

W. N. VANCE.
METAL SHELVING.
APPLICATION FILED OCT 25, 1917.

1,375,869.

Patented Apr. 26, 1921.
3 SHEETS—SHEET 1.

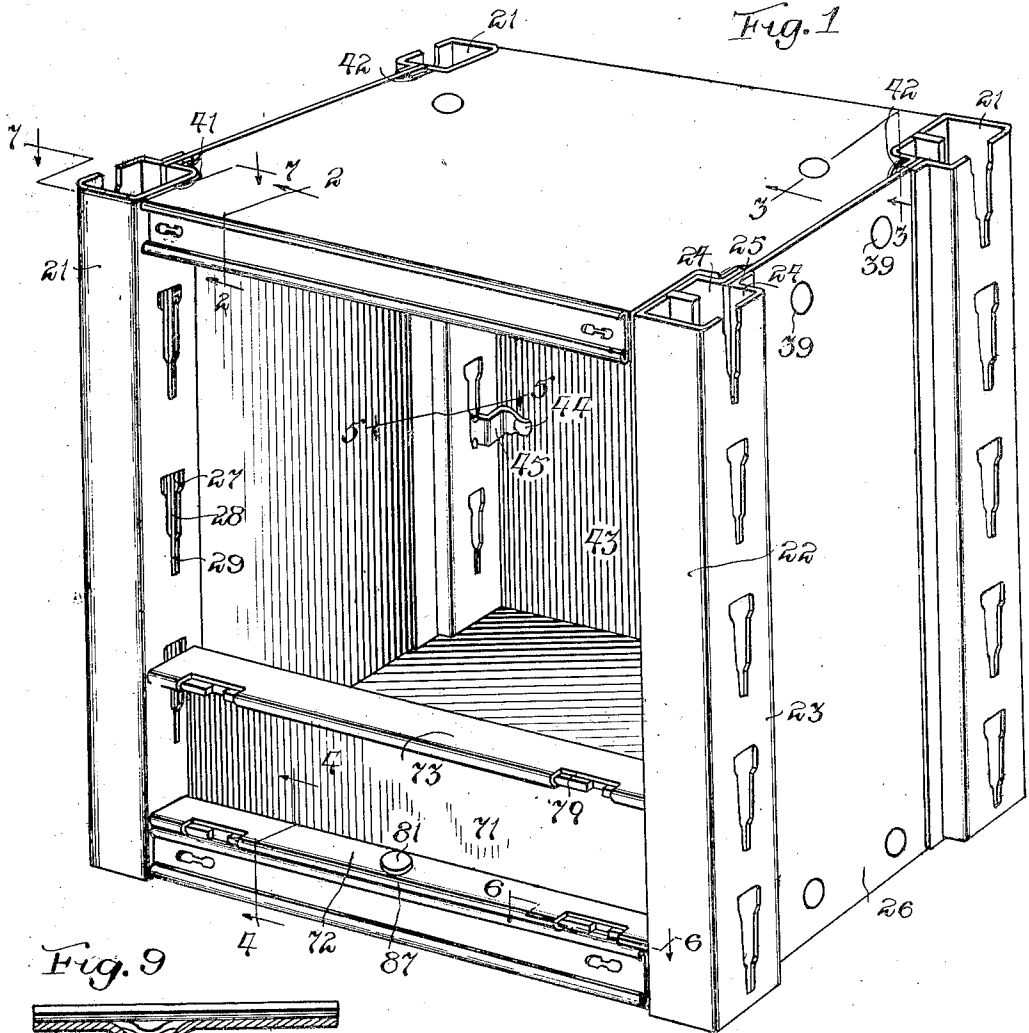
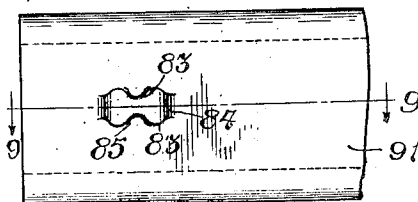


