

June 15, 1948.

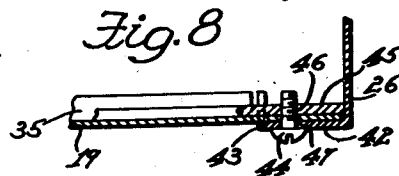
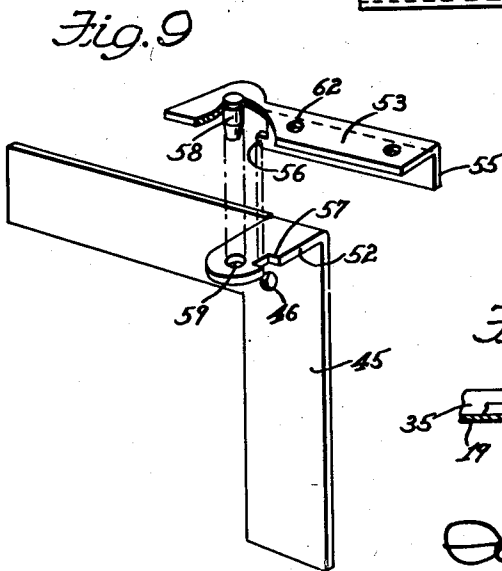
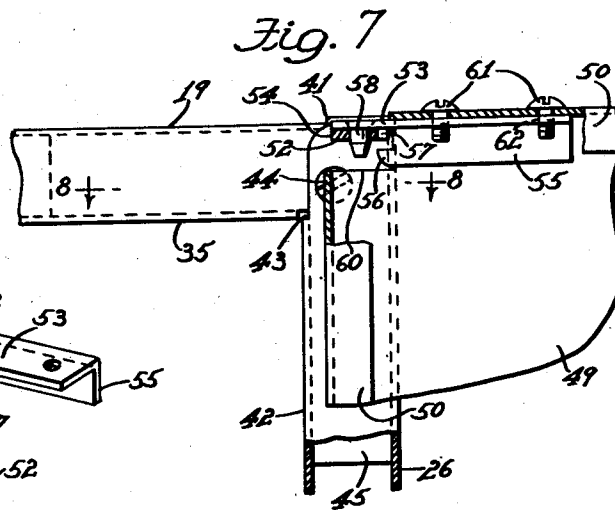
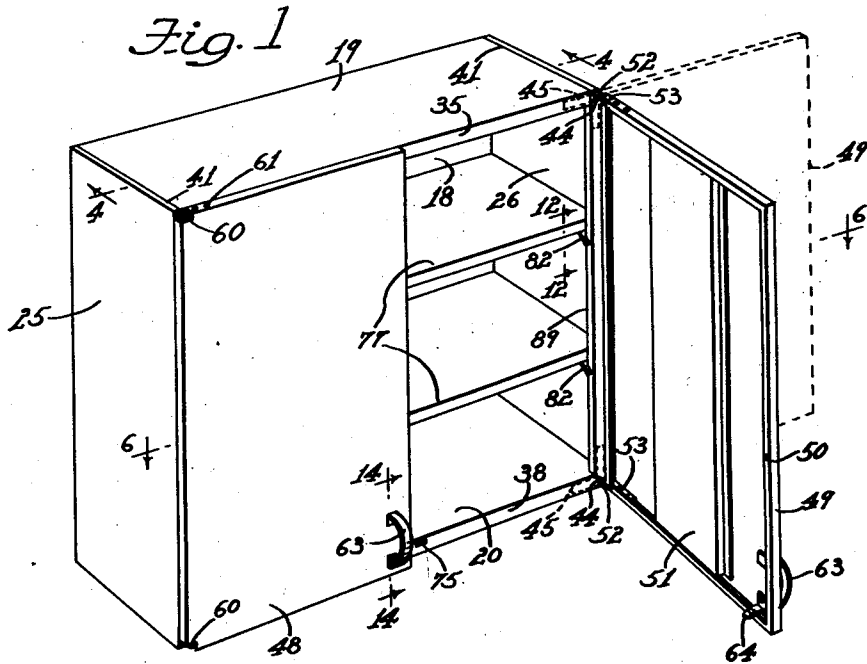
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2,443,515

