

Sept. 28, 1954

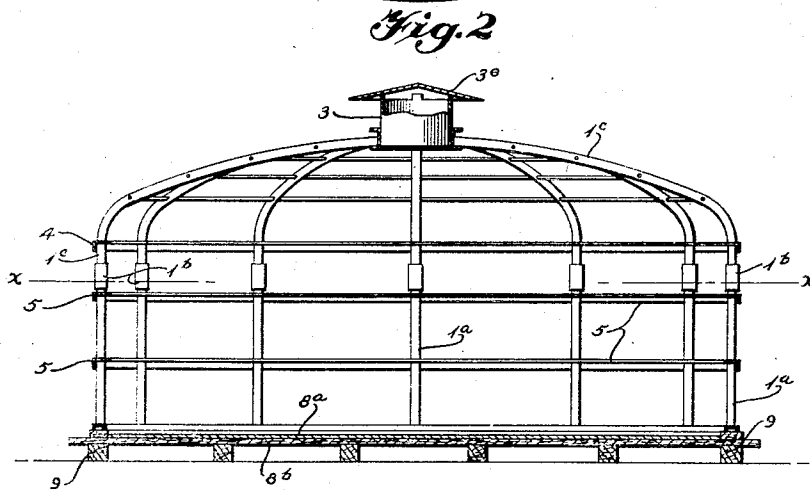
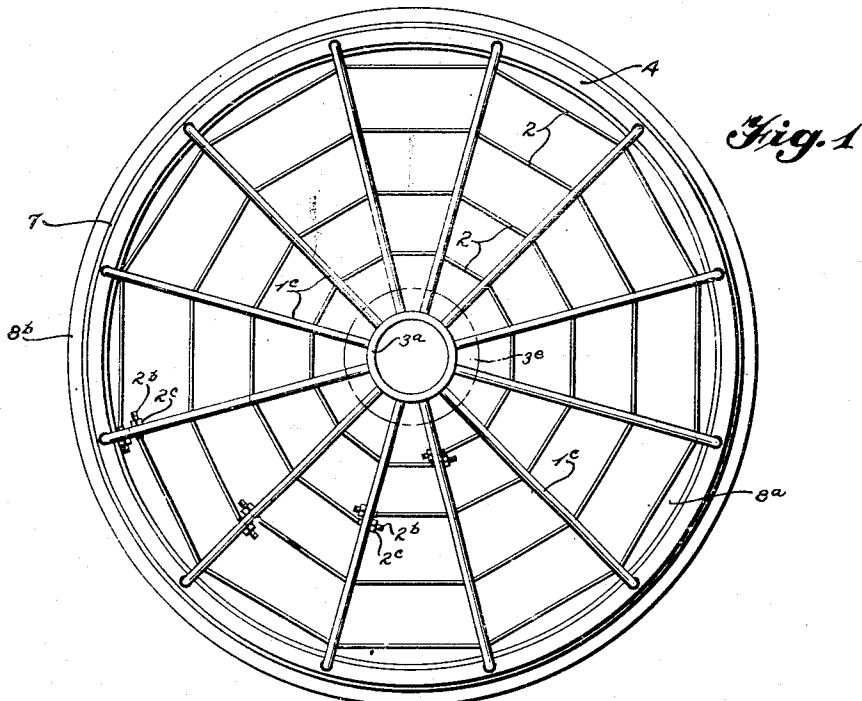
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2,690,185

