

May 30, 1961

M. L. CLEVETT, JR
BASE RING FOUNDATION

2,986,242

Filed Dec. 23, 1958

3 Sheets-Sheet 1

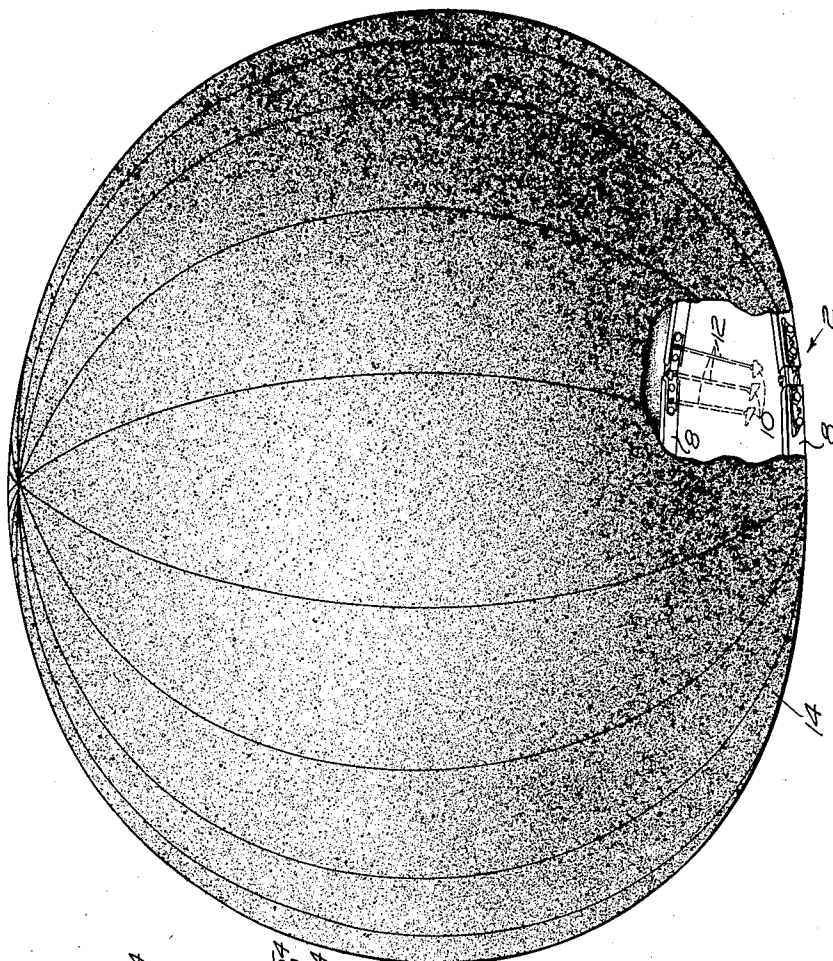
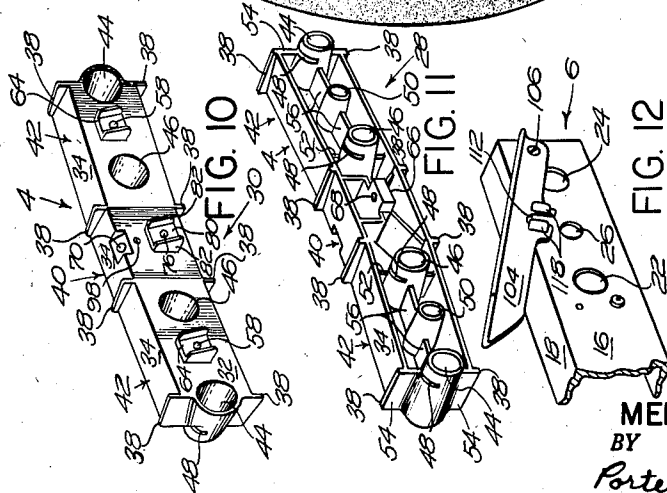


FIG. I



INVENTOR.
MERTON L. CLEVETT, JR.

