Jan. 18, 1944. E. D. KASER 2,339,339

STEEL CABINET CONSTRUCTION

Filed Jan. 28, 1942 4 Sheets-Sheet 1

Fig. 1

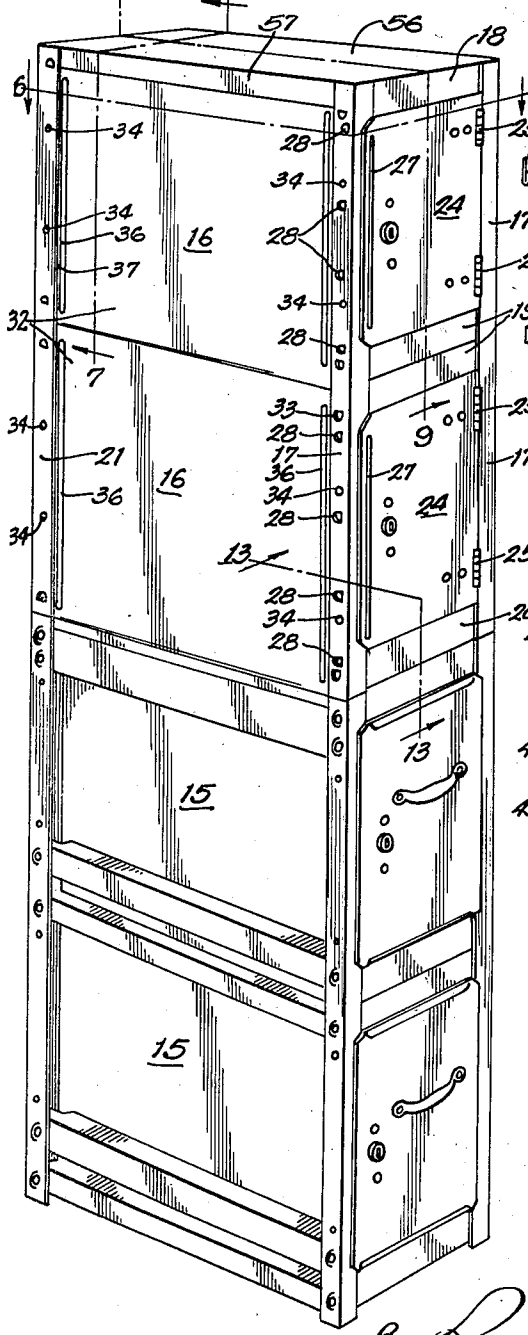


Fig. 2

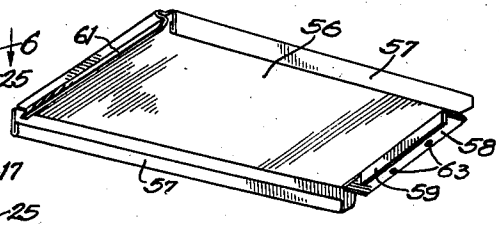


Fig. 3

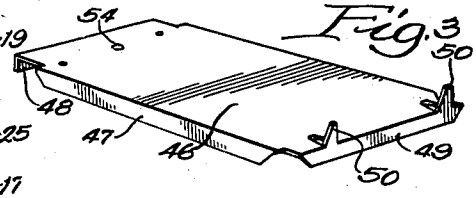


Fig. 4

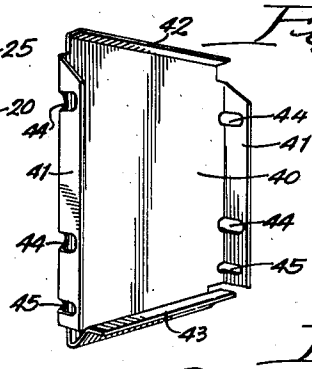
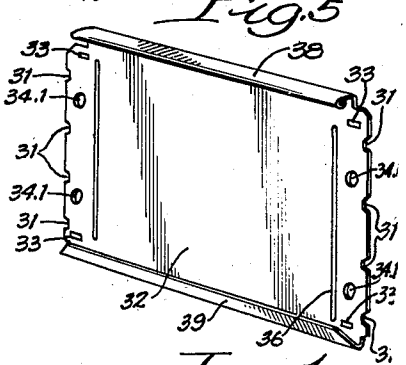


