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3,530,620

ELEMENT FOR THE CONSTRUCTION OF DOME-SHAPED STRUCTURES

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FIG. 1

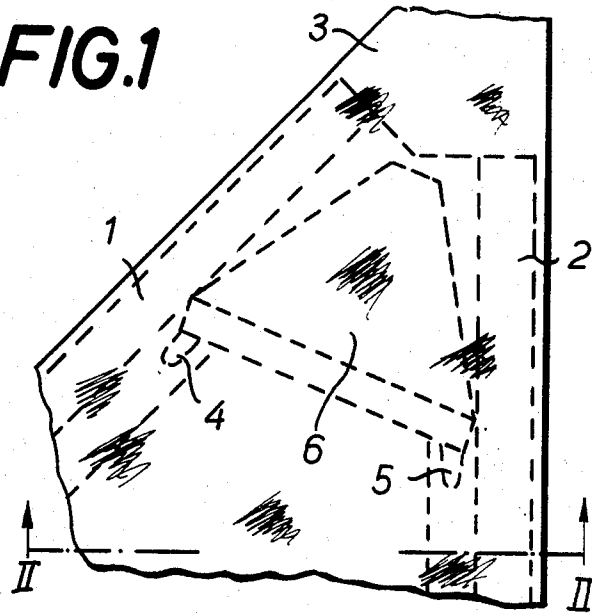


FIG. 2

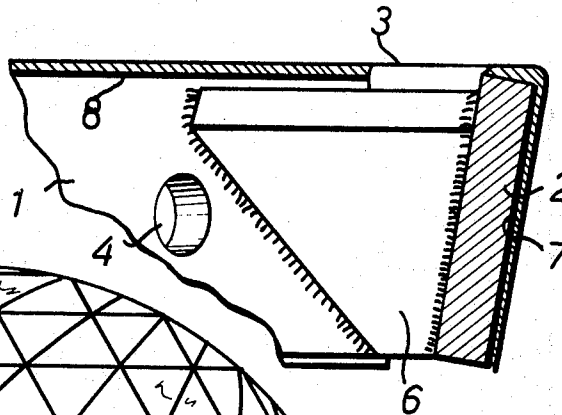
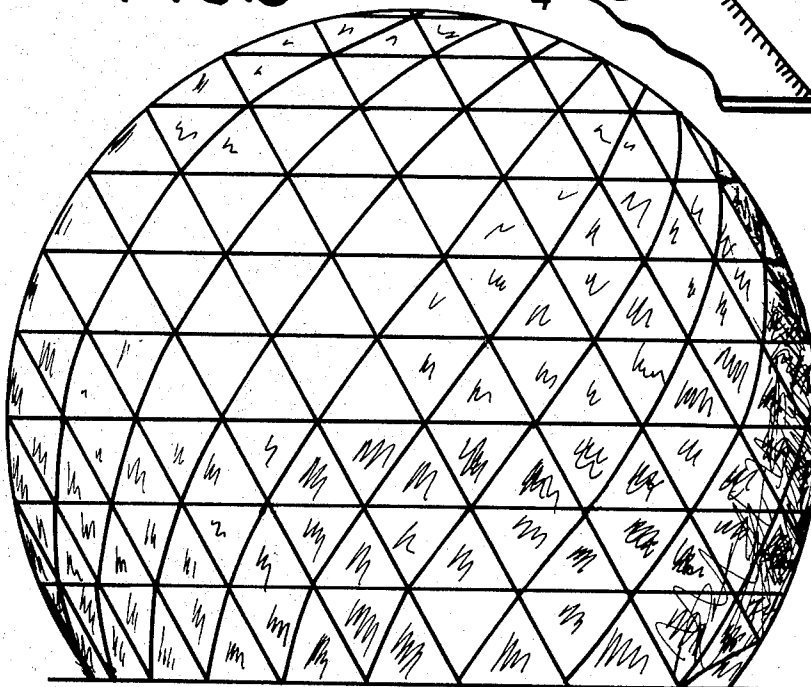


FIG. 3



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ELEMENT FOR THE CONSTRUCTION OF DOME-SHAPED STRUCTURES

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4 Claims

ABSTRACT OF THE DISCLOSURE

A triangular element for a dome-shaped structure such as a radome, comprises a covered triangular frame the sides of which are interconnected at the corners by means of obliquely positioned plates.

