Feb. 4, 1930. W. N. VANCE 1,745,518

METAL SHELVING

Filed May 16, 1927 3 Sheets-Sheet 1

Fig. 1

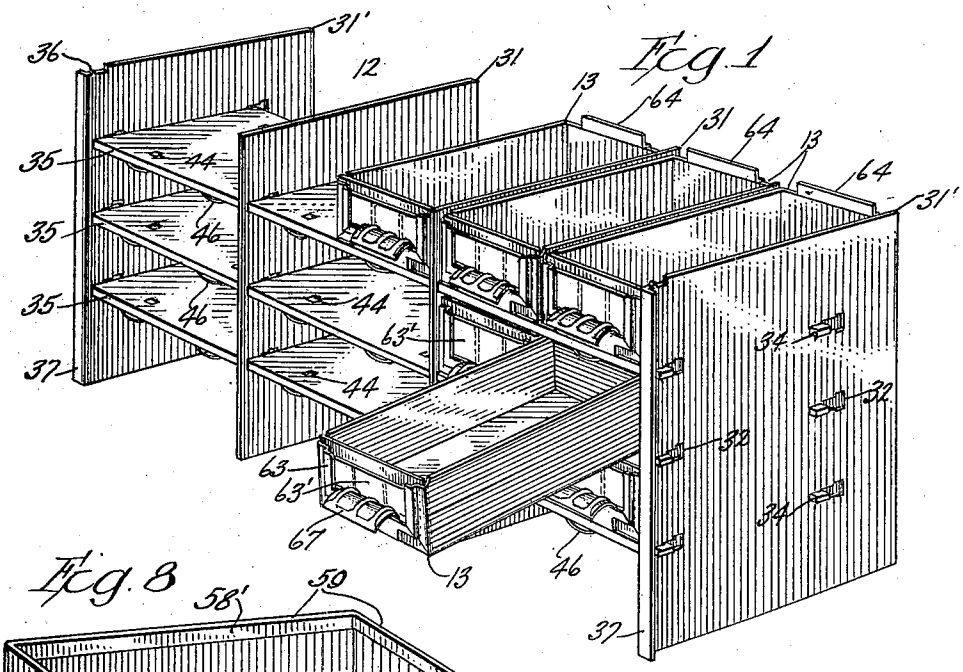


Fig. 8

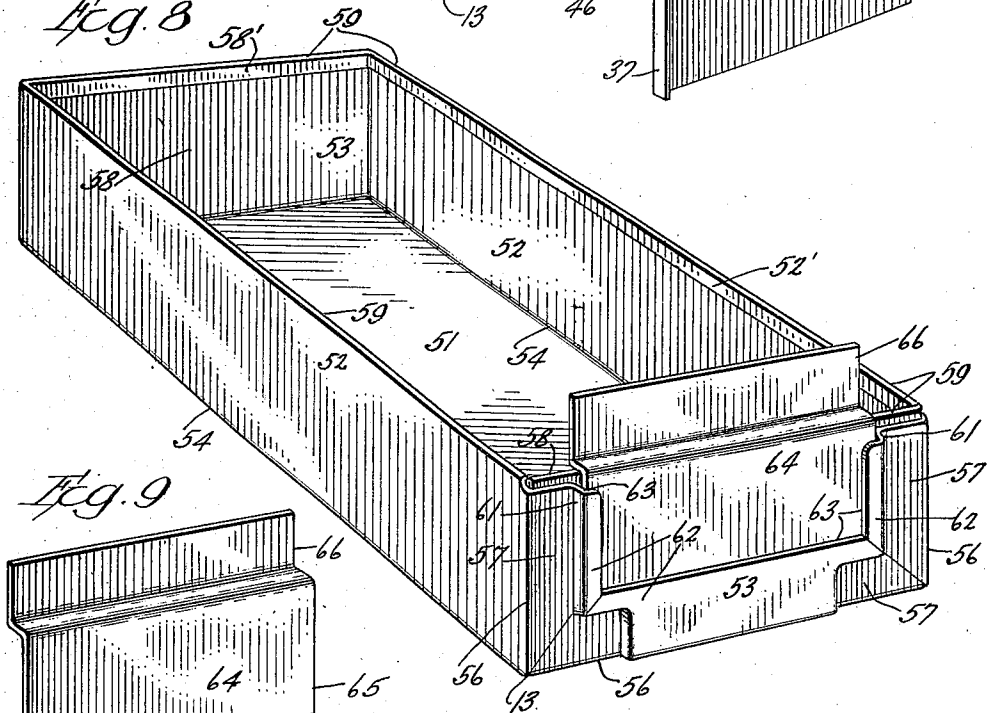
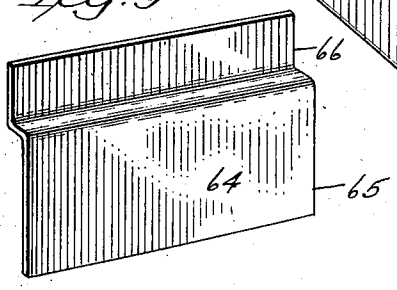


