United States Patent [19]

Burkholz et al.

[11] **3,766,573**

[45] **Oct. 23, 1973**

[54] **DOME STRUCTURE FOR SUPPORTING FLEXIBLE MATERIAL TO FORM A DOME**

[76] Inventors: **Herbert C. Burkholz**, 38309 Genesee Lake Rd., Oconomowoc, Wis. 53066; **Norman K. Burkholz**, N-87, W-15380 Kings Hwy., Menomonee Falls, Wis. 53051

[22] Filed: **July 29, 1971**

[21] Appl. No.: **167,267**

[52] **U.S. Cl.** ..... **4/172.12**, 52/63, 52/82, 52/90, 135/3 R

[51] **Int. Cl.** **E04h 3/16**, E04h 3/18

[58] **Field of Search** ..... 4/172.12, 172.14, 4/172; 52/63, 81, 82, 90; 135/3 R

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Primary Examiner—Henry K. Artis

Attorney—Cyril M. Hajewski

[57] **ABSTRACT**

The structure for supporting a flexible material, such as a plastic sheet over the water in a swimming pool. The flexible material is supported by the structure in such a manner as to provide sufficient open space over the water in the swimming pool to permit normal use of the pool by swimmers.

2 Claims, 10 Drawing Figures

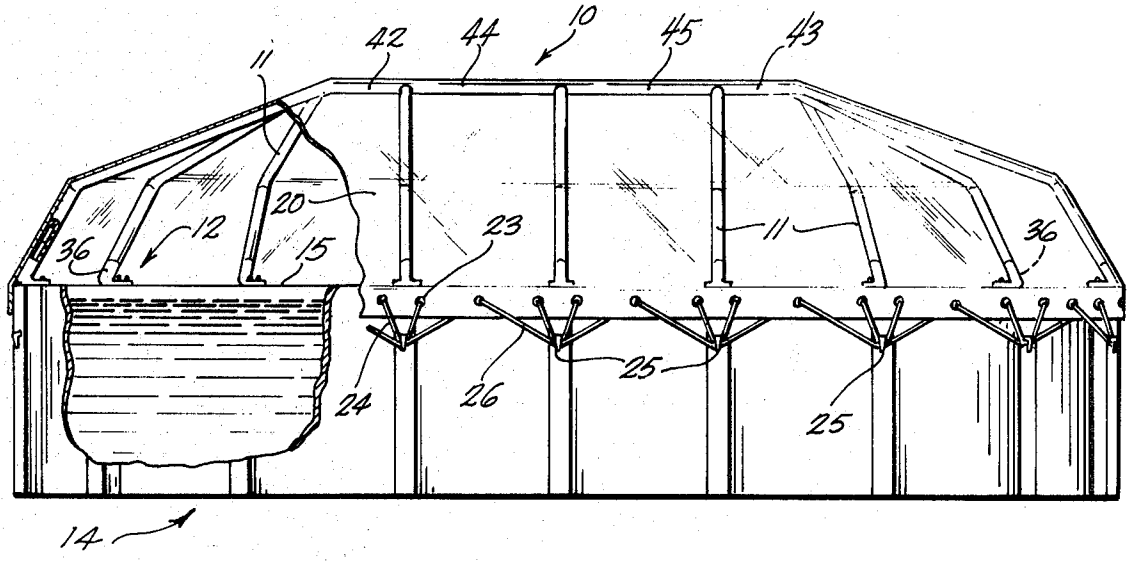


Fig. 2

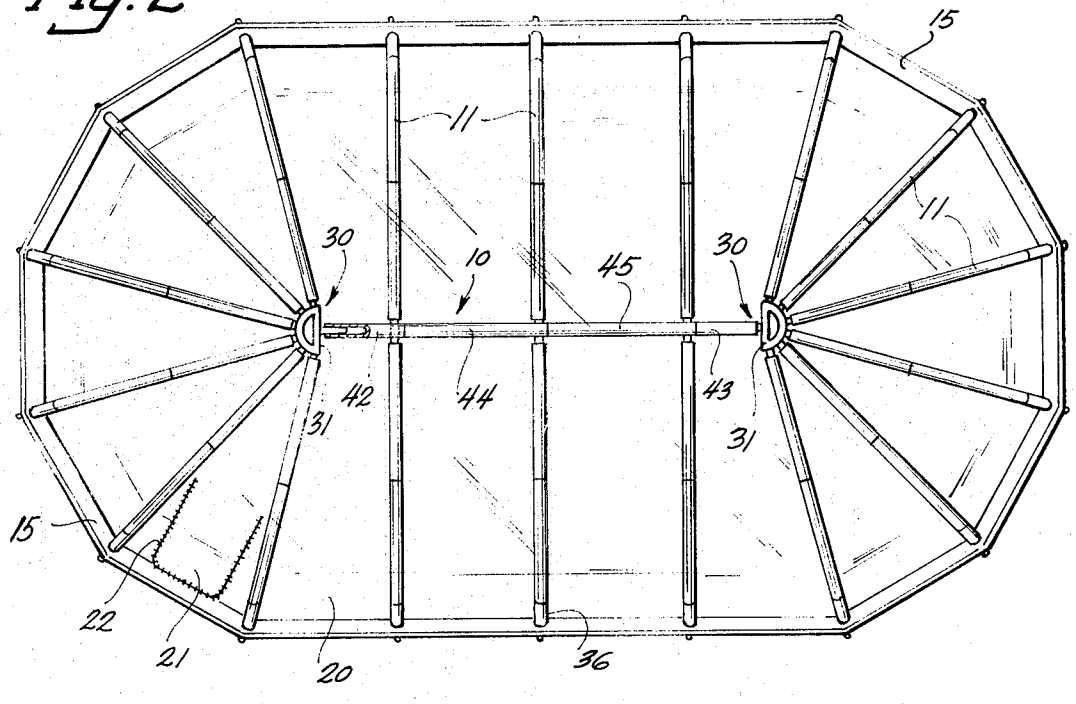


Fig. 1

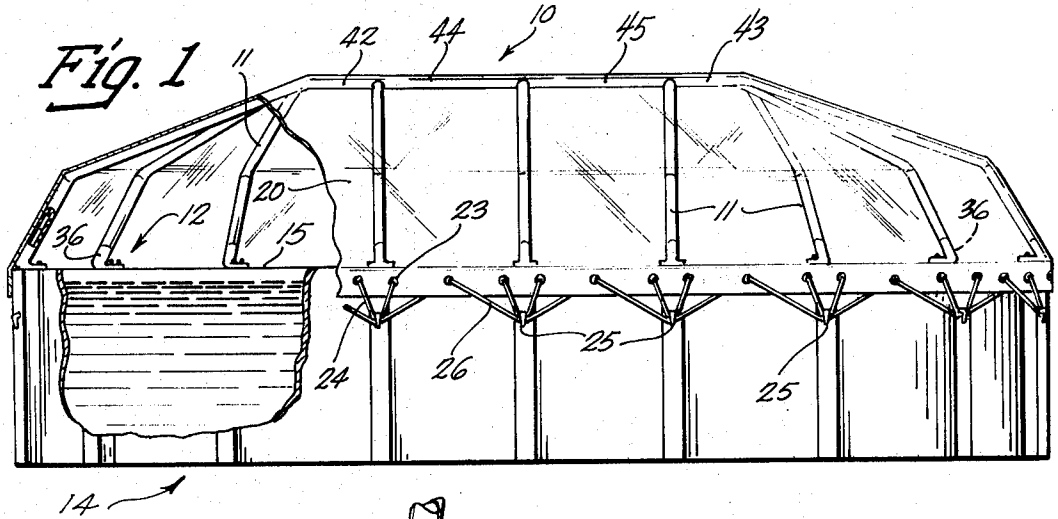
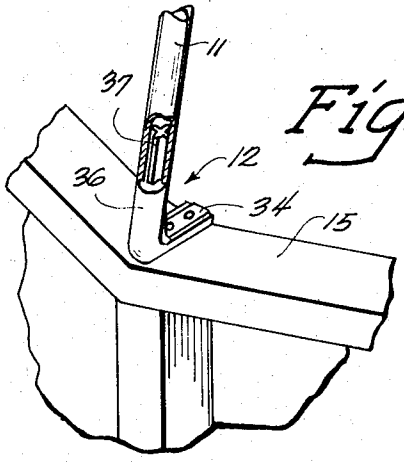


