

[54] CABINET CONSTRUCTION

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16/159

[51] Int. Cl. A47b 43/00

[58] Field of Search 312/257 R, 257 SK,
312/263, 258, 265, 111, 140; 16/159

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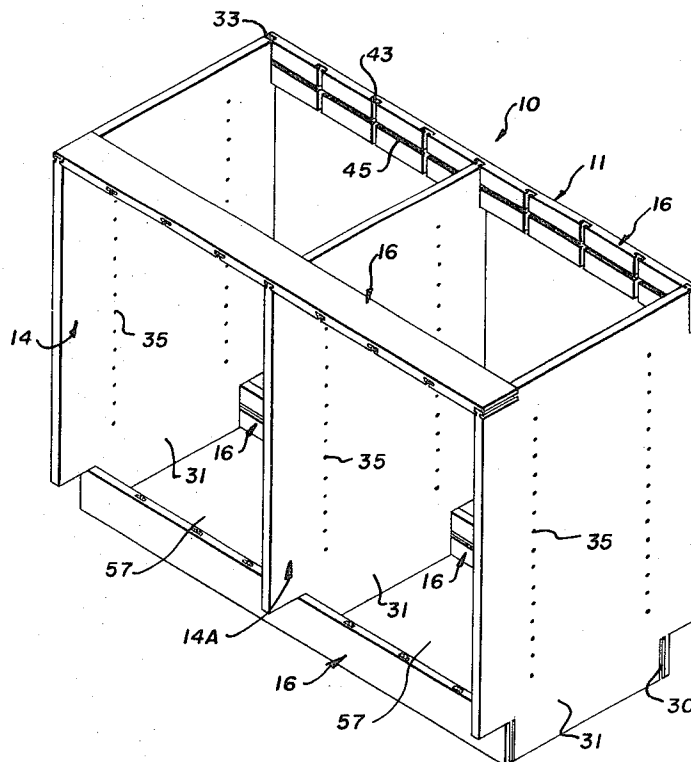
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[57] **ABSTRACT**

Prefabricated cabinet construction which can be shipped in knockdown form and assembled to provide a workbench of a predetermined length with storage compartments containing either drawers or shelves.

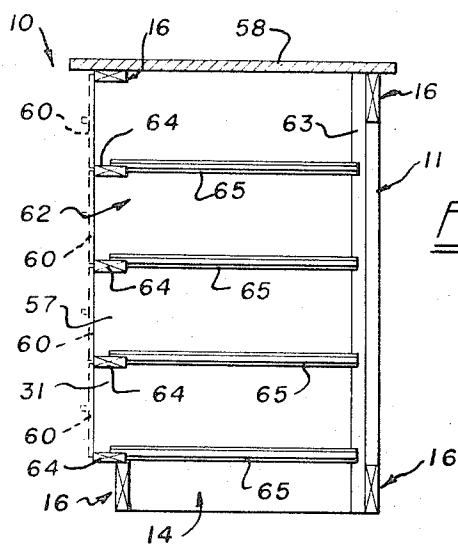
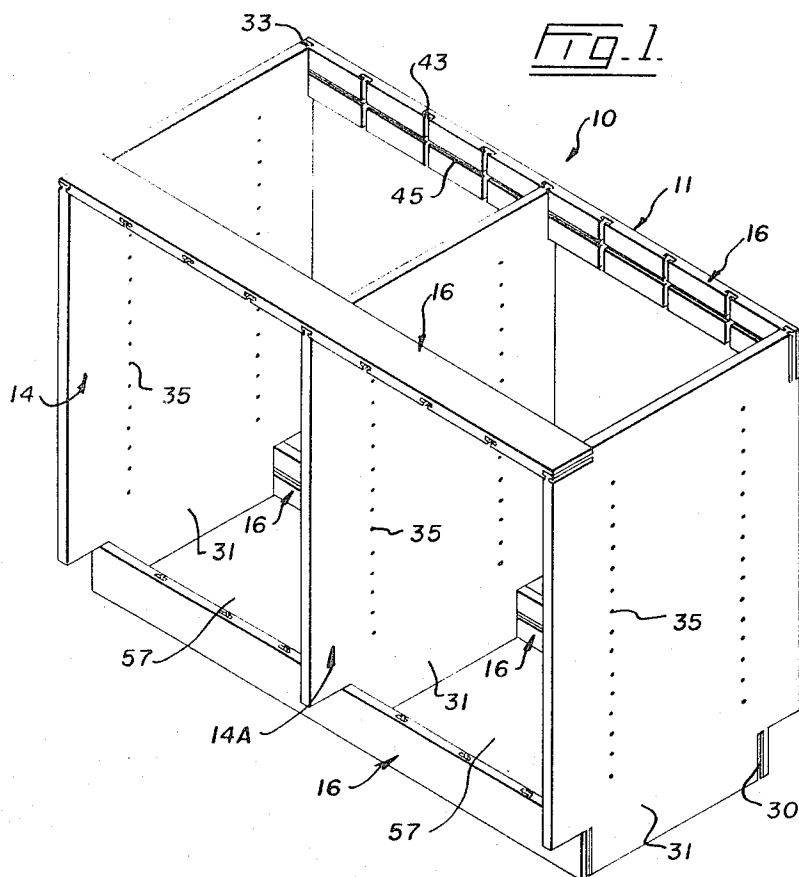
8 Claims, 17 Drawing Figures