BY
Porter, Chittick & Russell

ATTORNEYS

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M. L. CLEVETT, JR

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3 Sheets-Sheet 2

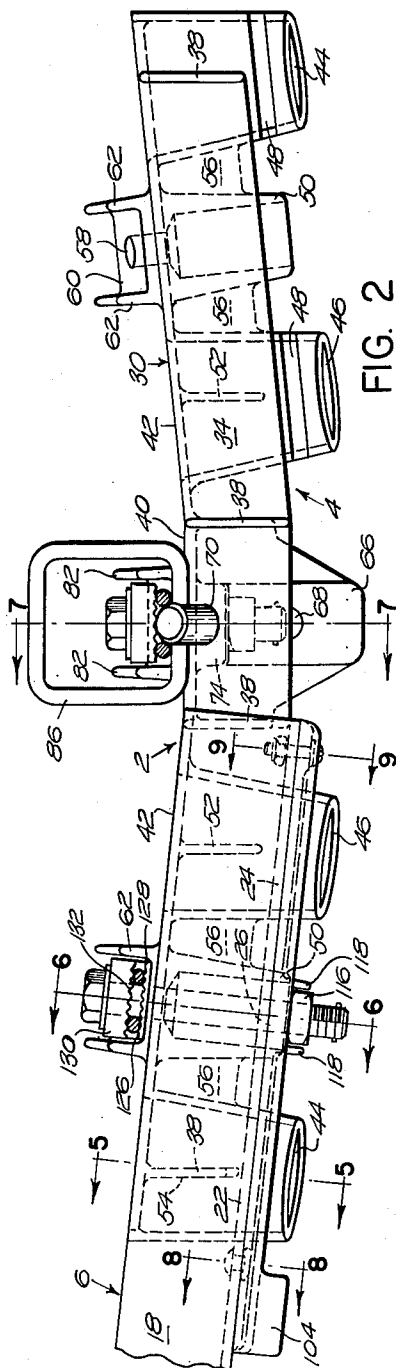


FIG. 2

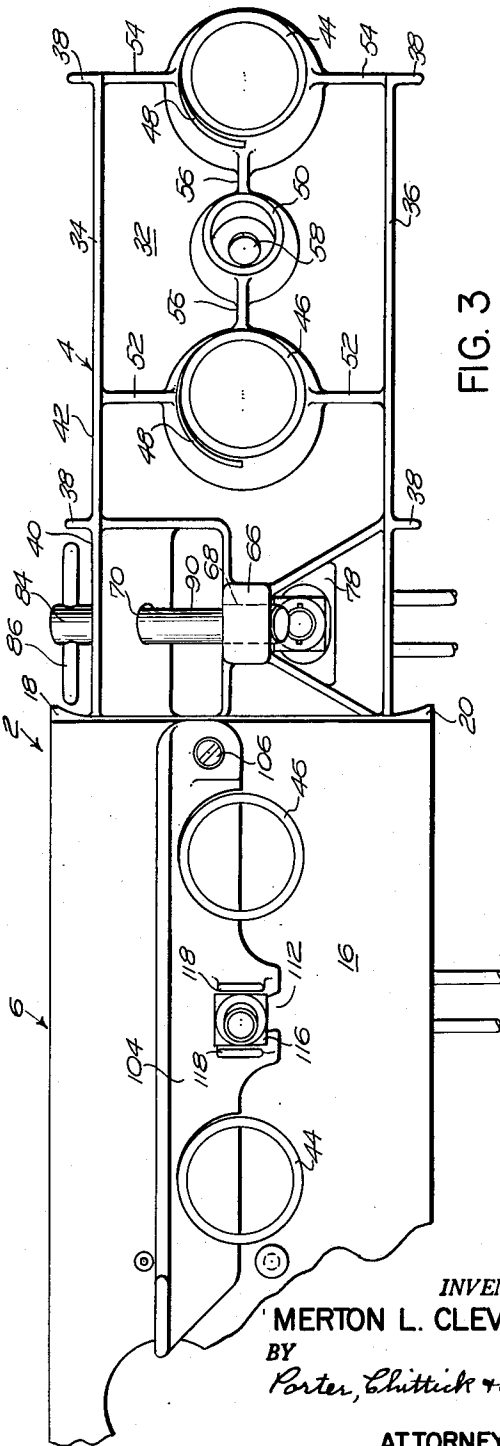


FIG. 3

INVENTOR.
MERTON L. CLEVETT, JR.
BY
Porter, Chittick & Russell
ATTORNEYS

May 30, 1961

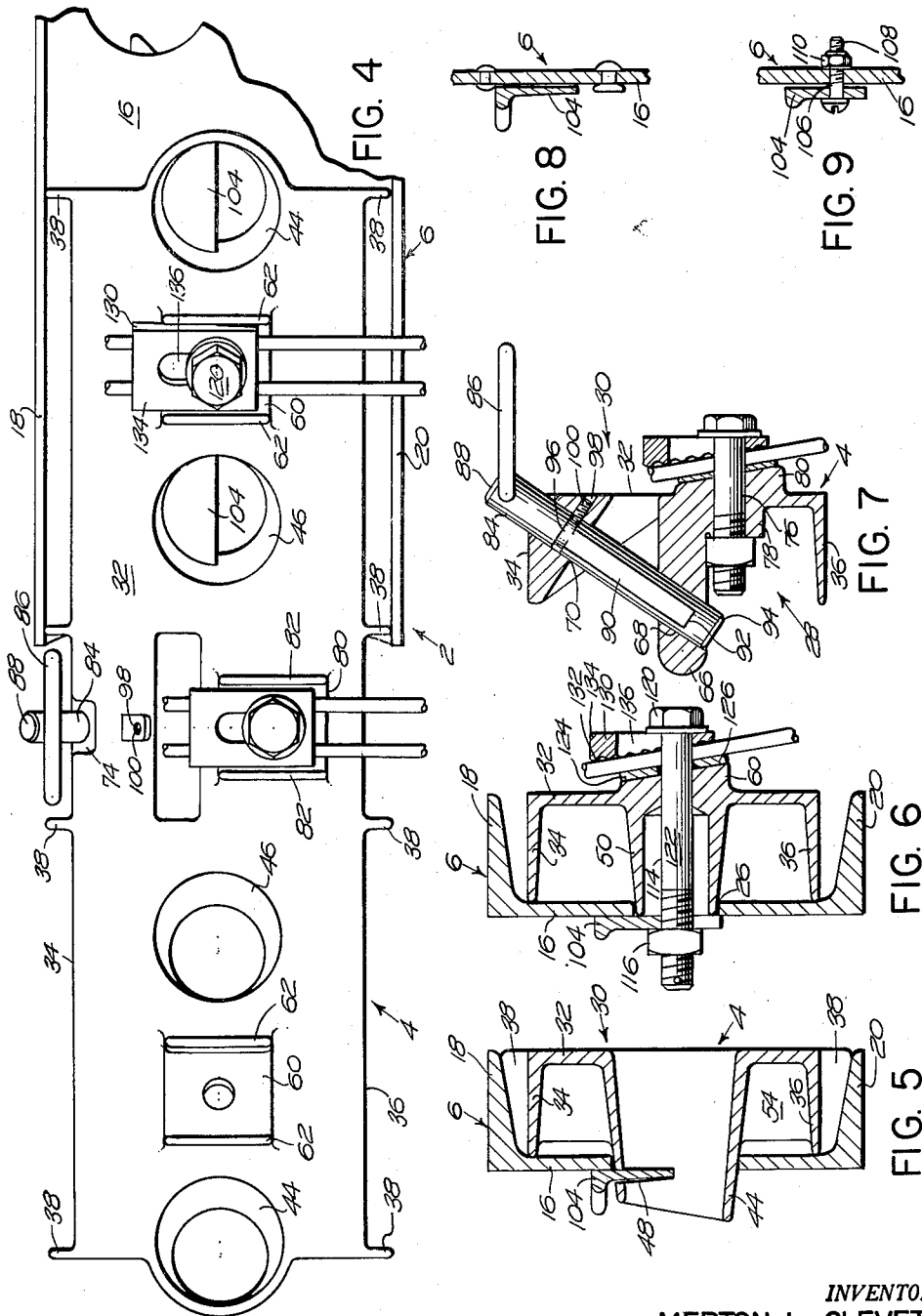
M. L. CLEVETT, JR

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BASE RING FOUNDATION

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3 Sheets-Sheet 3



INVENTOR.
MERTON L. CLEVETT, JR.

BY
Porter, Chittick & Russell

ATTORNEYS

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BASE RING FOUNDATION

Merton L. Clevert, Jr., Natick, Mass., assignor to Laconia Malleable Iron Company Inc., Laconia, N.H., a corporation of New Hampshire

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6 Claims. (Cl. 189—34)

This invention relates to an anchoring system for portable structures and more particularly to interconnecting units which form a base ring foundation for portable structures which are inflatable.

Since World War II at least, portable, inflatable structures have become commonplace in military usage. They can provide rapidly erected weather resistant enclosures of huge areas for personnel, supplies, and equipment. Moreover, the nearly spherical shape of the inflated fabric balloon structure is uniquely suited as a radome housing the large search radar antenna. Until now, however, the weak link in the speedy erection and secure anchoring of these often gigantic inflatable structures has been the mechanics of providing a foundation for the fabric balloon itself.

