(No Model.) 2 Sheets—Sheet 1.

F. L. COOK.

ROOF CONSTRUCTION.

No. 568,066. Patented Sept. 22, 1896.

Fig. 1.

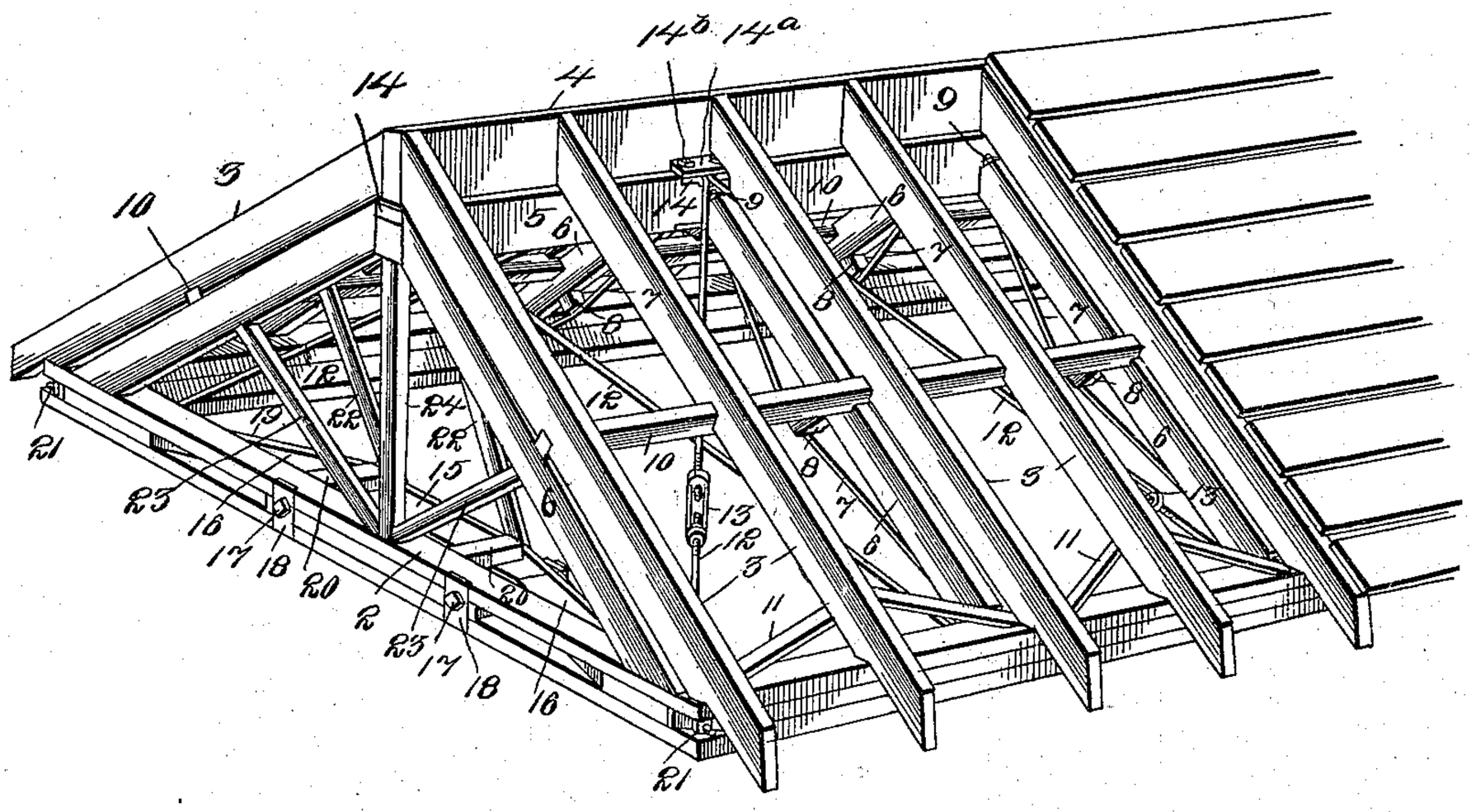
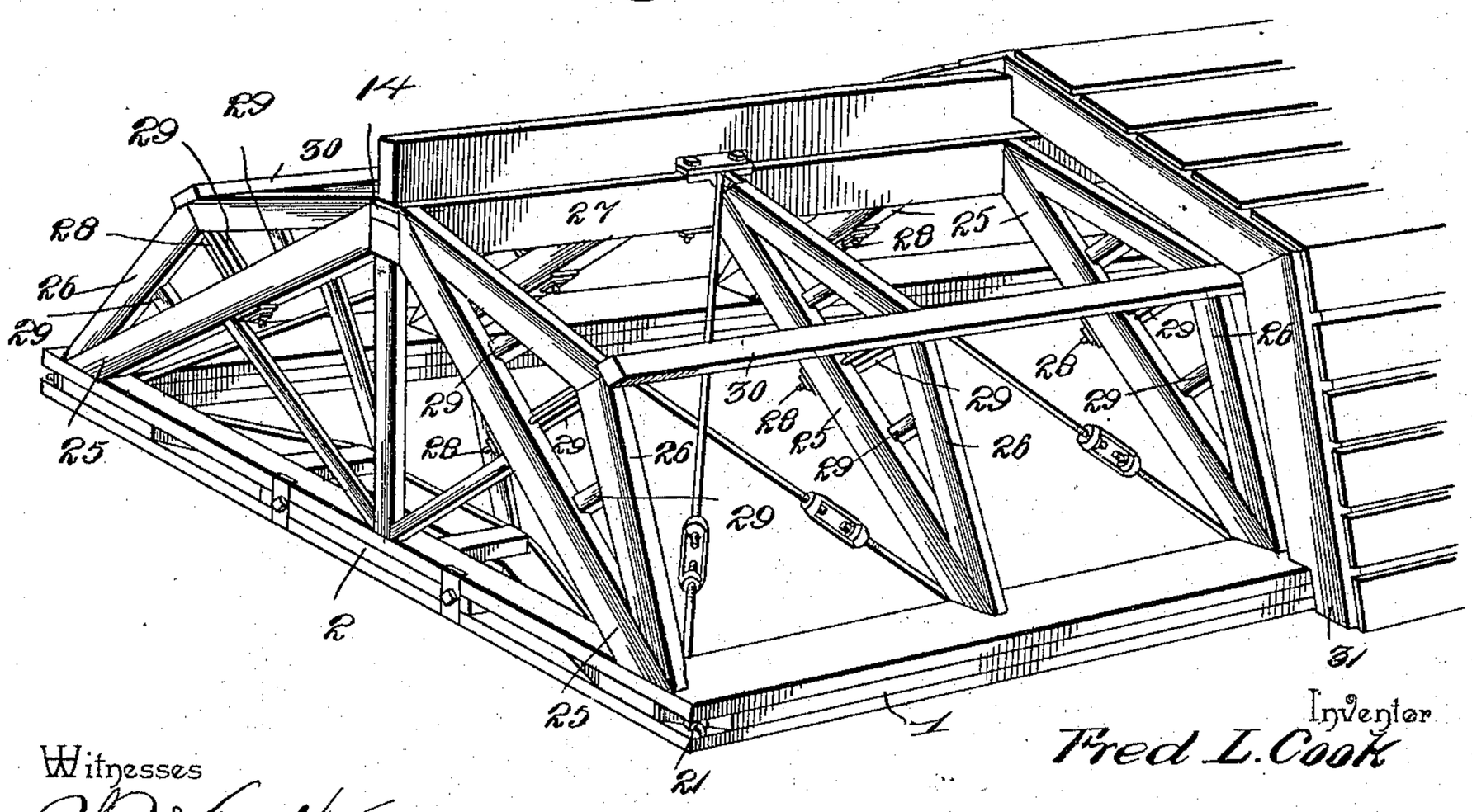


