Jan. 2, 1945. J. F. BLASKI 2,366,482

ARCHED ROOF

Filed Aug. 13, 1942

Fig. 1

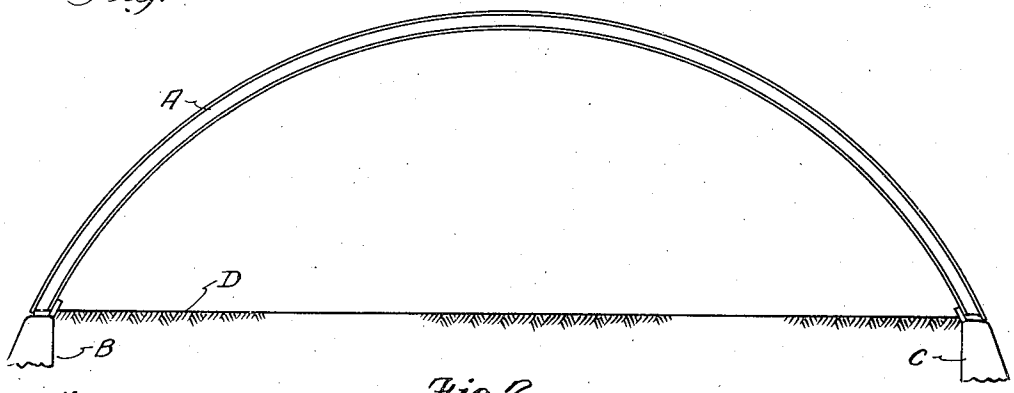

Fig. 2

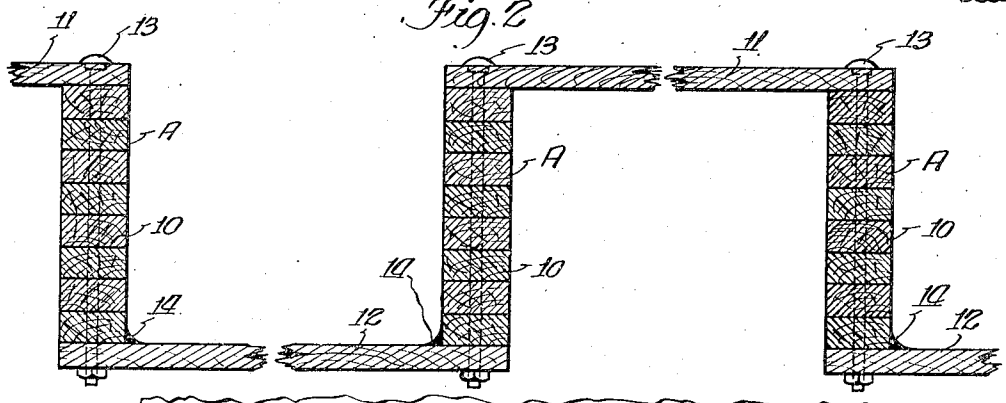

Fig. 3

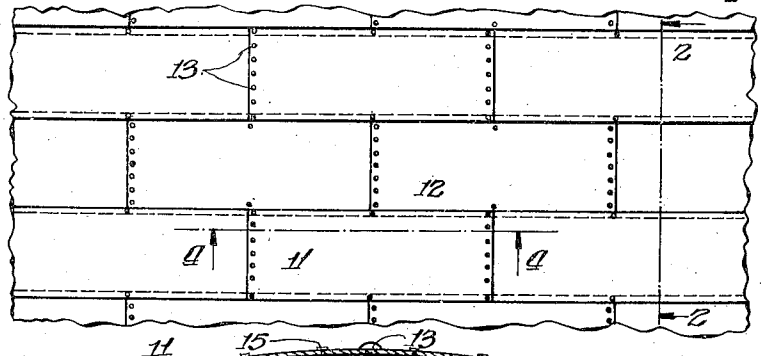

Fig. 4

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2,366,482

ARCHED ROOF

John F. Blaski, Chicago, Ill.

Application August 13, 1942, Serial No. 454,737

4 Claims. (Cl. 108—1)

My invention relates to an arched roof and method of making the same, and more particularly to arched roofs for large floor areas, e. g., hangars, garages and the like, wherein intermediate roof supports must be eliminated.

Because of present day conditions, limiting available material, there is need of a construction whereby an arched roof of wood may be quickly erected, and which is strong, rigid and waterproof and in the construction of which material and lumber are reduced to a minimum. My invention meets this need.

