

Oct. 16, 1934.

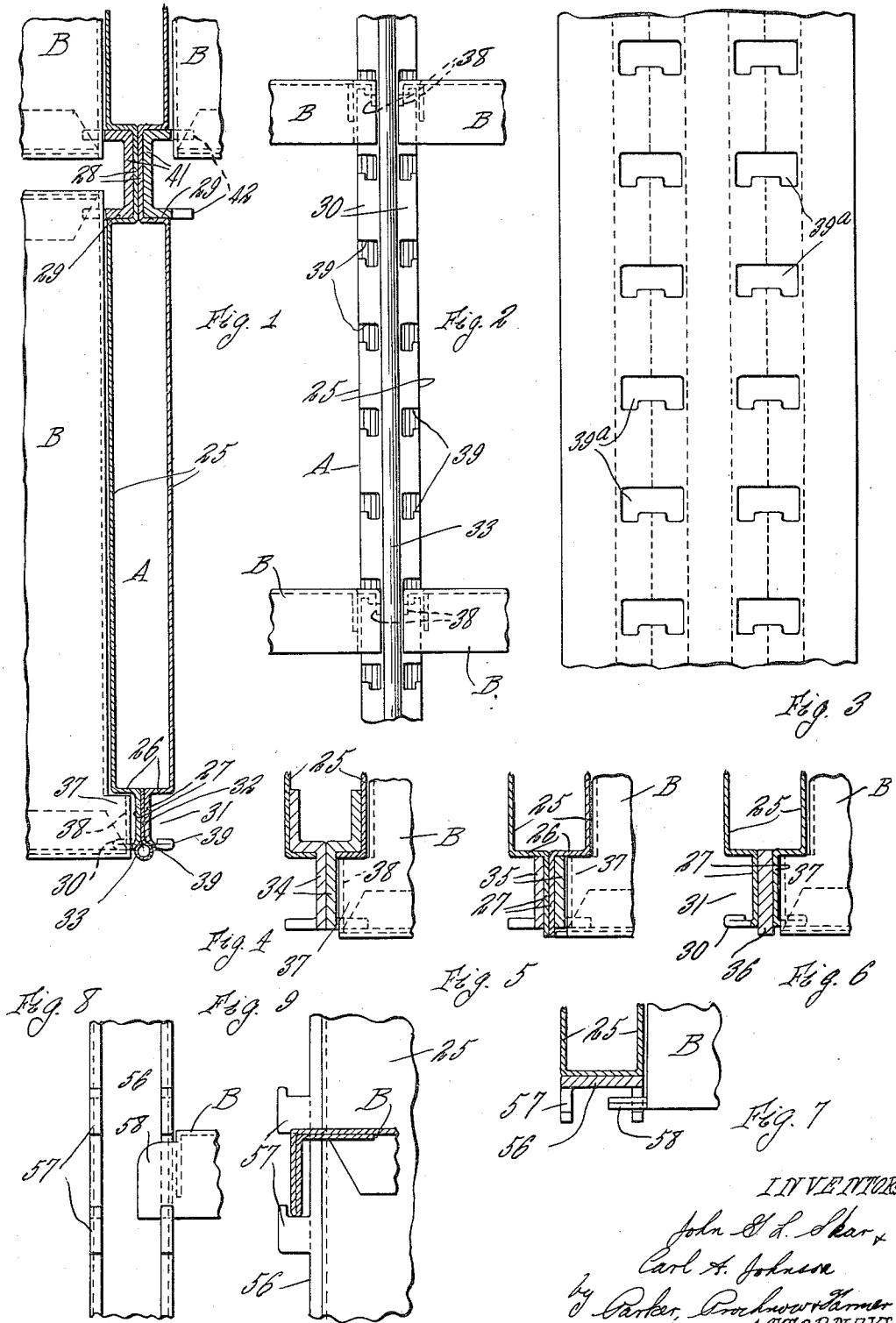
J. G. L. SKAR ET AL

1,976,810

SHELVING AND THE LIKE

Filed May 6, 1933

3 Sheets-Sheet 1



INVENTORS
John G. L. Skar &
Carl A. Johnson
by Parker, Proulx & Warner
ATTORNEYS

Oct. 16, 1934.

