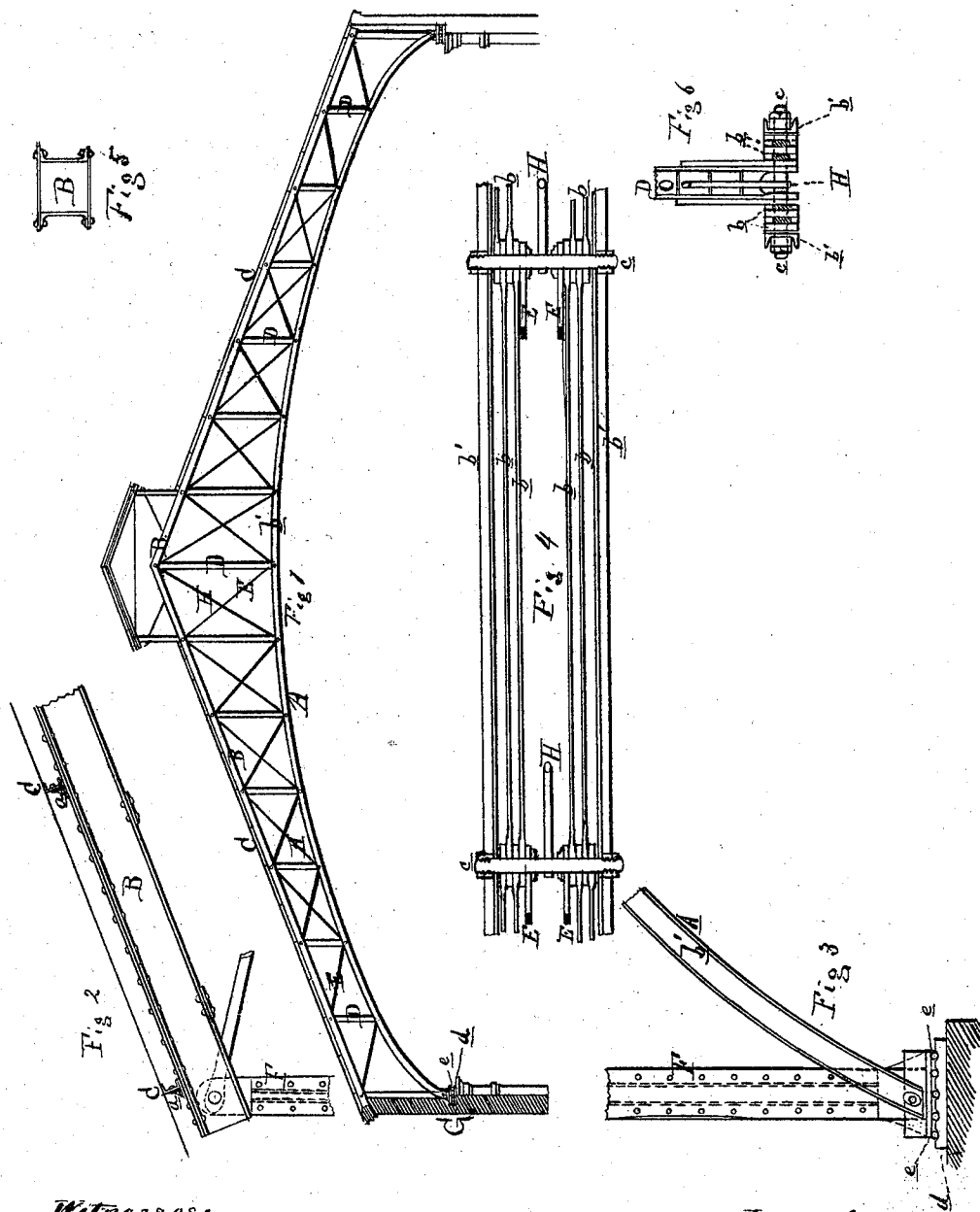


A. GOTTLIEB.
Iron Roof-Trusses.

No. 140,772.

Patented July 15, 1873.



Witnesses:
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UNITED STATES PATENT OFFICE.

ABRAHAM GOTTLIEB, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN IRON ROOF-TRUSSES.

Specification forming part of Letters Patent No. 140,772, dated July 15, 1873; application filed January 24, 1873.

