

[54] **HOUSING WITH CABLE SUSPENDED PANELS**

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[52] U.S. Cl. **135/4 R**

[51] Int. Cl. **A45f 1/16**

[58] Field of Search 135/1, 3, 4; 52/63, 80, 83, 52/86, 81

[56] **References Cited**

UNITED STATES PATENTS

3,215,153	11/1965	Huddle	135/1 R
3,060,949	10/1962	Moss	135/1 R
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[57] **ABSTRACT**

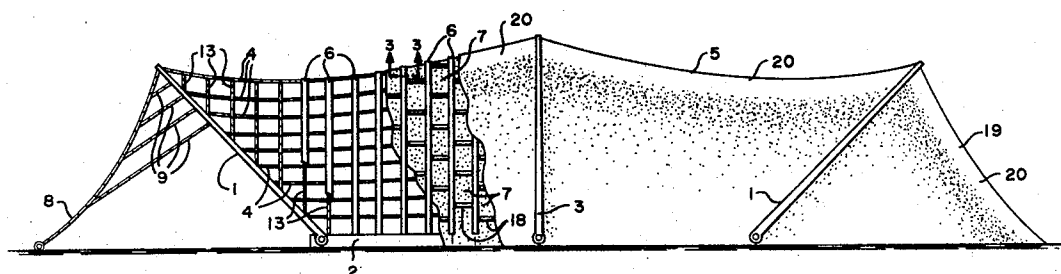
A housing which includes two arches inclined away

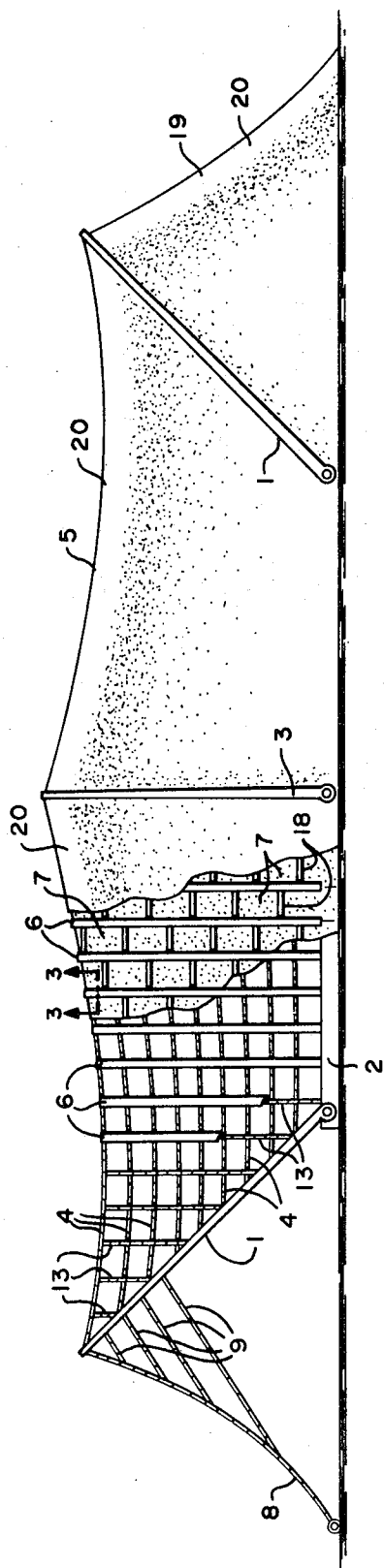
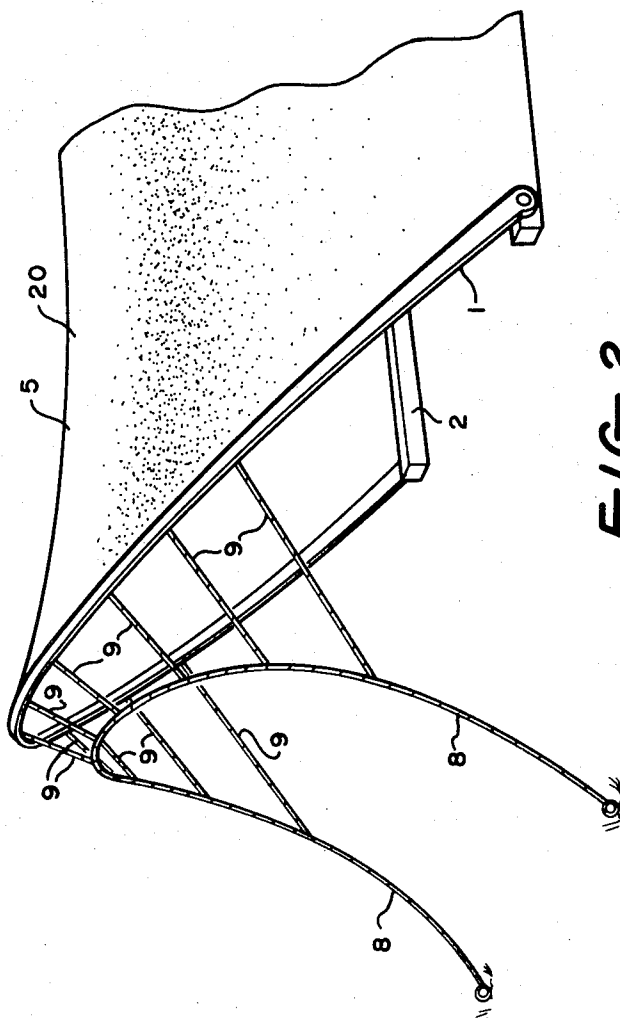
from each other at acute angles to the vertical and mounted on the ground or other base so that they may be swung about their leg ends toward and away from this position, cables which extend between the arches and are attached to them, a covering for the housing which consists of rows of panels carried by the cables, and restraining cables which extend transversely of and around the supporting cables and are attached to the panels and the base. In addition to the inclined arches an intermediate arch or arches may be provided especially in relatively lengthy housings. To hold the end arches down and reduce the sag in the covering to an acceptable value, tie-downs attached to the end arches and anchored to the base are provided.