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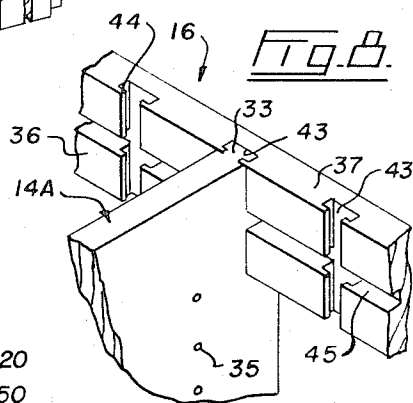
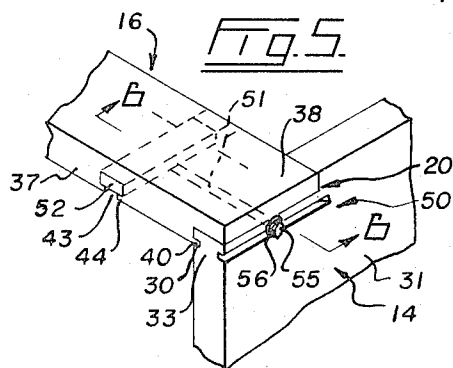
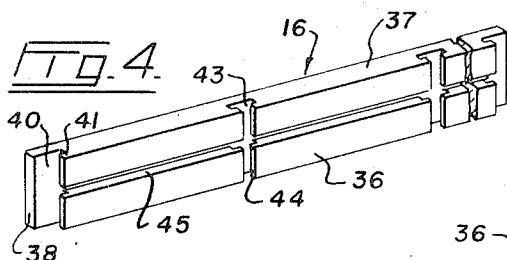
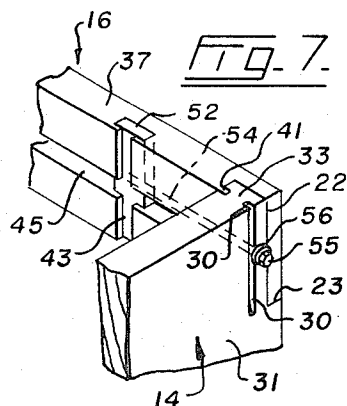
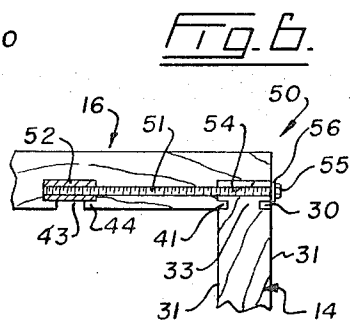
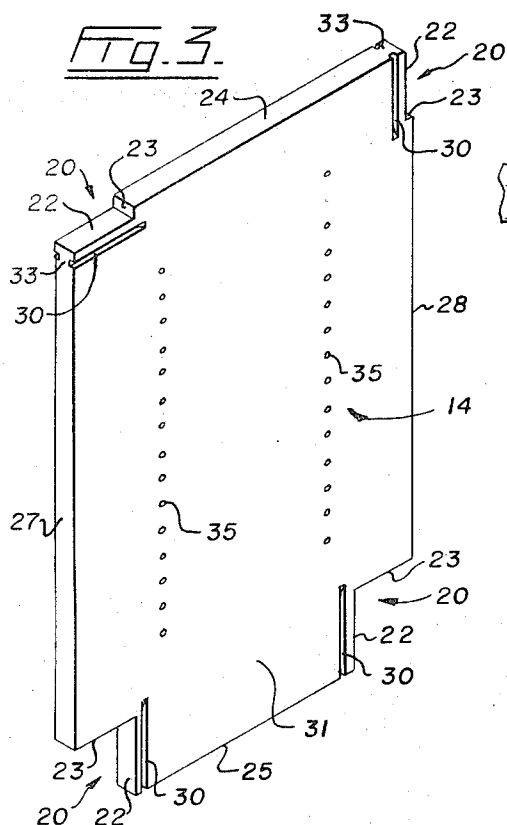