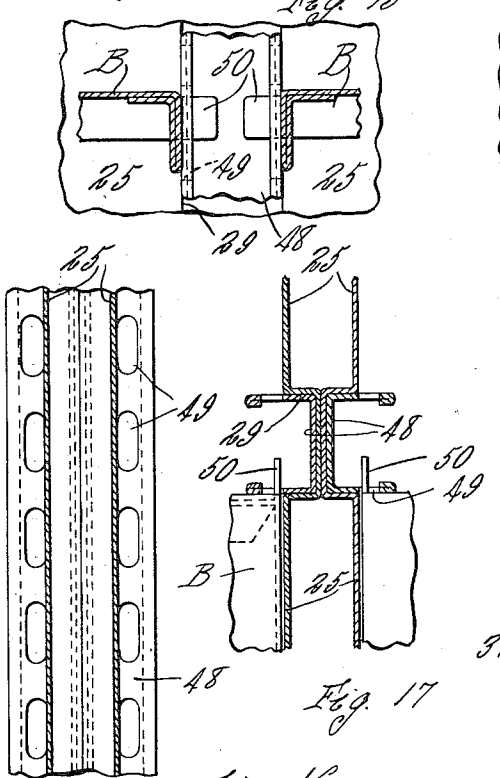
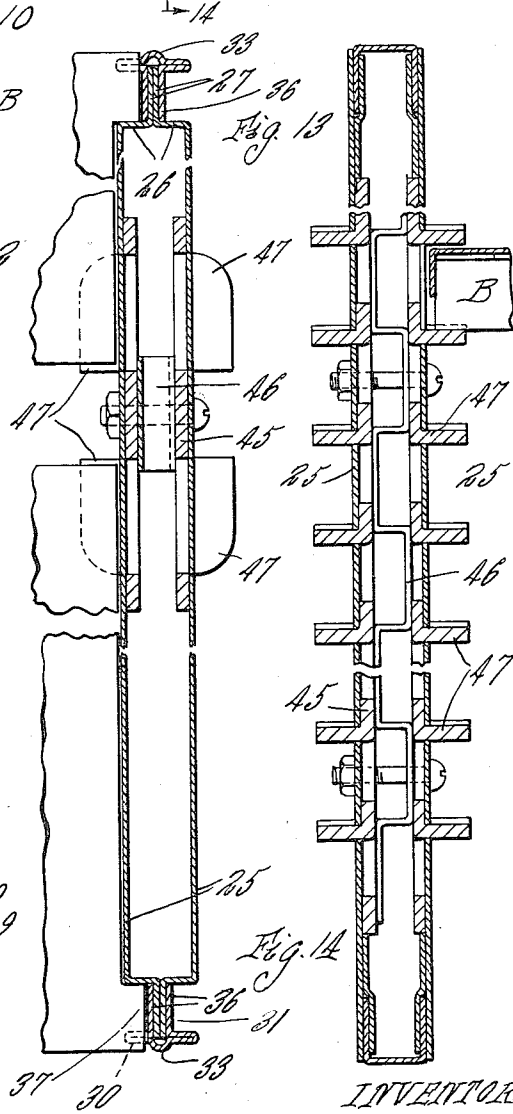
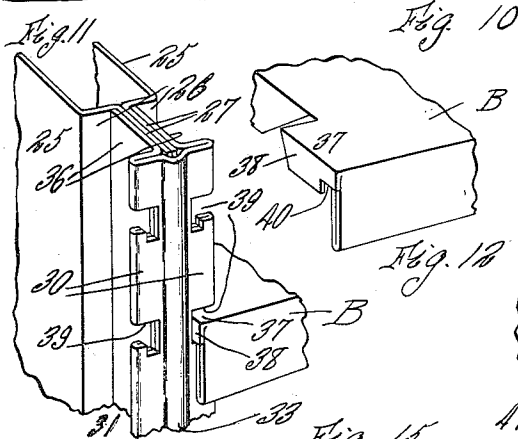
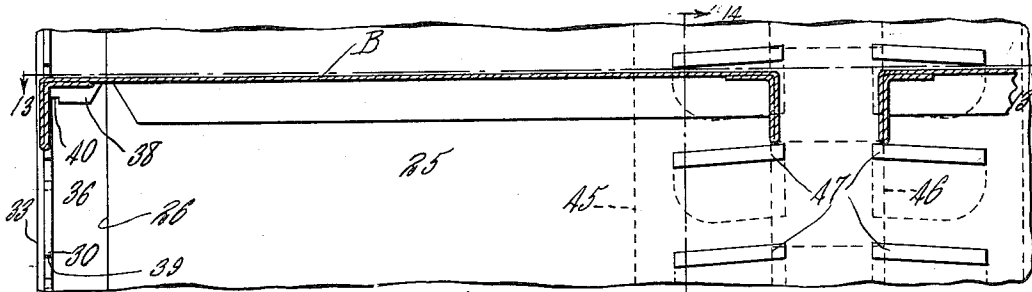
J. G. L. SKAR ET AL