SHEET METAL CABINET CONSTRUCTION

Filed May 22, 1944

3 Sheets-Sheet 1



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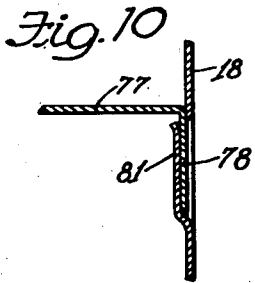
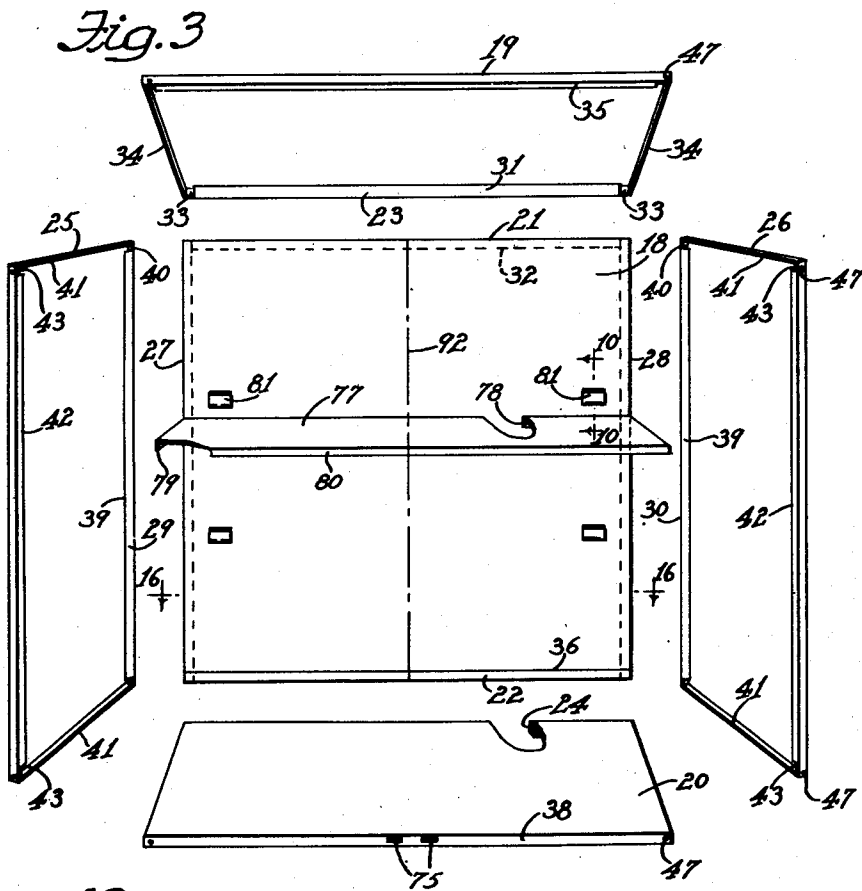
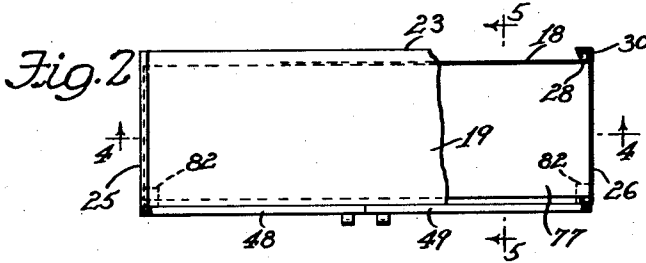
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SHEET METAL CABINET CONSTRUCTION