Fig. 3



INVENTORS
HERBERT C. BURKHOLZ.
& NORMAN K. BURKHOLZ.
BY Cyril M. Hajewski
Attorney

Fig. 4

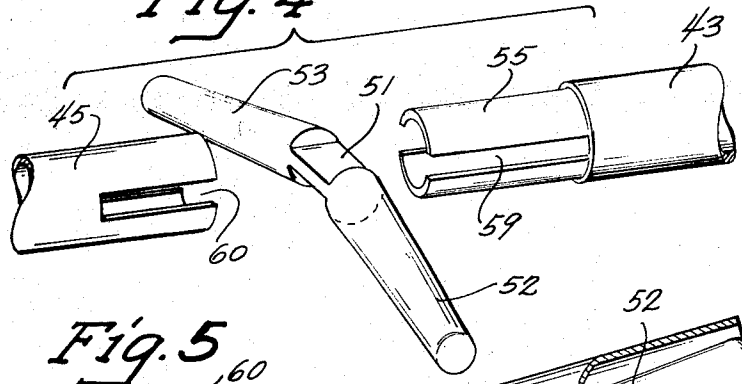


Fig. 5

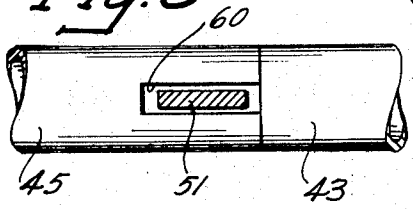
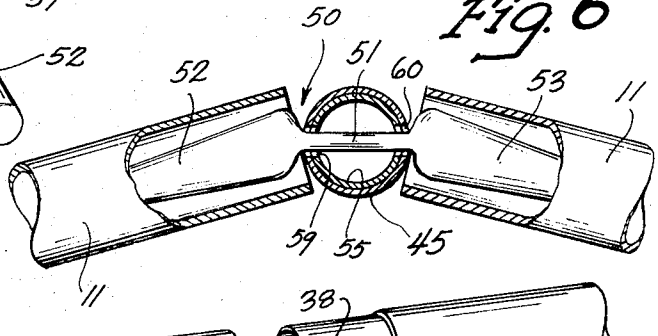


