

United States Patent

Huls

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[54] **DEVICE FOR JOINING TOGETHER PARTS OF A PIECE OF FURNITURE**

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[58] **Field of Search****287/189.36 R, 189.36 C, 20.92 C, 287/20.92 D, 20.92, 189.36 D; 52/730, 732; 211/177, 184; 5/288, 304; 108/106, 107, 108, 109; 248/243**

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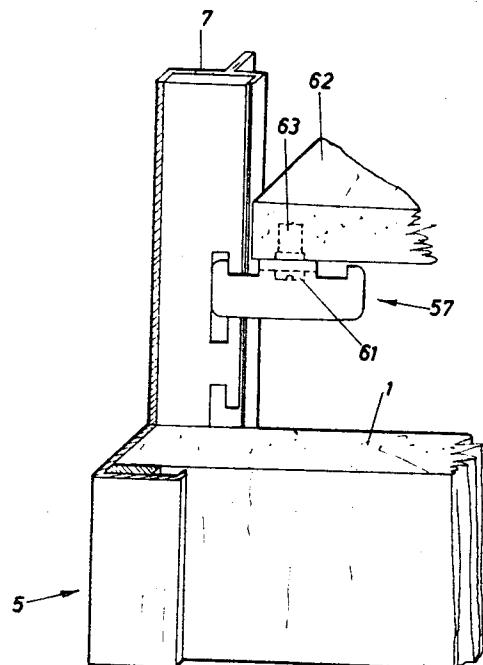
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[57] **ABSTRACT**

A device for securing together individual parts, such as wooden panels, of a piece of furniture is formed of an elongated U-shaped member which forms a groove within which a pair of strips are provided extending along the oppositely disposed legs or flanges of the U-shaped member. T-shaped recesses are formed in the edges of the strips located along the opening to the groove in the U-shaped member and connecting members are arranged to be interlocked into these recesses. One panel of the piece of furniture can be held between the strips within the groove in the U-shaped member while additional parts or panels are attached to the members interlocked into the recesses in the strips.