1,976,810

SHELVING AND THE LIKE

Filed May 6, 1933

3 Sheets-Sheet 2



INVENTOR

John G. L. Skar &
Carl A. Johnson
by Parker, Brockway & Thomas
ATTORNEYS

Oct. 16, 1934.

J. G. L. SKAR ET AL

1,976,810

SHELVING AND THE LIKE

Filed May 6, 1933

3 Sheets-Sheet 3

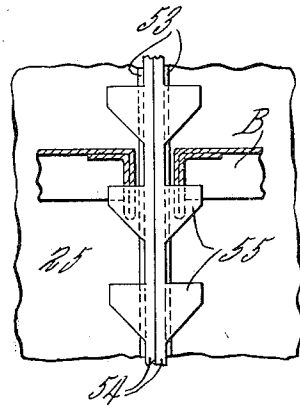
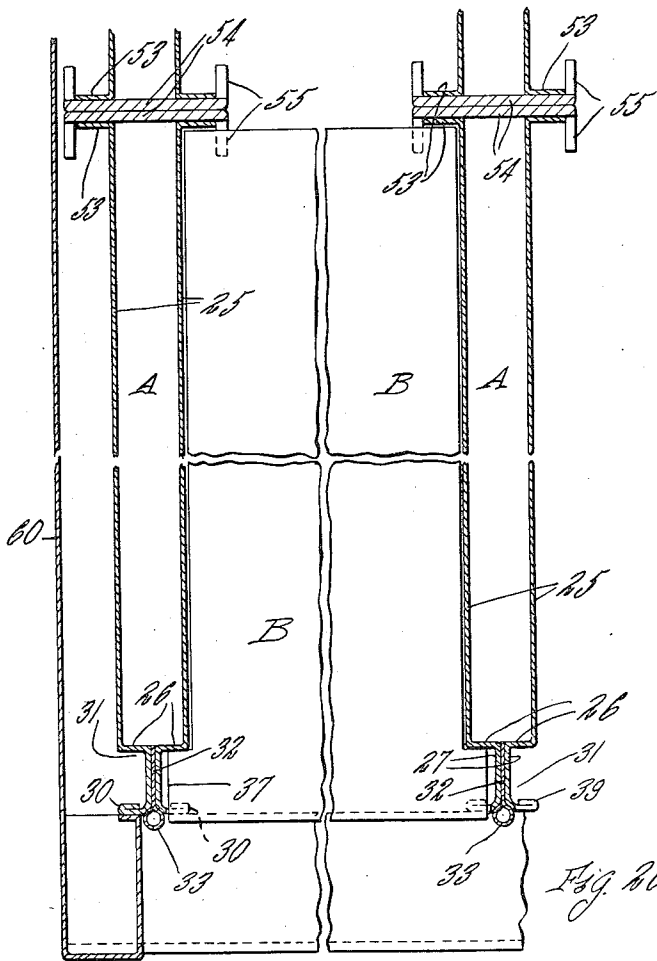
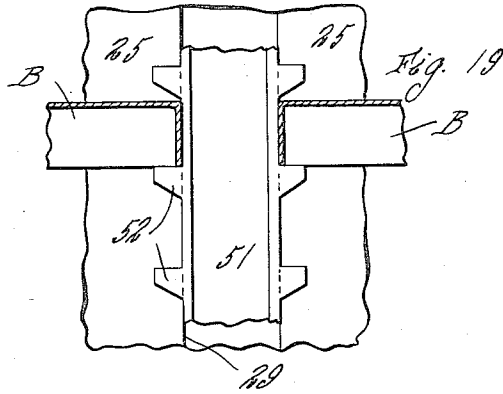
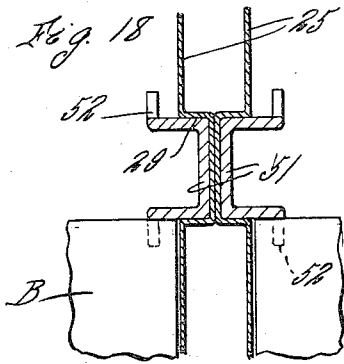


Fig. 21

Fig. 20

INVENTORS
John G. L. Skar &
Carl A. Johnson
by Parker, Prochnow & Warner
ATTORNEYS

UNITED STATES PATENT OFFICE

1,976,810

SHELVING AND THE LIKE

John G. L. Skar and Carl A. Johnson, Jamestown,
N. Y., assignors to Art Metal Construction Com-
pany, Jamestown, N. Y.

