United States Patent

[11] **3,600,052**

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[54] **KNOCKDOWN ARTICLE OF FURNITURE AND FITTINGS THEREFOR**
16 Claims, 15 Drawing Figs.

[52] **U.S. Cl.** **312/263,** 312/349
[51] **Int. Cl.** **A47b 47/00**
[50] **Field of Search** ..... 312/257-—265, 349

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ABSTRACT: A knockdown article of furniture formed of a plurality of panels. A number of the panels are interengaged by slidably interengaging male and female extruded fittings secured on edges and surfaces of the panels. A further panel is slidable in grooves formed in the slidably interengaged panels and is secured to one of the number of slidably interengaged panels, to lock all of the panels into unitary structure.

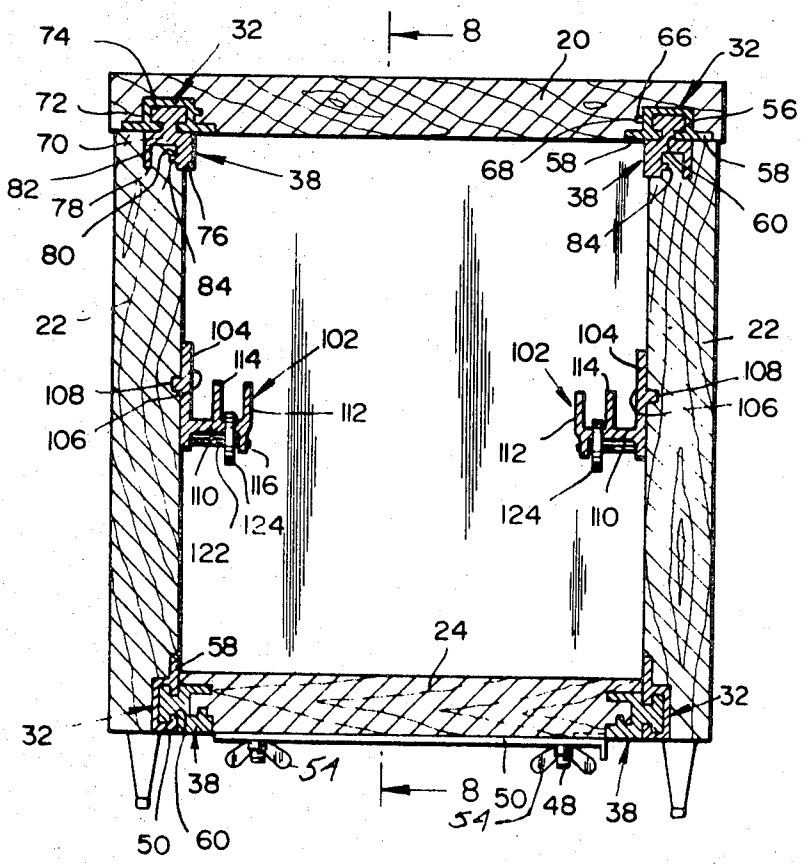
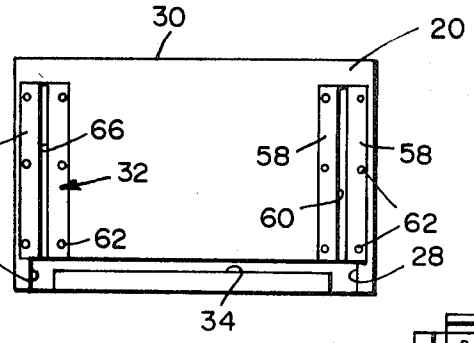


FIG. 1



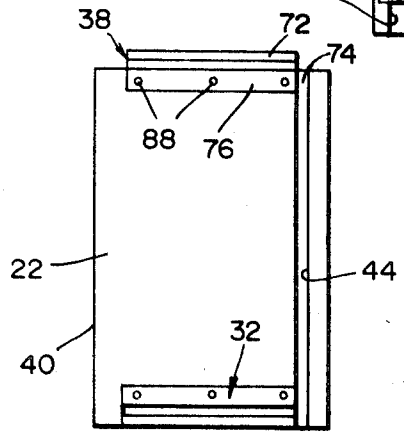


FIG. 2

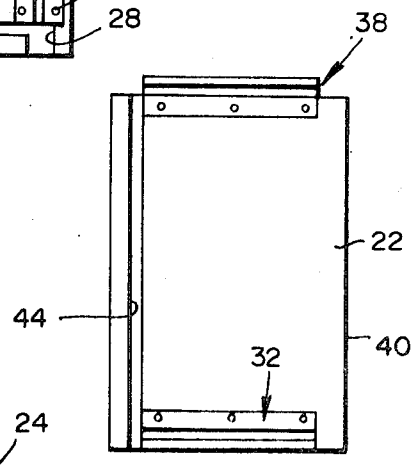
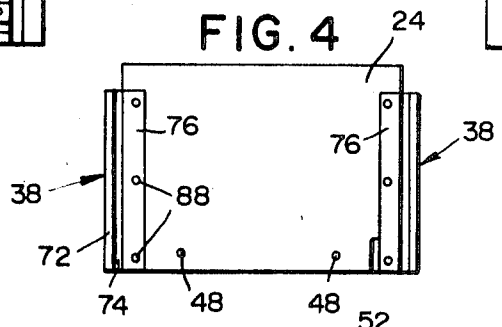


