J. L. DAVIDSON.

SECTIONAL METAL SHELVING.

APPLICATION FILED JULY 1, 1914.

1,201,703.

Patented Oct. 17, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

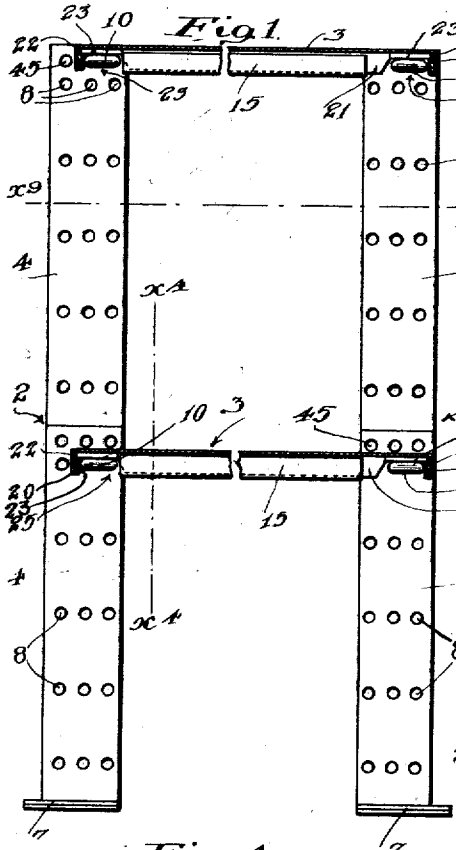


Fig. 2.

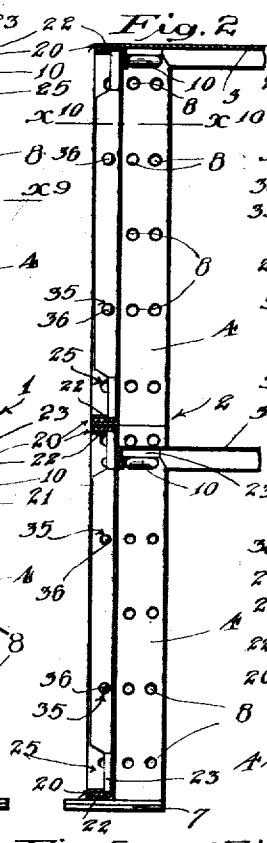


Fig. 3.

