

Oct. 9, 1956

L. M. DENNISON
FURNITURE CONSTRUCTION

2,766,092

Filed July 31, 1952

2 Sheets-Sheet 1

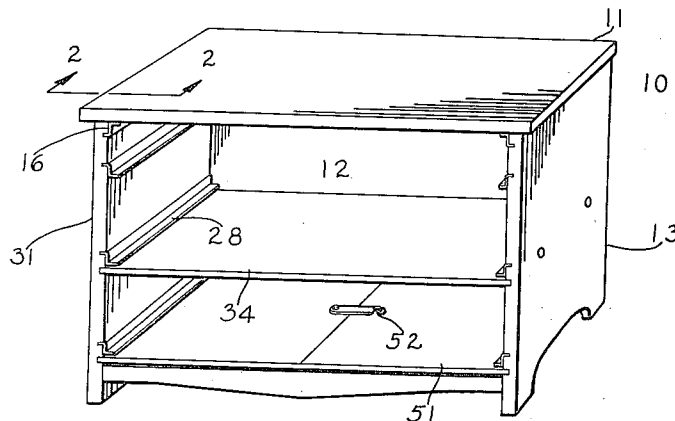


FIG. 1

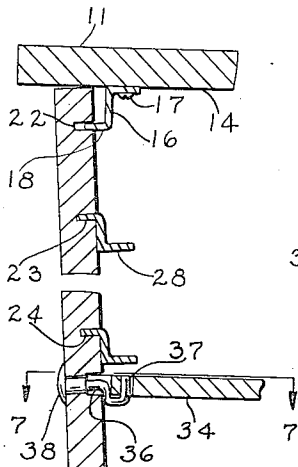


FIG. 2

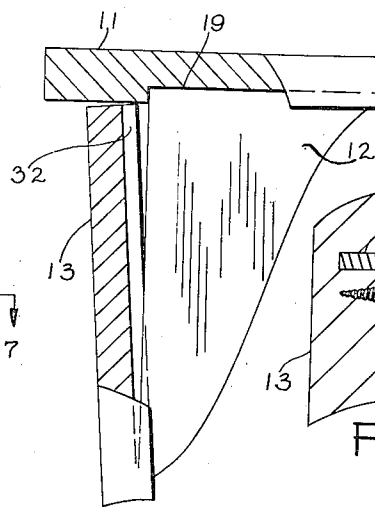


FIG. 3

FIG. 4

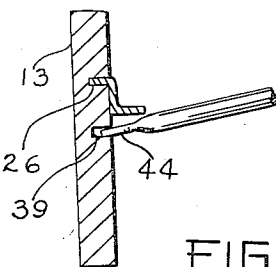


FIG. 5

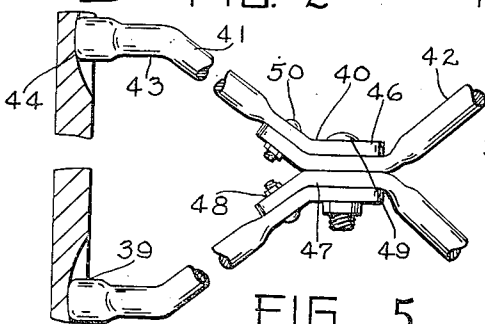


FIG. 6

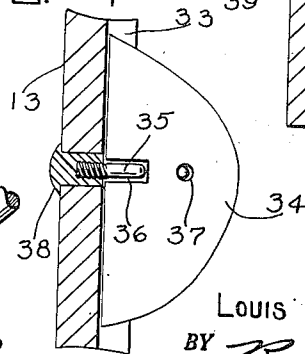


FIG. 7

INVENTOR.
LOUIS M. DENNISON
BY *Richard S. Hayes*
Attorney

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2 Sheets-Sheet 2

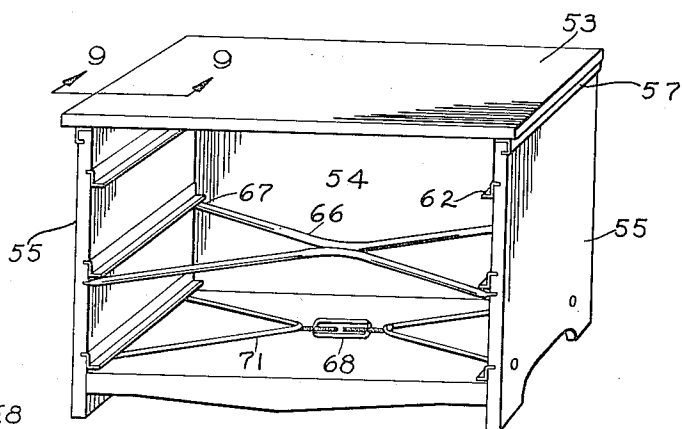


FIG. 8

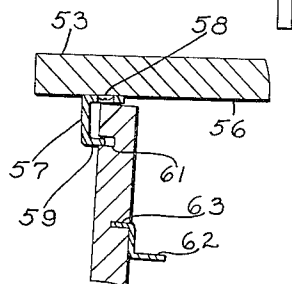


FIG. 9

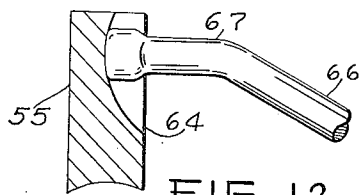


FIG. 12

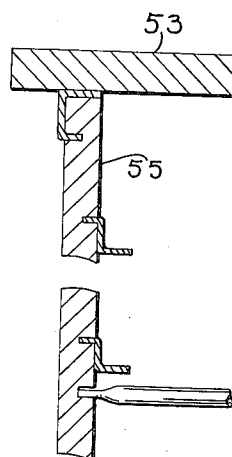


FIG. 10

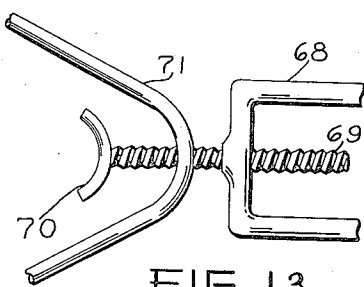


FIG. 13

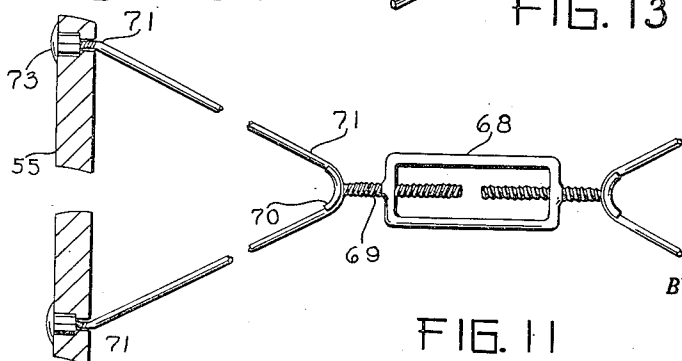


FIG. 11

INVENTOR.
LOUIS M. DENNISON
BY *Richard H. Hayes*
Attorney

2,766,092

FURNITURE CONSTRUCTION

Louis M. Dennison, Jamestown, N. Y.

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10 Claims. (Cl. 312—257)

This invention relates to improvements in furniture construction and particularly to the construction of articles of furniture of the case or box type wherein the exposed panels, top, and aprons are produced from wood or other suitable panel-like material.

It has long been the practice in the manufacture of case or box-like articles of furniture, constructed from wooden cores or panels, to produce the various parts in required dimensions. These parts were subsequently formed with tongues and grooves and interfitting dowels for the purpose of obtaining desired relationship of such parts. At the time of assembly of the parts, the tongues, intended to enter grooves as well as the dowels, were coated with a suitable adhesive. After assembly the article, one mechanism or another was provided by which to clamp or bind the assembled pieces together for such time as was required for the adhesive to set. The procedure briefly mentioned above has been followed extensively for many years. It is apparent, however, that articles of case or box-like construction have not been entirely satisfactory due, possibly, to improper assembly of the parts or failure of the adhesive to hold the parts assembled throughout a long period of use. It has been noted that in the assembly of some case or box-like articles the parts thereof are not drawn entirely into interfitting engagement during assembly, possibly due to incorrect grooving or doweling, or warpage of one or more of the parts. This results in a finished article which, unless disassembled and properly re-assembled, requires special attention in the mounting of shelves or drawers therein, or when applying one or more doors thereto.

