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J. J. RIBBENS ET AL
SUSPENSION FRAMEWORK

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3 Sheets-Sheet 1

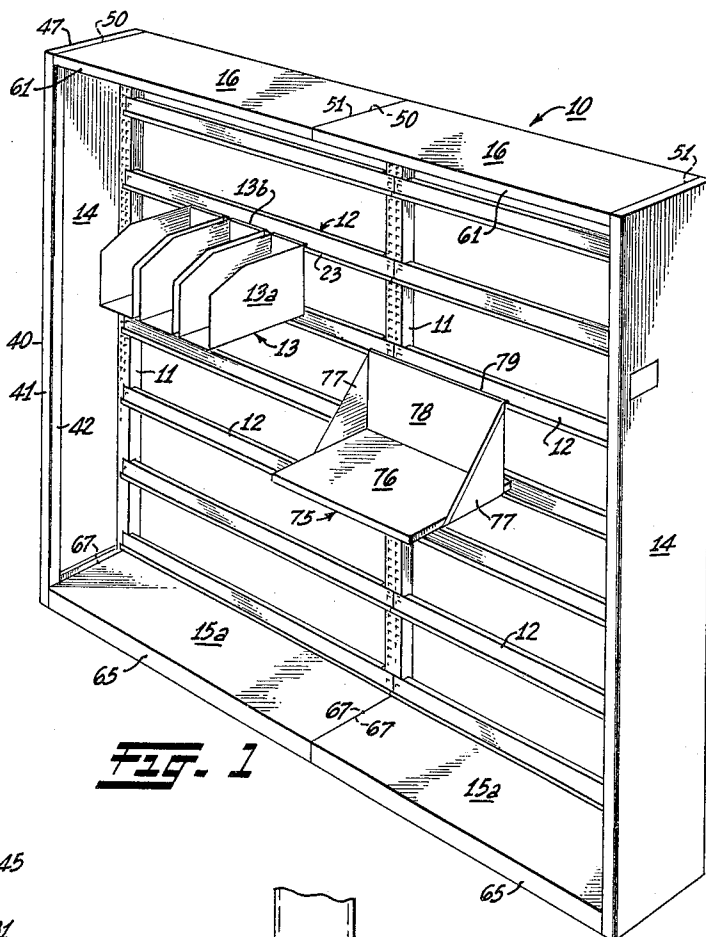


FIG. 1

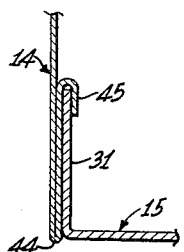


FIG. 3a

