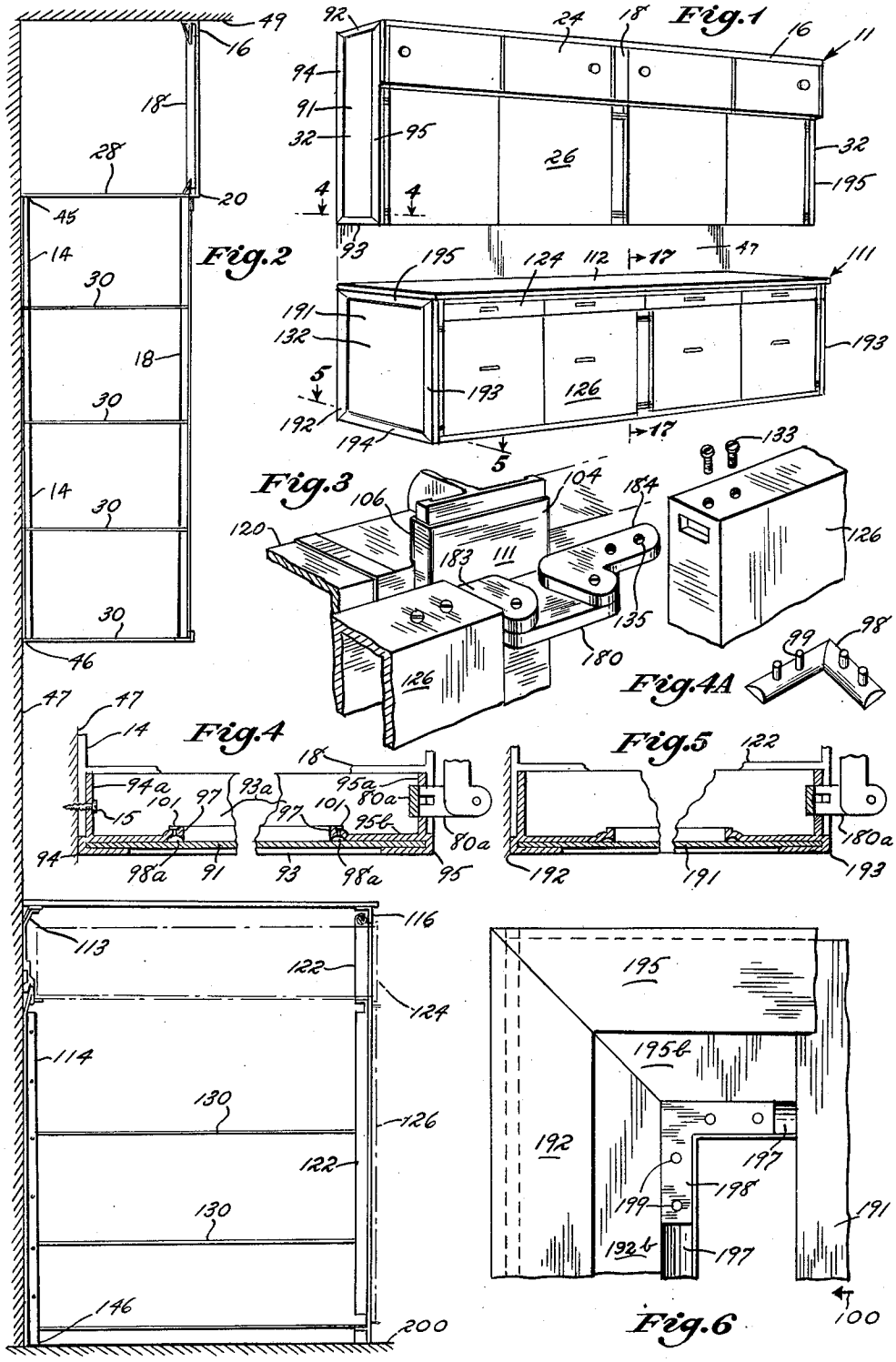
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KITCHEN CABINETS