Fig. 9.

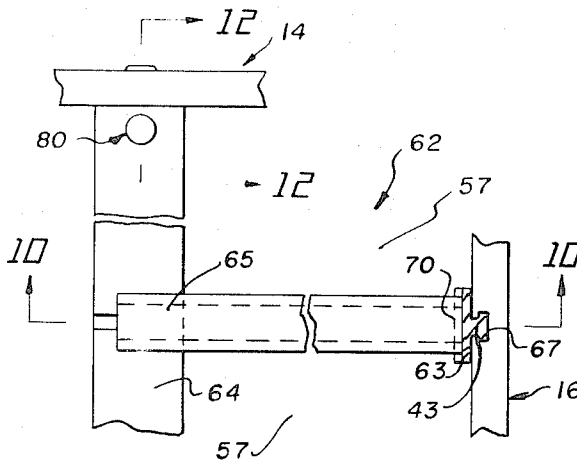


Fig. 11.

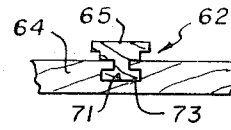


Fig. 10.

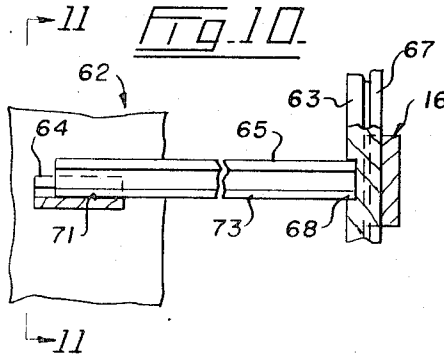


Fig. 13.

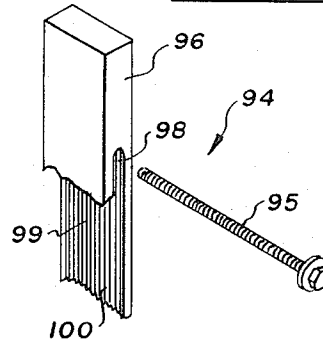


Fig. 12.

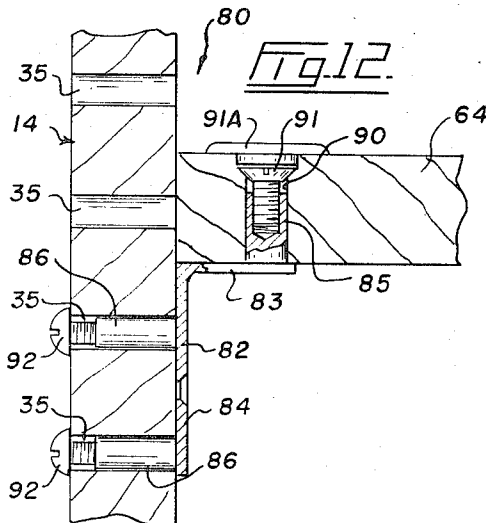


Fig. 14.