The housing may be left open at both ends or closed at one or both ends by end walls. In the latter event, the end walls may serve as tie-downs for the end arches or separate tie-downs may be provided. Means are also provided to close any gap which might otherwise exist between the covering and the end wall and the base and the arches.

In one form of the invention, the panels are mounted on arch-shaped carriers which extend around and are carried by the supporting cables. In another form, the carriers are dispensed with and the panels are mounted directly on the supporting cables.

1 Claim, 14 Drawing Figures





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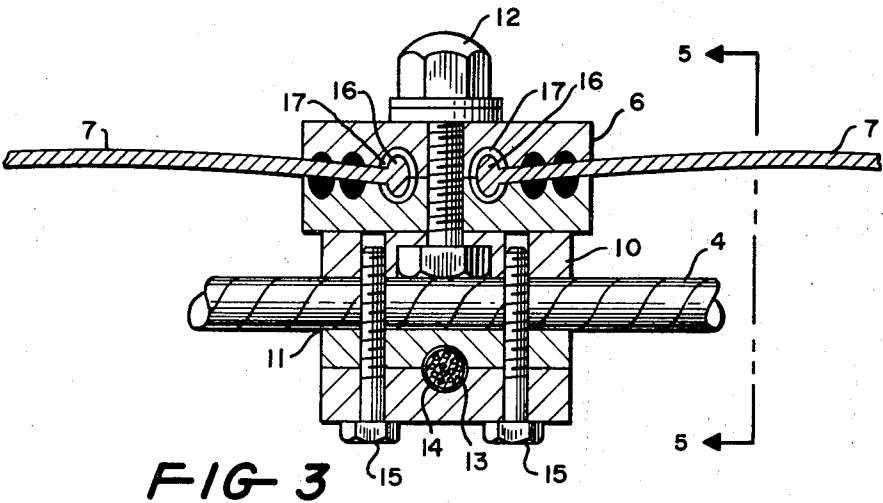