In the past the foundation systems, or base rings, which are anchored to the ground and to which the fabric structure is anchored, have been clumsy affairs, relatively heavy, complex and far too subject to breakdown. Assembling and anchoring these base rings required considerable labor, in some instances, six men working all day. Furthermore, the base ring had to be fully anchored before the fabric balloon could be attached and inflated, and once the structure was in use the adjustment of ground anchor cables and cables supporting the balloon was frequently impossible.

The various Armed Services have found that the inflatable structure fits many requirements of military operation especially in certain geographical areas such as the arctic and antarctic and of course in any situation where a large enclosed volume is required quickly. But, for as many years as the usefulness of such inflated structures has been recognized, another limiting factor in these structures has been the means employed for firmly anchoring them. Generally, the inflatable structures are of extraordinary volume. The tensions upon the securing system merely from the required inflating pressures puts a premium on secure anchoring. Furthermore, the gigantic outside surface area of a large balloon-shaped structure means that a hurricane force wind puts enormous stresses on the system used to keep the structure anchored to the earth. For example, in a 120 miles per hour wind encountered in the arctic, a radome atop a 35' base ring will put stresses on the base ring foundation and its anchors in the order of 5000 pounds every 40' around the periphery of the ring.

What has been sought is an anchoring system or base ring system for portable structures such as Geodesic domes and inflatable structures which is simple, easily erected by generally unskilled help, adapted to function in all climates, temperatures and geographical situations, is capable of withstanding the stresses of hurricane force winds, can be readily transported, and finally, which can be fabricated without undue complexity or expense.