16 Claims, 4 Drawing Figures

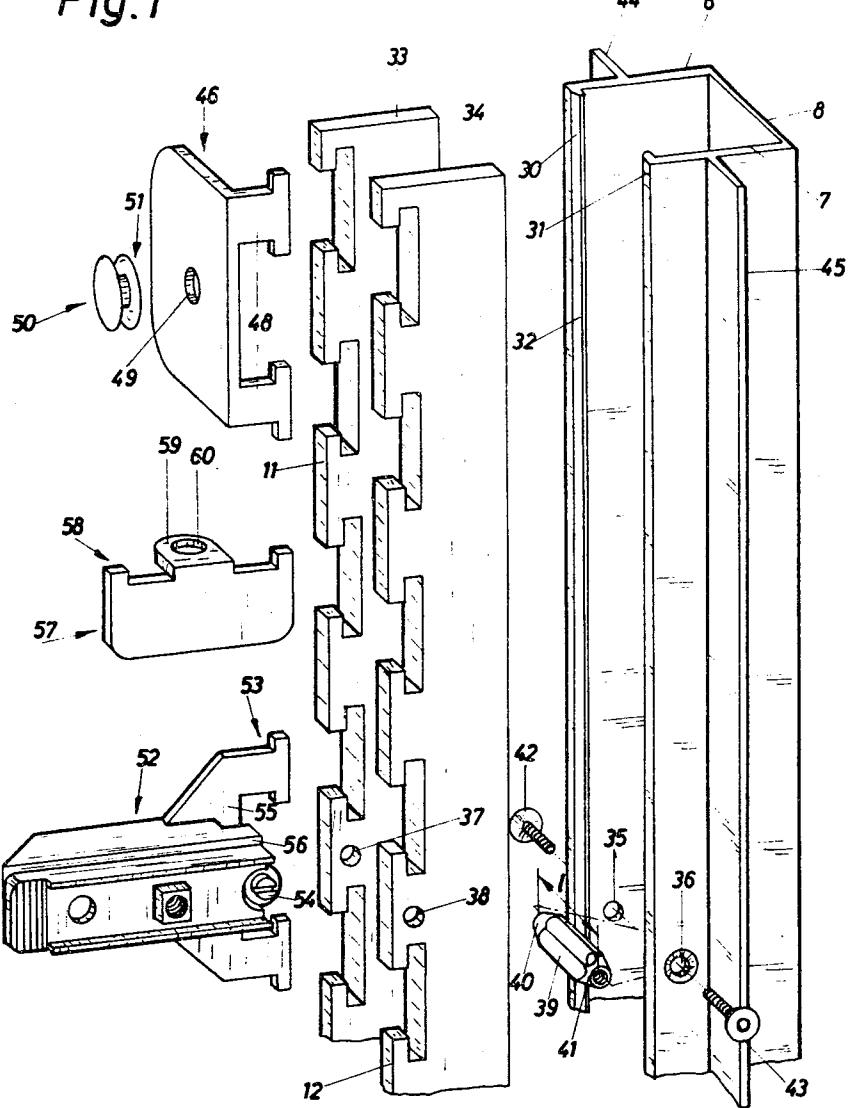


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SHEET 1 OF 2

Fig. 1



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Fig. 2

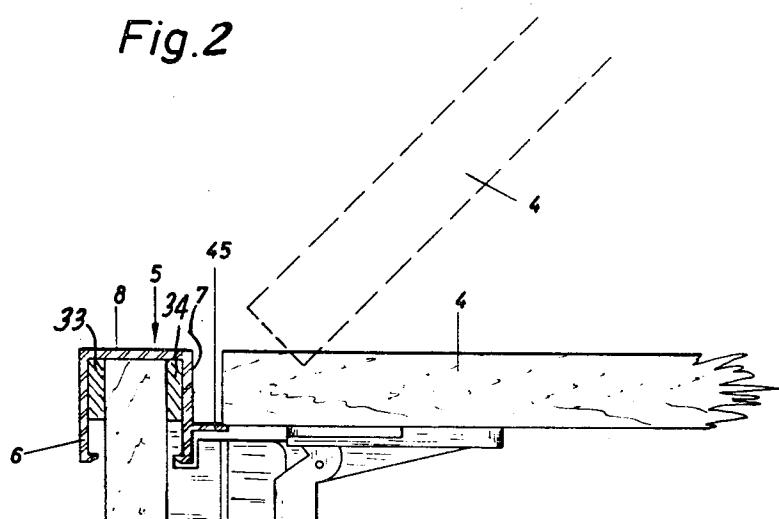


Fig. 4

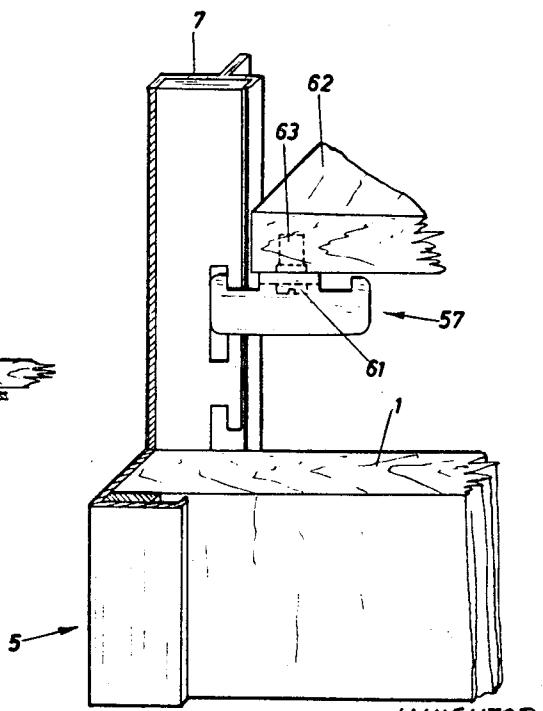
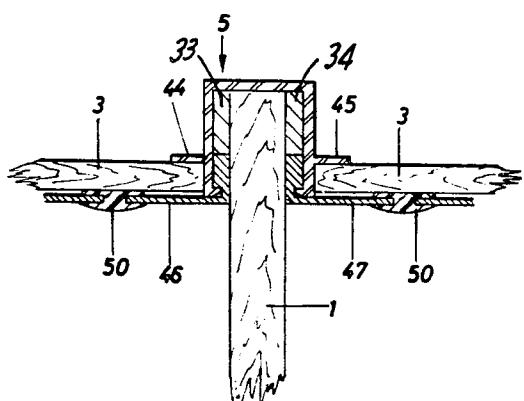