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3 Sheets-Sheet 2



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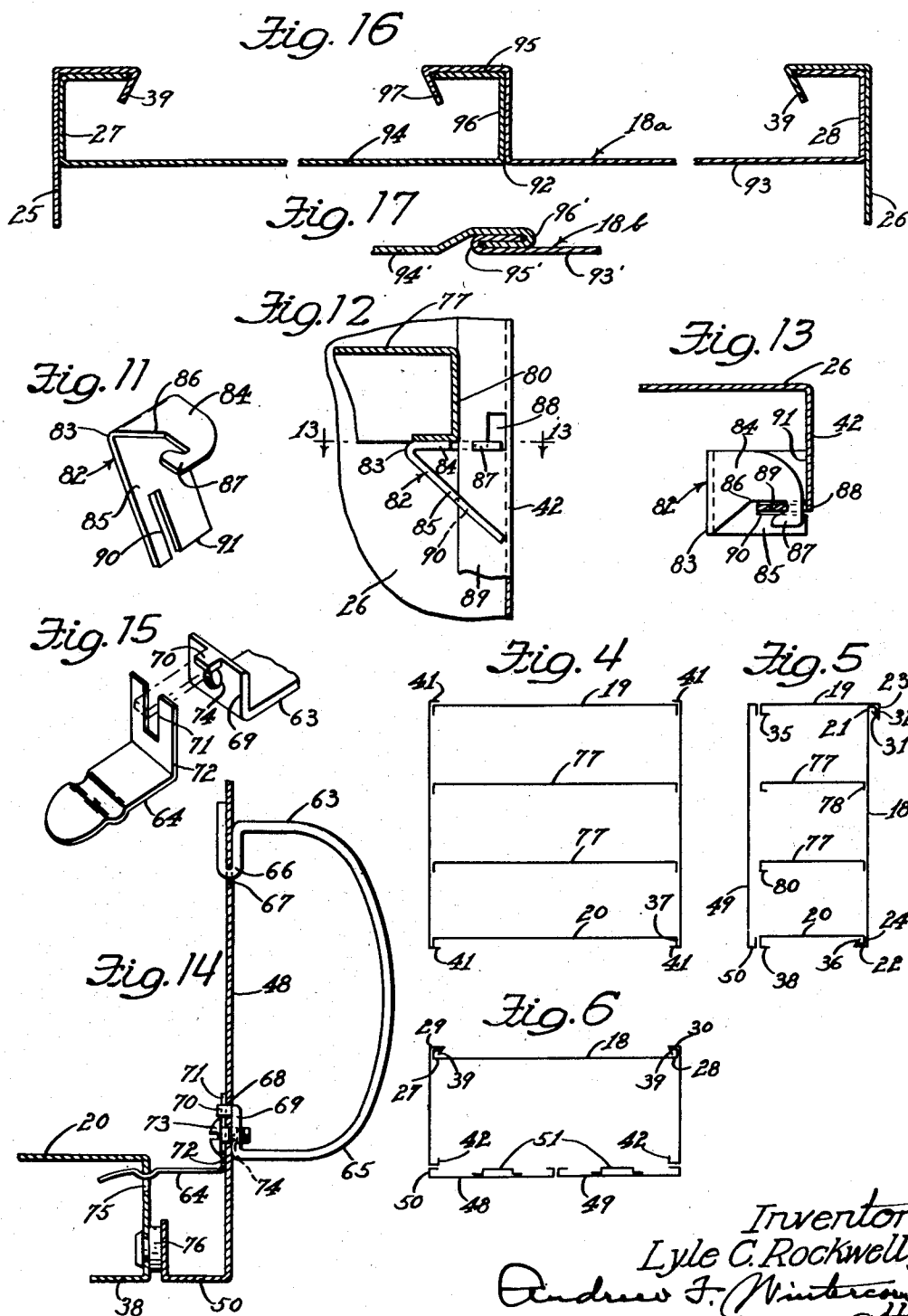
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SHEET METAL CABINET CONSTRUCTION

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,443,515

SHEET METAL CABINET CONSTRUCTION

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4 Claims. (Cl. 312-143)

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This invention relates to sheet metal cabinets generally, but is more particularly concerned with one of improved knock-down construction, with a view to permitting economical quantity production of cabinets, all of the panels of which are preferably enameled as individual units and thereafter packed for shipment in knock-down form for most economical shipment, resulting in great saving in space.

One of the principal objects of my invention is to provide a sheet metal cabinet, in which the panels to be interconnected have channel-shaped edge portions made to interlock, so that the knock-down cabinet can be put together quickly and easily, with a minimum amount of bolting, the channeled edge portions serving, furthermore, to lend strength and rigidity to the whole structure, so that it will retain the desired shape and remain true indefinitely.

