

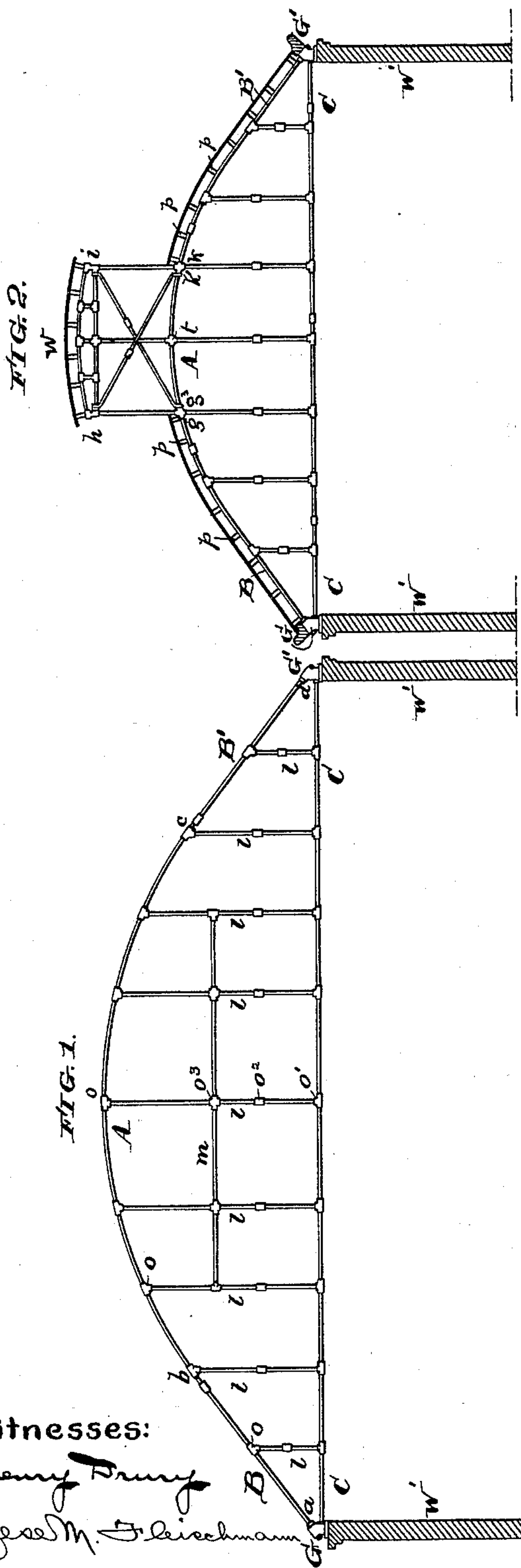
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2 Sheets—Sheet 1.