In carrying out my invention I utilize a plurality of wooden rafters of laminated construction supporting them on suitable piers or other supports in laterally spaced relation, then long panels of waterproof, bendable plywood are secured to the rafters. The manner of securement of the panels constitutes an important feature of the invention. To the upper edges of pairs of rafters, a pair being spaced from an adjacent pair a distance substantially that of the distance between the rafters of a pair, are attached plywood panels by bolts, nails and like means, preferably, although not necessarily, with one panel arranged with an end overlapping slightly the next panel, to shed water. Other similar panels are fastened to the lower edges of the adjacent rafters of the pairs, but not in register with the panels attached to the upper edges.

One object of my invention is to provide an arched roof which is rigid and strong and which may be erected with a minimum amount of material.

Another object of my invention is to provide an arched roof construction wherein large panels are used as roof boards and which are so connected to the rafters as to function in taking up compression and tension stresses applied to the rafters by weather or other conditions.

Another object of my invention is to provide an arched roof construction wherein rigidity is attained by a novel manner of securing the roof panels to the rafters.

A still further object of my invention is to provide an arched roof of crest and trough or hill and dale cross sectional construction for rigidity and reduction of material.

Another and further object of my invention is to provide an arched roof wherein roof panels of unsplittable, bendable wooden material are directly connected to the rafters, thus becoming integral parts thereof, in a manner to function with the rafters as tension and compression members.

A still further object of the invention is to provide a rafter supported arched roof in a manner to function as a trussed roof with all of the advantages of the latter.

Another and yet further object of my invention is to construct a rafter supported arched roof with alternate rows of roof panels in different curvilinear surfaces.

My invention has for an additional object the construction of a rafter supported arched roof in which adjacent rows of roof panels are out of register with each other.

Another object of my invention is to generally improve the rafter type of arched roof construction to provide a roof which possesses adequate strength and rigidity for its size and which is built with a truss effect, utilizing a minimum amount of material.

An additional object of my invention is to provide a novel method of making an arched roof wherein maximum strength and rigidity may be attained with minimum material.

The above, other and further objects of my invention will be apparent from the following description and accompanying drawing.

An embodiment of my invention, and also a disclosure of the method, is illustrated in the accompanying drawing and the views thereof are as follows:

Fig. 1 is a diagrammatic representation of the end view of an arched roof construction for hangars;

Fig. 2 is an enlarged fragmental transverse section taken in the plane indicated by line 2—2 of Fig. 3;

Fig. 3 is an enlarged fragmental plan view of a portion of the completed roof showing one manner of arranging the roof panels; and

Fig. 4 is a fragmental enlarged section taken in the plane indicated by line 4—4 of Fig. 3.

The drawing will now be explained.

Referring to Fig. 1, A represents an arched rafter in which a sufficient number are provided to erect a roof of a given size. These rafters are supported on piers or walls B and C set in the ground. D represents the floor or ground level.

The rafters are of laminated construction as shown at 10, with the ends spliced at random. The rafters are set up on their supports in laterally spaced relation.

For the roof boards I utilize panels 12 of bendable plywood material as I have found that this material is unsplittable and does not expand and contract as does straight grained lumber under varying weather conditions.

To the upper edges or margins of a pair of rafters A a series of panels 11 are secured, extending from end to end of the rafters. The panels are fastened to the rafters by means of bolts 13 spaced at intervals in the length of the panels and in addition, nails 15, screws, or other fastening means may be used to secure the panels to the rafters between the bolts. A series of rows of panels are thus fastened to the outer edges or margins of laterally spaced pairs of rafters.

Other roof panels 12 of like construction are attached to the lower edges or margins of certain of the rafters in staggered relation with respect to those attached to the outer margins of the rafters, as may be readily observed in Fig. 3. These panels 12 are secured in place by bolts, nails, screws, or other suitable fastening means.

It will be observed from Fig. 2 that my invention provides an arched roof in which adjacent rows of roof panels are out of register with each other and in which sections of the roof are in different curvilinear surfaces.

In order to provide water-tight joints between the rafters and the roof panels 12, the joints are sealed with suitable sealing material or compound 14 to prevent entry of rain and moisture through the roof. The manner of attaching the upper or outer roof panels 11, as described, I have found satisfactory in excluding rain and moisture.

In erecting a roof following the teachings of my invention, the various roof panels are preferably staggered in end to end relation, to break certain joints.

