Sept. 20, 1938. J. S. EDISON 2,130,419

ROOF STRUCTURE

Filed Oct. 27, 1936 2 Sheets-Sheet 1

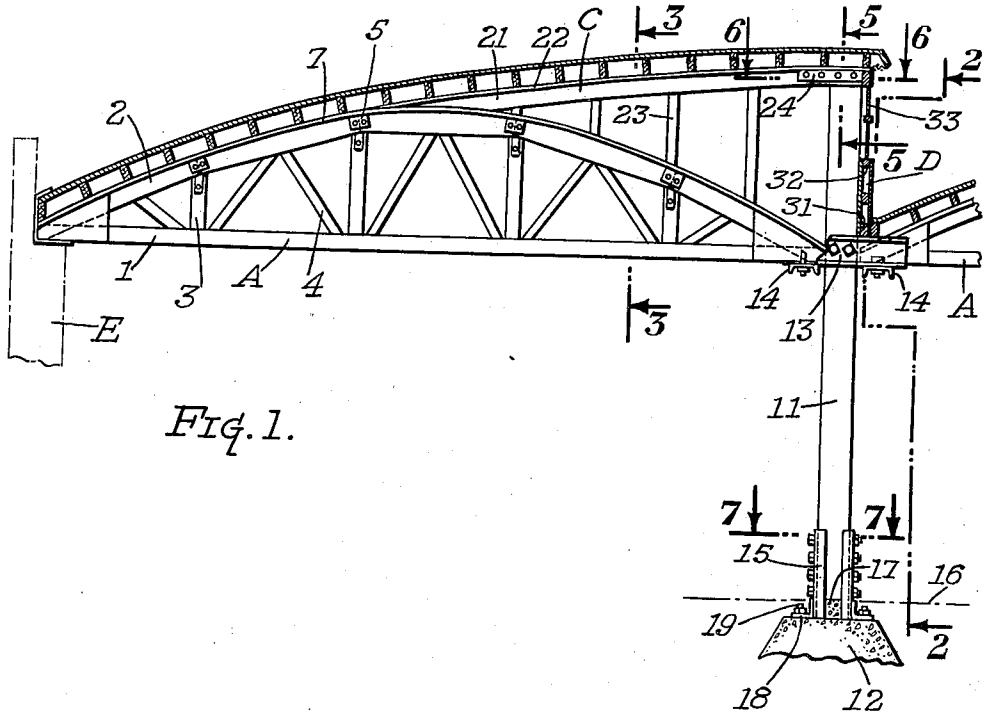


FIG. 1.

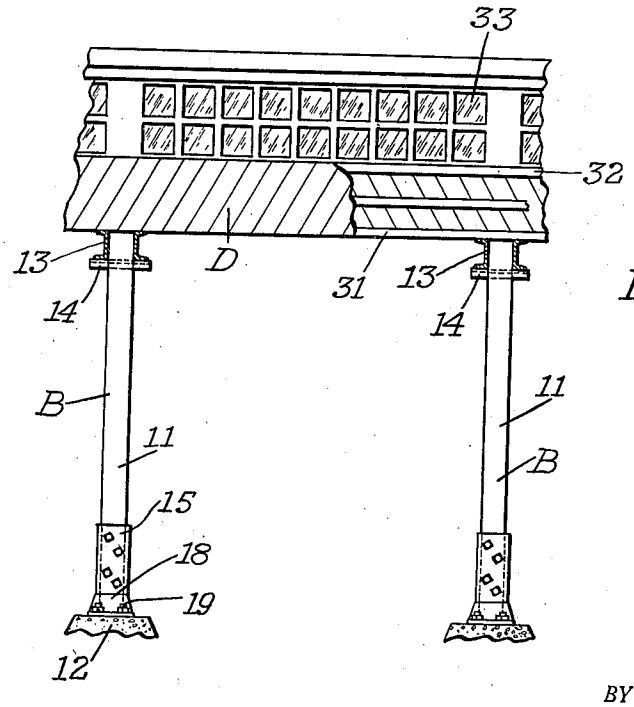


FIG. 2.