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

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No. 568,066. Patented Sept. 22, 1896.

Fig. 2.

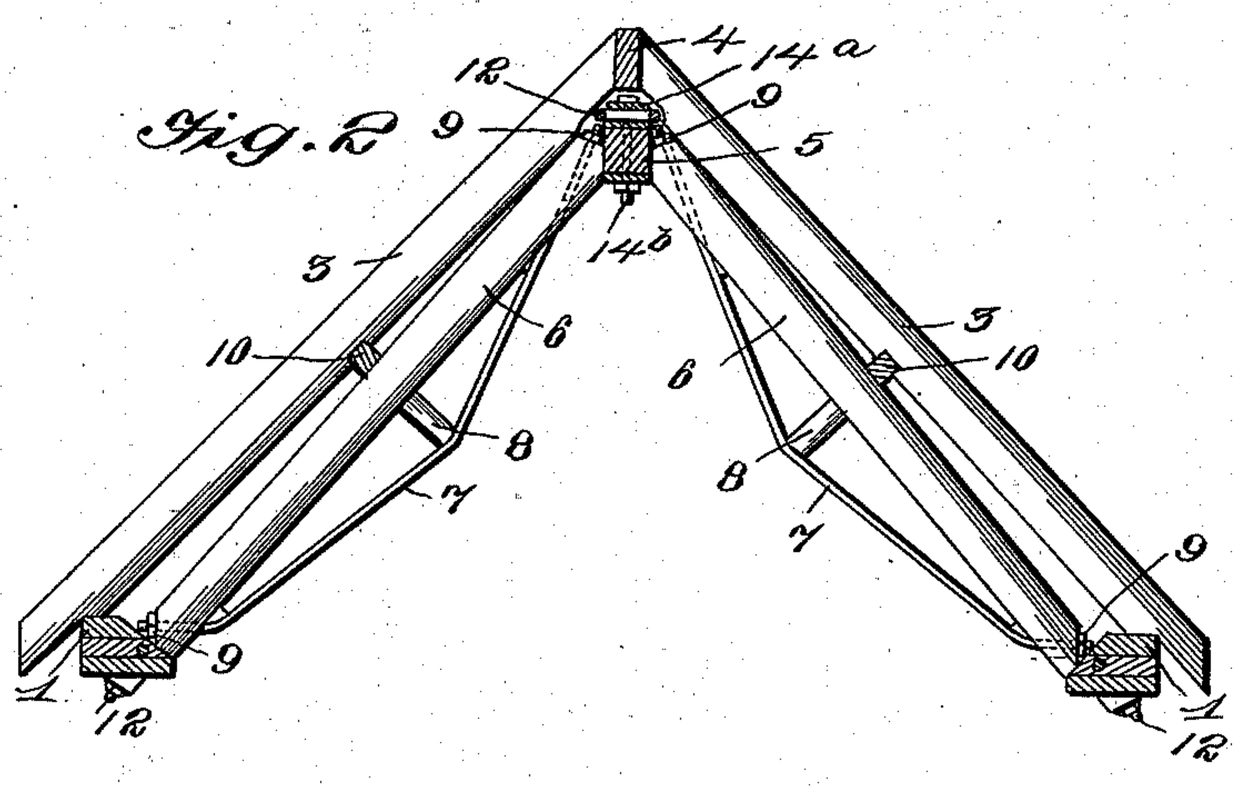


Fig. 3.

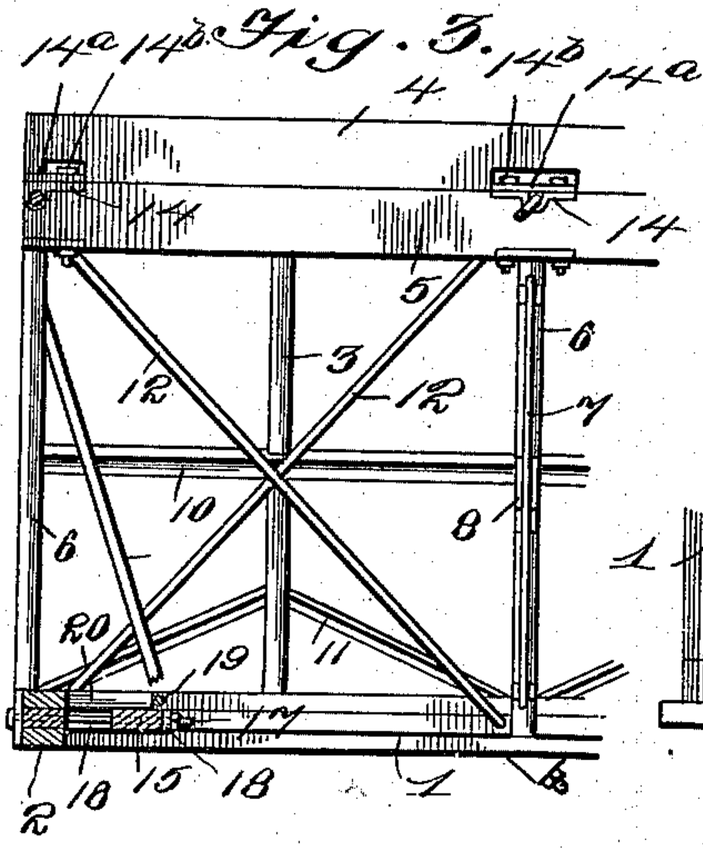


Fig. 4.

