

(No Model.)

2 Sheets—Sheet 1.

T. HYATT.  
CONCRETE FLOOR, ROOF, &c.

No. 290,886.

Patented Dec. 25, 1883.

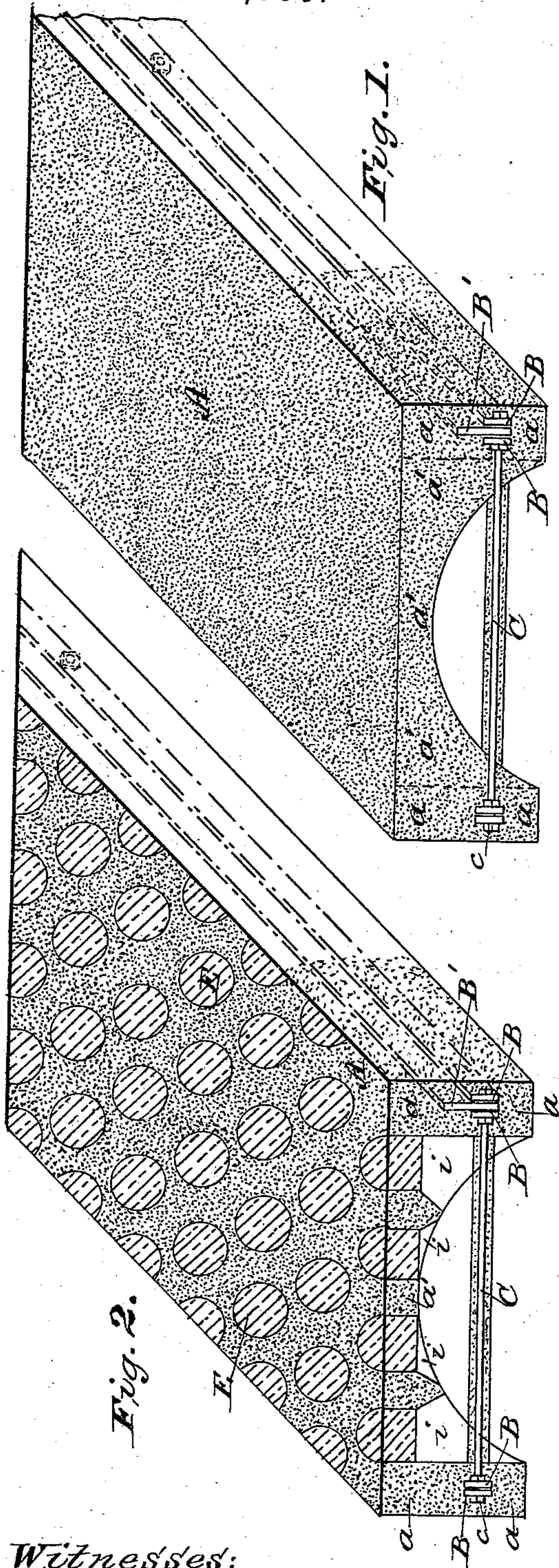


Fig. 1.