ALL WEATHER HUT

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Fig. 3

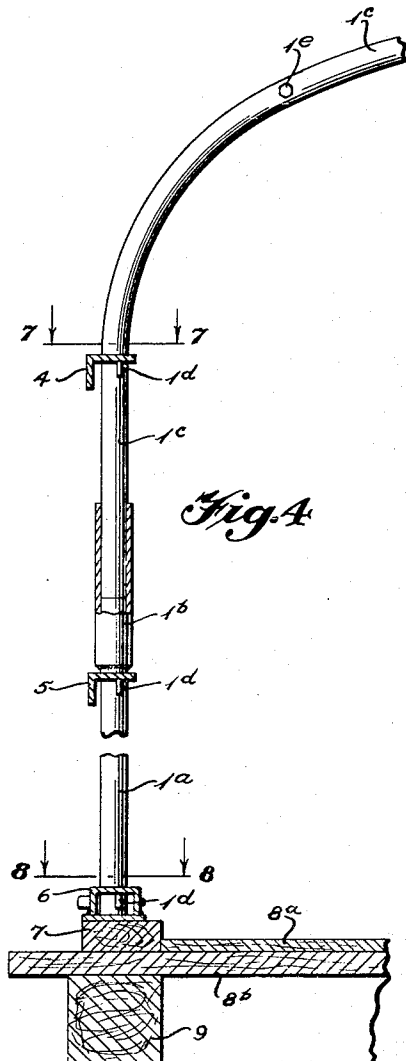
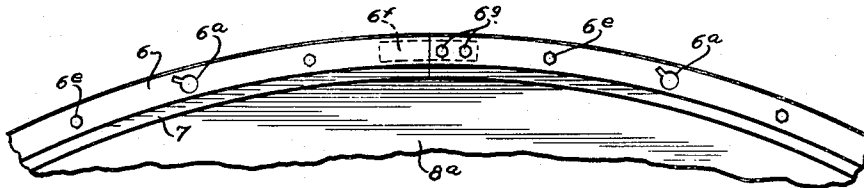


Fig. 4

Fig. 5

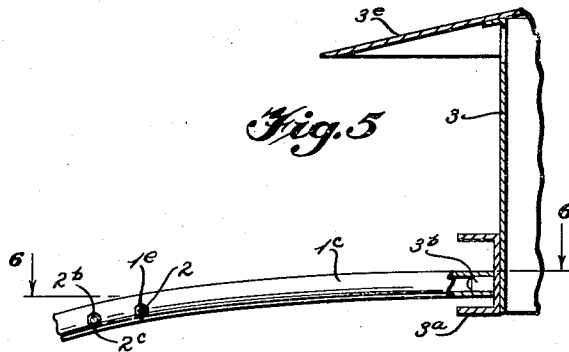


Fig. 6

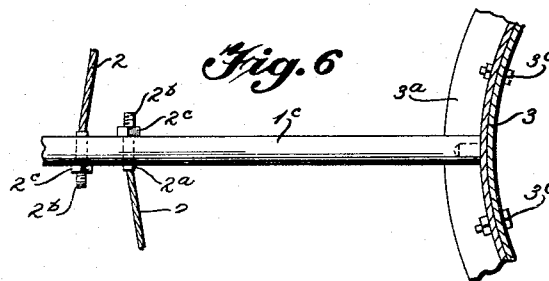


Fig. 7

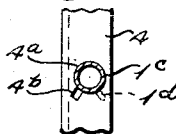


Fig. 8

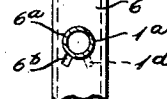


Fig. 9

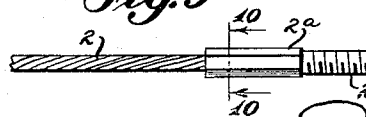


Fig. 10

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Fig. 11

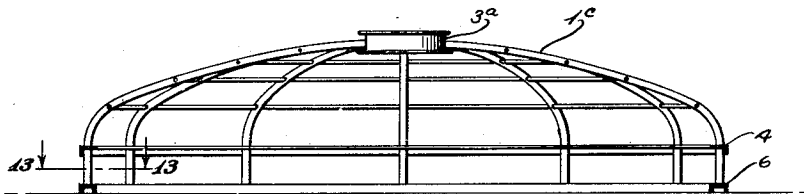


Fig. 12

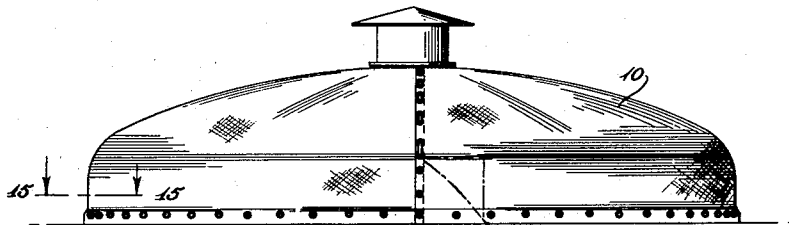


Fig. 13

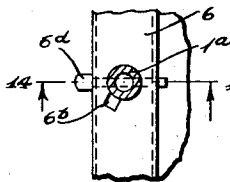


Fig. 14

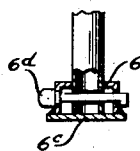


Fig. 15

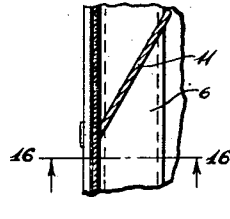


Fig. 16

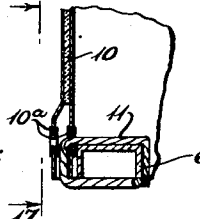
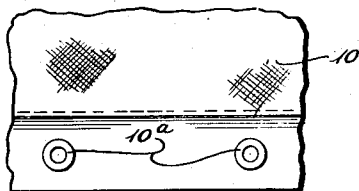