FIG 3

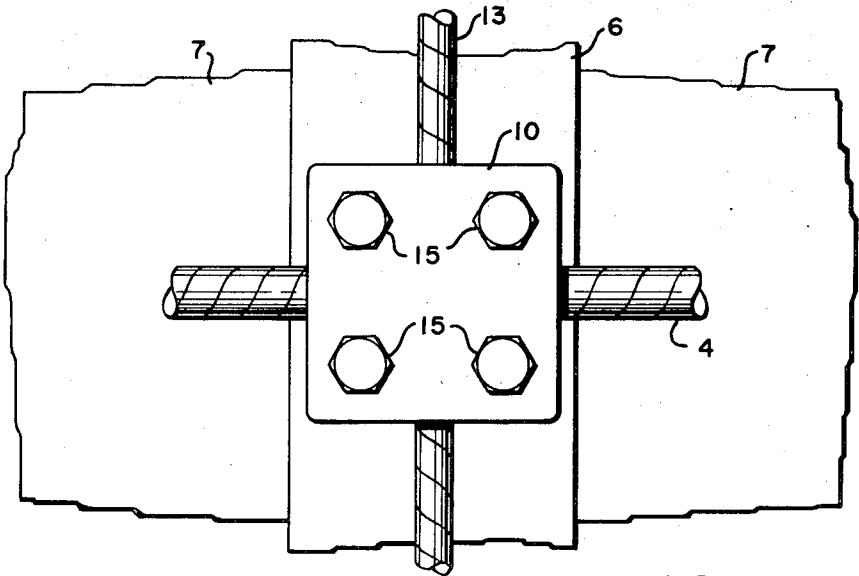


FIG 4

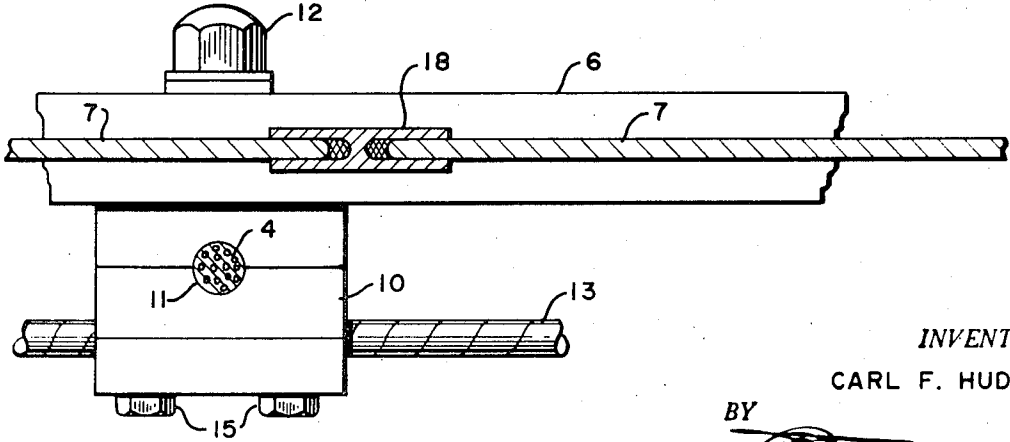


FIG 5

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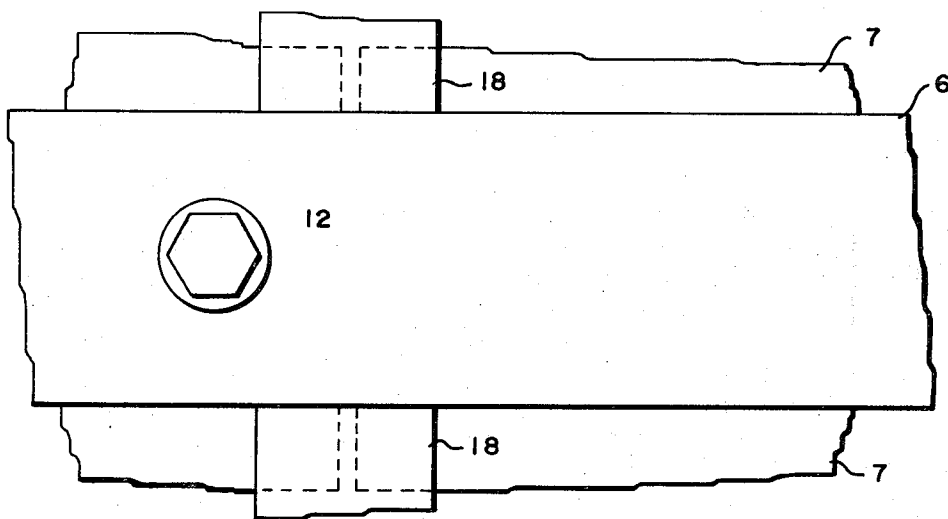