It is an object of this invention accordingly to provide a base ring system for inflatable structures which is generally foolproof: that is one in which the steps of assembling are within the mechanical competence of un-

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skilled and untrained personnel. Another object of this invention is to provide a base ring system which can be quickly assembled. A further object of this invention is to provide a base ring system which is uncomplicated, easily transported, and relatively light in weight making it suitable for transportation in aircraft. A still further object of my invention is to provide a base ring unit the interconnecting means of which are positive, strong, and relatively simple. A further object of my invention is to provide an interconnectable base ring unit having numerous interlocking points thus increasing the security and reliability of the interconnection. Yet another object of my invention is to provide a base ring unit with a plurality of ground connection points permitting adjustment of the means for anchoring the base ring to the ground and to the fabric structure even after the base ring is in use.

In the accomplishment of these and other objects of my invention I provide a series of interconnecting base ring units, each of which has the shape of part of a large polygon although appearing to be slightly arcuate. A feature of the invention is that the units make use of angled connecting sections which in effect are slightly curved, and for convenience will be so considered. Thus, when locked together, the base ring units form a circle of desired dimension. Each unit comprises a U-shaped channel member of standard extruded aluminum or magnesium alloy stock fastened to a slightly arcuate cast connecting member which fits and locks ingeniously at the end of the U-shaped extrusion. Successive linkages of interlocking channels and arcuate connecting members create a base ring which is suitably anchored to the ground, and to which the inflatable fabric balloon structure can be attached. Important features of the invention are the connecting and locking means. Spaced holes are provided at each end of a channel section. Lugs protruding from the convex face of the connecting member fit between the channel flanges into these holes, and a latch arm pivoted on the outer web face of the channel engages slots in the tops of the lugs. This arrangement is the mechanical analogue of, and is equivalent in simplicity to a pivoted latch arm seating into hooks on a door and door frame. Unwanted vertical knuckle joint action is in part avoided by choosing the configuration and dimensions of the connecting member to make a reasonably close fit within the flanges of the channel members. Both vertical and horizontal knuckle action are eliminated by using the two or more spaced locking lugs, engaged by the latch arm.

Another feature of this invention is the manner in which the latch arm is prevented from coming out of the slots. The arm is notched at its lower edge to engage a bolt which passes from the inside face of the connecting member extending through a third hole in the channel between the two holes receiving the slotted locking lugs already noted. A simple nut on the aforesaid bolt tightened down on the edges of the notch insures that the latch arm will not unseat from its slots. To facilitate tightening the aforesaid nut from the inside of the base ring, another feature of the invention is the provision on the notch in the lever arm of vertical flanges to keep the nut from turning when the bolt head inside the ring is turned. While not only keeping the arm in place, a second function of this nut and bolt arrangement is that it provides still another locking point between channel and connecting member and is notable as a further feature of the invention.

Another important feature of the invention is the provision for securing ground anchor connecting cables to the connecting member. Each member is provided with three securing points which employ tension-tightening wedge clamps. A feature of the invention decreasing

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bulk and weight, is the simultaneous use of the same bolt and nut combination which keeps the lever arm seated on the outside of the base ring unit to compress the wedge plates securing the anchor cables on the inside of the ring.

Still another feature of the invention is the means provided at the middle of each connecting member for securing cable loops from the fabric balloon structure. A steel pin pointing inside the ring is positioned into two spaced oblique holes. The upper oblique hole runs from the intersection of web and flange in the middle of the connecting member; a bracket projecting from the convex face below the upper hole carries a corresponding lower oblique hole. A portion of the pin running from a lateral groove near the top of the pin to near the lower end is flattened on one edge. A set screw extends through the top oblique hole to fit the groove and only when the pin is turned around to the flattened portion can it be pulled out. Because the flattened portion does not run to the lower end of the pin, it cannot be pulled out all the way, but only the length of the flattened portion. To anchor the balloon cable the cable loop is placed around the pin when the pin is removed from the lower oblique hole. The pin is then pushed back into the lower hole until the set screw engages the groove; when the pin is turned off the flattened portion it is locked in place and thus secures the balloon fabric cable loop.

Yet another feature is the use of small upstanding ribs cast integrally with the flanges of the connecting member. These ribs not only serve to positively space the connecting member from the interior flanges of the channel member but their shape permits the connecting member at these points to conform to the slightly sloping cross-section of the interior of the channel.