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Fig. 7

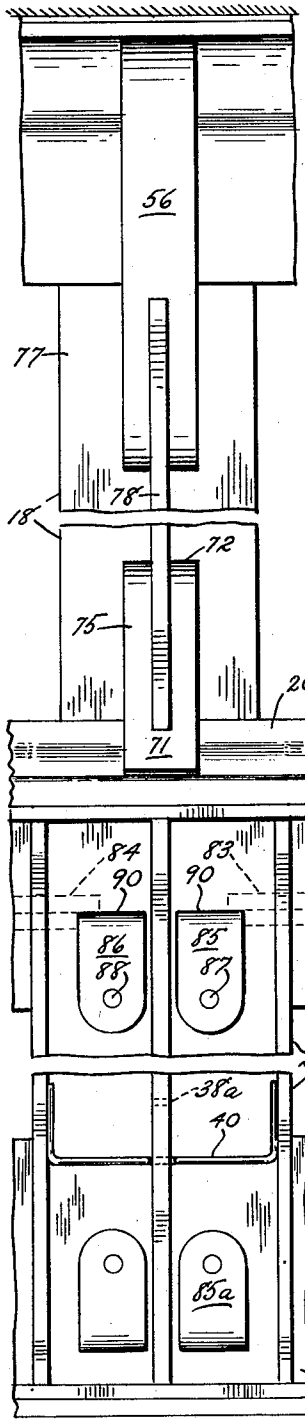


Fig. 9

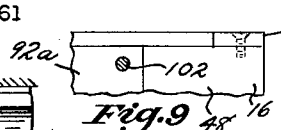


Fig. 10

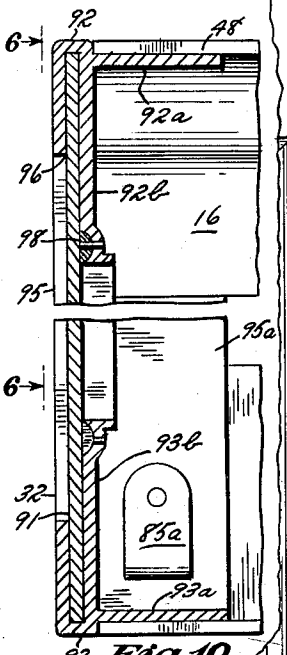


Fig. 11

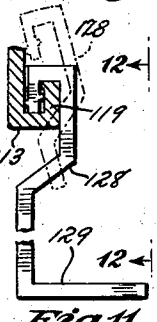


Fig. 13

