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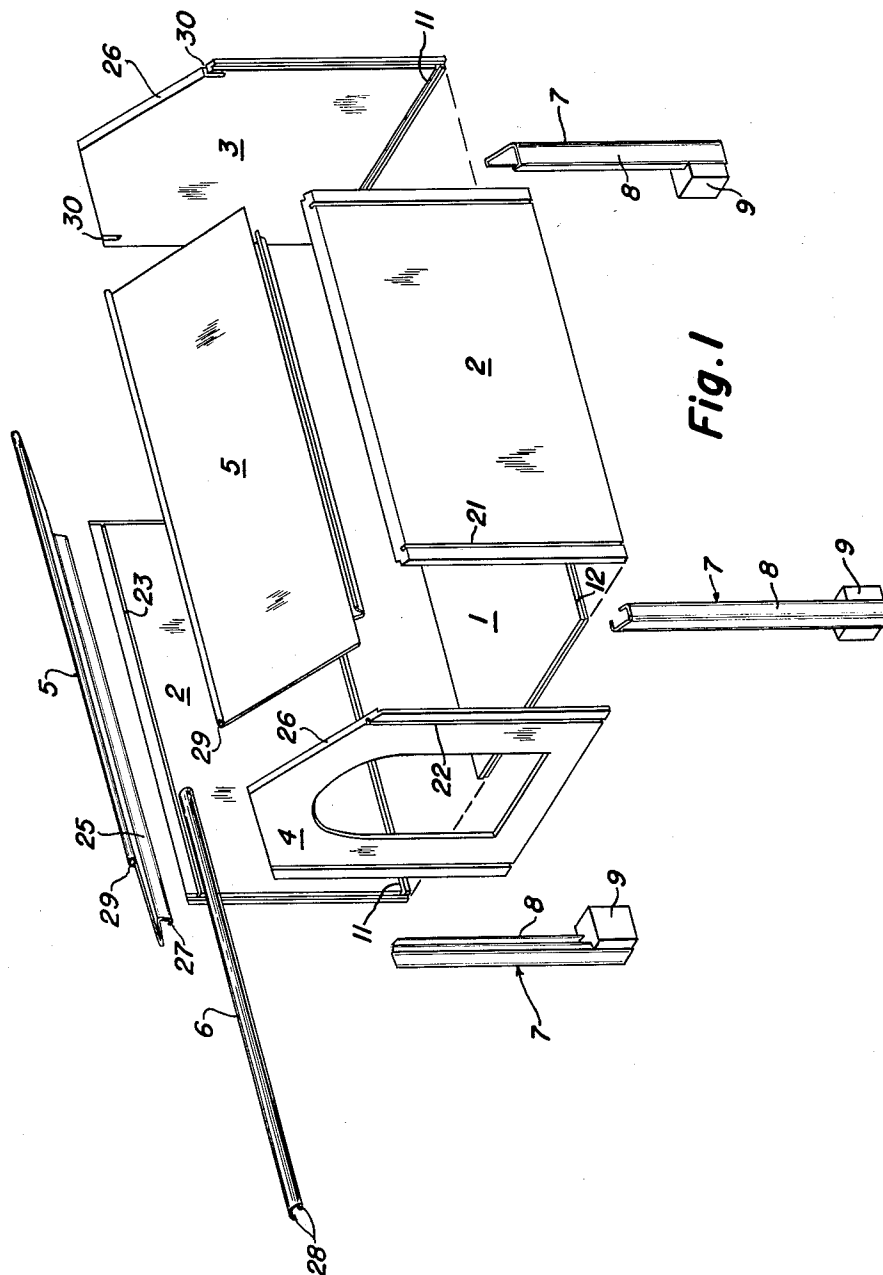
R. H. STAMBAUGH ET AL