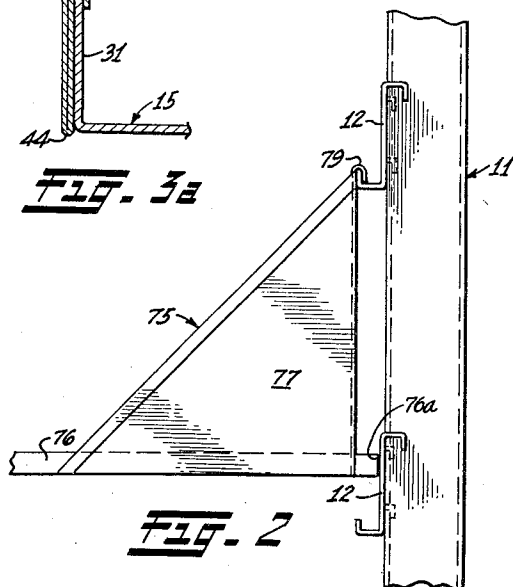


FIG. 2

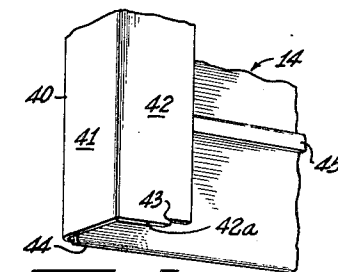
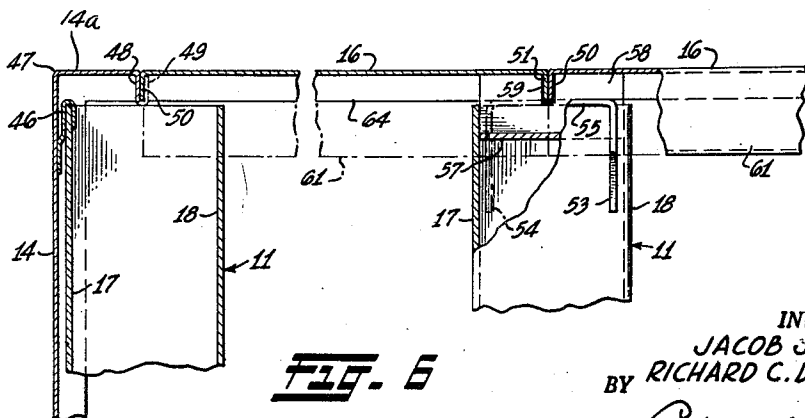


FIG. 3

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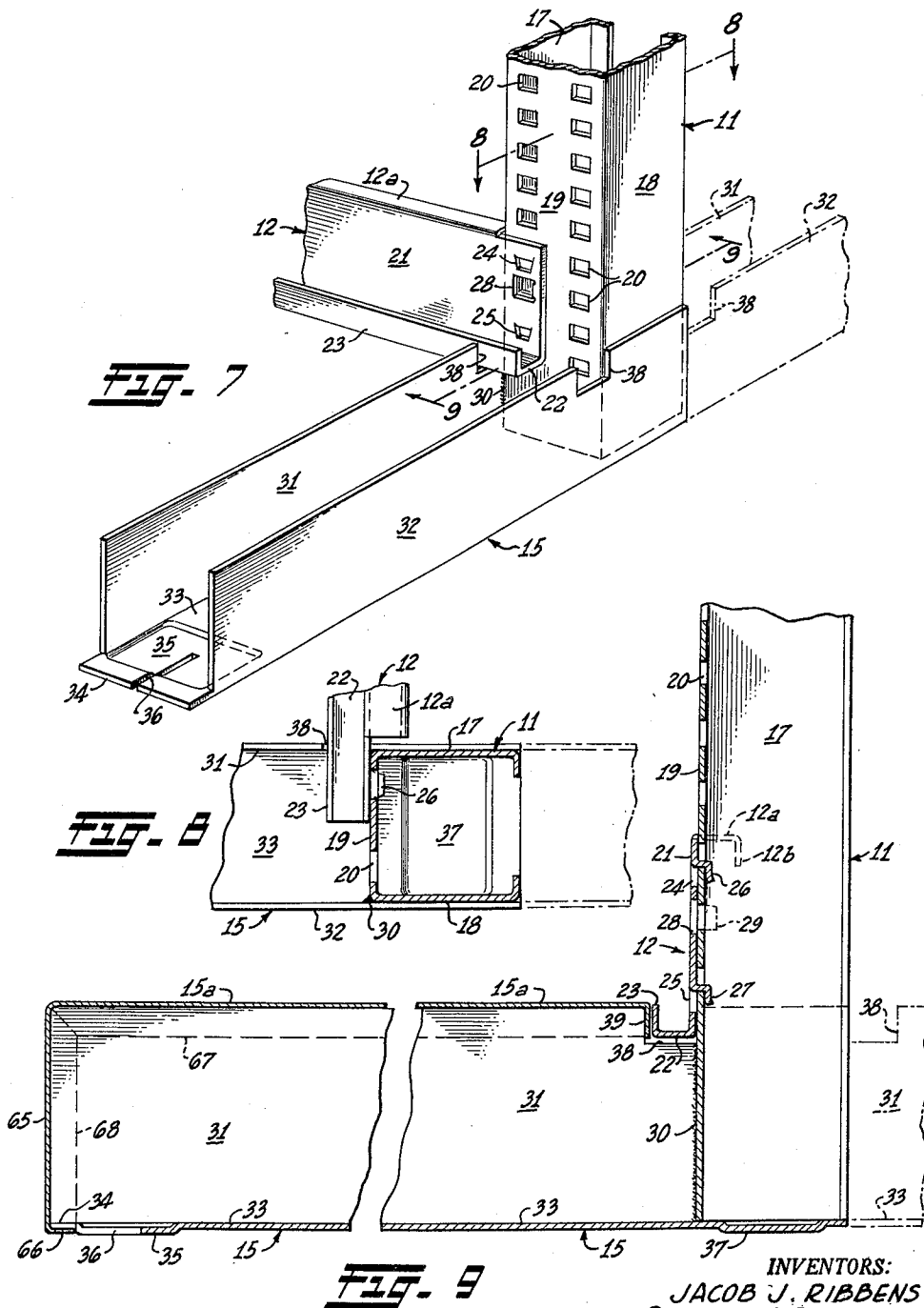
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SUSPENSION FRAMEWORK