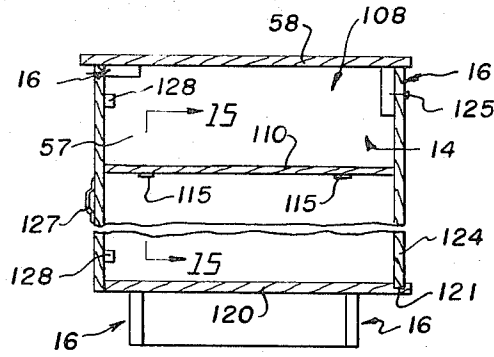


Fig. 15.

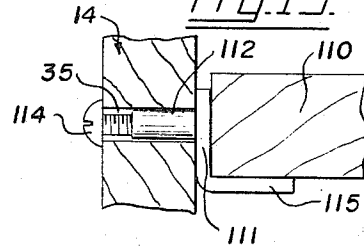


Fig. 16.

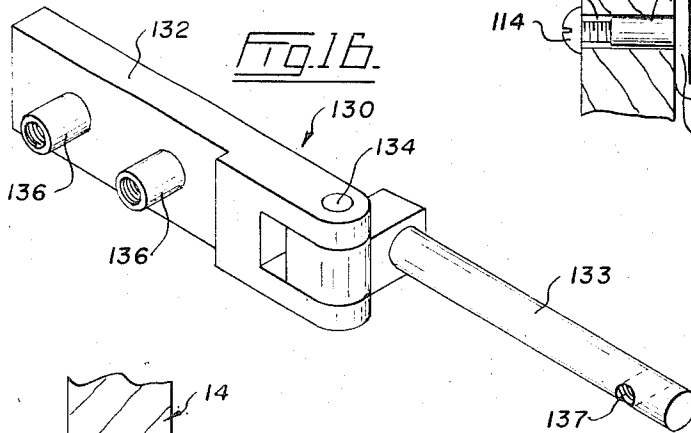
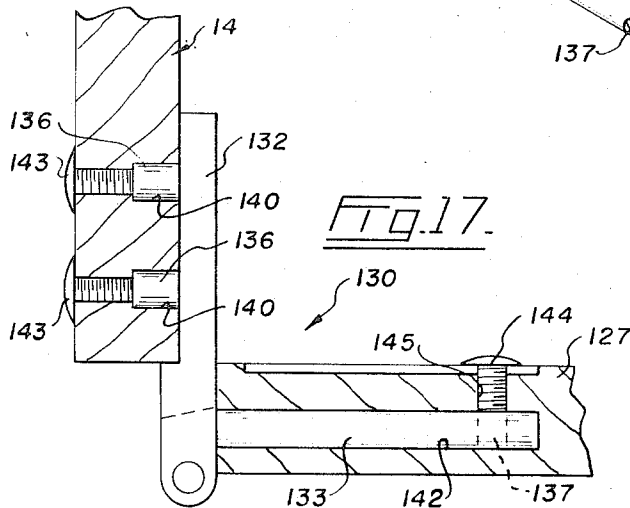


Fig. 17.



CABINET CONSTRUCTION

My invention relates to construction of cabinets particularly intended for use in hospitals, schools, and laboratories as well as in the home.

A cabinet of the type used in a laboratory, for example, generally is constructed at the factory by a cabinet maker or assembled in the lab by a finish carpenter to suit the requirements of the eventual users and to make the best use of whatever space is available. This has meant employing skilled workmen using costly tools who must spend a considerable amount of time cutting and fitting the individual parts of the cabinets all of which contributes greatly to the cost.