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PREFABRICATED KNOCK-DOWN BUILDING STRUCTURE

Filed Dec. 16, 1958

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Feb. 13, 1962

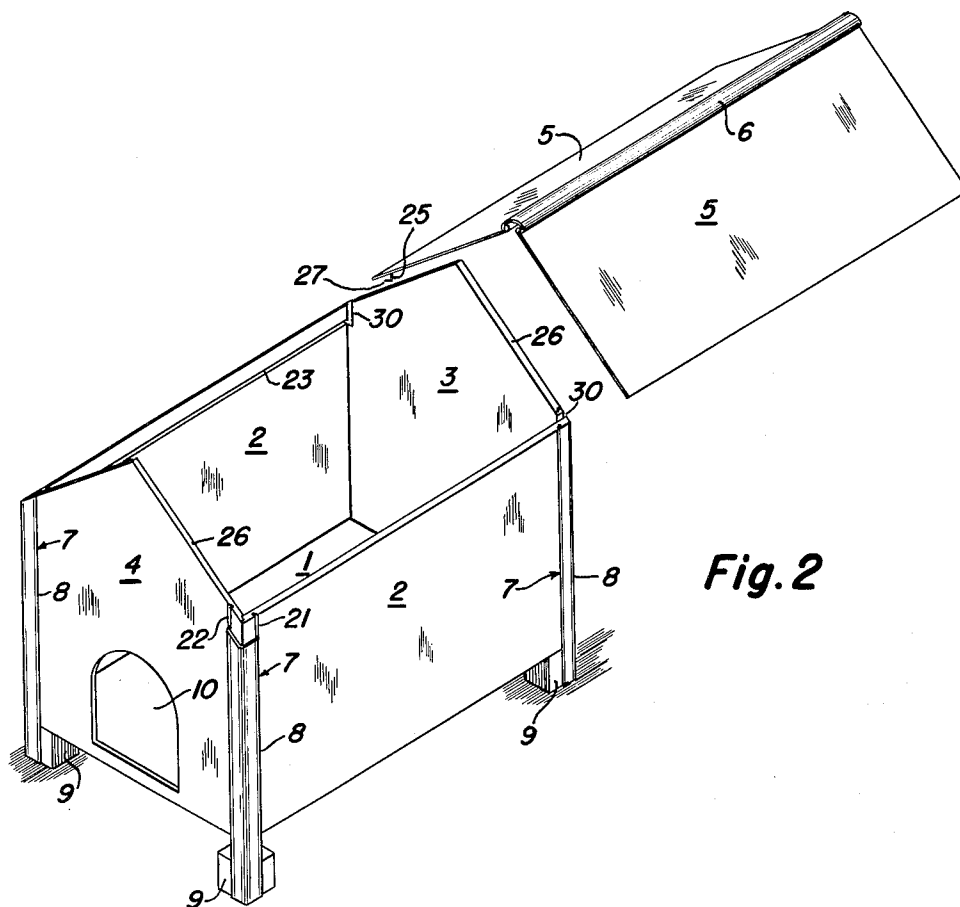
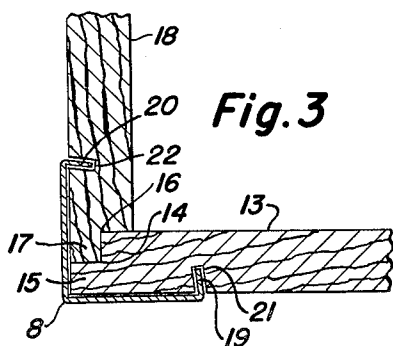
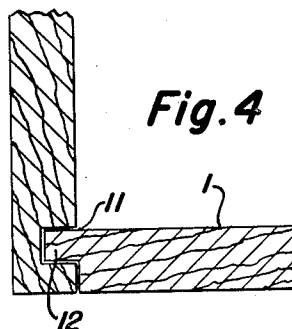
R. H. STAMBAUGH ET AL