It is well known that over a period of time the joints or connections of panels or other parts of a case or box-like article are repeatedly placed under considerable tension as a result of expansion or contraction due to changes in humidity. Also, these panels may be placed under tension by reason of the particular use to which the article is subjected. In either event, this repeated or continuing tension causes the interfitting joints or other parts to place sufficient strain on the adhesive as to loosen or completely break the bond thereof. When these joints or other interfitting parts have become loosened, the parts of the article do not properly fit, difficulty is experienced in operating drawers or doors, and the article can only be placed in proper condition again by disassembling the parts, cleaning the joints, or other interfitting parts, of all hardened adhesive and re-assembling in the manner of the original assembly.

Although all types of wooden furniture have been subject to the above mentioned assembly and use objections, it is believed that such objections may be overcome, at least insofar as articles of case or box-like type are concerned, through the use of structural means for securing the parts together in assembled relationship, such means being utilized in place of the traditional adhesive.

To this end, the present invention has been developed and, in its disclosed form, provides a case or box-like article of furniture in which the exposed parts or panels

are drawn into assembled interfitting relationship and so held under mechanically applied tension. These parts or panels may, of course, be of different proportions and sizes from those shown and described in adapting the invention to various articles of furniture in which panels or other plain parts are required to be held in rigidly assembled relationship.

It is an object of the present invention to provide improved structure for securing a plurality of panels in case or box-like assembled relationship.

It is another object of the invention to provide structure that will secure the assembled panels of a case or box-like article under tension.

Another and important object of the invention lies in the provision of structure to secure the parts or panels of a case or box-like article in assembled relationship through the utilization of mechanically operated means that enables assembly at will.

A further and important object of the invention lies in the provision of an assembly arrangement for a case or other box-like article that, by causing many of the assembled parts to be held in interfitting relationship under a continuing tension, provides such rigidity and ruggedness as to effectually eliminate any tendency of the article to twist or warp even after protracted use.

Other objects and advantages of the invention will be more fully understood from a consideration of the following specification, taken in conjunction with the accompanying drawings; in which

Fig. 1 is a frontal perspective view of a case or box-like article of furniture in which one form of the invention is embodied;

Fig. 2 is an enlarged fragmentary vertical sectional view, taken substantially as suggested by the line 2—2 of Fig. 1 and shows the relative position of certain of the parts of the article shown in Fig. 1 when said parts are in partially assembled position.

Fig. 3 is a view similar to Fig. 2, showing the relationship of the parts upon completion of the assembly operation;

Fig. 4 is a fragmentary vertical sectional view showing the relationship of the top and rear panel when the other parts of the article assume the position shown in Fig. 2;

Fig. 5 is a fragmentary plan view of the mechanism utilized to adjust and hold the various parts of the article in assembled position;

Fig. 6 is an enlarged fragmentary vertical sectional view showing the method of securing the fixed guides for movable members that may be located within the article;

Fig. 7 is an enlarged fragmentary vertical sectional view, taken substantially on the line 7—7 of Fig. 2 and shows means for mounting the intermediate bracing member in an end wall of the article;

Fig. 8 is a frontal perspective view, similar to Fig. 1, showing a modification of the invention;

Fig. 9 is an enlarged fragmentary vertical sectional view, taken substantially on line 9—9 of Fig. 8, and shows the relative position of certain of the parts of the article shown in Fig. 8 when said parts are in partially assembled position;

Fig. 10 is a view similar to Fig. 9 and shows the relationship of the parts upon completion of an assembly operation;

Fig. 11 is a fragmentary plan view of the means for holding the parts of the structure shown in Fig. 8 in assembled position;

Fig. 12 is a fragmentary horizontal sectional view showing the method of mounting the ends of intermediate brace members in the end walls of the article; and

Fig. 13 is an enlarged fragmentary plan view of the structure shown in Fig. 11.

Referring more particularly to the drawing, the refer-

ence numeral 10 is employed to generally designate a case or box-like article of furniture in which one form of the invention is shown. This article, for purposes of illustration, is shown in the form of a chest in which it is intended to locate a series of drawers. The chest comprises a top 11, rear panel 12, and identical opposed end panels 13. Attached to the under surface 14 of the top 11, at predetermined places adjacent each end thereof, are Z bars 16, suitable screws 17 being provided as means of securement. These bars terminate slightly short of the front and rear edges of the top 11 and, of course, include horizontal, outwardly extending flanges 18. Adjacent its rear edge, the under face 14 of the top 11 is formed with a lengthwise cut 19. This cut is intended to receive the upper edge of a back panel 12.