Fig. 9



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Filed May 16, 1927 3 Sheets-Sheet 2

Fig. 2.

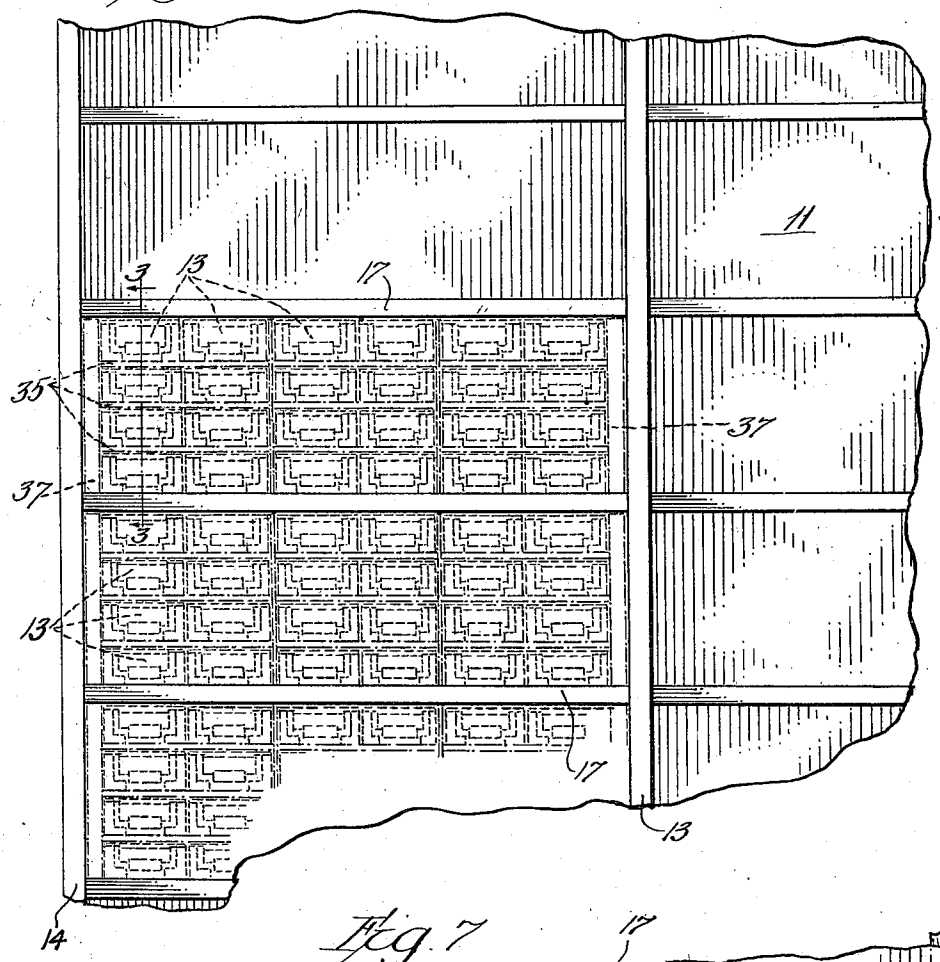
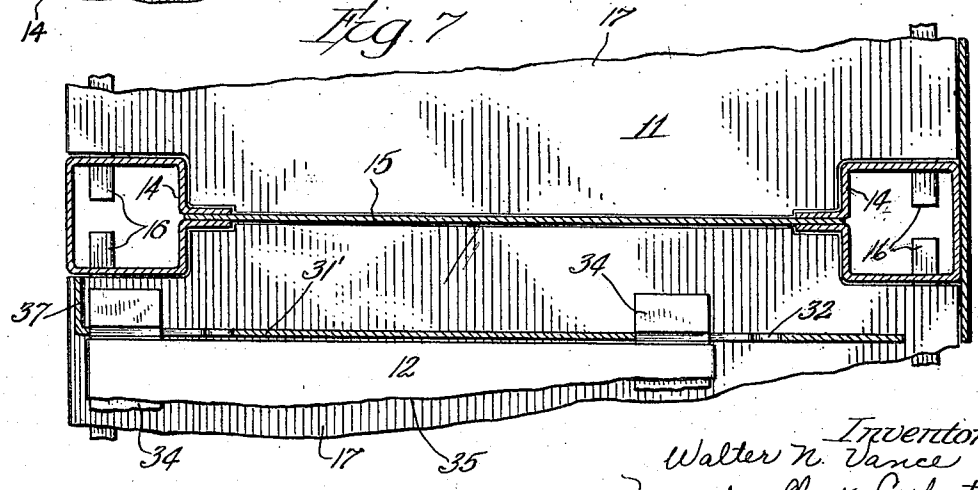


