United States Patent [19]

Huddle

[11] **3,726,294**

[45] **Apr. 10, 1973**

[54] **MOVABLE CLOSURE FOR PAVILION**

[76] Inventor: **Carl F. Huddle,** 3 Kenberton Drive, Pleasant Ridge, Mich. 48069

[22] Filed: **July 13, 1971**

[21] Appl. No.: **162,124**

[52] **U.S. Cl.** .....**135/4 R,** 49/40
[51] **Int. Cl.** **E04b 1/347,** E06b 3/34
[58] **Field of Search** .....135/4 R, 1 R, 14 D; 49/40, 41

[56] **References Cited**

UNITED STATES PATENTS

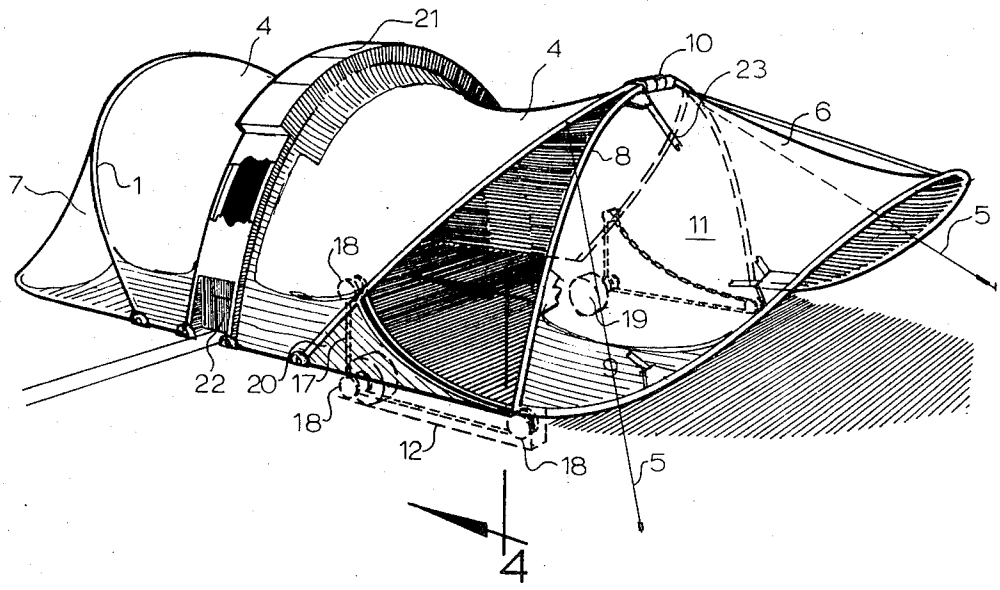
3,273,574	9/1966	Huddle	135/4 R X
2,627,865	2/1953	Mitchell et al.	135/4 R
2,864,133	12/1958	Younger	49/40
2,697,536	12/1954	Cicero	49/40 X
3,374,972	3/1968	Webb, Sr.	49/40 X
3,534,750	10/1970	Kolozsvary	135/4 R UX

Primary Examiner—David J. Williamowski
Assistant Examiner—Philip C. Kannan
Attorney—A. F. Baillio

[57] **ABSTRACT**

A closure for an end of a pavilion which includes two arches which are inclined away from each other and mounted on the ground or another base to swing toward and away from this position and a membrane which extends between the arches and is attached to them. The closure is arch-like in end view and triangular in side view and mounted on one of the inclined arches to swing lengthwise of the pavilion between two positions. In one of these positions, the inner end of the closure is in contact with the arch on which it swings and the outer end thereof is in contact with the base and the end of the pavilion is closed. In the other position, the outer end of the closure extends angularly upwardly from the base so that the closure constitutes an extension of the pavilion and the end of the pavilion is open. The closure includes a frame which defines its inner and outer ends and a membrane attached to the frame and so tailored and tensioned that it assumes a concave curvature longitudinally as well as a convex curvature laterally. A track and a chain which follows the track are provided to move the closure between its closed and open positions and control its movement vertically, laterally and lengthwise of the pavilion.