Fig. 3

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**DEVICE FOR JOINING TOGETHER PARTS OF A PIECE
OF FURNITURE**

SUMMARY OF THE INVENTION

The present invention is directed to a device for joining together different parts or panels of a piece of wooden furniture and, more particularly, it is concerned with a device which includes a U-shaped member and other members which can be secured within recesses formed in the U-shaped member for securing together different parts of the piece of furniture.

In the past, U-shaped members have been used for securing separate parts of a piece of furniture together. Projections have been formed within the interior of the U-shaped member and other members are provided which interengage with the projections. One part of the piece of furniture is secured within the groove formed by the U-shaped member and other parts are attached to the members which are secured to the U-shaped member. In a piece of furniture, such as a cabinet the various parts, such as panels and doors, can be assembled together to provide the required strength and at the same time afford the requisite stability for torsion resistance.

It is the primary object of the present invention to provide an improved arrangement of such a device using a U-shaped member in which the interengaging or interlocking parts are simplified and afford increased strength and stability.

Therefore, in accordance with the present invention, an elongated U-shaped member is provided having a pair of spaced legs or flanges extending along and from the opposite longitudinally extending edges of a web. The U-shaped member forms a groove within which a pair of flat strips are arranged, one extending along each of the inside surfaces of the legs and the outer edges of these strips extending along the opening into the groove in the U-shaped member are provided with shaped recesses for receiving similarly shaped projections on connecting members for securing the connecting members in interlocking engagement.

Another characteristic of the invention is the provision of stops along the edges of the legs of the U-shaped member at the opening into its groove so that the strips can be held between these stops and the inner surface of the web. The thickness of the strips can be equal to the corresponding dimension of the stops or the strips can have a thicker dimension than the corresponding dimension of the stops so that they extend inwardly into the groove beyond the stops for effecting the interlocking engagement with the other members for securing the parts of the piece of furniture together.

Since the U-shaped member and the strips are separate, it is easier to form the recesses which provide the interlocking engagement. The U-shaped member can be formed in one part, for example of aluminum, and the flat strips can be formed in another part of a similar metal, and then the strips can be punched or reworked to form the required recess configurations. The production of the U-shaped members and the flat strips of metal is advisable because it insures the necessary strength of the device. However, as this technology develops it is quite possible that plastics will be found which have the necessary stability and strength for use in place of the metal strips.

In two German utility models, Nos. 1,977,136 and 1,996,198, U-shaped members have been disclosed which are provided with an insert for receiving one of the parts of the piece of furniture which is to be joined to another part. However, in these arrangements the insert is a U-shaped part formed, for example of plastic, and it is configured on its exterior surface so that it cooperates with a corresponding profile on the inner wall of the U-shaped member into which it is inserted to insure the mounting support of the U-shaped insert. A U-shaped insert located within a U-shaped member has the disadvantage that, because of the web portion of the U-shaped insert, the part of the piece of furniture can not be inserted a sufficient distance into the combined U-shaped structure to afford adequate mounting support without increasing

the size of the U-shaped member which receives the insert. However, the increase in the size of the U-shaped member results in unnecessary costs and, of course, increases the size of the joint between the various parts of the piece of furniture.