F. SCHMEMANN.  
ARCH PIPE TRUSS FOR ROOFS.

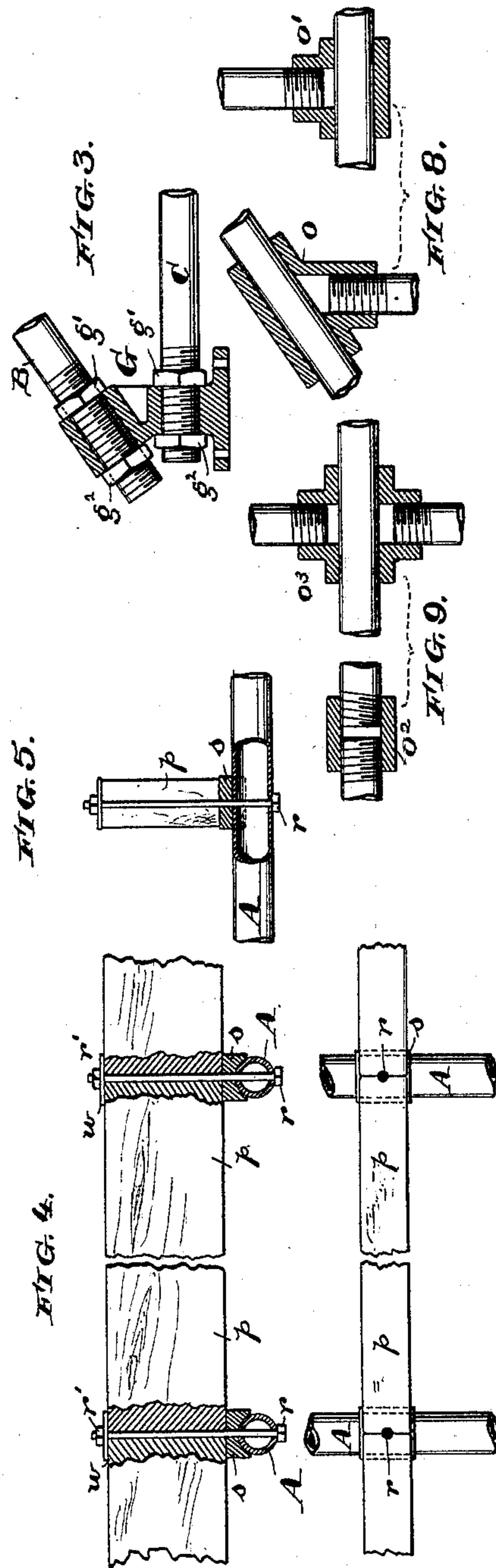
No. 435,156.

Patented Aug. 26, 1890.



Witnesses:

Henry Drury  
Reese M. Fleischmann



Inventor:

Friedrich Schmemmann,  
By his Attorney,  
Israel Pettit

(No Model.)

2 Sheets—Sheet 2.

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FIG. 6.