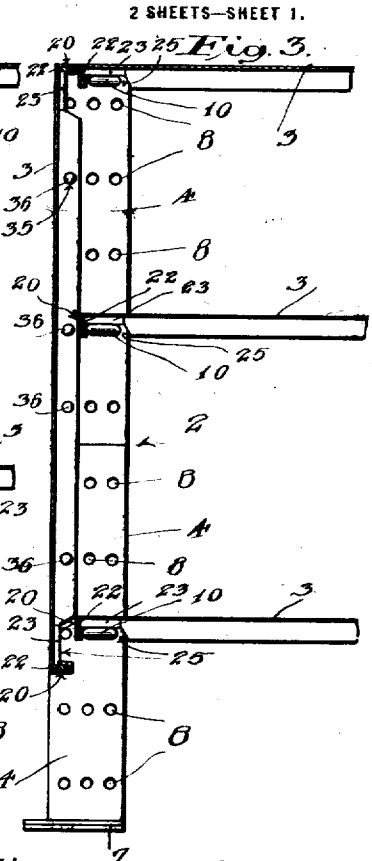


Fig. 4

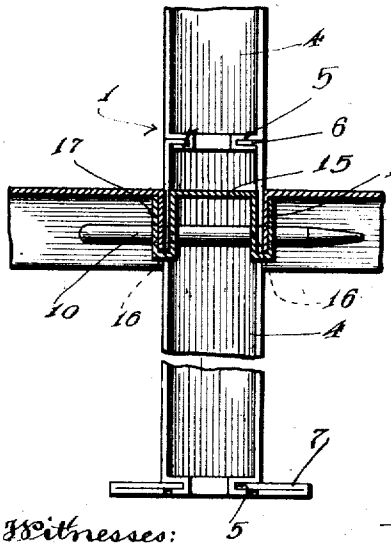


Fig. 5

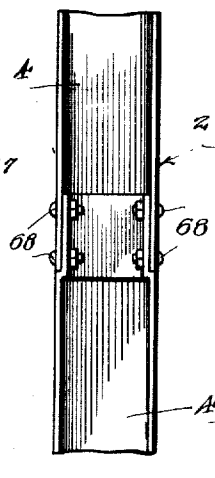


Fig. 6

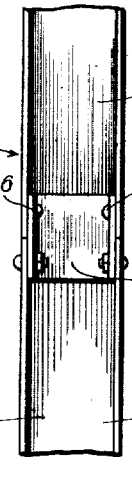
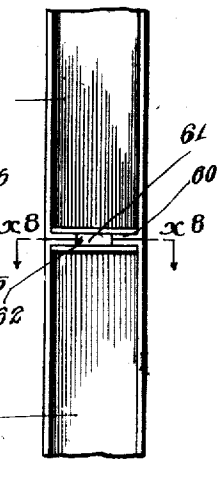
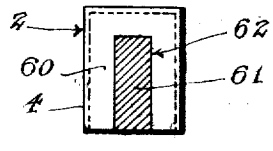


Fig. 7



Witnesses:
Sully Russo
Lita X. Alter.

Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 9.

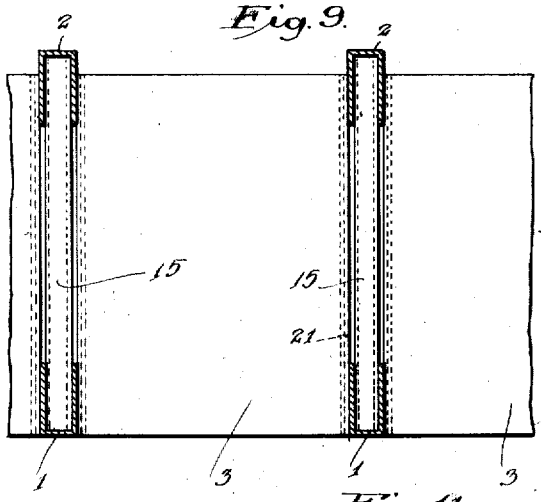


Fig. 10

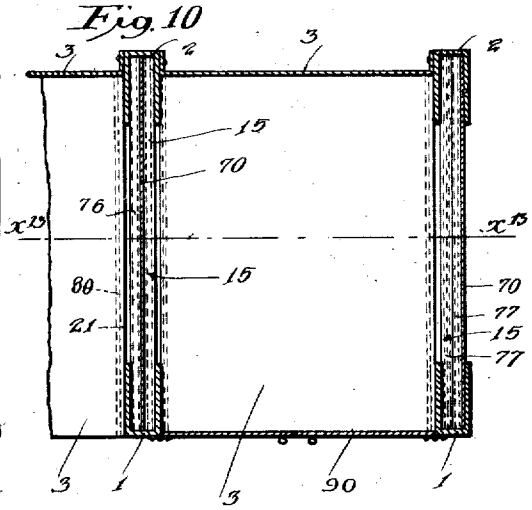


Fig. 11

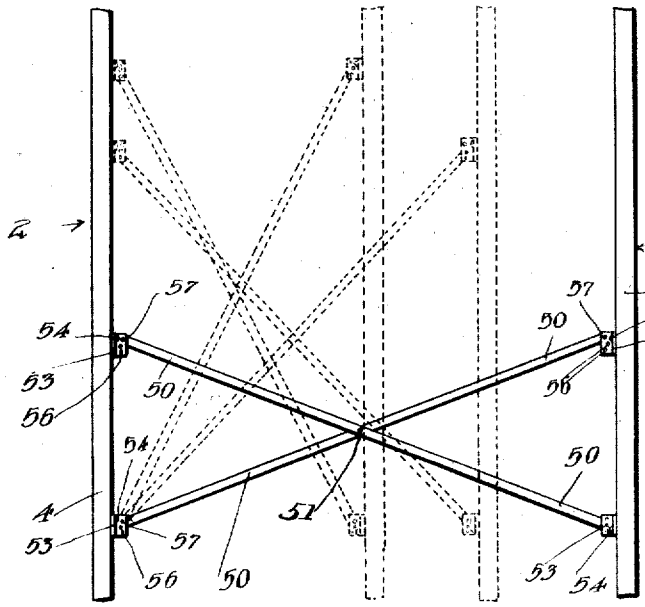


Fig. 12.