3 Claims, 5 Drawing Figures



4

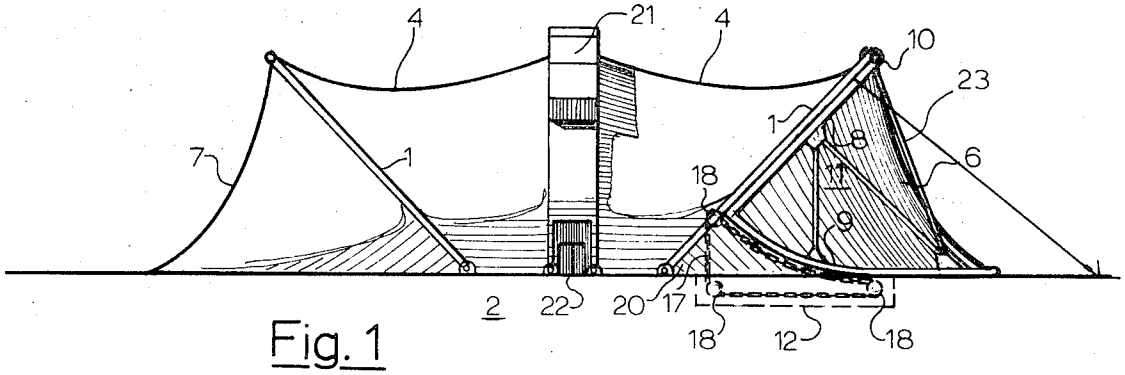


Fig. 1

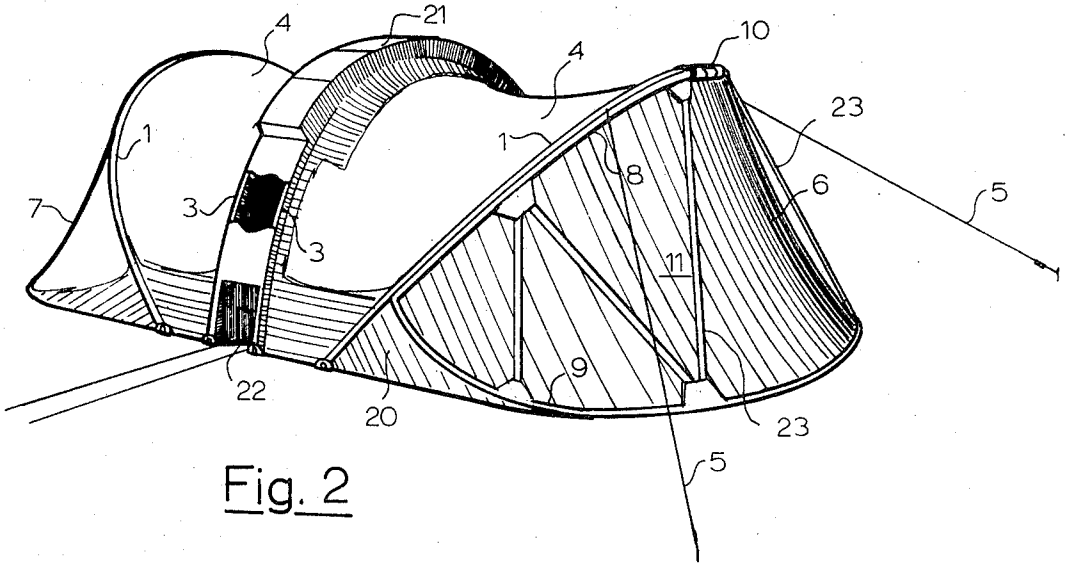


Fig. 2

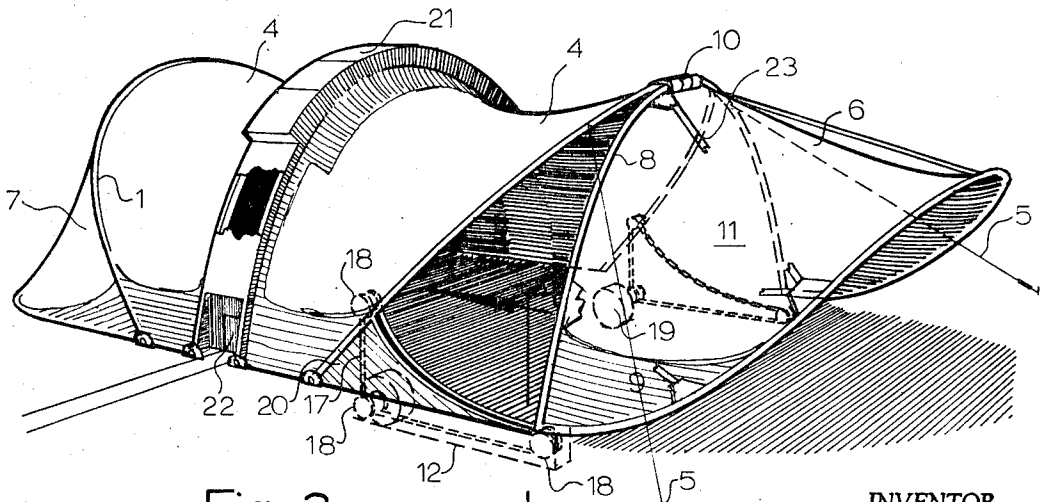


Fig. 3

4

INVENTOR.
Carl F. Huddle

BY

ATTORNEY

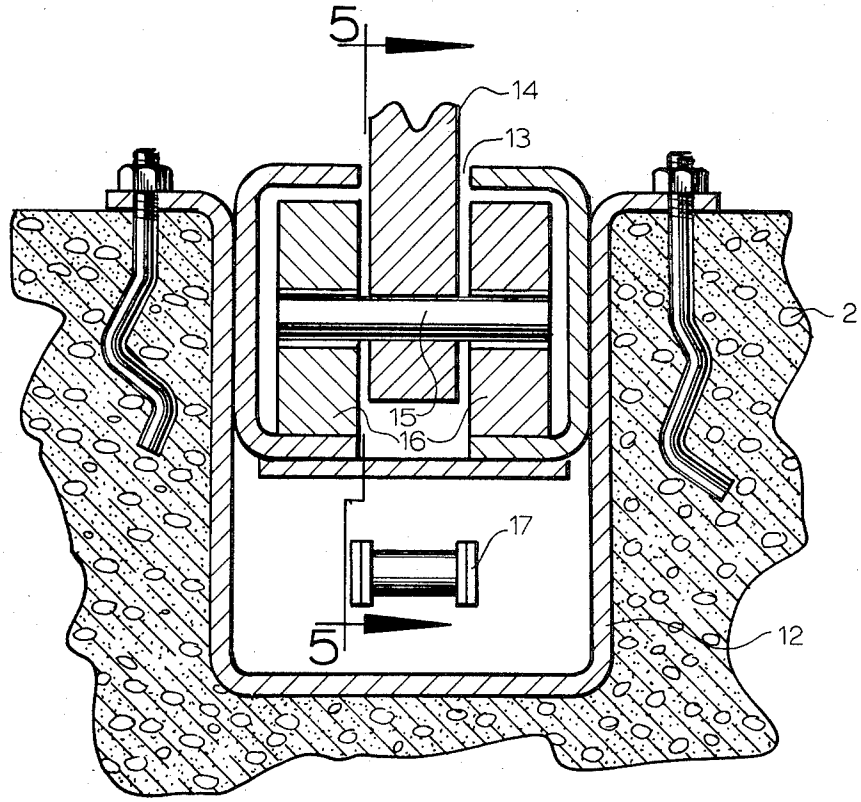


Fig. 4

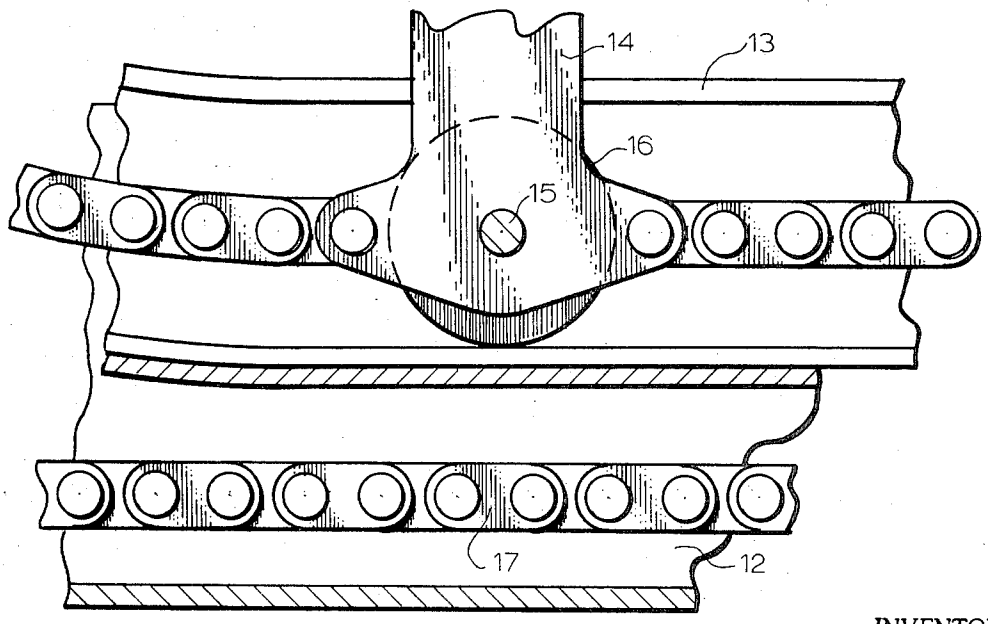


Fig. 5

INVENTOR.
Carl F. Huddle

BY

ATTORNEY

MOVABLE CLOSURE FOR PAVILION

SUMMARY OF INVENTION

This invention relates to pavilions like those disclosed in my Patent No. 3,215,153, dated November 2, 1965, and others of my patents and applications which include two arches which are inclined away from each other and mounted so that they may swing toward and away from this position and a membrane which extends between the arches and is attached to them. Particularly, the invention relates to such pavilions which are to house large objects, such as airplanes. The principal object of the invention is to provide a closure for one or both ends of such pavilions which is movable to a position in which the end or ends are fully opened so that the airplane or other object may be moved into or out of the pavilion without making it unduly oversize and without sacrificing any of the stability of the structure.

