

J. E. BALES.
SHELVING.
APPLICATION FILED JULY 25, 1912.

1,056,486.

Patented Mar. 18, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

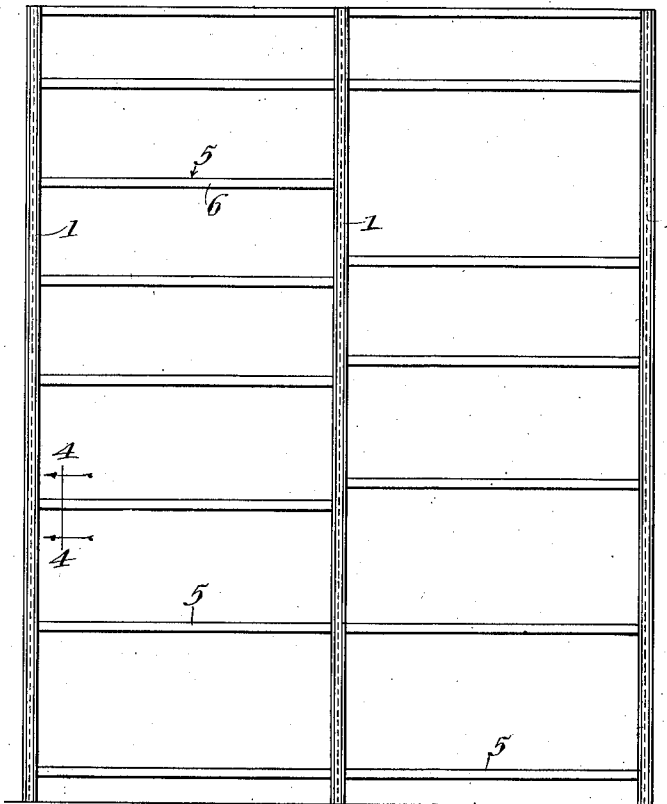


Fig. 2.

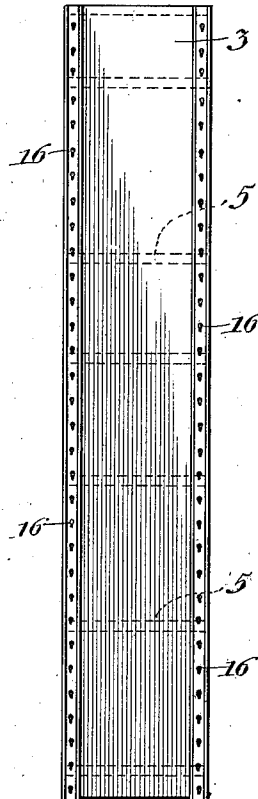


Fig. 3.

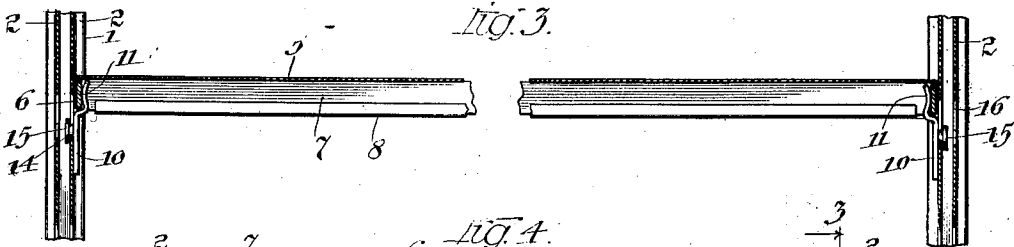
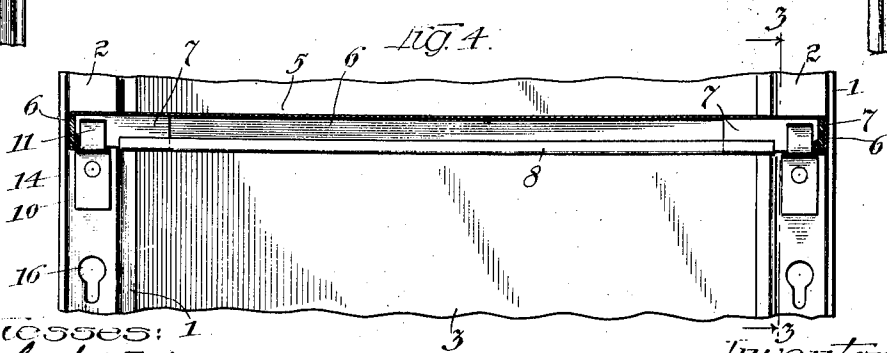


Fig. 4.