FIG. 3

FIG. 4



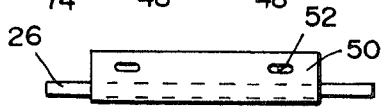


FIG. 6

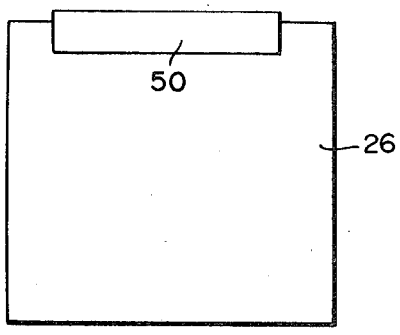


FIG. 5

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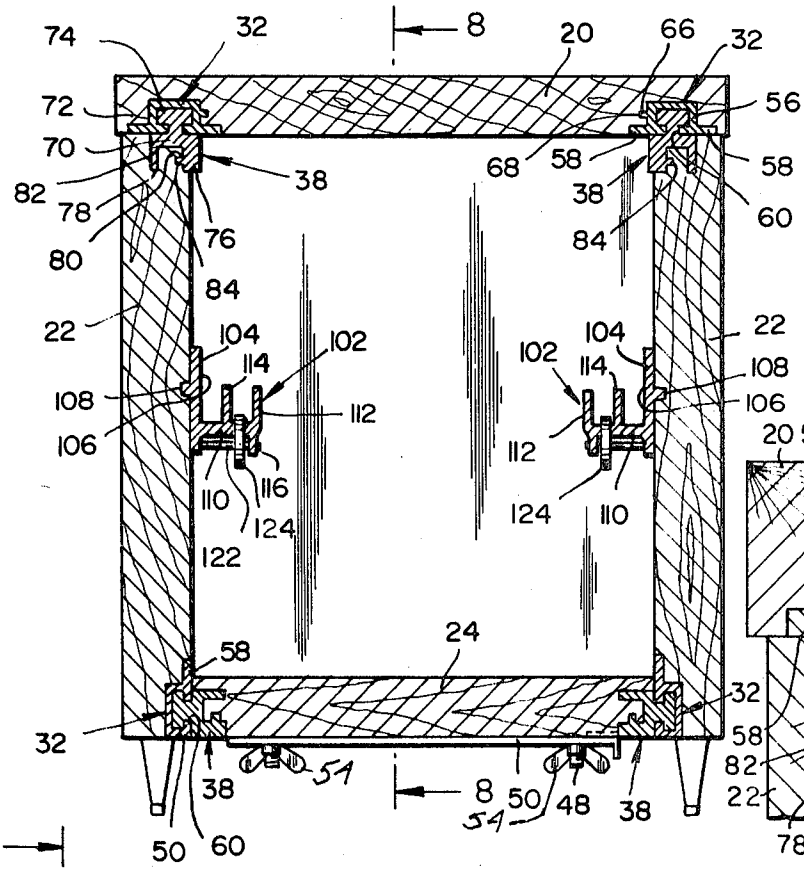