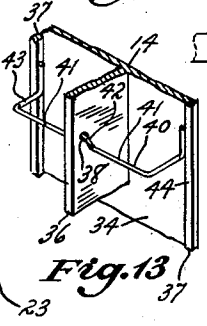


Fig. 8

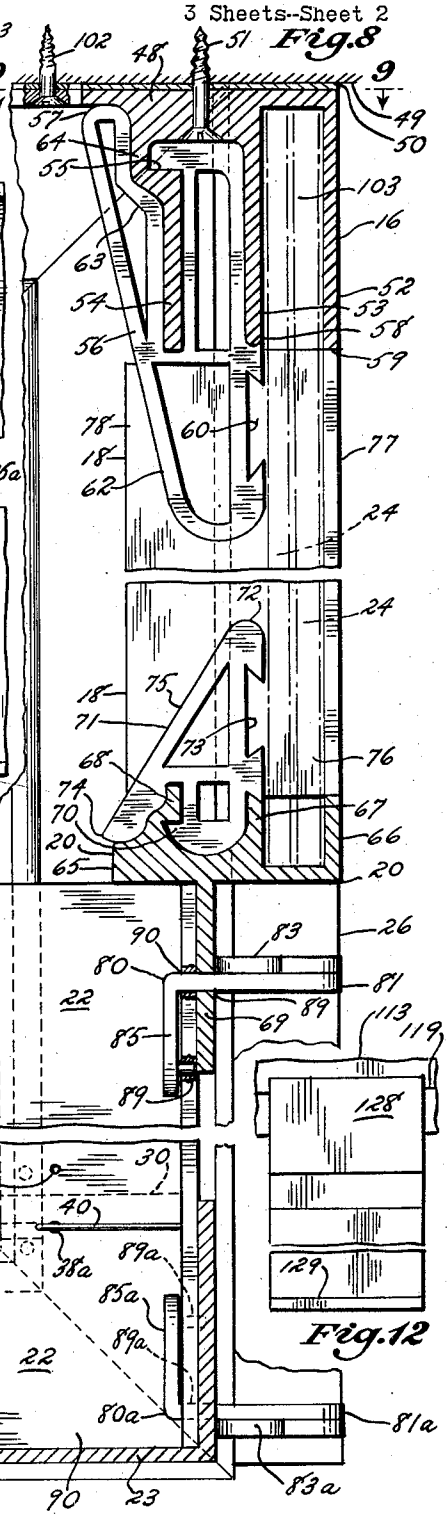


Fig. 12

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Fig. 14

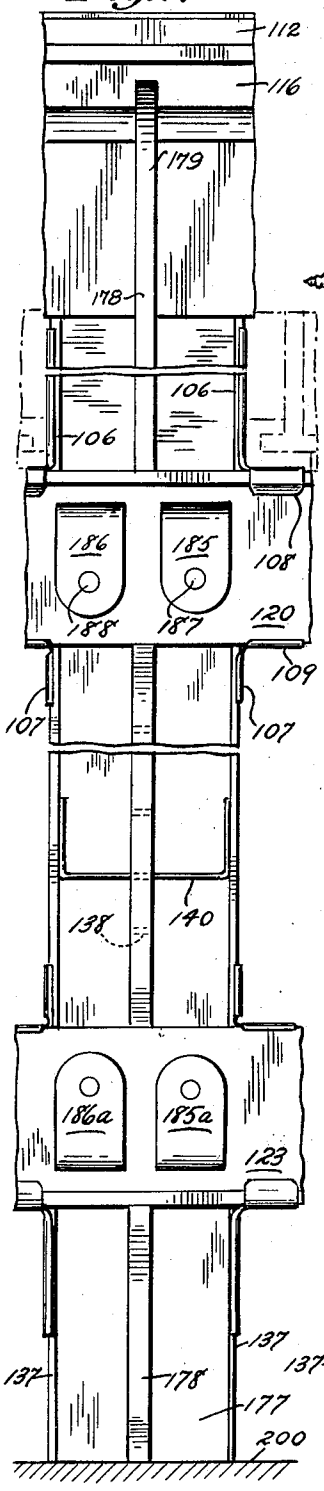


Fig. 16

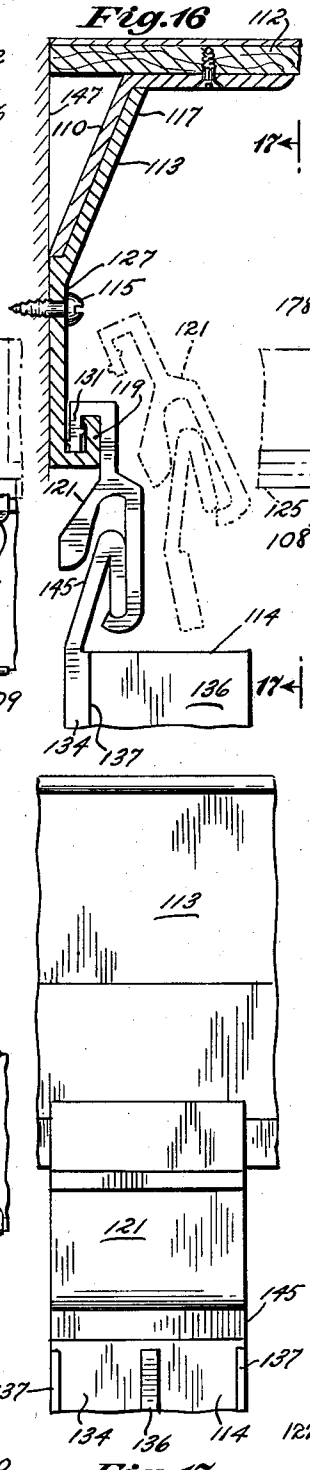
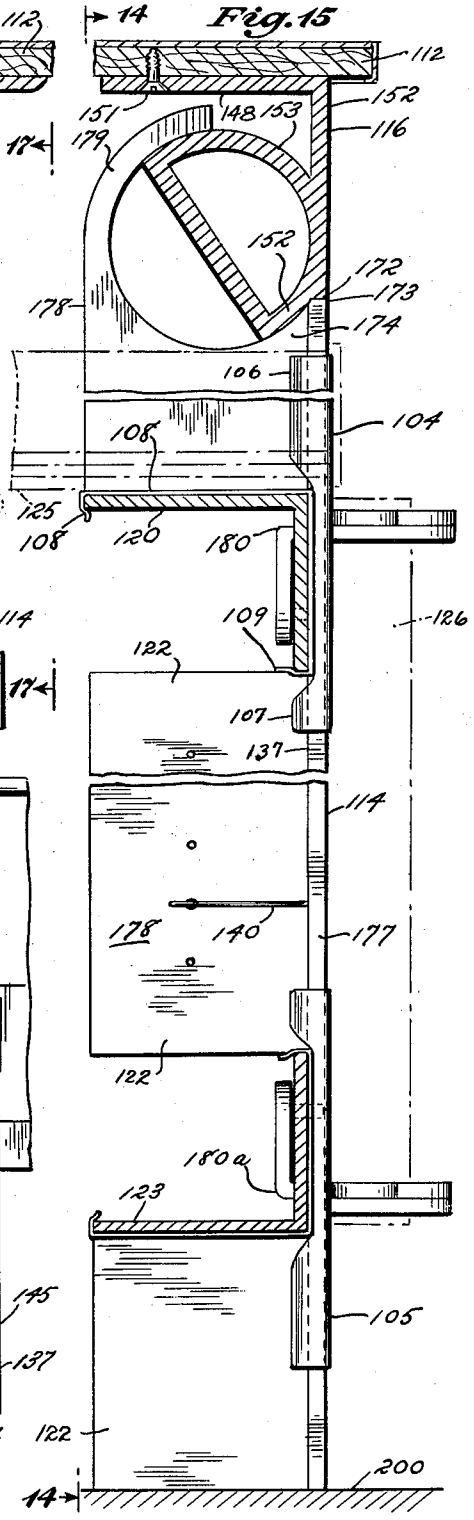


