

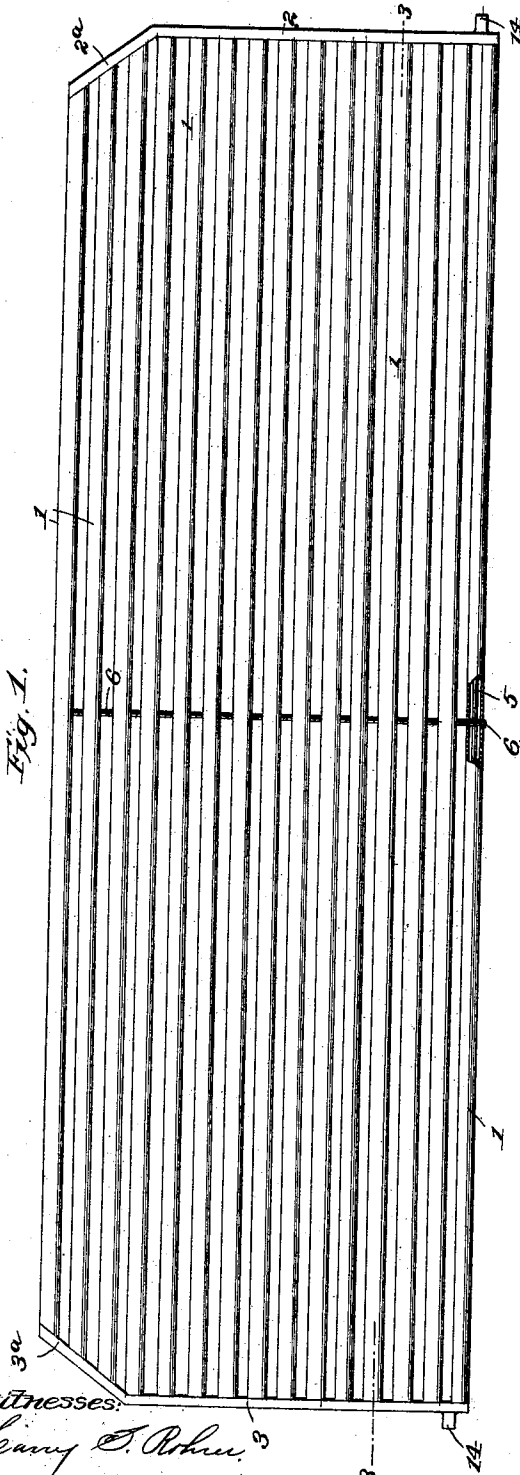
No. 707,983.

W. H. TAYLOR.  
METALLIC SHELVING.

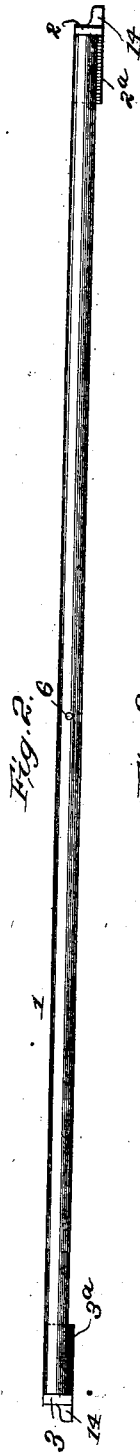
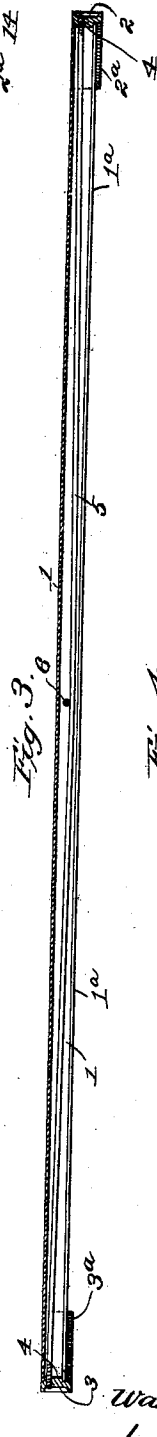
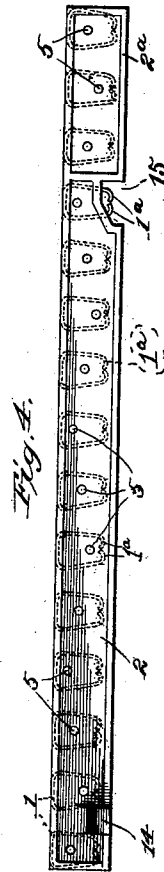
Patented Aug. 26, 1902.

(No Model.)

2 Sheets—Sheet I.



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(Application filed Feb. 3, 1894.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 5.