Application May 6, 1933, Serial No. 669,714

14 Claims. (Cl. 211-136)

This invention relates to improvements in metallic bookracks, shelving and the like. In structures of this sort, particularly in library stack shelving, the shelves commonly extend between and are supported at their ends by uprights or supports which form the end walls of the shelving and, in order to reduce the weight of the structure and yet provide the requisite rigidity and strength for carrying the weight of the shelves and their load, these uprights are frequently made of sheet metal and of hollow or tubular formation and provided with slots for the engagement of parts on the shelves or on shelf-supporting members for supporting the shelves. It has been found, however, that such constructions, in which these slots communicate with the interior chambers of the hollow uprights, are open to serious objection since they provide cavities which allow the lodgment and accumulation of dust or foreign matter and form hiding and breeding places for insects or vermin, and therefore make it difficult to keep the structures in proper sanitary condition and preserve the contents of the shelving.

One object of our invention is to provide shelving or the like in which the shelves are supported by uprights of light hollow or sheet metal formation but in which the uprights are constructed and the shelves connected therewith in such a manner as to avoid the above noted objections.

Other objects of the invention are to produce a shelving or like structure of novel construction which will be strong and rigid and of good appearance, and in which the shelves are removably arranged so that they can be readily placed in position and removed, and adjusted as required to provide different desired spacings between them, while nevertheless the shelves are held in place against unintentional displacement both lengthwise and crosswise and also serve to tie together the uprights and brace or strengthen the structure; and also to improve shelving and the like structures in the other respects hereinafter described and set forth in the claims.

The accompanying drawings illustrate several different embodiments of our invention. In said drawings:

Fig. 1 is a fragmentary, sectional plan view of a shelf-supporting upright of one form and the adjacent portions of shelves supported thereby.

Fig. 2 is a fragmentary, front elevation thereof.

Fig. 3 is a fragmentary plan of the sheet metal blank which is folded to form the flanged outer edge of the modified upright shown in Figs. 10 to 13.

Figs. 4, 5 and 6 are sectional plan views showing different ways of forming the flanged front edges of uprights similar in type to that shown in Figs. 1 and 2.

Fig. 7 is a sectional plan view showing the front edge portion of an upright of still another construction.

Figs. 8 and 9 are respectively a fragmentary, front elevation and a fragmentary, transverse sectional elevation showing an upright of the form shown in Fig. 7, and the adjacent portion of a shelf supported thereby.

Fig. 10 is a fragmentary, transverse sectional elevation of a shelving structure showing a modified construction of the supporting means for the outer and inner edges of the shelves.

Fig. 11 is a fragmentary perspective view of the front portion of the upright shown in Fig. 10.

Fig. 12 is a fragmentary, perspective view of one end of a shelf adapted to be used with uprights of the construction shown in Figs. 10 and 11.

Fig. 13 is a sectional plan view on line 13-13, Fig. 10.

Fig. 14 is a longitudinal sectional elevation on line 14-14, Fig. 10.

Figs. 15-17 are respectively a transverse sectional elevation, a longitudinal sectional elevation and a sectional plan view showing another construction for supporting the inner edges of the shelves.

Figs. 18 and 19 are respectively a sectional plan view and a transverse sectional elevation showing a different formation for supporting the inner or rear edges of the shelves.

Figs. 20 and 21 are respectively a sectional plan and transverse sectional elevation of still another modification of the invention.

Referring first to the construction shown in Figs. 1, 2 and 10-14, the shelf-supporting upright A is of hollow tubular shape formed by opposite spaced sheet metal side plates 25 joined or meeting at their opposite, vertical edges. The upright, as shown, is intended to support two tiers of shelves, arranged back to back, and is therefore formed at its opposite vertical edges to provide supports for the outer edges of the shelves of the two tiers, and is formed between its opposite vertical edges to support the inner edges of the shelves. Only one of the outer edge formations of the upright is shown in Fig. 1, but it will be understood that its opposite edge may be of the same or other suitable formation, as hereinafter explained.