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PREFABRICATED KNOCK-DOWN BUILDING STRUCTURE

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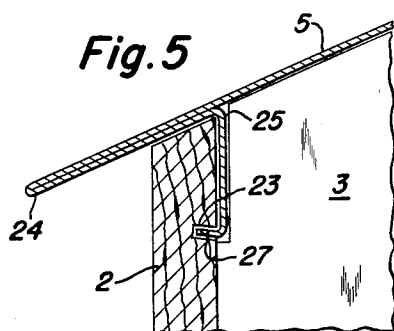
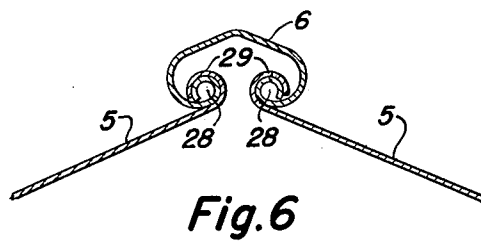
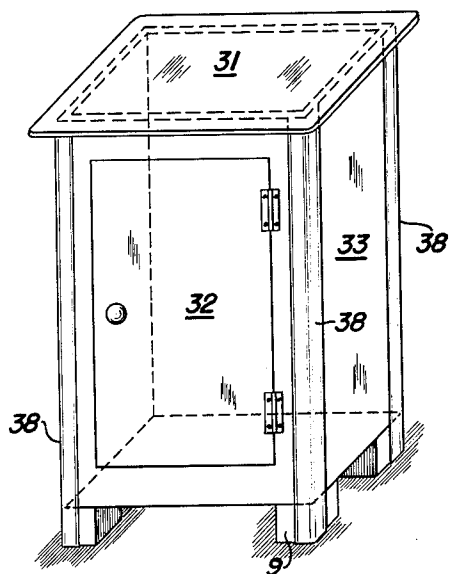
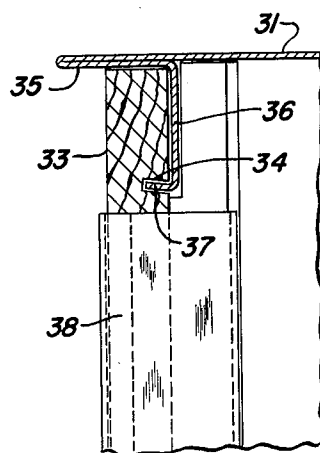
R. H. STAMBAUGH ET AL

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PREFABRICATED KNOCK-DOWN BUILDING STRUCTURE

Filed Dec. 16, 1958

3 Sheets-Sheet 3



1

3,020,601

PREFABRICATED KNOCK-DOWN BUILDING STRUCTURE

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1 Claim. (Cl. 20—2)

The present invention relates to small knock-down pre-fabricated building structures which may be used for a variety of purposes such as a dog house, a child's play house, a utility cabinet, a toy box or as a shipping or carrying case for pets such as dogs, cats, etc.

Broadly, it is an object of the present invention to provide a prefabricated structure which is light in weight, easy to assemble, requires no nails, bolts, screws, or tools for assembly and is easily dismantled for storage or transport and provides protection against the elements.

Essentially, the structure of the present invention consists of four vertically extending panels and a bottom panel which may be made of plywood or any other suitable panel material, a roof of metal or other suitable material and four corner members which serve to lock the entire assembly together into a useful building structure. The corner members are made of resilient angle members preferably of metal and are preferably provided with feet which serve to support the structure upon a supporting surface and to serve as stop members to limit movement of the corner members as they are moved into locking engagement with the other parts of the structure.

According to the present invention the vertical panels are formed with vertically extending mating tongue and groove joints at their lateral edges to hold them in proper alignment, with interior horizontal grooves adjacent their lower edges to interfit with the peripheral edge of the bottom panel or with tongues formed thereon, to support the bottom panel. The vertical panels are also formed with exterior vertical slits adjacent each of their vertical edges cut at an acute angle inclined toward their edges for a purpose which will presently appear.

According to the invention, the corner members are right angled and made of resilient metal or other suitable material with flanges turned inwardly at an acute angle from the vertical edges of the legs of the members to interfit with the vertical slits formed in the vertical panels. The inwardly turned flanges are spaced apart a distance relative to the distance between the adjacent vertical slits in the vertical panels that they will exert a resilient clamping action on the corners of the vertical panels when in assembled relationship therewith.

Feet are preferably secured to the inside of the bottom ends of the corner members to support the structure on a supporting surface with the bottom panel spaced above the supporting surface. These feet also act as stops to limit the movement of the corner members into their locking position.

According to the invention, two of the vertically extending panels, which may be termed the side panels, are formed with horizontally extending slits adjacent their interior vertical edges. These slits are cut at an acute angle inclining toward the upper edges of the panels so as to cooperate with similarly inclined flanges on the roof of the structure as will presently appear.

According to one modification of the invention, two opposed vertically extending panels, which may be termed end panels, are provided with gables and the structure is provided a slanting roof. In this modification the roof is made up of two panels preferably of sheet metal. At the eaves the metal of the roof panel is bent backwardly upon itself, then downwardly at the inside of the side panels

2

and ends in backwardly turned flanges bent at an acute angle inclining upwardly which cooperates with the slits in the side panels to hold the lower edges of the roof panels in position. At the crown the roof panels are formed with external beads which cooperate with the intumed edges of an inverted V-shaped crown member which holds the crowns of the roof panels in assembled position as well as provides a leak proof crown for the roof.