Witnesses: 1
Robert H. Weir
Arthur Carlson

Inventor
James E. Bales,
By Cheever & Cox Attor.

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3 SHEETS—SHEET 2.

Fig. 5.

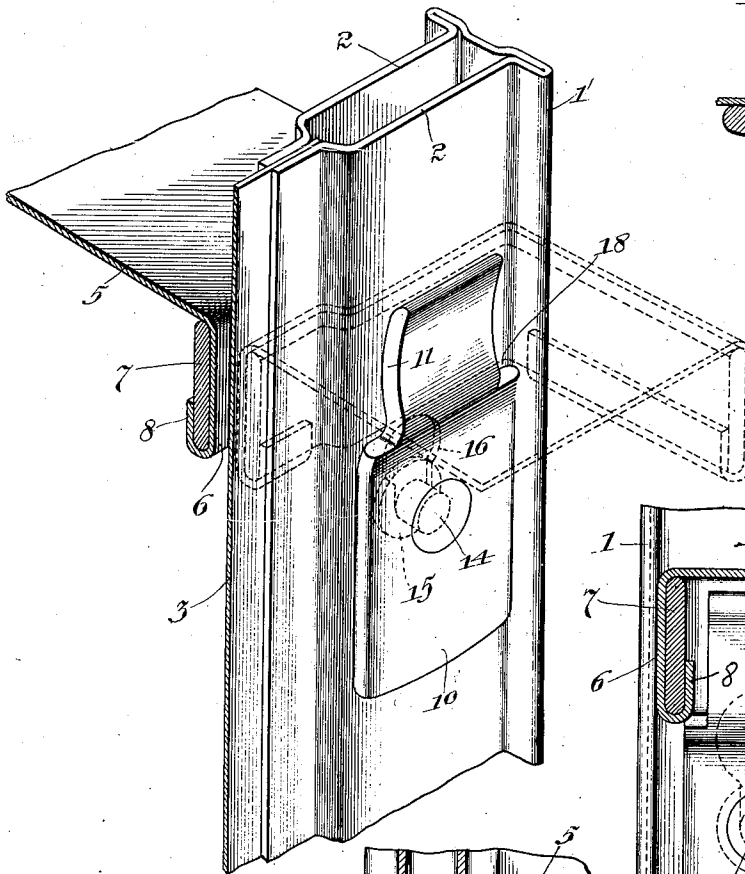


Fig. 8.

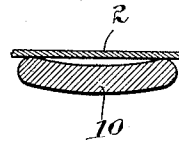


Fig. 6.

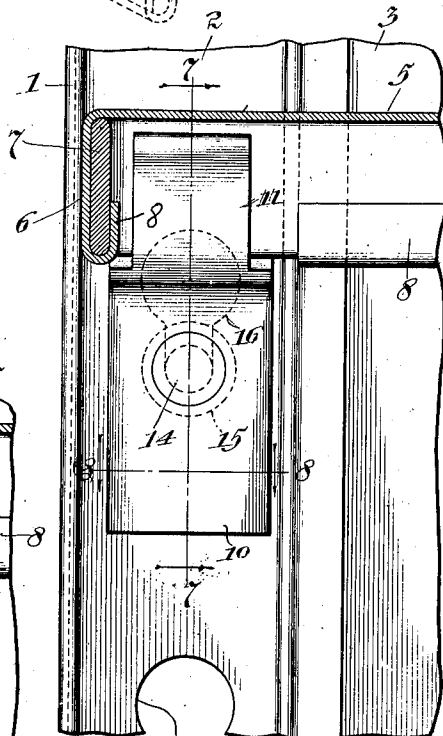
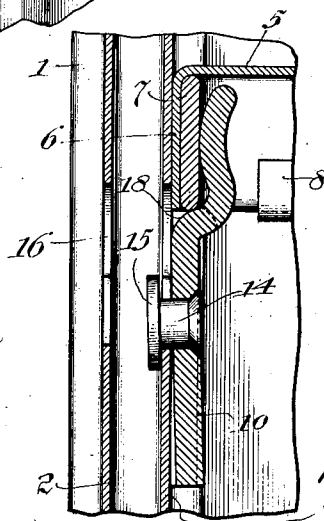


Fig. 7.



Witnesses:
Robert H. Weir
Arthur Carlson

Inventor:
James E. Bales,
By Cheever & Cox Attys.

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3 SHEETS—SHEET 3.

Fig. 9.