Fig. 5



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Fig. 6

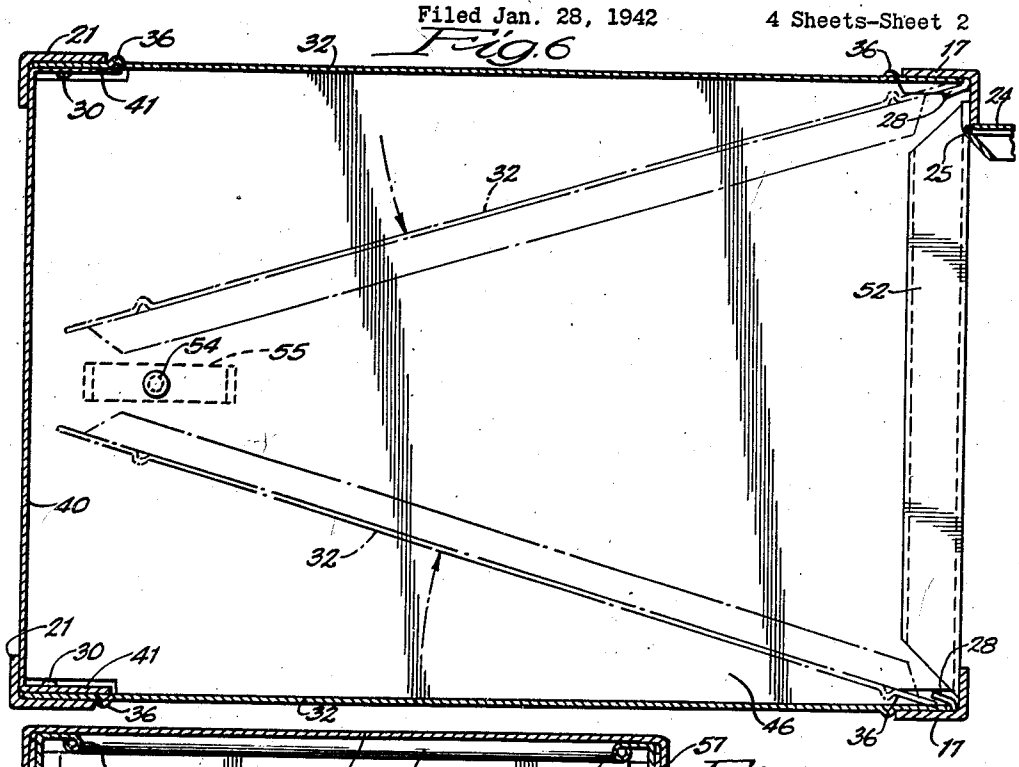


Fig. 7

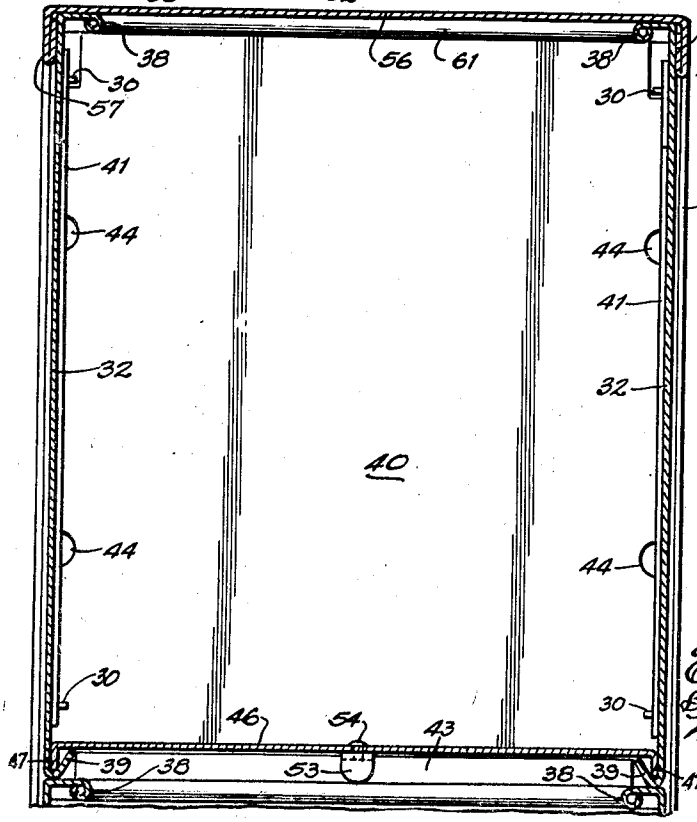
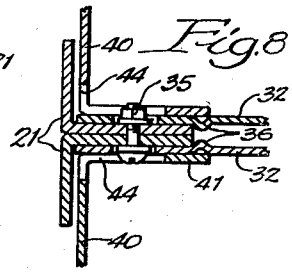