FIG. 7

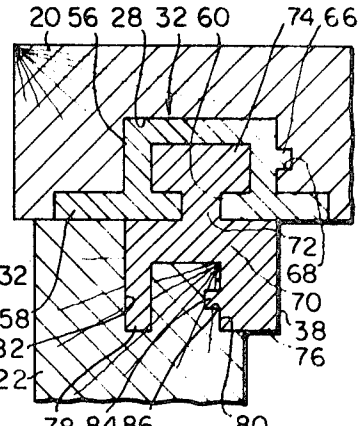


FIG. 7A

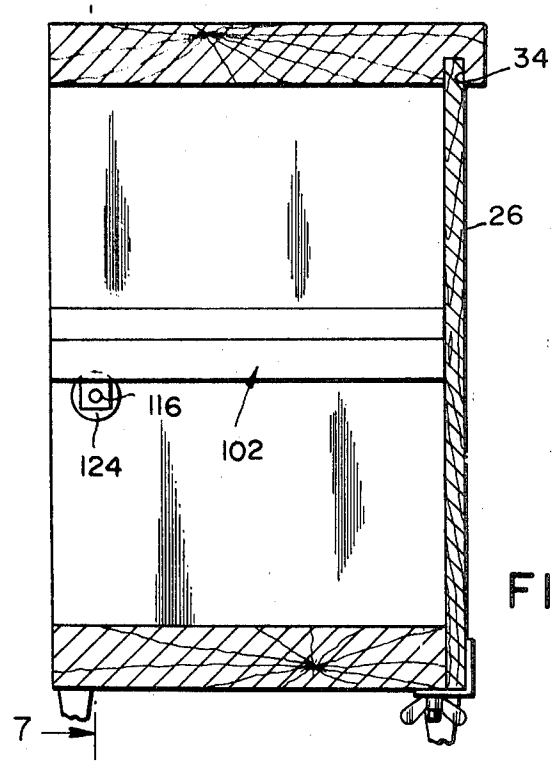


FIG. 8

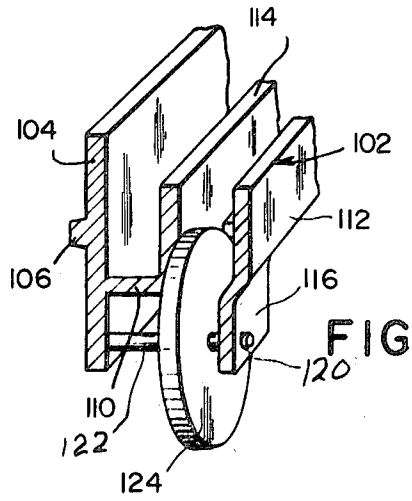


FIG. 9

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FIG. 10

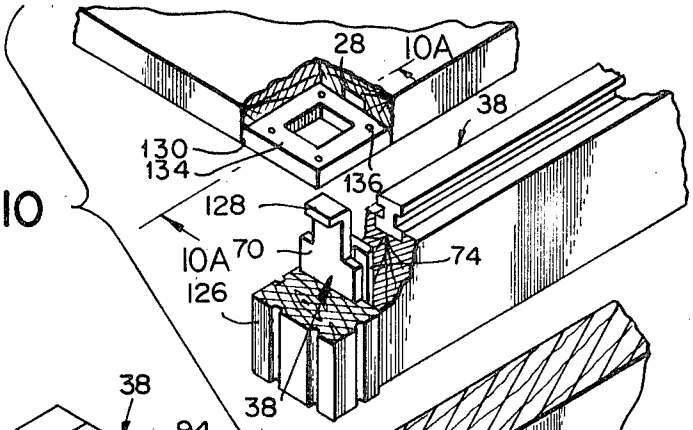
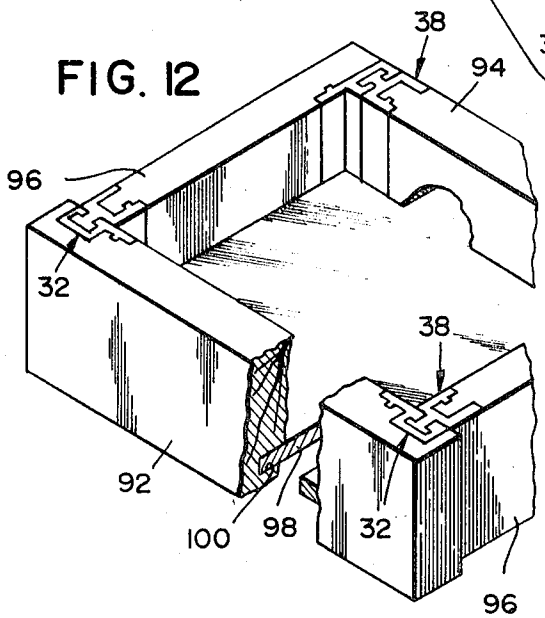


