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3,335,535

CABLE RETAINING ASSEMBLY

Filed Oct. 31, 1966

2 Sheets-Sheet 1

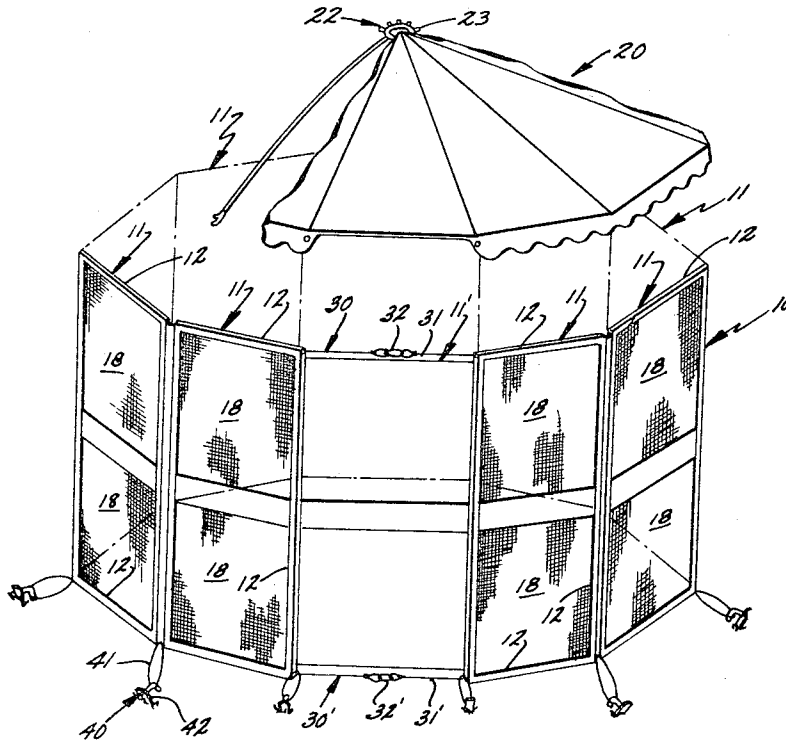


FIG. 1.

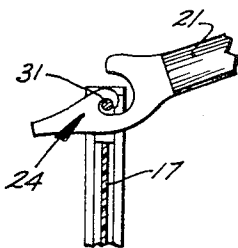


FIG. 2.

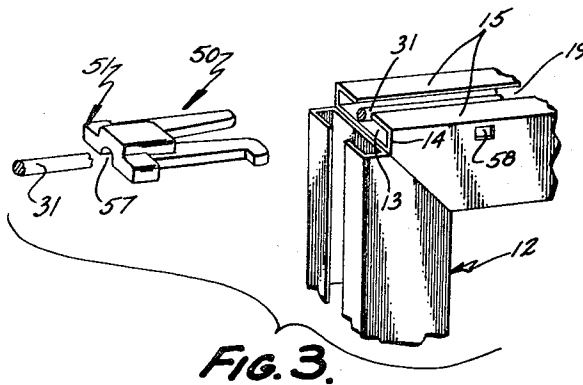


FIG. 3.

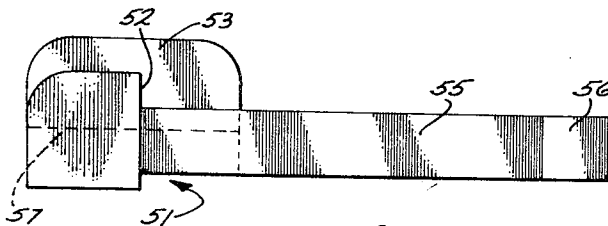


FIG. 6.