The outer edge formation of the uprights may be constructed in various ways, that shown in

Figs. 1 and 2, and 20 being at present considered as a preferred arrangement.

In this construction, the opposite side plates 25 are formed adjacent the outer edge of the upright with inbent portions 26 provided with outwardly projecting flanges 27, and between the opposite vertical edges of the upright, the plates 25 have depressed portions 28 which abut face to face and form vertical grooves 29 in the opposite faces of the upright, the purpose of which will hereinafter appear. The upright is also provided at its outer edge with opposite, laterally projecting vertical flanges 30 spaced from the inbent portions 26 of the plates 25 so as to form vertical grooves 31 in the opposite sides of the outer edge portion of the upright. The flanges 30 may be formed by bending these portions longitudinally upon themselves to make the double-thickness flanges 30 shown, thus providing strong and neat vertical edges therefor. The edge formations are preferably provided with a central vertical bead 33 which gives a desirable finish to the front edge of the upright. In said Figs. 1, 2 and 20, said bead 33 is formed on an edge of a separate strip or insert 32 which is placed between and in engagement with the flanges 27, the abutting parts 27 and 32 being rigidly secured together, as by welding.

The upright could be constructed in various different ways to provide opposite lateral flanges and grooves at its outer edge portion. For example, it could be constructed as shown in any of the Figures 4 to 6.

In Fig. 4 the flanges and grooves are formed by opposite abutting strips 34 which are bent to provide the lateral flanges and grooves and which strips extend between the inbent edges of the side plates 25. The strips 34 may be secured together and to the side plates as by welding.

In the Fig. 5 construction, the lateral flanges are formed by two angle-shaped strips 35 which are secured, as by welding, against the opposite outer faces of the outwardly projecting flanges 27 of the two side plates 25 of the upright.

As shown in Fig. 6, the outer edges of the flanges 27 of the side plates 25 are bent outwardly and folded back upon themselves to form the lateral flanges 30, as in the first construction, and the edge portion of the upright is strengthened by a thick metal strip 36 which is secured, as by welding, between the flanges 27.

In the construction illustrated in Figs. 10 to 14, the front flanges 30 of the uprights A are formed by a sheet metal edge strip made from a blank such as is shown in Fig. 3. This blank is folded lengthwise upon itself along the broken lines to make the double-thickness flanges 30, and inwardly extending edges 36, which straddle the flanges 27 and are secured thereto by welding. The bead 33 in this construction is formed integrally in the strip.

Each shelf B is preferably formed at each end, adjacent its opposite edges, for engagement with an adjacent upright so that the upright will support the shelf both at its outer and inner portions. For this purpose the shelf shown is provided at each end adjacent its front edge with an endwise projecting tongue 37 having a downbent end flange 38, see Fig. 12, adapted to project into the groove 31 of the upright and rest in any one of a series of notches 39 in the edges of the flanges 30 of the upright. These notches, in the construction shown in Fig. 1, are formed by the slots 39a shown in the blank, Fig. 3. The flanges 30 of the upright can be notched in any suitable

way, preferably the notches 39 are of angle form and the tongue flanges 38 are notched as shown at 40 so that these parts will interengage and thereby prevent either longitudinal or transverse shifting of the shelf so as to allow unintentional disengagement of the tongue from the notch of the upright.

The upright may be of various different constructions or formations adapted to support the shelves at or adjacent their inner edges. For instance, as shown in Fig. 1, channel-shaped strips 41 secured in grooves 29 in opposite sides of the upright, as by welding, have their projecting edges notched to form spaced lugs 42 on which downbent stiffening flanges provided at the ends of the shelves are adapted to bear to support the shelves.

With the described formation of the upright and shelf, each shelf can be slipped rearwardly into place between two of the uprights A until its end flanges rest on an opposite pair of lugs 42 of the uprights, and the tongues 37 at the outer edge of the shelf enter a pair of notches 39 in the outer flanges 30 of the uprights, the shelf being pushed inwardly until the tongues strike the inner walls of the grooves 31 in the uprights, which will arrest the shelf with the notches 40 in the ends of the tongues 37 registering with and adapted to straddle the lower edges of the notches 39 of the uprights. The shelf will thus be prevented from shifting either inwardly or outwardly unless its front edge is lifted sufficiently to disengage the notches 40 from the outer supporting lugs of the uprights. Furthermore, when the shelf is in place between the two uprights, the hook-like lugs formed by the angular notches 39 will engage the inner faces of the end flanges 38 on the shelf tongues and prevent accidental shifting of the shelf lengthwise out of engagement with the lugs, the shelf thus acting to tie together or prevent the spreading of the uprights. The shelf-supporting notches or lugs of the upright are so spaced as to permit the usual adjustments of the shelves to different desired distances apart.

