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3,169,281

CONVERTIBLE DOOR OR DRAWER FRONT

Filed Dec. 16, 1960

2 Sheets-Sheet 1

Fig. 1.

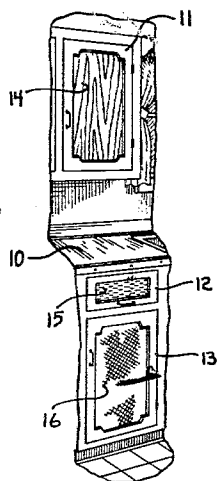


Fig. 2.

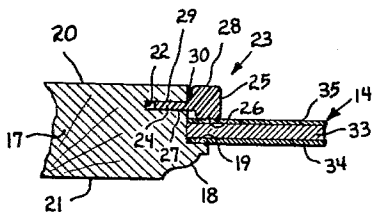
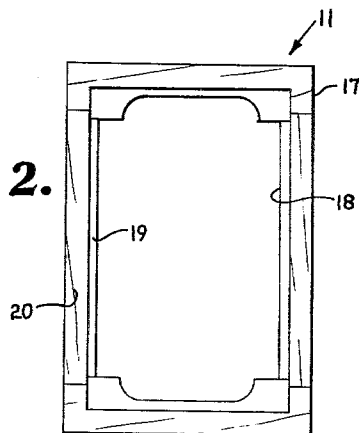


Fig. 3.

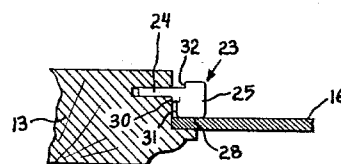


Fig. 4.

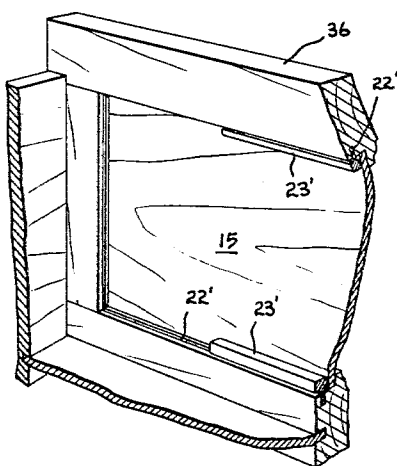


Fig. 6.

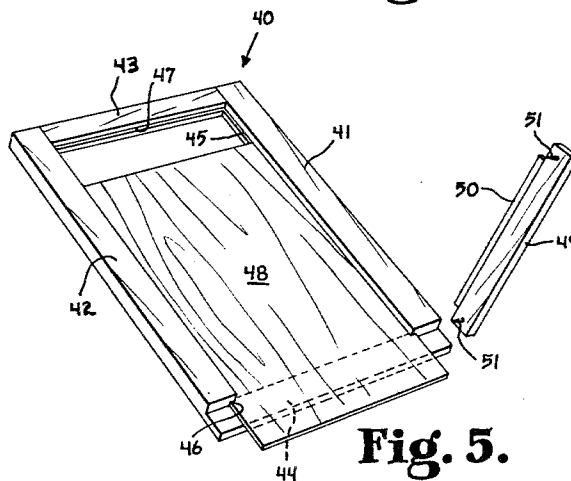


Fig. 5.

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2 Sheets-Sheet 2

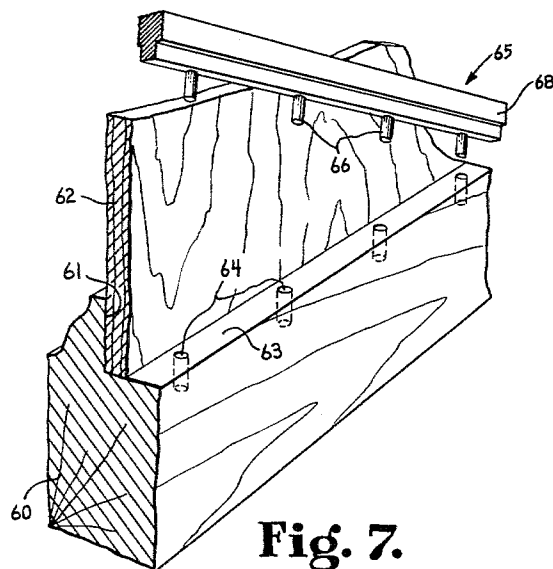


Fig. 7.