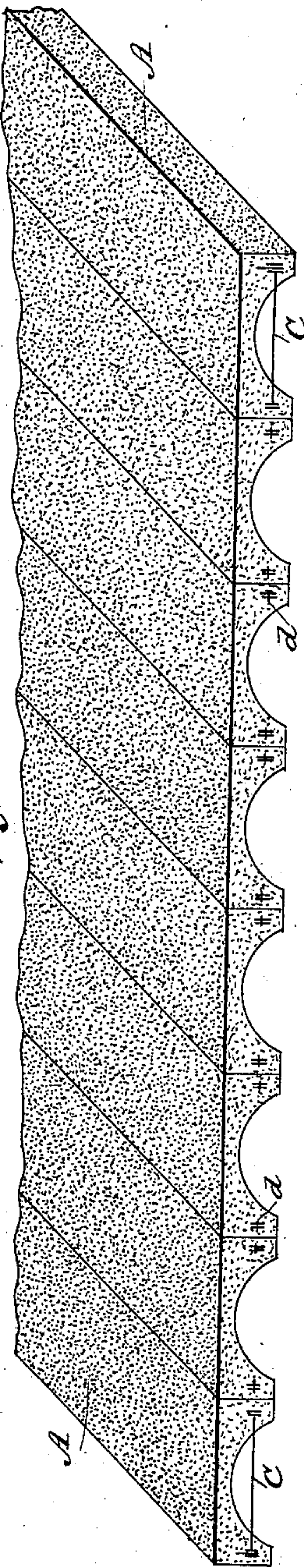
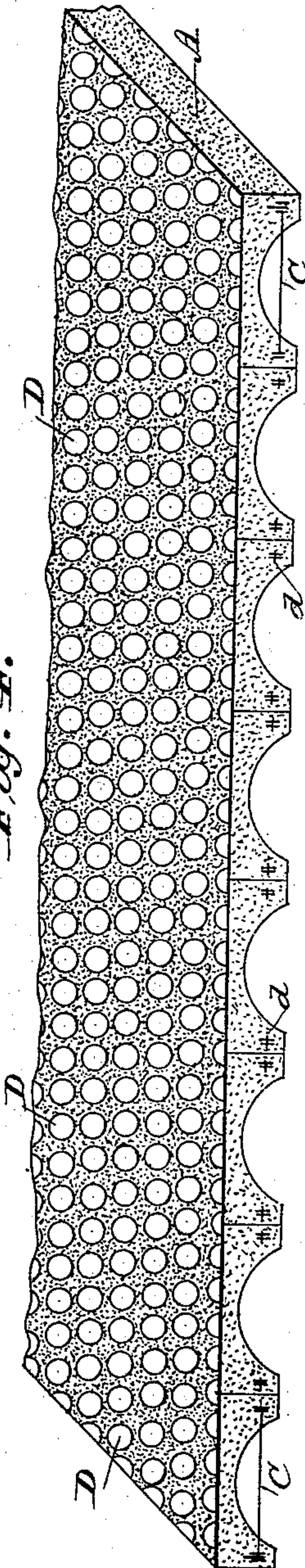


Fig. 3.