Fig. 17

Fig. 15



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3,149,587

KITCHEN CABINETS

Nat Levenberg, 2 Windsor Place, Lynbrook, N.Y.

Filed Jan. 13, 1961, Ser. No. 82,435
1 Claim. (Cl. 108—152)

This invention relates generally to cabinets and more particularly to improved kitchen cabinet construction, although these improvements may be used in other cabinetry as well.

A large proportion of kitchen cabinets are stored and shipped in a set up condition, necessitating large storage space and expensive transportation, thereby curtailing the distribution area. It is, therefore, among the objects of the present invention to provide an improved knocked-down construction resulting in small storage space requirements and low cost shipping.

Another object is to provide a construction which is easily set up and installed, needing only a screw driver.

Another object of this invention is to provide a lightweight but strong construction which reduces cost in a number of ways, including using surrounding building surfaces such as walls and ceilings together with low cost extrusions and panels.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claim.

In the drawings, in which similar reference characters designate corresponding parts throughout the several views:

FIGURE 1 is a perspective view of wall and base cabinets of an embodiment of the invention.

FIGURE 2 is a vertical sectional view.

FIGURE 3 is a fragmentary perspective view showing hinge and door connection and adjacent structure.

FIGURE 4 is a fragmentary horizontal sectional view as seen from the plane 4—4 on FIGURE 1.

FIGURE 4A is a fragmentary perspective view of an upper tenon member.

FIGURE 5 is a fragmentary horizontal sectional view as seen from the plane 5—5 on FIGURE 1.

FIGURE 6 is a fragmentary elevational view of an end panel for a base cabinet partially assembled (6—6 on FIGURE 10).

FIGURE 7 is a fragmentary elevational view, taken from inside a wall cabinet, a rear view seen from the left of FIGURE 8.

FIGURE 8 is a fragmentary vertical sectional view of a wall cabinet.

FIGURE 9 is a reduced fragmentary horizontal section, seen from the plane 9—9 on FIGURE 8.

FIGURE 10 is a fragmentary vertical sectional view of an end panel.

FIGURE 11 is a fragmentary vertical elevational view of a rear support for a drawer guide in a base cabinet.

FIGURE 12 is a front elevational view as seen from the plane 12—12 on FIGURE 11.

FIGURE 13 is a fragmentary perspective view of a wall cabinet rear vertical support element and shelf support member.

FIGURE 14 is a fragmentary elevational view, taken from inside a base cabinet looking forward, as seen from the plane 14—14 on FIGURE 15.

FIGURE 15 is a fragmentary vertical section of the front portion of a base cabinet.

FIGURE 16 is a vertical section corresponding to FIGURE 15 but showing the upper rear portion of a base cabinet.

FIGURE 17 is a fragmentary elevational view seen from the plane 17—17 on FIGURE 16.

In general, the invention contemplates, in some of its

major aspects, the elimination of the top and rear walls of the wall cabinets, the rear and bottom walls of the base cabinets, and the end walls of both cabinets where they abut an adjoining room wall. Furthermore, the vertical frame elements of the wall and base cabinets are suspended or supported by interlocking vertical elements which are horizontally adjustable in position so that doors and drawers may be selected to suit the total horizontal space and the choice of the user. In addition, a minimum of part types, plus certain interchangeability, affords maximum flexibility to accommodate for any installation but with low inventory requirements. This novel structure allows selection of exposed decorative surface panels, too.