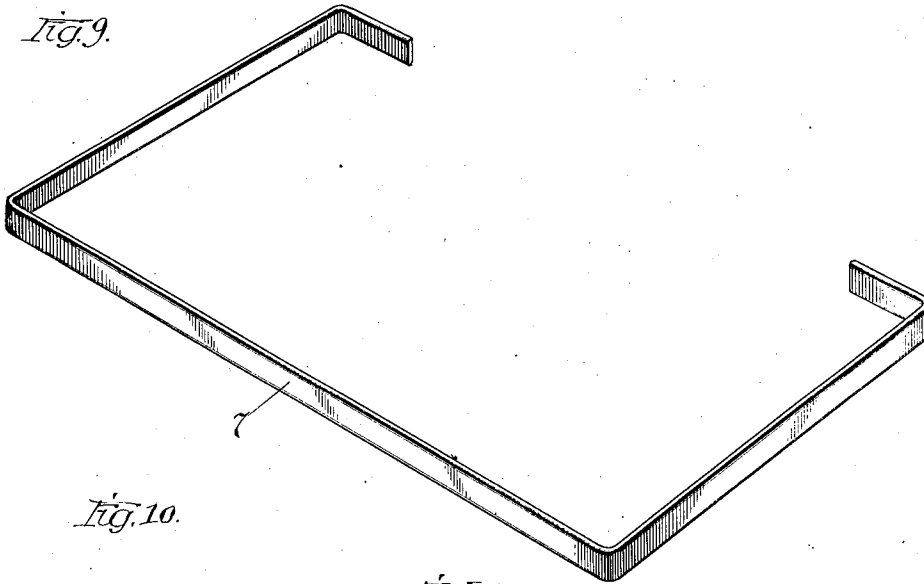


Fig. 10.

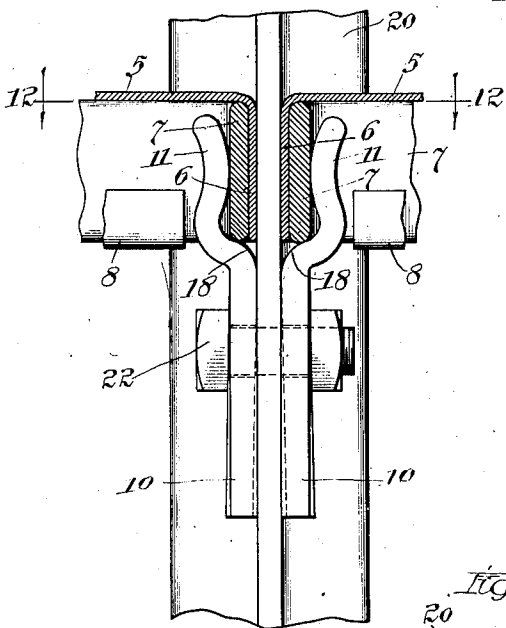


Fig. 11.

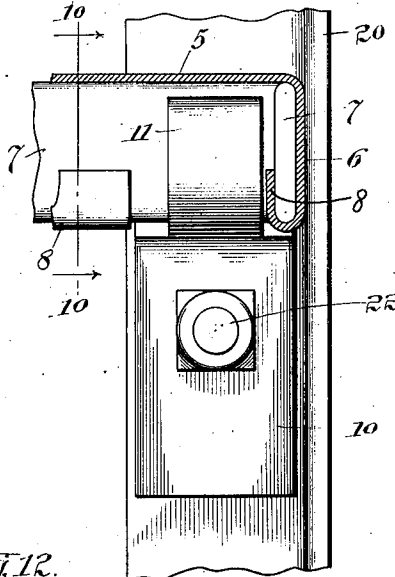
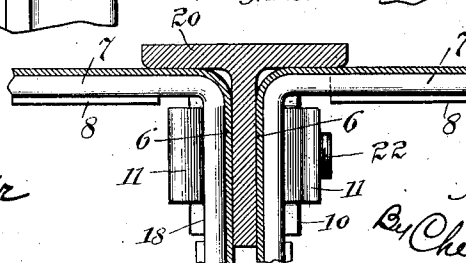


Fig. 12.



Witnesses:
Robert H. Weir
Arthur Carlson

Inventor
James E. Bales,
By Cheever & Cox, Attys.

UNITED STATES PATENT OFFICE.

JAMES E. BALES, OF MONTGOMERY, ILLINOIS, ASSIGNOR TO LYON METALLIC MANUFACTURING COMPANY, OF AURORA, ILLINOIS, A CORPORATION OF ILLINOIS.

SHELVING.