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ROOF STRUCTURE

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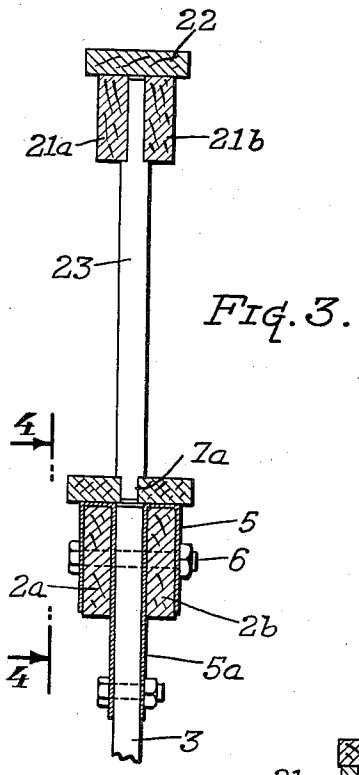


FIG. 3.

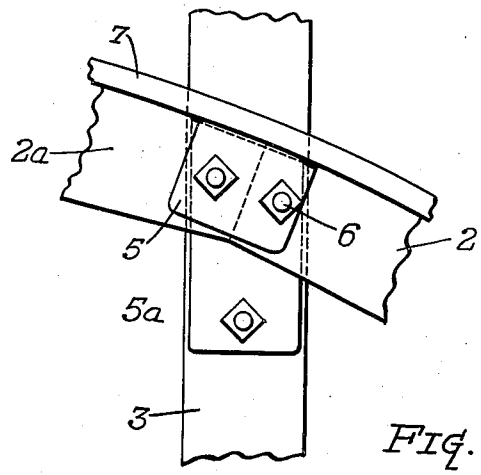


FIG. 4.

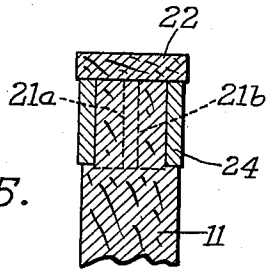


FIG. 5.

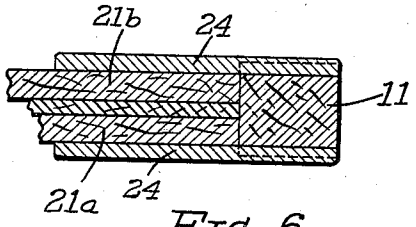


FIG. 6.

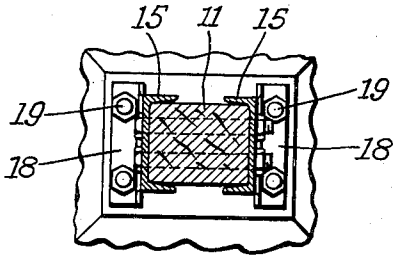


FIG. 7.

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Patented Sept. 20, 1938

2,130,419

UNITED STATES PATENT OFFICE

2,130,419

ROOF STRUCTURE

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Application October 27, 1936, Serial No. 107,833

11 Claims. (Cl. 108—23)

My invention relates to roof structures and particularly to wood structures, although certain features are applicable to other types. This invention has particular reference to structure employing bowstring or similar type of roof trusses.

One of the principal objects of this invention is to provide a roof structure of the saw tooth type having efficient internal bracing so as to eliminate extensive and thick outer walls and horizontal diagonal bracing, and thereby increase to a large extent the available storing or other space.

Another principal object of this invention is to provide a roof truss unit for saw tooth type of roofs, in which the truss and column or post for one end of the truss forms a part of and is erected with and as a part of the truss.

Another important object of this invention is the provision of a roof truss and supporting column in which the latter supports the lower portions of the truss and forms the side or end of the truss and the foundation for a vertical wall at the end of and between adjacent trusses.

A further important object of this invention is the provision of a roof structure employing a bowstring truss having a supporting column at one end and a super structure extending as a continuation of and curved upwardly from the top of the truss to and supported by the upper end of the column.

An important object also of this invention is the provision of a structure, as hereinbefore referred to, in which the supporting columns of adjacent trusses are reinforced relative to each other by transverse trusses and particularly at such a position above the lower chords of the first trusses so as to provide clear head room below the trusses, efficiently reinforce the structure transversely, and provide ample window clearance above the transverse trusses.

