

[54] LUNAR SHELTER

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[58] Field of Search ..... 126/270, 271; 237/1 A

[56] References Cited

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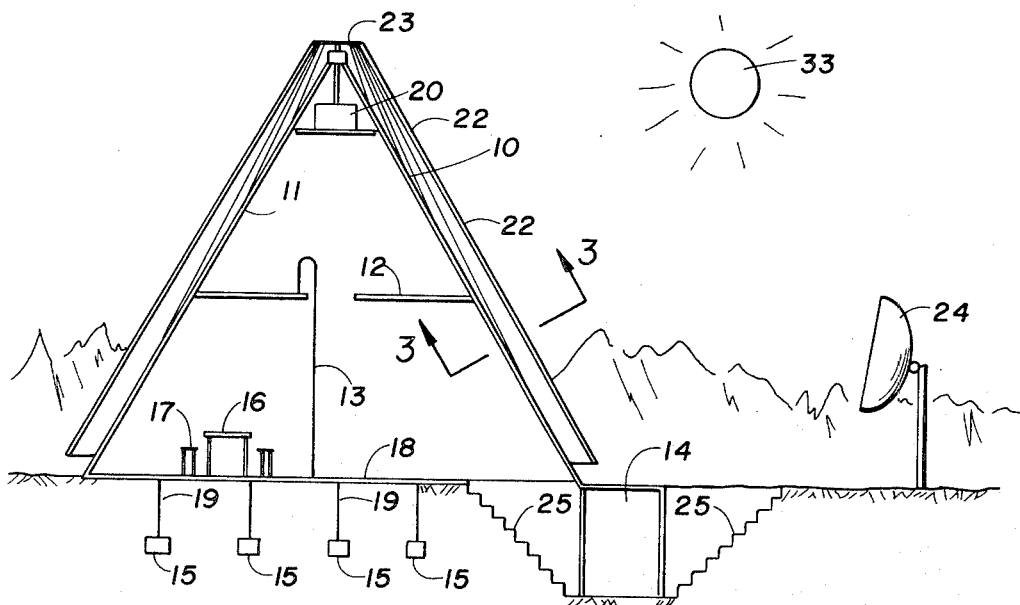