FIG. 12



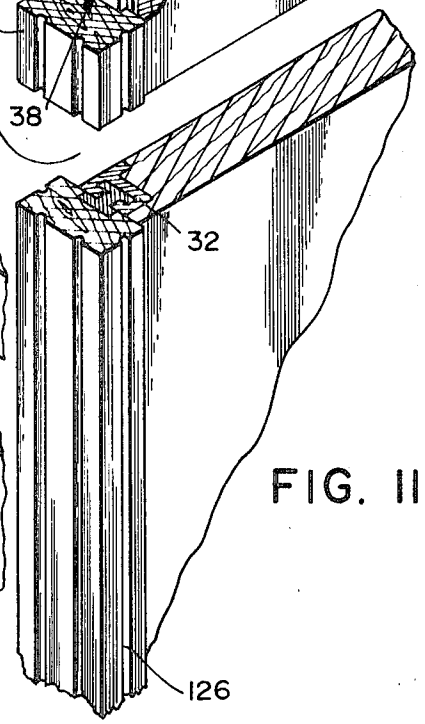


FIG. 11

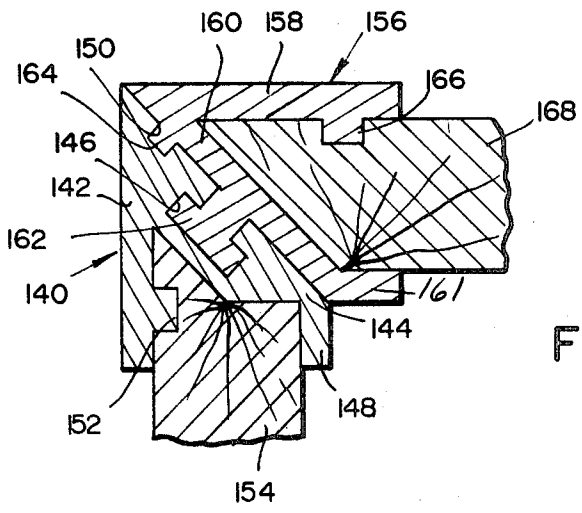


FIG. 13

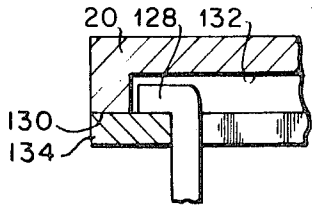


FIG. 10A

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KNOCKDOWN ARTICLE OF FURNITURE AND FITTINGS THEREFOR

The present invention relates to articles of furniture and, more particularly, to knockdown articles of furniture, of the general type that may be shipped and stored in knockdown state for assembly at the place and time of use.

Knockdown furniture of the general type to which the present invention relates capable of shipment and storage in compact, knockdown state, has heretofore been known. However, such furniture of the prior art has not been found completely satisfactory. Thus, the fitting together and the securing of the knockdown parts into an assembled, fully setup article of furniture generally required a substantial degree of skill and the availability of suitable tools for the purpose. Also, the individual knockdown elements for the articles of furniture, being made of wood, frequently tended to warp, especially when subjected to damp environment; making the assembly difficult and the resultant setup article of furniture distorted. Additionally, such knockdown articles of furniture were not readily capable of being dismantled and reassembled.

It is an object of the present invention therefore, to provide knockdown articles of furniture, of various types, including chests, cabinets, closets, wardrobes, and the like, of the character described, which may be easily, readily and simply put together and set up by even untrained and unskilled persons, at high speed, without the use of any tools or implements.

It is another object of the present invention to provide knockdown articles of furniture, of the character described, in which the likelihood of warping is reduced to a minimum.

It is a further object of the present invention to provide knockdown articles of furniture, of the character described, which may be dismantled and reassembled repeatedly without wearing out or loosening the components parts.

The present invention also relates to fittings for use with the knockdown components of the articles of furniture of the present invention which will permit ready, easy, rapid and smooth assembly; which will provide a tight, rigid and sturdy assembly, and which will at the same time inhibit the warping of the components with which they are associated.

It is a still further object of the present invention to provide knockdown articles of furniture, of the character described, which includes drawers that may themselves be of knockdown construction and which have slides for the drawers that may be easily and accurately secured in place, and will support the drawers for smooth, easy sliding.

It is yet a further object of the present invention to provide knockdown articles of furniture, of the character described, which include separable ornamental pilasters that may be assembled with the article of furniture and securely locked in place thereon, without the use of adhesive or tools.

The foregoing and other objects and advantages of the articles of knockdown furniture of the present invention will become more readily apparent to those skilled in the art from the embodiments thereof more or less schematically shown in the accompanying drawings, and from the description following. It is to be understood, however, that such embodiments are shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible, and without any intent of limiting the invention to the specific details therein shown. In the drawings:

FIG. 1 is a plan view of the inner face of a top panel of an article of furniture, in the form of a cabinet, embodying the present invention;

FIGS. 2 and 3 are plan views of the inner face of the two side panels of the article;

FIG. 4 is a plan view of the outer face of the bottom panel of the article;

FIG. 5 is an elevational view of the outer face of the rear panel of the article;

FIG. 6 is a bottom edge view of the same;

FIG. 7 is a vertical sectional view through the cabinet assembled from the panels of FIGS. 1 to 6, taken substantially on line 7–7 of FIG. 8;

FIG. 7a is a fragmentary enlargement of the interengaged male and female fittings as shown in the upper right-hand corner of FIG. 7;

FIG. 8 is a section taken on line 8–8 of FIG. 7;

FIG. 9 is a fragmentary, perspective view of a drawer rail shown in FIG. 7;

FIG. 10 is a fragmentary, blown perspective view of the top corner of an article of knockdown furniture formed with an ornamental pilaster;

FIG. 10a is a section taken on line 10–10a of FIG. 10;

FIG. 11 is a fragmentary section taken on line 11–11 of FIG. 10;

FIG. 12 is an isometric view of a drawer assembly for an article of furniture as shown in FIG. 7; and

FIG. 13 is a fragmentary plan view of a modified form of joint for a structure of the present invention. Generally stated, the present invention utilizes cooperating, slidably interengageable male and female fittings on four of the walls of a structure to assemble the same, and a fifth wall slidably held in grooves formed on three of the first four walls; such fifth wall being engaged on the fourth of said walls by means of threaded posts set into one of said last two walls, and an L-shaped member secured to the other of said two last-named walls on one side and having openings in the other side engageable over the threaded posts; the securing being completed by wing nuts threaded over the posts.