Still another object is to provide a sheet metal cabinet of knock-down construction, in which the top and bottom and end panels are interlocked with the back panel at their rear edges by interfitting channels, as above mentioned, and the front corners of the top and end panels and the bottom and end panels are interconnected by L-shaped, reinforcing cleats, set on the inside of the cabinet at the corners, behind the overlapping flanges of said panels, so that a single screw, passed through registering holes in the overlapping flanges and threaded into a hole in each cleat, is sufficient to securely fasten the cabinet together at each corner without any likelihood of the cabinet getting out of shape.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of a sheet metal cabinet, made in accordance with my invention, and showing one of the doors opened to disclose a portion of the interior of the cabinet, the dotted line position being the approximate angle at which the door is removable;

Fig. 2 is a top view of the cabinet with the doors closed, one end portion of the cabinet being shown in section, to better illustrate the construction;

Fig. 3 is an exploded view of the main portions of the cabinet, to better illustrate the form of the various panels and indicate the mode of assembly;

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Fig. 4 is a diagrammatic section on a reduced scale, taken in the vertical plane of the line 4-4 of Figs. 1 and 2;

Fig. 5 is a similar diagrammatic section, taken in the transverse vertical plane of the line 5-5 of Fig. 2;

Fig. 6 is still another similar diagrammatic section, in the horizontal plane of the line 6-6 of Fig. 1;

Fig. 7 is an enlarged detail, partly in front elevation and partly in vertical section, of the upper right-hand front corner of the cabinet, illustrating the corner reinforcing cleat, as well as the hinge for the door;

Fig. 8 is a horizontal sectional detail on the line 8-8 of Fig. 7, showing how the cleat is fastened into the corner portion of the cabinet with a single screw;

Fig. 9 is a perspective view of the cleat and door hinge, the dot-and-dash lines indicating the manner of assembly;

Fig. 10 is an enlarged sectional detail on the line 10-10 of Fig. 3, showing a rear shelf support, with the shelf in assembled relation thereto;

Fig. 11 is a perspective view of one of the front shelf-supporting brackets;

Fig. 12 is an enlarged sectional detail on the line 12-12 of Fig. 1, illustrating the bracket of Fig. 11 in operative position in the cabinet, supporting a shelf thereon;

Fig. 13 is a horizontal sectional detail, on the line 13-13 of Fig. 12;

Fig. 14 is an enlarged sectional detail on the line 14-14 of Fig. 1, illustrating the door-pull and detent;

Fig. 15 is a perspective view of the detent and the lower portion of the handle bail forming the door-pull, the dot-and-dash lines indicating the manner of assembly;

Fig. 16 is a section in the horizontal plane of the line 16-16 in Fig. 3, showing a two-piece back panel and indicating the end panels locked therewith, intermediate portions of the section being broken away to permit showing the parts on a larger scale, and

Fig. 17 is a horizontal sectional detail, showing an alternative construction, insofar as the locking feature of the two-piece back is concerned,

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Similar reference numerals are applied to corresponding parts throughout the views.