Fig. 6



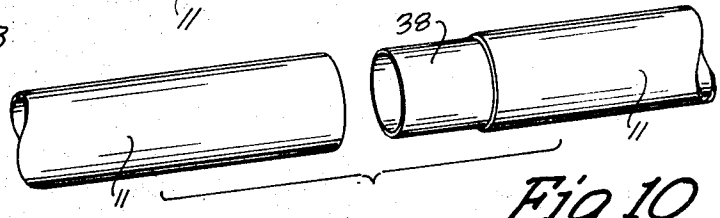


Fig. 10

Fig. 7

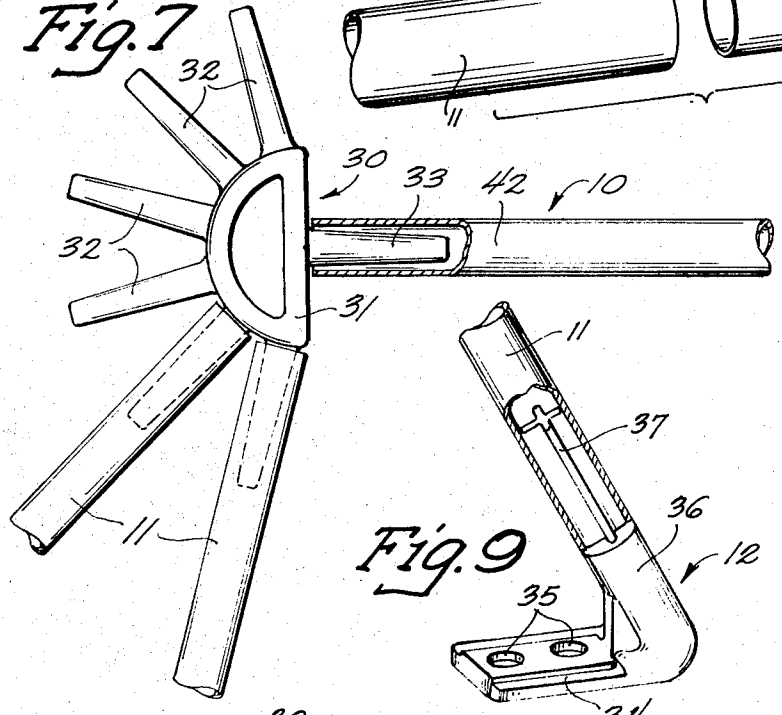


Fig. 9

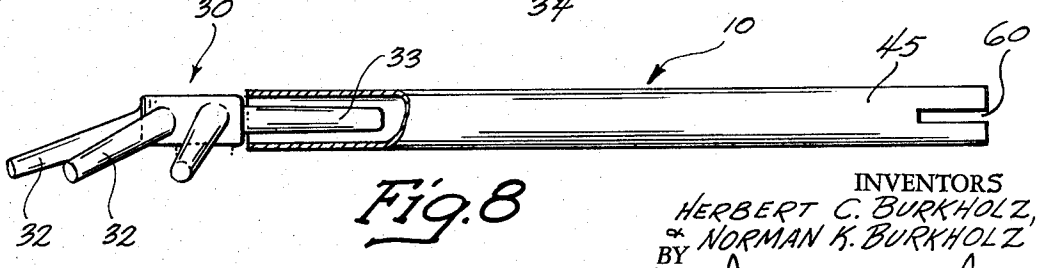


Fig. 8

INVENTORS
HERBERT C. BURKHOLZ,
& NORMAN K. BURKHOLZ
BY
Cyril M. Hajewski
Attorney

DOME STRUCTURE FOR SUPPORTING FLEXIBLE MATERIAL TO FORM A DOME

BACKGROUND OF THE INVENTION

The invention pertains generally to removable domes for swimming pools.

Our copending patent application, Ser. No. 67,399 filed on Aug. 27, 1970 is directed to an arrangement for providing a removable dome over the water in a swimming pool to substantially extend the use of outdoor swimming pools. Particularly when the sun is shining, the temperature of the atmosphere within the dome is appreciably higher than the outdoor temperature so that the pool may be used during cool days which would otherwise render it unusable.

In order for such dome to be practical, it is essential that it be readily and rapidly installed and disassembled. If a sound and stable supporting structure is provided, the installation of the flexible material over such support presents relatively few problems. The present invention is therefore directed to the problem of providing an improved supporting structure for supporting a flexible material over a swimming pool to form a dome over the water.

One object of the present invention is to pro-vide a supporting structure over a swimming pool to support a flexible material in the shape of a dome with the supporting structure being convenient to install and disassemble so that such operation requires a minimum of time.

A further object is to provide such supporting structure which is strong and rigid but inexpensive to manufacture.