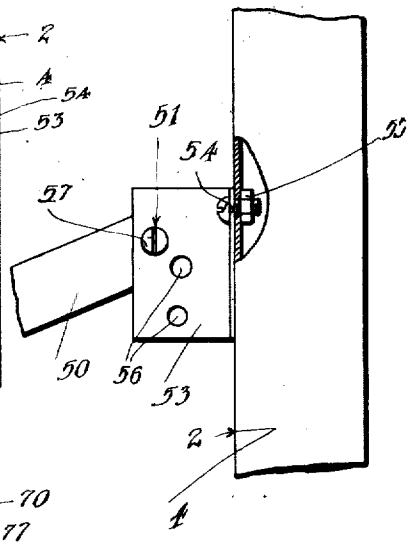
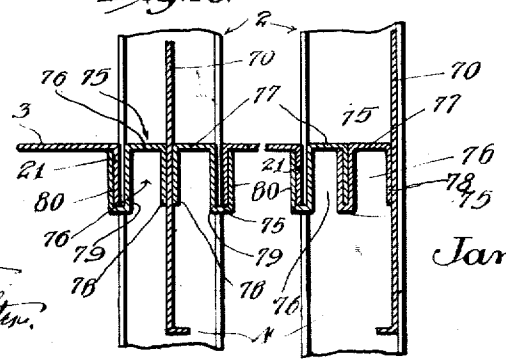


Fig. 13.



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UNITED STATES PATENT OFFICE.

JAMES L. DAVIDSON, OF LOS ANGELES, CALIFORNIA.

SECTIONAL METAL SHELVING.

1,201,703. Specification of Letters Patent. Patented Oct. 17, 1916.

Application filed July 1, 1914. Serial No. 848,386.

To all whom it may concern:

Be it known that I, JAMES L. DAVIDSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Sectional Metal Shelving, of which the following is a specification.

This invention relates to shelving.

One of the objects of the invention is to provide an improved metal shelving.

Another object is to provide a sectional metal shelving, which may be built up in sections to different heights.

Another object is to provide means whereby the various vertically extending sectional elements of the shelving structure may be conveniently fitted and secured together or taken apart.

Another object is to provide improved means whereby the various horizontally extending sectional elements of the shelving structure may be conveniently fitted and secured together or taken apart.

Another object is to provide a metal structure, which may be readily set up in the form of open or closed shelving or for a counter.

Another object is to provide an adjustable brace for bracing shelving of different dimensions.

Other objects will appear hereinafter.

Referring to the drawings: Figure 1 is a transverse vertical section of the shelving, set up in the form of open shelving. Fig. 2 is a partial transverse sectional view of the shelving, set up in the form of closed shelving. Fig. 3 is a partial transverse sectional view of the shelving, set up in the form of a counter. Fig. 4 is a partial longitudinal vertical section of the shelving, taken on line x^4—x^4 of Fig. 1. Figs. 5, 6 and 7 are fragmentary views of modified forms of the shelving standards. Fig. 8 is a sectional view of the shelving standard, shown in Fig. 7 and taken on line x^8—x^8 of said figure. Fig. 9 is a horizontal sectional view of the shelving, taken on line x^9—x^9 of Fig. 1. Fig. 10 is a horizontal sectional view of the shelving, taken on line x^{10}—x^{10} of Fig. 2. Fig. 11 is a view of the shelving brace. Fig. 12 is an enlarged view of the brace-connecting element. Fig. 13 is a partial vertical longitudinal section on an enlarged scale of the shelving, as shown in Fig. 10 and taken on line x^{13}—x^{13} of said figure.