Fig. 17



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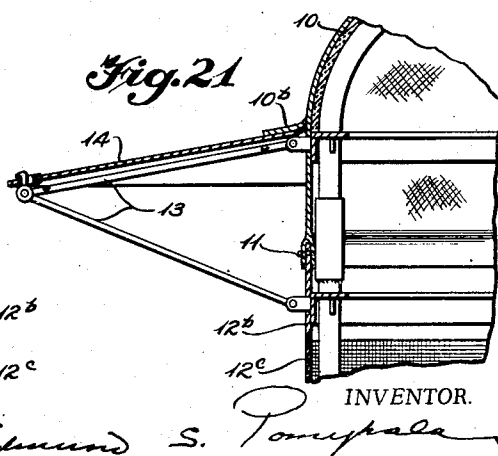
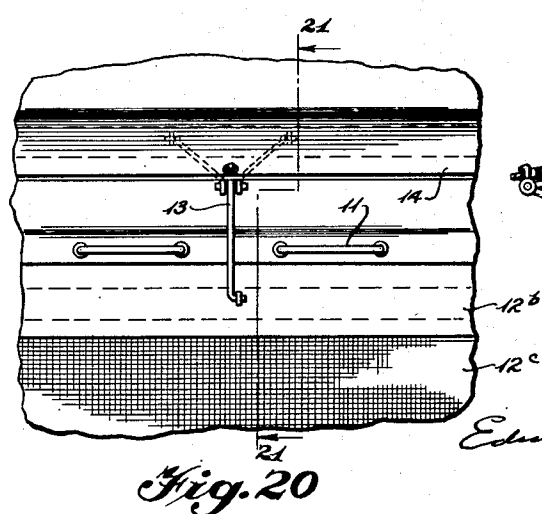
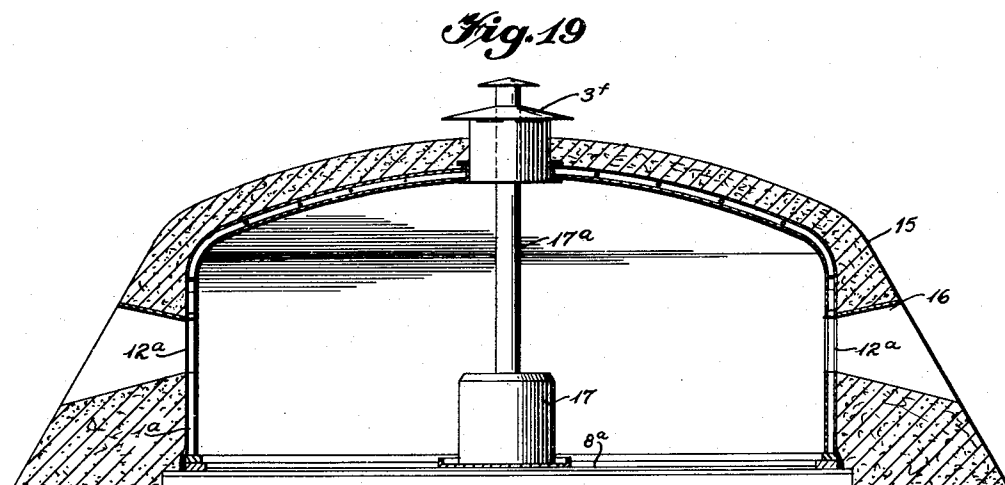
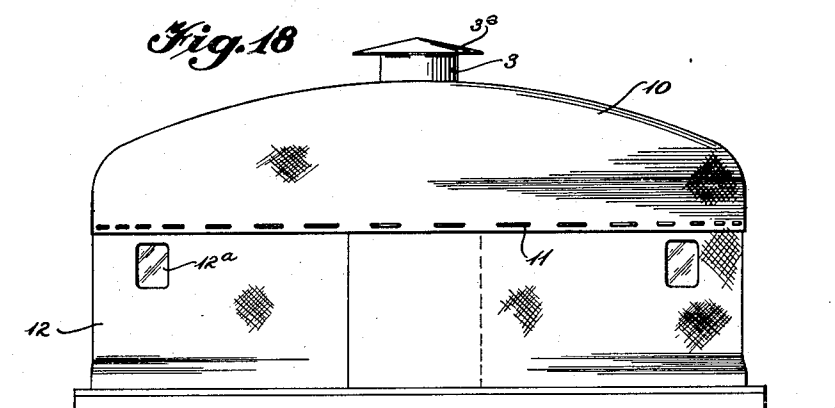
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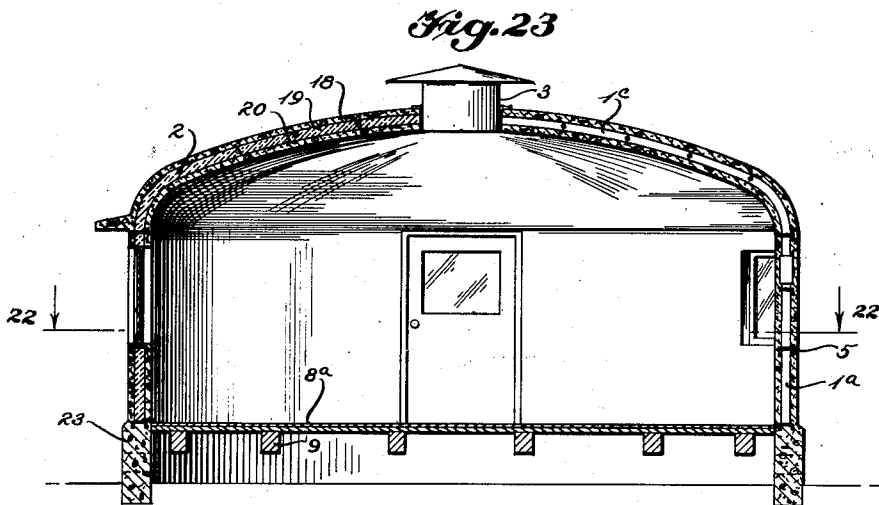