According to the above described modification of the invention, an opening may be provided in one of the end panels for the ingress and exit of the dog as is usual in dog houses or a hinged door may be provided in which case the structure may be used as a transport case for pets such as dogs, cats, etc.

According to a second form of the present invention the roof may consist of a single flat roof panel preferably of sheet metal. In this modification the end vertical panels are not provided with gables but have their upper edges square and even with the side panels. Again the interior of the side panels are provided with slits adjacent their upper edges cut at an acute angle inclined toward their upper edges. In this modification each edge of the roof panel is bent downwardly back upon itself, then downwardly at the inner sides of the side panels and formed with backwardly extending flanges which incline upwardly at an acute angle to interfit with the slits formed in the side panels.

The structure of the present invention is assembled as follows: the four vertical panels are interfitted with each other and with the bottom panel with the horizontal tongue and groove joints of the vertical and bottom panels interlocked and with the vertical tongue and groove joints of the vertical panels interlocked. The four corner members are then slid upwardly from the bottom with the flanges of the angle members sliding in the vertical slits in the vertical panels until the feet are at a slight distance below the bottom panel.

In the case of the first described modification the two roof panels are then slid horizontally over the gables of the end panels with the flanges of the roof panels interfitting with the interior slits formed in the side panels. The V-shaped crown member is then slid horizontally into place to hold the crowns of the two roof panels in place against the gabled upper ends of the end panels, care being taken at the roof panels are endwise centrally positioned over the structure. The four corner members are then slid upwardly to their final position with their upper ends extending across the ends of the flanges of the roof panels, it being noted that the feet will automatically stop the corner members in their correct position to hold the roof panels from being slid outwardly.

In the case of the second described modification, the single roof panel is slid lengthwise onto the structure with the flanges of the roof panel engaging in the interior slits formed in the interior upper edges formed in the side panels.

The resilient action of the corner members will hold the vertical panels in interlocking engagement with the bottom panel and will hold their vertical edges in interlocked engagement with each other. The acute angles of the flanges of the corner members and of the vertical slits in the edges of the vertical panels will prevent outward movement of the corner members relative to the side panels. The upper ends of the corner members will prevent sliding movement of the roof relative to the side panels. The acute angled flanges and slits between the roof and the side panels will prevent their separation in case of an upward pressure on the eaves.

The structure of the present invention may be made in various sizes and shapes to suit the particular purpose

3

for which it is intended, but is essentially a small structure capable of being transported from place to place, the preferred embodiment being a dog house.

Other objects and advantages of the present invention will become apparent as the description proceeds when taken in connection with the accompanying drawings in which:

FIG. 1 is an exploded view of one modification of the structure according to the invention,

FIG. 2 is a perspective view of the modification of FIG. 1 in partially assembled condition,

FIG. 3 is a cross sectional view taken through a corner of the structure of the present invention showing the interlocked joint between a corner member and the vertical panels according to the invention,

FIGURE 4 is a cross-sectional view showing the tongue and groove connection between the bottom panel and the side panels according to the invention,

FIG. 5 is a cross-sectional view of the joint between the roof panels and the side panels of the structure of FIG. 1,

FIG. 6 is a cross-sectional view of the joint between the crown member and the roof panels according to the modification of FIG. 1,

FIG. 7 is a perspective view of a second modification of the invention, and

FIG. 8 is a cross-sectional view of the joint between the roof panel and side panels according to the modification of FIG. 7, and showing the final assembly stage.

Construction of FIGS. 1-6

A preferred form of the invention is shown by FIGS. 1-6 inclusive.

Essentially the modification of FIGS. 1-6 includes only twelve parts, a bottom panel 1, four vertical panels including two duplicate side panels 2, a rear panel 3, a front panel 4, a pair of duplicate roof panels 5, a crown member 6 and four corner members 7. Each corner member 7 includes a clamping member 8 and a foot 9. The front panel may be provided with an access opening 10 suitable for use by a dog or other pet or it may be provided with a closable opening if desired.

The tongue and groove joint between the bottom panel 1 and each of the vertical panels is shown in FIG. 4. As shown the vertical panels are each provided with a groove 11 and the bottom panel with a tongue 12 which extends entirely about its periphery. Any other type of interlocking joint may be used, provided the bottom panel 1 is thereby supported by the side panels. The bottom panel 1 and the vertical panels may conveniently be made of plywood or any other material capable of being formed into panels of the type shown and which are weather-proof.