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Francisco, Calif., a corporation of California
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18 Claims. (Cl. 211—136)

This invention relates to a suspension filing rack, and more particularly to one comprising vertical frame members in the plane of the rear wall of the frame, with a plurality of horizontal suspension rails which act as transverse connecting frame members, and having detachable side walls, a top, and a bottom member so that the entire front face of the rack is open for access to file containers hanging from and in front of the suspension rails.

This application is in part a continuation of our copending application Serial No. 27,701, filed May 9, 1960, entitled "Suspension Framework," which became U.S. Patent 3,031,088 on April 24, 1962, and directed primarily to the frame members and suspension rack connection features.

In the aforesaid copending application there is described and claimed a suspension type of filing framework in which vertical members or posts are tied together by horizontal members without the need to use bolts and nuts, and file containers are suspended from the horizontal member. This type of filing or storage equipment has advantages over the conventional sliding drawer type of filing cabinet. For example, it conserves space because it does not have drawers which slide in and out of a cabinet. Also this suspension type of structure is inexpensive and it is easy to assemble and install and to disassemble.

Another type of suspension filing equipment is that described in Werner H. Furrer U.S. Patent No. 2,974,807, issued March 14, 1961, on application Serial No. 619,194, filed October 30, 1956, entitled "Suspension Filing Rack." The Furrer structure employs bolts and screws for fastening the parts together but it provides many of the advantages of the structure of our copending application.

The present invention relates to improvements upon the filing and storage equipment of our copending application and of the said Furrer patent. More particularly it relates to means whereby said equipment is provided with a housing and a base.

It is an object of this invention to provide an improved suspension rack of the general character described.

Another object is to provide improved elements of such a rack, in the form of vertical support members, side walls, intermediate support brackets and top and bottom members which cooperate by interlocking without the use of fasteners, to form a stable structure.

Another particular object is to provide simple elements or components which may be formed by simple bending, punching and spot-welding operations on the thin sheet steel or other metal which may be particularly adapted for this purpose.

These and other objects and advantages will be further apparent from the following description and the appended drawings, which form a part of this specification and illustrate a preferred example of the invention.

In the drawings,

FIGURE 1 is a front perspective view of a filing rack embodying the invention, with both file containers and a movable work shelf suspended from the fronts of the suspension rails.

FIGURE 2 is an end view of two suspension rails and the work shelf of the rack of FIGURE 1, with the right hand side wall removed, to facilitate showing of these members.

FIGURE 3 is a perspective view of the lower end of

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the left hand side wall, showing the preferred means for connecting it to the base support of the vertical post member.

FIGURE 3a is a fragmentary vertical section view taken through the lower end of the left-hand side wall showing how the structure of FIGURE 3 is connected to the adjacent base support for the respective vertical post member.

FIGURE 4 is a perspective view, partly broken away, of the upper end of the side wall of FIGURE 3 showing its connection to the vertical post member of that figure.

FIGURE 5 is a perspective view of a top member and an intermediate support bracket in place on a vertical post member.

FIGURE 6 is a front elevational view, partially in section along line 6—6 of FIGURES 4 and 5, showing further details of the top members, support bracket and vertical post members.

FIGURE 7 is a perspective view of the lower end of a vertical member and its base support with one lower suspension rail in place.

FIGURE 8 is a horizontal sectional view on line 8—8 of the arrangement of FIGURE 7.

FIGURE 9 is a vertical sectional view on line 9—9 of FIGURE 7, showing a preferred arrangement of vertical and base support members and a lower suspension rail in assembled relation.