Turning to an upper or wall cabinet assembly, generally indicated by reference character **11**, this may comprise broadly: intermediate rear vertical support element **14**; upper front horizontal support element **16**; upper front vertical support element **18**; intermediate front horizontal support element **20**; intermediate front vertical support element **22**; lower front horizontal support element **23**; top sliding doors **24**; intermediate hinged doors **26**; top shelf **28**; intermediate shelves **30**; and end walls **32**.

The intermediate rear vertical support element **14** (FIGURE 13) is preferably an extrusion composed, for example, of aluminum or synthetic resin and is generally T-shaped in cross section with a base **34**, central flange **36**, edge beads **37**, the flange **36** being provided with a vertical row of holes **38** adapted to receive shelf support members **40**. The members **40** are generally U-shaped but of irregular configuration, best seen in FIGURE 13, and including a cross piece **41** with a central crimp **42**, legs **43** and feet **44**. The crimp **42** is engaged by the edge of a hole **38** when the member **40** is half passed through and a twisting motion snaps the member **40** into fixed position where the two horizontal L-shaped portions formed by the cross piece **41** and the legs **43** serve to support the rear corners of the horizontally disposed shelves **30**. The shelves **30** may be of a width sufficient to extend between opposite central flanges **36** or bigger shelves may be used, notched to pass said flange **36**. The top shelf **28** at the rear thereof rests on the upper ends **45** of the support elements **14**, while the lower ends of the elements **14** extend down only far enough to hold the lowest member **40** to support the lowest shelf **30**. The base **34** is connected to the building wall **47** in any suitable manner, as by cement, masonry nails, screws **15** (FIGURE 4), or the like.

The upper front horizontal support element **16** is preferably a metal or plastic extrusion, the cross sectional configuration of which is best seen in FIGURE 8. The base **48** is secured to the ceiling **49** by cement **50** and screws **51** for which the base **48** is suitably perforated. Depending from the base **48** are a plurality of flanges **52**, **53** and **54**. The front flange **52** serves as a fascia and between it and the middle flange **53** is formed a channel wherein the upper edges of the sliding top doors **24** ride. Rear flange **54** includes a horizontally offset portion **55** which provides vertical support for upper connector **56** which is slidably (horizontally) keyed to the flanges **53** and **54**, but such movement is prevented after assembly because when the parts are straightened to the position shown in FIGURE 8 a wedging action takes place. Rearward twisting of movement is prevented by the head **57** butting against the base **48**; while forward twisting movement is prevented by the portion of the connector **56** which contacts the portion **55** and adjacent surfaces and the portion **58** which contacts the lower edge of flange **53**. It should be noted that the reinforcing portion **63** of connector **56** prevents rearward bending or collapse of flange portion **55**, the direction in which it could go in the case of overload, so that vertical support load is limited by tensile strength of web **64**. For-

ward twisting is also prevented by the upper end 59 of element 18 butting the lower edge of flange 52.

The lower portion of connector 56 has a dovetail groove 60, a rounded lower portion 61, and a sloping rear portion 62, and the upper end 59 of element 18 is correspondingly cut out so that element 18 is maintained vertically against front or rear movement.

The intermediate front horizontal support element 20 is preferably a metal or plastic extrusion, best seen in FIGURE 8. The base 65 has, projecting upward, three flanges 66, 67 and 68, and a downward flange 69. The front flange 66 and middle flange 67 form a channel for the lower edges of doors 24. Rear flange 68 has a horizontal offset portion 70 which provides vertical support for lower connector 71, slidably (horizontally) keyed to flanges 67 and 68, but horizontal movement is prevented after assembly by the weight of the parts and contents of the cabinet and a wedging takes place when the parts are straightened to the position shown in FIGURE 8. Relative rearward twisting movement of rounded portion 72 is prevented by the head 74 butting against base 65 and adjacent surfaces, while relative forward twisting movement of portion 72 is prevented at offset portion 70 and the upper edge of flange 67.

The upper portion of connector 71 has a dovetail groove 73 and a sloping rear portion 75, and the lower end 76 of element 18 is thus securely held in place. Overloading would tend to bend flange 68 rearward but it is supported against this by the head 74.

The upper front vertical support elements 18 are T-shaped in cross section and preferably identical to the rear ones 14 (FIGURE 13) having front bases 77 and central flanges 78, and their height is determined by the height of sliding doors 24.

The downward flange 69 on element 20 forms the upper margin of the hinged door enclosed portion of the wall cabinets 11 and the intermediate front vertical support elements 22 are suspended therefrom by combination connector hinges 80. Where the particular element 22 lies horizontally between doors 26 at their hinged edges a double unit such as that shown in FIGURE 3 is utilized, and where only one hinged edge is present (as at the end vertical edge of a cabinet) a modified unit, containing only one hinge, is utilized (compare lower portion of FIGURE 10).