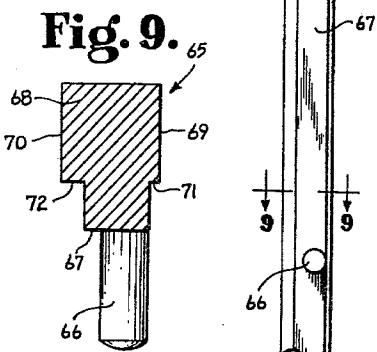


Fig. 9.

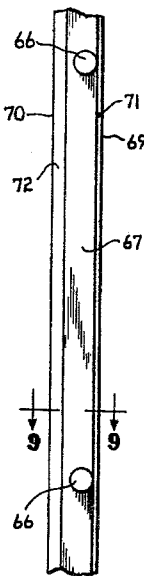


Fig. 8.

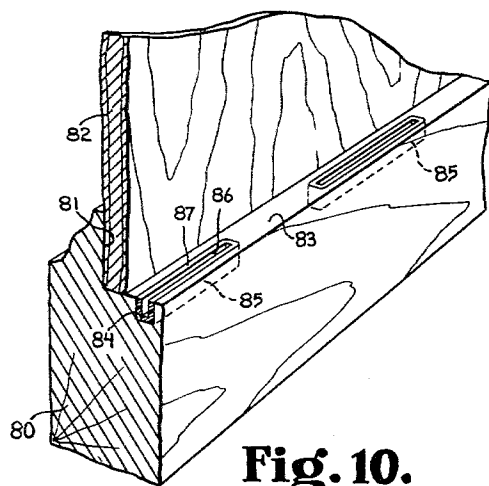


Fig. 10.

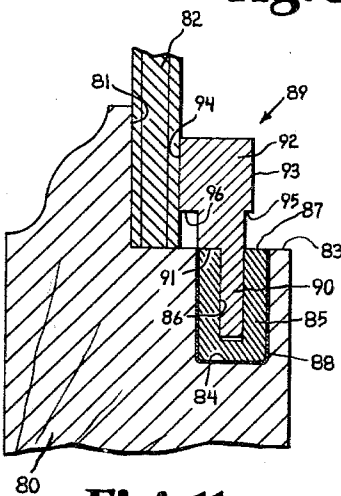


Fig. 11.

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3,169,281

## CONVERTIBLE DOOR OR DRAWER FRONT

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7 Claims. (Cl. 20-15)

The present invention relates to a convertible door or drawer front and the primary object of the invention is to provide a construction of that character comprising a frame and a readily-removable panel to be mounted in the frame, together with novel, highly simple and readily manipulable means for securing such a panel in such a frame. As the description proceeds, it will become apparent that my inventive concept is applicable not only in cabinet construction but also in many other environments including, but not necessarily limited to, room dividers, decorator screens or panels and other furniture.

In recent years, a substantial industry has developed in modular, pre-built cabinet systems for installation primarily in the kitchens of modern homes. Individual wall cabinets and individual base cabinet and drawer assemblies are factory-produced in various shapes, sizes and decorative finishes which may be stocked by a local dealer in any community and from which selections may be made by builders or home owners for installation in various combinations. Rather recently, there has arisen a demand for variegation in the doors and drawer fronts of such installations, whereby the finish or decorative appearance of such doors and drawer fronts may differ in any one of several ways from the general finish or decorative appearance of the cabinet or base construction, or whereby there may be variation in appearance among the several doors and/or drawer fronts of a given installation; and some manufacturers, in an effort to satisfy that demand, have produced interchangeable doors and/or drawer fronts of varying appearances to permit the composition of any one of a number of different arrangements in any given installation.

As a general rule, however, any such plan has heretofore necessitated the removal and replacement of an entire door or drawer front unit.

Obviously, according to any such plan, a dealer is required to maintain a relatively large stock of mutually interchangeable elements. It is a primary object of the present invention to provide a construction whereby the advantages of such systems may be fully attained while the cost of the inventory required to be maintained by a dealer is substantially reduced and the facility with which any desired variegation of arrangement may be attained is substantially improved. A further object of the invention is to provide a construction whereby an individual householder, once having set up a selected installation, may readily revise and rearrange the decorative appearance of the installation without added cost, by very simple manipulation of reversible and/or interchangeable parts, and without the necessity for removing any cabinet door or any drawer front from its operative position.