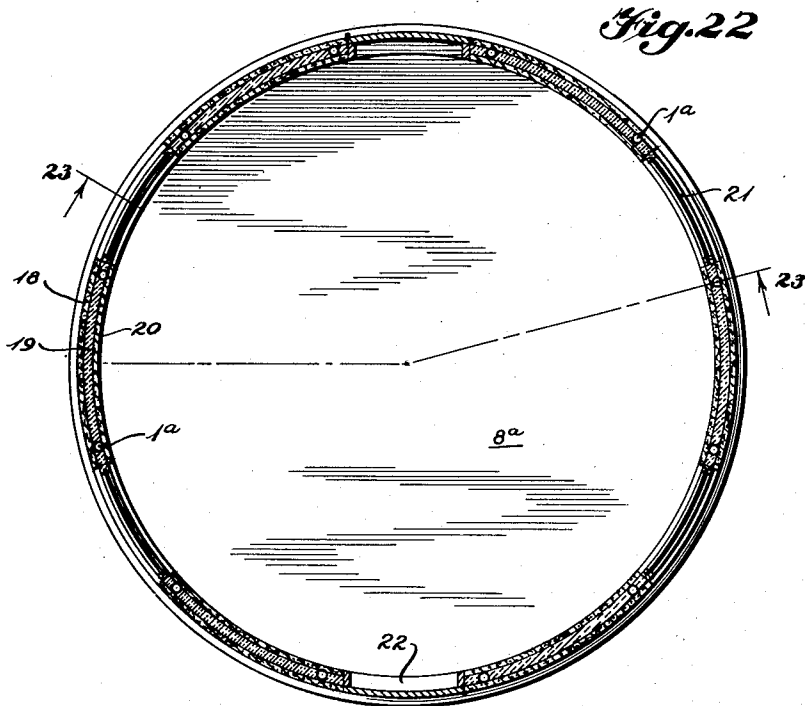
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ALL WEATHER HUT

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UNITED STATES PATENT OFFICE

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ALL WEATHER HUT

Edmund Stanley Pomykala, Mobile, Ala.