Another object of this invention is to provide a novel means and method of placing and anchoring the supporting column for the trusses.

An object also is the provision of novel, rigid but economical joints between the chords and braces.

With these and other objects in view, as will appear hereinafter, I have devised a roof structure having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a sectional elevation showing one truss unit, with its adjoining parts, of my roof structure in its preferred embodiment;

Fig. 2 is a transverse sectional elevation taken at 2—2 of Fig. 1, showing two adjacent truss units;

Fig. 3 is an enlarged typical vertical section taken at 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmentary elevation taken at 4—4 of Fig. 3; and

Figs. 5, 6, and 7 are enlarged fragmentary sections taken respectively through 5—5, 6—6, and 7—7 of Fig. 1.

My roof structure, as illustrated in the drawings, consists essentially of bowstring trusses A, supporting columns B, super trusses or structures C, and transverse wall trusses D.

The trusses A, commonly referred to as bowstring trusses, are illustrated and described in detail in my copending patent application for Roof trusses, Serial No. 100,887. This truss consists primarily of a horizontal bottom chord 1, a convex top chord 2, and transverse vertical braces 3 and diagonal braces 4.

The upper end of each vertical brace 3 is positioned between the spaced apart chord elements 2^a and 2^b, comprising the upper chord member, and in overlapped relation to each of the abutted pairs of elements also comprising said member; that is, approximately one half of the width of the vertical brace is positioned between one pair and the other half between the adjacent pair of elements.

I have provided U-plates 5, one of which is placed over the top and over the joint of each of the abutting elements 2^a and 2^b, one leg of each being placed against the outer side of the chord element and the other against the inner side. The ends of the abutted chord elements are secured to the plates 5 and brace 3 by transverse bolts 6 extending through all of the elements, thus rigidly uniting all of the members. As shown, the inner legs 5^a of the U-plates may be elongated and further secured to the braces below the chord elements, and thus further strengthening the structure.

In the drawings, one end of the truss is shown resting on a building wall E. In saw tooth roof construction, the other or opposite end is generally supported on a column B, which, in this instance, consists of a post 11 supported on a concrete foundation 12, and provided intermediate the ends and at the opposite sides with channels 13 which extend with their ends beyond the post. To the underside of the lower flanges of

these extended ends are secured cross channels 14, on one of which said opposite end of the truss A is supported and secured.

To the opposite sides of the lower end of the post are secured vertical channels 15, the post fitting between the flanges of the opposed channels. These channels support the post on the foundation 12. The channels extend below the post such a distance that the lower end of the post is spaced above the level of a floor 16 which is to be laid on the foundation 12. There is placed between the channels 15, to facilitate the support of the post on the foundation, a concrete block 17, as shown. To the outer sides of the lower ends of the channels 15 are secured angles 18 which are secured to anchor bolts 19 extending above the foundation 12.

In order to mount the truss and post in place, one end is secured to the wall E and the angles are merely placed over and secured to the anchor bolts 19.

The post extends above the bottom chord of the truss A, or above the supporting channels 13, a distance greater than the depth of the truss A. The upper end of the post supports the end of the super truss or structure C.

Said super truss or structure consists of a curved upper chord 21, comprising transversely spaced elements 21^a and 21^b, and a top plate 22. The top plate or cap merges in curved form with the corresponding member 7 of the truss A, slightly beyond the median line, in such a manner that the top plates of both trusses provide a graceful curve and substantially one continuous roof truss. The portion of the upper chord of the truss C, intermediate the ends are supported on the upper chord of the truss A by means of vertical braces 23, the ends of which form tenons which fit respectively between the spaced apart chord elements 21^a and 21^b and into mortise joints 7^a in the top plate 7. The chord elements 21^a and 21^b are preferably abutted against the post 11 and secured thereto by wood or other plates 24, mortised into the post, as shown in Fig. 5.

In effect the super truss forms with the bowstring truss a single truss structure supported at one end of the wall or on a post and at the opposite end of the post.

Adjacent posts, that is, posts supporting adjacent trusses are reinforced relative to each other by transverse trusses D which may be of any desired form. The lower members 31 of the trusses D rest on the channels 13. The width of this truss is preferably one-half or less than one-half the distance between the supporting channels 13 and the top chord of the super truss C. Above the upper element 32 of this truss are provided windows 33 for the building.