The shelving comprises two rows of standards, a front row composed of standards 1, and a rear row composed of standards 2, and shelves 3 supported upon said standards in a manner hereinafter described. The standards 1 and 2 are similarly spaced apart in their respective rows, so that each of the standards 2 rests directly in the rear of one of the standards 1. The standards are built up in sections 4, which sections are bent from sheet metal and are preferably U-shaped in cross section. The sections are placed in position for use, with the open sides of the sections in the row of standards 1 facing the open sides of the row of the standards 2. Each section 4 is formed with a groove 5 at its lower end, which extends along the three closed sides of the section. At the upper end of each section is formed a flange 6, which extends inwardly along the three closed sides of the section and is adapted to engage the groove 5 for the purpose of locking said sections together, one above the other and in alinement with each other. In order to put the sections 4 of the standards together the ends of the side portions of the flange 6 of one section are inserted in the open ends of the side portions of the groove 5 of the other section, until the intermediate portion of the flange engages the intermediate portion of the groove, in which position the sections are in alinement with each other and locked so that the grooved section can not be moved forwardly of the flanged section, and neither section may be moved sidewise with relation to the other section. Bearing members 7 are placed in the groove 5 in the lowermost section 4, each bearing member being adapted to rest upon the floor or other support to assist in supporting the standard.

Each section 4 is provided with a series of rows of holes 8, which rows are spaced vertically at a uniform distance apart in the sections and throughout the entire height of the standards. The holes 8 are located in the opposite side walls of the sections 4, and each hole in each row of holes in one side of the section registers with a corresponding hole in a row of holes in the opposite side of the sections. Each of said holes and its companion hole in the opposite side of the section are adapted to receive a pin 10 for supporting a shelf 3. The pin 10 is preferably in the form of a staple, the members 11 of which are spaced at such distance apart that they may be projected through two holes in each

row of holes. Connecting elements 15 are placed between the opposite standards 1 and 2, with the ends of said elements resting within said sections. The connecting elements 15 are bent from sheet metal and are preferably U-shaped in cross section. Each of said elements is at its respective ends provided with holes 16 in its opposite walls, which holes are adapted to register with the holes 8 in the sections 4, so that the pins 10 may be inserted through the holes 8 in one of the sections 4 and the holes 16 in the ends of the connecting element 15 to secure said element to the section 4, thus connecting a pair of front and rear sections 4 of the standards 1 and 2. The connecting elements 15 are provided with upturned flanges 17 at their respective sides, the ends of which flanges project over the inner edges of the opposite walls of the sections 4. The flanges 17 are spaced from the sides of the U-shaped element 15 and comprise with the sides of the elements 15 shelf flange-receiving members which are U-shaped in cross section.

The shelves 3 are bent out of sheet metal and have side flanges 20 and end flanges 21. Reinforcing bars 22 are placed against the inner surfaces of the side flanges 20, and their ends are bent at right angles and rest against the inner surfaces of the end flanges 21. Projections 23 from the flanges 20 extend around the lower edges of the reinforcing bars 22 and engage the inner sides of said bars to retain said bars in position against said flanges. The flanges 21 and the right angularly extending portions of the reinforcing bars 22 are cut away at their lower edges to provide notches 25.

The standards 1 and 2 are respectively spaced apart in their respective rows at such distance that the shelves 3 may fit therebetween, and the standards 1 and 2 are spaced at such distance from each other that the ends of the shelves may rest against the side walls thereof. The shelves are placed between the pair of standards 1 and 2, with the right angularly projecting ends of the reinforcing bars 22 and the portions of the shelf end flanges 21 adjacent said right angularly projecting end of said reinforcing bar resting upon the pins 10, and with the end flanges 21 engaging the inner sides of the flanges 17 of the connecting element 15. The pins 10 support the shelves upon the standards 1 and 2 at the desired elevations, and the engagement of the end flanges 21 of the shelves with the flanges 17 of the shelf-connecting elements 15 connect the respective pairs of standards 1 and 2 together.