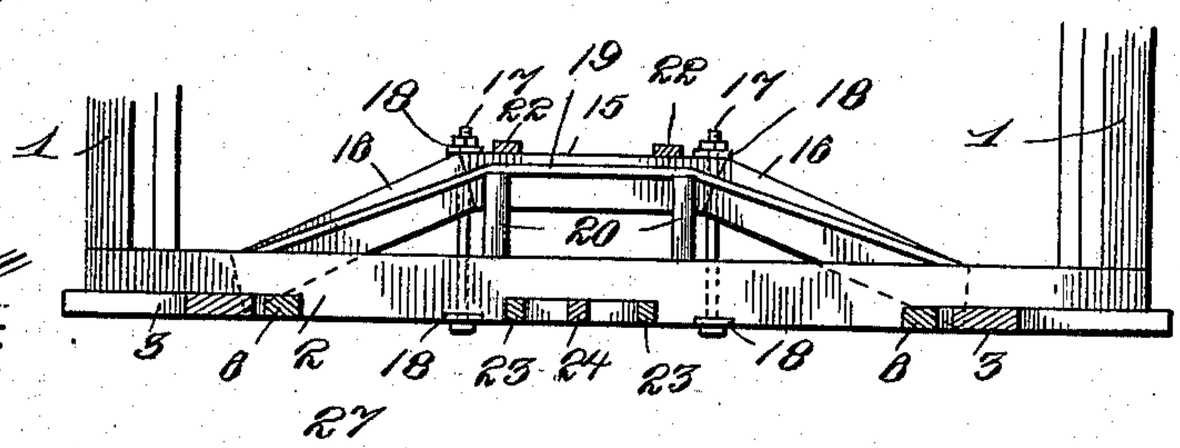
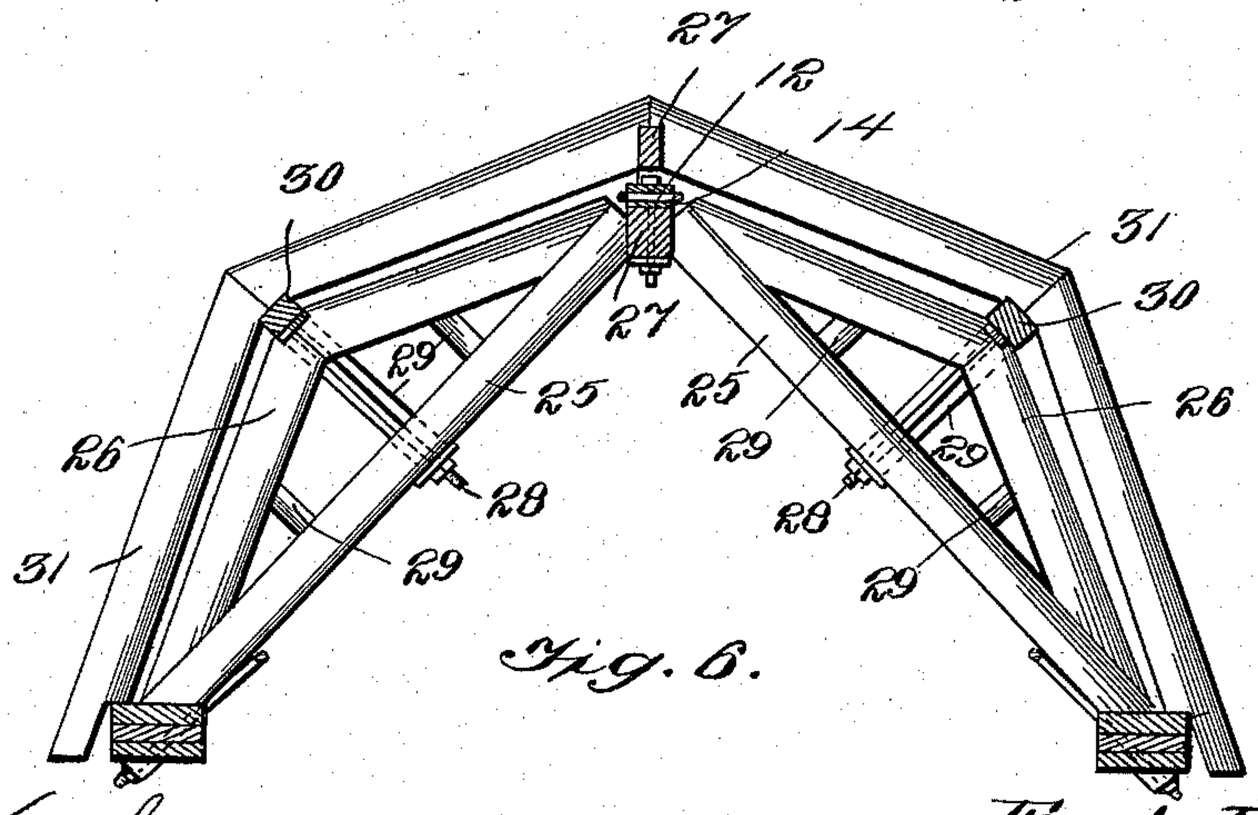