A further object of the invention is to provide a structure of the character under consideration embodying removable panels together with novel means for securing any panel in place, with either of its opposite major faces selectively exposed, such securing means being of such character as to be manipulable without the use of special tools and without danger or marring any of the parts of the assembly with which it is associated.

A still further object of the invention is to provide, for use in such a structure, securing means of such character as to be effectively usable with panels of varying thickness.

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Still another object of the invention is to provide, in connection with such securing means, structural detail of such character as to prevent or inhibit access of moisture to locations where such moisture might be entrapped with deleterious effects.

An additional object is to provide, in an assembly of the character described, a reversible panel whose opposite major faces are of different decorative appearance, together with means for securing such panel in an open frame, with either of its major faces selectively exposed therethrough, without dismounting the door or drawer front with which the panel is associated.

Still further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

FIG. 1 is a fragmentary perspective view of a kitchen installation including one wall cabinet unit, a section of work counter and one base unit providing a cabinet door and a drawer;

FIG. 2 is an enlarged, rear elevation of a door frame for use in the invention;

FIG. 3 is a further enlarged fragmental, transverse section through an element of the door frame of FIG. 2, showing a fragment of a panel held in place in the frame by securing means constructed in accordance with one form of the present invention;

FIG. 4 is a similar section showing the retaining means in position to secure a thinner panel in place in the frame;

FIG. 5 is a perspective view of a modified form of door with a removable panel;

FIG. 6 is a fragmental perspective of a drawer having a front constructed in accordance with the present invention;

FIG. 7 is a fragmentary perspective view, drawn to an enlarged scale, and illustrating a form of securing means designed to inhibit moisture entrapment;

FIG. 8 is an edge elevation, drawn to a further enlarged scale, of a portion of a retainer strip of the type illustrated in FIG. 7;

FIG. 9 is a still further enlarged section taken substantially on the line 9-9 of FIG. 8;

FIG. 10 is a fragmentary perspective view showing a further form of socket means; and

FIG. 11 is an enlarged sectional view showing a retainer strip operatively associated with the form of socket means illustrated in FIG. 10.

Referring more particularly to FIG. 1, it will be seen that a single unit of a kitchen installation of the character here under consideration may comprise a work counter section 10, a wall cabinet having a hinged door 11, and a base unit supporting the work counter and formed to accommodate a drawer 12 as well as a second cabinet door 13. The door 11 is formed to include a panel 14 and similar panels 15 and 16 are embodied in the front of the drawer 12 and in the door 13, respectively. It will be seen that, in the illustrated installation, the decorative appearances of the panels 14, 15 and 16 differ from each other.

According to the present invention, the door 11 comprises a generally rectangular frame 17 formed to provide a ledge or shelf 18 projecting into the opening through the frame and presenting a shoulder 19 which faces to-

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ward the inner surface 20 of the frame. The opposite major face 21 of the frame will be exposed when the door is mounted and in closed condition. Obviously, the shoulder 19 is preferably positioned closer to the frame face 21 than to the frame face 20.

Socket means 22 is formed in the inner edge of the frame 17 in a plane substantially parallel with the plane of the shoulder 19 and with the plane of the frame face 20, and between said two planes. In the embodiment of the invention illustrated in FIGS. 1 to 6, the ledge 18 is perimet- 10 rally continuous and the socket means 22 may be a continuous slot; and in many environments this arrangement is entirely satisfactory. However, while the ledge 18 will almost invariably be thus perimetally continuous, the socket means 22 may, if desired, consist of relatively 15 short, disconnected sections in the side and end members of the frame.

The panel means 14 may be of any desired construction so long as it is proportioned and designed to fit within, and substantially to fill, the opening through the frame 17, resting upon the shoulder 19, and so long as its perimet- 20 ral edge region has a thickness less than the dimension between the shoulder 19 and the socket means 22. Thus, when the panel 14 is in position on the shoulder 19, it may be secured therein by means of fastening means 25 of the character indicated generally by the reference numeral 23.