The connector hinge 80 has a body 81, to the upper surface at the front portion of which are pivotally connected the relatively movable L-shaped hinge members 83 and 84. The relatively free ends of members 83 and 84 are in the form of fingers with threaded holes (substantially identical with the members 184 and 183 on FIGURE 3) which are inserted in correspondingly positioned holes in the respective doors 26. At the rear edge of the body 81 there are a pair of right-angle bent ears 85 and 86 which have pins 87 and 88. The flanges 69 and the support elements 22 are provided with aligned slots, which are of sufficient size to allow passage of the ears 85 and 86 therethrough in a curving direction through approximately 90° until the pins 87 and 88 may be received by correspondingly sized and positioned receptacles 89. There is enough room and permissible movement for this operation when the hinge members 83 and 84 are not yet engaged by the doors. After such engagement, however, the connector hinges 80 are substantially stationary with respect to the flange 69 and element 22.

The length of elements 22 is substantially equal to the height of doors 26, and at the lower ends 90 of elements 22 are connected to the lower front horizontal support 23 (except for the inverted position of the combination connector hinges 80*a*) in a manner like that just described in connection with the hinges 80. The support 23 is preferably L-shaped in section, and concealed by the closed doors 26, and lies below the lowermost shelf 30. Elements 22 are perforated at 38*a* to correspond with elements 14, and shelf support members 40 carry the front corners of shelves 30.

When the upper wall cabinet lies between two opposed substantially parallel building walls, the parts can be sized horizontally so that no cabinet end walls 32 are required. When this is not the case end walls 32 are utilized. This structure is shown in FIGURES 1, 4, 4A, 8, 9 and 10. The end walls 32 are substantially identical, being left- and right-hand counterparts, the corresponding parts having the same reference characters. End walls 32 have an outer decorative panel 91 held in place by edge frame members 92, 93, 94 and 95, of irregular section, best seen in FIGURE 10, so that, as mitered, a peripheral inwardly opening channel 96 is formed with inner grooved flanges 92*b*–95*b*. Members 92–95 have inwardly directed right angle flanges 92*a*–95*a*, respectively, which are connected to or associated with adjoining parts. Flange 94*a* may lie forward of base 34 on element 14 and be held by screws 15 (FIGURE 4) which would normally hold base 34 in place. Next frame members 92 and 95 are put into place in vertical plane alignment with member 44. The grooves 97 in grooved flanges 94*b* and 95*b* line up at right angles with the groove 97 in flange 92*b*, and the upper right angle tenon members 98 are put into place into said grooves. Altogether there are four tenon members for each end wall 32. The upper two (FIGURES 4A and 10) have each leg semicircular in cross section with integral fixed dowels 99, and they fit flush into grooves 97, the dowels penetrating correspondingly positioned holes in said grooves.

Next, the panel 91 is slid into channel 96 in an upward direction and as soon as tenon members 98 are covered they can no longer be removed, so that the panel 91 locks frame members 92 to members 95 and 94. The lower two tenon members 98*a* have in their horizontal legs permanently secured dowels which engage holes in the groove of flange 93*b*, but the vertical legs have holes. Now the member 93 is moved vertically up into position so that its channel 96 engages the remaining edge of panel 91 and the vertical legs of tenon members 98*a* fit into the grooves in flanges 94*b* and 95*b* (FIGURE 4). Finally the pins 101 are passed through the aligned holes in the grooves 97 in flanges 94*b* and 95*b* which locks the parts together. The pins 101 are manipulated inside the cabinet. Now necessary combination connector hinges 80 and 80*a* are put into place securing flange 95*a*.

Additional support may be given the flange 92*a* by screws 102, flange 92*a* being cut back to allow clearance for the base 48 of element 16. A stop 103 may close the end of the channel within which the sliding doors 26 are located.

Turning to the base cabinet assembly, generally indicated by reference character 111, this may comprise broadly: a counter top 112; upper rear horizontal support element 113; lower rear vertical support element 114; upper front horizontal support element 116; front vertical support element 122; intermediate front horizontal support element 120; lower front horizontal support element 123; drawers 124; hinged doors 126; drawer guides 128; shelves 130; and end walls 132.