Fig. 8



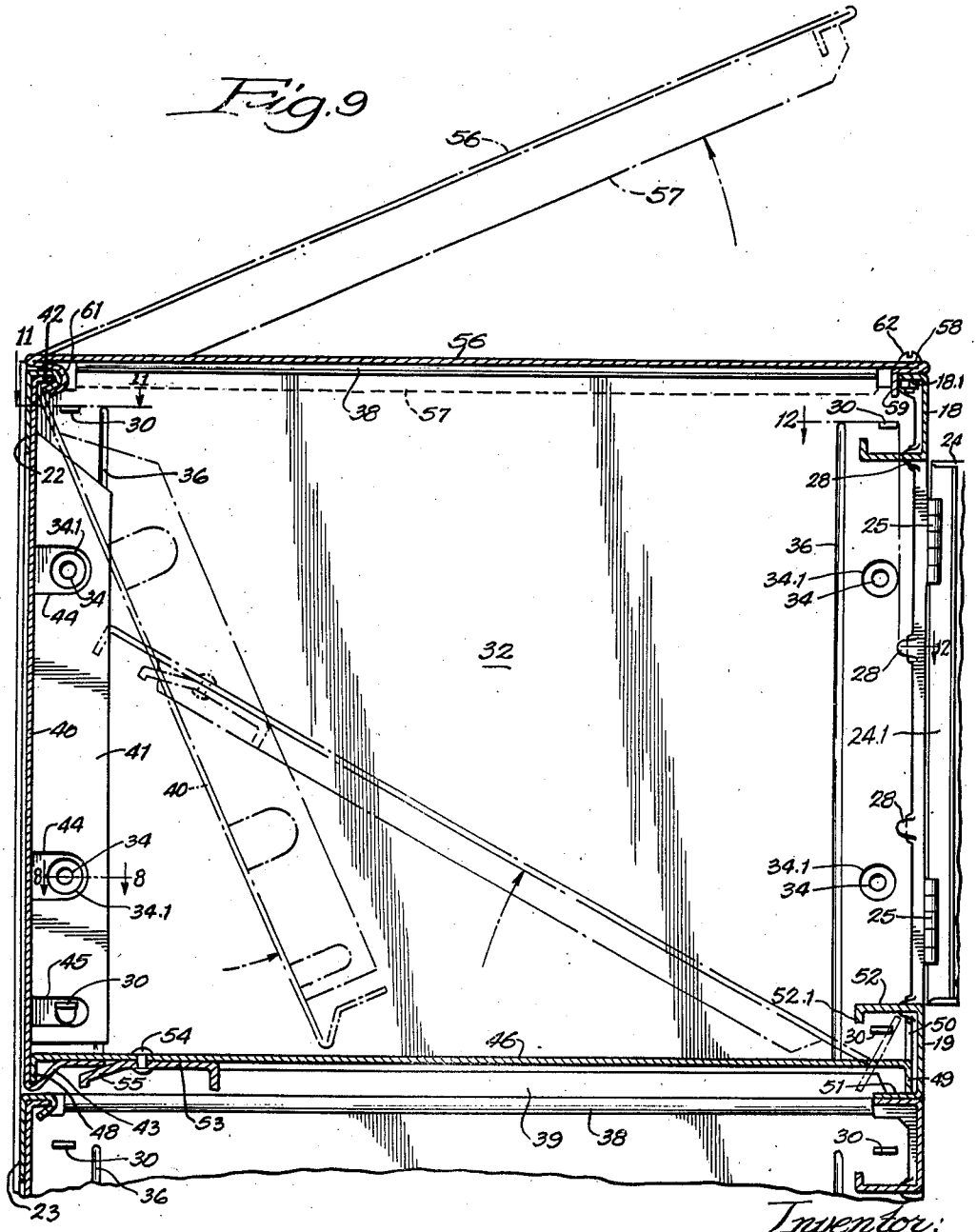
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STEEL CABINET CONSTRUCTION