On the top plates 7 and 22 of the upper chords of the trusses A and C are transversely supported the roof joists which in turn carry the roof proper.

With this construction, I have found that no horizontal diagonal bracing, and no elaborate side wall construction is required to provide a rigid structure.

Though I have shown and described a particular construction, I do not wish to be limited to the same, but desire to include in the scope of my invention, the construction, combination, and arrangement, substantially as set forth in the appended claims.

I claim:

1. In a roof structure, a bowstring truss, and a super truss constructed on and above the crown of the same at one side of its median line, the top of the super truss being curved and merging at one end with the crown of the bowstring truss, the opposite end portion of the super truss extending higher than said crown.

2. In a roof structure, a bowstring truss, a super truss constructed on and above the crown of the same at one side of its median line, the top of the super truss being curved and merging at one end with the crown of the bowstring truss, the opposite end portion of the super truss extending higher than said crown, and a column supporting one end of the bowstring truss and the latter end of the super truss and forming the side of the latter truss.

3. In a roof structure, a pair of parallel roof trusses, each having a bottom and top chord joined at one end and diverging therefrom and vertically separated at the opposite ends, vertical columns, one for each truss, each column supporting the latter ends of both chords of its respective truss, and a third vertical truss extending transversely to the former trusses and connecting and reinforcing said columns relative to each other.

4. In a roof structure, a pair of aligned roof trusses, each having a bottom and top chord joined at one end and diverging therefrom and vertically separated at the opposite ends, a vertical column supporting the latter ends of both chords of one truss and the joined end of the other truss, another pair of similar aligned trusses positioned parallel to the former pair, another column similarly supporting the latter pair of trusses, and a transverse vertical truss extending between and reinforcing adjacent columns relative to each other above the bottom chords.

5. In a roof truss, a lower chord and an upper chord, the latter comprising transversely spaced apart elements, vertical braces between the chords, the upper ends positioned between said spaced apart elements, separate U-plates arranged in opposed pairs, one U-plate of each pair being positioned over the upper edge of each of said elements, the inner legs of the opposed pairs being positioned at the opposite sides of the corresponding brace, and means securing said elements and braces together through said plates.

6. In a roof truss, a lower chord and an upper chord, the latter comprising pairs of spaced apart elements positioned with the ends of one pair abutting the ends of the adjacent pair, vertical braces between the chords, the upper end of each brace positioned between said spaced apart elements, and the upper end of each brace also overlapping abutting pairs of elements, separate U-plates arranged in opposed pairs, the U-plates of each pair overlapping the end portions of the abutting elements of each abutting pair, one U-plate of each pair extending over the upper edge of abutting elements, the inner legs of the opposed pairs being positioned at the opposite sides of the corresponding brace, and means securing the abutted ends of the elements to the brace and plate therebetween.

7. In a bowstring roof truss, a straight lower chord and an arched upper chord, the latter comprising abutting arch elements, vertical braces between the chords, and plates extending over the abutting ends of the elements, each plate being positioned between and secured to a pair of abutting elements and a brace.

8. In a bowstring roof truss, a straight lower chord and an arched upper chord, the latter com-

prising abutting arch elements, braces between the chords, and inverted U-plates extending over and secured to abutting end portions of the elements, each plate having one leg positioned between a pair of abutting elements and a brace and also secured to the latter.

9. In a bowstring roof truss, a straight lower chord and an arched upper chord, the latter comprising abutting arch elements, braces between the chords, and inverted U-plates extending over and secured to abutting end portions of the elements, each plate having one leg considerably longer than the width of the elements, said longer leg being positioned between a pair of abutting elements and a brace and also secured to the latter.

10. In a roof structure, a bowstring truss, and a super truss constructed on and above the crown of the same at one side of its median line, the top of the super truss being curved and merging at one end with the crown of the bowstring truss.

11. In a roof structure, a bowstring truss, a super truss constructed on and above the crown of the same at one side of its median line, the top of the super truss being curved and merging at one end with the crown of the bowstring truss, and a column supporting one end of the bowstring truss and the latter end of the super truss and forming the side of the latter truss.

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