Fig. 7



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Filed May 16, 1927 3 Sheets-Sheet 3

Fig. 3

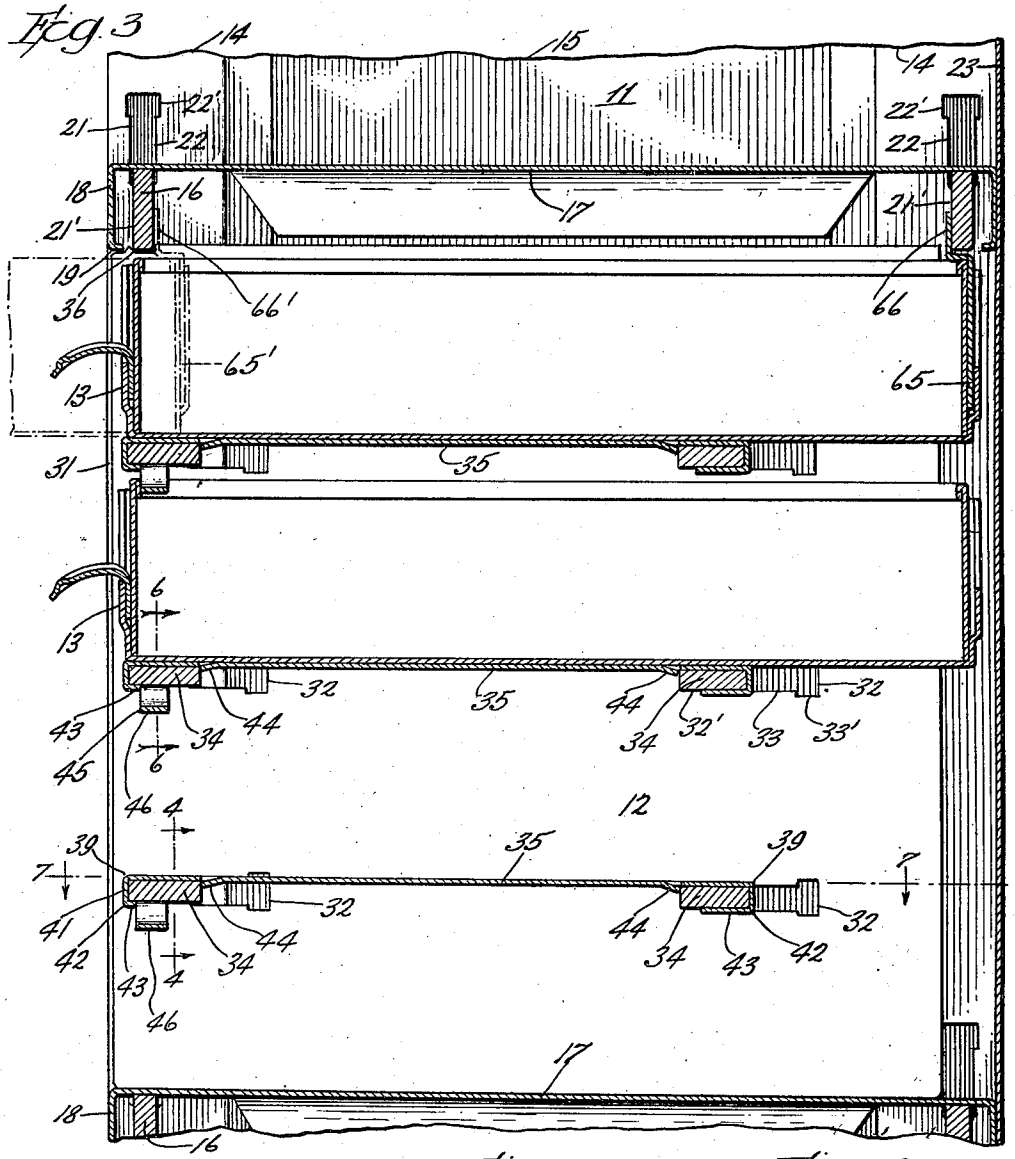


Fig. 4

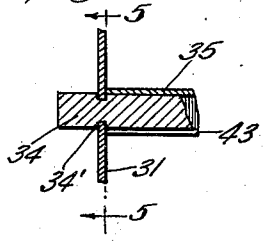


Fig. 5

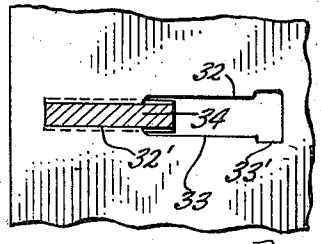
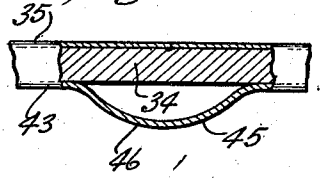


Fig. 6



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Patented Feb. 4, 1930 1,745,518

UNITED STATES PATENT OFFICE

WALTER N. VANCE, OF CHICAGO HEIGHTS, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LYON METAL PRODUCTS, INCORPORATED, OF AURORA, ILLINOIS, A CORPORATION OF ILLINOIS

METAL SHELVING

Application filed May 16, 1927. Serial No. 191,586.

This invention relates in general to metal shelving and has particular reference to an improved shelf rack for supporting shelf boxes or drawers.

The rack of the invention is adapted for use in stock rooms or other storage places where a diversified collection of small articles are stored in assorted arrangement. A storage room is ordinarily fitted with a number of shelf structures having shelf spaces of sufficient size to accommodate the largest article stored. Small articles are placed together in boxes, trays or other receptacles which are arranged upon the shelves of the larger racks. This procedure wastes much of the available shelf space as the receptacles only occupy that portion of the shelf space immediately above the shelf on which they are positioned. Further disadvantages of such a system are that boxes become misplaced or have their contents spilled when carelessly withdrawn from the shelves. It is also difficult to inventory the stock on hand. The provision of separate shelves especially for small articles is both costly and undesirable because additional space is occupied.

The principal object of the invention is the provision of an improved rack for supporting shelf boxes in compact arrangement and adapted for housing in a shelf space of a standard shelf structure to utilize all the space thereof for the storage of the box inserts.