The joint between the vertical panels themselves and between them and the clamping members 8 is shown by FIG. 3. The vertical panels are formed with interlocking joints. For ease in assembly the joints are formed as shown. One panel 13 is formed with a right angled recess 14 forming a tongue 15 which interfits with a corresponding recess 16 and tongue 17 of panel 18. The clamping member 8 is preferably made of a resilient metal such as galvanized iron and is of right angled formation in section. The edges of the legs of member 8 are bent inwardly to form flanges 19 and 20 which extend inwardly toward the inner corner of the member at an acute angle as shown and the panel members 13 and 18 are formed with slits 21 and 22 cut at an acute angle inclined toward the edges of the panels.

The joint between the roof panels 5 and the side panels 2 is shown by FIG. 5. The inner upper edges of the side panels 2 are formed with horizontal slits 23 which are cut on an acute angle inclined toward the upper edges of panels 2. The roof panels 5 are turned inwardly and backwardly at 24 and then downwardly at 25 at the inner upper edges of the panels 2 which are inclined as shown

4

to correspond to the angle of the gables 26 of the panels 3 and 4. The downturned portions 25 of the panels are turned outwardly at an acute angle to the vertical to form flanges 27 which interfit with slits 23.

The joint between the crown member 6 and the panels 5 is shown by FIG. 6. The crown edges of the panels 5 are rolled upwardly to form beads 29. As shown the crown member 6 is of inverted V shape and is provided with inturned edges 28 which interfit with beads 29 to hold the crown edges of the roof panels 5 against the gables 26. The crown member 6 is preferably made of resilient metal to exert an inward clamping action on the panels 5 and also serves to seal the joint between the panels 5 against the elements.

It is to be noted from FIG. 2 that the downturned portions 25 of panels 5 stop short of the ends of those panels and that the panel 3 is slit at 30 so that the panels 5 may be slid endwise over the structure with the flanges 27 fitting in the horizontal slits 23.

Assembly of FIGS. 1-6 inclusive

The tongues 12 of the bottom panel 1 are first inter-fitted with the grooves 11 in one of the side panels 2 and either of the end panels 3 or 4, for example the front corner as it appears in FIG. 2. The corner member 7 at that corner is then slid upwardly with the flanges 19 and 20 interfitting with the slits 21 and 22 in the vertical panels. The corner member is not slid to its final upper position but only to the position shown at the front corner of FIG. 2.

The same procedure is then followed for the other three corners.

The roof may then be preassembled as shown by FIG. 2 or each panel 5 may be separately assembled to the frame shown in FIG. 2. The latter procedure is preferable.

One of the panels 5 is slid onto the structure of FIG. 2 with the flange 27 sliding in the slit 23, with the downturned portion 25 sliding through slit 30 in the end panel 3 and with the panel itself sliding across the gables 26. When the ends of the downturned portions 25 and of the flanges 27 are even with the outer sides of panels 3 and 4, the sliding movement of panel 5 is stopped.

The other panel 5 may then be slid on in a similar manner after which the crown member 6 is slid lengthwise over the crowns of panels 5 with the edges 28 of the crown member 6 interfitting with the beads 29 of the panels 5. The crown member 6 is of resilient material and the edges 28 are so spaced that the panels 5 will be held firmly against the gables 26 and a weatherproof joint will be formed at the crown of the structure.

After the roof is assembled as just described the corner members 7 are all moved upwardly as far as permitted by the feet 9 engaging the bottom panel 1. That will bring the upper ends of clamping members 8 across the ends of the flanges 27 and downturned portions 25 of the roof panels 5 and hold those panels against endwise movement and thus lock the entire structure together.

The clamping members 8 are of resilient metal, preferably galvanized iron, and the flanges 19 and 20 are so spaced that they engage slits 21 and 22 with a resilient clamping action to hold the vertical panels tightly inter-fitted with each other and with the bottom panel 1.

Construction of FIGS. 7 and 8

FIG. 7 shows another preferred form of the invention in the form of a utility cabinet having a single top panel 31 and a hinged front door 32. The vertical panels, the bottom panel and the corner members are shown of different shape and size but the joints between those panels and the corner members are the same as in the first modification. The joint between the vertical and bottom panels is the same as shown by FIG. 4 and the joint between the vertical panels and the corner members are the same as shown by FIG. 3.