Application September 27, 1949, Serial No. 118,010

5 Claims. (Cl. 135—3)

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This invention relates to improvements in huts, tents, beach houses and other similar habitations, generally of temporary nature. In particular it concerns construction of economical shelters or quarters for military personnel at advance bases, especially in very cold polar regions.

The object of the present invention is to provide a prefabricated structure of a compact and economical nature which may be carried along with the personnel in aircraft or other means of transportation, for immediate construction of a suitable shelter or hut at undeveloped advanced bases.

A further object is to provide a self supporting structure, the inside of which is free from masts, and the outside free from guys and other obstructions and adaptable for extremely rapid and simple assembly and disassembly under adverse conditions, using a minimum of connecting pieces.

A further object is to make the above structure in the form of a basic frame with suitable alternate additional elements for use in different climates.

A further object is to make the above structure adaptable for the application of available raw materials such as foliage, dirt, snow, etc. to improve insulation characteristics.

A further object is to make the above structure adaptable for the application of a permanent covering, permitting construction of cheap but durable shelters for beaches, farm houses, and other outlying places.

Other and more specific objects will appear in the following detailed description of illustrative forms of construction based on the present invention, having reference to the accompanying drawings.

The hut is circular in plan and domical in section. Short vertical columns support a roof roughly elliptical in section. The short tubular columns and roof ribs together with roof rib stressing cables form a continuous rigid frame.

Further details are as follows:

Figure 1 is a plan view of roof framing.

Figure 2 is a typical sectional view showing floor, column and roof rib framing.

Figure 3 is a part plan view of the base channel ring, showing foundation bolts, and a typical splice.

Figure 4 is a part elevation view to an enlarged scale showing typical tubular column and rib framing.

Figure 5 is a part side elevation view of top rib framing at the ventilator.

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Figure 6 is a part plan view of rib framing taken on line 6—6 in Figure 5.

Figure 7 is a part plan view of a bracing angle at the point of its connection with a column taken on line 7—7 of Figure 4.

Figure 8 is a part plan view of the base channel ring at the point of connection with a column taken on line 8—8 of Figure 4.

Figure 9 is a detail of an end connector of one of the roof stressing cables.

Figure 10 is a section of a connector taken on line 10—10 in Figure 9.

Figure 11 is a typical section of roof framing serving as a preliminary shelter.

Figure 12 is an elevation of the hut serving as a preliminary shelter.

Figure 13 is a part plan view of the base channel ring at the point of its connection with a rib taken on line 13—13 of Fig. 11 showing fastening of the rib to the channel ring.

Figure 14 is a part sectional view of a rib and the channel ring taken on line 14—14 of Fig. 13.

Figure 15 is a part plan view of the base channel ring and the hut covering taken on line 15—15 of Fig. 12.

Figure 16 is a part sectional view of the hut covering and the base channel ring taken on line 16—16 of Fig. 15.

Figure 17 is a part elevational view of the bottom of the dome covering taken on line 17—17 of Fig. 16.

Figure 18 is a front elevation view of a completed hut for cold climate.

Figure 19 is a typical sectional view of the hut in very cold weather covered with snow for additional insulation.

Figure 20 is a partial side elevation showing outrigger framing and horizontal fastening of hut covering sections.

Figure 21 is an elevation of the canopy outrigger which may be used where required, taken on line 21—21 of Fig. 20.

Figure 22 is a typical sectional plan of a hut constructed for permanent occupancy.

Figure 23 is a typical sectional elevation view of a permanent hut.

In all views similar numerals or numerals and letters refer to similar parts.