The end panels 13 are each provided with a series of correspondingly arranged grooves which extend substantially the full width of the panel. Referring particularly to Fig. 2, it will be noted that adjacent the upper end of the panel 13 there is an inwardly facing cut 22. This cut can be made in any manner as, for example, by a circular saw running crossways of the panel. The flange 18 of each of the bars 16 is intended to project into the cut 22. Suitably spaced further down in the panel are further cuts, indicated at 23, 24, and 26. Each of these cuts receive the upper flange 27 of a drawer guide 28. The vertical flange of each guide abuts the inner face of the panel and is secured thereto in any suitable manner, as by means of screws 29. The guides 28 may extend to the front edge 31 of each of the side panels 13 and terminate short of a vertical slot 32 formed near the rear vertical edge and intended to receive the vertical edge of panel 12.

Midway of each panel 13, a horizontal, full width groove 33 is provided. This groove extends from substantially the front edge 31 to the vertical groove 32 and is intended to receive one end of a rigid central bracing member 34. As shown in this modification of the invention, the member 34 consists of a solid, non-pliant panel, the ends of which project into the grooves 33. Member 34 (see Figs. 2 and 7) is anchored to the panels 13 by means of hooks 35. Each hook has a U-shaped portion, a part of which being located in a notch 36. The end of this portion projects through an opening 37 in the member 34. The base of each hook is threaded and is engaged by a finish or cap nut 38 that projects into a suitable opening in the panel 13. As will hereinafter be more fully set out, the grooves 33 in the end panels are slightly flared, top and bottom, to enable possible slight angular relative movement of the end panels and member 34.

Directly beneath the lowermost drawer guide 28, each panel is provided with a pair of slots 39, substantially as shown in Figs. 2, 3 and 5. An extendable brace is provided (see Fig. 5). This brace, in one form, may consist of a generally X-shaped tubular frame 40 which includes pairs of legs 41 and 42. The ends 43 of these legs preferably terminate in flattened portions 44 which project into the slots 39 of the panels 13. The inner ends of legs 41 are flattened to form flanges 46, whereas the inner ends of legs 42, while formed with corresponding flanges 47, additionally have opposed end portions 48. Flanges 46 and 47 have apertures which, when aligned, receive a pin 49 that serves as a pivotal point for the swinging or jack-knifing of legs 41 with respect to legs 42. Adjacent the flanges 46 of legs 41, and in the portions 48, openings are made. These openings may be made to register and, when pins or bolts 50 are projected therethrough, all four legs of this frame are rigidly secured in a common plane. It will be noted that Fig. 1 of the drawing shows a lower bracing member 51 in the form of a pair of transversely hinged panels. The ends of these panels will project into an elongated form of the slots 39 above described. Any suitable means may be provided to hold these panels in the common plane shown, such, for example, as the swing plate 52.

For a clearer understanding of the invention, it is pro-

posed to briefly describe the location of the parts preparatory to and during an assembly operation. The bars 16 are secured to the top 11 and guides 28 are secured to the end panels 13. The ends of member 34 are projected into the slots 33 and secured by the hooks 35 and nuts 38. The top 11 is now placed in an upside down position and the upper edge of the rear panel 12 projected into the under side groove 19 of said top. The previously assembled end panels 13 and member 34 are now brought into position by interfitting the grooves 32 of the end panels with the ends of the rear panel 12 and moving said end panels downwardly to a position such that the top edges thereof substantially contact the under face of the top. It will be understood that the panels 13 must be slightly spread in order that they may pass the flanges 18 of the bars 16 and that the lower panel ends will be inclined inwardly. The frame 40, in somewhat jack-knifed position, is now mounted, the ends 44 thereof being projected into the slots 39. The central portion of this frame is now pressed downwardly to straighten the legs 41 and 42. This movement in effect extends the frame length, causing the lower ends of panels 13 to be spread apart and, in so doing, pivot about the member 34. Thus, the upper ends of the panels 13 are swung inwardly and flanges 18 of the bars 16 project into the cuts 22. This pivoting movement of the side panels 13 continues until the panels are perpendicular to the top 11 and it is considered as being essential that the frame 40, at this point (see Fig. 3), has not quite completed its movement to position the legs 41 and 42 in a common plane. Thus, by further movement of the central portion of the frame to bring said legs into a common plane, the lower ends of panels 13 are forced slightly further apart under tension. The corresponding openings in the legs now register and pins 50 may be projected through these openings to lock this frame against collapse or jack-knifing.