The present invention also contemplates the use of fittings and drawer rails which are guided into position by ribs formed in a side of the fittings that fit into preformed grooves in the walls or panels receiving the fittings or rails.

More specifically stated, and with particular reference to the structure illustrated in FIG. 1 to 8 inclusive, there is illustrated in said figure a preferably wooden, knockdown cabinet formed of a top panel, 20, side panels, 22, a bottom panel, 24, and a rear panel, 26.

Top panel 20 is formed with a groove, 28, adjacent each of its side edges; such groove preferably terminating short of its front edge, 30. Grooves 28 have set thereinto female fittings, each generally designated as 32, that terminate short of the rear edge of the panel. Top panel 20 is also formed with a groove, 34, on its inner side connecting grooves 28 immediately outwardly of female fittings 32. Fittings 32 will hereafter be described in detail.

Side panels 22 each has secured on its top edge a male fitting, generally designated as 38, equal substantially in length to female fitting 32, and secured in position to terminate short of the front edge, 40, of the panel, and of the rear edge thereof. Each side panel 22 is also formed with a groove, 44, on its inner face, adjacent its bottom edge, into which is set a female fitting 32 whose ends are spaced from the front and rear edges of the panel. Each side panel 22 is also formed with a vertical groove, 46, immediately adjacent to the rear ends of the fittings 38 and 32 and adapted to register with groove 34 in the top panel 20 when panels 22 are assembled therewith.

Bottom panel 24 is of a length shorter than top panel 20 and preferably equal to the distance between the inner edge of groove 34 and the front edge 30 of panel 20, and has secured to each side edge thereof a male fitting, 38, whose one end terminates short of the front edge of panel 24 and whose rear edges may coincide with the rear edge of the panel. Bottom panel 24 may have threaded posts, 48, set thereinto projecting from its bottom face adjacent its rear edge.

Rear panel 26 may be of a height slightly greater than the height of side panels 22 and of a width slightly greater than the width of bottom panel 24 and of a thickness at least at its top and side edges to have such edge portions fit within the grooves 34 and 44. Panel 26 may have secured thereto adjacent its bottom edge, on its outer face, an angle bar, 50, one of whose sides is secured to the bottom marginal edge portion of panel 26 and whose other side underlies the edge and projects to the other side thereof and is provided with preferably

elongated openings 52, adapted to engage over the projecting threaded posts 48.

To assemble the cabinet of FIG. 1 to 8, inclusive, top panel 20 is mounted on side panels 22 by slidably interengaging fittings 32 of the former on fittings 38 on the upper edges of the latter; sliding from the rear to the front. Bottom panel 24 is then engaged on side panels 22 by slidably engaging its male fittings 38 in the female fittings 32 at the bottom of side panels 22; likewise from the rear to the front. Thereafter, rear panel 26 is slid into grooves 46 of the side panels 22, upwardly into groove 34 of the top panel. This will bring openings 52 of the angle bar 50 over the threaded posts 48, when the assembly may be locked in place by wing nuts 54.

It will be seen that the ends of grooves 28 in top panel 20 and the ends of grooves 44 in side panels 22 form an abutment to limit the forward movement of the side panels relative to top panel and the bottom panel, and that the rear panel 26 limits the rearward movement of the top and bottom panels relative to the side panels.

It will also be clear that the assembly of the article of furniture, thus far described, does not require any skill or the use of any tools.

To provide a rigid assembly for the article, and at the same time render the knockdown parts for the article substantially warp-proof, the male and female fittings, 38 and 32 respectively, may comprise metal extrusions that may be readily and economically standardized and that may be cut to size as desired.

Fitting 32 comprises a channel member 56, of preferably rectangular cross section, each of whose edges is provided with flanges, 58, lying in a common plane and extending laterally to each side thereof. The portions of the flanges 58 directed towards one another form a restricted opening 60, for the channel member and the portions of the flanges directed away from one another serve for securing the fitting 32 to a panel, as by means of openings provided in them to receive the fastening screws 62.

It may here be stated that the channel members of fitting 32 may fit into grooves 28 whose marginal edge portions may be cut away to accommodate the flanges 58 so as to dispose them flush with the surface of the panel. It may here also be stated that the flanges 58 serve to maintain the fitting 32 in position against tilting. If desired, a rib 66, may be formed on the exterior of one side of the channel member 56 that may be guided in a groove 68 formed in the wall of a groove 28.

