H. P. BEECHER.

SHELVING.

APPLICATION FILED NOV. 13, 1911.

1,024,922.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

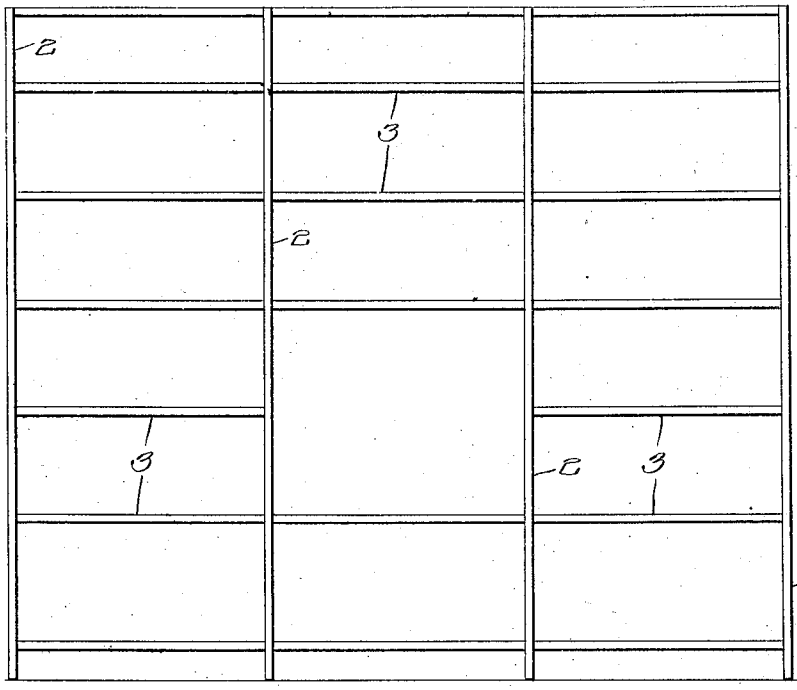


Fig. 2.

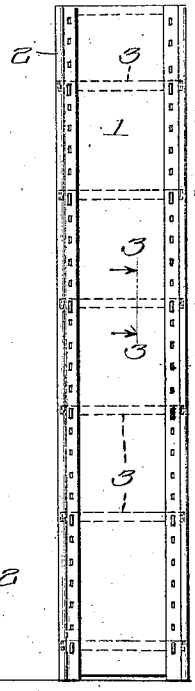


Fig. 3.

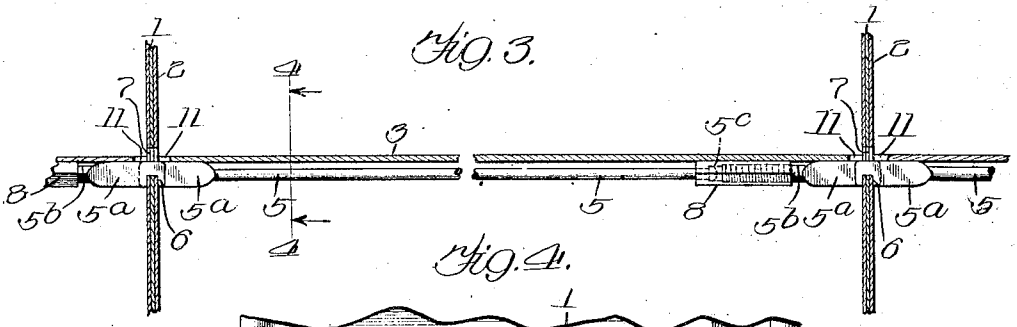
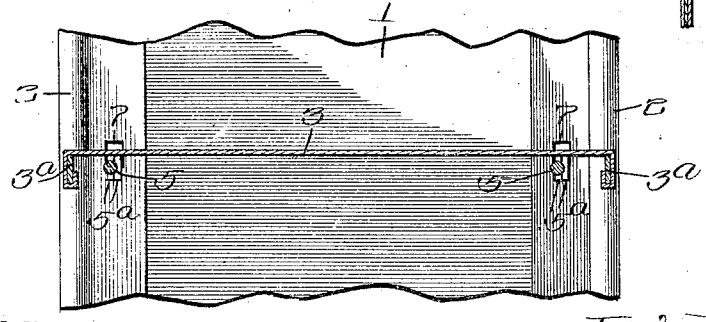


Fig. 4.



Witnesses:

Jno. B. Nelson Jr.

Edwin B. Nelson

Inventor:

Herbert P. Beecher:

By Cheever & Cox

Attys

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2 SHEETS—SHEET 2.

Fig. 5.