SUMMARY OF THE INVENTION

The present invention is directed particularly to the supporting structures for supporting flexible material in the shape of a dome. The structure is formed of tubing which is assembled by sliding fits over adjacent tubing and over brackets. Brackets are mounted on the top rail of the swimming pool by screws or other suitable fastening means. The rest of the structure is assembled by sliding fits so that there are no screws, nuts or other type of fastener to tighten when installing the unit. The brackets that are mounted on the top rail may remain in position when the dome is removed to be readily available for receiving the structure when desired.

The central ridge pole of the supporting structure extends along the length of the pool at the top of the structure. Laterally extending rafters must be coupled to this ridge pole to extend laterally and downwardly therefrom so that the other ends of the rafters are coupled to the brackets on the top rail of the pool. The upper ends of the rafters slide over brackets which are carried by the ridge pole. These ridge pole brackets have two projections extending about 160° apart and the ends of the rafters slide over these projections. The projections are separated by a flat which slides into slots formed in adjacent sections of the ridge pole. The adjacent sections of the ridge pole telescope into each other and the ends are provided with slots disposed in the plane of the axes of these sections. As the end of one section slides into the larger diameter end of the adjacent section, the flat of the ridge pole bracket is disposed within the slots, and the bracket is thus retained on the ridge pole without the use of any independent fasteners.

DESCRIPTION OF THE DRAWING

The foregoing objects of the invention may be achieved by means of the apparatus described in connection with the accompanying drawings in which:

FIG. 1 is a view in side elevation of a swimming pool incorporating the features of the present invention, a portion of the pool being broken away to disclose its interior arrangement;

FIG. 2 is a plan view of the swimming pool shown in FIG. 1;

FIG. 3 is a fragmentary detail view illustrating a bracket mounted on the top rail of the swimming pool;

FIG. 4 is a perspective exploded fragmentary view of a side rafter support and the ends of adjacent sections of the ridge pole shown in position to be assembled to each other;

FIG. 5 is a fragmentary detail view, partly in elevation and partly in section showing the parts illustrated in FIG. 4 assembled together;

FIG. 6 is a fragmentary detail view, partly in elevation and partly in vertical section depicting two opposing rafters assembled to the side rafter support shown in FIG. 4;

FIG. 7 is a detail plan view of a spider with a fragmentary showing of rafters and a ridge pole assembled to it;

FIG. 8 is a detail view in side elevation of the spider shown in FIG. 7 with an end section of the ridge pole shown assembled to it;

FIG. 9 is a perspective view of one of the top rail brackets with an end section of a rafter being shown coupled to the bracket and being broken away to illustrate the assembly of the rafter to the bracket; and

FIG. 10 is a fragmentary perspective view showing two adjacent rafter sections in position to be assembled to each other.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference is now made more particularly to the drawings and specifically to FIGS. 1 and 2 thereof which illustrate an outdoor swimming pool adapted to be mounted on top of the ground and that is equipped with a dome which incorporates the features of the present invention. The swimming pool is of an oval configuration so that a conforming oval dome is required to cover it. The dome comprises generally a ridge pole **10** that is centrally supported an appreciable distance above the water of the pool by a plurality of rafters **11** that extend downwardly from the ridge pole **10.** The bottom ends of the rafters **11** are coupled to brackets **12** that are fixedly mounted on a top rail **15** of the swimming pool proper which is generally identified by the reference numeral **14.**

The supporting structure of the dome is covered by a flexible material **20** that preferably is of a clear strong plastic material such as vinyl. The flexible material **20** includes a door **21** which may be closed by a zipper **22** if it is desired to fully enclose the interior of the dome. Suitable windows, similar to the door **21** may be provided to furnish additional ventilation for the interior.

The flexible material **20** is provided with grommets **23** along its lower edge for receiving an elastic cord **24** which is engaged over a hook **25** for retaining the bottom edge of the flexible material **20** secured to the upper edge of the swimming pool **14.** Another elongated elastic cord **26** is alternately threaded through

the grommets 23 and engaged with the hooks 25 to provide further support for securely retaining the bottom edge of the flexible material 20 to the swimming pool 14.