Referring now to the drawings and particularly to FIGURE 1, a suspension frame or filing rack is there shown which is generally designated by the reference number 10. In this example it comprises three vertical post members 11 (two of which are shown and the other concealed behind the right hand side wall) and a large number of horizontal cross members or suspension rails 12. Several file containers 13 are shown suspended from one of the suspension rails 12. These may be of any suitable construction, e.g., of the type described and claimed in our copending application above mentioned and they include a body portion on 13a having spaced side walls, a rear wall and a bottom, and having a hook 13b at the rear for suspension from the rails 12. As explained in our copending application, the rails 12 are preferably spaced apart so that (as shown in FIGURE 1 of the present application) the lower rear edge of each file container will abut the rail next below.

The filing rack 10 shown in FIGURE 1 also comprises right hand and left hand side walls 14; cover members or bottom panels 15a for base members 15 (see FIGURE 7); and top panels or members 16. The present invention concerns primarily the novel relations and interlocking constructions of these members which will now be described in considerable detail, with reference to the remaining figures of the drawings.

Referring first to FIGURES 7 and 9 the vertical post member 11 is illustrated as a hollow box member comprising two side flanges 17 and 18 connected by a face or web 19 having one or two vertically and horizontally spaced rows of perforations 20. These latter serving to receive and to support horizontal suspension rails 12. Posts at the ends of the rack 10 need only one vertical row of perforations, right or left hand, as required, but intermediate posts, as illustrated in FIGURE 7, will obviously require two horizontally spaced rows. Desirably each suspension rail is a flanged section having a wide vertical flange 21, a narrow bottom web 22 and a narrow upstanding front flange 23. Near each end of rail 12 and in its vertical flange 21, upper and lower holes 24 and 25 are punched out to form downturned rearwardly extending hooks 26 and 27 which project through and engage corresponding perforations 20 in the face 19 of vertical post member 11, as best shown in FIGURE 9. Be-

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tween holes 24 and 25 of flange 21 is a third hole 23 which is punched out to form a vertical tab 29 that can be bent backwardly sideways through that perforation 20 between the two occupied by hooks 26 and 27. This retains the suspension rail 12 securely against the face of post member 11, and hooks 26 and 27 prevent it from sliding downwardly under the weight of file containers 13 and their contents. By straightening tab 29 back into the plane of flange 21, the rail 12 may first be lifted slightly to disengage the hooks 26 and 27 from the perforations 20 and then brought forwardly to remove the rail when it is desired to disassemble the unit. As shown in FIGURES 7 and 9, each rail 12 is formed with a top, rearwardly projecting flange 12a which has a downturned portion at 12b. This flange may abut the adjacent post 11 or it may be spaced therefrom.

The lower end of vertical post member 11 is illustrated in FIGURE 7 as being received in and secured as by weld 30 to base member 15 comprising two upstanding side flanges 31 and 32 and a horizontal connecting web 33, all extending forwardly from the rear face of post 11. If it is desired to make two suspension racks "back to back" these flanges and the connecting web can also extend rearwardly as indicated by the dotted lines of this figure. In this case, the post member 11 would have to be rotated through 90° so that its flanges 17 and 18 would face the front and back, respectively, and these flanges would be perforated as at 20 to receive and support the front and rear suspension rails 12, as has just been described.

Desirably the front end 34 of web 33 of base 15 is somewhat longer than side flanges 31 and 32, has a flat "foot" portion struck downwardly as at 35 and is slotted longitudinally as at 36 for a purpose to be described below. A similar "foot" 37 is desirably formed in web 33 beneath the bottom of vertical post member 11 as shown in FIGURE 8. Side flanges 31 and 32 are notched as at 38 immediately in front of the front face of post member 11, this notch being wide enough to receive the narrow bottom web 22 and narrow front flange 23 of suspension rail 12, with enough space left over to receive and retain the rear downwardly extending flange 39 of the bottom panel 15a, which will be described later in more detail.

Referring now to FIGURE 3, there is illustrated a portion of the lower front end of a side wall 14, in this case the left hand one, with a stiffened vertical corner 40 extending throughout its length and comprising a front web 41 and a rearwardly extending flange 42, the latter notched shallowly as at 43. The entire lower end of the main portion of the wall 14 is desirably bent closely upwardly and inwardly as at 44, and then inwardly and downwardly as at 45 to form a downwardly open clip that will overlie the upper edge of flange 31 of base member 15 that projects forwardly from that vertical post member 11 whose upper end is shown in FIGURE 4. This retains the lower end of this side wall 14 against the base member 15 of its post 11 without the use of any other fastener. The lower end 42a of the corner flange 42 of the side wall is received in the longitudinal slot 36 of the base member web 33, with the notched portion 43 overlying the downwardly extending foot 35 of that web.