Short vertical columns 1a and the roof ribs 1c, all of metal tubing, form a continuous rigid frame. The splice is made slightly below the eave line on line x—x approximately 4.5 feet off the floor for a 20 foot hut. The columns are supported and frame into circular holes 6a of main bearing channel ring 6. The columns are braced by ring angles 5, which run completely

around except for a door opening. Columns 1a and ribs 1c are joined through tube connector 1b, which is welded to the column below but is open above. Ribs 1c are braced by ring angle 4 which runs completely around the hut. Both angles 4 and 5 are spliced about every 10 feet. A typical splice would consist of a short stub angle welded to one end of the ring angle, and would have two welded stud bolts at the connecting end. All that is necessary for making the connection is slipping the free end of the next ring angle over these bolts and tightening the bolt nuts. This is shown in a similar connection in Fig. 3. The ribs are additionally braced and also prestressed by cable ties 2. The ribs frame into circular eye ring angle 3a, through studs 3b. The end of the rib bears against the face of the angle 3a, as cables 2a are made taut. Each hut is equipped with a ventilator 3, having a slightly inclined circular peaked roof 3e. Ventilator 3 frames into eye ring angle 3a and is fastened with bolts 3c. A complete hut is equipped with wooden floor of plywood 8a and 8b resting on sleepers 9. The floor may be sectionalized and prefabricated.

Figure 3 is a part plan view of the base channel ring 6. This channel ring is bolted down through plywood ring block 7, with bolts 6e, and spliced about every 10 feet with stub splicing channel 6f, welded on one side and bolted on the other through welded stud bolts 6g.

Tube columns 1a drop through keyhole slots 6a, 6b, such slots permitting locking lug 1d to slip by. The bottom of the column rests on clip bearing plate 6c shown more in detail in Fig. 14. The column is rotated about 60° to lock it in position. The same system of locking is used for angles 4 and 5, the keyed holes being shown as 4a and 4b in Fig. 7. This obviates bolting and adds to speed in erection, particularly under adverse frigid conditions. Ribs 1c are also practically assembled without bolts, since the lower end drops in sleeve socket 1b and the upper end is held in position by stud bolts 3b. In assembling these ribs, ring angle 4 has to be loose and the splice nuts are not tightened until all the ribs are in position. Metallic wire cables 2 are then threaded through hexagonal holes 1e. These holes are lined with thin metal siding welded to the body of the metal tubular ribs. Cables 2 are terminated with metallic connectors 2a of hexagonal section. These connectors are swaged on the cable. The extreme ends of the connectors have a threaded shank 2b to receive nut 2c. After the cables are threaded, they are made taut by screwing the nuts 2c down shank 2b. A tension in the cables of about 100 lbs. is required. This tightening of the cables has several effects which are very important. It pulls all the ribs to bear against the face of angle 3a. It prestresses the ribs and induces a negative moment in the ribs. It braces the ribs against side buckling. Finally it causes the whole framing to act as a unit.

Figures 11 and 12 show the top part of the hut assembled on the ground serving as a temporary shelter in very cold weather before the main hut can be erected. The roof ribs frame into the base channel ring and are fastened by rotating key bolts 3d. The dome roof covering 10 is fastened to base channel ring 6 by threading rope 11 through grommets 10a and spirally winding it around the channel ring. Additional rope ties may be provided as required to fasten the covering 10 to the rib framing. Dome covering 10 as well as side wall covering 12 below is composed of

quilted canvas or other woven material and cotton felt about $\frac{3}{8}$ " thick. One layer of canvas is on each face. The cotton felt of covering 12 is in the interior serving as insulation. Both coverings 10 and 12 are joined by lacing rope 11 through respective grommets 10a. In more temperate climates heavy quilted coverings may be dispensed with particularly on the sides, where a single ply of plain canvas 12b would be sufficient. This could be made in smaller sectional lengths with vertical splices made by lacing rope through a double row of grommets. In tropical countries additional protection would be required from mosquitoes and so suitable netting 12c may be provided. This, in general, would be reinforced with canvas strips at intervals. Outriggers 13, in general, would only be provided for warmer climates. These outriggers would support canopy 14. Canopy 14 is attached to the dome covering by lacing rope through suitable grommets in two strips of canvas 10b projecting from the main dome covering. In very frigid weather it may be desirable to provide additional insulation over the hut covering in the form of snow, leaves and twigs. This is shown in Fig. 19, where 15 is such local insulation and 16 is lintel boards carrying insulation at windows 12a. Windows 12a of Plexiglas are generally removable and they are secured in side covering 12. Heating may be provided by space heater 17. Flue pipe 17a extends through special ventilator roof 3f. The framing described and illustrated also lends itself to permanent construction shown in Figures 22 and 23. Typical tubular column framing is covered by suitable metal furring lath and applying suitable stucco 18 on the outside, plaster 20 on the inside with rock wool or similar insulation 19 in between. In general the exterior stucco would be painted with elastic paints now on the market. Additional roofing materials may be provided as required. Such permanent hut would be provided with regular windows 21 and door 22. The whole structure would rest on a durable foundation of brick or concrete 23.