5 Accordingly, these known constructions are not comparable to the arrangement disclosed in the present invention.

Furthermore, another feature of the present invention is the provision of aligned bores through the U-shaped member and the flat strips through which threaded members, such as

10 screws, can be inserted into a cross connector provided through an aligned hole in the part to be secured within the groove in the U-shaped member. Preferably, the cross connector is polygonal so that when inserted in the part or panel it

15 will be held against turning. Further, the length of the cross connector corresponds to the thickness of the part secured in the groove and threaded bores are provided within the cross connector for receiving the threaded members which extend through the bores in the U-shaped member and the strips. With this arrangement it is possible to avoid the use of hooks

20 which have been necessary in the past for securing the part within the groove in the U-shaped member. Furthermore, with this arrangement it is possible to avoid bulging of the U-shaped member even when it is of a considerable height, since

25 the legs of the U-shaped member are rigidly connected with one another through the threaded members and the cross connector provided through the part secured within the groove in the U-shaped member.

Use of the cross connector has the additional advantage, 30 when a hinge member has projections which interengage with the recesses in the strips within the U-shaped member, that additional locking is achieved by means of a screw which is engaged within the threaded bore in the cross connector.

Another characteristic of the invention is the provision of 35 flanges along one or both of the exterior surfaces of the legs on the U-shaped member. The flanges are arranged normally to the surfaces of the legs and serve as stop edges for the parts of the piece of furniture which are secured to the U-shaped member. The spacing of the flanges from the edges of the legs can be arranged to correspond to the thickness of the part being mounted on the U-shaped member so that the part will have one of its surfaces flush with the plane of the opening to the groove in the U-shaped member or the plane of the exterior surface of its web.

45 Various forms of members can be provided for interlocking engagement with the U-shaped member to accommodate the interconnection of the different parts of a piece of furniture. One such member is an abutment plate with projections ex-

40 tending at right angles to its plate surface and which interengage in the recesses formed in the strips positioned in the U-shaped member. An opening can be arranged in the abutment plate for an elastically deformable pushbutton which contacts one surface of the part held by the abutment plate in a manner so that the member is held between the flange on the U-shaped member and the opposite surface of the abutment plate. Where a door hinge is engaged in the U-shaped member a slot-like recess is formed in the hinge for adapting to the position of the flange.

60 The stops located at the opening to the groove in the U-shaped member can be chamfered to facilitate the insertion of the part of the piece of furniture into the groove and to give the U-shaped member a certain esthetic appearance. In the construction of a cabinet wall, shelf or other piece of furniture

65 using the U-shaped member of the present invention, a bottom frame support can be provided with projections for engagement into the recesses in the U-shaped member with a right angled part extending from the support. In order to provide a stronger bottom frame support, which is of particular im-

70 portance in so-called construction bottoms, it is preferable to provide the right angled part with an opening through which a connector member can be inserted for securing the frame bottom to the support.

75 The various features of novelty which characterize the invention are pointed out with particularity in the claims an-

nected to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is an exploded perspective view of a device, in accordance with the present invention, for securing together different parts of a piece of furniture;

FIG. 2 is a top view of the device shown in FIG. 1 arranged to secure a cabinet door to the side wall of a cabinet;

FIG. 3 is a view, partly in section, of the device shown in FIG. 1 for securing rear cabinet walls to the side wall of a cabinet;

FIG. 4 is a side view part, partly in section, showing the attachment of a bottom frame support into the device shown in FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

In FIGS. 2, 3, and 4 various parts of a piece of furniture are shown in an interconnected arrangement. The piece of furniture is a cabinet comprised of a side wall 1, rear walls 3, a cabinet door 4, and a U-shaped member 5 which cooperates in assembling the various parts together. The U-shaped member has a pair of longitudinally extending legs 6 and 7 which extend perpendicularly from the opposite longitudinally extending edges of a web 8. The legs 6 and 7 and the web 8 combine to form a groove into which the side wall 1 of the cabinet is shown secured. At the opening to the groove formed in the U-shaped member 5 a pair of stops 30 and 31 extend inwardly from the free ends of the legs 6 and 7, respectively, and the surfaces of the stops are chamfered as shown at 32, note FIG. 1.