1,056,486.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed July 25, 1912. Serial No. 711,483.

To all whom it may concern:

Be it known that I, JAMES E. BALES, a citizen of the United States, residing at Montgomery, 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, and the object of the invention is to provide a construction in which the parts are simple in form and readily assembled and adapted to hold the structure rigid in all directions.

It will be understood by those skilled in the art that shelving for warehouses, stores, libraries, et cetera, is commonly built up of elements which are assembled in the place where they are to be used; also that the various parts are manufactured at a factory which may be remote from the place of use. Consequently it is desirable to avoid as far as possible the use of tools at the place of erection, and altering and fitting of the parts after they leave the factory must be avoided. At the same time the structure must be as rigid as possible after it is complete.

The object of my invention is to provide a structure which will as perfectly as possible fulfil these requirements.

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

Figure 1 is a front elevation of shelving embodying my invention. Fig. 2 is an end elevation thereof. Fig. 3 is a sectional view on the line 3—3, Fig. 4. Fig. 4 is a sectional view on the line 4—4, Fig. 1. Fig. 5 is a perspective view drawn to an enlarged scale and illustrating the position of the clip with reference to the associated parts. Fig. 6 is similar to Fig. 5 except that the view is taken looking directly at the outer face of the clip. Fig. 7 is a sectional view on the line 7—7, Fig. 6. Fig. 8 is a sectional view of the clip and portion of the face strip on the line 8—8, Fig. 6. Fig. 9 is a perspective view of one of the possible forms of the frame bar. Figs. 10, 11 and 12 show a slightly modified form of clip associated with the parts with which it coöperates, Fig. 10 being a sectional view on the line 10—10, Fig. 11; Fig. 11 showing a face view of the modified form of clip, and Fig. 12, being a sectional view on the line 12—12, Fig. 10.

Similar numerals refer to similar parts throughout the several views.

I will first explain the structure using the form of clip shown in Figs. 1 to 8 inclusive. The face strip 1 is a formed sheet metal element arranged vertically and forming a part of the partition at the ends of the sections. These face strips may exhibit various configurations, the one shown in Fig. 5 and elsewhere having two parallel walls 2 located at a slight distance apart. At the inner end these walls are secured to the upright partition plate 3. This form of face strip may be said to be box-like in form, as it completely incloses a space between its various walls.

The shelves consist of sheets 5 of metal having at their edges depending flanges 6, against the inner side whereof lie the frame bars 7. In the best construction these flanges are formed on all four edges of the shelves and terminate at their lower edges in upturned flanges 8 which engage the lower edge of the frame bars and hold the latter up into close contact with the horizontal portion of the shelf. The frame bars are thus tightly secured to the shelves at the margins thereof without the use of rivets, bolts or similar fastening devices. Furthermore, the need for puncturing the shelves or the frame bars is avoided.

The shelves are supported and pressed tightly against the face strips 1 by clips which form one of the important elements of my construction. These clips are formed of a single piece of metal and have a body portion terminating at the upper end in a finger 11, which is preferably somewhat narrower than the body portion, but may be of the same width if desired. By preference the body portion is transversely bowed, as clearly illustrated in the section Fig. 8. As a result of this construction the body contacts the face strip at the two lateral edges of the clip and thus prevents "weaving" or "wracking" in either a horizontal or a vertical plane. The clip is removably secured to the face strip either by bolts, as shown in Figs. 10, 11 and 12, or by other suitable fastening means. The preferred fastening means, however, is shown in Figs. 1 to 7 inclusive, the clips being here provided with studs 14 having heads 15 adapted to drop into slots 16 formed in

the parallel sides of the face strips. These slots 16 are narrowed at their lower ends to retain the head of the stud when the stud and clip are lowered into position. By employing this construction the clip may be small and dropped into place, whereupon it will be securely retained and no tools or wrenches of any kind are required for the assembling. The finger 11, above mentioned, bows backward at the top of the body forming a shoulder 18 adapted to support the frame bar 7. From this point the finger bows inwardly so as to contact the middle of the inner side of the bar. By the word "middle" I do not wish to be understood as referring to the mathematical center of the bar, vertically, the idea being that the point of contact between the finger and the bar is at a point approximately midway between the upper and lower edges of the bar, as clearly shown in Figs. 7 and 10. From this point of contact the finger again bends backward away from the bar to afford easy access for the bar in lowering it and the shelf into position. The upper end of the finger also forms a cam surface for wedging the bar toward the face strip.