These and other objects and features of the invention will best be understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration, and shown in the accompanying drawings in which:

Fig. 1 is a cut-away view of part of a base ring installation with the ring attached to the ground by ground anchors and connecting cables shown in phantom, and a fabric structure inflated to form a balloon-shaped enclosure attached to the base ring;

Fig. 2 is a top view of a single unit of a base ring structure comprising a channel member and a connecting member;

Fig. 3 is a view of the convex face or outside of a single base ring unit;

Fig. 4 is a view of the concave face or inside of a single base ring unit;

Fig. 5 is a cross-section of the base ring unit taken along the line 5—5 of Fig. 2;

Fig. 6 is a cross-section of the base ring unit taken along the line 6—6 of Fig. 2;

Fig. 7 is a cross-section of the base ring unit taken along lines 7—7 of Fig. 2;

Fig. 8 is a cross-section of a detail of the base ring unit taken along the lines 8—8 of Fig. 2;

Fig. 9 is a cross-section of a detail of the base ring unit taken along the lines 9—9 of Fig. 2;

Fig. 10 is a perspective view of the inside, concave face of the connecting member of the base ring unit;

Fig. 11 is a perspective view of the outside, convex face of the connecting member of the base ring unit; and

Fig. 12 is a perspective view of the outside of an end of the channel member.

In its general organization a base ring unit 2 consists of a slightly arcuate connecting member 4 which fits into and interlocks with straight channel members 6. The ends of the connecting member 4 link and lock with two sections of channel 6 and since the connecting section 4 is slightly arcuate, successive linkages of channels 6 and connecting members 4 form a large base ring 8. For accuracy, it should be noted that connecting members 4 are, in fact, not curved or arcuate, but slightly angled. It

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will be simpler, however, to continue to refer to the members 4 as though they were arcuate. Part of a complete ring 8 is shown in the cut-away view of a representative installation in Fig. 1. Ground anchors 10 can be seen, shown in phantom, securing the ring 8 to the ground by cables 12 connected to the base ring units 2. An air inflated balloon-like fabric structure 14 for men, supplies, radar antennae and the like is fastened in turn to the base ring 8.

The channel members 6 can be made up of any standard channel stock; relative lightness without great sacrifice of strength makes extruded aluminum or magnesium alloy channel the choice over steel channel. The size of stock used and the length of the channel member 6 will vary, of course, with the size of the completed base ring 8 desired. For example, in a representative base ring of 35' diameter, the channel member 6 will be cut into 40" lengths from standard aluminum or magnesium alloy channel with a web 16 dimension measuring approximately 6", the upper and lower flanges 18 and 20 measuring about 2". Of course, a larger ring would probably require somewhat larger, heavier and longer channel, a smaller ring would require less sturdy channel stock for satisfactory operation.

Referring now to Fig. 12, near each end of the channel 6 two spaced locking lug receiving holes 22 and 24 are cut or milled out of web 16, and as will be explained in detail below, these holes 22 and 24 will receive at each end of the channel 6 appropriate locking means from the connecting member 4 when the latter is fitted into channel 6. A bolt receiving aperture 26 is cut out of the web 16 between the lug receiving holes 22 and 24. Although not shown in the accompanying figures, the channel members 6 can be considerably lightened at only a small decrease in strength by drilling staggered holes in the web 16.

Turning now to the connecting section 4, Figs. 10 and 11 show in perspective the more complex configuration of both faces of the connecting section 4 as compared with the channel member 6 shown in Fig. 12. While the connecting section 4 could also be formed from ordinary channel stock, an unnecessary amount of complicated welding would be required; in any event, casting this section in aluminum or magnesium alloy has proved to be completely satisfactory both in terms of successful function and economy in fabrication.

The predominant shape of connecting section 4 is that of a slightly arcuate channel with an outside convex flange face indicated at 28 and an inside concave web face indicated at 30. The dimensions of web 32 and upper and lower flanges 34 and 36 respectively of the connecting member 4 are slightly less than the corresponding dimensions of web 16 and flanges 18 and 20 of channel member 6, thereby permitting the connecting member to be telescoped and seat completely within the flanges 18 and 20 of the channel.

To avoid vertical knuckle-joint action and uncertain fit when the connecting member 4 is seated within the flanges 18 and 20 of channel 6, as will be seen in Figs. 4, 5, 11 and 12, the upper and lower flanges 34 and 36 at each end of the connecting member are provided with small, integrally cast, upstanding, sloping transverse ridges 38. These ridges 38 cause the cross-section and size of the connecting member 4 to correspond to the interior configuration and size of the channel 6 precisely spacing the connecting member from the interior surfaces of the flanges 18 and 20 of the channel section.

For convenience in further describing the shape of connecting member 4, it can be divided into three segments as marked off by the ridges 38, a middle segment indicated at 40, and end segments indicated at 42. On each of the end segments 42 between the upper flange 34 and lower flange 36 cast integrally with the convex face 28, there will be seen two tapered, hollow projections or lugs 44 and 46 with transverse slots 48 near the tapered

ends thereof beyond the margin of the flanges 34 and 36. One lug 44 is at the very end of the segment 42 the other lug 46 is adjacent to the middle segment 40, lug 44 corresponding to the aperture 22 and lug 46 corresponding to aperture 24 in channel 6.

To give added strength to the integrally cast protruding lugs 46, transverse stiffening webs 52 extend between the flanges 34 and 36 and the lug. A similar transverse web 54 connects the lugs 44 between the flanges 34 and the lugs 36, and since the lugs 44 are at the ends of the connecting member 4 this stiffening web 54 also serves, in combination with the half periphery portion of the lug 44 itself to terminate each end of section 4.