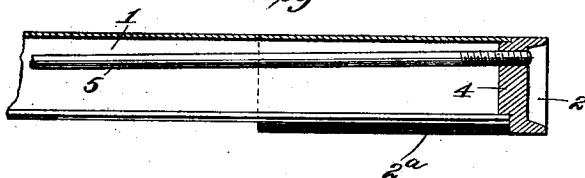


Fig. 6.

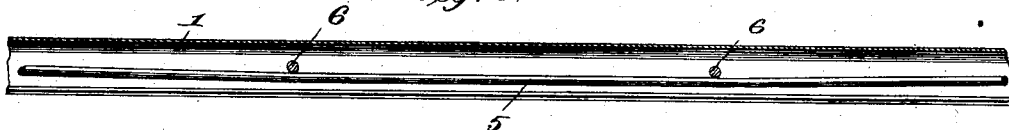


Fig. 7.

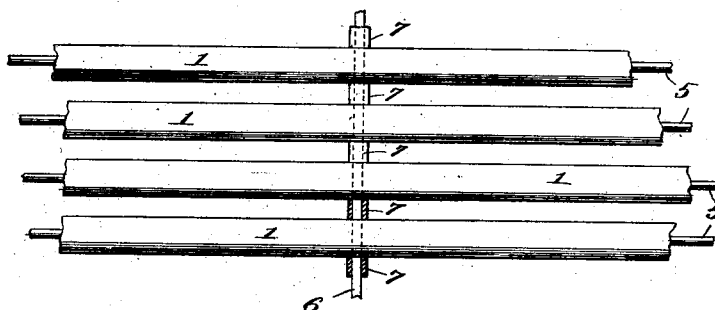


Fig. 8.

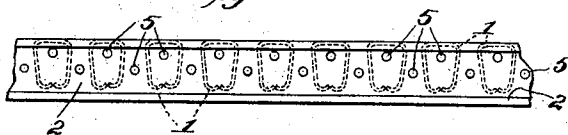


Fig. 9.



Fig. 10.



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# UNITED STATES PATENT OFFICE.

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## METALLIC SHELVING.

SPECIFICATION forming part of Letters Patent No. 707,983, dated August 26, 1902.

Application filed February 3, 1894. Serial No. 498,959. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN H. TAYLOR, a citizen of the United States, and a resident of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Metallic Shelving; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, is a full, clear, and exact description of my improvements, such as will enable those skilled in the art to make and use the same.

My improvements relate particularly to the construction of shelving for books; and the objects of my invention are to provide fire-proof shelves which shall possess sufficient strength and stiffness to properly support the books and which shall be as light as possible consistent with the above qualities.

To these ends I construct my improved shelving of metal bars of any shape which will best combine lightness and stiffness, and to add to the stiffness I provide them with brace or tie rods, the metal bars and brace or tie rods being carried by end pieces or headers.

It is preferable to construct my improved shelving of hollow bars or tubes of any desired cross-section and fasten the rods at their ends to the headers in any approved manner. The rods may extend longitudinally through the hollow bars or alongside of and between them, and they preferably pass under a stay-rod which passes transversely through or is otherwise fastened to the bars near the center. The exact position of the stay-rod is not material, and there may be more than one stay-rod if desired.

When a number of the above-described bars are organized together with headers, so as to form a shelf, any desired number or all of the bars may be provided with brace-rods, and the support of the rods is distributed through the adjacent bars, and a strong and stiff shelf of comparative lightness is produced by passing the stay-rod through all or several of the bars.

In order that my invention may be fully understood, I will first describe the same in connection with the accompanying drawings and afterward point out the novel features with more particularity in the annexed claims.

In said drawings, Figure 1 is a plan view of a shelf constructed according to my invention. Fig. 2 is a front view of the same. Fig. 3 is a longitudinal sectional view. Fig. 4 is an end elevation. Fig. 5 is an enlarged detail longitudinal section. Fig. 6 is a detail longitudinal section of a slight modification. Fig. 7 is a detail plan showing another modification. Fig. 8 is a detail end view showing the arrangement of brace-rods both inside and outside of the book-supporting bars. Figs. 9 and 10 are detail cross-sections of modified forms of supporting-bars.

1 is a metal book-supporting bar of any preferred cross-section. The bar may be hollow or tubular and of the form indicated by dotted lines in Fig. 4 or by full lines in Figs. 9 and 10. In Fig. 4 it is shown constructed of a strip of sheet metal bent into approximately oblong cross-section with the meeting edges 1<sup>a</sup> slightly inturned. In Fig. 9 the bar is of inverted-U-shape cross-section, and in Fig. 10 it is of circular cross-section.

