

April 11, 1961

W. H. FISCHER

2,979,064

INFLATABLE BUILDING CONSTRUCTION

Filed Oct. 9, 1958

11 Sheets-Sheet 1

Fig. 1.

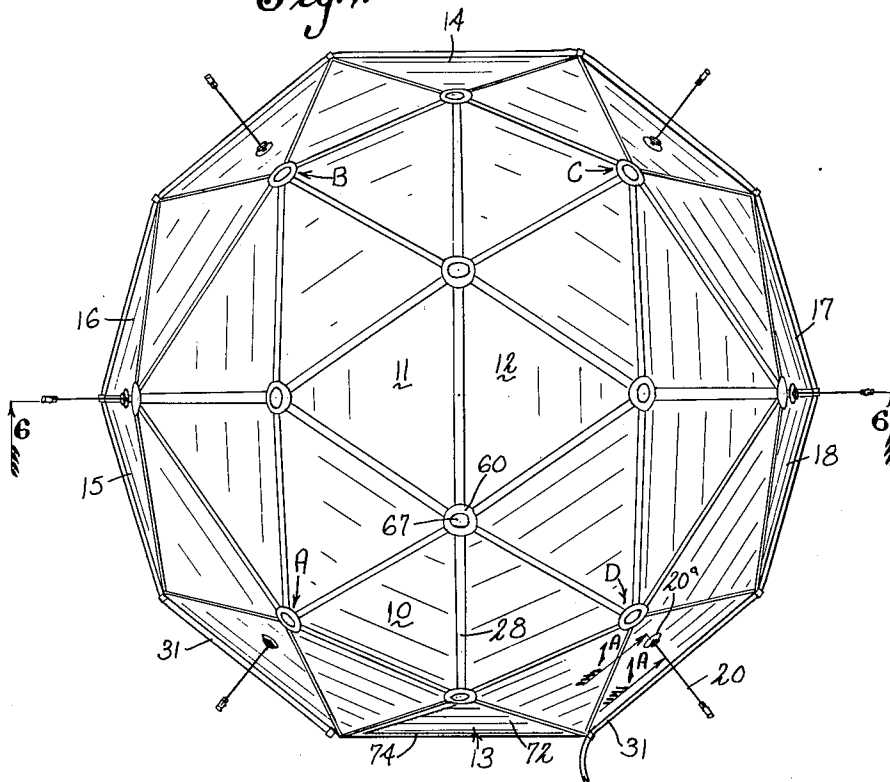
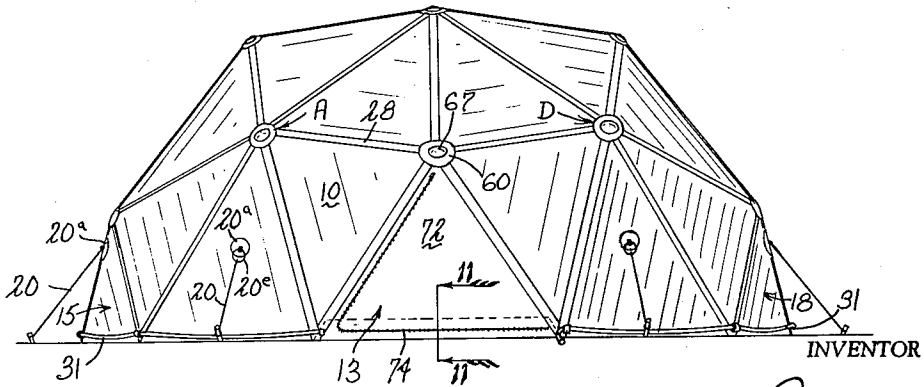


Fig. 2.



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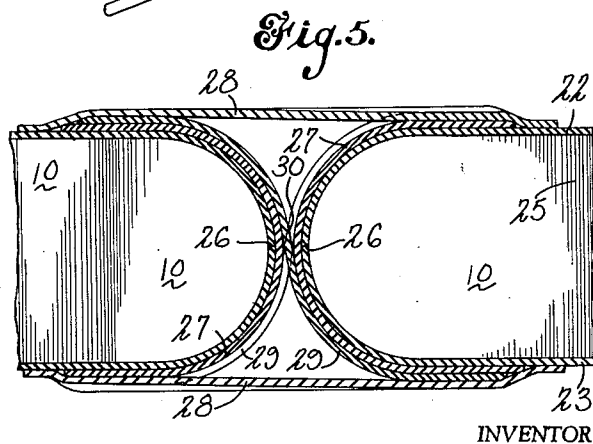
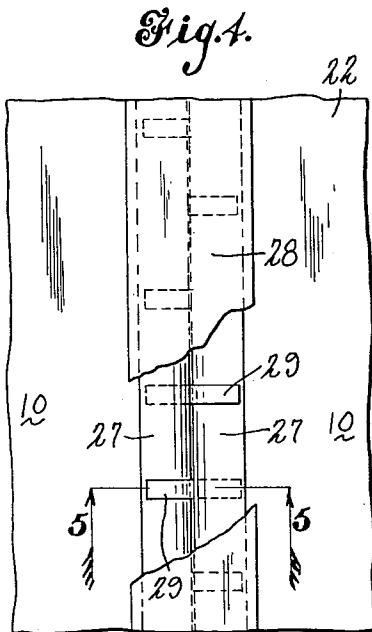
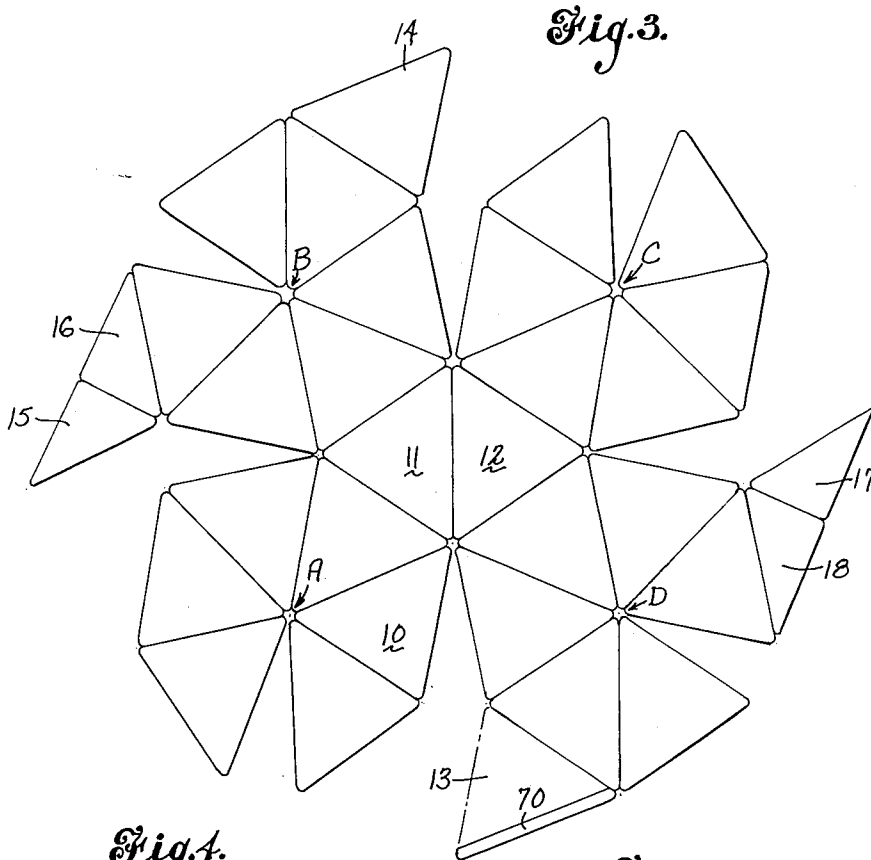
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INFLATABLE BUILDING CONSTRUCTION

Filed Oct. 9, 1958

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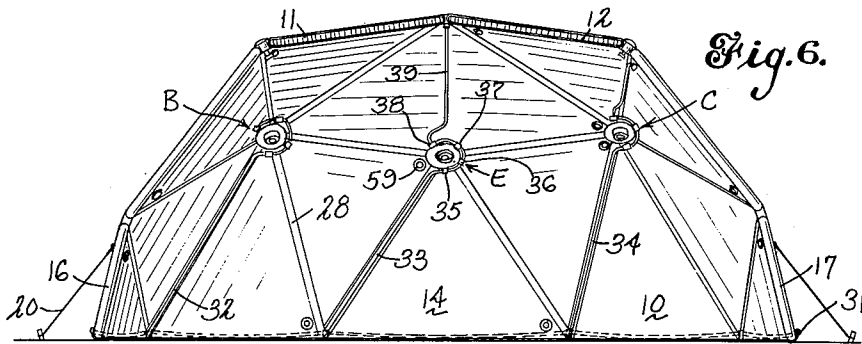


Fig. 7.