Said fastening means comprises a strip, preferably of resiliently compressible material such as vulcanized rubber, neoprene or an extruded plastic of suitable character- 30 istics. I presently believe that such an extruded plastic is the optimum material for use in my novel fastening means. The strip, in its optimum form, is formed at one edge as a substantially flat fin 24 proportioned and designed to fit snugly within the socket means 22. At its 35 opposite edge, said strip is formed as a head 25 enlarged to project oppositely beyond the planes of the opposite major faces 27 and 29 of the fin 24. Thus, the strip head 25 presents a face 26 which, when the fin 24 is received in the slot 22, retentively bears upon the inner face of the panel 14.

The strip 23 may be formed as a continuous, substantially rectangular loop so that, when it is used with a frame having a continuous perimetral slot 22, the fin 24 may be tucked into the slot throughout its length and the head 25 will retainingly engage the entire perimeter of 40 the inner face of the panel 14. Alternatively, a plurality of separate strips 23 may have their fins entered in such a slot at spaced points about the perimeter of the frame; and such separate strips may be substantially coextensive with the respective frame elements or they may be much 45 shorter than such frame elements and a plurality of such short strips may be associated with each side and end of the frame, or only four such strips may be arranged to engage the panel, for instance, substantially at the mid point of each of the sides and at the mid point of each of the ends of the panel.

As shown, the strip 23 is formed to provide an abutment 30 adjacent the region of juncture between the fin 24 and the head 25. The abutment 30 limits the degree of projection of the fin 24 into the socket means 22. It will be seen that the opposite projections of the head 25 define surfaces 31 and 32 which are substantially per- 50 pendicular to the width of the fin 24 and which, when the strip 23 is installed, are substantially parallel with the inner edge of the frame 17. Thus, because of the abutment 30, the surface 31 is parallel to, but spaced from, the inner edge of the frame when the fastening strip 23 is fully seated, whereby a screw driver blade or other 55 simple prying implement may be inserted between the surface 31 and the frame edge to facilitate removal of the fin 24 from the socket means 22.

Preferably, the panel 14 will comprise a relatively rigid plate 33 of plywood or composition having thin sheets 34 and 35 of wood veneer, sheet metal or a suitable

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plastic firmly adherently applied to its opposite major faces. The sheets 34 and 35 may be suitably and differ- 5 ently decorated by any one of the well known processes. Alternatively, I may use a panel such as that indicated at 16 in FIG. 4 and described hereinbelow.

A panel identical with the panel 14 may, of course, be mounted in the same manner in the frame of the door 13; and, depending upon the wishes of the housewife, either the sheet 34 or the sheet 35 may be exposed through 10 the opening in the door 13. Alternatively, and as suggested in FIG. 4, a different kind of panel 16 may be mounted in the door 13. It will be seen that the panel 16 is much thinner than the panel 14; but it will also be seen that the shape of the head 25 is such that its sur- 15 face 28 opposite the surface 26 projects farther from the plane 29 than the surface 26 projects beyond the plane 27. As a consequence, if the housewife elects to mount the thin panel 16 in the frame 13, the fastening means 23 is merely inverted before insertion of the fin 24 into the socket means 22, whereby the surface 28 of the head 25 20 will effectively bear against the rear face of the panel 16 to retain the panel in position on the shoulder 19. In this position of the fastening means, the surface 32 thereof is accessible to a prying tool to facilitate removal of the fin 24. As illustrated, the panel 16 may be a single 25 ply composition which may preferably be provided with different decorative grain prints on its opposite major surfaces.

The drawer 12 is provided with a drawer front frame 30 36 analogous in construction to the frame 17 and defining an opening through which either major face of the panel 15 may be exposed. The frame 36 is provided with socket means 22' analogous to the socket means 22 and fasten- 35 ing means 23' is provided to secure the panel 15, in either elected relationship, in place in the frame 36 to fill the opening therethrough.

A different form of frame means, having some of the advantages of the structure hereinbefore described, and in which a reversible or interchangeable decorative panel 40 may be mounted is illustrated in FIG. 5. Such a frame, indicated generally by the reference numeral 40, comprises allochiral side rails 41 and 42 joined by end rails 43 and 44. The side rails are formed with mutually facing grooves or slots 45 and 46 and the end rail 43 is 45 formed with a groove or socket 47 communicating at its opposite ends with the grooves 45 and 46. The end rail 44 has a thickness only equal to the spacing of the grooves 45, 46 and 47 from the front or exposed surface of the frame.