Witnesses:  
J. C. Brecht,  
Emy DeMotte

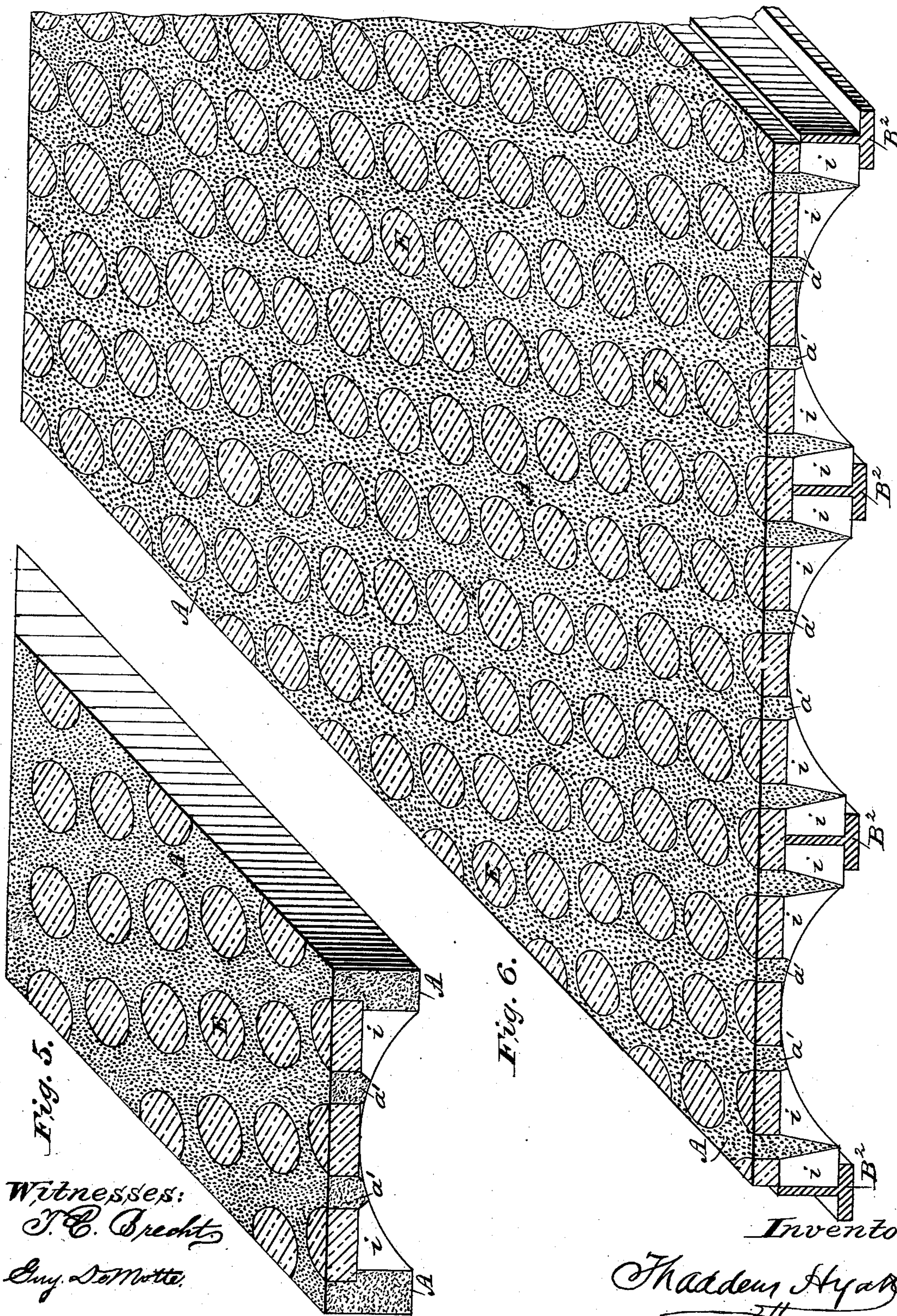
Inventor:  
Thaddeus Hyatt



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2 Sheets—Sheet 2.

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Witnesses:  
J. C. Brecht  
Guy D. Motte

Inventor.  
Thaddeus Hyatt



# UNITED STATES PATENT OFFICE.

THADDEUS HYATT, OF NEW YORK, N. Y.

## CONCRETE FLOOR, ROOF, &c.

SPECIFICATION forming part of Letters Patent No. 290,886, dated December 25, 1883.

Application filed December 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THADDEUS HYATT, a citizen of the United States, residing at the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Concrete Roofs, Floors, Pavements, and Area-Coverings, of which the following is a description, reference being had therein to the accompanying drawings, making part of this specification.

My invention relates to fire-proof concrete roofs, floors, and roof-pavements, including area-coverings.

The object of my invention is to lessen cost of construction and make the structure capable of admitting light without thereby exposing the premises to the spread of flames in case of fire; and it consists of, first, a self-supporting concrete composite beam-arch; second, a self-supporting concrete composite beam-arch formed with openings, after the manner of an illuminating-grating, to admit light; third, a self-supporting concrete composite beam-arch formed with openings, after the manner of an illuminating-grating, in combination with glass to shut out the weather and admit light; fourth, a concrete arch formed with openings, after the manner of an illuminating-grating, to admit light; fifth, a concrete arch formed with openings, after the manner of an illuminating-grating, in combination with glass to shut out the weather and admit light.

Figure 1 is a perspective view representing a self-supporting concrete composite beam-arch, *a a* indicating the beam portions outside of, and *a' a' a'* indicating the arch portion between the broken lines *b b*. Fig. 2 represents the same construction, but formed with openings, after the manner of an illuminating-grating, and set with glasses to give light. Fig. 3 represents a roof, floor, pavement, or construction made of self-supporting concrete composite beam-arches. Fig. 4 represents a roof, floor, pavement, or construction made of self-supporting concrete composite beam-arches formed with openings, after the manner of an illuminating-grating, to admit light. Fig. 5 represents an illuminating concrete arch designed for being carried upon outside

supports or beams. Fig. 6 represents a roof, floor, pavement, or construction made of illuminating concrete arches carried upon supports or beams.

A indicates concrete. B indicates tie metals. B' indicates web metals. B<sup>2</sup> indicates supports or beams. C indicates tie-rods. D indicates light-holes. E indicates glasses. *c* indicates nuts on tie-rods. *d* indicates cross-wires of tie metals. *i* indicates the under or flaring portion of the light-holes.