Fig. 9



Fig. 8



WITNESSES:

Chas. R. Korsch

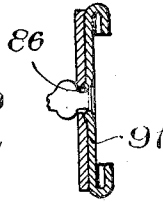
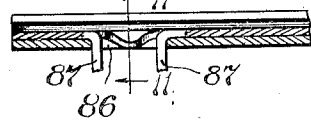


Fig. 11

Fig. 10



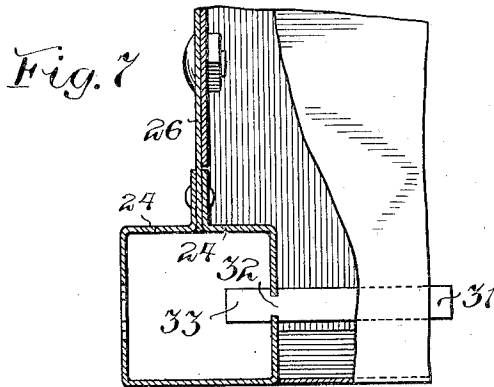
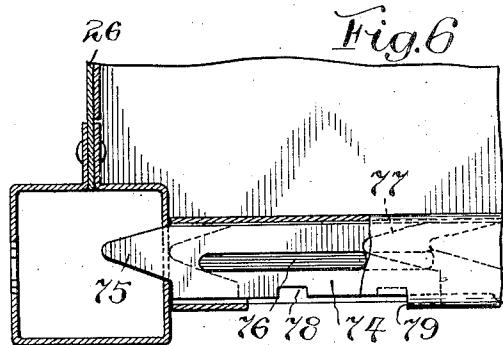
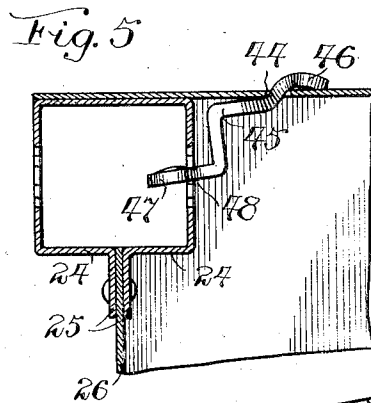
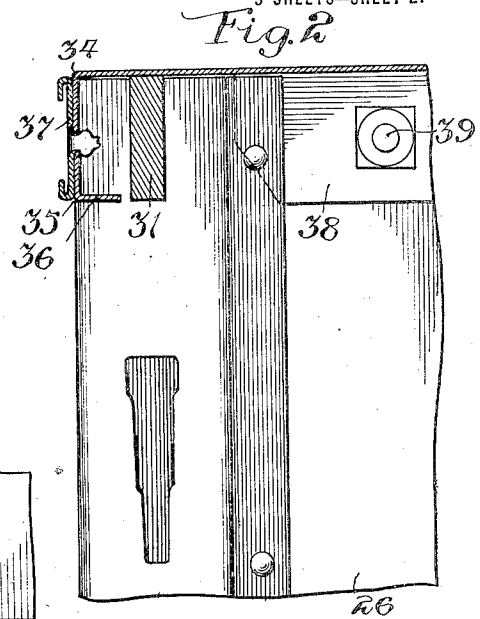
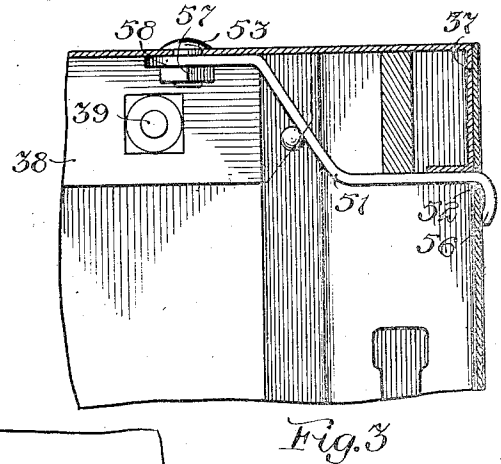
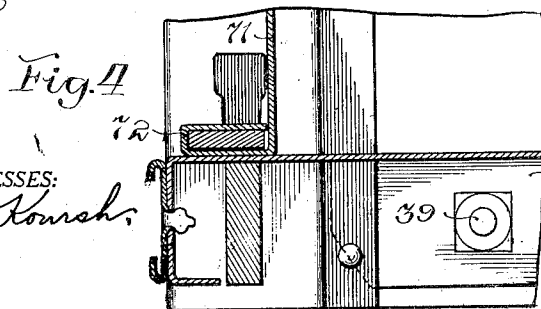
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1,375,869.