Thus, a panel 48, which may preferably be of the character of the panel 14, may be readily removably mounted in the slots 45, 46 and 47 by entering one end of the panel over the end rail 44 and sliding it into seated position in the socket 47. A bar 49 is proportioned and 50 designed to fit upon the end rail 44 and at one edge is formed with a flange 50 which, when the bar is seated in position, overlaps the rear end of the panel 48. Thus, when the bar 49 is secured in place as, for instance, by means of screws 51, the panel 48 will be securely held in the frame 40. To reverse the panel 48, or to replace it 55 with an otherwise-decorated alternative panel, it is only necessary to remove the two screws 51 thus releasing the bar 49 from the frame after which the panel may be slid freely out of the frame and may be replaced, either after reversal or by an alternative panel.

It will be apparent that, by properly selecting the edge of the frame to be provided with the removable bar 49, reversal or replacement of the panel can be accomplished 60 without removing the frame 40 from its mounting, either as a cabinet door or as a drawer front. Thus, if the frame 40 is a wall cabinet door, either its lower edge or its edge remote from its hinges will be provided with the removable bar 49. If it is a base cabinet door, the bar 49 will be either at the upper edge of the door or at 65 its edge remote from its hinges. If the frame 40 is to

be used as a drawer front, the removable bar will preferably be at its upper edge.

It will be seen that the three panels 14, 15 and 16 may be arranged as desired to provide a uniform effect or to provide any desired arrangement of departure from uniformity, and that any one of those panels may easily be reversed without the use of special tools, at the whim of the housewife. It will further be obvious that, in view of the special construction of the fastening means disclosed herein, it is well within the skill of any housewife to rearrange the several panels herself, so that she may modify the general appearance of her kitchen as often as she may desire to do so.

It is well known, of course, that moisture, entrapped against wood surfaces, will deleteriously effect the wood; and wood is particularly vulnerable to detergent-laden kitchen water. In the forms of invention thus far described, portions of the slots 22, 22', 45, 46 and 47 may remain wholly open or may be ineffectively sealed by the fins 24 or the edges of the panel 48; and where the invention is applied to cabinet doors or drawers closely adjacent a kitchen sink area, and particularly therebelow, those slots, or portions thereof, may act as traps for such detergent-laden moisture, with highly detrimental results. Particularly for such locations, then, I prefer the forms of invention illustrated in FIGS. 7 to 9 or in FIGS. 10 and 11.

In FIG. 7, I have shown a frame element 60 formed to provide a supporting surface 61 similar to the surface 19 for accommodating a panel 62 which may be similar to either of the panels 14 or 16. In place of the slots 22 or 22', in this embodiment of the invention I provide the inner edge 63 of each frame element with a series of sockets or pockets 64 preferably equidistantly spaced along the length of the frame element and opening through the surface 63. Conveniently, the sockets 64 may be cylindrical bores. In this form of the invention, the retainer means may consist of a molded plastic strip 65 formed along one edge with a plurality of similarly-spaced, cylindrical projections 66 proportioned and designed for snug, preferably slightly-compressed, reception in the respective sockets 64. The strip 65 comprises, at its edge opposite the projections 66, a head 68 having surfaces 69 and 70 comparable to the head surfaces 26 and 28 of the strip 23 and differently spaced beyond the lateral boundaries of the projections 66, as is most clearly illustrated in FIG. 9. The strip surface 67 performs the function of the abutment 30 of the strip 23, and the surfaces 71 and 72 are functionally equivalent to the surfaces 31 and 32 of the strip 23.

When the strip 65 is fully seated, the projections 66 fill and seal the sockets 64 against the entry of moisture thereinto, and the surface 67 bears uniformly upon the frame surface 63.

Still another form of securing means capable of guarding against moisture entrapment in contact with the wood is illustrated in FIGS. 10 and 11. Therein, I have illustrated a frame element 80 having a supporting surface 81 against which the panel 82 is adapted to rest. The inner edge 83 of the element 80 is, in this embodiment of the invention, formed with a plurality of pockets 84, each of which is elongated in the direction of length of the element 80 and each of which is substantially parallel with the plane of the surface 81 and spaced therefrom by a dimension at least equal to the edge thickness of the panel 82. In each such pocket there is seated a cup 85, preferably formed of injection-molded plastic and formed to define a socket 86 which, when the cup is seated in its pocket, opens inwardly through the frame element surface 83. The cups are preferably so proportioned and designed that, when they are fully seated, their mouth-bounding lips 87 will be flush with the surface 83. Preferably, each cup will be secured in place in its pocket by means of a layer of glue or other moisture-impervious adhesive 88, wholly covering the internal walls of the

pocket 84 and the external walls of the cup 85 seated therein. Thus, each pocket 84 is fully protected against the entrapment of moisture therein in contact with the wood surface.