FIG-6

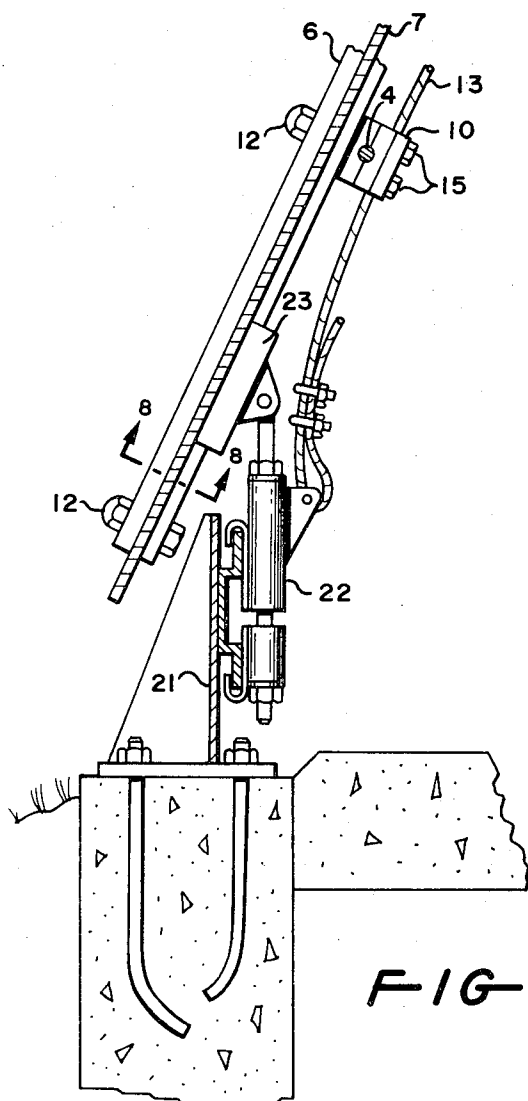


FIG-7

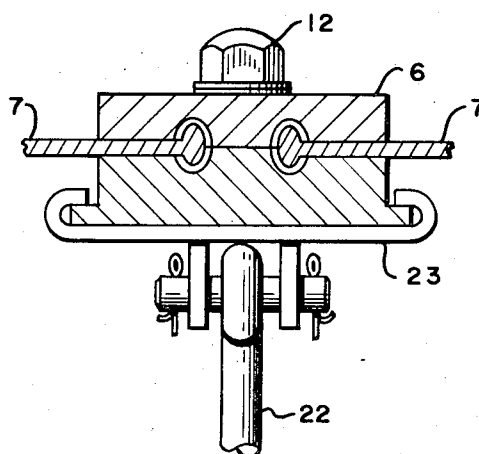


FIG-8

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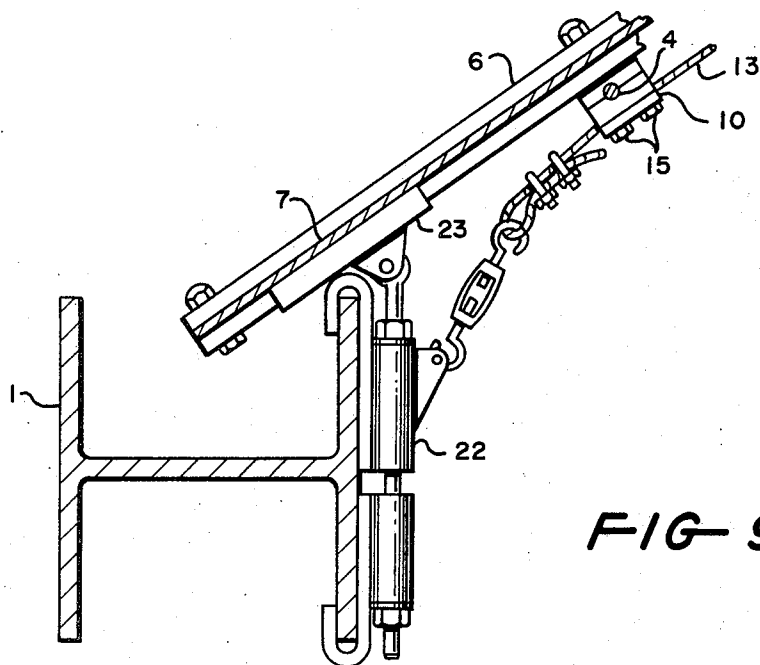