I overcome the above as well as other disadvantages of conventional cabinets by providing a construction which can be completely prefabricated at the factory and, if desired, prefinished by painting or applying other finishes. The purchaser of the present cabinet merely orders a cabinet which will provide the required length of counterspace and stipulates whether he wants drawers, shelves or a combination of both and the appropriate cabinet parts are shipped to him in knock-down form to conserve space and reduce transportation costs. The assembly can be made quickly and easily by semi-skilled workmen to complete a finished cabinet of a suitable size and design. The several parts making up a frame for the cabinet are positively locked together to provide a strong and rigid base on which the remaining cabinets parts can be mounted.

In drawings which illustrate preferred embodiments of the invention,

FIG. 1 is a perspective view of a frame used in the present cabinet construction,

FIG. 2 is a transverse vertical section of the complete cabinet construction equipped with drawers,

FIG. 3 is a perspective view of a gable of the cabinet,

FIG. 4 is a perspective view of a cabinet rail,

FIG. 5 is a perspective view of a top, front corner of the cabinet frame showing the connection between a rail end and one of the end gables,

FIG. 6 is a longitudinal section taken on the line 6—6 of FIG. 5,

FIG. 7 is a perspective view of a top, rear corner of the cabinet showing the connection between an end gable and a rail,

FIG. 8 is a perspective view showing the connection between an intermediate gable and a top, rear rail,

FIG. 9 is an enlarged, fragmentary plan showing an inner assembly for supporting drawers within the cabinet,

FIG. 10 is a vertical section taken on the line 10—10 of FIG. 9,

FIG. 11 is a vertical section taken on the line 11—11 of FIG. 10,

FIG. 12 is a further enlarged section taken on the line 12—12 of FIG. 9,

FIG. 13 is a perspective view, partly broken away, showing another embodiment of a locking means for the present apparatus,

FIG. 14 is a vertical section similar to FIG. 2 but partly broken away and showing the cabinet fitted with shelves.

FIG. 15 is a vertical section taken on the line 15—15 of FIG. 14,

FIG. 16 is a perspective view of a hinge used in the cabinet, and

FIG. 17 is a horizontal section showing a door secured to one of the side wall panels by a hinge.

Referring first to FIGS. 1 and 2 of the drawings, the numeral 10 indicates generally a cabinet having a frame 11. The frame of this particular embodiment of the invention, which is generally indicated by the numeral 11, comprises three wall panels or gables 14 which are connected by four rails 16.

The gables 14 are of identical construction and therefore interchangeable and preferably they are made of standard plywood or particle board for strength and economy of manufacture. The four solid wood rails 16 used on the frame 11 are also of a standard size and like all the cabinet parts they are completely finished at the factory so as to be ready for assembly at the building site. The rails 16 are manufactured in suitable standard lengths and are later joined together or cut as required to suit any desired cabinet length. For example, some sets of rails may be produced which are 30 feet long while other sets are made shorter or longer as required but still of standard lengths.

Referring now particularly to FIG. 3, each rectangular gable 14 will be seen to have a notch 20 at each corner thereof. The oblong notch 20 at the upper front corner of the gable 14 (FIG. 3) has an edge 22 and a shoulder 23, the edge being parallel to top and bottom edges 24 and 25 of the gable. The other three corner notches 20 have corresponding edges and shoulders indicated by the same reference numerals with the edges 22 of these other notches being parallel to front and rear edges 27 and 28 of the gable.

Near the edges 22, kerfs 30 are cut into two opposite side faces 31 of each gable and these kerfs are arranged in pairs with one pair adjacent each notch 20. The pairs of kerfs 30 are spaced from and disposed parallel to the notch edges 22 so as to define substantially T-shaped tongues 33. The gables 14 are provided with vertical rows of holes 35 extending parallel to the front and rear edges 27 and 28 and spaced a short distance inwardly therefrom. The holes 35 are regularly spaced apart and are located within an area above and below the notches 20.