Within the groove formed by the U-shaped member 5 a pair of flat strips 33 and 34 are arranged, each extending along one of the interior faces of the legs 6 and 7. The strips, 33 and 34, extend between the interior surface of the web 8 and the interior surface of the stops 30 and 31 as can be seen in FIG. 4. Spaced along the edges of the strips contacting the stops and located at the opening to the groove in the U-shaped member 5 are T-shaped recesses which are arranged so that the opening to the recess along the length of the strip is less than the length of the recess spaced inwardly from its opening. Due to this T-shaped configuration of the recess a pair of oppositely directed projections or teeth, 11, 12 are provided at the opening to the recess. FIGS. 2 and 3 clearly indicate that the strips 33, 34 are thicker than the corresponding dimension of the stops 30, 31, however, it is also possible to reduce the thickness of the strips or to have the stops 30, 31 project further across the opening into the groove in the U-shaped member.

Adjacent the free ends of the legs 6 and 7 of the U-shaped member 5, aligned bores 35 and 36 are provided which coincide with similar bores 37, 38 provided in the flat strips 33 and 34. Though not shown in the drawing, a hole is provided in the side wall 1 which coincides with the bores 35 to 38. To effect the securing of the side wall within the U-shaped member, a cross connector 39 is positioned in the bore through the side wall and the connector has a hexagonal transverse cross section whose outer circumference is somewhat larger than the bore through the side wall so that the connector is tightly secured within the wall and is held against turning. The length "1" of the cross connector 39, note FIG. 1, corresponds substantially to the thickness of the side wall secured within the U-shaped member. At its opposite ends the cross connector 39 is provided with bores 40, 41 each having a female thread for receiving the screws 42, 43 which extend through the opposite legs 6 and 7 of the U-shaped member and through the strips 33, 34. With this arrangement of the screws 42, 43 and

the cross connector it is possible to tighten the legs 6 and 7 of the U-shaped member towards one another and to secure the side wall in position within the groove in the U-shaped member.

5 In FIG. 1, on the outer surfaces of the legs 6 and 7 of the U-shaped member 5, flanges 44, 45 are provided which extend perpendicularly outwardly from the legs. It can be appreciated that the U-shaped member can be provided without any flanges extending from its legs or, as represented in FIG. 2, a flange 45 can be provided extending from only one leg of the member. As can be noted in FIGS. 2 and 3, the flanges are located intermediate the ends of the legs so that they provide a support for one surface of one of the cabinet walls and the dimension between the support surface of the flange and the adjacent end of the leg is equal approximately to the thickness of the wall positioned between the flange and the end of the leg, note the rear wall 3 in FIG. 3. In FIG. 2 the thickness dimension of the cabinet door 4 is approximately equal to the distance between the flange 45 and the outer surface of the web 8 of the U-shaped member 5.

In FIG. 3 the rear walls 3 are secured to the U-shaped member 5 and the side wall 1 by means of a pair of correspondingly arranged abutment plates 46 and 47. In FIG. 1, 25 the abutment plate 46 is illustrated on an enlarged scale and is provided with a plate surface extending perpendicularly to the legs and strips of the U-shaped member with a pair of spaced projections 48 arranged to extend inwardly toward and to fit within the recesses in the strips 33, 34. As can be noted, the projections 48 have a T-shaped configuration similar to that of the recesses in the strips 33, 34 to provide the requisite interlocking engagement between the abutment plate 46 and the U-shaped member 5. In the surface of the abutment plate extending transversely from the U-shaped member an opening 30 46 is arranged which holds a pushbutton 50, note FIG. 3, which is formed of an elastic material, for example rubber, and has a side 51 which presses against one surface of the rear wall 3 while the other surface along its edge contacts the flanges 44 or 45. As mentioned above, the distance between the flange 45 and the outer surface of the web 8 of the U-shaped member is selected so that it equals the thickness of the door 4 and the flange 45 serves as a stop for the door, note FIG. 2.