Referring first to Figs. 1 to 6, the reference numeral 18 designates the back panel, which is of rectangular form, and has the rectangular top and bottom panels 19 and 20 interlocked with its upper and lower edge portions 21 and 22, respectively, by means of the rear edge portions 23 and 24 of said panels. The two end panels 25 and 26 are arranged to interlock with the edge portions 27 and 28 of back panel 18 at their rear edge portions 29 and 30, respectively. The edge portions 21 and 23 are channel-shaped in cross-section, as indicated in Fig. 5, the flange 31 on the edge portion 23 being bent inwardly at an acute angle of approximately 60° with respect to the web of the channel, to enter the trough of the channeled edge portion 21, the flange 32 of which is bent inwardly substantially at right angles to the web of the channel. The flange 31 is cut away at both ends, as indicated at 33 in Fig. 3, to receive the upper ends of the channeled edge portions 27 and 28 of the back panel 18 when the top panel 19 is assembled onto the upper edge of the back panel, in the manner shown in Fig. 5. The side edges of the top panel are defined by downwardly projecting flanges 34, and the front edge portion 35 is bent downwardly and rearwardly to a channel-shaped cross-section, for reinforcement of the top panel, and so as not to present any exposed raw edges at the front of the cabinet. The channel 22 is on the front of the back panel, and has the flange 36 thereof bent rearwardly at an acute angle of about 60° relative to the web portion of the channel, to lock detachably in the channeled rear edge portion 24 of the panel 20. The side edges of the bottom panel are defined by downwardly projecting flanges 37, and the front edge is bent downwardly and rearwardly to define a channel 38, like the channel 35 on the top panel, for a similar purpose. The same mode of assembly is used in interlocking the end panels 25 and 26 onto opposite ends of the back panel 18, as indicated in Fig. 6, the flanges 39 on the edge portions 29 and 30 being bent at an acute angle of about 60° to the web portions of these channels, to have detachable interlocking engagement in the troughs of the channels 27 and 28 on the opposite ends of the back panel. The upper ends of the flanges 39 are cut away, as indicated at 40 in Fig. 3, to receive the flanged ends 34 of the top panel, the top panel being interlocked with the back panel, and the top and bottom panels being both interlocked with the back panel before the end panels are assembled onto the back panel. The top and bottom edges of the end panels are defined by flanges 41, which in the assembled cabinet overlie the ends of the top panel and project beneath the ends of the bottom panel, as indicated in Fig. 4. The front edges of the end panels are bent laterally and rearwardly, to define channels, as indicated at 42, similar to the channels 35 and 38 on the front edges of the top and bottom panels, for a similar purpose. The upper and lower ends of the rearwardly projecting flanges of the channeled front edges 42 are cut away, as indicated at 43, to provide clearance for the top and bottom panels in the assembling of the cabinet. It should be clear from this much description, that the channeling of the edge portions of the five panels mentioned, so that the top and bottom and both ends of the cabinet can be detachably interlocked with the back, makes for speedy and easy assembly, and all of

the parts are interconnected rigidly the full length of their interlocking edges, so that the resulting structure is extremely strong and rigid, great strength being insured by reason of the double channel formation along the top and bottom and both ends of the back of the cabinet, substantially the full length of these portions.

The top, bottom and end panels, when interlocked with the back in the manner described, are arranged to be fastened securely in assembled relationship, using only four screws 44, one at each of the four corners of the front of the cabinet. L-shaped cleats 45, stamped from sheet metal, preferably of medium heavy gauge in relation to the thinner sheet metal used in the panels, are inserted in the corners of the cabinet at the front thereof, and are made to fit snugly in the channels 35, 38 and 42. A tapped screw hole 46 in the corner portion of the L, registers with holes 47 punched in the overlapping web portions of the channels 35 and 42, or 38 and 42, as the case may be, to permit entering the screws 44 and threading the same in the holes 46, to draw the cleats up tight when the screws are tightened, and accordingly make for a rigid cabinet structure, and one which is not apt to get out of shape in service. The cleats keep the corners squared up, and whatever strains are imposed upon the cleats are distributed the full length of the arms thereof in the channels, in which these arms fits snugly, and, hence, there are little or no shearing strains imposed upon the screws 44. The screws merely prevent displacement of the cleats from operative position.

The cleats 45 also provide supports for the doors 48 and 49 of the cabinet. While I have shown two doors, each covering a half of the open front of the cabinet, it should, of course, be understood that I may provide a single door covering the whole front. Each of the doors is shown as made from a single sheet metal panel, the four edges of which are bent rearwardly and inwardly, to define channels 50, to give the desired strength and rigidity, and also to avoid exposure of any raw edges. A reinforcement 51 is preferably provided in the middle portion of the doors in the form of a dished sheet metal panel, the flanged edges of which are spot-welded to the inner side of the door. A lug 52 is bent outwardly from each of the cleats 45, to form a fixed hinge member for cooperation with a swingable hinge member 53 on the door. Registering slots 54 are punched in the webs of the channels 35 and 42, or 38 and 42, as the case may be, for projection there-through of the lugs 52, as indicated in Fig. 7. The hinge members 53 are preferably formed from sheet metal like the cleats 45, and each has a longitudinal reinforcing flange 55, on the end of which a prong 56 is formed, arranged in the assembling of the door on the cabinet to pass freely through a notch 57 in the edge of the lug 52 after the pintle 58 on the hinge member 53 has been entered in the hole 59 provided therefor in the lug 52. The pin 58 on the upper hinge member 53 is preferably a trifle shorter than the pin 58 on the lower hinge member 53 to simplify the assembling operation, the lower, longer pin being started in its hole 59 before the upper pin 58 enters its hole. There is therefore no such difficulty as would otherwise be involved if both pins had to be aligned with the holes at the same time. The pins are preferably also tapered on the ends, as shown, to facilitate assembling. The prong 56 and notch 57 will be provided only on the upper hinge, and it should be clear from Fig. 7 that,