Patented Apr. 26, 1921.

3 SHEETS—SHEET 2.

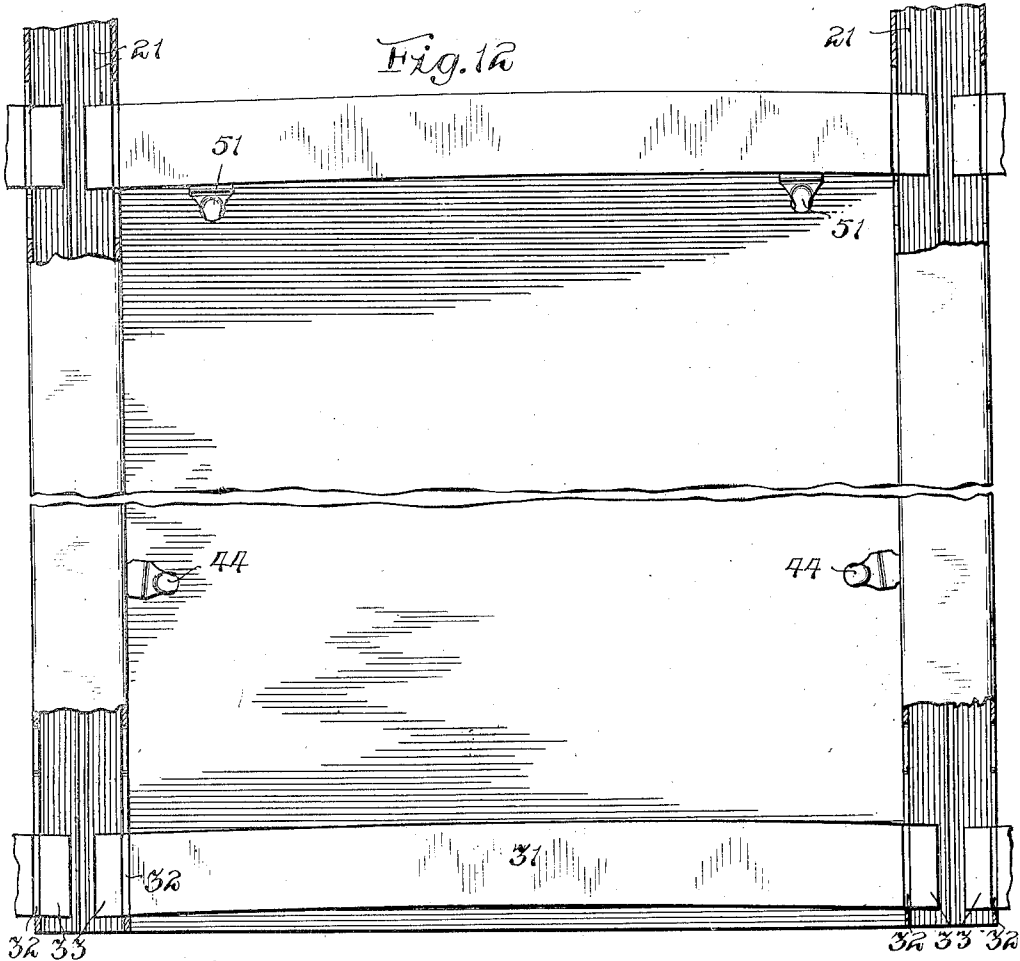
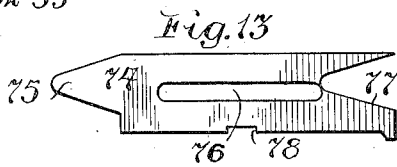
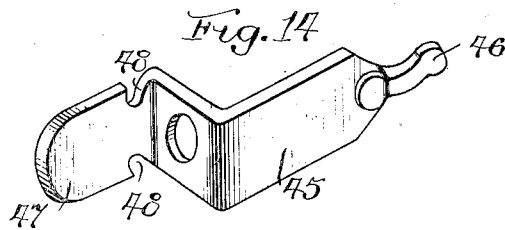
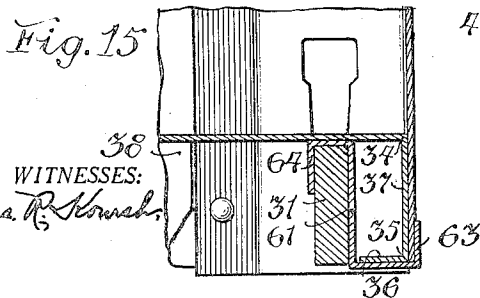