Another important object of the invention is the provision of a rack of simple construction, consisting of a minimum number of parts yet strong and durable and which provides a rigid structure for the support of shelf boxes within a main shelf structure.

Another important object is the provision of a rack to co-operate with metal shelving of standard design without necessitating the reformation thereof and which can therefore be carried as an auxiliary part to be installed either in shelving under construction or in shelf structures already in existence.

Another important object of the invention is the provision of a supporting rack for shelf boxes having means for preventing the accidental withdrawal of the boxes therefrom and consequent spilling of contents, which means does not impede normal use of the boxes.

Still another important object of the invention is the provision of a sectionalized support for shelf boxes adapted to be manufactured in a number of standard sizes by the mere addition of sections.

Numerous other objects of the invention will be apparent as it is better understood from the following description, which taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a rack unit embodying my invention;

Fig. 2 is a front elevation of a standard shelf structure having rack units embodying my invention mounted therein;

Fig. 3 is an enlarged section taken substantially on line 3—3 of Fig. 2;

Fig. 4 is an enlarged section taken substantially on line 4—4 of Fig. 3;

Fig. 5 is a section taken substantially on line 5—5 of Fig. 4;

Fig. 6 is an enlarged section taken substantially on line 6—6 of Fig. 3;

Fig. 7 is a section taken substantially on line 7—7 of Fig. 3;

Fig. 8 is a perspective view showing details of a shelf box used in connection with the structure of my invention; and

Fig. 9 is a perspective view of a stop member for use in connection with the rack and the shelf boxes as a part of my invention.