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Fig. 9



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STEEL CABINET CONSTRUCTION

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Fig. 10

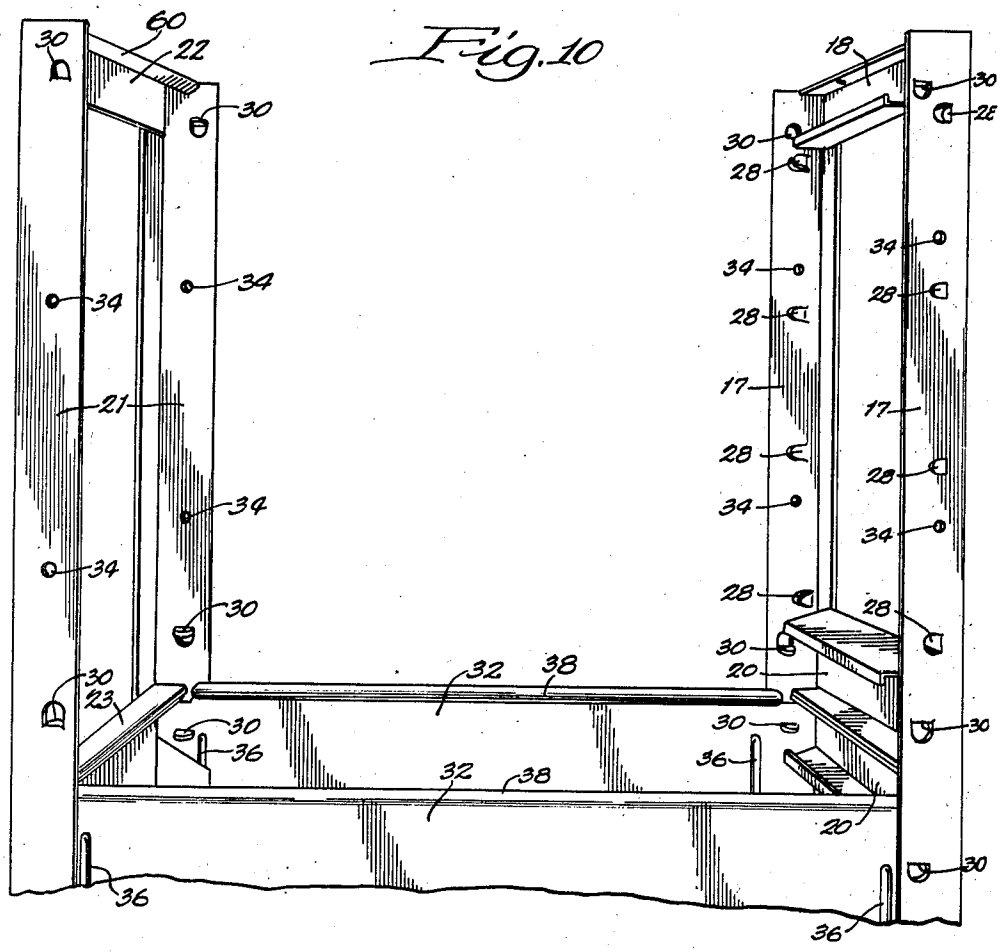


Fig. 11

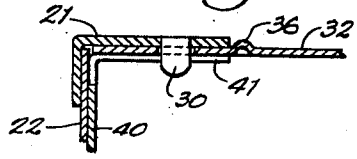


Fig. 12

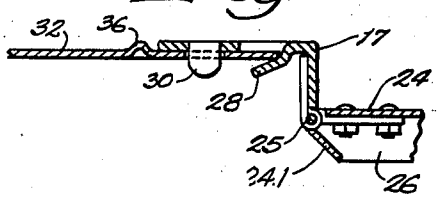
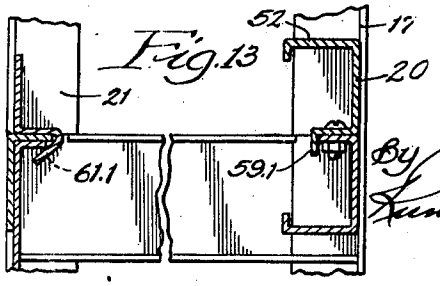


Fig. 13



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UNITED STATES PATENT OFFICE

2,339,339

STEEL CABINET CONSTRUCTION

Everett D. Kaser, Aurora, Ill., assignor to Durabilt Steel Locker Company, Aurora, Ill., a corporation of Illinois

Application January 28, 1942, Serial No. 428,469

8 Claims. (Cl. 312—143)

This invention relates to steel cabinet construction and is a continuation in part of my copending application Serial No. 385,111, filed March 25, 1941.