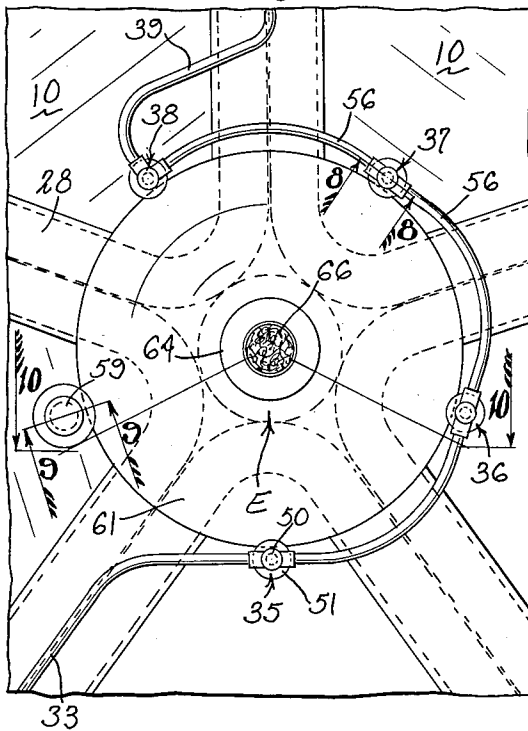


Fig. 8.

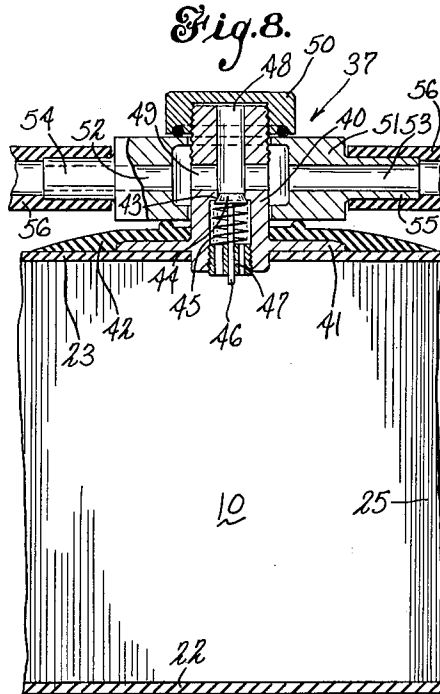
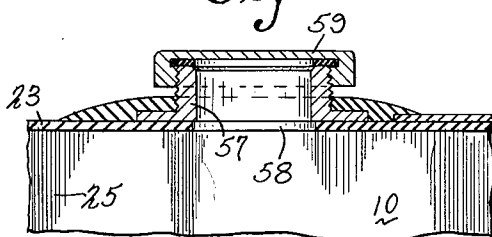


Fig. 9.



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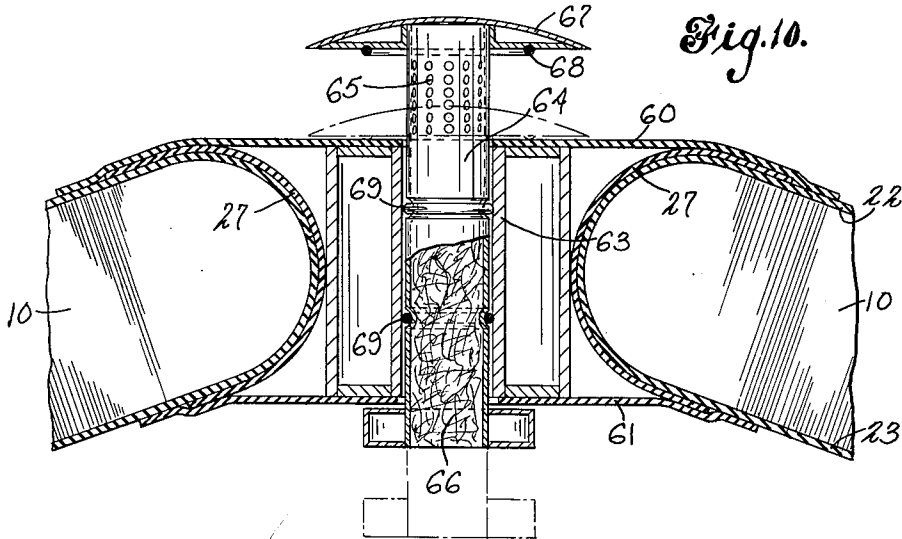


Fig. 10.

Fig. 11.

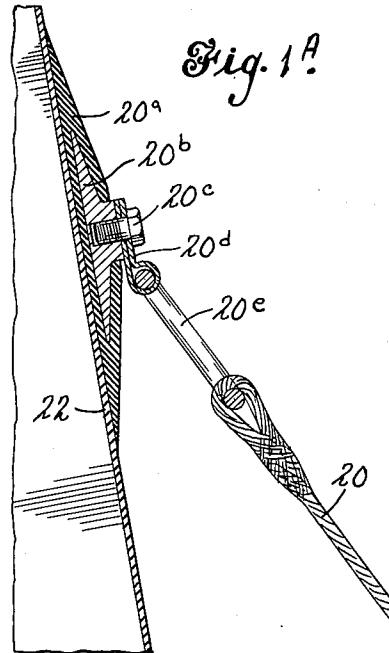
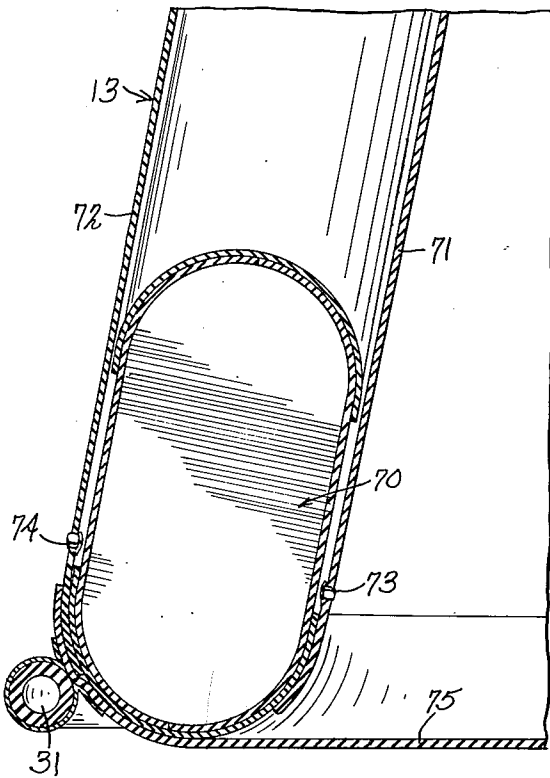


Fig. 1A.