In FIG. 4, the identical rails 16 are shown to each have an inner face 36, side edges 37, and end edges 38. A rabbet 40 is provided in the rails to extend across each end edge 38 and a rib 41 projects into the rabbet alongside the inner face 36. At regularly spaced intervals (preferably at 3 inch center to center spacing) along the length of the rails 16, the faces 36 are provided with transverse grooves 43 which are enterable from the side edges 37 as well as from said inner faces. Opposing ribs 44 extend over each groove 43 near the inner face 36. Each face 36 has a longitudinally extending and centrally disposed groove 45 cut therein, the groove extending into the rabbets 40 and the transverse grooves 43. It will be noticed the rabbets 40 are formed when the standard length rails are cut across a suitably located groove 43 to provide a rail of the required length, the cut removing one of the opposing ribs to leave a single rib 41.

FIGS. 5, 6 and 7 show how the two end gables 14 and rails 16 are connected together. The tongues 33 are received in the rabbets 40 and the ribs 41 are lodged in complementary kerfs 30. All the other rail ends 38 are fitted into the corner notches 20 in the same manner to provide the sturdy and readily assembled frame 11. Only the top, front rail 16 is horizontally disposed as

shown in FIGS. 1 and 5, for example, the other three rails 16 being vertically disposed as shown best in FIGS. 1 and 7.

The end gables 14 and rails 16 of the frame 11 are locked against separation by means 50, see FIGS. 5, 6 and 7. As illustrated, each locking means 50 comprises a clamping bolt 51 and a bar nut 52. The oblong bar nut 52 is of a size to closely fit the innermost portion of a transverse groove 43 and said bar nut is inserted into said groove from one of the side edges 37 of the rail so as to slidably engage the ribs 44. The bolt 51 extend through a hole 54 (FIG. 6) which is drilled at the factory through the tongue 33 for that purpose. Bolt 51 has a head 55 and is fitted with a washer 56 which bears against a face 31 of the gable. When the bolt 51 is tightened within the bar nut 52, the rail 16 is securely clamped to the gable 14 at this top, front corner of the frame 11.

Identical locking means 50 are used at the other corners of the oblong frame 11 with the total of 8 locking means being the only fastening devices used on the structure thus far described. By interlocking the end gables 14 and rails 16 as described and securing them against separation using the bolts 51 and bar nuts 52, a particularly rigid frame 11 is provided to support the remaining parts of the cabinet 10.

The frame 11, which as previously mentioned can be made of almost any required length by varying the length of the rails 16, is intended to be fitted with one or more intermediate gables 14A as shown in FIGS. 1 and 8. Intermediate gable 14A is constructed in exactly the same manner as the previously described end gables 14. The intermediate gable 14A is assembled in proper sequence with the remaining parts of the frame 11 and with the tongue 33 of said intermediate gable being lodged in suitably located transverse grooves 43 of the four rails 16 in the manner shown best in FIG. 8. When the eight locking means 50 are applied as described above, the entire frame 11 is locked together with no additional fasteners being required for the intermediate gable 14A. Use of three gables 14 divides the frame 11 into two compartments 57 (FIG. 1) which, in this instance, are shown to be of equal size although the spacing of the gables and therefore the widths of the compartments may be varied if desired.

Frame 11 is fitted with a top panel 58, see FIG. 2 only. The top panel 58 preferably overhangs the frame 11 slightly as shown best in FIG. 2 and is secured to said frame by suitable means, not shown. Panel 58 provides a rigidly supported workbench or the like.

Each compartment 57 of the cabinet 10 may be fitted with drawers 60, which are represented by dotted lines appearing only in FIG. 2. Since the drawers 60 are of conventional construction, detailed description of these components is not considered necessary. In order to support the drawers 60, each compartment 57 of the frame 11 is provided with an inner assembly generally indicated at 62. As shown in FIG. 2 and in detail FIGS. 9 to 12, each inner assembly 62 comprises a single vertical rear support 63, a horizontal front support 64 for each drawer 60, and a horizontally disposed runner 65 (one for each drawer) connecting each front support to the rear support.