Cabinets for storage purposes are usually made in the form of banks of drawers or of cupboards with doors at the front or combinations of both, and this invention relates mainly to so-called "knock-down" constructions for lockers of the cupboard type.

The main objects of this invention are to provide an improved construction for steel cupboards with special arrangement and connection of component parts, such that the same can be easily assembled and disassembled and be capable of being packed and transported as flat elements laid one upon another; to provide a structure of this kind in which the walls of any individual cell or cupboard can be readily removed for the purpose of cleaning and sterilizing them without disturbing the skeleton structure of the stack or bank of lockers of which it forms a part and without disassembling the adjacent units; to provide an improved structure and arrangement of a cupboard type of locker in which the individual panels are detachably interlocked with each other and with the supporting skeleton structure without necessitating the use of bolts, rivets, screws or hinge pins, to provide an improved form of open hook-hinge formation for connecting the marginal portions of panels to adjacent portions of steel cabinets; and to provide an improved arrangement of panels whereby the same may be assembled in cupboard relation or disassembled therefrom, in prescribed sequence to form a rigid cupboard or box of the knock-down type.

A specific form of steel cabinet construction embodying this invention is illustrated in the accompanying drawings in which:

Figure 1 is a perspective view of a vertical stack of steel lockers comprising a pair of cupboard units mounted in vertical alinement with a pair of drawer units.

Fig. 2 is a perspective view of the underside of the top of cover plate of such a stack as it would appear when removed from the adjacent structures.

Fig. 3 is a perspective view of the plate which forms the bottom panel of the cupboard as it appears from above.

Fig. 4 is a perspective view of the back panel plate as it appears from the front.

Fig. 5 is an inside view in perspective of the plate that forms either side panel of the cupboard.

Fig. 6 is a horizontal section of the cupboard taken on the line 6—6 of Fig. 1 showing in broken lines the manner in which the side panels may be swung into and out of position.

Fig. 7 is a vertical section of the cupboard taken on the line 7—7 of Fig. 1.

Fig. 8 is a sectional detail illustrating the structural arrangement whereby bolts may be used for connecting the frame members of one stack of lockers to those of another without requiring the removal of such bolts for the assembly or disassembly of any individual cupboard compartment of either stack.

Fig. 9 is a section taken on the line 9—9 of Fig. 1 and showing in broken lines the manner in which certain panels may be swung into and out of place for dismantling or assembling a cupboard unit.

Fig. 10 is a perspective view taken from one side and showing the skeleton frame of a locker unit with its panels removed.

Fig. 11 is a sectional detail on line 11—11 of Fig. 9.

Fig. 12 is an offset sectional detail on the line 12—12 of Fig. 9 illustrating the cooperative relationship between the two forms of lugs that are struck out from the frame bar to secure the side plates at the front end to the locker unit.

Fig. 13 is a detail in vertical section of the interlocking members whereby an upper stack of units is mounted in vertical alinement with a lower stack as illustrated in Fig. 1, wherein the plane of this section is indicated by the line 13—13.

In the form shown in the drawings, the lockers are assembled in vertical stacks of any desired height and the stacks are straight sided so that any number of them can be placed side-by-side to form banks of lockers. The vertical frame bars may be of the proper length for connecting the locker units in pairs as this provides a convenient unitary stack size for easy handling.

In the form shown in the drawings, the stack of lockers is made up of two drawer units 15 stacked one above the other and two cupboard units 16 stacked one above the other and mounted in vertical alignment with the drawer units so as to form a single stack. Each pair of units has a rigid front frame consisting of vertical bars 17 connected by a plurality of cross bars 18, 19 and 20, and a rigid rear frame made up of vertical bars 21 connected by cross bars 22 and 23. In the cupboards these front and rear

frames are connected only by the panel plates which enclose the cupboard compartments. Each cupboard compartment is provided with a door 24 connected to one of the up-rights 17 of the front frame by means of hinges 25. The top and bottom margins of the door panel 24 are bent inward to form flanges 26 which fit with slight clearance along frame bars 18, 19 and 20 at the door openings. The front marginal portion of each of these door panels is crimped to form a stiffening rib 27 and then extends beyond this stiffening rib so as to bear against a front frame bar 17 as shown in Figure 1. The door panel 24 also has a stiffening flange 24.1 along its rear edge with openings for the hinges.

