

April 7, 1959

J. P. McGRAND

2,880,741

COLLAPSIBLE PORTABLE HANGAR

Filed Sept. 17, 1956

2 Sheets-Sheet 1

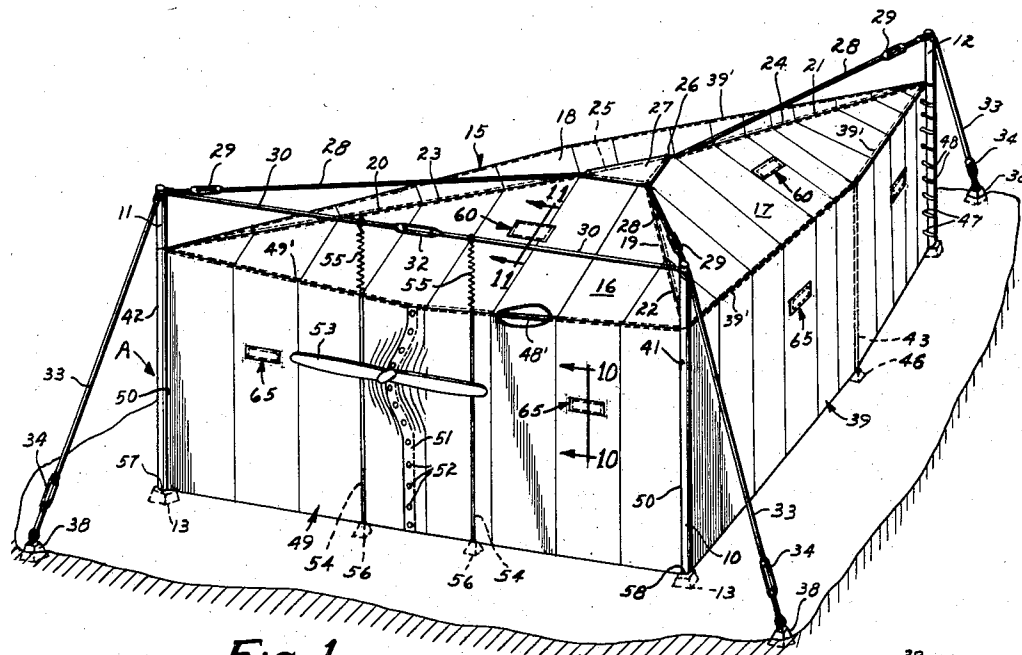


FIG. 1

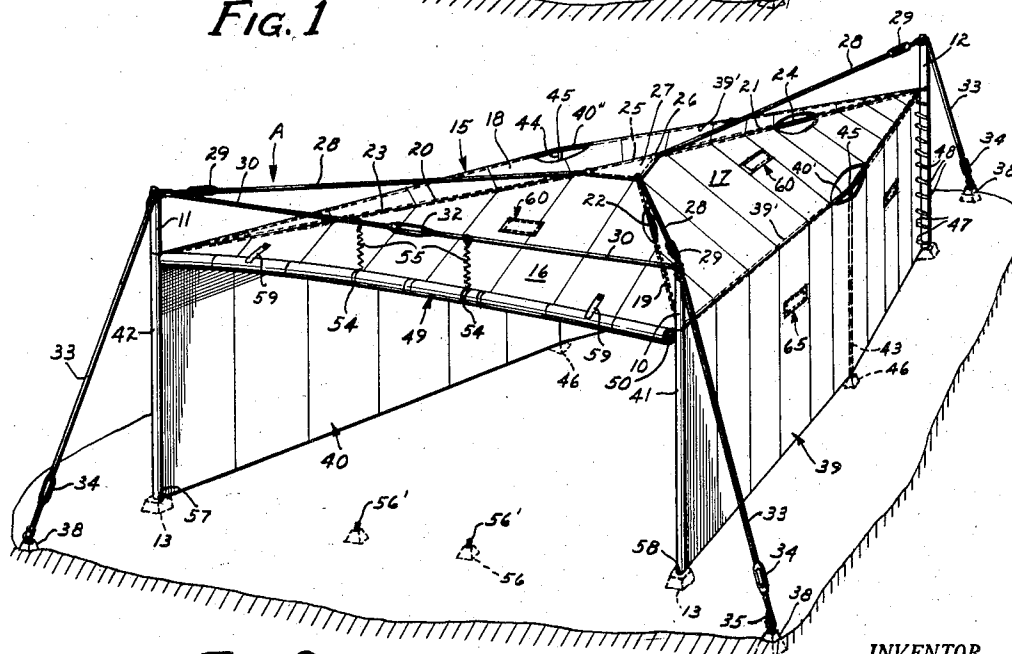


FIG. 2

INVENTOR.
JOHN P. McGRAND
BY
David H. Kilgore
ATTORNEY

1

2,880,741

COLLAPSIBLE PORTABLE HANGAR

John Patrick McGrand, Rochester, Minn.