2 and 3 are the end pieces or headers, which are formed on their inner faces with series of projecting pieces or bosses 4, over which the ends of the hollow bars or tubes 1 fit, the bosses 4 helping to support the ends of the bars and also fixing them in their proper relative positions when they are organized into a shelf, or the headers may be provided with depressions in their inner faces for the reception of the ends of the tubes. It is obvious that the depressions serve the same purpose as bosses. The inner ends 2<sup>a</sup> and 3<sup>a</sup> of the end bars or headers 2 and 3 may be inclined slightly inward, if preferred, for facilitating the arrangement of the shelves around their supports.

5 is a brace-rod attached in any suitable manner at its opposite ends to the end pieces or headers 2 and 3. In Fig. 3 the brace-rod 5 is shown with screw-threaded ends which engage in screw-threaded openings formed in the headers. The brace-rod 5 is passed under the transverse stay-rod 6, fastened in any suitable manner near the center of the bar 1. Sometimes it is desired to employ two transverse stay-rods near the center of the bars 1, as represented in Fig. 6. It is evident that by screwing up or otherwise shortening either

or both ends of the brace-rod 5 the center will tend to rise and materially support the center of bar 1 and that when the brace-rod is adjusted to the proper position and the bar 5 1 is supported at each end said brace-rod will strengthen the bar against deflection.

When a number of the bars above described are organized into a shelf, it is preferable to have the brace-rods attached to the headers 10 at variable vertical distances between the top and bottom thereof, as shown in Fig. 4, so that the bars may be more securely bound to the headers, and also so as to prevent any tendency of the headers to spread at the bottom. 15 The brace-rod 5 may be passed longitudinally through the bars 1 when the latter are formed hollow, and they may, if desired, extend alongside of and between the bars or some of them between the bars and some 20 within the bars, as shown in Fig. 8.

The stay-rod 6, above referred to, furnishes a bearing under which the brace-rods 5 pass. It also distributes the support of each brace-rod 5 over the adjacent tubes or hollow bars 25 1 and provides a means for properly spacing the longitudinal bars and holding them in proper relative position at the center. A good means for accomplishing this latter result is to have the stay-rod 6 screw-threaded 30 throughout its length, as shown in Fig. 1, in which case the openings through the bars would also be screw-threaded. The same result can be obtained by the employment of a smooth stay-rod, as shown in Fig. 7, in which 35 case spacing-collars 7 would be used between each pair of longitudinal bars.

I have shown several modified structures in carrying my improvements into practice; but I wish it to be understood that numerous 40 structural changes can be made without departing from the spirit of my invention, the unit of which may be said to consist of a metal supporting-bar and a strengthening brace-rod.

Having thus described my invention, the 45 following is what I claim as new therein and desire to secure by Letters Patent:

1. As a new article of manufacture, an open trussed fireproof shelf comprising transverse end pieces, hollow bars fixed at their ends 50 against transverse displacement upon said end pieces, trussed tie-rods having their ends fixed in the end pieces, tying said end pieces

together and holding them against the hollow bars, and a transverse supporting-rod passing through all of the hollow bars, fixed with relation thereto and resting upon the trussed tie-rods; substantially in the manner and for the purposes set forth. 55

2. As a new article of manufacture, an open fireproof shelf comprising end pieces formed 60 with seats, longitudinal hollow bars fitted to the seats on said end pieces in a manner to prevent transverse movement of the hollow bars on the end pieces, and a rod passing transversely through all of the hollow bars 65 and resting upon the tie-rods and thereby affording vertical support to the hollow bars; substantially as herein set forth.

3. As a new article of manufacture, an open fireproof shelf comprising transverse end 70 pieces having bosses formed thereon providing seats, longitudinal hollow bars fitted over said bars and thereby prevented from transverse movement upon the end pieces, trussed tie-rods extending through the hollow bars, 75 having their ends fixed in the end pieces and tying the latter rigidly against the longitudinal hollow bars, and a transverse rod passing through all of the hollow bars above and resting upon the tie-rods; substantially as set 80 forth.

4. A metallic shelf comprising a series of longitudinal hollow bars, the transverse pieces or headers in which the ends of the hollow bars are fitted and by means of which the hollow bars are supported, and the brace or tie 85 rods, located at variable heights between the top and bottom of the pieces or headers and by which the pieces or headers are connected and adapted to impart additional support and 90 stiffness to the hollow bars; substantially as described.

5. In a metallic shelf, the combination of the pieces or headers, the bars extending between the headers, one or more brace or tie 95 rods also extending between and attached to the headers, and a screw-threaded stay-rod passing through the bars and engaging the brace or tie rods, at or near the center, substantially as and for the purpose set forth. 100

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