Located longitudinally between the lugs 44 and 46, at each end 42 of the connecting member 4, and corresponding to the smaller bolt receiving aperture 26 in channel member 6, is a third hollow tapered lug, a bolt receiving lug 50, having a similar frustro-conical shape though smaller than the locking lugs 44 and 46 and lacking the slots 48 thereof. Fig. 2 shows the bolt receiving lugs 50 protruding slightly beyond the margin of the connecting member flanges 34 and 36, though less so than lugs 44 and 46. Finally, the bolt receiving lug 50 is made integral with the locking lugs 44 and 46 by longitudinal stiffening webs 56.

Disposed about the axis of an aperture 58 in bolt lug 50 and integrally cast with the connecting member 4 on its inside, concave face 30, is a raised, sloping pedestal 60 having a vertical retaining flange 62 on each side thereof. The pedestal 60 is substantially rectangular but its surface 64 slopes, the pedestal sloping outward from the face 30 toward the bottom flange 36. The function of pedestal 60 and its flanges 62 will be described later in the narrative.

It will be seen in Fig. 2 that the two straight end segments 42 join the middle section 40 of connecting member 4 at a slight angle, in the order of 6°. It has already been noted that the outside face 28 of the member 4 has convex configuration. Thus it is apparent that to call the connecting member 4 slightly curved or arcuate is not entirely accurate. In fact, however, since the equivalent circular arc embraced by a connecting member 4 is a mere 12°, only close observation indicates that the connecting member is not a curved section. Casting the connecting member in an angular rather than an arcuate shape is easier and less expensive. In any case, there is no difference in function between an actually curved member and the faceted segment herein employed.

Looking more closely at the middle section 40 of connecting member 4, Fig. 7 shows that at the convex face 28 a bracket 66 carrying an oblique aperture 68 protrudes at right angles to the face 28. A corresponding oblique aperture 70 runs through an integrally cast built-up section 72 located between the top flange 34 and web 32, emerging outside the connector 4 at a junction 74 seen in Fig. 4 of web 32 and flange 34. Beneath the bracket 66, a bolt receiving aperture 76 runs at right angles through a built-up step 78 emerging in a sloping pedestal 80 with vertical flanges 82 on the concave side 30 of the member 4, the pedestal and flanges being identical with the pedestal 60 already described.

Inserted in the oblique apertures 68 and 70 is a steel locking pin 84 which emerges at the junction 74 of web 32 and flange 34 carrying a loop 86 on the upper end 88. As will be explained below, this pin 84 engages cable loops (not shown) on the fabric balloon structure 14. The pin 84 is cylindrical except for a flattened portion 90 running along the length of the pin from a point 92 just above the lower end 94 to a transverse groove 96 in the pin located near the top end 88. A small hole 98 runs from the inside concave face 30 of the connector 4 through the upper oblique aperture 70. This hole 98 receives a small retaining screw 100 inserted therein after pin 84 is in place in the oblique aperture 70. The screw 100 is turned in until it just makes contact with the flat-

tened portion 90 and is then backed down slightly. The depth of groove 96 is the same as the extent of the flattening of portion 90. When the pin 84 is fully inserted, the screw 100 seats within the walls of groove 96 and permits the pin 84 to turn 360° when groove and screw are aligned. Only when the groove 96 of pin 84 is turned around screw 100 bringing the flattened portion 90 adjacent to the screw, can the pin 84 be pulled out of aperture 68. Because the flattened portion 90 does not extend completely down to the lower end 94 of pin 84, the pin can be pulled up only to the point where the screw 100 hits a vertical abutment wall 92 near the lower end 94 of the pin where the flattened portion 90 terminates. While the pin 84 can be flattened on any chord of its circumference it is most convenient to place the plane of the flattened portion 90 at right angles to the plane of the loop 86 when the loop is upright in relation to the pin. Thus, when the pin 84 is rotated 90° in one direction to bring the flattened portion 90 in contact with screw 100, the pin can be pulled out of its position in the lower oblique hole 68 to engage a structure retaining cable loop.

To attach a channel member 6 to a connecting member 4, the convex face 28 of the connecting member is placed between the flanges 18 and 20 of the channel with the locking lugs 44 and 46 which protrude from the convex face inserted into their respective receiving holes 22 and 24 on the channel. When the locking lugs 44 and 46 are fully inserted into their respective receiving holes 22 and 24, the slots 48 in the lugs will be located just beyond the outside margin of the web 16 of the channel 6. A lever arm 104 pivoted on the outside web 16 of channel 6 secures the connecting member 4 to the channel when the arm is moved into place in the slots 48 of the locking lugs 44 and 46. Each channel member 6 has two such latch levers 104, one at each end of the channel thus locking a connecting member 4 with channels 6 at each end. Pivot points 106 for each lever arm 104 are located close at the ends of the channel member 6 and consist simply of a small threaded bolt 108 passing through a hole in the lever arm 104 and a hole in web 16 of the channel, secured by a nut 110 on the inside of the channel as shown in the detail in Fig. 9. The use of two spaced lugs, rather than one, in their respective holes minimizes vertical knuckle action between connecting member and channel. The effect of latch arm 104 seated in the two grooves 48 close to the web face 16 not only locks the connecting and channel members together but also minimizes any tendency to horizontal play between them.