Application September 17, 1956, Serial No. 610,067

1 Claim. (Cl. 135—1)

My invention relates to an improvement in enclosing structures and more particularly to a collapsible portable aircraft hangar structure usable also as a garage, shelter, etc.

It is an object of my invention to provide a hangar which is collapsible and portable and which is particularly stable with regard to high wind velocities which ordinarily tend to create considerable stress on the parts thereof.

It is also an object of my invention to provide a collapsible hangar which is erected with a minimum amount of effort but which is extremely stable and easy to fabricate.

It is a further object of my invention to provide a collapsible hangar constructed of flexible sheet material and in its erected condition has no support members within the area covered by the hangar.

It is an additional object to provide means in the walls and roof of the hangar which lessen the effect of wind on the same.

I shall not here attempt to set forth and indicate all of the various objects and advantages incident to my invention, but other objects and advantages will be referred to in or else will become apparent from that which follows.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals indicate like parts throughout.

In the drawings forming part of this application:

Figure 1 is a perspective front view of my hangar structure with a portion of the front door portion and adjoining roof broken away.

Figure 2 is a perspective view similar to that illustrated in Figure 1 but with the front door portion in a rolled-up and open condition and a portion of the roof and side walls broken away exposing supporting cables.

Figure 3 is a side elevational view of my structure.

Figure 4 is a top plan view of a fragmentary portion of the roof of my structure showing the top connection frame member with a portion of the roof cut away.

Figure 5 is a side edge view of my top connection frame member and top members.

Figure 6 is a detailed enlarged view of the anchor connection for the lower end of a hold down guy wire.

Figure 7 is a side view of an anchor pin and anchor and a portion of a vertical support mounted thereon shown partly in section.

Figure 8 is a section on the line 8—8 of Figure 6.

Figure 9 is a section on the line 9—9 of Figure 8.

Figure 10 is a section on the line 10—10 of Figure 1.

Figure 11 is a section on the line 11—11 of Figure 1.

Referring to the drawings in detail, my collapsible hangar A is generally triangular in shape and includes the front corner vertical pole supports 10 and 11 and the rear pole support 12. The lower end of the support 10 and anchor base 13 are illustrated in Figure 7, and the same is illustrative of the supports 11 and 12 each of which

2

is formed of hollow tubing. The anchor base 13 is sunk in the ground and has secured therein the vertical pin 14 on which the pole supports are easily positioned for secure support.

I further provide a roof member 15 which is composed of the three triangularly shaped sections 16, 17, and 18 which may be made of canvas and which are sewed together along the multiple lines of stitching 19, 20, and 21. Light cables 22, 23, and 24 are positioned between the rows of stitching to thereby secure the same to the roof member 15. The outer ends of the cables 22, 23, and 24 are removably connected to the upper extended ends of the posts 10, 11, and 12 respectively. The inner ends of the cables 22, 23, and 24 are secured to the eyebolts 26 mounted on the triangularly shaped frame 25.

The frame member 25 is positioned beneath the roof member 15 substantially centrally thereof where the sections 16, 17, and 18 meet with the eye bolts 26 extending upwardly therethrough. A reinforcing patch member 27 is secured to the sections 16, 17, and 18 above and slightly beyond the confines of the frame 25 and through which the eyebolts 26 extend.

The numeral 28 designates the roof support cables, the inner ends of which are secured to the eyebolts 26 of the frame 25 with the outer ends thereof adjustably connected to the top ends of the posts 10, 11, and 12 by means of the turnbuckles 29. The numeral 30 designates a tie member the ends of which are secured to the tops of the posts 10 and 11. The tie member 30 is constructed of two parts joined in the center by the turnbuckle 32.

For external support of my hangar I provide the guy members 33 which are secured at the upper ends thereof to the top ends of the supports 10, 11 and 12. Each of the lower ends of the guy members 33 are connected to a turnbuckle 34. The turnbuckle 34 is connected to the loop member 35 which is mounted on the thimble member 36 which in turn is secured to the upright pin member 37 securely anchored in the outer anchor member 38 partially extending below the ground.

The numerals 39 and 40 designate the vertical side walls of my structure which are built up of canvas sections and are sewed at 39' along the upper edge to the edge of the roof 15. I further provide a cable member 40' extending from the post 10 to the post 12 which is positioned at a point under the sewing 39' (where the roof 15 and wall 39 join) to thereby aid in supporting the wall 39 and the roof 15. A further cable 40'' member extends from the post 11 to the post 12 at the point of juncture of the roof 15 with the wall 40 to aid in supporting the wall 40 and the roof 15.

The walls 39 and 40 have formed on the entire front vertical edges thereof the elongated pockets 41 and 42 respectively into which the poles 10 and 11 are inserted to thereby maintain the walls 39 and 40 erect and stable at the front edge.

I further provide the hold down cables 43 and 44, the upper ends of which are secured to the cables 40' and 40'' at 45 respectively and at the lower ends thereof to the anchor members 46 to further stabilize the walls 39 and 40. The members 43 may be pulled down slightly to give added pitch to the roof 15 for better drainage. The rear vertical end edges of the walls 39 and 40 have formed therein a series of grommets 47. A line 48 is passed through the grommets 47 successively and around the post 12 to thereby secure the ends of the walls 39 and 40 thereto.