For the purpose of illustrating my invention I have shown on the drawing a portion of a main shelf assembly 11 which provides a housing for an auxiliary rack 12. The rack 12 is adapted for support in the main shelf structure and to furnish support for shelf boxes or drawers 13 removably mounted therein.

The main shelf assembly 11, comprises a plurality of front and rear tubular uprights 14, each pair of which are connected by a vertical front to rear partition 15, front and rear bearer bars 16 mounted between adjacent uprights and shelves 17 extending be-

tween adjacent supports and supported at front and rear by the bearer bars to form vertically and horizontally aligned compartments (Fig. 1). The opposed sides of tubular uprights 14, Fig. 3, are provided with a plurality of spaced slots 21 of double T shape, that is to say slot 21 comprises a bottom relatively narrow portion 21', a wider portion 22 thereabove and a still wider top portion 22'. The narrow portion 21' is adapted to receive and support the end of a bearer 16 which is slotted for engagement therein. The portion 22 is large enough to receive a bearer bar which may be inserted therein endwise and forced down into engagement in the narrow portion 21' of the slot. Each shelf 17 is provided with front and rear downturned flanges 18 and these flanges are bent inwardly at their bottom edges to provide an inwardly disposed lip 19 the edge of which abuts the lower outer edge of the bearer bar 16. The shelves 17 are adapted to rest upon corresponding front and rear bearer bars to provide a series of adjustable shelves within the structure, the spaces between said shelves forming adjacent compartments. By engaging bearer bars 16 in slots of suitable elevation, the shelves may be positioned at any desired height within the structure.

The main shelf structure 11 may be provided with a back plate 23, which is fastened to the rear tubular uprights 14 and serves to enclose the back of the shelf structure.

The rack 12 is adapted for mounting in the main shelf structure 11 between vertically adjacent shelves 17, and comprises a plurality of upright panels 31, front and rear bearers 34 engaging every panel of the unit to support and maintain said panels in spaced relationship and shelf members 35 supported on corresponding front and rear bearers.

The outermost of the upright panels 31, designated by reference number 31', have front edges bent outwardly to form flanges 37, the edges of which are adapted to engage the opposed sides of adjacent front uprights 14 of the main shelf structure and thus support the rack more firmly within the main structure. The upright panels 31 extend vertically between the adjacent shelves of the main structure 11, and when supported on a shelf 17 extend upwardly and engage the lower edge of the supporting bearer bar 16 of the adjacent upper shelf. The upright panels 31' are slightly taller than the upright panels 31 and have upper front corners notched as at 36 to accommodate the lower portion of the upper bearer bar and the front flanged portion 19 of the upper shelf member. These notches provide a catch engagement between the main shelf bearer bars and the rack. In order to position the rack in the main shelf structure it is necessary to raise the upper shelf bearer bar slightly in order to slide the rack thereunder. When the rack is properly located upon its supporting shelf, the upper bearer bar is forced back into normal position, engages the notched portion 36 and locks the rack in position in the main shelf assembly.

The upright panels 31 and 31' are provided with a front and rear vertical series of slots 32. These slots are similar in shape to the slots 21 of the main shelf uprights, having a narrow portion 32' for engagement with a notched portion 34' of bearers 34 and wider portions 33 and 33'. The slots are positioned horizontally in the uprights having the narrowest portions 32 thereof forwardly disposed in the panel.

The bearers 34 are notched at each end for engagement in the slots of the end upright panels 31' and at intervals therealong for engagement with the corresponding slots of intermediate upright panels 31. The upright panels are thereby supported in spaced relation and provide partitions between adjacent sections of the rack, each partition accommodates two shelf boxes side by side between adjacent uprights.