To decrease the possibility that latch lever 104 might be jarred loose and thereby unseated from the locking lug slots 48, a notch 112 is provided in the lower edge of the lever arm at a point where the notch may engage a bolt 114 which passes through an aperture 58 in the smaller lug 50 from the inside, concave face 30 of the connecting element 4. The notch 112 is just wide enough to engage the shaft 122 of the bolt 114 and has just enough depth to permit the lever arm 104 to seat well within the slots 48 of the locking lugs 44 and 46. Since the notch 112 is just large enough to engage shaft 122, a nut 116 threaded on bolt 114 when tightened will engage the lever arm 104 around the notch 112 securing the lever arm in position in the slots 48 of the locking lugs. Because generally, in use, the convex or outside face 28 of the connecting member 4 will be relatively inaccessible, the notch 112 on the lever arm 104 is provided with small vertical upstanding flanges 118 on either side thereof. These flanges 118 keep the nut 116 from turning, thus permitting the nut to be tightened down from the bolt head 120 at the concave inside face 30.

The effect of nut 116 being tightened down on the lever arm 104 is not only to keep the arm from unseating from slots 48 of the locking lugs 44 and 46, but also to provide a further means of interlocking connecting mem-

ber 4 and channel 6. Apart from the locking effect of the locking lugs 44 and 46 and latch lever arm 104 combination, the nut 116 securing the lever arm 104 at the notch 112 has the same locking effect as placing a washer with an outer dimension larger than the bolt receiving aperture 26 on the shaft 122 of bolt 114 protruding through the channel 6 and then tightening up a nut on the bolt.

But tightening the nut 116 on bolt 114 is designed to serve still another function. As will be seen in Figs. 2, 4 and 6, the shaft 122 of bolt 114 passes through two ground anchor cable securing plates 124 and 130 and a washer mounted on the pedestal 60. The plate 124 immediately adjacent to the surface 126 of pedestal 60 is flat and while not completely distinguishable in the drawings has the same rectangular shape and size as the pedestal surface, its outside face 128 being knurled or otherwise roughened. Next to the inside plate 124 is a wedge-shaped plate 130, its surface 132 abutting the knurled surface 128 of the inside plate is also knurled and it too is about the same rectangular size as the pedestal surface 126. While the inner plate 124 has merely an aperture to permit the bolt shaft 122 to pass therethrough, the outer, wedge-shaped plate 130, has a vertical slot 136 which permits limited vertical movement of the plate 130 between the flanges 62 of pedestal 60. The knurled faces 128 and 132 of plates 124 and 130 respectively, provide a means of gripping the connecting cables 12 from ground anchor 10 when the bolt 114 and nut 116 combination are tightened to lock the latch lever 104 in place, thereby compressing the two plates together, securing the cables inserted therebetween as shown in Figs. 4 and 6.

Both Figs. 6 and 7 show the position of the wedge-shaped plate 130, when anchor cables 12 are in place, the thicker part 134 near the top flange 34. The effect of such placement is to cause a tightening of the grip on the cable between the two plates when the cable is put under tension by the inflated structure and tends to pull the wedge downward, increasing the compression between the plates. To prevent the wedge-shaped plate 130 from being turned around by inadvertence so that the thicker section 134 is toward the bottom flange 36, the slot 136 is cut out off-center, enough so that it will not fit between the flanges 62 when the thicker part of the wedge is turned toward the bottom flange.

A base ring 8 is formed by interconnecting channels 6 with connecting members 4. The latch lever arms 104, however, are not tightened down until the ground anchors 10 have been put in place adjacent to the ring units 2 and the ground anchor connecting cables 12 are inserted between the ground anchor cable securing plates 124 and 130 on the inside face 30 of the connecting member 4. The cables 12 and arm 104 are secured simultaneously by tightening the triple purpose nut 116 and bolt 114 combination.

Once the ring 2 is completed and secured by ground anchors 12, the fabric structure 14 can be fastened to the ring 8. This is readily accomplished either from inside or outside the ring by simply twisting pins 84 a quarter turn to bring the flat portion 90 of the pin next to the retaining screw 100, lifting the pin to remove it from the lower oblique hole 68, placing a cable loop (not shown) attached to the fabric balloon structure around the pin, replacing the pin in the lower oblique hole, and turning the pin back a quarter turn. When all the necessary balloon fabric attaching cable loops are thus attached, the structure 14 can be inflated.