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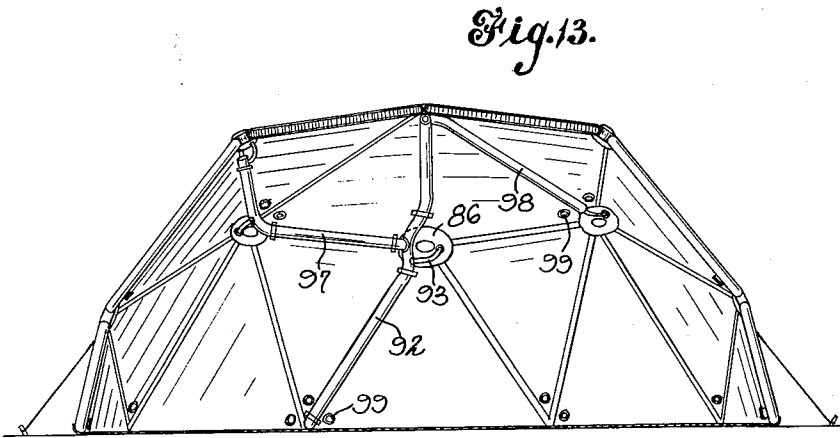
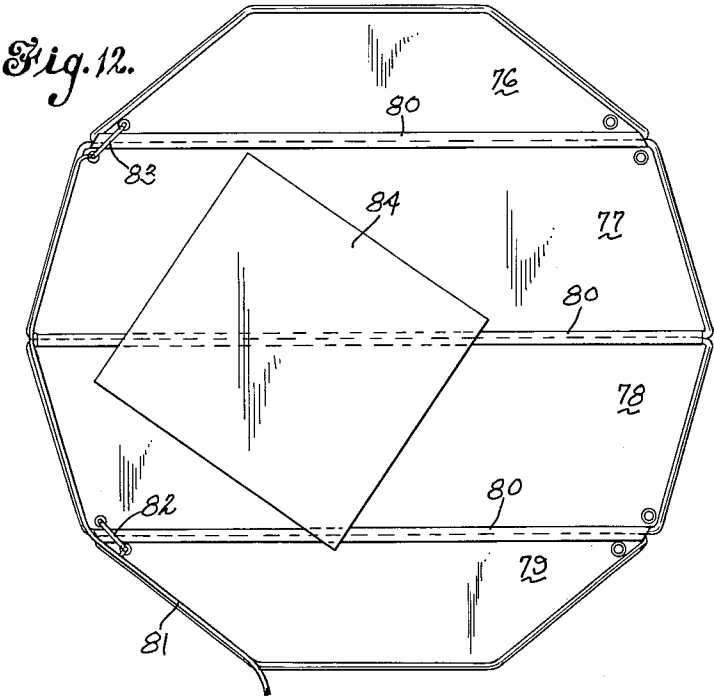
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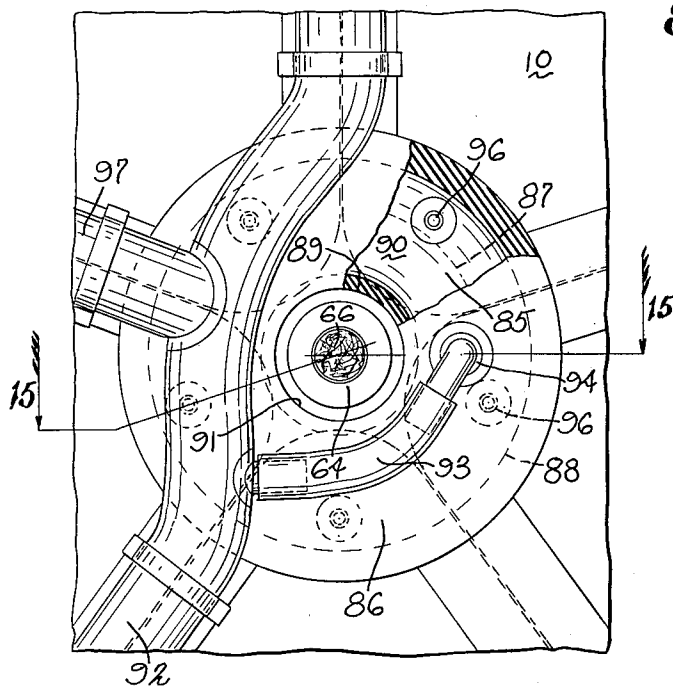


Fig. 14.

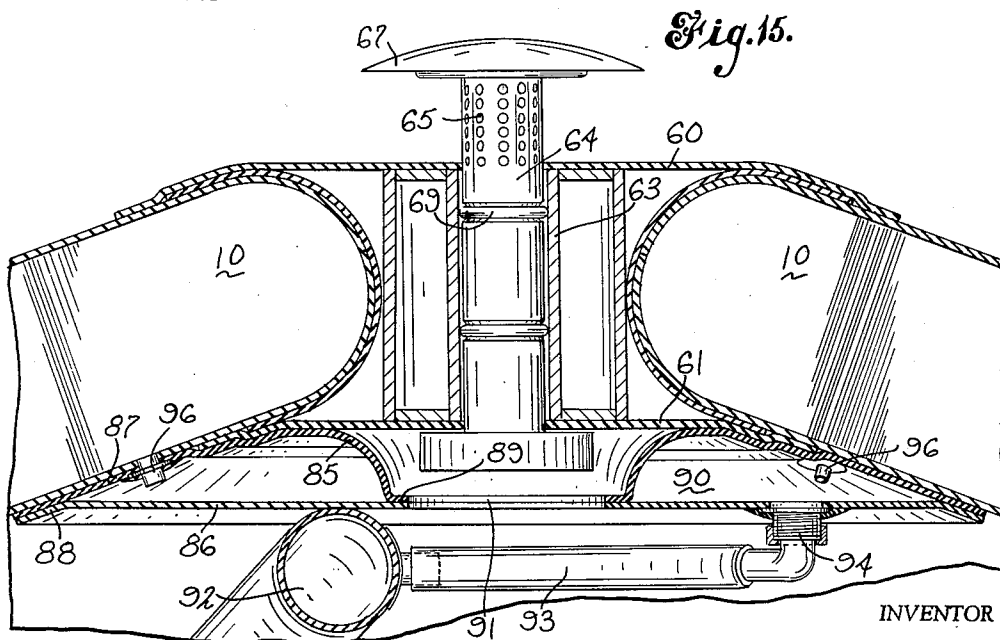


Fig. 15.

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Fig. 16.

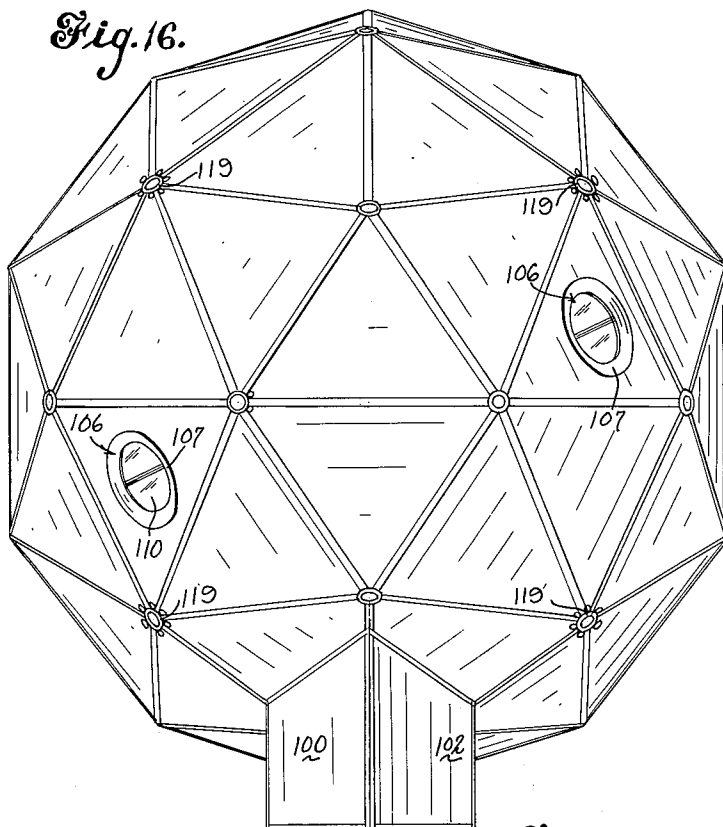
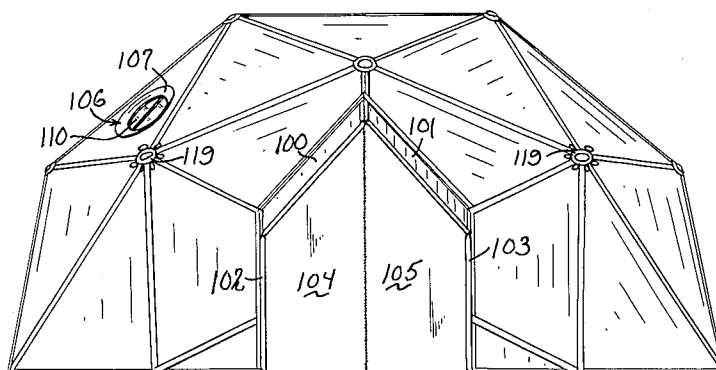


Fig. 17.