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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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METAL SHELVING.

1,375,869.

Specification of Letters Patent.

Patented Apr. 26, 1921.

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To all whom it may concern:

Be it known that I, WALTER N. VANCE, a citizen of the United States, residing in Chicago Heights, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Metal Shelving, of which the following is a specification.

This invention relates to metal shelving and has for its object broadly the general improvement of structures of this character.

An important object of the invention is the provision of a back which can be positioned after the frame is set up and without moving the frame away from the wall or out of an alcove in which it may be located. The shelving of the character to which this invention more particularly pertains is furnished in knocked-down condition and is assembled ordinarily at the location where it is to be finally installed. To the end that the shelving may be set up with the greatest facility, the parts of the embodiment of the invention about to be described are so constructed that they may be adjusted and secured together wholly from the front.

A further and important object of the invention is the provision of shelving of this character particularly designed to carry severe loads, such loads of course cause deflection of the parts and my invention contemplates the construction of the shelving so that this deflection within the prescribed or elastic limits of the material will not be objectionable either by reason of appearance or consequent separation of the parts.

Another important object of the invention is the provision of the shelves so constructed that maximum strength is provided.

Another important object of the invention is the provision of a readily positioned bin front which may be used or not as requirements may dictate and which may be substituted readily for others higher or lower and without requiring special formation of the other parts of the shelving.

A still further object of the invention is the provision of a new and improved construction of the parts to facilitate the positioning of the label holding devices.

Although the invention is believed to pertain primarily to open shelves, it will be manifest as the invention is better understood that numerous features or parts are

usable in other forms of shelves, in lockers, etc.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawing illustrating a preferred embodiment thereof.

Referring to the drawing,

Figure 1 is perspective view of part of a shelf unit, sufficient parts being shown, however, to disclose so much of the entire structure as is believed to be directly related to the present invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 1;

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 1;

Fig. 6 is a horizontal section taken on the line 6—6 of Fig. 1;

Fig. 7 is a horizontal section taken on the line 7—7 of Fig. 1;

Fig. 8 is a rear elevation of an end label holder before being positioned;

Fig. 9 is a section on the line 9—9 of Fig. 8;

Fig. 10 is a similar section showing the connection of said label holder secured in place;

Fig. 11 is a section taken on the line 11—11 of Fig. 10;

Fig. 12 is a front elevation with parts removed and parts broken away of the shelving embodying my invention and provided to show particularly the camber of the cross-bearings.

Fig. 13 is a detail plan view of one of the bin door holding dogs;

Fig. 14 is a perspective view of a clip employed to hold the rear wall in place; and

Fig. 15 is a detail section showing means of holding the bottom edge of a rear wall in place.