Periodically, it may be necessary to tighten up the ground anchor cable 12 connections to the ring 8. Since there are three possible points at each of the pedestals 60 and middle section pedestal 80, for connecting the anchor cables 12 to connecting members 4, if any two pedestals are used, the adjustments required can be made on one, while the other continues to provide securing means.

Certain minor variations of this preferred embodiment

will be apparent to those skilled in the art; and, therefore, it is not my intention to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus described and disclosed a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a base ring foundation for portable structures, interconnecting units comprising elongated first and second members; said first member with an inside and outside planar face having openings at each end in said face, said second member being slightly arcuate along its length with an outside convex face and an inside concave face, means including latch hook elements on said convex face at each end thereof corresponding to and located in said openings in said first member, latch arm means on said first member engaging said hook means on said convex face in locking relation, means for connecting said units to a portable structure, means for providing an additional locking point between said members, means for assuring the continued engagement of said first member hook means in locking relation with said latch arm means on said convex face of said second member, and means for securing said units to suitable ground anchoring connections.

2. In a base ring system for an inflatable structure, interlocking telescoped units of channel members and connecting members forming a large polygon; said channel member being an elongated channel having a web, upper and lower flanges, an outside web face and inside flange face, said web having spaced apart holes at each end of said channel; said connecting member being slightly arcuate along its length having two end sections connected by a middle section, said connecting member further having a concave web face, a convex flange face and a substantially U-shaped cross-section smaller than the cross-section of said channel member whereby said connecting member may be telescoped and seated within and between said flanges of said channel member, said connecting member having spaced-apart lugs at each said end thereof projecting from said convex face, said lugs corresponding to and extending through said holes in said channel members, said lugs having transverse slots in the portion near said channel upper flange beyond the margin of said channel web face, means including a pivoted arm member engaging said slots in latching relation, means for securing said latch member in said slots, means for securing said units to suitable anchoring cables, and means for securing said units to structure retaining cables.

3. The base ring units defined in claim 2 said channel members each having an aperture in the web portions thereof, said apertures corresponding when said channels are telescoped, said latch arm having a notched portion in the lower edge thereof with an upstanding vertical flange near a margin of said notch, said notch corresponding to said apertures when said arm seats in said slots, said notch engaging a bolt shaft passing through said apertures, ground anchor securing means at said inside concave face under the head of said bolt comprising the combination of a built-up pedestal on said second member concave face disposed about the longitudinal axis of said bolt, said surface being knurled and sloping downward toward said upper flange of said second member, with upstanding vertical ears located on each side of said surface, the shaft of said bolt passing through a vertical slot in a wedge-shaped plate seating between said ears, said vertical slot being sufficiently off center to permit the said wedge to seat between said vertical ears only when the thicker part of the wedge is adjacent said upper flange, said wedge plate having a knurled surface adjacent said pedestal knurled surface between which surfaces ground anchor cables may be secured, the tightening of said nut simultaneously securing said arm and said cable connecting means and providing a further locking point

between said channel members, the said vertical notch flange disposed close enough to said nut to permit tightening said nut from said bolt head.

4. A base ring comprising alternately connected straight members and arcuate members having a convex face, means for interlocking said members to prevent relative horizontal and vertical motion therebetween said means comprising at least two connection points between each connecting member and each straight member, and means for connecting to an inflatable structure comprising a bracket extending outwardly normal to the plane of said convex face having an oblique, pin receiving hole near the outer end thereof, said connecting member having a corresponding oblique hole in the said convex face above said bracket, with a removable pin located in said holes.

5. In a base ring system for an inflatable structure, interconnecting units comprising elongated first and second telescoped U-shaped channel members, said first member having a web portion and an outside web face, and upper and lower flanges, said second member having a web portion and upper and lower flanges, said second web being smaller than the space between said first member flanges whereby said second channel fits between said first flanges, walls in said first web forming an opening at each end of said first channel member, said second channel member having a slightly arcuate shape along its length with a convex flange face and concave web face, means including projections on said second member between said flanges on said convex face corresponding to and engaging said openings in said first channel when said second member is telescoped within said first channel flanges, means on said first channel cooperating with said means on said second channel to interlock said channels, means for securing said units to ground anchor connections, means for connecting to said inflatable structure, said openings further characterized as being spaced apart holes and said corresponding projections

having slots located in an upper part thereof beyond the margin of said first channel outside face when said projections are fully inserted in their said corresponding holes, said means on said first channel comprising a pivoted latch arm on the outside face thereof seating in said slots at one limit of its pivoted arc and removable from said slots at the other limit of its arc, means for securing said latch arm in said slots, means for providing an additional locking point between said channel members, and means for securing ground anchor connections thereto.

6. The combination defined in claim 5, said first and second members having corresponding holes normal to said faces, said latch when in locking engagement with said slots having a notch corresponding to said holes, a bolt passing through said holes with a nut thereon bearing upon the edges of said latch arm forming said notch, and ground anchor connecting cable clamp means under the head of said bolt on said concave inside face whereby tightening said nut simultaneously secures the said latch arm in its slots compresses the cable clamp means and provides an additional locking point between said first and second members.

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