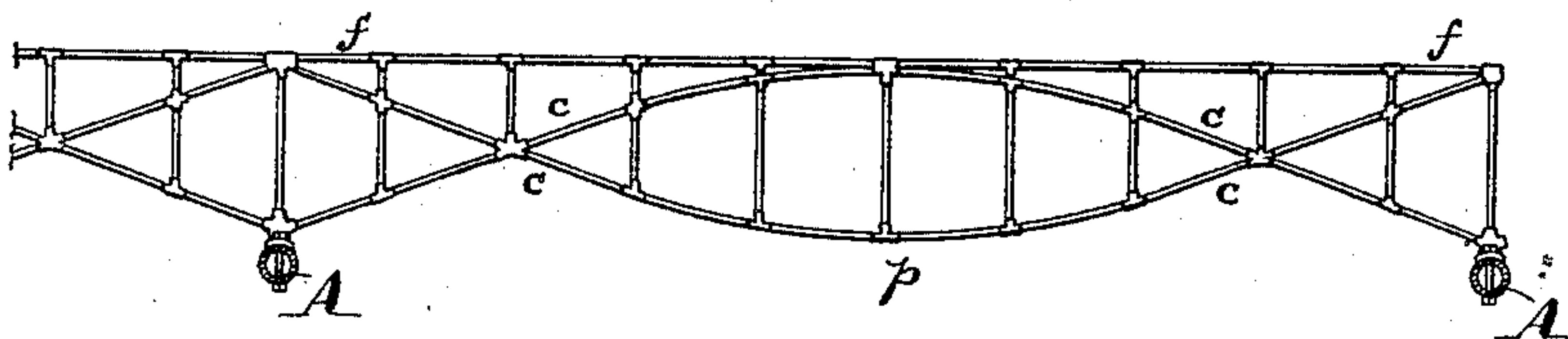
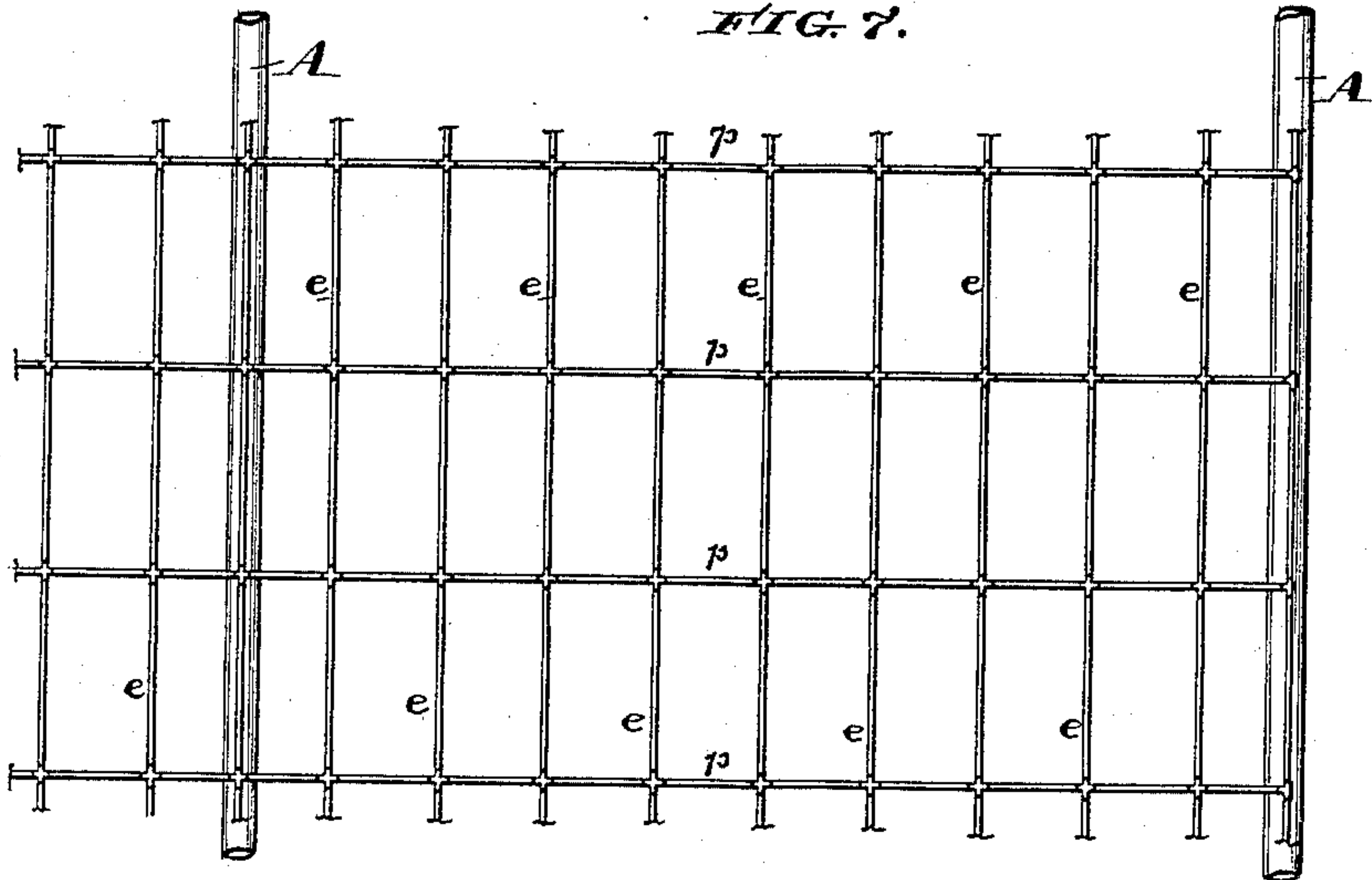


FIG. 7.



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# UNITED STATES PATENT OFFICE.

FRIEDRICH SCHMEMANN, OF PHILADELPHIA, PENNSYLVANIA.