Male fitting 38 comprises an H-bar which is disposed on a side with one of the sides, 70, adapted to fit snugly within the channel 56 of female fitting 32, with its web, 72, engaged in the narrowed opening 60 of a fitting 32. The other side, 74, of the H-bar forms the base by which it is rested on the end face of the thickness of a panel. Side 70 of fitting 38 may be formed with flanges, 76 and 78, depending therefrom at its edges. Where a panel is thicker than the width of side 74, an adjacent portion of the side face of the panel may be cut away, as at 80, to accommodate all or a portion of the thickness of flange, 76, and a slot, 82, may be formed in the thickness of the panel end to accommodate flange 76. Flange 76 may be formed with a rib, 84, on its inner face, which may be accommodated in a corresponding groove, 86, formed in the face of the cutaway portion 80 of the side of the panel. Fitting 38 may be secured in place by means of openings in flange 76 through which screws, 88, may be set into the supporting panel.

It will be clear that the fitting 32, being set into the thickness of a panel at its edge or into a panel adjacent its edge, will inhibit the tendency of such panel to warp and that, likewise, fitting 38, because of its flanges 76 and 78, which engage the marginal edge portion of a panel in depth, will also inhibit the warping of any panel to which they are attached.

In FIG. 10 there is disclosed an open-top structure in the form of a knockdown drawer made in accordance with the invention. The drawer comprises front panel, 92, rear panel, 94, side panels, 96, and bottom 98. Front panel 92 is provided with a female fitting 32 in its inner face adjacent each side edge thereof. Side panels 96 are provided with male fittings 38 secured on their forward edges and with female fittings 32 on their inner faces, adjacent their rear ends, to receive the male fittings 38 on the ends of the rear panel 94. Front panel 92 and side panels 96 may be provided with grooves, 100, adjacent and parallel to their bottom edges in which may be slid in and held the bottom 98. Fittings 32 and 38 may be of a length less than the height of panels 92 and 96, preferably short of the grooves 100. Rear panel 94 may be of a height less than panels 92 and 96; substantially equal to the height of the 1st-named panels above grooves 100. Bottom 98 may be of a length sufficient to underlie rear panel 94.

In assembling the drawer of FIG. 10, side panels 96 may first be interengaged on front panel 92, and bottom 98, which may have an angle bar, 50, secured to its rear end in upwardly extending relation, may be partly slid into grooves 100 of the side panels 96. Rear panel 94 may then be slid into place to rest on top of bottom 98, which may then be completely slid into place, thereby having the openings in the angle bar 50 fit over the threaded post 48 set into the outer face of rear panel 94. Wing nuts 54 are then threaded into place on posts 48; all in a manner that will be readily apparent from the preceding description and not thought necessary to be illustrated in detail in connection with the drawer of FIG. 10.

Improved rails for supporting a drawer, for the cabinet of the invention or any similar cabinet, may be provided. Such rail is illustrated in FIGS. 7 and 9 of the drawings, and comprises a metal extrusion, generally designated as 102, consisting of a first side 104, adapted to be secured against the inner face of side panel 22. Side 104 is formed with a projecting rib 106, on its outer surface, adapted to be engaged within a groove 108, formed in the face of a panel 22. The extrusion 102 further includes a second side, 110, normal to side 104 and extending from a point above its bottom edge. Rail side 110 is formed with an upstanding flange, 112, at its edge, and with a second upstanding flange, 114, intermediate side 104 and flange 112. One or more tongues, 116, may be struck out from side 110, between flanges 112, and 114 and downwardly bent to leave an opening, 118, in side 110. Tongue 116 may be provided with an opening 120, through which may be set a round pin 122, on which is mounted a roller 124, that extends into the opening 120 and serves to facilitate the movement of the edge of a runner that may be secured in the side of the drawer to extend into said space and ride on roller 124. The end of pin 122 may be caught in a suitable opening in the side 104, below side 110.

FIGS. 10 and 11 illustrate an adaptation of the present invention for use with articles of furniture having ornamental pilasters. FIGS. 10 and 11 show a top panel 20 and a side panel 22 to the edge of which is secured a pilaster, 126. The front edge of side panel 22 has a female fitting 32 set thereinto and pilaster 126 has a male fitting 38 secured to its inner face. The upper end portion of the male fitting 38 has side 74 and web 72 cut away to leave only a projection of fitting side 70 which may also be reduced in width and its end portion, 128, offset at right angles in a direction away from side 74.