Figs. 1 to 4 illustrate my invention in order to save the cost of iron beams, the invention consisting in the introduction of tie-metal strength into concrete-arches construction in manner as I have heretofore employed it in the construction of solid concrete floors.

Where web metal B' is shown, it is merely to illustrate the method of its employment. It would not be employed on one side of the arch only, but used for all the arches and in the beam portions of all. The purpose of web metals is to add rigidity where the beam-span is great between the walls or supports.

The effect of tie metals placed in the haunches of the arches is to convert that portion of the structure lying outside the broken line *b b*, and marked *a a*, into a beam, the compressive portion of which is the concrete and the tensile portion of which is the tie metal; but it may be reasonably supposed that the curved portions lying within and between the broken lines *b b* also enter into compressive resistance to the load when the beam is under strain.

The rule for calculating the size and strength of the tie metals is the same as for web and flange beams, examples in illustration of which may be found in my work entitled "An Account of Some Experiments with Portland Cement Concrete Combined with Iron as a Building Material," copies of which work are to be found in the Patent Office library and in other libraries, both in the United States and in England.

By the ordinary mode of building large openings or well-holes are cut through roof or floor to admit light, the closures of which are not fire-proof, such openings materially aiding the spread of flames in case the building takes fire. Where such roof or floor is constructed of concrete arches it is evident that if the same



area of light-opening be divided into small apertures and spread over a larger surface, as I have represented in Fig. 4, no such danger can happen.

5 Fig. 1 represents the perforated concrete arch closed by glasses, in the ordinary manner of making patent-light work; but Fig. 4 represents a structure where the light-holes are left open and ready to receive glass for  
10 the purpose of shutting out the weather.

My object in representing a structure of open light-holes is to explain that I do not limit the closing of these light-holes to glass blocks that plug them like a cork; but in some  
15 cases I overlay the surface with plate, sheet, or pane glass, suitably glazed, in sashes made in some cases to be opened for ventilation. In other cases I mold ribs of concrete on the face of the roof and glaze the glass between them.

20 In Figs. 3 and 4 I have represented the end arches only with tie-rods. They thus become abutments for the other arches and make tie-rods for them unnecessary.

To protect the tie-rods themselves against  
25 fire, I surround them with a coating of plaster-of-paris, concrete, or other fireproofing material, as represented in Figs. 1 and 2.

Fig. 5 represents an illuminating concrete arch designed to be employed with metal  
30 beams, and Fig. 6 represents a roof, floor, or construction made by combining such arches with beams, as indicated at B<sup>2</sup>.

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

1. A self-supporting concrete composite beam-arch, substantially as and for the purposes herein set forth and illustrated.

2. A self-supporting concrete composite  
40 beam-arch formed with openings, after the manner of an illuminating-grating, to admit light.

3. A self-supporting concrete composite  
45 beam-arch formed with openings, after the manner of an illuminating-grating, in combi-

nation with glass to shut out the weather and give light.

4. A roof, floor, pavement, or structure made of self-supporting concrete composite beam-arches, substantially as and for the pur- 50 poses herein set forth and illustrated.

5. A roof, floor, pavement, or structure made of self-supporting concrete composite beam-arches formed with openings, after the manner of an illuminating-grating, to admit 55 light.

6. A roof, floor, pavement, or structure made of self-supporting concrete composite beam-arches formed with openings, after the manner of an illuminating-grating, in combi- 60 nation with glass to shut out the weather and admit light.

7. A concrete arch formed with openings, after the manner of an illuminating-grating, to admit light. 65

8. A concrete arch formed with openings, after the manner of an illuminating-grating, in combination with glass to shut out the weather and admit light.

9. A roof, floor, pavement, or structure 70 made of concrete arches formed with openings, after the manner of an illuminating-grating, to admit light, in combination with supports or beams, substantially as and for the purposes herein set forth and illustrated. 75

10. A roof, floor, pavement, or structure made of concrete arches formed with openings, after the manner of an illuminating-grating, in combination with glass to shut out the weather and admit light, when the same 80 are combined with supports or beams, substantially as and for the purposes herein set forth and illustrated.

In testimony whereof I affix my signature in presence of two witnesses.

THADDEUS HYATT.

Witnesses:

T. C. BRECHT,  
GUY DE MOTTE.