In this form of the invention, a retainer strip 89 is formed to provide, at one edge, a fin 90 which is snugly receivable in the socket 86 of a cup 85. Obviously, each strip 89 may be of such a length as to be associable with one only of the cups 85, or it may be long enough to span two or more such cups, in which case it will be formed with separate fins 90 receivable, respectively, in separate cups 85. Preferably, each fin 90 will wholly fill and seal the socket 86 of its associated cup, though such filling and sealing is not of vital importance since the cup itself is moisture-impervious, will not be damaged by moisture, and will protect the wooden surface of its associated pocket against the effect of any moisture which does enter its socket 86.

The surface 91 is functionally comparable to the abutment 30 of the strip 23 and the surfaces 95 and 96 are functionally equivalent to the surfaces 31 and 32 of the strip 23. The head 92 of the strip 89 is analogous to the head 25 and is provided with alternatively-usable surfaces 93 and 94 which are differently spaced from the adjacent planes of the major surfaces of the fin 90, in analogy to the surfaces 26 and 28 of the head 25 of the strip 23.

I claim as my invention:

1. In a device of the class described, a boundary frame defining an opening therethrough, ledge means at the inner edge region of said frame providing a supporting surface substantially parallel with, but spaced from, the plane of one major face of said frame, a panel disposed within said frame and resting on said supporting surface to close said opening, the inner edge region of said frame being formed with socket means extending substantially parallel with said supporting surface, disposed between said supporting surface and said one major face and spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and retainer means for securing said panel in place in said frame comprising a strip formed at one edge with a fin portion snugly received in said socket means and formed at its opposite edge with a head extending laterally in opposite directions to different degrees beyond the lateral dimensions of said fin portion to define shoulders generally perpendicular to the width of said fin portion and facing toward said fin portion, said strip being formed with an abutment having a face extending transversely relative to the lateral dimension of said fin portion and disposed between said shoulders and the distal end of said fin portion, said abutment face engaging said frame to maintain separation between said shoulders and said frame.

2. In a device of the class described, a boundary frame defining an opening therethrough, ledge means at the inner edge of said frame providing a supporting surface substantially parallel with, but spaced from, the plane of one major face of said frame, a panel disposed within said frame and resting on said supporting surface to close said opening, the inner edge of said frame being formed with slot means extending substantially parallel with said supporting surface, disposed between said supporting surface and said one major frame face and spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and retainer means for securing said panel in place in said frame comprising a strip formed at one edge as a fin snugly received in said slot means and formed at its opposite edge with a head presenting surfaces facing toward the distal edge of said fin and extending oppositely beyond the planes of the major faces of said fin, said strip being formed with an abutment presenting a surface substantially perpendicular to said planes and disposed closer to the distal edge of said fin than either of said head surfaces and engaging the inner edge of said frame when said fin is so received

in said slot means with either side of said head retainingly bearing against said panel, whereby the other of said head surfaces will be arranged in spaced, facing relation to the inner edge of said frame for the reception of a prying tool therebetween.

3. In a device of the class described, a boundary frame defining an opening therethrough, ledge means at the inner edge of said frame providing a supporting surface substantially parallel with, but spaced from, one major face of said frame, a panel disposed within said frame and resting on said supporting surface to close said opening, the inner edge of said frame being formed with socket means extending substantially parallel with said supporting surface and symmetrical with respect to a plane parallel with said supporting surface, said socket means being disposed between said supporting surface and said one major frame face and spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and retainer means for securing said panel in place in said frame comprising a strip formed at one edge with a first portion snugly and reversibly received in said socket means and formed at its opposite edge with a head, said head presenting, when said first portion is seated in said socket means, a first surface substantially parallel with said plane and facing in one direction therefrom, and a second surface substantially parallel with said plane and facing in the opposite direction therefrom, said head surfaces being oppositely spaced laterally from said plane to different degrees for selective cooperative engagement with a panel resting on said supporting surface, said head further presenting shoulders oppositely projecting from said first portion and facing the inner edge of said frame, said strip having abutment means disposed between said shoulders and the distal edge of said first portion and engaging said frame to maintain separation between said shoulders and said frame.