The upper rear horizontal support element 113 is preferably an extrusion extending substantially the full length of the base cabinet. It is composed, for example, of aluminum of synthetic resin and is of irregular configuration, best seen in FIGURE 16. The base 127 may be secured to wall 147 by adhesive cement and screws 115, and has a forward upper angular lip 117 and a lower lip 119. The lip 119 forms a channel along which connectors 121 may be placed in selected positions. The lip 117 diverges forward from the wall 147 so that even when the wall 147 is not flat the counter top rear support 110 may be adequately engaged. The connectors 121 need not be very wide, for example 1½ inches, and they serve to carry upper ends of the elements 114 which are T-shaped in cross section.

The elements 114 include a base 134 and a central flange 136. Flange 136 is provided with a series of spaced holes 138 to receive shelf support members 140 which are

identical with the members 40 (FIGURE 13), while base 134 has edge beads 137 to coact with members 140. Elements 114 at the lower ends 146 thereof rest on the floor 200, while at the upper ends a portion of central flange 136 is removed and the remaining base 134 is bent to form a hook 145 which engages into connector 121.

Connector 121 is used where a vertical element 114 will be used to support the rear corners of shelves 130 by members 140 thereon. In those locations along base cabinet 111 where the rear ends of drawer guides 125 are supported, structure shown in FIGURES 11 and 12 is used. Here the upper end of the drawer supports 128 are hooked onto the lower lip 119 while the forwardly extending horizontal brackets 129 are at the same level as the element 120.

It is to be noted that the engagement of the connectors 121 and the rear drawer guide supports 128 with the lip 119 affords a high degree of flexibility and adjustment while at the same time providing a rigid structure. The connectors 121 and supports 128 are put in place with a twisting motion which first hooks them onto the lip 119 and then when the connectors 121 and the supports 128 are swung down into a vertical position they become rigidly self-clamped to a solid connection in which they are fixed against movement longitudinally of the lip 119.

Since the structure of the upper portions of connectors 121 and supports 128 is substantially identical, description of one will describe the other as well. Connector 121 has a downwardly directed tongue 131 which has first and second opposed protuberances which are vertically offset (FIGURE 16), the first or rear protuberance being lower than the second or front one. The distance between the crowns of the two protuberances (horizontally front to rear) is slightly greater than the width of the trough formed between the lip 119 and the base 127. The inner surface of the lip 119 adjoining the upper edge thereof is provided with a third rearwardly extending protuberance. When canted as shown in the dot-dash lines on FIGURE 16, the effective transverse distance between first and second protuberances is substantially equal to the width of said trough at its narrowest part (at the level of the third protuberance). This allows the connector 121 to be slidably lowered into said trough. When the connector is moved to its vertical position, a wedging action occurs in the trough so that sliding along the horizontal element 113 is prevented. Furthermore, any tendency of the connector 121 to rise is prevented by the third protuberance which is on the inner surface of lip 119. As seen in FIG. 16, hook 145 is angularly insertable into connector 121 (dot-dash lines) but is retained (full lines) because rearward movement past vertical of element 114 is prevented by wall 147.

The upper front horizontal support element 116 is preferably an extrusion and includes a flat top flange 148 which is secured to the under surface of the counter top 112 by cement or screws 151. The front flange 152 is disposed at the exact distance from wall 147 to determine the depth of the base cabinet. The connecting portion 153 is approximately a half circle so that the rounded hook 179 formed in the central flange 178 of element 122 may first be engaged by rotating the same clockwise (as viewed in FIGURE 15) about portion 153 and then rotating the hook 179 in a counterclockwise direction until the curved lock member 174 is engaged under the portion 152. The upper edge 173 butting against the ledge 172 places the element 122 in vertical position, where it is held when the shelves 130 and drawer guides 125 are put in place.

The elements 122 have bases 177 and central flanges 178, the latter being notched to receive the elements 120 and 123 which are partially held in position by clip elements 104 and 105. All of the clip elements are identical so a detailed description of one will suffice for all. Clip element 104 is preferably formed of resilient sheet material such as spring steel, aluminum alloy or

the like, and comprises a body 111 having a pair of openings which align with corresponding openings in the base 177 and through which the ears 185 and 186 of the combination connector hinge 180 pass during assembly. Clip element 104 has a pair of upper vertical clip members 106 and lower clip members 107 which are adapted to engage, in snap fashion, the outer vertical edges of the base 177 and the beads 137. Clip element 104 also has upper horizontal clip members 108 and lower horizontal clip members 109. The members 108 snap on to engage the upper horizontal flange of the element 120 while members 109 snap on to engage the lower vertical flange of the element 120. Clip element 105 is put on in an inverted position (see lower portion of FIGURE 15). With the clip elements 104 and 105 in place, the installation of the combination connector hinges 180*a* is a simple procedure, substantially identical with that described above with reference to the combination connector hinges 80, the insertion of pins 187 and 188 into aligned holes in the elements 120 and 123 and the base 177, and the placing of the doors 126 secures the parts in operating positions. The placing of the doors 126 is illustrated in FIGURE 3, the doors being finally secured by the screws 133 which engage the door and the threaded holes 135.