FIG 9

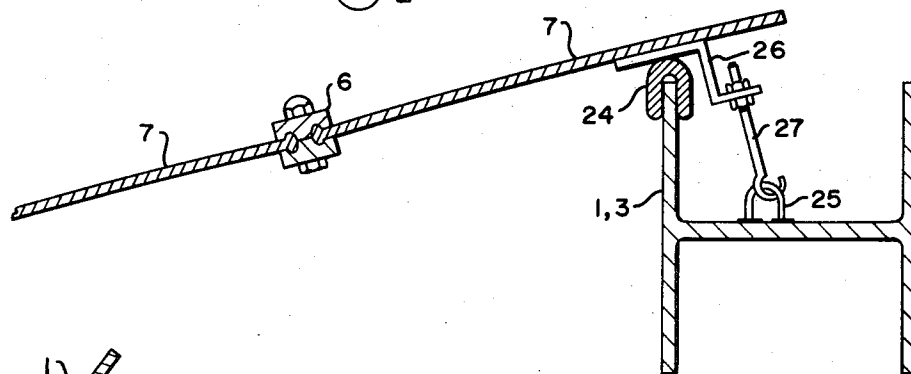


FIG 10

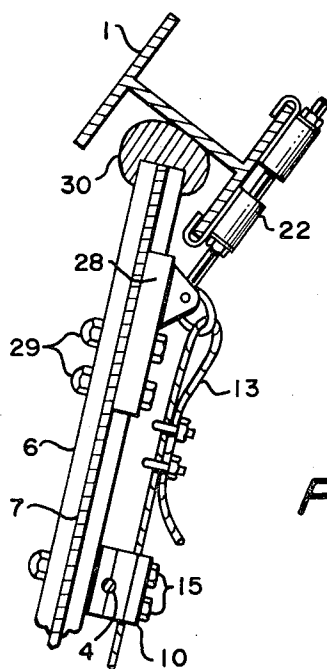


FIG 11

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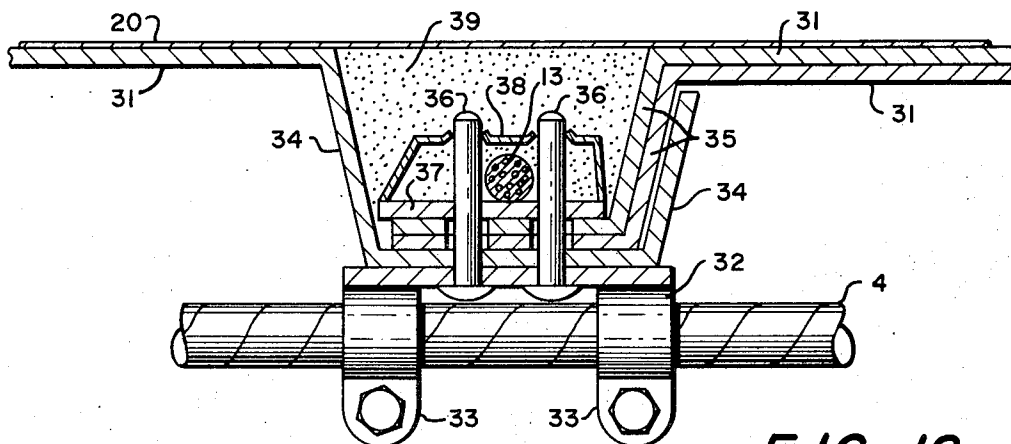



FIG-12

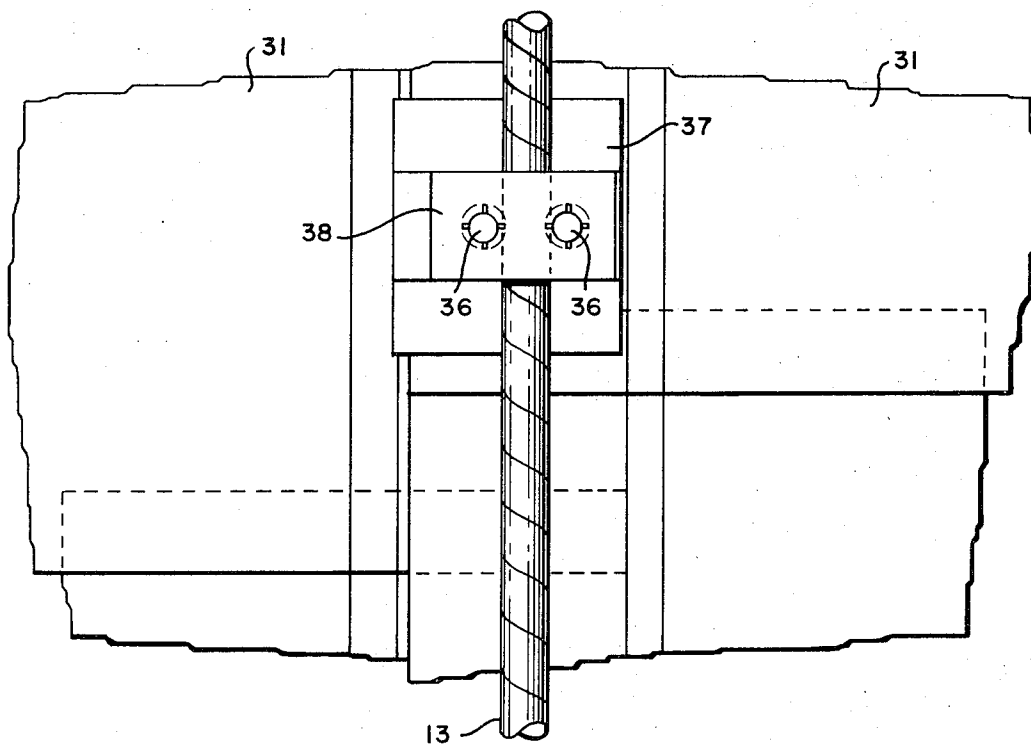


FIG-13

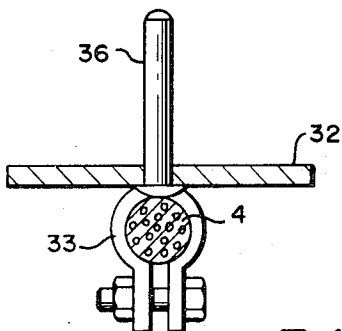


FIG-14

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[Signature]

HOUSING WITH CABLE SUSPENDED PANELS

BACKGROUND OF INVENTION

Housings for humans, animals, equipment, material, etc. have conventionally been of one or the other of two general types. One is structures which are relatively expensive in materials and erection, relatively sturdy, and basically permanently located, generally called buildings. The other is tent-like structures or pavilions which are less expensive and more or less portable, but less able to withstand hard use and abuse by man and the elements, of which those disclosed in my U.S. Pat. 3,215,153, dated Nov. 2, 1965, and others of my patents and applications are examples.