In FIG. 2 the hinge side of the door is shown and in dashed lines the position of the door 4 is shown displaced from the opening to the cabinet. As indicated in FIG. 2, a hinge 52 is secured to the door and is interengaged within the U-shaped member 5, and in FIG. 1 the hinge is shown in more detail on an enlarged scale. Extending upwardly and downwardly from the hinge 52 are projections 53 which are T-shaped at their ends for engagement within the recesses in the strips so that an interlocking engagement is provided with the projections 11 or 12 on the strips. In addition, to the engagement provided between the projections 53 and the recesses in the strips, a screw 54 is provided through the hinge which extends into the aligned bores through one side of the U-shaped member and into the cross connector 39 located within the side wall 1. Due to the arrangement of the screw 54 and the interengagement 55 60 with the strip a firm attachment of the hinge 52 to the U-shaped member is provided.

In adapting the hinge 52 to the thickness of the side 6 or 7 and the flat strips 33 or 34, a slot 55 is provided with a projecting nose 56 which extends along the outer surface of the leg of the U-shaped member. It is not considered that any further explanation of the hinge and its function is required, since these are conventional technical means which are well known.

In FIG. 4 a bottom frame support 57 is shown in interengagement with the U-shaped member and this support is 70 shown on an enlarged scale in FIG. 1. A projection 58 is provided on each end of the bottom frame support 57 and the projection is configured so that it engages within the recess formed in the strip and is held against one of the projections 11 or 12 at the opening to the recess. The height of the support is such that it fits closely within the opening to the recess,

note FIG. 4. This is characteristic also of the projections 48 on the abutment plate 46 and projections 53 on the hinge 52 which fit closely within the recesses in the strip. The bottom frame support 57 extends forwardly from the opening to the U-shaped member and a projecting surface extends laterally from one side at a position spaced intermediate the projections 58 which acts as a support for the lower surface of the bottom frame 62. An opening 60 is provided in the projecting surface 59 for receiving a screw 61 and a known expansion dowel 63 is provided in the bottom frame 62 so that the screw can be locked into the bottom frame. This attachment arrangement secures the bottom frame against any upward pressure once the screw is inserted. This arrangement is particularly important in the case of so-called construction bottoms.

The embodiments shown in the drawing are provided merely for illustration of the invention and are not intended to limit the application of the invention. It will be readily appreciated that the U-shaped member 5 can be used in various ways for securing parts of a piece of furniture together.

What is claimed is:

1. In a device for assembling wooden furniture panels to form a piece of furniture, and of the type including elongated U-shaped members arranged to conformingly seat edges of panels and having interlock formations interengageable with mating interlock formations on connecting members securable to other panels, the improvement comprising, in combination, an elongated U-shaped member of substantially rectangular crosssection including a web and a pair of legs extending perpendicularly from said web to define a groove; a pair of substantially similar elongated substantially rectangular strips each positioned against the inner surface of a respective leg and having an inner edge seating on said web, the outer edges of said strips being formed with said interlock formations; a first wooden furniture panel seated in said groove; the thickness of said strips relative to the interior width of said U-shaped member being such that the lateral spacing between said strips is substantially equal to the thickness of said first wooden furniture panel, so that said first panel is tightly engaged between said strips; means restraining displacement of said strips outwardly of said groove; at least one metal connecting member having interlock formations matingly engaged in interlock formations of one of said strips, each connecting member extending outwardly from said groove; and a wooden furniture panel secured to each connecting member.