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after the door is hung and the prong 56 is disposed under the lug 52 and the door is swung forwardly from the dotted line position shown in Fig. 1 and corresponding to that in Fig. 7, the door is locked against accidental displacement off its hinges, because the prong 56 will strike the bottom of the lug 52 and prevent upward displacement of the door from operative position in all positions except that indicated in dotted lines in Fig. 1, where the lug 56 is in register with the notch 57 and is therefore movable through the notch, as indicated by the dot-and-dash lines in Fig. 9. The upper and lower hinge corners of the door are cut away, as indicated at 60 in Fig. 7, for projection of the pintle and prong-carrying ends of the hinge members 53 and to receive the lugs 52 forming the fixed hinge members and provide operating clearance for these lugs for the extent of vertical movement of the door required in applying and removing the same. While I have shown screws 61 threading in holes 62 provided therefor in the hinge members 53, to fasten the hinge members 53 in the channelled upper and lower edges 50 of the door, it should be understood that these hinge members may be riveted or spot-welded to the door.

The doors 48 and 49 have improved door-pulls 63 and spring detents 64, illustrated in Figs. 14 and 15. The pull comprises a sheet metal bail member 65, forming a generally C-shaped handle, one end of which is bent downwardly and upwardly to form a C-shaped clip, which can be entered easily through a slot 67 provided in the door, to interlock that end of the handle bail with the door. Another slot 68 is provided in the door in vertically spaced relation to the slot 67, adjacent the other end of the handle bail, which has a portion 69 bent at right angles to the end portion of the bail, for abutment with the outside of the door, a small lug 70 being provided on the edge of the portion 69 and at right angles thereto, and arranged to pass through the slot 68 and into a slot 71 on the attaching end portion 72 of the detent 64, which is disposed in abutment with the inner side of the door. The attaching end portion 72 of the detent is bent at right angles to the body of the detent, and is vertically adjustable with respect to the inner side of the door. A screw 73 is entered through the slot 71 and through a hole provided in the door, and is threaded in a hole 74 provided in the bent end portion 69 of the handle bail, whereby to fasten the detent to the inside of the door and at the same time fasten the adjacent end portion of the handle bail securely to the door on the outside. The vertical slot 71, which may be closed at the upper end, if desired, serves a double purpose: it permits vertical adjustment of the detent 64 with respect to the handle bail, in order to get the detent into proper relationship to the keeper slot 75, provided in the web of the channelled front edge portions 38 of the bottom panel 20; and it cooperates with the lug 70 to prevent rotation of the detent 64 with respect to the screw 73, thus making it practical to rely upon a single screw for the fastening of the door-pull and detent to the door. Rubber bumpers 76 are preferably mounted in the web portion of the channelled edge portions 35 and 38 of the top and bottom panels, as indicated in Fig. 14, for abutment with the channelled upper and lower edge portions of the doors, to silence the closing of the doors and prevent rattling.

Two shelves are indicated at 77 in Figs. 1, 4 and 5, and are preferably formed from sheet metal,