Each end of the ridge pole 10 is coupled to a spider generally identified by the reference numeral 30. The construction of the spiders 30 is best shown in FIG. 7 and includes a semi-circular base 31 with radially extending fingers 32 projecting from the arcuate portion of the base 31. A finger 33 projects laterally from the rectilinear portion of the base 31 for receiving the end of the ridge pole 10. On the other hand, the fingers 32 are angled downwardly a slight amount to receive the upper ends of the end rafters 11 which are disposed at the semi-circular ends of the swimming pool 14. The ridge pole 10 and the rafters 11 are all formed of tubing and the ends of these tubes slide over the fingers 32 and 33 for supporting the rafters 11 and the ridge pole 10 in position.

The bottom ends of the rafters 11 are coupled to the brackets 12 which are mounted on the top rail 15 of the swimming pool 14. A bracket 12 is clearly shown in FIG. 9 and comprises a base 34 having two holes 35 for receiving screws which fasten the bracket 12 to the top rail 15. A cylindrical portion 36 extends upwardly at an angle from the base 34. A support 37 extends upwardly from the cylindrical portion 36, the cross section of the support 37 being in the form of a cross. The support 37 is adapted to receive the bottom end of a rafter 11. Thus, each rafter 11 has its bottom end supported by a bracket 12 and its upper end supported by a finger 32 of the spider 30.

The rafters 11 are formed in sections and as shown in FIG. 10, the upper end of each section 11 has a reduced diameter portion 38 which telescopes into the end of the adjacent section of the rafter 11. Thus, by telescoping the reduced end portions 38 into the interior of the adjacent section, the several sections of the rafter 11 are coupled together without any fasteners.

The ridge pole 10 is likewise formed of sections, four such sections being shown in the illustrated embodiment. Thus, the left end of the ridge pole 10 as viewed in FIGS. 1 and 2, is formed of a section 42 while its right end is formed of a section 43. Two central sections 44 and 45 are disposed between the end sections 42 and 43. Three side rafters 11 extend from each side of the ridge pole 10 for supporting the central portion of the flexible material 20.

The side rafters 11 are supported at the ridge pole 10 by side rafter supports or brackets generally identified by the reference numeral 50 and best shown in FIG. 4. One of the side rafter supports is disposed at the juncture of each of the sections of the ridge pole 10. Thus, one side rafter support is located at the juncture of the section 42 with the section 44, another is located at the juncture of the section 44 with the section 45 and a third side rafter support 50 is located at the juncture of the section 45 with the end section 43.

Each of the side rafter supports 50 comprises a flat central section 51 with a finger 52 extending from one end of the flat section 51 and another finger 53 extending in the opposite direction from the central section 51. The central section 51 is supported by the ridge pole 10 in a substantially horizontal position and the fingers 52 and 53 extend therefrom in opposite directions at a slight downward angle to the section 51 for receiving the upper hollow ends of the side rafters 11.

The ridge pole sections are coupled to each other by the end of one section telescoping into the end of its adjacent section in the same manner as the sections of the rafters 11 are coupled to each other. Thus, as shown in FIG. 4, the end section 43 of the ridge pole 10 is provided with a reduced diameter end 55 that telescopes into the full diameter end of the adjacent section 45. However, the ridge pole sections differ from the rafter sections insofar as the adjoining ends are provided with slots for receiving the flat central section 51 of the side rafter supports 50. Thus, the reduced end portion 55 of the section 43, as clearly shown in FIG. 4, is provided with an axial slot 59 and the adjacent end of the section 45 is likewise provided with a cooperating axial slot 60. When the section 43 is telescoped into the section 45 the slots 59 and 60 will embrace the flat central section 51 of the side rafter supports 50 for securely supporting the side rafter supports 50 at the ridge pole 10.