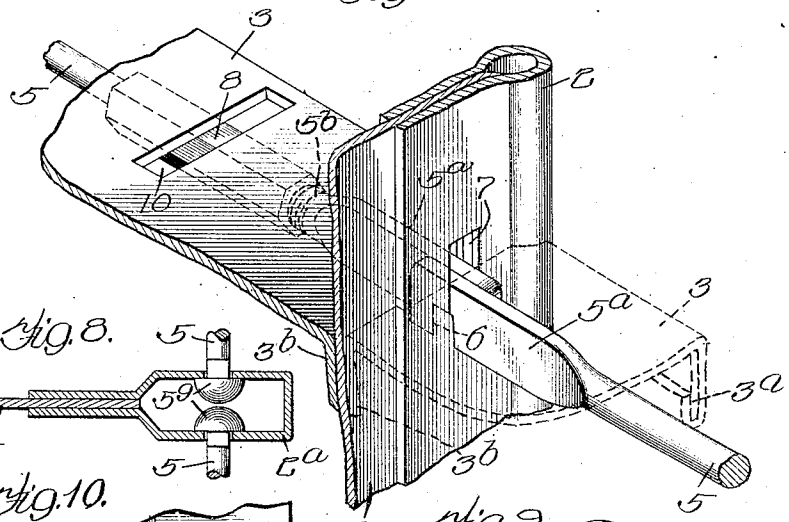


Fig. 8.

Fig. 10.

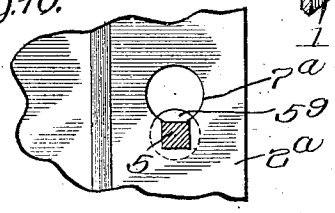


Fig. 9.

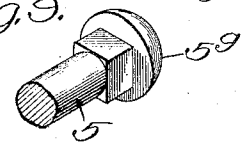


Fig. 6.

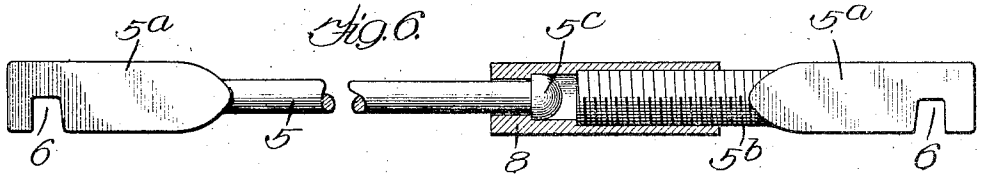
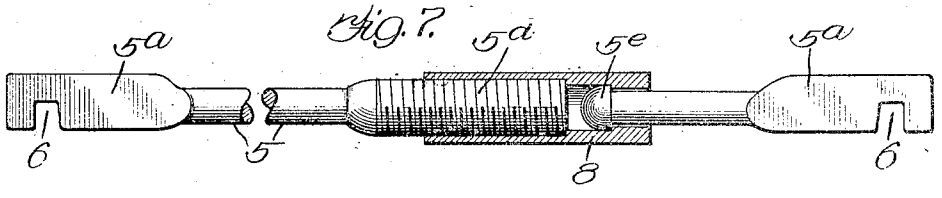


Fig. 7.



Witnesses:
Jno. B. Nelson Jr.
Edwin B. Nelson

Inventor:
Herbert P. Beecher.
By Cheever & Cox
Attys

UNITED STATES PATENT OFFICE.

HERBERT P. BEECHER, OF AURORA, ILLINOIS, ASSIGNOR TO LYON METALLIC MANUFACTURING COMPANY, OF AURORA, ILLINOIS, A CORPORATION OF ILLINOIS.

SHELVING.

1,024,922. Specification of Letters Patent. Patented Apr. 30, 1912.

Application filed November 13, 1911. Serial No. 659,964.

To all whom it may concern:

Be it known that I, HERBERT P. BEECHER, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented a certain new and useful Improvement in Shelving, of which the following is a specification.

My invention relates to shelving, particularly of the sectional type, and the object of the invention is to provide shelving so constructed that any shelf may be removed without disturbing any of the surrounding shelves, the structure remaining at all times tight and rigid.

I accomplish my object by the construction illustrated in the accompanying drawings, in which—

Figures 1 and 2 are general front and end views respectively of shelving embodying my invention. Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2. Fig. 4 is a vertical section taken on the line 4—4, Fig. 3. Fig. 5 is a detail view in perspective showing the construction at the ends of the shelves. Fig. 6 is a detail view showing the preferred form of tie rod. Fig. 7 shows a modified form of tie rod. Figs. 8, 9 and 10 are detail views showing modifications in the form of partition and of the heads at the ends of the tie rods.

Similar numerals refer to similar parts throughout the several views.