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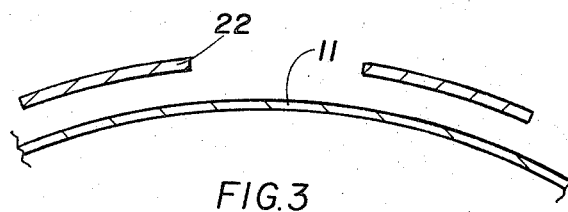
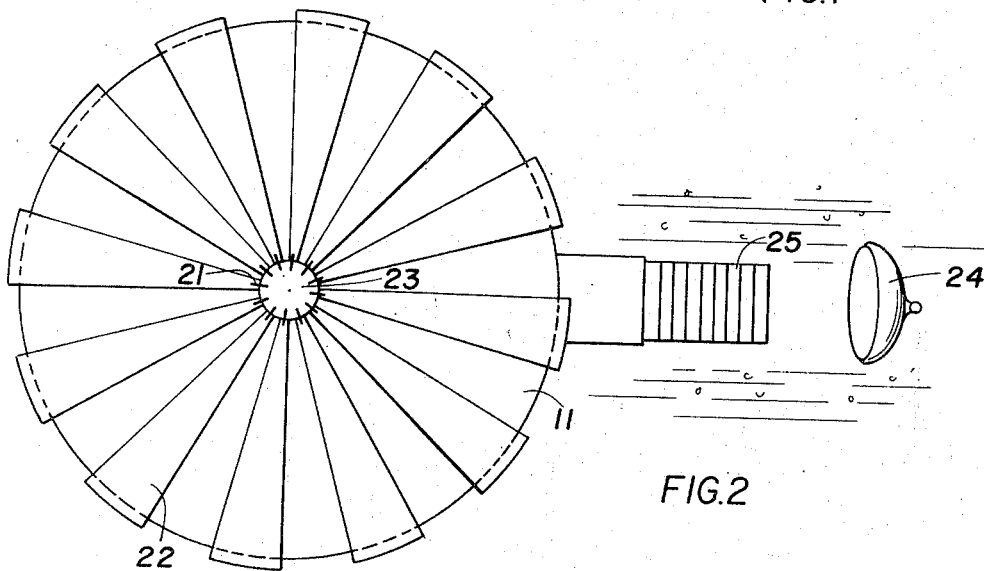
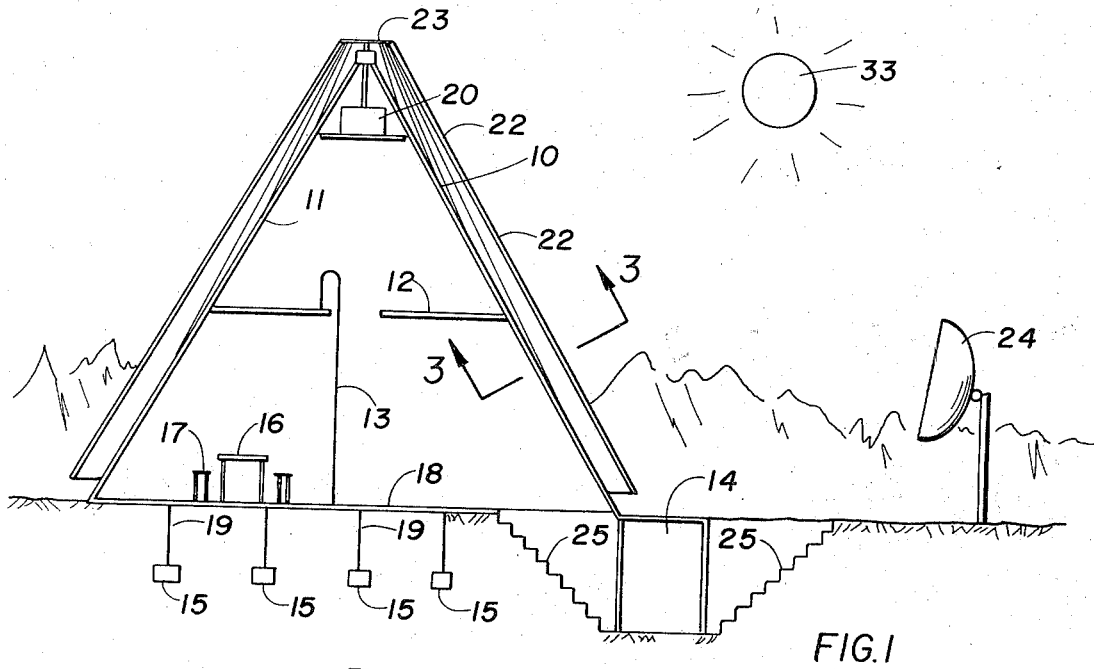
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[57] ABSTRACT