4. In a device of the class described, a boundary frame defining an opening therethrough, ledge means at the inner edge of said frame providing a supporting surface substantially parallel with, but spaced from, the plane of one major face of said frame, a panel disposed within said frame resting on said supporting surface to close said opening, the inner edge of said frame being formed with a plurality of substantially cylindrical sockets uniformly spaced therealong and opening inwardly, the mouth of each such socket being spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and resiliently compressible strip means formed along one edge with a plurality of substantially cylindrical projections arranged in substantial parallelism, spaced therealong in conformity to the spacing of said sockets and snugly received in such sockets, said strip means further being formed to provide a first head surface substantially parallel with the plane common to said projections and spaced laterally in one direction from said common plane, and to provide a second head surface substantially parallel with said common plane and spaced laterally in the opposite direction and to a different degree from said common plane, one of said head surfaces being retainingly engaged with a panel of one thickness when said projections are received in one order in said sockets, and the other of said head surfaces being retainingly engaged with a panel of a different thickness when said projections are received in a reverse order in said sockets, said head further presenting shoulders extending oppositely from said common plane and facing the distal ends of said projections, said strip having abutment means disposed between said shoulders and said distal ends of said projections and engaging said frame to maintain separation between said shoulders and said frame.

5. In a device of the class described, a wooden boundary frame defining an opening therethrough, ledge means at the inner edge of said frame providing a supporting surface substantially parallel with, but spaced from, the

plane of one major face of said frame, a panel proportioned and designed to fit within said frame and resting on said supporting surface to close said opening, the inner edge of said frame being formed with socket means elongated in a direction substantially parallel with said supporting surface, disposed between said supporting surface and said one major frame face and spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and a plurality of cups of resiliently distortable, moisture-impervious material snugly seated in said socket means at spaced points about the inner perimeter of said frame and each presenting an open mouth inwardly toward said opening through said frame, and retainer means for securing said panel in place in said frame comprising a strip of resiliently compressible material formed at one edge as a fin snugly received in at least one of said cups through the mouth thereof substantially to fill said cup and formed at its opposite edge with a head proportioned and designed to bear firmly against that face of said panel remote from said supporting surface when said fin is so received in such a cup, said head being formed to provide oppositely-facing, panel-engaging surfaces substantially parallel with the plane of said fin and oppositely and unequally spaced from said last-named plane, and said head further being formed to provide shoulders extending oppositely from said last-named plane and facing the distal edge of said fin, and abutment means having a face extending transversely relative to the lateral dimension of said fin and disposed between said shoulders and said distal edge, said abutment face engaging said frame to maintain separation between said shoulders and said frame.

6. In a device of the class described, a wooden boundary frame defining an opening therethrough, ledge means at the inner edge of said frame providing a supporting surface substantially parallel with, but spaced from, the plane of one major face of said frame, a panel proportioned and designed to fit within said frame and resting on said supporting surface to close said opening, the inner edge of said frame being formed with socket means comprising a plurality of pockets disposed between said supporting surface and said one major frame face and spaced from said supporting surface by a dimension at least equal to the edge thickness of said panel, and a cup of resiliently distortable, moisture-impervious material snugly seated in and filling each such pocket and presenting an open mouth inwardly toward said opening through said frame, and retainer means for securing said panel in place in said frame comprising a strip of resiliently compressible material formed at one edge with projecting means arranged in a plane and snugly received in at least one of said cups through the mouth thereof substantially to fill said cup and formed at its opposite edge with a head proportioned and designed to bear firmly against that face of said panel remote from said supporting surface when said projecting means is so received in such a cup, said head being formed to provide oppositely-facing, panel-engaging surfaces substantially parallel with the plane of said projecting means and oppositely and unequally spaced from said last-named plane, and said head further presenting shoulders extending oppositely from said projecting means and facing the distal end of said projecting means, and abutment means having a face extending transversely relative to said projecting means and facing toward the distal end thereof, said face being disposed between said shoulders and said distal end and engaging said frame to maintain separation between said shoulders and said frame.

7. The device of claim 6 in which the mouth of each cup lies in a plane flush with the surface of the frame edge in which said cup is seated, and a layer of moisture-impervious adhesive is interposed between said cup and the internal walls of the pocket in which it is seated.

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