Thus, in FIG. 5, the section 43 is shown coupled to the section 45 by telescoping the reduced diameter portion 55 of the section 43 into the full diameter end of the section 45. The central section 51 of the side rafter supports 50 is clearly shown within the slots 59 and 60 which are now in coincidence for cooperating relationship by reason of the coupling of the two adjacent sections of the ridge pole 10.

The assembly is also shown in FIG. 6 where the rafters 11 are shown in engagement with the fingers 52 and 53 of the side rafter support 50 and the central flat section 51 of the side rafter support 50 is clearly shown engaged by the slots 59 and 60 of the sections 43 and 45. The opposite end of the section 43 is in engagement with the finger 33 of the spider 30 and the left end of the section 45 is coupled to the adjacent end of the section 44 and also cooperates with the section 44 to carry another side rafter support 50 in the manner described.

It is therefore apparent, that the side rafter supports 50 are securely supported by the ridge pole 10 without the use of any fasteners whatsoever but merely by sliding the several sections of the ridge pole 10 together and supporting the side rafter supports 50 in the slots 59 and 60 of the adjacent sections. The slots 59 and 60 are slightly larger than the thickness of the central section 51 to provide some play between the parts to facilitate assembly. Such play does not weaken the assembly but because of the full engagement that is thus provided, thereby actually improves the strength of the structure. Similar play is provided between other parts of the assembly so that the parts may be readily fitted together.

It will be thus seen, that the end rafters 11 support the two spiders 30 above the water in the pool and the ridge pole 10 is supported between these two spiders 30. A ridge pole 10 carries the side rafter supports 50 and the side rafters 11 have their upper ends assembled to the fingers 52 and 53 of the side rafter supports 50 with the lower end of the side rafters 11 being coupled to the brackets 12. Three such side rafter supports 50 are shown in the illustrated embodiment although it should be understood that any number of such side rafter supports 50 may be provided depending upon the size of the swimming pool.

From the foregoing detailed description of the illustrative embodiment of the invention set forth herein it will be apparent that there has been provided an improved supporting structure for supporting a flexible material in the form of a dome over a swimming pool.

The supporting structure is formed of tubular rafters and a tubular ridge pole with the lower ends of all of the rafters sliding over a bracket for supporting them along the top rail of a swimming pool. The upper ends of the end rafters are disposed in fingers extending from spiders at each end of the ridge pole and the side rafters slide over fingers of supports which are uniquely carried by the central ridge pole **10** without the use of any fasteners.

Although the illustrative embodiment of the invention has been described in considerable detail for the purpose of disclosing a practical operative structure whereby the invention may be practised advantageously, it is to be understood that the particular dome supporting structure is intended to be illustrative only, and that the various novel characteristics of the invention may be incorporated in other structural forms without departing from the spirit and scope of the invention as defined in the subjoined claims.

The principles of this invention having now been fully explained in connection with the foregoing description, we hereby claim as our invention:

1. In a supporting structure for supporting a flexible material in the form of a dome to cover a swimming pool; a ridge pole; rafters extending upwardly from the swimming pool with their upper ends being coupled to said ridge pole for supporting the latter above the water in the swimming pool; and rafter supports coupled to said ridge pole and in engagement with said rafters for coupling said ridge pole to said rafters, said rafter supports comprising a flat portion; and a finger extending from said flat portion in each direction for insertion into cooperating hollow ends of said rafters for coupling said rafters to said supports; and said ridge pole is provided with a slot for receiving said flat portion wherein the slot is narrower than the thickness of said fingers so that the rafter support cannot escape from the slot and the rafter support is thereby coupled to said ridge pole.

2. A supporting structure according to claim **1**; wherein said ridge pole is formed of sections with one end of each section telescoping into the end of the adjacent section and the slots are formed in both ends of each section; and said flat portion is placed in the slots as the sections are telescoped together so that said flat portion is disposed in the superimposed slots of the telescoping portion of two adjacent sections and said rafter support is thereby securely locked to said ridge pole when the latter is assembled.

* * * * *