A lunar shelter which is maintained at a uniform temperature during the lunar day, by means of reflecting shutters about the outside of the shelter with the temperature of the shelter itself controlled by rotation of the external shutters. The shutters may be varied in projected width so as to vary the opening between the shutters to permit the desired amount of radiation from the sun to warm the shelter walls.

2 Claims, 3 Drawing Figures





# 1

## LUNAR SHELTER

### SUMMARY OF THE INVENTION

This invention relates to a lunar shelter and particularly to a lunar shelter which is protected from excessive solar radiation. The advantage of this invention is that the temperature of the shelter may be controlled without the requirement for internal heating or cooling mechanism during the lunar day.

The shelter is preferably formed of a conical shape with an external ring of shutters mounted concentrically about the shelter. The projected width of the shutters may be varied by rotation of each shutter about its mounting and the entire set of shutters may be rotated about the exterior of the walls of the shelter so as to control the radiation of the sunlight upon the external walls of the shelter.

### BRIEF DESCRIPTION OF THE DRAWINGS

The objects and features of the invention may be understood with reference to the following detailed description of an illustrative embodiment of the invention, taken together with the accompanying drawings in which:

FIG. 1 is a sectional view of the shelter and the external shutters;

FIG. 2 is a plan view of the shelter; and

FIG. 3 is a sectional view of the shelter wall and shutters taken along line 3—3 of FIG. 1.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIG. 1 illustrates the shelter 10 which is of general conical shape, about which are mounted shutters 22 fastened to hub 23 above the top of the shelter 10 so that each shutter 22 lies parallel to the adjacent section of the external wall 11 of the shelter.

The shelter may be fitted with furniture 16 and 17 on the lower floor 18, with an upper floor 12 to be reached by means of a pole or ladder 13. The entire shelter 10 is anchored to the lunar surface by means of embedded anchors 15 attached by tension members 19 to the shelter floor. Entrance to the shelter is through stairways 25 leading through an underground airlock 14. The hub 23, to which the shutters are anchored, may be rotated by means of internal motor 20 mounted near the apex of the shelter cone.

As shown in FIG. 1-3 the shutters are fabricated of a radiation reflecting material and may be coated with a reflector surface so as to protect the surface of the shelter wall 11 covered by the shutter from the radiation of the sun 33.

An external reflector 24 may be remotely controlled so as to reflect radiation from the sun to a side of the shelter which does not directly receive the rays of the sun 33. Each shutter 22 is mounted by means of rotatable pins 21 to the shutter hub 23 with the rotation of the pin 21 being controlled by remote means in the shelter so that the effective width of the shutter 22, with regard to the interruption of the sun's rays from

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the wall 11 of the shelter, may be varied by rotating shutter 22 from a position parallel to the tangent of the adjacent surface of the wall 11 of the shelter to a position which is in a position perpendicular to the adjacent wall of the shelter. The rotation of each shutter 22 about hinge pin 21, may be varied automatically by mechanical means as the shutter 22 revolves about the shelter 10 so that the shutter 22 may interrupt a greater amount of solar radiation on one side of the shelter than on the other side.

The temperature of the shelter may be thus regulated by the mechanism of the shutters so that a uniform amount of radiation energy strikes the wall 11 of the shelter regardless of the position of the sun, by regulation of the speed of rotation of hub 23 to which all the shutters 22 are mounted, and by means of rotation of each individual shutter 22 about hinge pin 21 connected to the hub 23.

Remote control reflector 24 may be adjusted so as to throw solar radiant energy upon a wall that is otherwise in the shadow of the sun 33 at a given position of the sun.

Additional remote controlled reflectors 24 may be located about the perimeter of the shelter as required.

Since obvious changes may be made in the specific embodiment of the invention described herein, such modifications being within the spirit and scope of the invention claimed, it is indicated that all matter contained herein is intended as illustrative and not as limiting in scope.

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

1. A shelter which is heated by the radiant energy of the sun, with the amount of radiant energy reaching the shelter walls controlled by means of shutters mounted outside of the walls of the shelter, said shelter being of conical shape,

40 said shutters fabricated of radiation reflecting material, with

each said shutter being oriented so that the shutter axis is parallel to a ray of the adjacent wall of the shelter, with each shutter mounted to a rotatable hub mounted exterior of the top of the shelter to the apex of the shelter cone, the mounting of each individual shutter to said hub providing means for rotating each shutter about its axis, such that the amount of external radiation reaching the shelter wall may be varied both by rotating an individual shutter about its axis to vary the area of the radiation shadow which the said individual shutter casts on the adjacent shelter wall, and by rotating the hub to which all shutters are mounted so as to vary the orientation of all shutters with regard to the fixed shelter wall.

2. The combination, as recited in claim 1, in which a radiation reflector is mounted externally of the shelter and attached shutters, said reflector being oriented to cast radiation from the sun to a side of the shelter which is not otherwise in the direct path of the radiation of the sun.

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