To all whom it may concern:

Be it known that I, ABRAHAM GOTTLIEB, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Iron Roof-Truss; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is an elevation of my improved roof-truss, with a ventilator-truss added. Fig. 2 is an enlarged elevation, showing, in detail, the connection of the top of the end post and end main brace with the top chord, together with a portion of the latter. Fig. 3 is a view of the lower end of the end post resting on rollers, and a portion of the outer bar of the bottom chord, with the elongated bolt-hole in its lower end. Fig. 4 is a sectional plan of a panel of the lower chord. Fig. 5 is a cross-section of the top chord. Fig. 6 is a cross-section of the lower chord.

Like letters refer to like parts in the several figures.

The nature of this invention relates to an improved construction of iron roof-trusses in such a manner that the upper chord shall be subjected to compressive strains only, and the lower chord to tensile strains only. The lower chord is arch-shaped, its outer members being of rolled angle or channel iron and the intermediates of short link-bars, and the truss being so arranged as to exert no thrust upon the supporting-walls, and that without horizontal tie-rods, whereby more clear headway is afforded within the structure. The invention consists, first, in the combination of an arched bottom chord with a top chord of peculiar construction; second, in the specific construction of the lower chord; and, third, in the employment of an end post to transmit the weight of the roof to the wall, as will be fully described hereinafter.

In the drawings, A represents the lower chord of my truss in the form of an arch. B is the top chord straight from the crown to ends, supporting the purlins C, which are of rolled channel-bars resting on or against cast-iron bearings *a*, riveted to the top chord. The truss shown is divided into fourteen

panels in top and bottom chord, by the vertical posts D, which may be either of wood or iron, and the diagonal main and counter rods E H. The outer members of the lower chord are either angle or channel iron bent, to give a more distinct shape to the curve of the arch. The other members of the lower chord are ordinary flat chord-bars, seen at *b* in Fig. 4, *b'* being the outer members. The pins *c* pass through the eyes of the chord-bars *b* and the lower ends of the main and counter rods E H and posts D, the relative positions of which are shown in Fig. 4, and also through the outer members *b'* of the lower chord. The top chord is made up of two channel-bars for the sides, with a plate riveted to the top and connecting or stay plates riveted to the bottom, at intervals, to the flanges of the channel-bars, as shown in Fig. 5. The main rods E are flat iron bars, commencing at the pin at the foot of the king-post and extending diagonally to the top of the next post each way, the last main rods being connected to the tops of the end posts F of the truss. There are two main rods in each panel, one at each side of the foot of the strut, which is bifurcated to allow the eye of the round counter-rod H to have the pin *c* passed through it, there being one of the counter-rods in the ten center panels and none in the two end panels. The foot of each end post is inserted in a heavy socket of cast-iron, which rests on rollers *e* interposed between it and a bearing-plate, *d*, on an abutment of the walls G provided for allowing the linear expansion and contraction of the truss to proceed without detriment to the supporting-wall. The whole system of rods, bars, struts, and chords forms a truss, of which the lower chord and rods are subject to tensile strain, while the top chord and posts are subject to compressive strain.

The advantages of this truss over others of its character are, first, other roof-trusses having a curve on the inside and a straight outside surface to receive the covering have two arch-ribs, the one above the other, and a straight rafter jacked upon the upper arch-rib to receive the purlins to which the covering is secured; second, in such constructions the two arch-ribs are both subject to tensile and compressive strains, and have

therefore to be made rigid by the employment of rolled iron of sufficient section to insure stiffness in the structure under such strains, while the arched bottom chord of my truss may be made of link-bars of any section, because subject to tensile strain only, such material being cheap and readily obtained; third, other trusses internally arched necessitate the employment of a horizontal tie-rod connecting the opposite bases of the truss in order to take the thrust from the walls, which in my truss is taken by the bottom chord, thereby saving the material of the tie-rods and affording a greater uninterrupted headway inside the structure and permits of the application of a ceiling with good effect, especially in large halls where acoustic properties must be considered; fourth, by the employment of vertical end posts, compressive strains only are transmitted to the supporting-walls, which can therefore be built of less thickness and also of less height, as compared with other systems, and still give the same height clear, or headway to the bottom chord in the center of the truss.

Where the outer members of my lower

chord are continuous, as shown, the eye at each end of the bottom chord where the pin passes through into the end post should be oval, to allow for the linear expansion and contraction of the arch.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of an arched bottom chord and the top chord composed of two equal inclined beams without the use of a tie-rod, in the manner and of the construction as described and shown.

2. The construction of the lower arched chord of an internally arched roof-truss, with the inner members made of short link-bars b'' , or riveted flat bars in their place, and the outer ones of continuous channel or angle bars b' to form the curves, as shown and set forth.

3. The employment of the end posts F in a roof-truss to transmit the weight of the roof to the walls, as shown and set forth.

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Witnesses:

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