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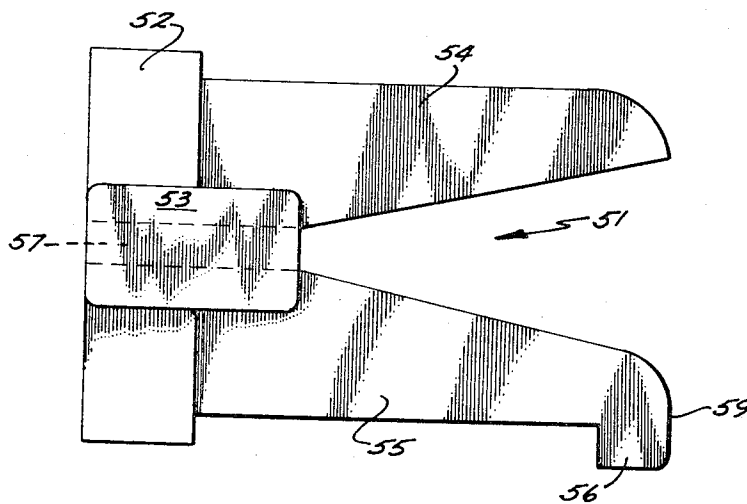
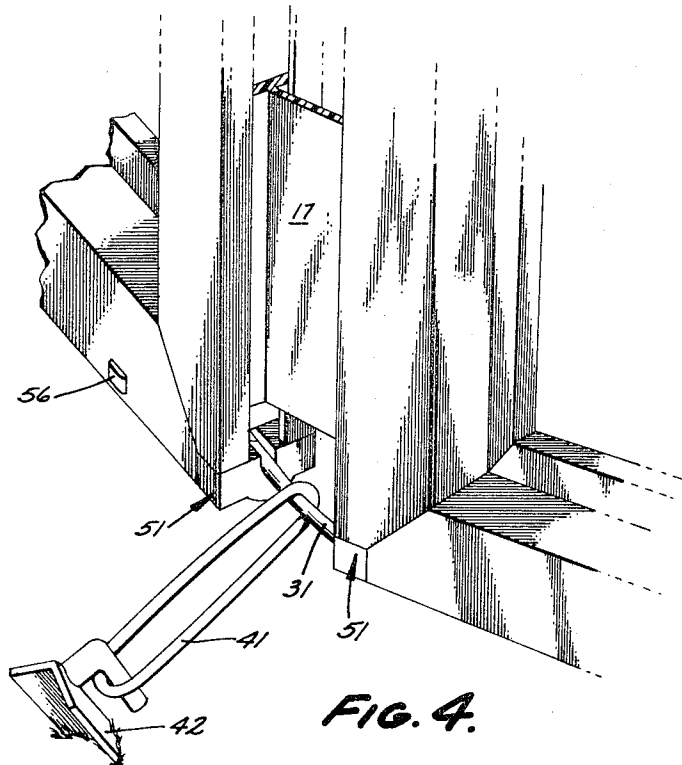
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2 Sheets-Sheet 2



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CABLE RETAINING ASSEMBLY

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10 Claims. (Cl. 52-204)

This invention relates to portable structures having a plurality of hingedly connected panel members and a roof and, more particularly, to a novel means for insuring the vertical stability of such structures both intraststructurally and with respect to the surface upon which they are resting.

Portable enclosures of the types shown generally in United States Patents Nos. 3,118,186 and 3,134,200 have become increasingly popular in recent years. Basically, these enclosures comprise a plurality of wall panels hingedly affixed together and adapted to be stood on end and closed upon one another to form a polygonal wall enclosure. The wall panels are staked or otherwise affixed to the surface upon which the enclosure is resting as a means of preventing sideways movement or overturning during high winds. Generally, the wall enclosure is covered by means of a dome-shaped roof comprising a plurality of bowed supports running from a central hub and affixed to the upper edges of the panels. A suitable covering is placed over these supports.

Generally, structural stability for the enclosure is provided by means of a pair of flexible cables encircling the wall enclosure at the bottom and top thereof. These cables usually conform to the polygonal configuration of the wall enclosure and, therefore, suitable guide means must be furnished at each of the hinged joints. In addition to maintaining the wall panels in the prescribed polygonal configuration, the cables furnish a convenient means whereto the roof compression-bowed tubes or struts may be affixed and, additionally, the lower cable may be utilized as a convenient tie-down point to secure the enclosure to the surface. Thus, the cables function not only in the lateral structural sense, but also in the vertical structural sense since, without them, the roof would be free to blow away and/or the enclosure would be free to separate from the surface upon which it was resting.