For the purpose of illustrating my invention I have shown on the drawing what may be termed a shelf unit, the complete shelving consisting of a multiple duplication of the parts shown. These parts comprise four uprights 21 which may be multiplied in number and in length, only sufficient uprights being shown on the drawing to sup-

port two shelves of the same vertical tier. In the present instance each of these uprights is of rectangular horizontal section having an outer imperforate wall 22, side 5 slotted walls 23 and inner walls consisting of two halves 24, each terminating in a flange 25, which flanges 25 of each upright extend outwardly from the upright and toward the corresponding upright in front-to-back alinement therewith. Each pair of 10 flanges in the present instance embraces an edge of a partition 26 extending vertically and from front to back; the edges of each of these partitions are firmly held between the flanges in any suitable manner. The 15 slots 27 of the uprights are duplicates each of the others and are arranged at intervals in two side walls 23 and they are of T shape. An upper part 28 is larger than a lower part 29, the side edges of the uprights forming these parts being preferably tapered so that the lowermost end of each slotted part is smaller than its uppermost end. Cross supports 31 having a neck 25 portion 32 near each end and a head 33 therebeyond are engaged in appropriate slots 27 and serve to support the shelves proper. Each of these shelves consists of a metal sheet which rests at the front and back upon 30 two cross supports 31 and secured as will be presently described at its side edges to the partitions. At the front and back the shelves extend beyond the cross support to the outer edge of the uprights and are bent 35 downwardly at 34 to about the height of the lower edge of the supports and are then bent inwardly at 35 to provide a flange 36 nearly closing the space between the outer part 37 between the bends 34 and 35 and the shelf 40 support 31. At the sides these shelf sheets are provided with flanges 38 which are bent downwardly to be disposed alongside the adjacent partition 26 to which they are secured by bolts 39 through appropriate apertures 45 in the partition and in the flanges 38. The corners are cut away on a right angle at 41 to fit about the uprights or posts and the flanges 38 extend between the post parts 34, the flange and shelf body being bent at 50 the points 42 to accommodate the flanges 25 of the uprights. This feature has been found to be of material importance as it adds greatly to the load bearing qualities of the shelves. That is to say, the shelves can 55 carry a greatly heavier load than they are able to carry if the material were cut away to accommodate the flange 25 instead of being bent as just described.

The space between the uprights at the 60 rear is closed by a vertical wall 43 which is perforated to form round holes 44 appropriately arranged at intervals and near the side edges. This vertical wall, or back in the present instance, has its edges overlying 65 the outer faces of the adjacent uprights and

it is secured in place by a number of clips of different form now about to be described, it being understood, however, that all of these clips need not be used although their conjoint use is thought to provide the best 70 construction.

Considering first clips indicated on the drawing at 45, which may be termed side clips and which secure the back 43 to the uprights, it will be noted by comparing 75 Figs. 1, 5 and 14 that each of these clips consists of a strong sheet metal strap having its ends 46 and 47 bent in order that the end 46 may engage through a perforation 44 in the back and through one of the 80 slots 45 in the upright. The end 46 is of reduced form and serves as an interlocking tongue when installed through the aperture 44 and given a rotative movement to bring the end 47 into the slot 27. The connection 85 between the tongue 46 and the aperture 44 is in effect a universal joint permitting the end 47 to have a plurality of movements, first into position in the upper part of the slot and then down into the lower part. 90 The end 47 is provided with top and bottom notches 48 where it engages the material of the upright and the clip is bent intermediate its edges as indicated in Fig. 5 to lie close along the back wall and close also along the 95 upright. These clips thus interlock with both the uprights and back or vertical wall and bind the uprights and vertical wall together.

Two clips or shelf supports 51 are also 100 provided to hold the vertical wall close against the vertically extending part 37 of the shelf. These clips are secured in place through perforations 52 in the back wall and 53 in the shelf. Each top clip has a reduced end 56 formed into a bent tongue and engageable through an appropriate perforation 52. The other end of the clip 51 is perforated to receive a bolt 57 also extending 105 through the perforation 53 in the shelf. This clip is positioned by having the tongue 56 inserted through a perforation 52 and then springing the clip upwardly until its other end 58 contacts with the under face of the shelf and in position to receive the 115 bolt 57. Two of the walls of the shelving are thus locked together, these walls in the present instance being one of the shelves and the back although the clip may be used to connect other walls in substantially like 120 manner.