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the rear edge being defined by a downwardly projecting flange 78, and both ends being defined by downwardly projecting flanges 79, but the front edge being bent downwardly and rearwardly, as indicated at 80, so as not to leave any raw edges exposed at the fronts of the shelves. The flanges 78 and 79 and channels 80 reinforce the shelves, so that they have the desired strength and rigidity, and are not apt to buckle under load. Upwardly projecting tongues 81 are struck out of the back panel 18, and the rear flange 78 fits behind these tongues, as shown in Fig. 10, for support of the shelves at the rear. There are sheet metal brackets 82, detachably secured to the channelled front edges 42 of the end panels 25 and 26, as shown in Figs. 12 and 13, for support of the shelves at the front of the cabinet. One of these brackets is shown in perspective in Fig. 11, and is made from a single elongated strip of sheet metal, bent transversely intermediate the ends, as at 83, to form a V, the one arm 84 of which provides the supporting ledge for the shelf, and the other arm 85 the prop portion. The ledge portion 84 is cut out on one side, as at 86, to define a hook 87 on the outer corner portion that is arranged to be entered in a slot 88 provided therefor on the rearwardly projecting flange 89 of the channelled edge portion 42 of the end panel 25 or 26, as the case may be. The brackets 84 will, of course, be provided of right- and left-hand types, the ones shown in Figs. 11-13 being the right-hand type, to fit the right end panel 26. The left-hand type has the hook 87 on the opposite side of the ledge portion 84. The brackets 82 have to be held in substantially right angle relation to their operative positions to enter the hooks 87 in the slots, or to disengage hooks therefrom, and after a bracket has its hook 87 entered in the slot 88, the prop portion 85 is adapted to straddle the flange 89, there being a longitudinally extending slot 90 provided in the lower end portion of the prop, to receive said flange, in the manner indicated in Figs. 12 and 13. The bottom edge 91 of the prop 85 has abutment with the inner side of the web portion of the channel 42, as clearly appears in Fig. 13, so that the brackets 82 form steady supports for the shelves. These edges 91 will tend to engage the webs of the channels even before the weight of the shelves is placed on the brackets, because each of the brackets is unbalanced in that direction, and therefore tends to gravitate to that position. The shelves 77, being each supported at the front at both ends on brackets 82 and at the back near both ends on tongues 81, and being furthermore reinforced along all four edges by the flanges 78 and 79 and channels 80, will not be apt to sag under load. The construction described, furthermore, permits quick and easy assembling and disassembling, and does not complicate matters so far as the quick assembly and disassembly of the cabinet as a whole is concerned.

I prefer to have all of the panels used in the present cabinet of a size not substantially larger than any of the top, bottom and end panels and shelves 77, and for that reason prefer to make the back panel 18 in two pieces, as indicated by the vertical center line 92 in Fig. 3. This center line, as shown in Fig. 16, corresponds to the joint line 92 between the two halves 93 and 94 of the two-piece back panel 18a. These two pieces are adapted to be interlocked similarly as the top, bottom and end panels are interlocked with the back panel 18, namely, by the interfit-

ting of the channelled edge portion 95 on the piece 93 and the channelled edge portion 96 on the piece 94. The flange 97 of the channel 95 is bent inwardly at an acute angle of about 60° with respect to the web portion of that channel, as indicated, so as to project into the channel 96 to the extent necessary for positively interlocking the pieces 93 and 94, similarly as in the interlocking of the top, bottom and end panels with the back panel 18 of the cabinet, as previously described. With such a construction, it is apparent that a much smaller package can be made of the disassembled cabinet, and, therefore, a substantial saving in the cost of shipment is realized. It is also considered of advantage in the quantity production of cabinets to have all of the panels nearly of the same size. If desired, the back panel may be like that shown at 18b in Fig. 17, in which the pieces 93' and 94' have C-shaped edge portions 95' and 96', which are adapted to be interlocked in the manner shown. Such a construction is of advantage from the standpoint that wooden cleats are usually nailed to a wall horizontally for support of the cabinet, the cabinet being thereafter fastened by its back panel to the cleats, and with the construction shown in Fig. 17, it is a simpler matter to notch out the cleats to accommodate the folded interlocking edge portions of the pieces 93' and 94', and thus use continuous pieces in the top and bottom cleats, than it is to put up two-piece cleats at the top and bottom in sufficiently spaced relation to accommodate therebetween the interlocked edge portions 95 and 96 of the pieces 93 and 94, shown in Fig. 16. In a narrower cabinet having a single door, the split back construction would not be necessary, because the full width back panel would not be apt to be much, if any, larger than the other panels of the cabinet.

While I have made reference to "sheet metal" as the, at present, preferred material for manufacture of this cabinet, it should be clear that my invention is not to be regarded as limited to that or any other specific material, and hence wherever the term "sheet metal" occurs in the claims, the claims should be construed accordingly.