The gables of the front and rear panels have been

5

omitted and the tops of those panels are square and even with the tops of the side panels.

The joint between the roof panel 31 and one of the side panels 33 is shown by FIG. 8. The side panels 33 are provided with horizontal slits 34 inclined at an acute angle toward the upper edge of the panels 33.

The roof panel 31 is bent downward and under at 35 and then downwardly at 36 on the inside of panels 33. A flange 37 is bent outwardly and upwardly at an acute angle from the bottom edge of the downwardly extending portions 36 to interfit with the slits 34 in the side panels 33.

One of the corner members 38 is shown in FIG. 8 just prior to its final locking movement, it being noted that the downwardly extending portions 36 of the roof panel 31 stop just at the edge of the side panels 33 so that when the corner members 38 are slid upwardly to their final position the roof panel is locked in position.

Assembly of FIGS. 7 and 8

The assembly of this modification is substantially the same as that of the modification of FIGS. 1-6 except for the assembly of the roof.

The vertical side and end panels, the bottom panel and the corner members are assembled as in the first modification until the corner members 38 reach the position shown by FIG. 8.

The roof panel 31 is then slid over the structure with the flanges 37 sliding in slits 34 in the side panels 33 until the ends of the flanges 37 and downwardly bent portions 36 are even with the outer surfaces of the end panels, after which the corner members 38 are moved to their uppermost position which locks the entire structure together.

The modification of FIGS. 7 and 8 may be used as a utility cabinet, a playhouse for children or as a carrying receptacle for pets such as dogs, etc.

According to both modifications the structure is easily disassembled for storage, shipment or transport and just as easily reassembled to serve its ultimate purpose.

While we have shown and described but two modifications of our invention it is to be understood that those modifications are to be taken as illustrative only and not in a limiting sense. We do not wish to be limited to the particular structure shown and described but wish to include all variations thereof except as limited by the scope of the claim.

We claim:

A six sided structure including four sides, a bottom panel and a top closure comprising two vertically extending side panels and two vertically extending end panels, the vertical interior edges of each of said vertically extending panels being formed with a right angled tongue and groove joint constructed to prevent inward movement

6

of said panels when assembled in rectangular form, a groove formed in the interior surface above the bottom edge of each of said vertically extending panels, said bottom panel having a tongue formed on each of its four edges which extends into said grooves to prevent downward movement of said bottom panel, a vertically extending slit formed in the outer surface of each of said vertically extending panels adjacent to each edge thereof, each slit being inclined toward the edge of the panels, four corner members of generally right angled formation formed with inwardly extending flanges slanted to slidably interfit with said vertically extending slits and lock said vertically extending panels in place, horizontally extending slits formed in the interior surface of said side panels below their top edges, the side edges of said top closure having downward extensions along the inner walls of said side panels, flanges extending outwardly from the downturned extensions and slidably engaging said horizontally extending slits, vertically extending slits formed in the top edge of one of said end panels in line with said downward extensions so that said top closure may be slidably assembled with said downward extensions sliding through said vertically extending slits in the top edge of said one end panel and said outwardly extending flanges on said extensions being slidably received in said horizontally extending slits on the interior of said side panels, said corner members being slidable upwardly across said vertically extending slits in the top edge of said one end panel to prevent removal of said top closure and to thus lock the entire structure in assembled relationship.

References Cited in the file of this patent

UNITED STATES PATENTS

79,522	Vaux	June 30, 1868
101,172	Smith	Mar. 22, 1870
261,919	Gibbons	Aug. 1, 1882
305,584	Forrest	Sept. 23, 1884
359,344	Burt	Mar. 15, 1887
756,338	Doten	Apr. 5, 1904
1,155,206	Brock et al.	Sept. 28, 1915
1,159,229	Keith	Nov. 2, 1915
1,354,753	Howard	Oct. 5, 1920
1,703,149	Joughins et al.	Feb. 26, 1929
1,716,238	Nichols et al.	June 4, 1929
2,339,220	Crowley	Jan. 11, 1944
2,445,055	Capaul	July 13, 1948
2,809,404	Hinds	Oct. 15, 1957
2,951,312	Engh	Sept. 6, 1960

FOREIGN PATENTS

13,246	Switzerland	Dec. 3, 1896
14,017	Great Britain	May 6, 1899