At the bottom the wall or back 26 is connected to the adjacent cross support 31 by clips 61 (Fig. 15). The lower edge 62 of the back extends down to or adjacent the 125 bend 35 in the shelf. Each clip 61 is composed in the present instance of a stiff metallic strip having its ends 63 and 64 bent to provide oppositely arranged channels. The clip is positioned by arranging the chan- 130

nel formed by the ends 64 to embrace the upper edge of the cross support 31 and disposing the lower edge of the shelf and the lower edge of the back 62 in the channel formed by the end 63. When this back is to be positioned the clips 61 are first hung upon the lower cross support in the manner shown and described. The shelves are then placed in position and the backs slid down from above and behind the uprights until its lower edge 62 rests with the lower edge of the shelf in the channel formed by the end 63. The other clips may then be inserted from the front by placing the tongues 46 and 56 through appropriate apertures 44 and 52 respectively and the other ends of these clips connected in place as already described.

It is frequently desirable to close a part of the space between the uprights at the front of the shelves and to this end I provide bin fronts indicated at 71, which bin fronts are arranged to be positioned after the entire shelving is set up and these bin fronts may be of almost any height desired. Each bin front comprises a metal sheet adapted to fit between the adjacent front uprights and has its edges bent to provide loops 72 and 73 which embrace holding dogs or latches 74, one being arranged at each end of each embracing loop. Each of these dogs or latches has a tapered forward end 75 adapted to engage in appropriate slot 27 and at its rear or other end is bifurcated, the bifurcation extending almost to the end 75. These dogs or latches are stamped from suitable heavy material and the tapered end 75 of one results in a tapered recess at the other end of the adjacent dog or latch formed in the punching. A slot 76 connecting at one end with the tapered recess 77 just described produces the bifurcation mentioned. In one edge of each dog or latch a slot 78 is provided to permit the manipulation of the dogs or latches when in place in the bin front. The loops 73 are cut away at 79 to expose this slot and to permit it to be engaged by a suitable tool to retract or project the ends 75 as occasion may require. The dogs are held tightly in the embracing loops of the wall or bin front, the bifurcated end rendering them somewhat yielding.

When the bin front is positioned the two lowermost dogs enter into the slots 27 in which the cross support just beneath is secured. The tapered ends of the dogs enable them to engage in slots higher up and at any desired heights in said slots, the difference in cross sectional area of the slots being taken care of by the extent the dogs are caused to project. It will be manifest, therefore, that the only heights at which bin fronts cannot be provided are heights that would bring the dogs between the successive slots. As these slots are placed relatively

closely adjacent vertically for all practical purposes bin fronts of any desired height can be inserted or substituted for others already in place.

The shelving shown on the drawing is adapted to carry heavy loads and of course a consequent resulting deflection is sustained by the cross supports and also by the shelves which are more readily bendable. In order that this deflection shall not destroy the appearance of heavily loaded shelves I give to the cross supports a camber so that the deflection from unloaded to loaded condition is divided upon both sides of the true horizontal and is therefore almost imperceptible to the eye. The edges of the bin fronts are straight and in order that the bin fronts may follow the deflection of the front, I provide central perforations 81 extending through the lower embracing loop 72 and through the shelf in which a bolt 82 is secured.