When the shelves are supported in position on the standards by the pins 10, said pins rest in notches 25 of said shelves, so that lateral movement of the shelves in one direction will cause one end of the notch to engage the pin and prevent such movement of the shelf in one direction, while any movement of the shelf in the opposite direction will bring the other end of said notch against said pin and prevent such movement, so that the shelves can not slide laterally out of position. When the parts of the shelving are thus assembled, the upper wall of the connecting element rests in alinement with the upper surface of the shelves 3, so that there is no opening between the ends of the shelves. The pins 10 may be shifted to different holes in each row of holes 8 in the sections 4, so that when the shelves are supported on said pins, the position of the side edges thereof, with relation to the outer edges of the standards 1 and 2 may be changed. As shown in the drawings, the right side edges of the shelves 3 rest flush with the outer edges of the standards 1, while the left sides of the shelves 3 rest within the left edges of the standards 2. By shifting the pins 10 to the holes to the left of the holes in which they are shown in the drawing, the position of the shelves, when placed upon said pins, will be such that the left sides of the shelves would rest flush with the left edge of the standards 2, while the right edges of the shelves 3 would rest at a distance within the right edges of the standards 1. Any number of holes may be provided in the rows of holes 8, so that the shelves might be shifted to various lateral positions on the standards.

The shelving, as shown in Fig. 1, is what is termed "open shelving", for the reason that the shelving has no back wall. In Fig. 2 of the drawing, shelves 3 are placed vertically between the rear standards 2 against the left side walls of the shelving 3 to provide a rear wall for the shelving, the positions of the pins 10 and the shelves 3 being such as to provide for such position of said vertical shelves. The flanges 21 of the shelves 3 are provided with holes 35 which are adapted to register with the holes 8 in the sections 4, so that rivets 36 may be extended through the holes in the shelf flanges 21 and the sections 4 to secure the shelves in vertical position to the standards at the rear of the shelving. When the shelves are placed vertically between the standards 2, as shown in Fig. 2, the upper faces of the shelves are turned inwardly with relation to the shelving.

If desirable, the shelving may be put together to form a counter, as shown in Fig. 3. When used as a counter, the shelves 3 are placed vertically between the standards, as above described and as shown in Fig. 2, with the exception that the upper faces of the shelves are turned outwardly instead of inwardly, the holes 35 in the end flanges of the shelves being adapted to register with the holes 8 in the sections 4 whether the upper surfaces of the shelves are turned inwardly

or outwardly. In this counter structure shelves of such width are used for the vertical wall as to leave a space between the lower edge thereof and the floor, which provides a sanitary counter structure. The sections 4 are preferably provided with an upper row of holes 45 for the pins 10 to support the shelves on the sections flush with the upper ends of the sections. This arrangement is particularly desirable when the shelving is built up to form a counter, as shown in Fig. 3 of the drawing.

The shelving is braced by bracing rods 50, which are pivoted together at 51 and connected at their ends to the adjacent standards 2 by means of the couplings 53. These couplings 53 are secured to the standards 2 by screws 54, which project through the holes 8 in the sections 4 of said standards, and the nuts 55, which screw on the ends of said screws against the inner walls of the sections. The bracing rods are adjustable, so that the standards may be spaced at different distances apart for shelves of different length. In order to adjust the bracing rods to the standards, when placed at different distances apart, the couplings 53 are disconnected from the standards 2 so that said standards may be moved toward or away from each other. The standards are then moved to the desired distance apart for a shelf of different length, in which position of the standards the disconnected couplings 53 are brought into register with the other holes 8 in the standards 2. The screws 54 are then introduced through the said other holes 8, and the nuts 55 are screwed onto the ends of said screws. The coupling elements 53 are provided with a plurality of holes 56, through which a screw 57 may be introduced for connecting the ends of the bracing rods 50 in different positions on said coupling element, if necessary, in order to make the braces fit properly between the couplings. In bracing the shelving, the braces may be placed between any two standards. They are preferably placed between two standards at the respective ends of the shelving at the top of the same.

