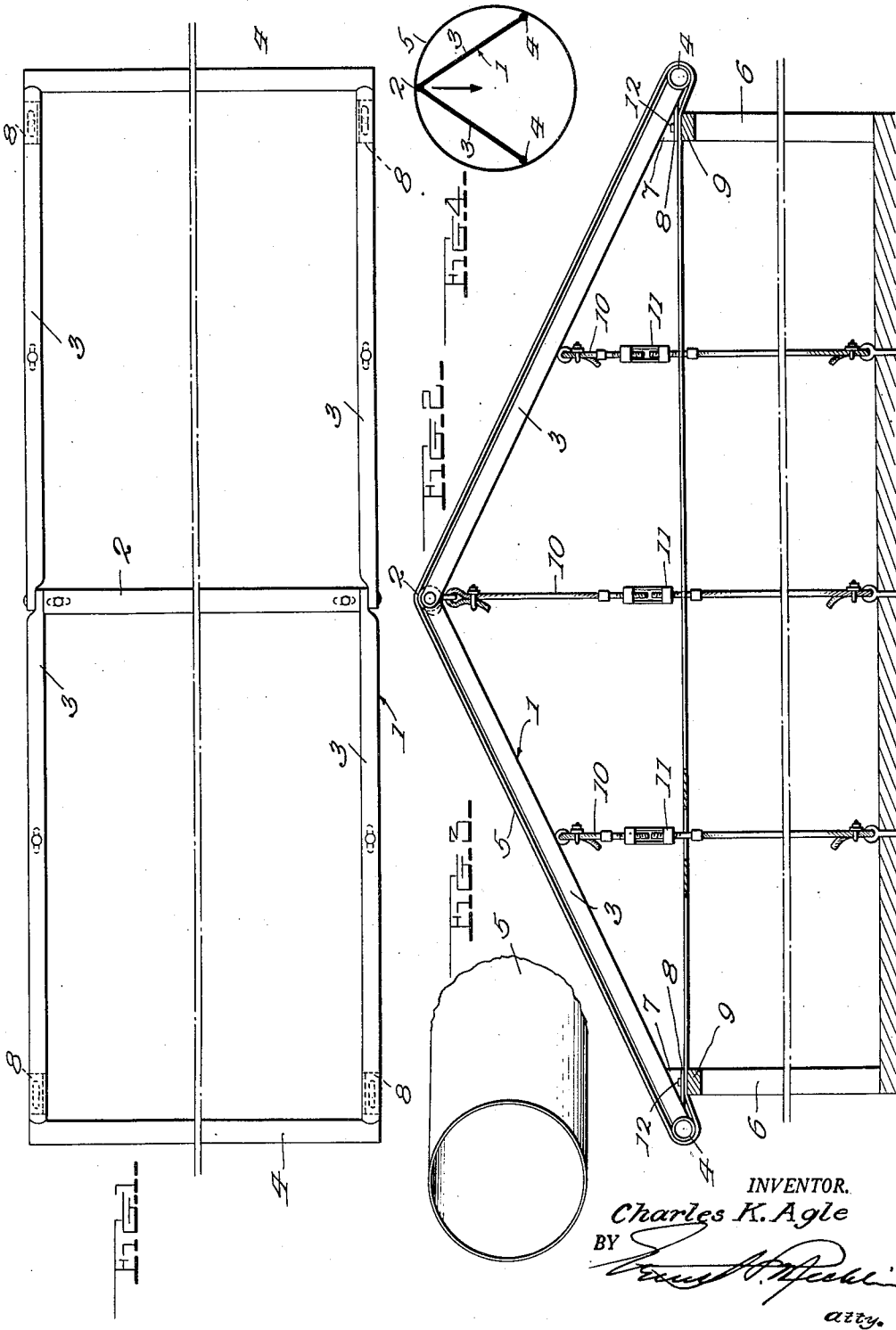


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C. K. AGLE
ROOF STRUCTURE

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ROOF STRUCTURE

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This invention relates to roof structures.

The primary object of the invention is to provide a roof structure having a continuous sheathing acting as a stress member.

Another object of the invention is to provide a roof structure having a frame encircled by a continuous stressed sheathing whereby the sheathing acts not only as a stress member but forms both a roof covering and a ceiling for the space below the roof structure.

An additional object of the invention is to provide a roof structure formed of a collapsible frame encircled by a sheathing of sheet material under tension whereby there is obtained an efficient roof structure of minimum number of parts, weight and cost.

Other objects and advantages of the invention will appear hereinafter in the detailed description, be particularly pointed out in the appended claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a frame for use in the roof structure of the present invention.

Figure 2 is an end elevational view of a roof structure embodying the invention.

Figure 3 is a perspective fragmentary view on a reduced scale of a tube of sheet material utilized in forming the sheathing for the roof structure; and

Figure 4 is an end elevational view on a reduced scale showing the frame inserted in the tube of sheathing before stressing.