The inner face of the upper end of side wall 14 (FIGURES 4 and 6) is provided with a permanently secured downwardly extending short clip 46 near its rear edge at a proper height to receive and overlie the upper end of the side flange 17 of the vertical post member 11. This detachably secures the side wall 14 at its upper end to the open top of post member 11. The extreme upper end 14a of side wall 14 is bent inwardly at 47 to overlie the stiffened corner 40, web 41 and flange 42, and is bent downwardly at 48 and then upwardly at 49 to form a clip into which a downwardly extending flange 50 at the left side of the left hand top member 16 is adapted to be received. At the opposite side of this top member

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16 a similar downwardly extending flange 51 is adapted to be engaged by and overlie an intermediate support bracket, best shown in FIGURES 5 and 6, which will now be described.

Referring now to FIGURE 5, the intermediate support bracket generally designated 52 comprises a forwardly extending channel formed by downturned side flanges 53 and 54 and a horizontal connecting web 55. The rear end of the bracket is formed by a U-shaped box section or clip means 52a having a downwardly extending transverse flange 56, a horizontal web 57 and an upwardly extending transverse flange 58, the latter extending upwardly to terminate somewhat above the plane of web 55, and provided with a central vertical slot 59 into which flange 51 of top member 16 is received. Side flanges 53 and 54 terminate short of transverse flange 56, leaving a space 60 for the upper end of the face web 19 of intermediate vertical post 11, as well as the vertical flange 21 of the uppermost suspension rail 12. Thus the "box member" formed by transverse flanges 56 and 58 and horizontal web 57 is received in the open top of intermediate post member 11, with the inner ends of side flanges 53 and 54 bearing against the upper suspension rail 12 and retaining it in position and also holding the whole intermediate bracket 52 in a horizontal position projecting forwardly from its support post.

The front edge of top member 16 is desirably flanged downwardly as at 61 to a distance that will overlie and cover the front end face of bracket 52, as shown, and has a tab or lug portion 62 which extends rearwardly in the plane of the side flange 50 at top member 16 to engage a longitudinal slot 63 in the end of bracket 52. Desirably, slot 63 at the front of bracket 52 and slot 59 at the rear of this bracket are just wide enough to receive both side flanges 50 and 51 of abutting top members 16 so that those members are detachably but securely retained on the frame and serve to brace it against twisting. In addition, it is desirable to provide a downwardly extending flange 64 at the rear edge of top 16, as shown, to stiffen the latter.

Referring again to FIGURE 9 it will be noted that the bottom cover member 15a is provided with a front flange or face 65 which overlies and conceals the front end faces of base members 15. Desirably, the lower edge of face 65 is bent rearwardly at 66 to form a finished edge and also to underlie the outer end 34 of web 33 of that member. The ends of bottom cover member 15a are also flanged downwardly and inwardly as at 67 and 68, the former overlying the top edge of the base member flange at the corner or side posts 11, and the latter engaging at its lower end the slot 36 in the web member 33 of the intermediate base members 15 as shown in FIGURE 9, thus adding to the stiffness of the rack.

Referring now to FIGURES 1 and 2 a detachable, movable work shelf 75 is shown which comprises a base 76, side walls 77, a back wall 78 and a hook 79. The hook 79 serves to suspend the work shelf from any of the rails 12 and permits the shelf to be moved along the rail to any desired position. The projecting rear edge 76a of the base 76 abuts the rail below. The base 76 serves as a movable desk to be used by a file clerk while using or recording data from files held by the file containers 13.

In conclusion, it will be apparent that the suspension rack described and illustrated is characterized by its interlocking parts which provide for assembling and dismantling without the use of screws, or other separable fasteners, simplicity of fabrication and susceptibility of being joined to form racks of substantial length. The resulting structure is very stiff and rigid for its size and weight and has no sharp corners, projecting nuts or screws, which add to its safety and facility in use.

Although a single example is shown and described, it is apparent that numerous modifications could be made without departing from the essential features of the in-

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vention, and all such changes that come within the scope of the appended claims are intended to be embraced thereby.