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Fig. 18.

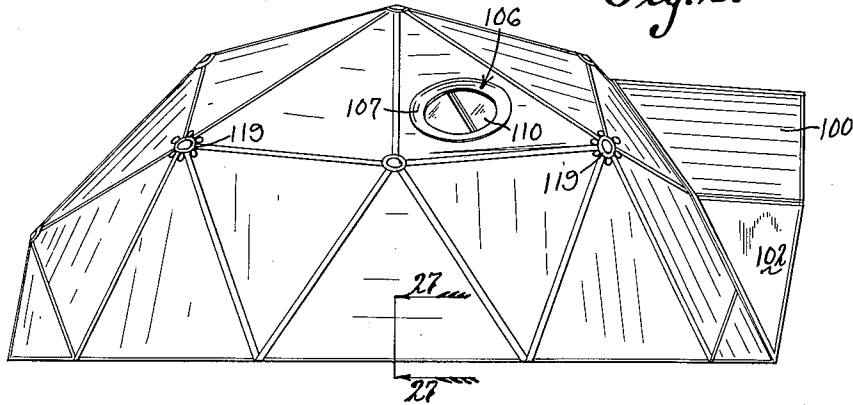
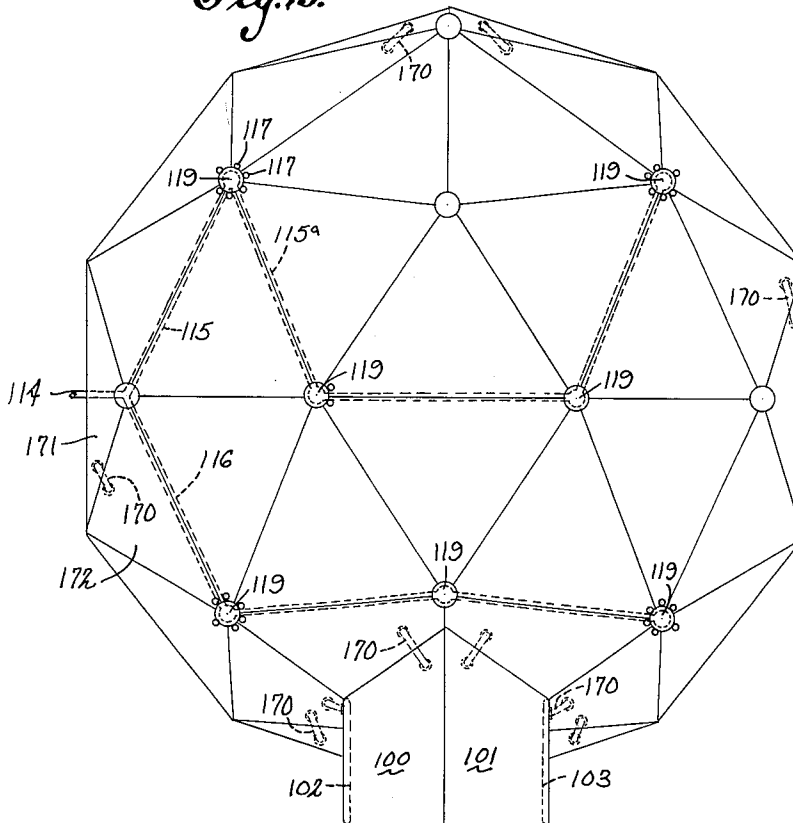


Fig. 19.



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Fig. 20.

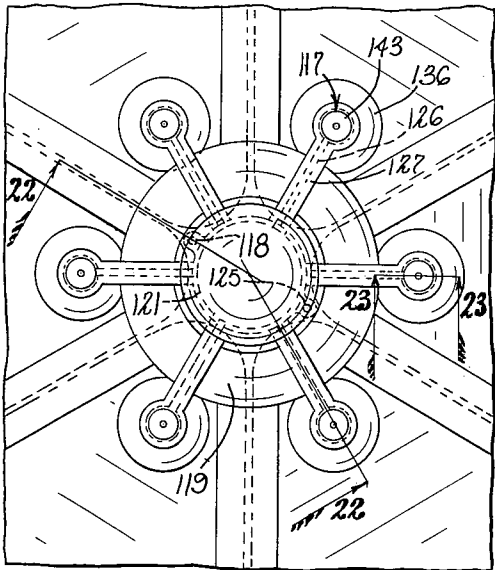


Fig. 21.

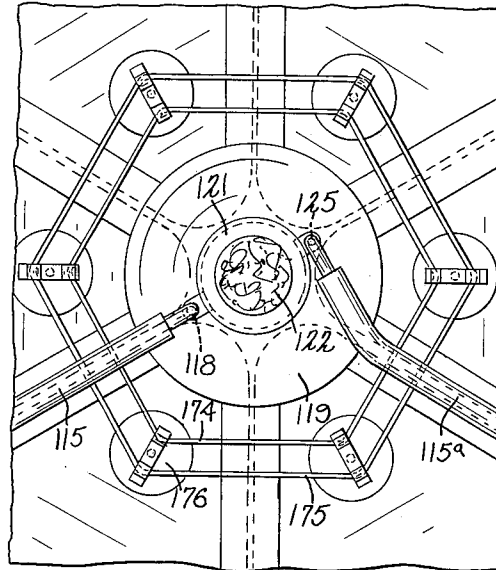
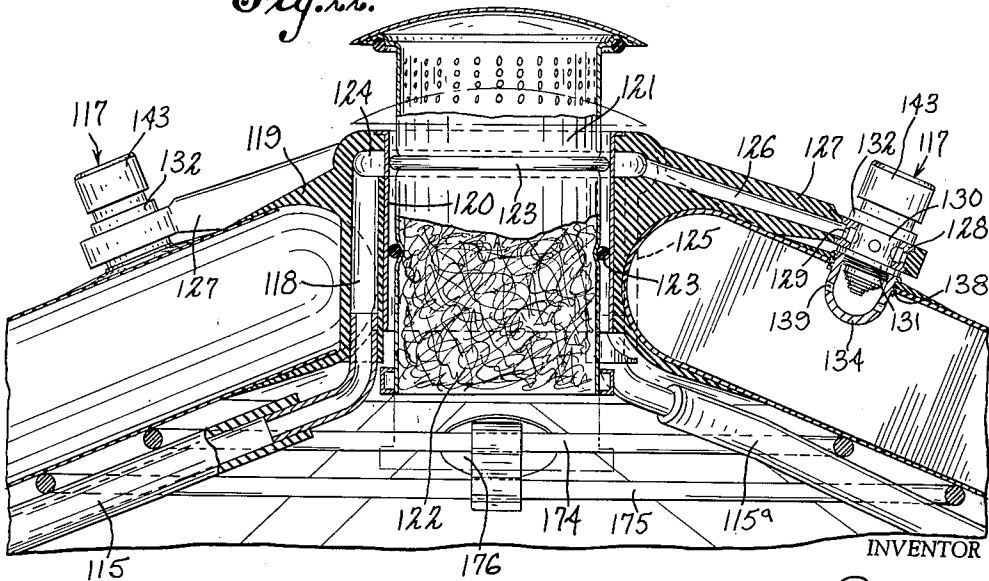


Fig. 22.