While portable structures of the type described have enjoyed commercial acceptance far above that enjoyed by previously available portable enclosures, they have been extremely susceptible to vertical separation under the influence of excessive winds. More particular, up to this time no satisfactory means have been available for attaching the upper and lower panel cables to the panels which were not subject to separation under wind conditions far less than dangerous in the ordinary sense. This drawback has been promulgated by the desirability of designing the panels and cable keeper assemblies in such a manner that they can be assembled and disassembled with relative ease and such that the components therefor may be fabricated at a minimal expense.

It is an object of this invention to provide a portable structure of the type described which is not subject to the disadvantages outlined above.

More particularly, it is an object of this invention to provide a portable structure having a plurality of hingedly connected panels and a roof wherein the panel enclosure may be affixed to the ground and the roof to the upper edge of the panels with sufficient structural rigidity to prevent vertical separation of the components during abnormal wind conditions.

It is an object of this invention to provide a device of the type described wherein component assembly and disassembly may be executed with relative ease.

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It is an object of this invention to provide such a device wherein the components may be fabricated at a relatively low cost and, yet, will provide years of satisfactory service.

It is yet another object of this invention to provide an enclosure of the type described wherein vertical stability may be achieved without the necessity of elaborate structural revisions of currently available manufacturing techniques and, thus, which is subject to implementation with relative ease.

These, as well as other objects of this invention, will be readily understood by those skilled in the art with reference to the following specification and accompanying figures in which:

FIG. 1 is a fragmentary, perspective view of the portable structure embodying the teachings of this invention;

FIG. 2 is a fragmentary, side-elevational view, partially in cross section, illustrating the manner in which the roof supports are affixed to the panels;

FIG. 3 is a fragmentary, exploded perspective view of the cable retaining clip and its associated panel;

FIG. 4 is a fragmentary, perspective view, partially in cross section, of the bottom section of a panel joint illustrating the manner in which it may be staked to the surface;

FIG. 5 is a plan view of the retaining clip; and

FIG. 6 is a side-elevational view of the retaining clip.

Briefly, the portable structure comprises a plurality of rigid panel members hingedly affixed to one another in side-by-side relationship and adapted to be positioned on a surface and closed to form a generally polygonal enclosure. Upper and lower flexible cable members are provided along the upper and lower edges of the polygonal structure at the panel joints. The upper cable members are utilized as a means whereby the roof members may be affixed to the panels and the lower flexible cable means are utilized to affix the enclosure to the surface by any conventional means such as stakes. The flexible members function additionally, of course, to maintain the closed, polygonal relationship of the panels.

Each of the panels is provided with a channelure recess at opposite upper and lower corners thereof and, preferably, this recess extends around the entire periphery of the panel being broken only at the corners thereof. In accordance with the teachings of this invention, the means for affixing the flexible cables to the upper and lower edges of the panel enclosure comprise a retaining clip adapted to slide into each of the channelure recesses. The clip is provided with a nipple portion adapted to mate with and resiliently protrude into a suitable aperture or detent in one of the walls of the channelure recess and, additionally, has means associated therewith for engaging the cable between the panel and the clip in slidable fashion. Preferably, the recess is provided with converging boundaries along its open surface and additional vertical stability is provided by having portions of the clip underlie these converging boundaries.

Referring now to the figures, a preferred embodiment of this invention will be described in detail. FIG. 1 illustrates a portable enclosure having a wall assembly 10 comprising a plurality of rigid panels 11. Each of the panels 11 has a channelure periphery 12 (see FIG. 3) comprising a base 13, walls 14 and converging closure sections 15. The channel so formed preferably extends about the entire periphery of the individual panel as illustrated but, as will become apparent, the practice of this invention requires only a relative short channelure recess at each panel corner. The term "channelure recess" as utilized in this specification is meant to include any type of structure having a cross-section adapted to receive a plug or retaining clip of the general type to be described and may, for example, include a closed tube.

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The channelure periphery 12 of each of the panels is broken, preferably, at each of the corners in the manner indicated in FIG. 3 to permit insertion of a hinge member 17 (see FIG. 4) having a dumbbell or I-beam shaped cross-section. Preferably, the flexible hinge member 17 runs the entire height of the panels to provide weather protection as well as a flexible joint whereby the panels may be rotated at different angles with respect to one another. Conveniently, panels 11 may incorporate a plurality of differing insert sections 18 which may be of the self-storing type and, thus, which may be changed to accommodate varying weather conditions. One of the panels, such as that indicated by the reference numeral 11', may be hingedly affixed to only one of the adjacent panels so as to provide an access into and out of the enclosure.