SUMMARY OF INVENTION

The object of the invention is to provide housings which are less inexpensive in materials and erection than buildings but better able to withstand hard use and abuse than pavilions.

For a better understanding of the nature and objects of the invention, reference is made to the following specification and accompanying drawings in which preferred embodiments of the invention are described and shown.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of a housing in accordance with the invention with parts broken away to show the structure at four stages of its construction.

FIG. 2 is a perspective of the left end of the housing shown in FIG. 1.

FIG. 3 is a section on line 3—3 of FIG. 1.

FIG. 4 is an inside view of the structure shown in FIG. 3.

FIG. 5 is a section taken on the line 5—5 of FIG. 3.

FIG. 6 is a fragmentary outside view of the structure shown in FIG. 5.

FIG. 7 is a sectional view of means for attaching the lower edges of the covering and end wall to the base and closing any gap between them.

FIG. 8 is a section on the line 8—8 of FIG. 7.

FIG. 9 is a sectional view of the means shown in FIG. 7 at the junction of the lower edge of the covering and one of the end arches.

FIG. 10 is a sectional view of means for attaching the outer edges of the endmost panels to the arches and closing any gap between them.

FIG. 11 is a sectional view of means similar to that shown in FIGS. 7 and 9 for attaching the upper edge of an end wall to an end arch and sealing any gap between them.

FIG. 12 is a sectional view corresponding to FIG. 3 of a portion of another pavilion in accordance with the invention.

FIG. 13 is a fragmentary outside view of the structure shown in FIG. 12.

FIG. 14 is a view at a right angle to FIG. 12 of a portion of the structure shown in FIG. 12.

DESCRIPTION OF PREFERRED EMBODIMENTS OF INVENTION

The housing shown in the drawings includes two end arches 1 inclined away from each other at acute angles to the vertical and mounted on the ground or other

base 2 so that they may swing about their leg ends toward and away from this position. On the base 2 between the end arches 1, there is also mounted so that it can swing an upright intermediate arch 3.

Between the end arches 1, there extend a number of supporting cables 4 for the covering 5 which are attached to the end and intermediate arches. On the cables are mounted two-part carriers 6, in the form of arches, for panels 7 whose edges are clamped between the two parts of the carriers and form the covering 5. The panels 7 may be made of any suitable, more or less rigid, material, such as metals, plastics or plywood, and may be opaque, clear or translucent.

To tension the cables 4 sufficiently to reduce the sag in the covering to an acceptable value, about 10 percent of each span of the cables, and maintain it at that value, and to provide substantially full width and height access, there are provided at one or both ends of the housing adjustable primary tie-downs 8 in the form of cables which are attached to the end arches and anchored at their ends to the base. The primary tie-downs 8 are attached to the arches from the summit to about half-way down to the base 2 through branches 9 also in the form of cables to counteract the tendency of the load imposed by the covering to bend the intermediate portions of the arches inwardly.

The carriers 6 are mounted on and clamped to the cables 4 through the intermediaries of three-part blocks 10 through cylindrical channels 11 between the outer two parts of which the cables 4 extend. The two parts of the carriers are clamped together and to the cables 4 and to the outer two parts of the blocks 10 by bolts 12.

Transverse restraining cables 13 extend slidably through cylindrical channels 14 between the innermost and intermediate parts of the blocks 10 and are attached to the base to anchor the carriers 6. The three parts of the blocks 10 are clamped together by screws 15. Alternatively, the carriers may be anchored by directly attaching them to the base and serve as the restraining means and the cables 13 thus dispensed with.