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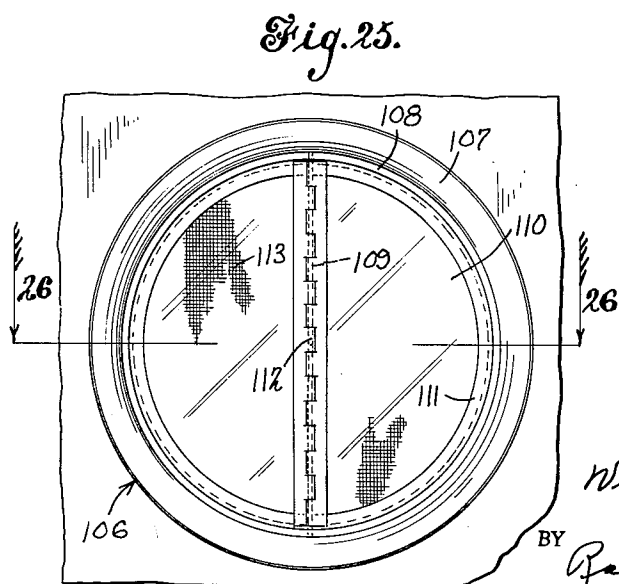
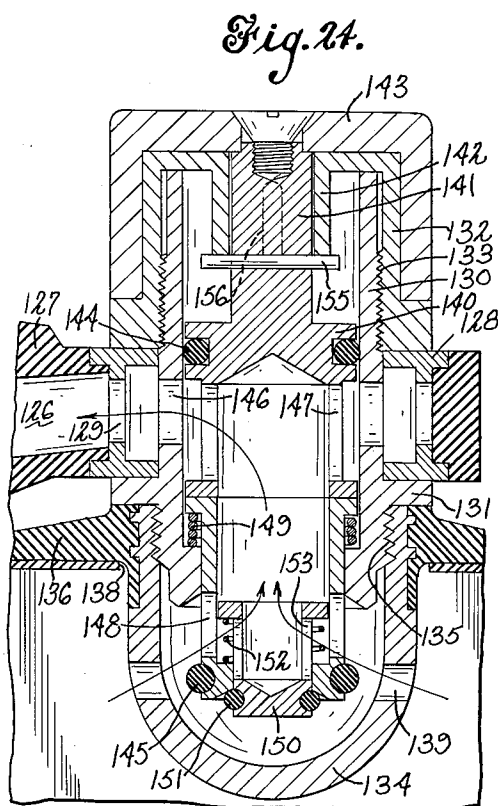
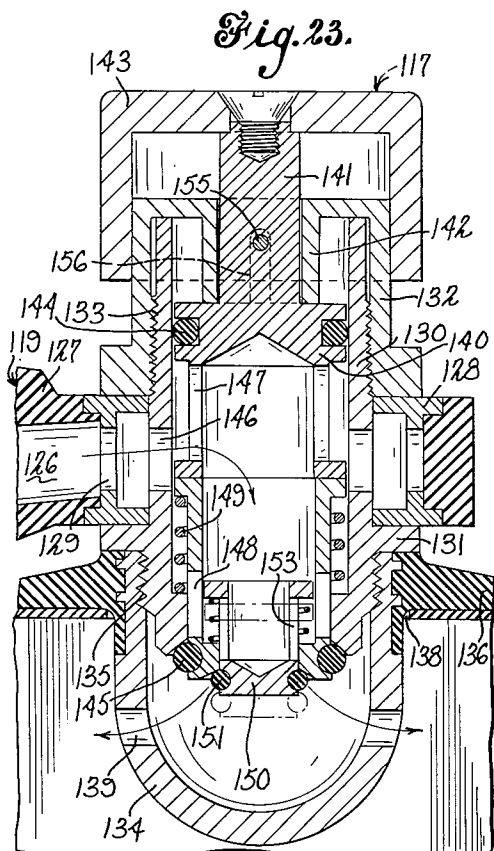
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Fig. 26.

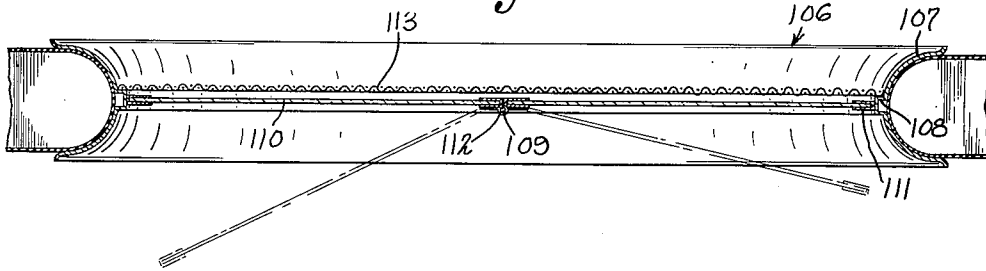
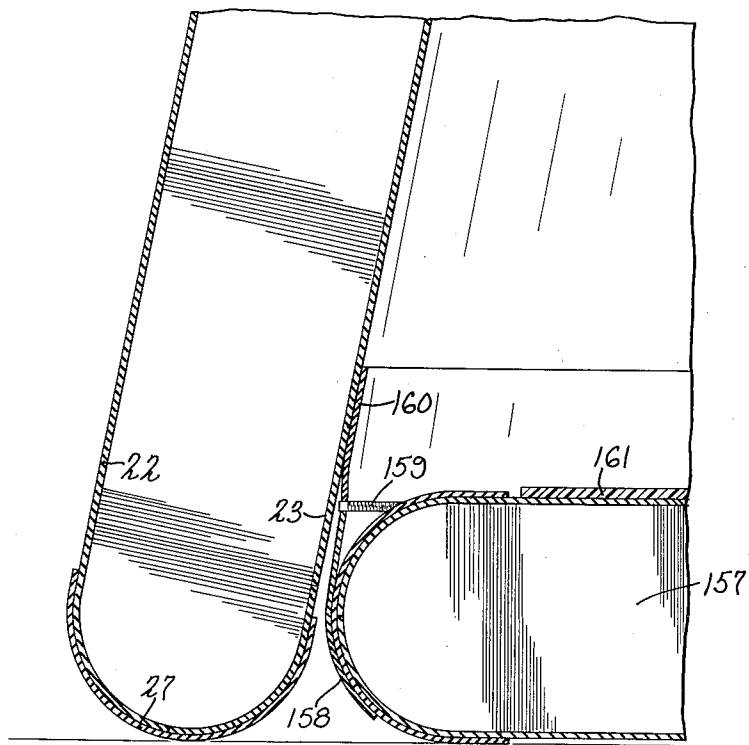


Fig. 27.



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INFLATABLE BUILDING CONSTRUCTION

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8 Claims. (Cl. 135—1)

This invention relates to an inflatable building construction and more particularly to a building construction or shelter of domelike form constructed of inflated units suitably secured together in such a pattern that the building will be self-supporting without the use of struts or the like.

There are many instances where it is desired to employ a shelter or building structure which will be of temporary character, of relatively light weight, and which may be dismantled or folded into a relatively small space when it is desired to transport the structure from one place to another.

At the same time the structure should be of such form that it will possess suitable strength and rigidity when set up and will be durable and able to withstand the elements.

According to the present invention and as illustrated herein, the structure is in the form of a dome of generally semi-spherical shape, being constructed of units of triangular form arranged in a geodesic structure. Each of the triangular units comprises a panel of double-walled construction, the walls being secured or tied together by strands which will limit their separation when air under pressure is introduced into the unit between the spaced walls thereof. These units or panels are secured together in a certain pattern or configuration to form the dome-shaped structure in such a manner that, when the units are inflated, a rigid self-supporting structure will result which will rest upon a surface such as the ground, for example, and will require no struts or reinforcement to retain its dome shape and, therefore, provide a housing structure or shelter of considerable capacity in relation to its diameter.

Arrangement is made for inflating all of the separate panels or units from a single source and likewise for deflating the units also from a single point although at the same time one unit may be inadvertently deflated or leak and the remaining units will not be affected so that the loss of air in one will not effect the collapse of the entire structure. When the units are all deflated, however, the structure will collapse and may then be folded or rolled into a relatively small bundle of light weight for transportation from one place to another.

One object of the present invention is to provide a suitable shelter or housing structure formed of double-walled units suitably secured together which, when inflated, will be self-supporting and provide a relatively rigid shelter structure.

Another object of the invention is to provide a housing structure of the character described formed of a plurality of separate inflatable panels of triangular shape secured together at their edges and arranged in a geodesic pattern to form a structure of substantially hemispherical shape.

Still another object of the invention is to provide a structure of the character described which has means for inflating the various units of the device from a single source, the units when inflated forming a rigid struc-

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ture which will maintain its desired shape without extraneous bracing or supporting means.