The roof assembly 20, as shown in FIGS. 1 and 2, comprises a plurality of flexible tube members 21 and a central hub 22 having a plurality of radially protruding nipples 23. The tubes 21 are bowed by compression during assembly of the enclosure as described more fully in the previously noted patents. The hub 22 functions to position and retain the central extremities of the tubes 21 by insertion of the protruding nipples 23 therein and assumes, of course, a generally horizontal position after complete installation. The panel abutting tube extremities are retained by means of hook sections 24 which engage the upper flexible cable 31 in the manner indicated in FIG. 2.

The upper cable assembly 30 and the lower cable assembly 30' each comprise a flexible cable 31 and 31' which may be merely a piece of heavy, flexible wire. The cable assemblies are slidably affixed to the panels at each corner thereof in a manner to be described hereinafter and are secured together by means of conventional snaps, 32 and 32' respectively. Of course, snap hooks 32 and 32' may be replaced by means of turn buckles or the like, should this be necessitated by the assembly characteristics of the particular enclosure.

It is necessary, of course, that some means be provided to secure the enclosure to the surface upon which it is resting. Since enclosures of this type are generally assembled directly upon the ground, the means illustrated comprise a series of stake assemblies 40, one such assembly being provided for each panel junction. The stake assemblies 40 comprise a flexible loop 41 (see FIG. 4) passing directly around the lower flexible cable 31' and being secured to the ground by means of a conventional stake 42.

The portable enclosure described thus far is conventional in the art. Referring now to FIGS. 3 through 6, the novel cable retaining assembly 50 which is the subject of this invention will be described. The retaining assembly 50 comprises a snap clip 51 having a shoulder section 52, a reinforcing section 53, a spring leg 54 and an engaging leg 55. Engaging leg 55, as shown best in FIGS. 3 and 5, has a shouldered nipple 56 extending outwardly therefrom. The snap clip 51 is fabricated, preferably, from a plastic material having resilient qualities and, yet, being sufficiently rigid to prevent undesirable separation from the panel. A material such as nylon or Delrin, for example, has been found suitable.

The retaining clip 51 is provided with a routed cable track 57 in the panel abutting surface thereof. The clip slides into the horizontal section of the upper or lower portion of the channelure periphery 12 adjacent a particular panel joint. Prior to the time that the clip 51 is inserted, the cable 31 is placed through the slot 19 and is secured between track 57 and base 13 of the channel subsequent to clip insertion.

The legs 54 and 55 of the clip are sized such as to be resiliently depressed together as the insertion process is begun. The leading extremities of legs 54 and 55 cause the legs to be compressed under the influence of a turning and pushing motion. As the clip slides into the chan-

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nelure recess over the cable 31, and the shoulder 52 abuts the outer boundary thereof, nipple 56 springs into aperture or detent 58 provided in the side wall of the recess. The protrusion of nipple 56 into aperture 58 secures the clip in its inserted position and the bearing of legs 54 and 55 against converging sections 15 of the recess insure that the clip, and the wire which it retains, will not pull away from the associated panel.

The retaining clips 51 are placed at each of the lower corners of each of the panels, as indicated in FIG. 4, to retain the lower cable assembly 30'. Similarly, a retaining clip 51 is placed at each of the upper corners of each panel to retain the upper cable assembly 30. The loops 41 for the stakes may be affixed to the structure by merely passing the cable 31' therethrough during the assembly process.

After the structure has been assembled and a tendency occurs for either the roof structure 20 to separate vertically from the side fall structure 10 or the side wall structure 10 to separate from the ground, the bearing of the surfaces of legs 54 and 55 against the converging sections 15 of the channelure recesses positively prevents such vertical separation and, thus, retains the entire structure in its assembled configuration. Similar results might also be obtained by inserting the clip vertically and hooking it, for example, on both sides of the channelure recess although the illustrated scheme is preferable. In the alternative case, of course, it would be necessary to provide a different type of cable guide within the clip.