## ARCH PIPE-TRUSS FOR ROOFS.

SPECIFICATION forming part of Letters Patent No. 435,156, dated August 26, 1890.

Application filed December 14, 1889. Serial No. 333,816. (No model.)

*To all whom it may concern:*

Be it known that I, FRIEDRICH SCHMEMANN, of the city of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Arch Pipe-Trusses for Roofs; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to produce a roof-truss which shall be light and yet at the same time possess great uniform strength throughout, composed of homogeneous material, and with the liability to cramping through expansion and contraction reduced to a minimum.

My invention has relation principally to roofs for buildings; and it consists in a pipe or tubular roof structure, as hereinafter particularly set forth and described.

I will now describe my invention, so that others skilled in the art to which it appertains may make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which similar letters of reference refer to similar parts throughout.

Figure 1 is an end or cross sectional view of the bare roof structure. Fig. 2 is a similar view, but with the purlins and the sheeting attached, and showing a ventilator surmounting the structure. Fig. 3 is a detail view of the shoe-casting G in cross-section, in which respectively the respective ends of the upper chord are set and secured, together with the end of the horizontal lower chord. Fig. 4 shows the wooden purlins secured to the top of the upper chord and running from one to the other. Fig. 5 is a cross-section of the wooden purlin adjusted to the upper chord. Fig. 6 is the metal purlin, a substitute for the wooden purlin, composed of a reversed-arch truss and a horizontal top pipe-chord connected with the arch-truss by vertical posts. Fig. 7 is a plan view showing the metal purlins connecting the upper chords one with another and joined and braced laterally by pipes running from the top fitting of one purlin to that of another. Fig. 8 shows in cross-section the loosely-sliding sleeve-fittings. Fig. 9 shows in cross-section the piping or tubing connections.

A is the upper chord forming in the center an arch *b c*, and B B' are the two ends respectively forming the tangents *a b c d*.

C is the lower horizontal chord, and may be provided with a camber to compensate for any slight settling or subsidence. The upper and lower chords are joined and united into one structure by the vertical tubes or posts *l*, connected at their upper end to the upper chord and at their lower end to the lower horizontal chord by sleeve-fittings which are secured to the posts *l* by screw-threads. The upper chords A B B' and the lower chord C are preferably formed of wrought-iron or steel pipes connected by sockets, as well as are the other connections hereinafter described. The tangential ends of the upper chord B B' and the ends of the lower chord C are secured into and attached, respectively, to a shoe-casting G G' by means of lock-nuts *g<sup>2</sup> g'*, as shown in the drawings, which thus form a perfectly rigid and secure structure and obviate the necessity of "walling in" the arch. The shoe-castings G G' are placed and rest upon the upright walls or pillars W', provided in the building to sustain the roof.

Attached to the truss, or, rather, directly to the upper chord A B B', are the purlins *p*, either of wood or metal. In Fig. 4 a detail view of a wooden purlin is shown in cross-section. A saddle *s* is provided on the chord A or B B', as the case may be, upon which the purlin *p* is set and secured by the nutted bolt or rod *r*, running through the entire combination and binding together the purlin *p*, the saddle *s*, and the upper chord A. A washer *w* is also provided on the top of the purlin *p* under the nut *r'*. When iron purlins are employed, they are secured on the top of the upper chord and attached to the same by means of flanges and top screws, and are laterally braced by means of piping *e*, running from the top fitting of one purlin to the top fitting of another, which is continuous and gives great strength, and is adapted to receive directly the coping of tin-plates, slates, &c., by means of hooks or other suitable means.

The metal purlin which I employ is particularly shown in Fig. 6, and is a reversed-arch truss *c c*, in combination with an extra horizontal top pipe chord *f*, running from end to



end of the purlin connected with the arch-truss by vertical posts secured by sleeve-fittings, as shown in Fig. 6. This metal purlin is a substitute for the wooden purlin described, either of which may be employed.