We claim:

1. A side wall assembly for a vertical metal framework comprising an upright hollow post member, a forwardly extending base support for said post member, said support comprising an upwardly facing channel; a side wall panel comprising a metal sheet having an inturned flange at its upper end, a first downwardly facing clip below said flange on the inside face of said wall panel adjacent to its rear edge to engage the open top of said post member, and a second downwardly facing clip adjacent to the lower end of said wall to engage the outer flange of said base support.
2. A metal post member according to claim 1 with the addition of a first foot portion below the web of said channel base support at its juncture with said upright post member and a second foot portion adjacent to the outer end of the web of said channel, said foot portions being pressed downwardly from the plane of said web.
3. An intermediate top panel support bracket for a vertical metal framework having a plurality of hollow vertical post members in the plane of the back of said framework; said support bracket comprising a channel having downturned side flanges connected by a generally horizontal web, the rear end of said web forming a transverse box means adapted to fit into the open top of one of said post members, the rear wall of said box means projecting upwardly above said web, and provided with a central vertical slot, the side flanges of said bracket having notches spaced from the face of said transverse box means adapted to overlie the front face of said post member.
4. A cabinet structure comprising
 - at least two upright post members having open upper ends,
 - a sheet metal side wall secured to one of said post members and having an upturned clip along the inner top portion thereof,
 - a top support member extending forwardly from the post member adjacent to said one post member, clip means on the rear end of said top support member engaging the open top of said adjacent post member to hold it in horizontal extension therefrom,
 - a flange on the rear end of said top support member having a vertical slot therein, and
 - a sheet metal top panel having down-turned flanges along its front, rear and end edges, one end flange being received in the up-turned clip of said side wall,
 - the other end flange being received in said vertical slot and supported on said top support member,
 - the front flange extending downward over the front end of said top support member.
5. The cabinet structure defined in claim 4 including a central horizontal slot in the front end of said top support bracket, and
 - a downwardly extending lug on said other end flange received in said slot.
6. A cabinet structure comprising:
 - at least two upright post members each having open upper ends,
 - a forwardly extending base support for each of said post members,
 - each of said base supports comprising an upwardly facing channel member receiving the lower end of one of said post members,
 - a pair of side wall members of sheet material,
 - a first downwardly facing clip secured adjacent the upper end of each of said side wall members engaging the open upper end of one of said post members, and,
 - a second downwardly facing clip adjacent the lower end

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- of said each side wall member engaging the outer flange of a channel base support.
7. The cabinet structure defined in claim 11 including notches in the flanges of each of said channel base supports adjacent to the upright post member received therein, and
 - a bottom panel of sheet material having down-turned flanges along its front and rear edges,
 - the rear flange of said bottom panel being received in the notches of the base support flanges,
 - said front flange thereof extending downwardly over the front ends of said base supports.
8. The cabinet structure defined in claim 7 including a longitudinal slot in the outer end of the web of each of said channel support members, and
 - rearward extensions on the ends of the front flange of said bottom panel adapted to be received in said slot.
9. The cabinet structure defined in claim 6 including a longitudinal slot in the outer end of the web of each of said channel support members,
 - an inwardly directed narrow front panel on each of said side wall members, and
 - a rearwardly directed flange on said front panel received in said slot.
10. A cabinet structure comprising:
 - a pair of upright hollow post members each having at least three closed sides,
 - a channel base support secured to the lower end of each of said post members to extend forwardly from one side of said member,
 - a cross member secured between said pair of post members,
 - a pair of side wall members of sheet material,
 - a first downwardly facing clip secured adjacent the upper end of each of said side wall members engaging the open upper end of one of said post members, and,
 - a second downwardly facing clip adjacent the lower end of said side wall member engaging portions on said channel base support.
11. The cabinet structure defined in claim 10 including a longitudinal slot in the outer end of each of said channel base supports,
 - an inwardly directed narrow front panel on each of said side wall members, and
 - a rearward extension on the end of said front panel received in said slot.
12. A cabinet structure comprising
 - at least three upright post members each having open upper ends,
 - a forwardly extending base support for each of said post members,
 - each of said base supports comprising an upwardly facing channel member receiving the lower end of one of said post members,
 - a pair of side walls of sheet material,
 - a first downwardly facing clip adjacent the rear edge of each of said side walls engaging the open top of an outer one of said upright post members,
 - a second downwardly facing clip adjacent the lower end of said each side wall engaging the outer flange of a channel base support,
 - a top support bracket for each intermediate one of said upright post members,
 - each of said support brackets comprising a channel having down-turned side flanges connected by a web, the rear aligned slots in said side flanges adjacent the rear end of said support bracket forming a clip fitting into the open upper end of an intermediate one of said post members,
 - a vertical wall on said support bracket projecting above the top of the post member and having a vertical slot therein, and
 - a top panel of sheet material having down-turned flanges along its front, rear and end edges, one end flange of said top panel being received in the