In the preferred form the standards or uprights are comprised of vertically arranged sheets of metal 1, reinforced at the front and rear edges by bent metallic face strips 2. The shelves 3 also are preferably of sheet metal and provided with depending flanges 3^a which rigidify them and impart a finished appearance to the structure. It is desirable also to form depending flanges 3^b at the ends of the shelves, so shaped as to abut the uprights and brace the structure when the tie rods are tightened.

The tie rods 5 have heads 5^a formed at their ends provided with notches 6 formed at the under edges near the ends. By preference these heads 5^a are somewhat flattened, as shown. They are adapted to drop into the apertures 7 formed at suitable intervals in the uprights 1, 2. Said apertures are slightly more than twice the width of the heads in order to accommodate two of them side by side, and the height of said apertures is sufficient to permit the rods to be lifted in and out without disturbing the adjacent parts. The rods are provided with turn buckles or equivalent devices for increasing and decreasing their lengths, the preferred form being shown in Fig. 6, wherein one of the heads 5^a is provided with a screw portion 5^b of larger diameter than the body of the rod. This screw threaded portion is adapted to screw into an interiorly threaded sleeve or nut 8 which also engages a head 5^c formed at the inner end of the rod body. The exterior of the nut 8 is polygonal so that it may be rotated by a spanner wrench or similar tool. In the form of tie rod shown in Fig. 7 the construction is similar except that the exteriorly screw threaded portion 5^b is formed upon the rod body while the other portion of the rod is provided with a head 5^e engaged within the nut 8, which is similar to the nut shown in Fig. 6. The form shown in Fig. 6 is preferred, for the reason that it is somewhat simpler to manufacture.

Slots 10 are formed in the shelves to receive a spanner wrench or similar tool for rotating the nuts 8, thus enabling the nuts to be tightened and backed off while the operator's hand is above the shelf instead of beneath it and enabling the operator to see the nut at the time he is working upon it. Slots 11 are also formed in the tops of the shelves adjacent to the apertures 7 for permitting the projecting ends of the heads in the adjacent sections to be lifted out and removed when desired.

Referring to the modified form of rod ends and face strips, shown in Figs. 8, 9 and 10, the face strip, if desired, may be made to form what is known as a "box section" 2^a, so formed and apertured as to receive the headed ends of the tie rods. The rods which coöperate with this box section may be hooked, as shown in Figs. 1 to 7, or they may have other forms of heads, for example, the mushroom type of head 5^g, shown in perspective in Fig. 9. In this case the aperture in the partition may assume the form 7^a, as shown best in Fig. 10, in which the upper portion is larger than the lower portion for permitting the headed end to enter the face strip and then drop down into engagement, as shown in Fig. 10.

In operation, let it be assumed that it is desired to remove a shelf in the middle of the structure, as indicated in Fig. 1. The

operator applies the tool to the nut 8 to back it off, thereby loosening the rod which relieves the shelf of strain and permits the shelf and rod to be readily removed. Conversely when it is desired to place a shelf in position, the two supporting rods are first dropped into place with their heads 5ª in the apertures 7. The shelf is then laid upon them, after which the operator tightens up the nuts 8, thereby placing the rods in tension and the shelf in compression. As the ends and front and rear edges of the shelves are flanged, the placing of the shelves in compression causes the flanges to forcibly abut the uprights and thereby brace the structure. Of course one or both of these flanges may be removed, but they produce a superior structure and are, therefore, desirable.

It is obvious that with my construction not only may a single shelf be removed or replaced but different sections of shelving may be added to the structure from time to time as required. The adding of a section or the taking away thereof does not necessitate the loosening up of any part of the rest of the structure, a consideration which will be appreciated as of great importance by those skilled in the art.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. Shelving comprising uprights having apertures therein, shelves between said uprights, and tie rods having heads thereon adapted to penetrate the uprights and engage the same at the said apertures therein, said shelves having slots in the ends for permitting the rise of the rods whose major portions are located on the opposite side of the upright.

2. Shelving comprising uprights having apertures therein, shelves between the uprights, tie rods having notched ends adapted to drop into the apertures in the uprights and turn buckles for tightening the rods, the ends of the shelves having slots for permitting the rods on the opposite side of the uprights to be lifted out, said shelves having transverse slots therein to facilitate manipulation of the turn buckles.

3. Shelving comprising uprights having apertures therein, and tie rods for holding the uprights in position, the tie rods being provided with turn buckles and having notched ends adapted to drop into the apertures in the uprights, the ends of the rods being flattened and the apertures in the uprights being of a width slightly more than twice the thickness of the flattened ends, whereby the ends of the rods may lie side by side in pairs and be freely placed and removed and yet be prevented from rotating when the turn buckle is tightened or loosened.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HERBERT P. BEECHER.

Witnesses:
FRED B. SHEARER,
M. A. SEGERS.