Shelf members 35 extend horizontally between adjacent upright panels 31 and are supported therebetween by the corresponding front and rear bearer bars 34. The shelf members are provided with downwardly extending flanges 41 bent therefrom at front and rear edges on lines of bend 39 and arranged to engage the outer faces of the supporting bearers 34. Inwardly extending flange portions 43 are bent from flange portions 41 on lines of bend 42. The portions 41 and 43 of the members 35 comprise pockets for receiving the front and rear bearers 34 and also embrace these bearers. Portions 44 of the body of the shelf members are punched therefrom and bent downwardly to engage the inner faces of front and rear bearers to lock the bearers in the pocket formed by flange portions 41 and 43. Portions 45 of the lower flange portion 43 of each shelf member are punched therefrom and extend downwardly to form loops 46. Each loop is adapted to engage the rear wall of a shelf box 13 positioned on the shelf below to prevent accidental withdrawal of the box insert completely from the rack. The stop also engages the front wall of the shelf box to prevent it from being pushed too far into the rack. When it is desired to withdraw the box completely from the rack, it is drawn forward until the stop 46 engages the upper edge of the rear wall of the box whereupon the front end of the box is lifted until the lower rear edge is clear of the front edge of the shelf member 35. The rear of the box may then be lowered and disengaged from behind the stop.

The shelf boxes 13 are made of sheet metal cut to proper shape and bent into box form. Each box comprises a bottom 51, side walls

52 and end walls 53. The side and bottom walls are constructed from a single sheet of metal comprising a rectangular bottom 51 from which the side walls 52 are bent upwardly along parallel lines of bend 54. The bottom and side walls of the box are provided at each end with inturned integral end flanges 57 bent along lines of bend 56. The flanges 57 embrace rectangular end plates 58, and are secured thereto by spot-welding or other convenient means to form the ends 53 of the box. The upper edges of the side walls 52 and of the end plates 58 are bent inwardly and thence downwardly parallel therewith as at 59 to form folded edges 52′ and 58′ which increase the strength and rigidity of the box and improve its appearance.

The edges of the inturned end flanges 57 are offset at 61 to provide strips 62 parallel with and spaced from the end plates 58. The strips 62 form a rectangular pocket 63 at front and rear of the box, which is of double-end construction that is to say if formed having identical front and rear ends. A handle 67 is secured in any convenient manner to the end selected as the forward end of the box. Pocket 63 at the forward end may be used to support a rectangular card 63′ by which to identify the contents of the box. The uppermost row of boxes supported in the rack have no shelf members immediately thereover and hence no stop means corresponding to the loop 46 of the lower rows is provided. A stop member 64 is provided at the rear end of each box positioned in the uppermost row of the rack. This stop member is mounted in the rearward pocket 63 of the box and comprises a portion 65 adapted for removable engagement in pocket 63 and an upstanding portion 66 which projects above the top of the box and is adapted for engagement with the front bearer bar 16 of the main shelf structure to prevent the box from being wholly withdrawn from the rack. The box may be withdrawn from the shelf until the stop member 64 engages the bearer bar 16 which prevents further withdrawal thereof as shown at 66′ in Fig. 3. Accidental withdrawal is thus prevented. When it is desired to remove a box entirely from the rack, it is drawn out until the stop engages the bearer bar. The front end of the box is then raised until the lower rear edge thereof is disengaged from the front edge of the supporting shelf member. The box is then lowered until the stop 64 and bearer bar 16 are disengaged. The stop portion 66 is adapted to engage the rear bearer bar of the main structure when the box in which it is engaged is fully inserted in the rack and this prevents the box from being inserted too far into the rack.

The rack shown accommodates a bank of twenty-four boxes arranged between the end upright panels 31 in three vertical sections. Each section is divided from its adjacent section by an intermediate upright panel 31.

Three rows of box inserts rest on shelf members 35 of the rack, while the lowest row rests directly upon the shelf 17 of the main structure on which the rack itself is supported. The rack comprises a suitably proportioned structure adapted to fit into a shelf compartment of the main shelf structure. The size of the rack may be varied to fit larger shelf compartments either by adding more shelves and increasing the height of the rack walls to accommodate the additional shelves or by adding shelves and side walls and extending the bearers to provide additional rack sections.

It is thought that the invention and many of its attendant advantages will be apparent 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 all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A shelf structure comprising vertical partition members and horizontally spaced shelves extending therebetween forming adjacent compartments, a rack housed in said shelf structure, one in each of said compartments and comprising upright end and partition panels having a vertical series of slots at front and rear, integral bearers connecting said panels and extending therethrough from end to end of said rack, said bearers engaging in said slots to lock said rack within a said compartment of the shelf structure, shelf members carried by said bearers, and shelf boxes mounted in said rack on said shelf members.