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- slot in the vertical wall on said support bracket with the front flange extending downward over at least a portion of the front end of said support bracket.
13. A cabinet structure comprising
 at least three hollow upright post members, 5
 a forwardly extending base support for each of said post members,
 each of said base supports comprising an upwardly facing channel member receiving the lower end of one of said post members, 10
 a top support bracket for each intermediate one of said upright post members,
 each of said top support brackets including a horizontal web and a clip member at the rear end thereof fitting into the open upper end of an intermediate one of said post members, 15
 a vertical wall at the rear end of said support bracket projecting above said horizontal web and having a vertical slot therein, and
 a series of horizontal cross members secured between adjacent pairs of said post members, 20
 downwardly directed hooks in the ends of said cross members engaged in perforations in said post members.
14. The cabinet structure defined in claim 13 including transversely aligned notches in the flanges of each of said channel base supports adjacent to the upright post member received therein, 25
 one of said cross members being received in said notches. 30
15. A cabinet structure comprising:
 at least two upright post members each having open upper ends,
 a forwardly extending base support for each of said post members, 35
 each of said base supports comprising an upwardly facing channel member receiving the lower end of one of said post members,
 a side wall member of sheet material,
 a first downwardly facing clip secured adjacent the upper end of said side wall member engaging the open upper end of one of said post members, 40
 a second downwardly facing clip adjacent the lower end of said side wall member engaging the outer flange of a channel base support, 45
 a top panel support member extending forwardly from the other post member,
 a top panel, and
 complementary interlocking means on the upper end of said side wall member and an adjacent end of said top panel, 50
 the other end of said top panel being supported on said support member.
16. A cabinet structure comprising 55
 at least three upright post members each having open upper ends,
 a forwardly extending channel base support secured to the lower end of each of said post members,
 a pair of side walls of sheet material,
 a first downwardly facing clip adjacent the rear edge of each of said pairs of side walls engaging the open top of an outer one of said upright post members, 60
 a second downwardly facing clip adjacent the lower end of said each side wall engaging the outer flange of said channel base support, 65
 a top support bracket for each intermediate one of said upright post members,

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- each of said support brackets comprising a channel having down-turned side flanges connected by a web, the rear end of said web forming a transverse box means fitting into the open upper end of an intermediate one of said post members,
 the rear wall of said box means projecting above the top of the post member and having a vertical slot therein,
 top panels of sheet material having down-turned flanges along their front and end edges extending between adjacent pairs of said post members,
 one end flange of each of said top panels being received in the slot in the rear wall of said box means with the rear flange extending downward along said rear wall and the front flange extending downward over at least a portion of the front end of said support bracket, and
 a member on the upper end of each of said side walls interlocking with an end flange of one of said top panels.
17. A cabinet structure comprising
 at least two post members having open upper ends,
 a support bracket comprising a channel having down-turned side flanges connected by a web,
 transversely aligned notches in said side flanges adjacent the rear end thereof forming a clip fitting into the open upper end of a post, and
 a top panel supported at one end on said bracket and at the other end on portions carried on the other post member.
18. A cabinet structure comprising
 at least two post members having open upper ends,
 a support bracket comprising a channel having down-turned side flanges connected by a generally horizontal web,
 the rear end of said web forming a transverse box means fitting into the open top of one of said post members,
 the rear wall of said box means projecting above said web and having a central vertical slot,
 the side flanges of said bracket having notches to overlie the front face of said one post member, and
 a top panel supported at one end on said bracket and at the other end on portions carried on the other post member,
 said top panel having a down-turned flange on said one end received in said vertical slot.

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