The front frame bars 17 have two sets of lugs respectively designated 28 and 30 struck inward from their side flanges for securing the side panels of cupboards 16. The lugs 28 stand inward and rearward at an angle, best shown in Figure 12, to coact with placement notches 31 in the side panels 32 and the lugs 30 stand at right angles to the frame panels 17 and engage marginal apertures 33 in the side panels 32. The rear frame bars 21 are similarly provided with lugs 30 but do not require the hook hinge lugs 28. Additional apertures 34 are positioned in the side flanges of the frame bars 17 to provide bolt holes for bolts that connect adjoining stacks of lockers to each other. The arrangement of these bolts is illustrated in Figure 8 where a frame bar 21 of one stack is shown connected to a frame bar 21 of an adjoining stack by means of bolt 35.

The structure of the side panel plates 32 is best seen in Figure 5 and, since the apertures 33 and notches 31 in its front and rear margins are symmetrically arranged, it will be seen that the plates forming both side panels are exactly alike. The side panel plates 32 have apertures 34.1 registering with the apertures 34 in the side frame bars. These panel plates are crimped to provide stiffening ribs 36 positioned to lie along and adjacent to the frame bars 17 and 21 thus assisting in bringing the front and rear frame bars into parallelism when the side plates 32 are in place. The top marginal edge of side plate 32 is bent inward to form a flange and the edge of this flange is curled upon itself for stiffness. The panel plate 32 has its lower margin bent inward to form a flange 39 that faces inward and upward forming a V-shaped seat along the lower margin of the plate 32.

The structure of the rear panel plate 40 of the cupboard is shown in Figure 4. This plate is substantially rectangular with inwardly facing side flanges 41, an inwardly facing top flange 42 and an inwardly facing bottom flange 43, which latter extends both inward and upward to form a V-shaped seat along the lower edge of the plate 40 and is then bent horizontally to form a marginal lip. The corner portions of the rear panel plate 40 are cut away as shown in Figure 4 to provide the necessary clearance for the adjoining structures as it is swung into and out of its normal position. Before the flanges 41 are bent up, the blank from which the plate 40 is formed is punched to provide apertures 44 and 45 which extend across the bend as shown in Figure 4 to clear the bolts 35 and the studs 30, as shown in Figure 8.

The structure of the bottom panel plate is illustrated in Figures 3, 7, and 9. This is a flat plate 46 with downwardly turned marginal side flanges 47, a downwardly turned rear flange 48 and a downwardly turned front flange 49. Upstanding formations 50 in the form of spaced lugs are struck out of the body of the plate 46 adjacent its front margin so that these will be carried to an upright position when the flange 49 is turned down.

This front formation of the plate 46 is designed to enter the bosom of the channel shaped front cross bar 19 of the frame and to coact with the inwardly facing bottom and top flanges 51 and 52 of said frame bar 19 so as to provide in effect an open hook-hinge connection between the bottom plate 46 and frame bar 19. Figure 9 illustrates the relation of the parts of this hook-hinge formation.

The flange 52 of the channel bar 19 is curled downwardly at 52.1 to provide a smooth sill for the door opening. To bring the parts of this hook-hinge formation into engagement with each other, the bottom plate 16 is inclined to the position in which it is shown in broken lines and then the lugs 50 are inserted under the hook-like lip 52.1 of the flange 52 so that the flange 49 will rest on the flange 51. Then the bottom plate 46 is swung down into the position in which it is shown by full lines in Figure 9 where the flange 49 and lugs 50 brace its front edge against up-and-down movement and the side flange 47 and rear flange 48 are seated in the marginal seats provided by the inclined flanges 39 of the side panels and the inclined portion of the flange 43 of the rear panel respectively.

In the form shown, the bottom plate 46 is provided with a swinging latch member 53 pivoted on rivet 54. The slightly inclined arm 55 engages the underside of the lip of the flange 43 and locks the bottom plate 46 in place. The bottom plate 46 of an upper cupboard may serve as a top plate for the next lower cupboard.

The uppermost locker of the stack is provided with a cover plate 56, of which the structure is shown in Figures 2, 7 and 9. This cover plate 56 has depending side flanges 57 which flanges are folded back upon themselves, so as to be of double thickness and provide strong reinforcement for the plate 56 throughout its length which spans the distance between the rigid front frame and rigid rear frame of the locker stack.