In the modification of the standards, shown in Fig. 5 of the drawing, one end of the section 4 has an integral, reduced portion, over which slips one end of another section. The upper section is secured to the reduced portion of the lower section by means of rivets 68.

In the modification of the standards, shown in Fig. 6 of the drawing, the sections 4 of the standards telescope with each other, one end of the section having a projecting member 65 secured thereto, over which slips the lower end of another section 4. The upper section is secured to said projecting member by rivets 66.

In the modification of the standards, shown in Fig. 7 of the drawing, flanges 60 are substituted for the grooves 5 on the lower ends of the sections 4, which flanges correspond to the flanges 6 at the upper ends of the sections and are adapted to rest thereon. In this form of standard the sections 4 are coupled together by coupling element 61, provided with grooves 62, which are adapted to receive flanges 6 and 60 of the sections 4.

When the parts are set up in the form of closed shelving, as shown in Figs. 2 and 10, the shelving is divided into separate compartments by compartment end walls 70, which extend across the shelving between and within each pair of standards 1 and 2. In this form of shelving, connecting elements 75 are substituted for the connecting elements 15, used for the open shelving, through which elements 75 the walls 70 extend, so that one continuous wall 70 may be used to close the ends of a plurality of superposed compartments. The connecting elements 75 are composed of two U-shaped sections 76, which extend side by side between the standards 1 and 2. Each member 76 comprises an intermediate member 77, side members 78 and 79, and a flange 80, which projects upwardly from member 79 and is engaged by an end wall 21 of a shelf 3 to hold the pairs of standards 1 and 2 together.

When a wall 70 divides two compartments, the sections 76 of each connecting element 75 are placed within and against the side walls of the standards, with their side members 78 toward each other. When an element 75 is placed in this position, a space is left between the members 78, owing to the relative dimensions between the standard side walls and between the outsides of the side members 78 and 79 of the sections 76, through which space the wall 70 extends. In this position of the connecting element 75, the flanges 80 are at the respective sides of the element for engaging a shelf flange 21 at each side of the element.

When a wall 70 closes an end of the shelving, one of the sections 76 of the connecting element 75 is reversed and placed so that its flanges 79 and 80 receive therebetween the flange 78 of the other section 76, and the flange 78 of the reversed section lies adjacent the inside of the outside side walls of the standards at the end of the shelving, leaving a space between the said member 78 and the outside standard side wall, through which space extends the wall 70 which closes the end of the shelving. The flanges 79 and 80 are connected along their lower edges but are spaced otherwise, and provide flange-receiving members which are U-shaped in cross section.

If it is desired to use the shelving as a cupboard, doors 90 may be hinged to the

standards 1 to close the front of the shelving compartments.

What I claim is:

1. In sectional metal shelving, a plurality of channel shaped standards arranged in pairs, connecting members secured to the standards of each pair, shelves having depending end flanges, depending flange receiving members carried by the connecting members on opposite sides of said connecting members and each being substantially U-shaped in cross section and designed to receive the flanges on said shelves.

2. In metal shelving, a plurality of standards, connecting members secured to the standards, spaced parallel flanges carried by and depending from the connecting members and being connected with each other along their lower edges, shelves and flanges on said shelves engaging between the parallel flanges, said standards being channel shaped, said spaced parallel flanges projecting over opposite faces of one of the sides of each standard.

3. In metal shelving, upright channel shaped standards arranged in pairs, a pair of connecting members secured to the standards of each pair, each of said connecting members being channel shaped, flange receiving members carried on the outer longitudinal sides of the connecting members, the connecting members of each pair being spaced from each other throughout their length, shelves and flanges on said shelves engaging in the flange receiving members.

4. In metal shelving, a pair of standards each being channel shaped and having their open sides opposed, a channel shaped connecting member extending between and secured to the side flanges of the channel shaped standards, and a parallel offset flange secured along one longitudinal edge of the connecting member and projecting over the outer face of one of the side flanges of the standards.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 25th day of June, 1914.

JAMES L. DAVIDSON.

In presence of—

ALAN FRANKLIN,

LORRAINE E. DURROW.