As noted previously, the resilient nature of legs 54 and 55 positively retain the shoulder 52 in abutment with the edge of the channelure recess and, thus, insure that the clip will not pull horizontally free from the recess during utilization and transport of the structure. Should, for any reason, it be desirable to remove the retaining clips 51 to free the cables 30 and 30', it is necessary only to depress the portion of nipple 56 protruding through aperture 58 with a screwdriver or the like and the clip may then be withdrawn with relative ease.

While a preferred embodiment of this invention has been illustrated in detail, it will be readily apparent to those skilled in the art that many other embodiments may be conceived and fabricated without departing from the spirit of this specification and the accompanying drawings. Such other embodiments are to be deemed as included within the following claims unless these claims, by their language, expressly state otherwise.

I claim:

1. In a portable structure having a plurality of rigid panel members, a door and a roof, said panel members and said door being hingedly affixed to one another in side-by-side relationship and positioned on a surface to form a generally polygonal enclosure, each of said panel members having a channelure recess in at least one of the upper or lower portions thereof; a flexible means; means affixing said flexible means to said panel members, said flexible means adapted to furnish a vertical support for maintaining the vertical stability of said structure; the improvement in said means affixing said flexible member to said panels comprising: an aperture in one wall of said channelure recess; a resilient clip adapted to slide into said channelure recess, said clip having a nipple portion adapted to mate with and resiliently protrude into said aperture when said clip has been slid into said channelure recess; and means associated with said clip engaging said flexible means and retaining it in fixed, vertical relationship with respect to said panel.

2. The structure as set forth in claim 1 wherein said channelure recess is horizontally positioned on the edge of said panel, and has a base, two side walls, and a pair of converging sections extending from said side walls, said clip being adapted to slide between said base and said converging sections and be vertically retained therebetween.

3. The structure as set forth in claim 2 wherein said

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engaging means comprises a groove in the surface of said clip abutting said base adapted to receive said flexible member.

4. The apparatus as set forth in claim 3 wherein at least two of said flexible means are provided, one at the upper surface of said enclosure and the other at the lower surface of said enclosure, one of said affixing means being provided at each corner of each of said panels, said lower flexible means being vertically retained by the affixing means on the lower corners of said panels and said upper flexible means being retained by the affixing means on the upper corners of said panels.

5. The apparatus as set forth in claim 4 wherein said lower flexible member is affixed to the surface upon which said structure is resting and wherein said upper flexible member retains said roof above said polygonal enclosure.

6. The apparatus as set forth in claim 3 wherein said clip comprises a pair of resilient legs, one of said legs being adapted to slide between one of said converging sections and said base and the other of said legs adapted to slide between said other converging section and said base, said legs being compressed by said side walls.

7. In a portable structure having a plurality of rigid panel members and a door hingedly affixed to one another in side-by-side relationship and adapted to be positioned on a surface to form a generally polygonal enclosure, each of said panel members having a horizontal channelure recess on one horizontal edge thereof, said recess having a base, two side walls and converging sections extending from said side walls; a flexible means; means affixing said flexible means to said panel members, said flexible means adapted to furnish a vertical support

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for maintaining the vertical stability of said structure; the improvement in said affixing means comprising: a clip adapted to slide into said channelure recess, said clip being adapted to slide between said base and said converging sections and be vertically retained thereby; and, means associated with said clip engaging said flexible member.

8. The apparatus as set forth in claim 7 wherein one of said side walls has a detent therein and wherein said clip has a nipple portion adapted to engage said detent when said clip has been slid into said recess, whereby said clip is retained in its inserted position.

9. The apparatus as set forth in claim 8 wherein said clip comprises a pair of resilient legs, one of said legs being adapted to slide between one of said converging sections and said base and the other of said legs adapted to slide between said other converging section and said base, said legs being compressed by said side walls.

10. The apparatus as set forth in claim 9 wherein said engaging means comprises a groove in the surface of said clip abutting said base to slidably receive said flexible member and wherein said clip further comprises: a shoulder portion adapted to abut the outer edges of said channelure recess when said clip is inserted therein and said nipple portions has sprung into said detent; and, a reinforcing portion of greater thickness than said legs overlying said groove.

References Cited

UNITED STATES PATENTS

3,118,186 1/1964 Moss ----- 52-71

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