If desirable, the joints of the outer roof panels 11 may be butt joints, in which event suitable sealing material will be interposed between the joints to exclude rain and moisture. To eliminate the use of sealing means between such butt joints, I may utilize a construction which is shown in Fig. 4 in which certain of the upper or outer roof panels 11 have their ends overlapping the adjacent ends of the adjacent panels. Where this construction is employed, the bolts 13 at the ends of the overlapping panel will pass through the ends of the underlapping panels to reduce the number of bolts required.

By securing the panels 11 and 12 to the rafters in the manner stated, any compression loads imposed on the outer roof panels 11 will set up tension stresses in the lower or inner portions of the rafters. The securement of the inner roof panels 12 in the manner stated makes these integral parts of the rafters and thus they function to absorb certain of the tension stresses and in fact constitute integral parts of the rafters so that such tension stresses are spread over wide areas, thus providing truss effect in the rafter constructed roof.

Assume a heavy load of snow on the right portion of the roof, as viewed in Fig. 1. This load will set up compression strains along the upper margins of the rafters and be distributed through the outer roof panels 11 attached to the rafters and in the zone of the load. Resulting tension stresses are set up in the lower margins of the rafters, in the right-hand portion of the roof, which stresses are taken by the inner roof panels 12 and distributed over considerable area. The presence of this load will set up compression stresses along the lower margins of the rafters at the left-hand part of the roof establishing tension stresses along the outer margins of the rafters. The attachment of the inner panels 12 to the inner margins of the rafters and to the outer panels 11 to the outer margins of the rafters will absorb these stresses, thus maintaining the strength of the roof under abnormal weather conditions and rigidifying the roof.

It will be noted that a roof constructed in accordance with my invention functions as a truss roof in which the truss effect is created by the novel crest and trough arrangement of the alternating rows of roof panels, securing the truss effect with a minimum amount of roofing material. Utilizing the roofing panels in the manner stated eliminates any lateral bracing between adjacent rafters.

It is to be noted that the rafters are laterally spaced, one from another, at substantially equal distances.

Along the ends of the lapping roof panels enough bolts 13 are used to make the joints tight.

I do not intend to limit my invention to the specific constructions shown and described except only insofar as certain of the claims may be so limited as it will be apparent to those skilled in the art that changes in the construction and arrangement of the parts may be made without departing from the principles of my invention.

I claim:

1. A roof construction comprising a plurality of rafters, a plurality of upper roof panels, and a plurality of lower roof panels, the upper roof panels extending between and overlapping predetermined pairs of rafters and the lower roof panels extending between and overlapping alternate pairs of rafters to form a roof structure having a square-wave cross section taken on a plane perpendicular to the span of the rafters, bolts passing through a rafter and the edge of the upper and lower panels associated therewith to join said rafter and panels together.

2. A roof construction comprising a plurality of rafters of joined laminated strips, a plurality of plywood lower roof panels and a plurality of plywood upper roof panels, the upper roof panels extending between and overlapping predetermined pairs of rafters and the lower roof panels extending between and overlapping alternate pairs of rafters to form a roof structure having a square-wave cross section taken on a plane perpendicular to the span of the rafters, bolts passing through a rafter and the edge of the upper and lower panels associated therewith to join said rafter and panels together.

3. An arched roof construction comprising a plurality of arcuate rafters, a plurality of bendable upper roof panels and a plurality of bendable lower roof panels, the upper roof panels extending between and overlapping predetermined pairs of rafters and the lower roof panels extending between and overlapping alternate pairs of rafters to form a roof structure arched in a plane containing a rafter, and having a square-wave cross section taken on a plane perpendicular to the span of the rafters, bolts passing through a rafter and the edge of the upper and lower panels associated therewith to join said rafter and panels together, said panels being maintained in juxtaposition with said rafters by being bent against said rafters and retained in said position by said bolts.

4. A roof construction comprising a plurality of rafters, a plurality of upper roof panels and a plurality of lower roof panels, the upper roof panels extending between and overlapping predetermined pairs of rafters and the lower roof panels extending between and overlapping alternate pairs of rafters to form a roof structure having a square-wave cross section taken on a plane perpendicular to the span of the rafters, the panels comprising the roof section intermediate any pair of rafters being overlapped with respect to each other, and bolts passing through a rafter and the edge of the upper and lower panels associated therewith.

JOHN F. BLASKI.