Still another object of the invention is to provide a housing or shelter structure of the character described in which the units may be simultaneously deflated from a single point but the units being so arranged that inadvertent deflation of one will not effect deflation of the remaining units.

Still another object of the invention is to provide a housing or shelter structure of the character described and made of a plurality of inflatable units which, when the units are inflated, will be relatively strong and rigid but which, when the units are deflated, may be collapsed into a relatively small space.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a top plan view of a geodesic shelter structure embodying my invention;

Fig. 1A is an enlarged sectional view on line 1A—1A of Fig. 1;

Fig. 2 is a front elevational view thereof;

Fig. 3 is a diagrammatic view, showing the shape and disposition of the units employed in the structure;

Fig. 4 is a fragmentary view of the joint between two of the units, some parts being broken away from the sake of clearness;

Fig. 5 is an enlarged sectional view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view on line 6—6 of Fig. 1;

Fig. 7 is an enlarged plan view of one of the apices at the inside of the structure;

Fig. 8 is an enlarged sectional view on line 8—8 of Fig. 7;

Fig. 9 is an enlarged sectional view on line 9—9 of Fig. 7;

Fig. 10 is an enlarged sectional view on line 10—10 of Fig. 7;

Fig. 11 is an enlarged fragmentary sectional view on line 11—11 of Fig. 2;

Fig. 12 is a plan view of a floor structure which may be employed;

Fig. 13 is a view similar to Fig. 6 but showing a modified construction for inflating the units of the device;

Fig. 14 is an enlarged interior view of one of the apices from which the units are inflated, some parts being shown in section;

Fig. 15 is an enlarged sectional view on line 15—15 of Fig. 14;

Fig. 16 is a view similar to Fig. 1, showing a construction of slightly modified form;

Fig. 17 is a front elevational view of the structure shown in Fig. 16;

Fig. 18 is a side elevational view;

Fig. 19 is a diagrammatic view showing the connections for inflating the various units of this form of my invention;

Fig. 20 is a top plan view of one of the apices at which the device is inflated;

Fig. 21 is an interior view of the apex shown in Fig. 20;

Fig. 22 is an enlarged sectional view on line 22—22 of Fig. 20;

Fig. 23 is an enlarged sectional view on line 23—23 of Fig. 20;

Fig. 24 is a sectional view similar to Fig. 23, showing the parts in another position;

Fig. 25 is an exterior view of one of the windows provided in the structure;

Fig. 26 is an enlarged sectional view on line 26—26 of Fig. 25; and

Fig. 27 is an enlarged sectional view on line 27—27 of Fig. 18.

To illustrate a preferred embodiment of the invention, there is shown in the drawings a housing or shelter structure of substantially hemispherical dome-shaped form. The structure is made of a plurality of triangular units which, as will be explained hereinafter, are of double-walled construction so that air under pressure may be introduced between the walls and the units inflated to form a substantially rigid triangular panel. These units are secured together along their side edges in a geodesic pattern so that the resulting structure will, when inflated, be self-supporting and relatively rigid.

As shown in Fig. 3, the structure comprises four groups of six triangular units about the apices A, B, C, and D. In addition to these twenty-four units which, as shown, are triangles 10 of substantially isosceles form, two roof or upper triangular units 11 and 12 are employed at the extreme top of the structure. To complete the structure the triangular unit 13 is employed between units of the groups A and D and a similar panel or unit 14 between those of the groups B and C. Also to complete the structure smaller panels 15, 16, 17 and 18 are employed at the base line.

As illustrated in Fig. 2, the panel 13 may be provided on two of its sides with a zipper construction so that these two edges may be separable from the remainder of the structure and the panel swung aside to provide a doorway. On account of the light weight of the structure it may be desirable to secure cables or other anchoring members 20 to various ones of the panels by molded rubber or neoprene anchor patches with aluminum inserts as shown in Fig. 1A, which are adhesively secured to the outer walls of certain of the panels. These members comprise a neoprene patch 20^a of circular shape within which is mounted an aluminum insert 20^b. Secured by screw 20^c to this insert is a clamp member 20^d to which a ring 20^e is swivelly connected and the cable 20 is connected to this ring.

As previously stated, each of the triangular panels or units referred to is a closed double-walled structure in which air under pressure may be introduced. As shown more especially in Fig. 5, these units may be made of a double-walled cloth which comprises two spaced walls 22 and 23 of fabric connected by cords or tie threads 25, which cords are woven into the walls or layers 22 and 23. These cords or filaments limit the separation of the walls and hold them in parallel relation as they are quite numerous over the entire area of the cloth. The outer surfaces of the walls of this fabric are coated with neoprene or the like and are then laminated with an outer layer of nylon or other suitable fabric pre-covered with a neoprene coating. These outer layers are cemented firmly to the base cloth over their entire surfaces forming an air-impermeable wall and a resulting fabric which is quite tough, difficult to rip and will resist scuffing, puncture and weather. The adjacent edges of the walls may be brought together, as shown at 26, and covered by a strip of material 27 cemented thereto to seal the space between them and form an air-tight structure so that each of the panels may be inflated.

As shown in Figs. 4 and 5, these panels are secured together along their meeting edges by means of strips 28 cemented over the joints between two adjacent units. In addition to the strips 28, fabric straps or tapes 29 may be secured in spaced relation within the strips 28, these straps 29 being secured at one face of one unit and at the opposite face of the other unit so that they cross, as shown at 30.

As illustrated, the inflation of the various units is effected by means of conduits arranged at the inside of the structure (see particularly Figs. 1, 6, 7 and 8). For this purpose a compressed air conduit 31 is directed around the base of the structure and from this conduit various leads such as shown at 32, 33 and 34 (Fig. 6)

extend up to certain of the apices at which a number of units or panels abut so that these panels may be supplied with air. For example, the lead 33 may extend to the apex E which is shown in the enlarged view of Fig. 7. The lead extends about this apex and passes through a number of identical valve units 35, 36, 37 and 38, each of which delivers air to one of the panels, the unit 37 being shown in sectional view in Fig. 8. From the valve unit 38 a conduit 39 extends to another of the apices to inflate another set of panels.

Each of these valve units comprises a body 40 secured to one of the walls 23 of a panel by means of having its flange 41 embedded in a rubber disk 42 secured to the panel. This valve body is provided with a valve seat 43 against which seats a valve 44 urged outwardly by the spring 45. The valve is provided with a stem 46 passing through a guide member 47. Above the valve seat 43 the valve body is provided with a longitudinal passage 48 and a transverse passage 49, the passage 48 being closed by a screw cap 50.

Embracing the valve body 40 is a block 51 having passages 52 and 53 therein communicating with the transverse passage 49 and to nipples 54 and 55 secured to this member are attached flexible conduits 56 so that air under pressure may be furnished to all of these valve bodies from a single source. To one of the valve bodies, such as that shown at 35 in Fig. 7, the lead 33 is secured, and it will be understood that leads 32 and 34 are directed to the valve bodies at others of the apices so that all of the valves may be inflated through the main conduit 31 adjacent the bottom of the structure. With this construction it will be apparent that air under pressure introduced into the main 31 will be distributed to and inflate all of the units.

Also each of the units is provided with deflating means, shown more especially in Fig. 9. This deflating means comprises a neck member 57 secured to the inner wall 23 of one of the units and communicating with the interior thereof through the opening 58. A screw cap 59 may be threaded upon the neck 57 to seal the same when it is desired to maintain the unit in inflated condition.

From Fig. 10 of the drawings the construction at each of the apices A, B, C and D is disclosed. At this point adjacent panels are secured together by means of suitable pieces of webbing 60 and 61 suitably secured to the apices of the panel as by cement, for example. Mounted between the members 60 and 61 is a hollow cylindrical guide member 63 within which is slidably mounted a tube 64 having a number of perforations 65 adjacent its upper end. Within the tube 64 may be suitable filtering material 66. At the upper end of the tube a cap 67 is secured thereon so that when the tube is in its lower position, shown in dotted lines in this figure, the cap will cover the opening in the guide member 63 and close it against the admission or exit of air. However, when the tubular member 64 is in its raised position, as shown in full lines in this figure, ventilation will be provided through the filter material 66. The lower face of the cap 67 may be provided with a seal 68 which seats against the member 60 while the tubular member 64 may be provided with seals 69 so that all of the air entering the interior of the structure must pass through the filter 66.