A further object of the invention is to provide such a closure which harmonizes architecturally and structurally with the basic structure.

For a better understanding of the nature and objects of the invention, reference is made to the following specification and the accompanying drawing wherein a preferred embodiment of the invention is described and shown.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a side elevation of a pavilion with an end closure in accordance with my invention.

FIG. 2 is a perspective view of the pavilion with the end closure in closed position.

FIG. 3 is a perspective view of the pavilion with the end closure in open position.

FIG. 4 is a section on the line 4—4 of FIG. 3 of the track and chain for moving the closure and controlling its movement.

FIG. 5 is a section on the line 5—5 of FIG. 4.

DESCRIPTION OF PREFERRED EMBODIMENT

The pavilion shown in the drawing includes two arches 1 which are inclined away from each other at acute angles to the vertical and mounted on the ground or other base 2 so that they may be swung about their leg ends toward and away from this position. On the base 2 there is also mounted so that it may be swung about its leg ends an upright intermediate double arch 3 like that disclosed in my application, Ser. No. 49,811, filed June 25, 1970.

Between each of the end arches 1 and the nearer of the components of the intermediate arch 3 extends a tailored membrane 4 of suitable material, such as woven fabric, plastic, plastic-coated fabric or thin metal, of which one end is attached to each of them. The membrane is preferably pre-stretched, if it is made of a stretchable material, so that it is essentially inextensible in both directions and may be self-supporting or supported by cables which extend between the end and the intermediate arches.

One or both ends of the pavilion may be fitted with a closure in accordance with this invention. In the latter case, guys 5 are provided to tie the end arches 1 to the base and tension the membrane 4 to impart to it the desired contour and stabilize the structure as a whole. In the event such a closure is to be provided at only one end of the pavilion, the other end may be closed by a membrane of the same material as the membrane 4 and attached to the arch and the base so as to perform the same function as the guys. Alternatively, the other end of the pavilion may be left open in which event guys similar to the guys 5 are provided to perform the same function.