Attention is now more particularly directed to a modification of the invention shown in Figs. 8 to 13 inclusive. An article of furniture of the case or box-like type is shown in Fig. 8 and includes a top 53, rear panel 54, and duplicate end panels 55. Attached to the under face 56 of the top and extending transversely thereof, adjacent the ends, are channels 57. These channels extend at least the full width of the panels 55 and are secured against the under face 56 along their upper flanges in any suitable manner, as by screws 58. The lower flange or side 59 of each of these channels is preferably of less height than the flange secured to the top. Adjacent the rear, the under face 56 of the top 52 is formed with a lengthwise cut which is intended to receive the upper edge of the back panel 54 in a manner identical with the corresponding parts in the previously described modification.

The end panels 55 are each provided, in their outer faces, with grooves 61 which are adjacent the panels' upper edges and intended to receive flanges 59 of channels 57 when the structure is assembled. A number of guides 62 are mounted on the inner faces of the panels, the flanges 63 thereof being projected into suitable cuts in the inner faces of the panels. Here again the mounting of these drawer guides is identical with the corresponding structure previously described. Each panel 55 is provided with a pair of slots 64, located adjacent the front and rear panel edges and directly beneath the intermediate guides 62. A rigid member is intended to extend from one panel to the other directly beneath the intermediate guide 62, this member corresponding to the member 34 of the previously described modification and to the panel-like member 51 shown in Fig. 1.

In the present instance this rigid member may be tubular and of X form, as indicated at 66. The ends of the legs 67 of this member project into the slots 64 in the panels 55. The length of this member is such as to very slightly incline the panels outwardly from top to bottom even when said panels, at their upper ends,

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are secured to the top 53. The purpose of this will be more fully understood from a description of the assembly of the article.

Beneath the lowermost guides 62 is a tensioning structure that consists of a turn buckle 68. The screws 69 of the turn buckle are each formed with curved, end collars 70. A flexible rod 71 is bent at its longitudinal center around the collar 70. The rod thus takes a wish-bone shape. The ends 71 are threaded and project into openings 72 in the panels 55. Cap or finish nuts 73 are projected into the openings 72 from the outer face of the panel and engaged with the threaded ends 71.

In assembling the article described in this modification of the invention, it is first necessary to properly locate and secure channels 57 to the under face of the top 53. The ends of rods 71 are now secured to the panels 55. Following this, the rigid tubular member 66 is assembled with the panels 55. The upper ends of these panels are now inclined inwardly and are within the space between the channels 57. The lower ends of the panels are now drawn toward each other by operation of the turn buckle 68 to cause the channel flanges 59 to enter the slots 61. Continued rotation of the turn buckle draws the lower ends of the panels 55 into parallel relationship and perpendicular to the top 53. A comparison of Figs. 9 and 10 of the drawing suggests this portion of the assembly operation. Of course, during the drawing in of the lower ends of these panels, the panels are pivoted about the ends of the member 66 and the upper ends thereof are thus caused to closely engage the channels 57. It is contemplated that continued rotation of the turn buckle 68 will slightly bow the panels 55 to exert an outward pressure of the upper panel ends against channels 57 and an inward pressure of the central portions of the panels against the rigid member 66. Thus, the panels 55 are held under tension in engagement with the top and in connected tension with each other.

It will be understood from the foregoing that applicant's invention provides mechanical structure for securing together the panels comprising a case or box-like article and that this structure, without the aid of an adhesive applied to tongue and groove parts, or without the aid of dowels or extraneous screws or nails, maintains these parts in rigid interfitting engagement and under a continuing tension. Thus absolute rigidity of the article as a whole is obtained. Also there can be no loosening of the parts of the article due to changes in relative humidity and, furthermore, it is possible, in the event of damage to one of the parts, to easily disassemble the article, remove the damaged part, and reassemble with a new part.

Although applicant has shown and described only two modifications of his invention as applied to an article of furniture of the case or box-like type, it will be understood that there are many other articles of furniture, such as cabinets, lockers, chests, etc., to which the invention may be adapted with modifications of the present structure and such modifications are contemplated as being within the spirit and scope of the invention insofar as they are set out in the annexed claims.

Having thus set forth my invention, what I claim as new and for which I desire protection by Letters Patent is:

1. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, transversely extending bars secured to the under face of said top panel adjacent the ends thereof, the upper ends of said end panels having slots to receive edge portions of said bars, and means connecting the lower ends of said end panels, said means being extensible and retractable to selectively move the lower ends of said end panels, ef-

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fect their pivoting about said brace, and engage the edge portions of said bars with the slots of said end panels under pressure.

2. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, bars secured to the under face of said top panel adjacent the ends thereof, edge portions of said bars projecting into slots formed in said end panels adjacent their top edges, and tensioning means connecting the lower ends of said end panels, said means including parts operable to pivot said end panels about said brace and effect movement of the upper ends thereof in opposite directions and into pressure engagement with the edge portions of said bars.

3. In a case or box-like article having end, top and rear panels, structure for securing all of said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, said top panel and said end panels having suitable grooves for receiving the top and side edges respectively of said rear panel, brackets secured to the under face of said top panel adjacent its ends, edge portions of said brackets projecting into slots formed in the upper ends of said end panels, and means for pivoting said end panels about said brace to effect full engagement of said brackets with the end panel slots and the ends of said rear panel with the grooves of said end panels.

4. In a case or box-like article having end, top and rear panels, structure for securing all of said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, said top panel and said end panels having suitable grooves for receiving the top and side edges respectively of said rear panel, brackets secured to the under face of said top panel adjacent its ends, edge portions of said brackets projecting into slots formed in the upper ends of said end panels, and means connecting the lower ends of said end panels, said means including parts operable to effect slight pivotal movement of said end panels about said brace whereby to cause said rear panel and brackets to be pressure engaged with said end panels under stress of said pivotal movement.

5. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, brackets secured to the under face of said top panels adjacent its ends, edge portions of said brackets projecting into slots formed in the upper ends of said end panels, a transversely jointed member located between the lower ends of said end panels, the outer ends of said member projecting into slots in said end panels when the parts of said member are out of a common plane, the parts of said member being movable into a common plane to extend the ends of said member and pivot said end panels about said brace whereby to effect pressure engagement of said end panels with said brackets.

6. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, brackets secured to the under face of said top panel adjacent its ends, edge portions of said brackets projecting into slots formed in the upper ends of said end panels, a pair of brace elements, means connecting said elements for relative pivotal movement transversely of the direction of their length, the outer ends of said elements projecting into slots in the lower inside faces of said end panels, said elements being relatively movable into a common plane to extend the ends thereof and spread the lower ends of said end panels to create pressure engagement of the upper ends of said end panels with said brackets, and means operable to secure said brace elements in a common plane.

7. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace connecting said end panels substantially midway of their length, brackets secured to the under face of said top panel adjacent the ends thereof, horizontal flanges on said brackets extending toward the ends of said top panel, the upper inner faces of said end panels having slots receiving said flanges, a further brace consisting of a pair of elements in end to end arrangement, means pivotally connecting said elements along their meeting ends, the inner faces of said end panels having slots located adjacent their lower ends and receiving the outer ends of said elements when said elements are in partially jack-knifed relationship, said elements being relatively pivotal into a common plane to increase the length of said further brace and spread the lower ends of said end panels whereby to effect pressure engagement of the upper ends of said end panels with said brackets.

8. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising a rigid brace extending between said end panels substantially midway of their length, means anchoring the ends of said brace to said end panels, brackets secured to the under face of said top panel adjacent its ends, edge portions of said brackets projecting into slots formed in the upper ends of said end panels, a further brace consisting of a pair of elements in end to end relationship, means connecting said elements at their meeting ends, said means enabling relative movement of said elements to extend or reduce the length of said further brace, the remote ends of said elements being engaged with the lower ends of said end panels.

9. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising brackets secured to the under face of said top panel adjacent the ends thereof, said brackets

projecting into slots formed in the upper ends of said end panels, means engaged with said end panels intermediate their length and serving as a rigid brace at such intermediate place of engagement, and a multiple part member located between the lower ends of said end panels and connected therewith, the parts of said member being relatively adjustable to change the over-all length of said member whereby to slightly pivot said end panels about said bracing means and cause pressure engagement of said end panels with said brackets.

10. In a case or box-like article having top and end panels, structure for securing said panels in assembled relation comprising means providing substantially full width interengagement of the upper ends of said end panels with the end portions of said top panel, a rigid brace connecting said end panels substantially midway of their length, a multiple part member located between the lower ends of said end panels and connected therewith, the parts of said member being relatively adjustable to change the over-all length of said member whereby to slightly pivot said end panels about said brace and effect complete interfitting of said means and provide relative rigidity as between said end and top panels.

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