The vertical rear support 63 extends between the two rails 16 at the rear of the cabinet frame and is provided with a T-shaped spline 67 which extends longitudinally the full length of said support. Spline 67 is received in

vertically aligned transverse grooves 43 of the top and bottom rails 16 as shown in FIG. 9. The side of the support 63 opposite the spline 67 is provided with horizontal grooves 68 (FIG. 10) which have substantially the same vertical spacing as the front supports 64.

Supports 64 extend across each compartment 57 and are secured to the gables 14, 14A as will be described later. One end 70 of each runner 65 is lodged in a groove 68 on the vertical support and may be suitably secured to said support. The opposite end of the runner 65 is received in a transverse groove 71 cut in the top face of the front support 64 and may be secured thereto by a screw or the like, not shown. Runners 65 are provided with the usual laterally projecting ribs 73 (see particularly FIG. 11) which act as guides for suitably shaped brackets (not shown) depending below the drawers 60.

To secure opposite ends of a front support 64 to an end gable 14, the cabinet 10 is provided with hanger means generally indicated at 80. As shown best in FIG. 12, the hanger means 80 comprises a bracket 82 having horizontal and vertical arms 83 and 84 which are provided with internally threaded sleeves 85 and 86. Sleeve 85 is received in a hole 90 formed in an adjoining end of the support 64 and is secured therein by a flat-headed screw 91 which preferably is covered by a plastic disc 91A. The two sleeves 86 on the arm 84 project into holes 35 in an end gable 14 with suitable screws 92 being used to secure said sleeves against withdrawal. The opposite end of the front support 64 is attached to the intermediate gable 14A by similar hanger means 80.

FIG. 13 shows a modified locking means 94. The means 94 comprises a bolt 95 and a bar nut 96. The bar nut 96 is provided with a slot 98 which extends from one end of the oblong bar nut to the center thereof. The opposing faces 99 of the slot 98 are provided with striations 100 as shown in FIG. 13, the striations acting as threads to mate with the threads of the bolt 95. This arrangement enables the bolt 95 to be fitted in position whereupon a bar nut 96 can be pushed downwardly into one of the transverse grooves 43 to engage the bolt. The bolt 95 is received in the striated slot 98 and, when said bolt is tightened, the bar nut 96 and the rail to which it is secured are drawn inwardly so as to be clamped to the gables.

The cabinet 10 may be fitted with shelves in lieu of the above mentioned drawers in which case, an inner assembly 108 is provided as shown in FIGS. 14 and 15. The numeral 110 indicates a shelf which is mounted in a compartment 57 using a hanger bracket 111 having an internally threaded sleeve 112. Sleeve 112 projects into a hole 35 in an end gable and is secured therein by a screw 114. End 115 of the bracket 111 supports an edge of the shelf 110. Thus, the shelves 110 are suitably supported within the cabinet compartments 57.

To finish off a cabinet 10 fitted with the shelves 110, each compartment 57 is provided with a bottom panel 120 which is supported on, and is suitably secured to, the upper edges of the two lower rails 16, see FIG. 14. The rearwardly projecting edge of the bottom panel 120 is grooved as at 121 to receive a lower edge of a back panel 124. This panel 124 is secured to the upper, back rail 14 by means of a suitable fastener 125. The fronts of the compartments 57 are closed off by doors 127 which are hung on hinges 128.

Referring now to FIGS. 16 and 17, each hinge 130 will be seen to comprise a plate 132 and a stem 133 connected by a hinge pin 134. Plate 132 is fitted with internally threaded sleeves 136 and the stem 133 has an internally threaded hole 137 near an end thereof. FIG. 17 shows such a hinge 130 is attached to an end gable 14 and a door 127. The sleeves 136 are entered into openings 140 formed in panel 14 and the stem 133 is inserted into an opening 142 formed in an edge of the door. Flat headed screws 143 are used as shown in FIG. 17 to lock the plate 132 to the gable 14. A similar screw 144 is projected through a hole 145 in the door 127 to enter the hole 137, thus locking the stem 133 against withdrawal from the door opening 142.