Several different constructions of the inner or middle shelf-supporting portion of the upright are shown in the drawings. For example, Figs. 13 and 14 show a construction in which the sheet metal side plates 25 of the upright are reinforced by vertical, metal lug strips 45 which may be secured in place with an interposed spacer 46 between the side plates 25 by bolts, welding or otherwise and are provided with struck-out lugs 47 which project out through and closely fit in slots in the side plates 25. The usual depending stiffening flanges at the inner edges of the shelves may rest on these lugs, as indicated in Figs. 10, 13 and 14.

Figs. 15-17 show another construction in which sheet metal channel strips 48 are secured in the grooves 29 in the opposite faces of the upright. These channel strips, the flanges of which are preferably reinforced by folding in their edge portions, are provided with slots 49 into which rearwardly projecting lugs 50 at the inner edge of the shelf are adapted to project to support the shelf.

Two other slightly different constructions for this purpose are illustrated in Figs. 18-21. As shown in Figs. 18 and 19, channel strips 51 are secured in the opposite vertical grooves 29 of the upright, as in the construction shown in Fig. 1, but their flanges are provided with forwardly and rearwardly bent lugs 52 on which the down-

bent stiffening flanges at the inner edges of the shelves bear.

In the construction illustrated in Figs. 20 and 21 the side plates of the upright A are divided at the middle of the upright, the inner edges of the plate sections being formed with laterally bent flanges 53 and two lug strips 54 extend transversely through the upright between the flanges 53 of the sections of the side plates to which they may be secured as by welding. These transverse lug strips are provided at their outer edges with forwardly and rearwardly bent spaced lugs 55 on which the inner edge flanges of the shelves may rest, as illustrated in these figures.

Figs. 7, 8 and 9 show still another formation for the front or outer edge of the upright. In this case the upright, instead of being provided with the laterally projecting flanges 30, as hereinbefore described, has secured on its outer, or front edge face, a lug strip 56 provided with forwardly projecting hooked lugs 57 on which laterally projecting tongues 58 at opposite ends of the front edge of the shelf are adapted to rest.

It will be noted with reference to each of the constructions illustrated and described that while the shelf supporting upright is of sheet metal or light weight hollow formation, yet it is of strong and rigid construction which has ample load-carrying capacity. Nevertheless, the openings or notches provided for the adjustable engagement of the shelves with the uprights do not lead into or connect with any interior chamber of the hollow upright. Therefore all of the surfaces or spaces on or in which dust, insects or other foreign matter can lodge are exposed and can be readily cleaned, and there are no hidden or inaccessible cavities for the accumulation of such material.

When an upright A is located at the end of a range of shelving where it would be exposed to view, it can be constructed so that its exposed outer side will present a desired attractive or finished appearance, or instead of this, a suitable finishing or cover wall or plate 60 can be arranged at the outer side of the upright, as represented at the left hand end of Fig. 20.

The interior chamber of the hollow upright A may be closed at its upper and lower ends by any suitable construction, such for instance as illustrated in Fig. 13 of the drawings.

We claim as our invention:

1. Shelving comprising shelves and shelf-supporting uprights at opposite ends of the shelves one of which at least has a body of hollow formation arranged opposite the ends of said shelves and vertical shelf-supporting flanges projecting from the upright in front of said hollow body, said flanges being of solid formation provided with slots which removably support the shelves but which have no communication with any interior chamber of said upright, said shelves being movable rearwardly between said uprights for supporting engagement therewith and with said slots.

2. Shelving comprising shelves and shelf-supporting uprights at opposite ends of the shelves each having a body of hollow formation arranged opposite the ends of said shelves, and spaced shelf-supporting slots formed along the front edge portion of the upright in a part of the upright of solid formation and having no communication with any interior chamber of said hollow body, said shelves being movable rearwardly between said uprights for supporting engagement therewith and with said slots.