2. A device, as set forth in claim 1, wherein said strip formations have a T-shaped configuration in the plane extending along the surface of said leg of said U-shaped member.

3. A device, as set forth in claim 2, wherein the interlock formations on said connecting means have a T-shaped configuration similar to the T-shaped configuration of the interlock formations of said strips.

4. A device, as set forth in claim 1, wherein stops extend along each of the outer edges of said legs substantially perpendicularly to the legs and partly across the opening to the groove in said U-shaped member, said stops being arranged in engagement with the outer edges of said strips.

5. A device, as set forth in claim 1, wherein said legs of said U-shaped member and said strips have aligned bores therethrough, a cross connector arranged to be fitted into a bore in the panel to be secured within said groove of said U-shaped member and to be aligned with the bores in said legs and strips, and securing means arranged to extend through the bores in said legs and strips into said cross connector for securing the panel within said groove and for securing said legs and strips together.

6. A device, as set forth in claim 5, wherein said cross connector has a polygonally shaped transverse cross section for

preventing turning when it is positioned within a panel, said cross connector having a bore therethrough aligned with the bores in said legs and strips, said cross connector having a length substantially equal to the thickness of the panel positioned within said groove, and said securing means comprising threaded members each arranged to pass through the bores in one said leg and strip and to be secured within the bore in said cross connector for securing the U-shaped member and the panel positioned within its groove together.

10. 7. A device, as set forth in claim 1, wherein a flange extends along and outwardly from the outer surface of at least one of said legs, said flange being positioned intermediate said web and the outer edge of said leg.

8. A device, as set forth in claim 7, wherein the distance of said flange from the outer edge of said leg corresponds substantially to the thickness of a panel to be secured against said flange on the side thereof facing toward the outer edge of said leg.

9. A device, as set forth in claim 7, wherein the distance of said flange from the outer edge of said web of said U-shaped member corresponds substantially to the wall thickness of a panel to be positioned between the flange and the outer surface of said web.

10. 10. A device, as set forth in claim 7, including a connecting member in the form of an abutment plate arranged to be interlocked with one of said strips; said abutment plate comprising a plate part and a pair of T-shaped projections extending perpendicularly from said plate part and constituting said interlock formations, said T-shaped projections having mating engagement in T-shaped recesses in the associated strip.

11. 11. A device, as set forth in claim 10, wherein said plate part of said abutment plate has an opening therethrough, an elastically deformable button-like member positioned within said opening and arranged to extend from one surface of said plate part into engagement with the panel to be secured thereby and providing contacting engagement with the panel on one side while the opposite side of the panel is secured against said flange extending outwardly from said leg on said U-shaped member.

12. 12. A device, as set forth in claim 4, wherein the surfaces of said stops adjacent the opening into said groove in said U-shaped member are chamfered.

13. 13. A device, as set forth in claim 4, wherein said strips have a thickness which corresponds to the dimension of said stops extending from the inner surface of said legs of said U-shaped member.

14. 14. A device, as set forth in claim 4, wherein said strips have a thickness which is greater than the dimension of said stops extending from the inner surface of said legs of said U-shaped member so that the strips extend further into said groove in said U-shaped member than do said stops.

15. 15. A device, as set forth in claim 1, including a connecting member in the form of a door hinge having a pair of interlock projections extending therefrom and arranged to have mating engagement in a pair of interlock recesses in one of said strips; said hinge being formed with a recess arranged to embrace the outer edge of the adjacent leg of said U-shaped member.

16. 16. A device, as set forth in claim 1, including a connecting member constituted by a relatively elongated bottom frame support; said bottom frame support comprising an angle member having interlock formations in one leg engageable with an interlock formation in one of said strips, and having a second leg extending at right angles to said first leg; said second leg having an aperture therethrough for fastening means to secure said bottom frame support to a bottom frame or panel.

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