2. A rack for supporting shelf boxes, comprising upright end and partition panels having a vertical series of horizontal slots at front and rear thereof, integrally formed bearers connecting and extending through said panels from end to end of said rack, said bearers engaging in said slots to lock said rack within a said compartment of the shelf structure, and shelf members carried by and interlocking with said bearers.

3. A rack for supporting shelf boxes, comprising upright end and partition panels provided with a vertical series of horizontal slots at front and rear thereof, integrally formed front and rear bearer members, notched for engagement in said slots and connecting said upright panels in spaced relation, and shelf members supported on said bearer members and having downwardly and inwardly flanged portions adapted for engagement around said bearers to lock the latter in place in said slots.

4. A rack for supporting shelf boxes, comprising upright end and partition panels provided with a vertical series of horizontal slots at front and rear thereof, bearers notched for engagement in said slots and connecting said upright panels in spaced relationship, and shelf members supported by said bearers and having flanged portions embracing the outer edges and struck out portions engaging the inner edges thereof to lock said shelf members firmly to said bearers and to lock said bearers in said slots.

5. The combination of a main shelf structure, comprising vertical partition members and horizontally spaced shelves extending therebetween forming adjacent compartments, boxes supported in the compartments of said shelf structure, and a protuberance projection mounted on the rear wall of a said box and adapted to engage portions of said main shelf assembly to limit insertion and withdrawal of said box from said shelf structure.

6. In a metallic shelf structure, the combination of a main shelf unit comprising vertical walls, front and rear bearer members adjustably mounted in said walls and shelves supported by said bearers, an auxiliary shelf unit removably insertable between two superposed shelves of said main shelf unit and substantially filling the space between said shelves, said auxiliary shelf unit comprising vertical end walls having interlocking engagement with said bearer members of said main shelf unit, slots in said end walls, and intermediate slotted parallel partitions, front and rear bearer bars extending through said partitions and adjustably mounted in said slots, shelf members supported by said bearer bars and having flanged portions embracing said bearer bars and struck-out portions engaging the exposed sides of said bearer bars to removably secure said shelf members to the bearer bars and the latter within said slots, and a plurality of slidable boxes supported by the shelf members of said auxiliary unit, said shelf members having struck-out portions engaged by certain of said boxes to limit the degree of insertion and removal of the latter, other of said boxes having upstanding projections adapted to engage the bearer members of said main shelf unit to limit the degree of insertion and removal of the latter mentioned boxes.

7. The combination with a rack having vertical upright members and horizontal shelves supported by said members and forming a plurality of compartments, of means arranged in each of said compartments for slidingly supporting a plurality of vertical tiers of drawers, and means cooperating with a part of said first named means to limit the sliding movement of each drawer.

8. The combination with a rack having vertical upright members and horizontal shelves supported by said members and providing a plurality of compartments, of removable means in said compartments and having interlocking engagement with said members and forming shelf bearers, and auxiliary shelves mounted on said bearers for slidingly supporting a plurality of drawers.

9. The combination with a rack having vertical upright members and horizontal shelves supported by said members and providing a plurality of compartments, of removable means in said compartments and having interlocking engagement with said members and forming shelf bearers, auxiliary shelves mounted on said bearers for slidingly supporting a plurality of drawers, and means cooperating with a part of said auxiliary shelves for limiting the sliding movement of said drawers.

10. The combination with a rack having vertical upright members and horizontal shelves supported by said members and providing a plurality of compartments, of upright panels having interlocking engagement with said shelves and forming a plurality of sub-compartments, and means arranged in each of said sub-compartments for slidingly supporting a vertical tier of drawers.

11. The combination with a rack having vertical upright members and horizontal shelves supported by said members and providing a plurality of compartments, of upright panels having interlocking engagement with said shelves and forming a plurality of sub-compartments, means arranged in each of said sub-compartments for slidingly supporting a vertical tier of drawers, and means communicating with said last named means for limiting the sliding movement of said drawers.

12. The combination with a rack having vertical upright members and horizontal shelves supported by said members and providing a plurality of compartments, of upright panels having interlocking engagement with said shelves and forming a plurality of sub-compartments, shelf bearers extending through said panels, shelves on said bearers, drawers slidably mounted on said last named shelves, and means on said drawers and cooperating with a part of said last named shelves for limiting the sliding movement of said drawers.

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