The front marginal edge of the cover plate 56 is turned back upon itself and then downwardly so as to provide a stiff marginal portion 58, equal in width to the width of the top flange 18.1 of the frame bar 18, and a depending lip 59 positioned to abut against the rear edge of said top flange 18.1.

The top bar 22 of the rear frame is an angle bar with its top flange bent along a line parallel with its edges so as to provide a downwardly and rearwardly inclined lip 60 (Fig. 10) which forms part of open hook-hinge connections with both the back panel plate 40 and the top panel plate 56, as may be best seen in Fig. 9.

In this relation the flange 42 on the back panel plate 40 is hooked within the bent flange 60 of the frame bar 22 and the top plate has an inwardly and outwardly bent hook-like marginal formation 61 that forms a seat for engaging the outer rim of the frame bar flange 60.

To attach the top plate 56 to the cupboard structure, its rear marginal hinge seat 61 is engaged with the rim of the bent flange 60 while the top plate is in an inclined position as shown by broken lines in Fig. 9 and the plate is then swung downwardly on this open hook-hinge formation until it rests firmly on the top of the side plate flanges 38 and front frame bar 18. The

lip 59 engages the inner edge of the flange 18.1 and the marginal flanges 57 overhang the outer face of the side plates 32 as shown in Fig. 7.

It will be understood that when the parts are in their disassembled relation the front and rear skeleton frames are comparatively flat structures that can be laid horizontally, one upon the other; and similarly, the panel plates are comparatively flat so that the parts can be packed in exceedingly compact form for shipment and warehouse storage.

The assembling operation is comparatively simple and consists in first setting the front and rear frames upright, then applying the side panels by first seating their front edges in the hook-hinge formations that are provided by the placement notches 31 on the side panels and the lugs 28, and then swinging the side panels outwardly so that their apertures 33 engage the lugs 30 on both the front and rear frames.

The lugs 30 fit the apertures 33 snugly so that they effectually determine the spacing between the front frame and the rear frame. The ridges 36, that are formed by crimping of the side panel plates, lie along the edges of the frame bars 17 and 21 and thus also contribute to holding those frame bars properly spaced and parallel.

The rear panel is next inserted between the side panels, its upper flange 42 is hooked into the open flange formation 60 on the frame bar 23 or 22, as the case may be, and the panel 40 is then swung into its vertical position against the frame bars 17 as shown in Fig. 9, its flanges 41 bearing between the rear margins of the side plates 32 pressing them against the side flanges of frame bars 17 and preventing them from becoming displaced.

The bottom panel 46 is then inserted between the side panels in an inclined position as shown in Fig. 9 and its front margin is inserted into the bosom of the channel 19 where these parts cooperate in the open hook-hinge formation hereinbefore-described; and then the bottom plate 46 is swung downwardly so that its side and rear flanges enter the seats formed by the bottom flanges of the side and rear panels and finally the latch member 55 is turned in a position to engage the lip of the flange 43 on the back plate to lock the parts rigidly in their assembled relation.

The top panel is then attached by engaging the hook-hinge formation provided by the bent flanges 60 and 61 and is swung down to its closed position where it requires fastening only at its front margin, which fastening may be an internal latch formation, such as is provided by the member 53 on the bottom plate, or it may be simple bolts, such as are shown at 62 in Fig. 11 and for which registering apertures 63 are provided in overlapping margins of the top plate 56 and the frame bar 18.

On assembling a stack of cupboard structure, it is preferable to assemble the lowest compartment first and then follow with the assemblage of the succeeding compartments of the stack but it will be seen that for the purpose of cleaning the walls of any compartment, it will be possible to disassemble such compartment without disturbing adjoining compartments even when adjoining stacks of lockers are fastened together by bolts 35 connecting their frames. To this end, the circular apertures 34.1 in the side plates are of suitable size to clear the washers on such bolts and the cutouts 44 in the back panel plate provide the necessary clearance for removing it without disturbing the bolts. Similarly, the cut-away corner portions of the bottom panel plate 46 permit it to be swung into and out of its normal position without interference by such bolts.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A locker structure, comprising back and front end frames having side bars, a pair of side panels between said end frames and bearing on inner faces of said side bars, lugs and recesses in interfitting relation on said side bars and the adjacent marginal portions of said side panels to secure said side panels to said frames, a back panel adjacent said back end frame and bearing between said side panels, said side and back panels having lower marginal portions shaped to form upwardly facing inner marginal channeled seats, a bottom panel having depending flanges to engage and interfitting with said marginal seats, said front frame having a seat for hingedly interfitting with the front margin of said bottom panel, and a top panel hingedly interfitted at the upper edge of said rear panel and extending into position for engagement with said front frame.