The front vertical parts 37 of the shelves form desirable label carrying parts and label holders are secured thereto. These label holders each consist of a channel member 91 adapted to be fastened at a plurality of points to a shelf edge. The fastener is formed from the holder itself by providing a pair of slits 83 and depressing the material between them as seen on a large scale in Figs. 8 and 9, the slits 83 setting off the bottom of the depression from the remainder. The depression is so formed that this connection 84 and the transverse center 85 are narrower than the intermediate parts. An oval or elongated aperture 86 is formed at a corresponding location in the part 37 of the shelf. When the label holder is to be positioned the depressions are brought into registration with these apertures and a punch or nail set driven in the depression which results in a separation at the center and a straightening back of the two halves of the depression thus formed. Each of these halves form an undercut lug 87 engaging back of the narrower ends of the recess thereby securing the label holder in place.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing any of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. Metal shelving comprising: uprights, shelves carried thereby, a vertical wall closing the space between two uprights, and clips interlocked with said shelves and said wall for holding said wall in position.

2. Metal shelving comprising: uprights, 130

shelves secured thereto, a wall closing the space between a pair of said uprights, a plurality of clips engaging said wall and said uprights, and a plurality of clips engaging said wall and said shelves for securing said wall in position.

3. Metal shelving comprising: perforated uprights, shelves carried thereby, a back wall for closing the rear of said shelving and extending between two of said uprights and provided with perforations, and clips for securing said wall in position and engageable in appropriate perforations in said wall and said uprights, said clips being positionable from the front of said shelving.

4. Metal shelving comprising: uprights having elongated slots or perforations, a vertical wall for closing the space between two of said uprights and provided with perforations, and clips for securing said wall to said uprights,—one of said clips having a bent tongue engageable in a perforation in said wall and having a bent end at the other adapted upon subsequent rotative movement of the clip to engage in one of said slots.

5. Metal shelving comprising: uprights provided with T slots, a vertical wall for closing the space between two of said uprights and provided with perforations, and clips for holding said wall in position, one of said clips having a bent tongue adapted for insertion in a perforation of said wall and having a head at the other engageable in said slot.

6. Metal shelving comprising: uprights provided with T slots, a vertical wall for closing the space between two of said uprights and provided with perforations, and clips for holding said wall in position, one of said clips comprising a metal strip bent to conform to the angle between said wall and upright and having its two ends offset and engageable respectively in one of the slots of the upright and one of the perforations of the wall.

7. Metal shelving, comprising a pair of angularly disposed sheet metal walls, one of which may be a shelf, uprights supporting the same, and clips intermediate opposite uprights and connecting said walls together.

8. Metal shelving comprising: a pair of angularly disposed perforated walls, one of which may be a shelf, and clips connecting said walls together, one of said clips having a bent end insertible through a perforation of one of said walls and having the other end secured against the adjacent face of the other of said walls.

9. Metal shelving comprising: a pair of angularly disposed perforated walls, one of which may be a shelf, and clips connecting said walls together, one of said clips comprising a bent end of reduced size insertible through a perforation of one of said walls

and having the other end secured to the other said wall and against its adjacent face.

10. Metal shelving comprising: uprights, cross supports connected to and carried by adjacent uprights, shelves carried by said cross supports, and bin fronts disposed above said cross supports, said cross supports being cambered and the bottom of said bin fronts being straight to cause deflection under load to maintain in substantial parallelism the bottom of said bin fronts and the tops of said shelf support.

11. Metal shelving comprising: uprights, cross supports connected to and carried by adjacent uprights, shelves carried by said cross supports, and bin fronts disposed above said cross supports, said cross supports being cambered and the bottom of said bin fronts and said shelf supports being connected together at the top of the camber to maintain said bin fronts and said shelf support in closely adjacent relation.

12. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing the space between a pair of said uprights, said wall having retractable dogs or latches projectable lengthwise of the shelf and in the perforations of said uprights.

13. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing the space between a pair of said uprights, said wall having retractable spring dogs or latches projectable lengthwise of the shelf and in the perforations of said uprights.

14. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing the space between a pair of said uprights, said wall being disposed between said uprights and having retractable dogs or latches projectable lengthwise of the shelf and in said perforations for maintaining said wall in place.

15. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing space between said uprights, said wall being looped upon itself to provide horizontally disposed flanges, and retractable dogs or latches carried by said flanges and adapted to engage said perforations to maintain said wall in place.

16. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing space between said uprights, said

5 wall being looped upon itself to provide horizontally disposed flanges, and retractable dogs or latches embraced in said flanges and adapted to engage said perforations to maintain said wall in place.

10 17. Metal shelving comprising: uprights provided with perforations, cross supports carried by said uprights, shelves carried by said cross supports, and a vertical wall for closing space between said uprights, said wall being looped upon itself to provide horizontally disposed flanges, and retractable dogs or latches embraced in said flanges and adapted to engage said perforations to maintain said wall in place, the extreme turned back edges of said flanges being cut away to manipulate said dogs or latches.

15 18. Metal shelving comprising: uprights provided with a plurality of perforations, cross supports engaged appropriately in said perforations, shelves on said cross supports, and a vertical wall for closing space between said uprights, said wall having retractable dogs engaging in perforations of said uprights, one of said dogs engaging in the same perforation with an end of a cross support.

20 19. Metal shelving comprising: uprights provided with a plurality of perforations, cross supports engaged appropriately in said perforations, shelves on said cross supports, and a vertical wall for closing space between said uprights, said wall having retractable dogs engaging in perforations of said uprights, one of said dogs engaging in the same perforation with an end of a cross support and the second dog engaging in a perforation thereabove.

25 20. Metal shelving comprising: uprights provided with duplicated elongated perforations or slots of varying horizontal dimensions, cross supports engaging in appropriate slots or perforations of said uprights, and a vertical wall for closing space between said uprights, and dogs at its upper edge engageable with said slots and irrespective of the presented horizontal dimension of the same.

30 21. Metal shelving comprising: uprights provided with duplicated elongated perforations or slots of varying horizontal dimensions, cross supports engaging in appropriate slots or perforations of said uprights, and a vertical wall for closing space between said uprights, and dogs at its upper edge engageable with said slots and irrespective of the upper horizontal dimension of the same, and provided with other dogs at its bottom and engaging the same slots with an adjacent cross support.

35 22. A wall for metal shelving comprising: a metallic sheet bent upon itself to provide an inclosing fold, a dog or latch embraced

in said fold, said dog having an end adapted to protrude from said fold, and an end bifurcated and yieldingly compressed by said fold. 65

23. A wall for metal shelving comprising: a metallic sheet bent upon itself to provide an inclosing fold, a dog or latch embraced in said fold, said dog having an end adapted to protrude from said fold, and an end bifurcated and yieldingly compressed by said fold, a part of said fold being cut away to permit manipulation of said dog. 70 75

24. Metal shelving comprising: uprights arranged in pairs from front to back the members of each pair having outstanding flanges extending toward each other, partitions engaged between said flanges, cross supports extending between members of adjacent pairs of uprights, shelves carried by said cross supports and flanged at their ends, the flanges of the ends of said shelves being connectible to said partitions, the flanges of said shelves extending past the flanges of said uprights, and the shelves and their flanges being bent to pass said flanges of said uprights. 80 85

25. Metal shelving comprising: uprights, cross supports extending between appropriate uprights, a wall for closing space between uprights connected by said cross supports, the lower edge of said wall being disposed adjacent the lower edge of one of said cross supports and connected thereto by clips passing over the upper edge of said cross support. 90 95

26. Metal shelving comprising: uprights, cross supports extending therebetween, metal shelving disposed upon said cross supports and having an edge bent downwardly and inwardly toward a cross support, a wall for closing space between the uprights connected by said cross supports, and clips passing over said cross support and under the edge of said shelf and the lower edge of said wall. 100 105

27. Metal shelving comprising: uprights, cross supports connecting the same, shelves carried by said cross supports and having their edges turned down in parallelism with said cross supports, a wall for closing space between uprights connected by one of said cross supports, and clips for holding said wall in place, said clips being provided with oppositely extending channels,—one extending in one direction and one extending in the opposite direction, to embrace the lower edge of a shelf and said wall. 110 115 120

Signed in the presence of two subscribing witnesses.

WALTER N. VANCE.

Witnesses:

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ETHEL WOOD.