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRED LEE COOK, OF ASHTABULA, OHIO.

ROOF CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 568,066, dated September 22, 1896.

Application filed February 20, 1896. Serial No. 580,037. (No model.)

To all whom it may concern:

Be it known that I, FRED LEE COOK, a citizen of the United States, residing at Ashtabula, in the county of Ashtabula and State of Ohio, have invented a new and useful Roof Construction, of which the following is a specification.

My invention relates to roof construction, and has for its object to provide improved means for trussing in the plane of the roof against side thrust and wind-pressure to avoid obstructing the space between the planes of the sides of the structure.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a portion of a gable-roof constructed in accordance with my invention. Fig. 2 is a vertical transverse section of the same. Fig. 3 is a longitudinal section of the end of the gable to show the means for supporting the bracing devices for the end plate. Fig. 4 is a plan view, partly in section, of the end plate and bracing devices. Fig. 5 is a perspective view of a portion of a gambrel-roof constructed in accordance with my invention. Fig. 6 is a transverse section of the same.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates side plates, and 2 the connecting end plate, the rafters 3 being notched at their lower ends upon the side plates and terminating at their upper ends in contact with the ridge-piece 4.

A ridge-beam 5 is arranged parallel with and contiguous to the ridge-piece, and extending therefrom to the side plates are struts 6, which are provided with truss-braces, consisting of a tension rod or cable 7 and a bridge-block 8, arranged at the center of the strut. Said tension rod or cable is provided with suitable means for adjustment, such as screw-couplings 9. The struts are connected transversely at points approximately midway between the side plates and the ridge-beam 5 by cross-braces 10, over which the rafters 3 are notched, and auxiliary inclined braces 11 are secured to the rafters contiguous to the plates and are stepped at their outer ends against the feet or lower extremities of the struts 6. These auxiliary inclined braces convert downward thrust of the rafters into longitudinal thrust parallel with the side plates.

In order to overcome side thrust of the roof and brace the same longitudinally in the plane of the roof, I employ tensile braces 12, disposed diagonally between the side plates and the ridge-beam and approximately in the plane of the struts. The lower end of each tensile brace is secured to a side plate preferably adjacent to the foot or lower end of a strut, and said brace extends thence in a diagonal direction to the ridge-beam, which it engages at the upper extremity of another strut, and said braces are preferably disposed in opposite or intersecting positions in order to prevent vibration of the roof structure in either direction.

The tensile braces are preferably provided with adjusting devices, such as screw couplings or nuts 13, and the upper ends of the braces engage shoes 14, which are let into the ridge-beam. In the construction illustrated the braces are formed in pairs of a continuous rod or cable, which is secured at one end to a side plate at the foot of one of the struts, thence extends upwardly to and traverses the ridge-beam contiguous to the upper extremity of the next strut, and then passes to the other side of the plate at the foot of the strut opposite to the first-named strut. Thus the complete tensile brace forms a loop, and therefore permanent attachment to the ridge-beam is unnecessary. To prevent slipping of the rod or cable through the shoe, I may employ caps 14^a, bolted, as at 14^b, to the shoe and spanning the rod or cable.