The present invention relates to dome-shaped structures, for example, protective domes for radar installations and antennas, the so-called radomes. Such domes can of course serve as construction for other purposes. The domes are constructed mainly of triangular elements the corners of which, in the finished dome, are tangential to a dome surface. Each triangular element normally consists of a frame and a diaphragm of plastic or metal secured thereto. The actual frame is normally made of metal, e.g. steel. This type of dome is mounted by bolting together the separate elements by means of bolts threaded through holes in the frame sides of the element.

The object of the present invention is to provide an element of such a construction that the shape of the element is securely maintained when subject to forces transferred through the bolts, preferably those bolts located closest to the corners of the elements.

It is further an object of the invention to provide a simple method of mounting the necessary diaphragms, and replacement of these.

In accordance with the invention an element is provided for the construction of dome-shaped structures, for example, protective domes for radar installations. The said element consists of a triangular frame and is characterized in that the separate sides of the frame are held together by means of corner plates positioned obliquely with respect to the plane of the frame and spaced at a distance from the corners.

In order to maintain the triangular frame, preferably trapeziform corner plates are employed, and the corner plates are arranged in such a way as to be neither horizontal nor vertical with respect to the plane of the frame. In this manner the corner plates secure both the angle of inclination of the sides in relation to the plane of the frame and the corner angle of the frame when subject to forces which are transferred through the bolt hole closest to the corner plates.

By mounting the corner plates spaced at a distance from the corners, the side ends of the frame are free and it is unnecessary to attach them together, for instance by means of welding, nor is it necessary for the side ends of the frame to meet. In fact, in the embodiment shown in the drawing, it will be seen that the side ends of the frame do not meet. This fact obviously facilitates the production of the triangular elements in that the exact corner connection, otherwise required, is unnecessary. It is important to note here that the construction of such dome-shaped structures requires comparatively great precision with respect to the separate elements, since errors quickly accumulate and become particularly noticeable in the final construction.

In accordance with the invention the necessary diaphragm of plastic or metal is secured to the frame in that the diaphragm is simply cut in the corners of the triangle and applied over the frame when mounting the elements. In the finished dome, the diaphragm is held in place by clamping the side of the element to an adjacent element the diaphragm being thus also clamped between two adjacent frame sides which are held together by means of the said bolts.

A simple and inexpensive production is achieved by means of the present invention, and also easy mounting, simple and reasonable replacement possibilities for the diaphragm and a secure attachment of the diaphragm to the frame.

The invention is further described in the following with reference to the drawing wherein

FIG. 1 shows a horizontal projection of an element corner,

FIG. 2 shows a section along the line II—II in FIG. 1, and

FIG. 3 shows, in diagram form, a dome constructed of elements according to the invention.

The corner of an element shown in FIG. 1 comprises two frame sides 1 and 2, together with a corner plate 6. The corner plate 6 is obliquely positioned, on the drawing at about 45° to the plane of the frame, and, as indicated in FIG. 2, is welded to the sides of the frame. By adjustment of the inclination of the corner plates the inclination of the frame sides may be adjusted, and the triangle may be readily varied. A bolt hole 4 is shown in the frame side 1, and a bolt hole 5 is shown in frame side 2, by which, as explained above, the separate elements are bolted together. A diaphragm 3 is applied on the element, as shown most effectively in FIG. 2, and an epoxy bonding agent 7 and 8 is disposed between the diaphragm and the sides of the frame. The use of the bonding agent is not absolutely necessary since the diaphragm will be maintained in sealing relationship between two frame sides when the elements are mounted in a dome as shown schematically in FIG. 3.

Having described my invention, I claim:

1. A triangular element for the construction of dome-shaped structures, comprising a triangular frame covered by a diaphragm, and corner plates obliquely positioned relative to the plane of the frame adjacent but spaced from the corners of the frame, each said corner plate being secured to and rigidly interconnecting two sides of the frame.

2. Element according to claim 1, characterized in that the sides of the frame are shorter than the corresponding sides of the triangle, in a manner such that said sides do not meet at the corners.

3. A dome structure comprising a plurality of elements according to claim 1 bolted together.

4. An element according to claim 1, characterized in that said corner plates are positioned at angles of about 45° to said plane.

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