3. A shelf-supporting upright for shelving which upright is hollow transversely of the shelves

for substantially the width of the shelves, and has solid flanges with forwardly opening shelf-supporting slots which project laterally at opposite sides of the upright and are spaced from opposite edges of said hollow portion by solid portions of less thickness than said hollow portion, but which flanges do not project laterally beyond the sides of the hollow portion of the upright.

4. A shelf-supporting upright for shelving which at its outer vertical edge portion has an outwardly projecting slotted solid flange for supporting the outer edge portions of shelves, and is hollow inwardly beyond and spaced from said flange, the internal chamber of said hollow portion being closed against access of dust or insects thereto, said slotted flange having portions adapted to interlock with portions of the shelves to prevent unintentional shifting of the shelves in the flange slots.

5. Shelving comprising shelves and a shelf-supporting upright having a body of hollow formation arranged opposite the ends of said shelves, the internal chamber of said hollow body being closed against access of dust or insects thereto, and shelf-supporting flanges of solid formation projecting from the upright in front of said hollow body but not laterally beyond the side faces thereof, said flanges having forwardly opening slots and said shelves having end extensions at their front portions engageable with said slots by rearward movement of the shelves.

6. Shelving comprising shelves and a shelf-supporting upright having a body of hollow formation arranged opposite the ends of said shelves, the internal chamber of said hollow body being closed against access of dust or insects thereto and shelf-supporting flanges of solid formation projecting laterally from the upright forwardly of said hollow body and having forwardly opening slots which allow the shelves to be slid rearwardly into supporting engagement with the slots of the upright.

7. Shelving comprising shelves and a shelf-supporting upright having a body of hollow formation arranged opposite the ends of said shelves, spaced solid projections on said upright for supporting the front portions of the shelves, said projections being disposed forwardly of said hollow body and not extending laterally beyond the sides thereof, and spaced parts projecting laterally beyond the sides of said hollow body for supporting the rear portions of the shelves, said shelves being engageable with said supporting projections by rearward movement of the shelves parallel with the side of the upright.

8. An end supporting upright for shelves having a hollow body portion which is closed against access of dust or insects to the interior thereof, and having at its front edge portion outwardly projecting solid vertical flanges provided with shelf supporting slots which open forwardly and are spaced forwardly from said hollow body portion and have no communication with any interior chamber of the upright.

9. An end supporting upright for shelves having a hollow body portion, and a solid front vertical edge portion of substantially T-form in cross section, the head of the T being spaced forwardly from said hollow body and having spaced slots in its laterally projecting flanges for removably supporting the front portions of the shelves.

10. An end supporting upright for shelves having a hollow body portion, and a solid front vertical edge portion of substantially T-form in cross section, the head of the T being spaced forwardly

from said hollow body and having spaced slots in its laterally projecting flanges for removably supporting the front portions of the shelves, and said upright having external spaced projections on its sides for supporting the rear portions of the shelves.

11. An end supporting upright for shelves having a hollow body portion, and a solid front vertical edge portion of substantially T-form in cross section, the head of the T being spaced forwardly from said hollow body and having spaced forwardly opening slots in its laterally projecting flanges for removably supporting the front portions of the shelves.

12. A supporting upright for shelves having a hollow body portion which is closed against access of dust or insects to the interior thereof, a laterally projecting solid flange at the front vertical edge portion of the upright provided with forwardly opening shelf-supporting slots, and a portion of less thickness than said body which connects said flange to and spaces it forwardly from said hollow body.

13. A supporting upright for shelves having a

hollow body portion which is closed against access of dust or insects to the interior thereof, a vertical web portion of less thickness than said hollow body which projects forwardly from the front edge of said hollow body, and solid flanges which project laterally to opposite sides from said web portion in front of and spaced from said hollow body and are provided with shelf-supporting slots extending through said flanges in a forward and rearward direction.

14. A supporting upright for shelves having a hollow body portion which is closed against access of dust or insects to the interior thereof, the side walls of said hollow body having inwardly offset vertical edge portions which are connected and form an outwardly projecting web of less thickness than said hollow body, and an edge strip secured to said web and having a flange projecting laterally from said web in front of and spaced from said hollow body and provided with shelf-supporting slots.

JOHN G. L. SKAR.
CARL A. JOHNSON.

25

100

30

105

35

110

40

115

45

120

50

125

55

130

60

135

65

140

70

145

75

150