2. A locker structure, comprising rigid front and rear end frames, side panels, means providing said side panels with swingably detachable interfitting connection to one of said end frames and with lug and recess interfitting connection with the other said frame, a rear panel bearing between said side panels to brace same in place, means providing said rear panel with swingably detachable interfitting connection to the rear end frame, a bottom panel bearing against said rear panel when said bottom panel is swung to its horizontal position to brace the rear panel in place, and means providing said bottom panel with swingably detachable interfitting connection to said front frame.

3. A locker structure, comprising rigid front and rear end frames, side panels, means providing said side panels with swingably detachable interfitting connection to one of said frames and with lug and recess interfitting connection with the other said frame, a rear panel bearing between said side panels to brace same in place, means providing said rear panel with swingably detachable interfitting connection with the rear end frame, a bottom panel bearing against said rear panel to brace the rear panel in place, means providing said bottom panel with swingably detachable interfitting connection to said front frame, and means to lock said bottom panel in its horizontal position.

4. A knock-down locker structure, comprising front and back rectangular frames, side panels, means providing said side panels with swingably detachable interfitting connection to the front frame and with lug and recess engagement with both said frames for securing them in spaced relation, a rear panel bearing against said back frame and against said side panels and having an upwardly facing hook formation at its lower margin, a bottom panel bearing between said side panels and against said rear panel and having a depending rear marginal formation interfitting the hook formation on said rear panel, and means providing said bottom panel with swingably detachable interfitting connection to said front frame.

5. A knock-down locker structure, comprising

front and back rectangular frames, side panels, means providing said side panels with swingably detachable interfitting connection to the front frame and with lug and recess engagement with both said frames for securing them in spaced relation, a rear panel bearing against said back frame and against said side panels, said side and rear panels each having an upwardly facing hook formation at its lower margin, a bottom panel bearing between said side panels and against said rear panel and having depending rear marginal formations interfitting the hook formations on said side and rear panels, and means providing said bottom panel with swingably detachable interfitting connection to said front frame.

6. A knock-down locker structure, comprising front and back rectangular frames, side panels, means providing said side panels with swingably detachable interfitting connection with the front frame and with lug and recess engagement with both said frames for securing them in spaced relation, a rear panel bearing against the back frame and against said side panels and having an upwardly facing hook formation at its lower margin, a bottom panel bearing between said side panels and against said rear panel and having a depending rear marginal formation interfitting the hook formation on said rear panel, means providing said bottom panel with swingably detachable interfitting connection to said front frame, said side and rear panels each having an inwardly facing top flange, and a top panel seated on said top flanges, means whereby said top panel is swingably and detachably held at the top of said rear panel, and means for securing the front margin of said top panel to said front frame.

7. A knock-down structure, comprising front and back rectangular frames, side panels, means providing said side panels with swingably detachable interfitting connection to the front frame and with lug and recess engagement with both said frames for securing them in spaced relation, a rear panel bearing against said back frame and against said side panels and having an upwardly facing hook formation at its lower margin, a bottom panel bearing between said side panels and against said rear panel and having a depending rear marginal formation interfitting the hook formation on said rear panel, means providing said bottom panel with swingably detachable interfitting connection to said front frame, and a movable lock member for fastening said bottom panel at its back end.

8. A knock-down structure, comprising front and back rectangular frames, side panels, means providing said side panels with swingably detachable interfitting connection to the front frame and with lug and recess engagement with both said frames for securing them in spaced relation, a rear panel bearing against said back frame and against said side panels and having an upwardly facing hook formation at its lower margin, a bottom panel bearing between said side panels and against said rear panel and having a depending rear marginal formation interfitting the hook formation on said rear panel, means providing a swingably detachable interfitting connection between said bottom panel and said front frame and comprising a horizontally disposed bar of said front frame having inwardly facing spaced flanges and upwardly and downwardly extending projections on the front margin of said bottom panel bearing between said front frame and flanges.

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