On the edges of the panels 7, there are provided beads 16 which are disposed in enlarged channels 17 between the two parts of the carriers 6 to accommodate lateral expansion and contraction of the panels. The panels 7 may be made in sections, in which event, their adjacent ends may be bridged by suitable members 18, such as H-section members, into whose oppositely facing channels the ends of the panels extend. Clearance is provided between the ends of the panels and the bottoms of the channels in the members 18 to accommodate endwise expansion and contraction of the panels.

In the event it is desired to close one or both ends of the housing, there may be provided an end wall or end walls 19 attached to the end arch or arches as shown in FIG. 11. The end walls 19 may be similar in construction to the covering 5, except that in this case the cables 4 serve as the restraining cables. In this event, the tie-downs 8-9 may be retained and serve their original function. Alternatively, the tie-downs may be eliminated and the cables 13 or the carriers 6 be made to serve their purpose by attaching them to the end arch or arches 1 and suitably anchoring them to the base 2.

To further seal the covering 5 and the end walls 19 against leakage, a suitable coating 20 may be sprayed onto or otherwise applied to the carriers 6 and panels 7.

To prevent wind, rain, etc. entering the housing between the covering or the end wall and the base or the arches, suitable means such as those shown in FIGS. 7 to 11 may be provided.

At the junctions of the covering and the base and the end wall and the base, there are provided as shown in FIG. 7 upstanding walls 21 attached to the base and which the covering and the end wall overlap. To anchor the cables 13 and the covering 5 and end walls 19 and draw the latter inwardly toward the walls 21 and accommodate differential expansion of the cables and the covering and end wall, there are also provided suitable clamps 22 which are attached to the base and to which blocks 23, which are mounted to slide lengthwise on the carriers 6, and the cables 13 are connected. As shown in FIG. 9, a similar structure may be used at the junctions of the lower edges of the covering and the arches.

At the junctions of the lateral edges of the endmost panels 7 and the arches, there are provided, as shown in FIG. 10, on the arches, gaskets 24 on which the panels are seated and eyes 25, and, on the panels, brackets 26 to which are attached hooks 27 which extend through the eyes 25 on the arches.

At the junction of the end wall 9 and an end arch 1, the carriers 6, panels 7 and cables 13 are, as shown in FIG. 11, attached to the arch by clamps 22 like those shown in FIGS. 7 and 9 and blocks 28 attached to the carriers by bolts 29. Between the upper edges of the panels and the arch, there is provided a gasket 30 to bridge any gap.

In the form of the invention shown in FIGS. 12-14, the carriers are dispensed with and the panels 31 mounted directly on the supporting cables 4 through brackets 32 with adjustable clamping eyes 33 on them through which the cables extend. The panels are

formed with depressed channels 34 on one edge and stepped-down extensions 35 on the other edge and overlap laterally with the extensions seated in the channels with clearance between them and the walls of the channels to accommodate expansion and contraction of the panels. To attach the panels to the brackets, there are provided pins 36 which extend through the brackets 32, the bases of the channels 34, the extensions 35 and plates 37 which are seated on the outer of the extensions 35. Suitable clamps 38 are provided to hold the pins and temporarily the plates 37, the extensions 35 and channels 34 in place. The openings in the extensions 35 may be enlarged and clearance provided on the edges of the plates 37 to accommodate lateral expansion and contraction of the panels. The restraining cables 13 are disposed in the channels on top of the plates to hold the extensions 35 permanently in place. The channels may be filled with a suitable plastic foam 39 to seal them.

The panels 31 may also be made in sections which overlap endwise as shown in FIG. 13 and indicated by the showing of two extensions 35 in FIG. 12.

I claim:

1. In a housing, two arches mounted on the ground or other base so that they are inclined away from each other and may swing in both directions from this position, flexible tension members which extend from one of the arches to the other and are attached to them, rows of panels carried by the tension members and forming the covering of the housing, flexible tension members which extend transversely of and in restraining relation to the first-mentioned flexible tension members and whose ends are attached to the base, arch shaped carriers which extend transversely of and in restraining relation to the first-mentioned flexible tension members and to which the edges of the panels are attached, and means for attaching the carriers to the second-mentioned flexible tension members.

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