Referring now in detail to the drawings in which like reference characters designate like parts, the disclosed embodiment of the roof structure of the present invention comprises a frame or compression member 1 preferably rectangular in shape and includes or contains a ridge pole 2 to the opposite sides of which are connected spaced pairs of struts, cross braces or rafters 3, the outer ends of the latter being connected by purlins, connecting members or longitudinal braces 4 disposed substantially parallel to the ridge pole. The spaced pairs of struts and their connecting purlins are preferably welded together and the side portions of the frame so formed are hinged at the ridge pole such that the frame is expansible for the purpose to be hereinafter described. The several members of the frame may be of tubular or other suitable construction.

As a covering for the frame 1, there is provided a sheathing, band or skin 5 which initially is in the form of a tube, such as illustrated in Figure 3. The sheathing preferably extends the full length of the frame and for this purpose may

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be formed from either a single sheet or a plurality of sheets of material which may be butt, lap or spirally welded or otherwise joined to provide a tube of the desired dimensions. The sheet material may be of steel, galvanized iron, aluminum or other material having like weather-resistant and stress properties, and may be flat, corrugated or of other desired configuration.

As shown in Figure 4, the roof structure is formed by inserting the frame 1 in collapsed condition into the tube of sheathing 5 and subsequently applying force to expand or open the frame until the latter approaches or nears its expansion limit as determined by the perimeter of the encircling or enclosing sheath formed by the tube. The roof structure, then substantially triangular in end section, is next superposed on or applied to the upper ends of the walls 6 of a building or other structure for which it was designed. In attaching the roof structure to the walls the frame 1 may be provided with connecting brackets or wall anchors 7 which may be of L or other suitable shape, and the lower portions or flanges 8 of which are slotted transversely of the frame and substantially horizontally disposed when the frame is in its expanded position. By bolting the frame to the buttresses or other members 9 forming the top portions of the walls 6 through the brackets 7 the transverse slotting of the latter serves to secure the frame to the walls, while permitting the relative shifting or movement therebetween required in the final stage of the erection of the roof structure.

After the roof structure has been bolted or otherwise loosely secured to the walls, additional force is applied to further expand the frame to cause the roof structure to take its ultimate shape or configuration. For this purpose there may be provided one or more cables or the like 10 connected at their upper ends to the frame and having their lower ends anchored beneath the frame, as to the floor of the space below the roof structure, the ceiling portion of the sheathing being appropriately slotted to permit passage of the cables. On tensioning the cables through turnbuckles 11 or other suitable means the frame is expanded until the metal sheathing is stretched tight and stressed in tension. With the sheathing thus prestressed, the connecting bolts 12 between the brackets 7 and the walls 6 are taken up or tightened until the roof is tightly secured or affixed in place.

In the roof structure so obtained the continuous sheathing 5 serves as both the roof covering and the ceiling of the space below the roof. Also

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by being prestressed in tension through the tensioning or anchoring cables 10 the sheathing functions as one of the stress members of the roof structure, with its ceiling portion forming the bottom chord of the roof truss. While the ceiling portion of the sheathing is shown coextensive with its roof covering portion, it will be understood that the ceiling portion may be drilled or slotted for the connection of partitions or other purposes without materially weakening the structure. Additionally, although the roof structure in its disclosed form provides a minimum weight and cost construction for low cost housing, the stress characteristics of the sheathing may be retained by employing spaced continuous bands, serving as stress members if different forms of roof covering or ceiling are desired.

From the above detailed description it will be apparent that there has been provided a roof structure having a stressed continuous sheathing which is of adequate strength, light in weight and economical in use. It should be understood that the described and disclosed embodiments are merely exemplary of the invention and that all modifications are intended to be included which do not depart either from the spirit of the invention or the scope of the appended claims.

Having described my invention, I claim:

1. A roof structure comprising an expansible frame, a continuous band encircling said frame, and adjustable means connected to said frame and anchored therebeneath for expanding said frame and maintaining said band under stress.

2. A roof structure comprising a centrally hinged compression member, a continuous sheathing encircling said member, and adjustable means connected to said member and anchored therebeneath for compressing said member and maintaining said sheathing in tension.

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3. A roof structure comprising an expansible compression member, a continuous sheathing enclosing said frame and substantially coextensive therewith, and adjustable means attached to said member and anchored therebeneath for expanding said member and maintaining said sheathing under stress, said sheathing serving as both roof covering and a ceiling for the space below said structure.

4. A roof structure comprising an expansible compression member, a continuous metal sheathing encircling said member, and adjustable tension cables attached to said member and anchored therebeneath for expanding said member and maintaining said sheathing under stress.

5. A roof structure for a building comprising a centrally hinged compression member, a continuous metal sheathing encircling said member, adjustable tension cables attached to said member and anchored therebeneath for expanding said member and maintaining said sheathing under stress, and means for slidably connecting said frame to walls of said building during expansion of said frame and thereafter fixedly attaching said frame to said walls.

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