In connection with the above-described construction I employ means for bracing the end plate against inside pressure, as by the hay or other contents of the roof, including a strut-brace having a crown-piece 15 and inclined or strut pieces 16, which are arranged at one end in contact with the extremities of the crown-piece and at the other end are seated against the end plate, tension-bolts 17 being employed at the connected extremities of the crown and strut pieces to cause lateral thrust of the strut-pieces, or thrust toward

the side plates. The nuts with which said bolts are provided are seated upon wear-plates 18. In connection with this strut-brace I employ a truss-brace, also arranged in a horizontal position to resist outside or wind pressure and consisting of a tensile rod or cable 19, secured at its extremities to the end plate near the terminals thereof and traversing bridging-blocks 20, arranged near the center of the end plate. Said tensile rod or cable is provided with adjusting devices 21.

The strut-brace is supported from the struts 6 by means of downwardly and inwardly inclined hangers 22, and radiating braces 23 are arranged above the end plate with their lower ends contiguous to the center thereof and their upper ends in contact with the centers of the struts 6, which are in the plane of said end plate. An auxiliary support 24 may also, as shown in the drawings, be arranged in a vertical position between the center of the end plate and the extremity of the ridge-beam.

In Figs. 5 and 6 I have shown a slightly-modified form of my invention as applied to a gambrel-roof, and in this connection I employ string-pieces 25, similar to the struts 6 used in connection with the gable-roof, and strut-braces 26, which are seated at their remote ends upon the extremities of said string-piece contiguous, respectively, to the ridge-beam 27 and the side plate 1 and are arranged in contact at their contiguous ends and a tension-bolt 28 for producing the desired thrust in opposite directions of the struts 26. Holding-pieces 29 will also be employed to hold said struts in the desired position after the tension-bolt has been tightened. The centers of the hips formed by the struts 26 are connected by transverse braces 30, which form side ridges upon which to frame the rafters 31. The diagonally-disposed tensile braces used for strengthening the roof longitudinally, as described in connection with the gable-roof shown in Figs. 1, 2, and 3, are employed in connection with the gambrel-roof, and the end plate is also adapted to be braced in the manner hereinbefore described.

From the above description it will be seen that in addition to bracing all parts of the roof against wind-pressure applied to either the side or the end of the structure the space within the roof is left free of obstructions, whereby hay-carriers and similar devices may be arranged to operate without interference.

I am aware that various means have been devised heretofore for bracing a roof against wind-pressure; but it is desirable also to arrange the bracing devices in such a way as to allow a hay or straw carrier to operate freely and thus increase the capacity of the building.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a roof, the combination with side plates and a ridge-beam, of continuous or looped tension-braces connected at their extremities to the side plates and extending over the ridge-beam, the side portions of said braces being diagonally disposed, substantially as specified.

2. In a roof, the combination with side plates and a ridge-beam, of diagonally-disposed tension-braces connecting the side plates with the ridge-beam and disposed in opposite or intersecting planes to brace the structure longitudinally in opposite directions, substantially as specified.

3. In a roof, the combination with a plate, of a horizontally-disposed strut-brace having struts stepped at their remote ends upon the plate, and tension-bolts for adjusting the thrust of said struts, substantially as specified.

4. In a roof, the combination with a plate, of a horizontally-disposed strut-brace having a crown-piece, struts arranged at their contiguous ends in contact with the extremities of the crown-piece and stepped at their remote ends upon the plate, tension-bolts for adjusting the thrust of the struts, and hangers for supporting the intermediate portion of the brace, substantially as specified.

5. In a roof, the combination with a plate, of a truss-brace arranged in a horizontal position, and having a tensile rod or cable attached at its extremities to the plate and traversing a bridging-block, substantially as specified.

6. In a roof, the combination of side plates, a ridge-beam, inclined struts connecting said plates with the ridge-beam, diagonally-disposed tensile braces in the plane of the struts, and cross-braces connecting the struts, the roof-rafters being adapted to be notched over said cross-pieces, substantially as specified.

7. In a roof, the combination of side plates, a ridge-beam, inclined struts connecting said parts and provided with truss-braces, cross-braces connecting the struts, rafters seated upon the side plates and notched over the cross-braces, and auxiliary inclined braces extending from intermediate points of the rafters to the lower extremities of the struts, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRED LEE COOK.

Witnesses:
HENRY FASSETT,
JAMES REED.