It is believed the foregoing description conveys a good understanding of all of the objects and advantages of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. In a cabinet structure, a plurality of individual sections formed of sheet material to provide top, bottom and side walls for the cabinet, the forward edge portion of each section being bent at right angles to the plane of the section to provide a web and thence bent rearwardly in spaced parallel relation to the section to provide a depending flange, the flange of each section being cut away at its ends to permit overlapping of the ends of adjacent webs, and means comprising two pairs of generally L-shaped corner members, one pair for each side of the cabinet at the front, the upper one of each pair having one leg thereof extending longitudinally with respect to the front edge portion of a side wall and the other leg extending longitudinally with respect to the front edge portion of said top wall, and the lower one of each pair having one leg thereof extending longitudinally with respect to the front edge portion of a side wall and the other leg extending longitudinally with respect to the front edge portion of said bottom wall, the overlapped webs

on the front edge portions of said top and side walls and of said bottom and side walls having registering openings provided therein, and said corner members each having a screw-threaded hole provided therein registering with the registering openings, and a single screw for fastening each of said corner members to said walls entered in the screw-threaded hole in the corner member through the registering openings in said webs.

2. In a cabinet structure, comprising top, bottom, and opposed side walls of sheet material disposed in assembled relationship to one another, the front edge portions of said walls being formed into channel-shape with the webs of the channels in substantially vertical planes and substantially coplanar relation, four L-shaped corner members for interconnecting the side walls with the top and bottom walls at the front corners of the cabinet, two of said L-shaped members having one leg fitting snugly in the channel of their respective side walls and the other leg fitting snugly in the channel of said top wall, the other two of said L-shaped members having one leg fitting snugly in the channel of their respective side walls and the other leg fitting snugly in the channel of said bottom wall, whereby to reinforce and square up the front corners of said cabinet, means for fastening said corner members to said walls, two of said corner members on the same side of the cabinet having outwardly projecting door supporting lugs provided thereon in substantially parallel horizontal planes and having holes provided therein in coaxial relation on a substantially vertical axis.

3. In a cabinet structure, comprising top, bottom, and opposed side walls of sheet material disposed in assembled relationship to one another, the front edge portions of said walls being formed into channel-shape with the webs of the channels in substantially vertical planes and substantially coplanar relation, four L-shaped corner members for interconnecting the side walls with the top and bottom walls at the front corners of the cabinet, two of said L-shaped members having one leg fitting snugly in the channel of their respective side walls and the other leg fitting snugly in the channel of said top wall, the other two of said L-shaped members having one leg fitting snugly in the channel of their respective side walls and the other leg fitting snugly in the channel of said bottom wall, whereby to reinforce and square up the front corners of said cabinet, means for fastening said corner members to said walls, two of said corner members on the same side of the cabinet having outwardly projecting door supporting lugs provided thereon in substantially parallel horizontal planes and having holes provided therein in coaxial relation on a substantially vertical axis, a door for the cabinet, and pintles provided on said door and journaled in the holes formed in said door supporting lugs.

4. In a cabinet, a plurality of substantially rectangular sections formed of sheet material arranged to define the top, bottom and sides of the cabinet, the front edges of said sections being formed into channel shape, and L-shaped members entered into said channel at the adjacent front corner portions of said top and side sections, and said bottom and side sections, said L-shaped members being secured in position therein to interconnect said top and side sections and said bottom and side sections at said front corner portions, said L-shaped members at one side of the cabinet having projections provided thereon

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extending forwardly from the plane of the front of the cabinet, and a door hingedly mounted on said projections to form a front closure for said cabinet.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
71,032	McCoy	Nov. 19, 1867

Number

913,429
1,178,612
1,581,256
1,692,765
1,742,976
1,746,307
1,806,610
1,829,009
1,944,394
2,142,953
2,226,670

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Name

Date

Ralph	Feb. 23, 1909
Weiss	Apr. 11, 1916
Wege	Apr. 20, 1926
Salt	Nov. 20, 1928
Vance	Jan. 7, 1930
Frank	Feb. 11, 1930
Christensen	May 26, 1931
Madsen	Oct. 27, 1931
Bales	Jan. 23, 1934
Raymond	Jan. 3, 1939
Pratt	Dec. 31, 1940