The corner of the top panel 20 overlying a pilaster 126 is formed with a recess in its underside; the recess having a shallow outer portion 130, and a deeper center portion 132. A metal frame 134, having a center opening is set into the shallower recess portion 130 where it may be secured in place by screws extending through openings 136, formed in the sides thereof. The deeper recess portion 132 extends at least under a part of the side of the frame 134 closest to the front edge of panel 20. The article of furniture of FIGS. 10 and 11 may be assembled by sliding panel 20 over side panels 22, from the front to the rear, until the center opening of the frame 130 is disposed over the folded-over end portion 128 of fitting side 74. Pilaster 126 is then moved upwardly to bring end portions 128 into the recess center 132. Rearward movement of the top panel 20 is then completed to have fitting end 128 engage over the side of the frame 134 overlying recess portion 130. Rear panel 26 may then be moved into place and locked on bottom

panel **24**, in the manner described with reference to the article of FIGS. **1** to **6**, inclusive.

In FIG. **13** there is disclosed a modified form of male and female fittings, both of which may be extruded metal strips and both of which may be extruded metal strips and both of which are secured to an edge of a panel and are visible from the exterior of an assembled article, to serve as a decorative element, if desired.

The female fitting, generally designated as **140**, comprises a preferably extruded metal body formed of two sides, **142** and **144**, that are set at 45° angles to one another. Side **144** is of appreciable thickness and has formed, in its thickness, a longitudinally extending T-shaped groove, **146**, with the leg of the T opening into its outer surface. Side **144** is formed with an end portion **148**, which is of reduced thickness and is offset to be parallel to side **142** and may also be provided, in its outer surface, with a longitudinally extending groove, **150**, preferably between groove **146** and the apex of the triangle formed by sides **142** and **144**. Side **142** may be formed with a longitudinally extending rib, **152**, on its inner face, adjacent its free end.

Female fitting **140** may be assembled with the edge of a panel, **154**, which is cut and grooved to fit within the space between sides **142** and **144** and the extension **148** of the latter, by longitudinal sliding movement, and held therein in a manner clearly shown in FIG. **13** and not thought necessary to be specifically described.

The male fitting, generally designated as **156**, likewise comprises two sides, **158** and **160**, set at 45° angles to one another, side **160** adapted to contact side **144** of fitting **140** and having on its outer face a longitudinally extending T-shaped projection, **162**, adapted to be slidably engaged in T-shaped groove **146** of fitting **140**, and a longitudinal rib, **164**, adapted to fit in groove **150** of fitting **140**. Side **160** is formed with an end portion **161**, offset to be parallel to side **158**. Side **158** of fitting **156** may be provided on its inner surface, adjacent its free end, with a longitudinally extending rib **166**. Fitting **156** may likewise be secured, by longitudinal sliding on the edge of a panel **168**, that may be cut and grooved to fit within the space between fitting sides **158** and **160** and to receive the rib **166**.

Fittings **140** and **156** may be held in place upon their respective panels **154** and **168** by their ribs **152** and **166** and, if desired, also by screws passed through suitable openings in leg portions **148** and **161**, and engaged in the respective panels in a manner that will be readily understood and not thought necessary to be specifically illustrated. Panels **140** and **156** may be connected to one another by sliding projections **162** in the groove **146** and projection **164** in the groove **150**.

This completes the description of the knockdown articles of furniture of the present invention and of the interengaging fittings with which they are formed. It will be readily apparent that the panels for the articles of furniture of the present invention may be prefabricated by the requisite grooving and routing to accurately receive and hold their appropriate fittings, and that such prefabricated panels may be readily, easily and accurately assembled with the fittings at the point of manufacture. It will also be apparent that such assembled knockdown elements or units will be compact for storage and shipping and will resist and substantially prevent any warping of the panels. It will be further apparent that such knockdown elements or units may be easily and quickly assembled into strong and rigid articles by anyone with a minimum skill and without the use of any tools. It will be likewise apparent that the knockdown articles of furniture of the present invention may be disassembled for storage and reshipment and readily reassembled as and when desired, without any loss of or detraction from their advantages.

While the present invention has been described in connection with panel-type articles of furniture, such as closets, cabinets, counters and drawers for the same, it may here be stated that this invention with the fitting thereof may also be applied to other types of knockdown furniture, such as upholstered chairs and sofas, for instance.

It will be further apparent that numerous modifications and variations may be made in the knockdown articles of furniture and of the fittings for use therewith, of the present invention, by anyone skilled in the art, in accordance with the principles of the invention hereinabove set for, without the use of inventive ingenuity.

I claim:

1. A knockdown article of furniture formed of a plurality of panels, all but one of said panels having cooperating male and female fittings secured thereto, each said male fitting on one of said panels slidably interengageable with a female fitting on another of said panels, whereby said panels may be joined together, means limiting the sliding interengagement movement of said fittings to thereby dispose said joined panels in predetermined aligned relation with one another, said all but one of said panels having grooves formed in their surfaces adapted to register with one another when said panels are in said aligned position to slidably receive therein said one panel, and means on said one panel and on one of said other panels for securing the same to one another, to thereby secure said panels into unitary structure.