The construction adjacent the lower edge of the door panel 13 is shown in Fig. 11. Here an inflatable sill 70 extends across the threshold and is secured at its ends to the lower ends of the adjacent panels so as to connect them together. Inner and outer door flaps 71 and 72 are provided, one on each side of the threshold 70. These members are connected to the adjacent panels at one edge and provided with zippers shown at 73 and 74 along their lower edges and one side edge so that they may be opened to provide entrance to the structure.

When the building structure described has been assembled and inflated, a rigid shelter will be provided which may be made of any desired size depending upon the size

and number of the panel units employed. Inflation of the units renders them substantially rigid and, while they will withstand substantially 30 pounds per square inch pressure, considerably less is necessary to maintain the shape of the structure. As described, they may all be inflated from a single source at the same time but, due to the provision of the check valves 44 and the individual vents 57, each of the panels will individually maintain its inflation. No interior supports are necessary and the floor area is completely free of obstructions. A fabric floor member such as shown at 75 in Fig. 11 may be employed and extends over the area of the structure, this member being secured adhesively to the lower edges of the panels.

If desired, the floor member may be constructed as shown in Fig. 12. Here a number of floor panels 76, 77, 78 and 79 are formed of the same cloth as are the panels of the structure previously described. The edges of these panels are sealed, as described in connection with Fig. 5, so as to provide airtight structures which may be inflated. The adjacent panels are secured together by the strips 80 adhesively secured thereto above and below the joints so as to form a continuous floor of the inflated units. Inflation may be effected through the conduit 81 which leads to any source of air pressure and which is connected to the panels as shown at 82 and 93. If it is desired to support heavy articles upon the floor, a rigid platform 84 of wood or metal may be laid upon the inflatable units.

In Figs. 13 and 14 of the drawings a structure is shown of somewhat modified form at the apices of the units. In this instance an annular pocket is provided at each of the inflating apices of the structure, as shown in Fig. 15, by means of web members 85 and 86. These members are of circular form and are adhesively secured at their peripheries to the inner walls of the adjacent panels as shown at 87 and 88. These members are also secured together at their central portions, as shown at 89, thus leaving an annular air space 90 between them. Within the secured portions 89 an opening 91 is left for manipulation of the ventilating member 64.

An inflating tube 92 is connected by a branch conduit 93 and nipple 94 to the annular space 90 between the members 85 and 86 and check valves 96 lead from this space into the adjacent panels. It sometimes occurs that, when the units of the structure are inflated, the apices are not forced outwardly to their full extent and the inflating construction just described and illustrated in Figs. 13 to 15 will insure that this occurs. As the annular space 90 is first filled with air under pressure, it will force the apices between adjacent units outwardly so that there will be no tendency to sag at these points.

Referring to Fig. 13, it will be understood that other inflating mains such as 97 and 98 will extend from the main 92 to others of the apieces in order that all of the units will be inflated. Likewise individual venting valves 99 are provided to deflate the units individually.

A modified form of my invention is shown in Figs. 16 to 27 inclusive. The difference between this form of the invention and those previously described consists principally in the method of inflating and deflating the units and in the provision of windows for air and light and in the provision of a vestibule or entrance structure.

The structure shown in these figures is formed of inflatable triangular units and panels constructed as previously described and secured together at their edges as previously described so that no further description of these units will be necessary. However, at the front of the structure, as shown more especially in Figs. 16 to 19, a vestibule is provided comprising roof units 100 and 101 of trapezoidal form, side panels 102 and 103 of triangular form, and doors 104 and 105 which close the opening. The shapes of the structural panels adjacent the vestibule may be suitably altered from triangular form to quadrilateral form, as shown, but it will be understood that these

panels are inflatable and are formed similarly to the triangular panels.

In certain of the panels are windows designated generally by the numeral 106. These windows are shown more particularly in Figs. 25 and 26. An annular rim 107 is inserted in one or more of the units, this rim being of substantially semicircular or arcuate form in cross section so as to receive therein the edge of the panel. It is provided with an annular inwardly extending rib 108 within which are secured the ends of a hinged pin 109. Transparent panels 110 have secured to their edges channel-shaped frames 111 and, as shown more particularly in Fig. 25, these frames are provided at their adjacent edges with knuckles 112 through which the hinged pin 109 passes so as to swingably mount the windows or transparent panels 110 within the frame 107. The open position of the windows is shown in dotted lines in Fig. 26, and the closed position in full lines. A screen 113 may also be provided within the frame 107 to screen the opening when the windows are opened.

It is contemplated that in this modification also the various panel units which make up the structure may all be inflated from a single source. As shown diagrammatically in Fig. 19, for example, main inflating line 114 may lead from such source and branch out into the dotted lines 115 and 116, which lines lead to various apices or polyhedral angles of the structure where inflating valves 117 are provided.

The particular arrangement at any one of these inflating stations is shown in Figs. 20, 21 and 22. As shown in the latter figure, the line 115 communicates with a passage 118 in a plastic apex member 119 adhesively secured to the apices of the adjacent units. Within this member 119 is a thimble 120 in which is slidably mounted a ventilating tube 121 which may be filled with filter material 122. A sealing ring 123 seals the space between the tube 121 and the thimble 120.

An annular passage 124 is provided in the member 119 around the thimble 120 with which the passage 118 communicates and a passage 125 similar to the passage 118 leads downwardly to convey pressure air from the annular passage 124 to a second branch 115^a of the main inflating tube which leads to another inflating station.

From the annular passage 124 a passage 126 leads to the valve structure 117 which controls the inflation of the panel in which it is mounted. This passage 126 is provided in an arm 127 formed integrally with the member 119, and mounted in the end of this arm is a circular hollow valve-supporting member 128 (Fig. 23). An opening 129 in this member affords communication between its interior and the passage 126. The end of the arm 127 may be left free of the surface of the adjacent panel so that it may be moved in one direction or another to accurately register with the opening in the panel.

Within the member 128 is a valve body 130 having a shoulder 131 formed thereon so that the member 128 may be clamped between this shoulder and the lower edge of a cap 132 threaded upon the valve body, as shown at 133. A guard member 134 is threaded at 135 to the valve body, and this guard is bonded to a rubber or plastic disk 136 adhesively secured to the panel in such a position that the guard member 134 will be disposed within the panel through an opening 138. The guard member is provided with openings 139 to permit air to pass to and from the interior of the panel.

Within the valve body 130 is slidably mounted a cage 140 having a stem 141 extending upwardly through the cap 132, the cap being provided with an annular skirt portion 142 surrounding this stem. To the upper end of the stem is secured a cup-shaped member 143 by which it may be manipulated. This cage is provided with sealing rings 144 and 145 to seal the space between it and the valve body 130.

The valve body is provided with a plurality of openings

146 which permit the entry of air from the interior of the hollow valve-supporting member 128, the air being received by this member through the opening 129 and the openings 146 permitting this air to enter the interior of the valve body 130 and this air may also enter the interior of the hollow cage 140 through openings 147 in its wall. Openings 148 are provided adjacent the lower end of the cage to permit the passage of air from the interior of the guard 134 to the interior of the cage, the air coming from the inflatable units.

The valve cage may be urged upwardly by the spring 149 so that normally the sealing ring 145 seats against the lower end of the valve body 130 and the communication between the lower openings 148 in the cage 140 and the interior of the guard 134 is closed. When, however, the valve cage is in its lower position, as shown in Fig. 24, air may pass through these openings 139 and 148 to the interior of the cage and thence outwardly through the openings 147 and 146 into the passage 126 for deflating the units.

Within the valve cage 140 is slidably mounted a valve member 150 provided with a sealing ring 151 seating against the lower end of the cage, and this valve member is urged upwardly by a spring 152. Openings 153 are provided in the side wall of this valve member to permit passage of air from the interior of the cage to the interior of the guard 134. It will be appreciated that the lower end of the cage acts as a valve seat for the valve member 150, and likewise the lower end of the valve body 130 acts as a seat for the sealing ring 145 which in effect forms a second valve controlling the deflation of the units.