This in general illustrates the main features and the wide adaptability of this hut. The main framing and covering is purposely made in two sections for several reasons.

1. Ease of erection.
2. Simplicity of breakdown for transportation.
3. Adaptability to changing climates and seasons.

4. Adaptability for quick protection on establishing a new camp.

In severe cold and snow it may not be feasible to set up an entire hut at landing or on establishing a camp. It is proposed that only the top part be assembled on the ground. This can be done in about ten minutes. The members can crawl in for protection, and the construction of the main and more permanent structure can follow at greater leisure.

For more temperate climate it is desirable to give protection from sun and rain and so a canopy of single ply canvas is added. This is attached to the main roof covering either by snap fasteners or preferably by lacing rope, and is supported on outriggers. For tropical climates all covering is, in general, of single ply canvas with an additional separate layer of mosquito netting reinforced with canvas strips serving as side protection. For beach houses and outlying farm dwellings permanent construction may be desirable. The hut shown and described is approximately 20 feet in diameter and is intended to house eight men.

Framing, in general, would be of aluminum for lightness. These huts can be made in much larger sizes. They are very strong, highly resistant to earthquakes and windstorms and because of their shape they admirably lend themselves to camouflage.

The huts, as shown, can be easily transported by air with a minimum of weight and volume. Because of the large area covered in relation to the surfacing material involved and the large amount of prefabrication, they are basically very economical.

Having described the main features and details, it is within the scope of any engineer, manufacturer or others skilled in the art, to develop other suitable details without departing from the spirit of the invention as defined by the scope of the appended claims.

I claim:

1. A skeleton framework for a hut which comprises in combination an outer base ring provided with spaced vertical holes, an inner concentric ring, a plurality of radially-disposed elastic arched ribs forming a domed roof structure, converging at the top and secured in said inner ring; the depending lower ends of said ribs being adapted to fit in said vertical holes of said base ring to form a framework for a low temporary shelter, lacing cables attached to said ribs at points intermediate the base ring and the central ring and forming concentric polygons, and means for stressing said cables in order to stress the ribs and to make the ribs and rings into a structural unit.

2. A skeleton framework for a hut which comprises in combination an outer base ring provided with spaced vertical holes, an inner concentric ring, a plurality of radially-disposed elastic arched ribs forming a domed roof structure, converging at the top and secured in said inner ring, the depending lower ends of said ribs being adapted to fit in the vertical holes of said base ring to form the framework for a low temporary shelter, vertical stub columns also adapted to fit into the vertical holes of said base ring provided at their tops with sockets fitting the depending lower ends of said ribs, lacing cables attached to said ribs at points intermediate the base ring and the central ring and forming concentric polygons, and means for stressing said cables in order to stress the ribs and to make the elements of the hut into a structural unit; said vertical columns, when inserted in the holes of the base ring and

surmounted by the roof framework, providing a framework for a more permanent shelter of greater height.

3. The framework of claim 1 in combination with a circular bracing angle embracing the depending ends of said ribs and means mounted on said ribs for supporting said bracing angle at spaced distance above the base ring.

4. The framework of claim 2 in combination with circular bracing angles embracing said stub columns and means mounted on said columns for supporting said angles at spaced distances above the base ring.

5. An all weather hut comprising in combination an outer base ring provided with spaced vertical holes, an inner concentric ring, a plurality of radially-disposed elastic arched ribs forming a domed roof structure, converging at the top and secured in said inner ring, the depending lower ends of said ribs being adapted to fit in the vertical holes of said base ring, a dome-shaped covering adapted to fit over said roof structure, means for securing said covering to the base ring; the said covering and roof structure forming a low temporary shelter; vertical stub-columns also adapted to fit into the vertical holes of said base ring provided at their tops with sockets fitting the depending lower ends of said ribs, lacing cables attached to said ribs at points intermediate the base ring and the central ring and forming concentric polygons, means for stressing said cables in order to stress the ribs and to make the elements of the hut into a structural unit, a side wall covering extending around the stub columns, and means for securing the side wall covering to the dome-shaped covering and to the base ring; the combination of said coverings and said vertical columns surmounted by the roof structure forming a more permanent shelter of greater height.

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