2. The knockdown article of furniture of claim **1**, wherein said panels are five in number.

3. The knockdown article of furniture of claim **1**, wherein said male fittings are secured on edges of panels and said female fittings are secured to surfaces of panels.

4. The knockdown article of furniture of claim **1**, wherein each said female fitting comprises an elongated channel member having a narrowed opening and each said male fitting comprises an H-bar, including two sides and a web connecting said two sides, said bar disposed by one side on a surface of a panel with its other side engageable within the channel member of said female fitting and its web disposed within said narrowed opening of said channel member.

5. The knockdown article of furniture of claim **4**, wherein said channel member of said female fitting is formed with a flange extending laterally outwardly from at least one side of said channel member of said female fitting.

6. The knockdown article of furniture of claim **4**, wherein each said female fitting receiving panel is formed with a grooved channel for receiving said channel member.

7. The knockdown article of furniture of claim **4**, wherein the panel contacting side of said H-bar is formed with outwardly extending flanges normal to said side, said flanges encompassing between them a portion of the panel to which said male fitting is secured.

8. The knockdown article of furniture of claim **4**, wherein said panels include a top and side panels and ornamental pilasters for the edges of said side panels, and means securing said pilasters to said edges, said edges each having a female fitting secured thereto longitudinally thereof and said pilaster having a male fitting slidably engageable in said female fitting secured thereto longitudinally thereof, said male fitting having a portion thereof projecting above the top edge of said pilaster, said projection portion comprising a rod portion extending above said surface contacting side thereof and having its end portion offset at substantially right angles thereto in a direction overlying said pilaster, and means on the underside of said top panel adapted to engage under said offset end of said projecting portion.

9. The knockdown article of furniture of claim **4**, wherein a panel contacting surface of each said fitting is formed with a longitudinally arranged projection means and the surface of each said panel contacting said fitting surface is formed with a groove for receiving and guiding said projection means.

10. The knockdown article of furniture of claim **1**, wherein the means for securing said one panel and said one of said other panels to one another comprises threaded posts set into the outer face of one of said two panels and an angle bar secured to the other of said two panels at an edge thereof by one side thereof, the other side of said angle bar having openings formed therein adapted to fit over said threaded posts, and threaded nuts engaged on said threaded posts out-

wardly of said other angle bar side when said other angle bar side is fitted over said threaded posts.

11. Cooperating, interengageable fittings for attachment to panels of knockdown articles of furniture comprising a male fitting and a female fitting, such said female fitting comprising an elongated body having a channel formed longitudinally thereof, said channel having a narrowed opening formed by flanges extending from the edges of the sides of said channel and overhanging the same; said male fitting comprising an elongated body including a pair of longitudinally extending spaced sides connected by a web, one of said sides adapted to slidably fit within said channel of said female fitting with said web thereof disposed within said narrowed opening of said channel, and means on said male fitting and said female fitting for securing the same to a panel comprising spaced parallel flanges extending outwardly from a side of the body of one of said fittings in normal relation to said side and adapted to encompass between them a marginal edge portion of a panel, and a laterally extending flange from at least one side of the body of the other of said fittings normal to said side and adapted to overlie a surface portion of a panel on which said other fitting is disposed.

12. The cooperating fittings of claim 11, wherein said parallel flanges extend from said other side of said male fitting and said lateral flange extends from an edge of a side of said channel of said female fitting and substantially continuous with one of said overlying flanges.

13. The cooperating fittings of claim 11, wherein a lateral flange extends from the edge of each side of said channel of said female fitting, substantially continuous with the adjacent one of said overlying flanges.

14. The cooperating fittings of claim 11, wherein said means securing said fittings to a panel comprise lateral extensions of said other side of said body of said male fitting, each projecting beyond the longitudinal edges of the channel-engaging side thereof, one of said flanges having an extension at its outer edge disposed at an angle of about 45° thereto and overlying said body, the other of said flanges having an extension at its end, offset at an angle thereto and parallel to the extension of said first flange; and lateral flange extensions from the edge of each side of said channel of the body of said female fitting, each said channel side extension continuous with the adjacent one of said channel overlying flanges, one of said last-named laterally extending flanges having an extension at its outer edge at a substantially 45° angle thereto and overlying said female fitting body, the other of said flanges of said female fitting having an extension at its end offset at an angle thereto and substantially parallel to the flange extension of said one flange thereof.

15. The cooperating fittings of claim 14, wherein the flange extension of said one flange of each said fitting is formed with a longitudinally extending rib on its inner face.

16. The cooperating fittings of claim 14, wherein said one lateral flange of one of said fittings is formed with a longitudinally extending groove and one lateral flange of said other of said fittings is formed with a rib adapted to be slidably received and guided within said groove.