In connection with the door and hinge construction, by cutting back the corners of the doors at the pivoting edges thereof, the hinge members may be fully recessed so that said pivoting edges may lie closely next to each other, thereby concealing the front vertical support elements 22 and 122. It may also be noted that by virtue of the construction illustrated in FIGURE 3, two swingable doors may be hung in hinge fashion from a single upright and there need be no cabinet lateral walls at that area. This gives the user considerable freedom of use because of no compartmenting, although where desired vertical dividers may be secured between the central flanges on the T-shaped opposed (front and rear) uprights.

The same considerations apply to the base cabinets with regard to the end walls 132, so that the structure previously described with reference to the end walls 32 is substantially equally applicable, except that the edge frame member 193 is inserted from the front of the base cabinet. Certain of the parts corresponding to the equivalent upper wall cabinet structure, and illustrated in FIGURES 1, 5 and 6, are given the same reference characters with the prefix "1".

Installation of the base cabinets is preferably accomplished by first connecting element 113, and the requisite number and positioning of rear elements 114, to wall 147. Next the requisite guide supports 128 are hooked on. The necessary shelf supports 140 may be connected to elements 114. Since the upper rear horizontal support element 113 serves as a hanger bar, it will not normally be necessary to attach the base 134 to the wall 147.

Next with the bars 120 and 123 in the cabinet area, at least two of the elements 122 are connected to the element 116. Now the counter top rear support 110 is hooked onto the element 113. The lower ends of elements 122 are rested on the floor 200, and the elements 120 and 123 are put into place using the clip elements 104 and 105.

Following this, additional elements 122 are installed as required by catching the hooks 179 on the portions 153 with the elements 122 rearwardly canted and they are then swung forward until vertical. The remaining cross junctures between front upright elements 122 and horizontal elements 120 and 123 may be connected by clip elements 104 and 105, or they may be omitted.

Thus, it will be seen that the clip elements 104 and 105 strengthen the interconnections between the horizontal elements 120 and 123 and the vertical element to which they are attached. Furthermore, they maintain the respective orifices in alignment so that when the com-

bination connector hinges 80 and 180 are put in place, they quickly and easily slide into the proper position. It is, however, possible to obtain a connection without the clip elements by temporarily aligning the parts as the elements 180 and 80 are put into position.

With the framework of the base cabinet thus set up, it becomes a matter of choice, in some respects, as to the sequence in which the remaining parts are put in place. For example, the drawer guides 125 may now be engaged at that rear end on the brackets 129. This connection may be made by a dowel relationship, or a hook and orifice, or nut and bolt, or adhesive. The forwardmost portions of the drawer guides 125 may then be suitably connected to the horizontal elements 120 in a similar manner. This structure is illustrated in dot-dash lines at the upper portions of FIGURES 14 and 15. Following this, the drawers 124 may be put into place upon the drawer guides 125.

Now the front shelf support members 140 are put in place at the same level as the rear ones previously installed, and the shelves 130 may be dropped into place.

While I have shown the work top 112, as plain, it will be obvious that where desired, a sink may be incorporated, or built in cook tops or range units.

I wish it to be understood that I do not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art to which the present invention relates.

I claim:

Cabinet shelving construction comprising: a horizontal shelf; a vertical support element which is T-shape in cross section, having a base portion and a central flange, said base portion having edge beads projecting in the same direction as said central flange; said flange having a plurality of holes of predetermined size arranged in a row; a shelf support member of generally U-shape being formed of an elongated piece of material of uniform cross section which is a sliding fit through any one of said holes and which is substantially equal in diameter to said holes; said shelf support member including a cross piece with a central crimp, a pair of legs, and a pair of feet on the ends of the legs; said legs being substantially at right angles to said cross piece and extending a distance equal to the distance of a hole from said base; each of said feet being substantially at right angles to its leg and engaged against said base and the nearest rib; said crimp being engaged by the edge of a hole when the shelf supporting member is half passed through said hole, and snapped into fixed position by a twisting motion; said shelf resting on the horizontal L-shaped portions formed by the cross piece and legs.

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