The normal position of the parts of the valve is shown in Fig. 23, the springs 149 and 152 holding the two valves, that is to say, the valve cage 140 and the valve member 150, in their upper positions with both sealed. However, when air under pressure is admitted to the passage 126, it will pass into the valve cage through the openings 146 and 148 and depress the valve member 150 to the dotted-line position shown in Fig. 23, thus unseating the sealing ring 151 and admitting air under pressure to the guard member 134, and thence through openings 139 into the panels as indicated by the arrows shown in this figure. So soon, however, as the air pressure in the passage 126 is discontinued, the pressure in the panel together with the spring 152 will move the valve member 150 upwardly to its seated position shown in Fig. 23 which will close this valve and maintain air pressure in the panel or unit and keep the latter inflated.

When it is desired to deflate the panels, the passage 126 is either vented or connected to exhaust and the cage member 140 is moved downwardly to the position shown in Fig. 2 by depressing the member 143. It may here be noted that the stem 141 of the valve body is provided with a transverse pin 155, the ends of which, in the position of the parts shown in Fig. 23, rest in a slot 156 formed in the skirt portion 146 of the cap 132. When the member 143 is depressed and turned through an angle of 90 degrees, the ends of the pin bear against the lower edge of the skirt 142, as shown in Fig. 24, and prevent the cage being moved upwardly by its spring 149. At this time the sealing ring or valve 145 will be unseated from the lower edge of the valve body 130 and thus permit air to enter the cage through the openings 148 and thence through the cage into the passage 126, as shown by the arrows. Thus the openings 148 are the deflating openings for the panel while the openings 153 in the valve member 150 serve to carry the inflating air. Since the openings 148 are open to a greater extent than the openings 153, the deflating openings are in effect of greater area than the inflating openings in order to permit speedy deflation of the panels.

In Fig. 27 the construction of the structure adjacent the floor is shown. In this instance the floor consists of inflatable panels 157 similar, for example, to those shown

in Fig. 12. A strip of fabric 158 is adhesively secured to the edges of the panels, which stripping is secured by zippers 159 to a fabric strip 160 adhesively secured to the panels, forming the side wall of the structure, and adjacent the lower ends of these panels. Thus the floor unit can be readily detached from the remainder of the structure. A floor covering 161 of suitable plastic composition may be laid over the upper wall of the floor panels 157 so as to provide a firmer footing than would be obtained from the fabric of which the panels are made.

It will be apparent from the above that I have provided a building structure which will be of relatively light weight and which, when deflated, may be folded so as to occupy a comparatively small space so that it may be readily transported from one place to another. At the same time, when the panels or units are inflated, a rigid shelter structure will be provided which will be self-sustaining, needing no framework or interior supports so that the floor area will be completely free of obstruction.

It will be understood that the inflating line 114 (as is also the case with the conduit 31, Fig. 1) is adapted for connection to a pump or other source of fluid under pressure such as compressed air. When it is desired to vent the panels and collapse the structure, the conduit 114 may be secured to the intake side of the compressor and the air drawn positively from the panels after the valves have been placed in the position shown in Fig. 24 by depression of the caps 143. Alternatively, the conduit 114 may simply be vented to the atmosphere and allow the compressed air in the panels to escape.

As shown in Fig. 19, certain of the panels, particularly those adjacent the bottom of the structure, are connected to adjacent panels for inflation instead of being provided with their own inflating valves. This arrangement does not extend, however, to the point where the structure would collapse if these panels were deflated for it is, of course, desirable that the structure be so supported that the accidental deflation of a few of the panels would not cause it to collapse.

In Fig. 19, a connection 170 is shown between adjacent panels 171 and 172 so that the former may be inflated and deflated with the latter, and similar connections 170 are also shown between others of the panels, particularly at the lower edge of the structure or at the vestibule portion thereof, so that the main conduits conveying the compressed air need not be unnecessarily extended.

If desired, means may be provided in the form of my invention shown in Figs. 16 to 27 to force outwardly the apices at which the various triangular panels meet. As shown more particularly in Figs. 21 and 22, elastic cords 174 and 175 are secured by molded neoprene anchor patches 176, like those shown in Fig. 1A, to the under and inner sides of the panels adjacent the apices at which they meet. These cords are connected to each of the panels and, therefore, extend entirely around the apices and exert light tension to draw the panels together at that point. When the panels are inflated, the effect of the tension of these cords is to force the apices outwardly so that there will be no tendency of the panels to sag at these points.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A light weight collapsible shelter structure formed of a multiplicity of substantially triangular inflatable panels, said panels being disposed edge to edge to form a dome-shaped structure and being secured together along their abutting edges, said structure having a plurality of apices at which a plurality of panels meet each of said panels having spaced fabric walls and sealed at its edges to provide a closed chamber, the walls being connected

by filaments which hold them in flat substantially parallel relation, and inflating conduits adapted for connection to a source of pressure and leading at the under side of the structure to the said apices and there separately communicating with the panels.

2. A light weight collapsible shelter structure formed of a multiplicity of inflatable panels, said panels being disposed edge to edge to form a dome-shaped structure and being secured together along their abutting edges, each of said panels having spaced fabric walls and sealed at its edges to provide a closed chamber, the walls being connected by filaments which hold them in flat substantially parallel relation, and the means securing the abutting edges of the panels together comprising crossed straps secured to the outer surface of one panel and to the inner surface of an adjacent panel.

3. A light weight collapsible shelter structure formed of a multiplicity of inflatable panels, said panels being disposed edge to edge to form a dome-shaped structure and being secured together along their abutting edges, each of said panels having spaced fabric walls and sealed at its edges to provide a closed chamber, the walls being connected by filaments which hold them in flat substantially parallel relation, said panels being of triangular shape and a plurality thereof meeting at apical points, an inflating valve provided in each of a plurality of panels adjacent one of such points to permit inflation thereof, and inflating conduits leading along the under surface of the structure from a source of pressure to said points.

4. A collapsible shelter structure as in claim 3 wherein means are provided to urge the apices of the structure outwardly upon inflation of the panels.

5. A light weight shelter comprising a dome-shaped structure formed of flat triangular panels of double-walled material presenting closed inflatable chambers, said panels being secured together along their abutting edges and a plurality thereof meeting at apical points, an inflating tube leading to certain of said points, a valve mechanism providing communication between each panel and the inflating tube leading thereto, said valve mechanism having an inflating valve member biased toward closed position and movable toward open position by fluid pressure in said tube, a deflating valve member biased toward closed position and manually movable to open position for deflation of said panel, and said deflating valves venting said panels to said tube.

6. A light weight collapsible shelter structure formed of a multiplicity of inflatable panels disposed edge to edge and secured together to form a dome-shaped structure, cables secured to certain of said panels for anchoring the structure to the ground, and means for securing each of said cables to a panel comprising a patch member of flexible material adhesively secured to the panel

and having a metallic insert embedded therein, and the end of said cable being secured to said insert.

7. A light weight shelter comprising a dome-shaped structure formed of a plurality of substantially flat triangular panels of double-walled material presenting closed inflatable chambers, the edges of said panels being abutted and secured together along their abutting edges to form a continuous structure, the vertices of a plurality of said panels meeting at apical points, conduit means leading to said points from a single source of pressure and there connected to the meeting panels, a single source of pressure to which said conduit means leads, and means for securing the abutting edges of the panels together comprising crossed straps secured to the outer surface of one panel and to the inner surface of an adjacent panel.

8. A light weight collapsible shelter structure formed of a multiplicity of inflatable panels, each of said panels comprising spaced fabric walls, the edges of which are sealed together to provide a closed chamber, the spaced walls being of substantially triangular shape, means holding said walls in substantially parallel relation to form a substantially rigid structure when inflated, a plurality of said panels being disposed in edge-to-edge relationship and being secured together along their abutting edges, and a plurality of such panels meeting at apical points, an inflated tube leading to certain of said points and a valve mechanism providing communication between each panel and the inflating tube leading thereto, said mechanism comprising an inflating valve member biased toward closed position and movable toward open position by fluid pressure in the inflating tube and a deflating valve biased toward closed position and manually movable to open position to effect communication between the panel and the inflating tube to vent said panel through said inflating tube when the latter is vented.

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