The front wall or door 49 is sewed along its upper edge 49' to the front edge of section 16 of the roof 15 and supported by the cable 48'. The outer vertical edges 50 of the door 49 are free, and centrally of the door wall 49 is the strip 51 formed with the snap fasteners 52 to pro-

vide access to the hangar. The strip 51 has a small opening formed therein through which the propeller 53 of a plane stored therein may extend.

The door 49 has secured thereto the hold down cables 54, the upper ends of which are secured to the coil spring members 55. The lower ends of the cables 54 are detachably connected to the anchor members 56 at 56'. The strip 51 allows access to my hangar without rolling up the entire front door member 49. The lower corners of the door 49 are fastened as at 57 and 58 to the posts 11 and 10 respectively.

In opening the door 49 from the position of Figure 2 to that of Figure 1 the fastening at 57 and 58 are released together with the connections at 56'. The door 49 is then pulled up slightly by the springs 55 and rolled up to the position shown in Figure 2 where it is secured in the rolled up condition by the straps 59.

In high winds it is the tendency of light weight canvas structures to be literally blown apart due to the force of the wind against the structure and the lifting or suction effect of the wind. To materially lessen the above I provide the covered vents 60 in the roof 15. As an example, in the vent 60 in the roof section 16, in detail in Figure 11, is found the opening 61. The numeral 62 designates the cover flap member which is secured along the upper edge thereof as at 63 so that the same hinges and is drawn upwardly, outwardly, and away from the roof 15 when the wind passes over the roof thereby letting air spill through rather than lifting the canvas members. The member 62 is held to a maximum opening by the retaining spring member 64.

The side walls 39 and the door 49 are also provided with covered vents 65. As an example, the covered vent 65 in the door 49, in detail in Figure 10, includes the opening 66. Further provided is the flap member 67 which is secured along the upper edge to the door portion 49 as at 68 so that the same may hinge inwardly and let the air pass in and through the hangar A to thereby prevent the same from being unduly stressed at various points. The flap 67 is held to a maximum opening by the spring 69. In high winds the same may pass through any of the vents 65 and out through any of the vents 60.

It is apparent that my structure may also be formed rectangular in shape and used as a garage or storehouse.

In erecting my hangar A the canvas body portion is placed on the ground and the poles 10 and 11 placed in the elongated pockets 41 and 42 respectively. The poles 10 and 11 are then positioned on the pins 14 of the anchor members 13 and thereby placed in a vertical position. The post 12 is inserted on a pin 14 mounted on the rear anchor 13 and the rear edges of the walls 39 and 40 laced thereto as explained above. The cables 28 are then connected to the tops of the posts 10, 11, and 12 and adjusted

to position the roof 15 correctly by means of the turnbuckles 29 with the guy wires 33 in position on the pins 37. The turnbuckles 34 are then adjusted to place the posts 10, 11, and 12 in correct position, and as a result the roof 15 is held correctly through the cables 28. The hold down cables 43 and 44 are connected at their lower ends to the anchor members 46 and drawn down tightly to form a slight valley in the sections 17 and 18 of the roof 15.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claim without departing from the spirit and scope of the invention.

Having thus described the invention, that which I claim as new and desire to secure by Letters Patent is:

In a structure of the class described, a collapsible body having two converging side walls, a front wall affording a door and a roof, an upright support member connected to said side walls at the point of convergence, an upright support member connected to the front edge of each of said side walls, said upright members extending above said side walls, a horizontally disposed rigid tie rod having endwise adjustment, connecting the upright support members, which support the forward edge portions of the side walls, at the upper end portions thereof, and at least one non-rigid member connecting the front wall with the said rigid tie rod to support the same substantially at the longitudinal center thereof, horizontal support cables connecting said upright support members, roof support cables connected to said roof centrally thereof and the upper extended portions of said upright members, guy members extending from said upright members, at least one of said side or front walls formed with an opening having a flap member hingedly mounted along its upper edge on the inner surface of said wall and covering said opening, a weak spring member secured to said wall adjacent said flap and contacting the same to hold the flap normally closed but which yields to allow said flap to open inwardly under a predetermined wind velocity against the same.

References Cited in the file of this patent

UNITED STATES PATENTS

144,054	Brien et al. -----	Oct. 28, 1873
302,535	Holabird -----	July 22, 1884
1,493,915	Baker -----	May 13, 1924
1,528,629	Quinan et al. -----	Mar. 3, 1925
2,134,879	Levy -----	Nov. 1, 1938
2,186,535	MacGeorge -----	Jan. 9, 1940
2,440,557	Power -----	Apr. 27, 1948
2,511,974	Finken et al. -----	June 20, 1950
2,516,869	Harris -----	Aug. 1, 1950
2,520,055	Pomerance -----	Aug. 22, 1950
2,646,057	Blanchard -----	July 21, 1953