From the foregoing, it will be apparent I have provided a form of cabinet construction which can be economically produced and very readily assembled by almost anyone able to fit one part to another. The standardized parts of the cabinet allow variation in the length of the structure as a whole, or in the length of the individual compartments, and also provide a choice of the use of drawers or shelves or a combination of both. If necessary, the cabinet can be knocked down and reassembled in another location or the counter and storage space provided by the cabinet can be rearranged or varied in size at some later date merely by replacing some of the standardized parts with others. The location and general design of the cabinet usually can be changed at a fraction of the cost normally required to shift and rearrange a conventional cabinet. When a cabinet is installed and it is later found that additional counter space is required, a second cabinet can be placed end to end with the first without the need to duplicate the gables at the point where the sections are joined.

I claim:

1. A cabinet construction comprising a frame having generally rectangular end gables connected at each corner by longitudinally extending rails, said end gables each having opposite side faces and corner notches, said opposite side faces having kerfs arranged in pairs with one pair spaced from each notch to define a tongue, said rails each having an inner face and end edges containing transversely extending rabbets, a rib projecting into each rabbet adjacent the inner face, said tongues being received in the rabbets with the ribs lodged in some of the kerfs, said inner faces each having a plurality of transverse grooves regularly spaced apart along the length of the rail between the rabbeted end edges thereof, and locking means including a member inserted into a transverse slot for securing each rail end to an end gable.

2. Cabinet construction as claimed in claim 1, and including an intermediate gable in the frame, said intermediate gable being identical to the end gable and having tongues entered into transverse grooves of the rails.

3. Cabinet construction as claimed in claim 1, in which said inner face of each rail has a longitudinal groove extending through the transverse grooves

therein, said transverse grooves each having opposing ribs adjacent the inner face, said members each being a bar nut retained in its transverse groove by the opposing ribs thereof, a bolt engaging each bar nut and extending parallel to the longitudinal groove, said end gables each having a hole adjacent each corner notch and through which a bolt extends to project outwardly of said gable.

4. Cabinet construction as claimed in claim 3, in which each of said bar nut has an end edge and is provided with a longitudinal slot extending into said end edge to approximately the centre of said bar nut, said longitudinal slot having opposing faces provided with thread-like striations engaging the threads of a bolt.

5. Cabinet construction as claimed in claim 1, in which each of said gables has front and rear edges and a vertical row of holes adjacent each of said edges, a load-carrying inner assembly mounted within the frame, and hanger means fitted to a selected hole of a vertical row of holes for securing a part of the inner assembly to a gable.

6. Cabinet construction as claimed in claim 5, in which said inner assembly includes a vertical support connecting rails at the rear of the frame, said vertical support having a T-shaped spline housed within transverse grooves of the connected rails.

7. Cabinet construction comprising a frame having generally rectangular end gables connected at each corner by longitudinally extending rails, said end gables each having opposite side faces and corner notches, said opposite side faces having kerfs arranged in pairs with one pair spaced from each notch to define a tongue, said rails each having an inner face and end edges containing transversely extending rabbets, a rib projecting into each rabbet adjacent the inner face, said tongues being received in the rabbets with the ribs lodged in some of the kerfs, said inner faces each having a plurality of transverse grooves regularly spaced apart along the length of the rail between the rabbeted end edges thereof, said inner face of each rail having a longitudinal groove extending through the transverse grooves therein, said transverse grooves each having opposing ribs adjacent the inner face, a bar nut and bolt connecting each rail end to an end gable, each of said bar nuts being housed within a transverse groove for engagement by a bolt extending inwardly through a gable alongside the longitudinal groove in the rail.

8. Cabinet construction as claimed in claim 7, and including a door hung on an end gable by hinge means, said hinge means comprising a plate secured to an inner face of the end gable to project beyond an end edge thereof, a stem hingedly secured at one end to the projecting end of the plate and having a transverse threaded hole, said door having an end edge provided with an opening to receive the stem, and a threaded fastener extending into the door to enter the transverse threaded hole.

* * * * *