In Figs. 10, 11 and 12 the face strip assumes the form of a T bar 20, the lateral flanges of the bar lying in front of the front edge of the shelves and the central leg lying between the approximate ends of two adjacent shelves. This relationship is clearly shown in Fig. 12. In this instance the clips are apertured and held in position by bolts 22.

The frame bars 7 previously mentioned may assume various forms, and in fact might be entirely omitted without departing from the spirit of my invention considered in its broader aspect. The frame bars, however, are desirable and may extend throughout the periphery of the shelf or may terminate so that the major portion of the front and rear edges of the shelf are unprovided with a bar.

In operation, when the preferred form of clip having the stud 14 is employed the clip is first dropped into position. This brings the middle bow of the clip finger nearer to the adjacent surface of the face strip than the aggregate thickness of the frame bar 7 and the depending flange 6 of the shelf. Consequently when the shelf is lowered into position said bar and flange force the finger backward and consequently set up a strain in the clip. The result is that the clip when the parts are assembled, continually exerts a pressure of greater or less degree against the inside of the bar and firmly holds the shelf flange and the face strip in contact with each other. This pressure is all concentrated near the middle portion of the bar so that the shelf flange cannot leave the surface of the face strip at any point

without increasing the strain on the clip. In other words, as the clip exerts a pressure at the center of the bar the pressure is distributed both upwardly and downwardly and close contact between the shelf flange and the side of the face strip is assured. The shelf flanges all pressing thus upon the face strips produce a rigidity in the complete structure which is remarkable for shelving of this general character. Each clip acts as a brace and yet it lies close against the side of the face strip and thus avoids the disadvantages of an ordinary brace which would interfere with the free access to the spaces between the shelves. And it will be noted that this rigidity of structure is obtained without the use of tools of any kind, even a wrench, as the clip in its preferred form is secured by merely dropping it into place. When the form shown in Figs. 10, 11 and 12 is employed a wrench is necessary for tightening the bolt but the bolts are located where they are comparatively easy of access.

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

1. Shelving comprising an upright, a shelf having a downward flange at a marginal edge of said shelf and a clip on said upright adapted to support the shelf, said clip having a bend in position to contact a limited area of the inside of the shelf flange between the upper and lower edges thereof when the shelf is in place, said clip being resilient and normally holding the bend portion comparatively close to the upright whereby the clip exerts appreciable pressure to hold the shelf flange close to the upright, and the area of pressure of the clip is confined chiefly to said bend.

2. Sectional shelving comprising an upright, a shelf having a depending flange at its end in position to contact the upright, and a clip adapted to be secured to the upright, and having an ogee curve, one portion of the curve being adapted to exert pressure upon said flange between the upper and lower edge thereof for holding it in close contact with the side of the upright.

3. Sectional shelving comprising an upright, a shelf having a depending flange at its end in position to contact the upright, and a clip adapted to be secured to the upright, said clip having an ogee curve at its upper end, one portion of the curve forming a shoulder for supporting the shelf and another portion forming a contactor for exerting pressure on the inside of the flange between the top and bottom thereof.

4. Sectional shelving comprising an upright, a shelf having a depending flange at its end in position to contact the upright, and a clip adapted to be secured to the upright, the upper end of the clip being bent

backward to receive the lower edge of a shelf flange as the latter descends, and force the same toward the upright, substantially as described.

5 5. Sectional shelving comprising an upright, a shelf having a depending flange at the end for contacting the upright, and a clip adapted to be secured to the upright, there being a cam at the upper end of the
10 clip for receiving the flange and forcing it toward the upright as the shelf descends, the cam portion terminating near the middle of the flange whereby the pressure of the cam is exerted at a point between the
15 lower and upper edges of the flange.

6. Sectional shelving comprising an upright, a shelf having a depending flange at the end for contacting the upright, and a detachable clip having a body portion
20 adapted to be secured to the upright, said body portion being transversely bowed whereby the marginal edges may contact the uprights to prevent weaving in a horizontal direction, said clip having

a spring finger at its upper end adapted 25 to hold said flange in close contact with said upright.

7. Sectional shelving comprising an upright, a shelf having a depending flange at the end for contacting the upright, a frame 30 bar, an upturned flange integral with said depending flange for holding said frame bar in the shelf, and a clip having a body portion adapted to be secured to the side of the upright and a finger at the upper end of 35 the clip bending inward from the body of the clip and forming a shoulder for supporting the bar, said finger also being adapted to engage the inside of the bar between the upper and lower edges thereof for holding 40 the parts rigid.

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

JAMES E. BALES.

Witnesses:

THEODORE WORCESTER,
GERTRUDE L. LINTUN.