The ventilator W (shown in Fig. 2) is of a substantially similar construction in principle to the structure hereinbefore described. It is adjusted to and connected with the upper chord by means of the fittings  $g^3 k' t$  and provided with lateral braces  $g^3 i$  and  $h k$ .

In the main structure the vertical posts  $l$  connect the upper chord  $A B B'$  and the lower chord  $C$  by being secured thereto by the sliding sleeve joints  $o o'$ , screwed on ends of said posts  $l$ . The joints  $o^2$  are screw-threaded sleeve-connections, and  $o^3$  are double cross screw-threaded connections employed where the vertical posts  $l$  and the cross-braces  $m$  intersect each other. These cross-braces  $m$  are used where the posts  $l$  are long and require additional cross-brace support.

The main object of the tangents  $B B'$  is to more thoroughly brace the truss in the event of a one-sided load, though the entire upper chord may describe an arch from end to end. The trusses are placed across the building from wall to wall at proper distances apart and connected at right angles with the purlins, wooden or iron, as desired. When wood is employed, the wooden covering is nailed directly to the wooden purlins. When the iron purlins are used, the piping  $e$  connect, their top fittings running across at right angles to the purlins, which receive directly the coping of tin plates, slate, &c. The construction and erection of the said structure are easy, and the whole, when constructed as described, is uniform and gives great strength.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a roof structure, a tubular truss in which the central or upper portion of the upper chord forms an arch and the lower ends of the said upper chord form a tangent to the said arch, in combination with a lower horizontal chord connecting the respective ends of the upper chord by means of shoe-castings, connecting vertical posts connecting said upper and lower chords and secured thereto by screw-threaded and loose sleeve-fittings, substantially as hereinbefore set forth and described.

2. In a roof structure, tubular tangential arched trusses provided with lower horizon-

tal connecting-chords and vertical connecting-posts connecting and securing together the said upper and lower horizontal chords, in combination with purlins connecting the upper chords of the respective trusses constituting said structure and secured to said upper chords and set at right angles thereto, substantially as hereinbefore set forth and described.

3. A roof structure, in combination with an upper tubular arched chord and tangential ends provided at the ends of the said upper chord, a lower horizontal chord, and vertical posts connecting said upper and lower chords and connected to said upper and lower chords at the respective ends of the said vertical posts by fittings, substantially as hereinbefore set forth and described.

4. In a roof structure, a tubular truss provided with vertical pipe-posts attached to the upper and lower chords by means of fittings loosely slipped over the chords and provided alternately with screw-threads, substantially as hereinbefore set forth and described.

5. In a roof structure, a truss consisting of an upper chord having a tangential arch, in combination with a horizontal lower chord, vertical posts, and a cross-brace connecting and securing said vertical posts, substantially as hereinbefore set forth and described.

6. In a roof structure, a truss consisting of a tangential arched upper chord, in combination with a horizontal lower chord, vertical posts, and a ventilator secured on top of the upper chord, substantially as hereinbefore set forth and described.

7. In a roof structure, the upper arch-chord  $A$  and tangential chords  $B B'$ , and a horizontal lower chord  $C$ , in combination with the shoes  $G G'$ , the sliding sleeve joints  $o' o$ , the screw-threaded joints  $o^2 o^3$ , the vertical posts  $l$ , and the cross-brace  $m$ , substantially as hereinbefore set forth and described.

8. In a roof structure, in combination with the upper and lower chords, the shoe-castings  $G G'$ , the vertical posts  $l$ , the sliding sleeve joints  $o o'$ , the screw-threaded joints  $o^2 o^3$ , and the purlins  $p$ , substantially as hereinbefore set forth and described.

In witness whereof I have hereunto set my hand this 3d day of December, A. D. 1889.

FRIEDRICH SCHMEMANN.

Witnesses:

WILLIAM M. STEWART, Jr.,  
HORACE PETTIT.