In the drawing a closure 6 in accordance with the invention is provided only at the right end of the pavilion and the left end is closed by a fixed membrane 7.

The closure 6 includes a frame made up of inner and outer arches 8 and 9 rigidly joined to each other at the ends of their legs and mounted to swing on the nearer end arch 1 by a suitable hinge 10 which interconnects the apices of the arches 8 and 1. The inner arch 8 is made of the same shape and size as the arch 1 to which it is hinged except that its legs are made sufficiently shorter that they just reach down to the base 2 when the closure is swung to a position in which its inner end is vertical. The inner portions of the legs of the outer arch 9 are curved to conform to the arc in which the ends of the legs of the inner arch 8 swing until they reach the level of the base 2 when the closure is closed and then extend straight along the base to the apex of the outer arch.

To the frame 8–9 is attached the edges of a membrane 11 which may be of the same character as the membranes 4 and 7 which is so tailored and tensioned that it assumes a concave curvature longitudinally as well as a convex curvature laterally comparable to that of the membrane 7 so as to minimize its tendency to vibrate in winds and make the two ends of the pavilion harmonize architecturally when the closure is closed. Suitable bracing, such as that indicated diagrammatically by the reference character 23, may be provided on the inside or the outside of the closure to stiffen and strengthen it.

To control movement of the closure laterally and vertically, there may be provided trianguloidal tracks 12 whose upper runs conform in shape and location to the arcs in which the junctions of the legs of the arches 8 and 9 swing. The lower runs of the tracks 12 may be installed and anchored in trenches in the base 2 of such depth that the upper surfaces of the lowermost portions of the tracks are just flush with the surface of the base. The tracks are of rectangular cross-sections and closed except for slots 13 in the outer walls of their upper runs. Into each of the tracks through this slot extends one or more tongues 14 attached to the frame at the nearer junction of the legs of the arches 8 and 9 and/or elsewhere on the curved portions of the legs 9. Within the tracks, there extend through each of the tongues an axle 15 which between the tongue and the side walls of the track are mounted rollers 16 which ride on the lower walls of the tracks. If tongues 14 are provided elsewhere than at the junctions of the legs 8 and 9 or the closure 6 is to be swung outwardly beyond the vertical position of the leg 8, the tracks 12 may be extended beyond their lowermost positions correspondingly to retain control of the closure.

To open and close the closure and control its movement lengthwise of the pavilion, there are provided chains 17 whose ends are attached to the tongues 14 and which between their ends extend around rollers 18 located at the angles of the tracks. To move the closure

between open and closed positions, there are provided suitable synchronized electric motors **19** on whose shafts drive rollers are mounted.

Suitable means may be provided to hold the inner arch of the frame **8–9** against the arch **1** on which it is mounted and the outer arch of the frame against the base **2** when the closure is closed.

Panels **20** of appropriate shape made of the same material as the membranes **4, 7** and **11** or other suitable material may be provided to close the space between the upper sides of the tracks **12**, the lower ends of the legs of the arch **1** and the base **2**.

The space between the components **3** of the intermediate arch may be closed in any suitable fashion. In this space may be installed a ventilating cupola **21** as shown in FIGS. 7 to 10 of my application, Ser. No. 49,811. In this closure, there may also be provided a door **22** for passage of personnel or other bodies.

I claim:

1. In a pavilion which includes an outwardly inclined end arch which is mounted on the ground or another base, a closure for the end of the pavilion which includes an arched body trianguloid in profile which is mounted on the arch to swing lengthwise of the pavilion between a position in which its inner side is near the arch and terminates above the base and the outer portion of its lower side is near the base and the inner portion thereof is curved upwardly from the outer portion thereof to the lower end of the inner side of the body and the end of the pavilion is closed, and a position in which the lower side of the body extends angularly upwardly from the base and the end of the pavilion is open.

2. The pavilion claimed in claim **1**, plus a track and means associated with the track and body which controls movement of the body.

3. The pavilion claimed in claim **1** in which the body includes a frame which defines its inner and lower sides and a membrane attached to the frame and so tailored and tensioned that it assumes a concave curvature lengthwise of the body.

* * * * *