 and 7 may lie at opposite sides of the upright, as clearly shown in Fig. 2 of the drawings. It will here be explained that the height of the opening 2 is slightly greater than the greatest height or width of the webs 6, so that the bracket may be conveniently passed through the opening 2 and then dropped down into its position shown in Fig. 2 of the drawings. When in position, the body of the bracket rests upon the bottom edge of the opening 2, while the webs 6 lie in substantial engagement with the opposite sides of the upright and thereby hold the bracket in a substantially horizontal position and brace the same against tilting.

The shelf of the present invention, best shown in Fig. 4 of the drawings, is formed from a single blank of metal and includes a rectangular body portion 7, the front and rear edge portions of which are formed into a hollow or substantially tubular rib 8, which is substantially rectangular in cross-section and depends from the body of the blank. The top and bottom of each rib are provided with corresponding openings 9 and 10, for a purpose as will be hereinafter explained. The side edges of the blank are turned downwardly to form flanges 11, the ends of which are cut off so that the flange may lie snugly between and brace the ends of the ribs 8. Near each end of each flange 11, an ear 12 is struck therefrom and extends inwardly in a substantially horizontal plane.

With four of the shelf-supporting brackets in place, as hereinbefore described, two in one upright and two in the opposite upright, a shelf is placed between the uprights above the brackets, the rib portions 8, of course, being at the front and rear of the shelf, the shelf is lowered until the projecting end portions of the brackets come into the seats produced by the formation of the ears 12, with the latter lying flat on the tops of the brackets and at the inner sides of the upstanding ears 4. When thus seated, the flanges 11 lie in substantial engagement with the inner faces of the uprights 1, and the extremities of the ears 12 lie in substantial engagement with the inner faces of the upstanding ears 4 on the brackets, whereby the uprights are properly spaced and braced and are likewise tied together so that when a plurality of uprights and shelves have been assembled, the structure is maintained in a strong, rigid and durable condition without the use of bolts, screws, rivets, or the like, and can be conveniently taken apart whenever it is desired to remove the shelving for purposes of transportation or storage. The shelves can, of course, be put in at any desired location where the openings 2 occur, so that the shelves may be spaced according to the vertical space desired between adjacent shelves. Inasmuch as the seats produced by the formation of the ears 12 embrace the several brackets, as best illustrated in Fig. 3, the shelf will be held against edgewise play front and rear of the shelving, and therefore looseness of the structure is absolutely prevented.

As double brackets are not necessary and are not desirable at the end of the shelving, I provide for this purpose the form of bracket shown in detail in Fig. 6, wherein one of the ears 4 and one pair of webs 6 are omitted, and the end of the body 3 is bent down to form a wing 13 to lie against the outer face of the adjacent upright, as clearly shown at the right hand side of Fig. 2 of the drawings.

A modified form of shelf-supporting bracket is shown in Figs. 11, 12 and 13, wherein the body 14 of the bracket is of rod metal, having its ends bent or directed upwardly to form ears corresponding to the ears 4 of the bracket shown in Fig. 5. At the middle of the body of the bracket and in its opposite upright sides are grooves or recesses 16 which receive the lower edges of the key-hole slot or opening 17 in the upright. It will be understood that the shelf may be applied to this form of bracket in the same manner as described for the form of bracket shown in Fig. 5.

In order that the space between adjacent shelves may be sub-divided, I employ a partition such as shown at 18, preferably in the form of a single piece of sheet metal having its top and bottom edges folded over to stiffen it, as at 19, and its front and rear edges bent to form beads 20 snugly embracing the respective rods 21, the extremities of which project at the top and bottom of the partition, as at 22 and 23. To place this partition in position, it is tilted slightly to the vertical, as illustrated in dotted lines in Fig. 9 of the drawings, and then the studs or pins 22 are passed upwardly through corresponding openings 10 in the lower sides of the front and rear ribs 8 of the upper shelf until the lower studs or pins 23 are clear of the bottom shelf, whereupon the partition is brought into an upright position and then lowered so as to bring the studs or pins 23 into the desired openings 9 in the lower

shelf. It will, of course, be understood that the pins 22 are long enough to remain in the openings 10 when the partition has been lowered to its lowermost position, whereby the partition will be held in its normal position. By providing a plurality of openings 9 and 10, the partition may be given various positions, or a plurality of partitions may be employed between the same shelves.

Having thus described the invention, what I claim is:—

1. The combination of a pair of uprights having corresponding openings therein, shelf-supporting brackets detachably engaged in the openings of the uprights and each provided with an upstanding ear spaced from the upright, and a shelf provided at opposite edges with depending flanges having seats therein receiving the respective brackets and provided with inwardly extending projections to engage the inner sides of the respective ears.

2. The combination of a pair of uprights having corresponding openings, of shelf-supporting brackets detachably engaged with the openings and provided with upstanding ears, and a shelf provided with depending flanges having ears struck up and extending inwardly from the flanges, said ears lying on the brackets at the inner sides of the ears thereon, and the edges of the openings in the flanges produced by the formation of the ears lying at opposite sides of the brackets.

3. The combination of a plurality of uprights having corresponding openings therein, shelf-supporting brackets, each bracket lying in an opening and projecting at opposite sides of the upright and provided at its opposite ends with upstanding ears and also provided with depending webs at opposite sides of the upright, and shelves, each shelf having opposite depending flanges provided with seats receiving projecting bracket portions and provided with ears lying at the inner sides of the ears of the brackets.

4. A shelf-supporting bracket formed of a single blank of metal and including a body having upstanding transverse ears at its opposite ends and opposite depending longitudinal flanges provided with corresponding bifurcations.

5. A shelf formed from a single blank of metal having opposite edges formed into substantially tubular ribs and provided with corresponding openings in the tops and bottoms of the ribs.

6. A shelf formed from a single substantially rectangular blank of metal having opposite edges formed into substantially tubular ribs provided with corresponding openings in the tops and bottoms thereof, the other opposite edges of the blank being formed into flanges extending between the ribs and provided with corresponding ears struck from the flanges and extending inwardly therefrom.

7. In shelving, spaced supporting members formed with corresponding openings, a shiftable member insertible between the supporting members and adjustable to desired position by a combined tilting and rectilinear movement, and pins projecting to unequal distances from opposite edges of the shiftable member to enter corresponding selected openings of the supporting members and retain the said shiftable member in the required adjusted position.

8. In shelving, the combination of upper and lower shelves and a partition therebetween, each shelf having its front and rear edges formed into substantially tubular ribs provided with corresponding openings in the tops and bottoms of the ribs, the partition being provided with upper pins for engagement with the openings in the under side of the ribs of the upper shelf, and also provided with lower pins for engagement with the openings in the upper side of the ribs of the lower shelf, the distance between the top of the partition and the extremities of the lower pins being less than the distance between the lower shelf and the bottoms of the ribs on the upper shelf.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES B. ULRICH.

Witnesses:
E. W. SHEPARD,
W. M. HART.