

(No Model.)

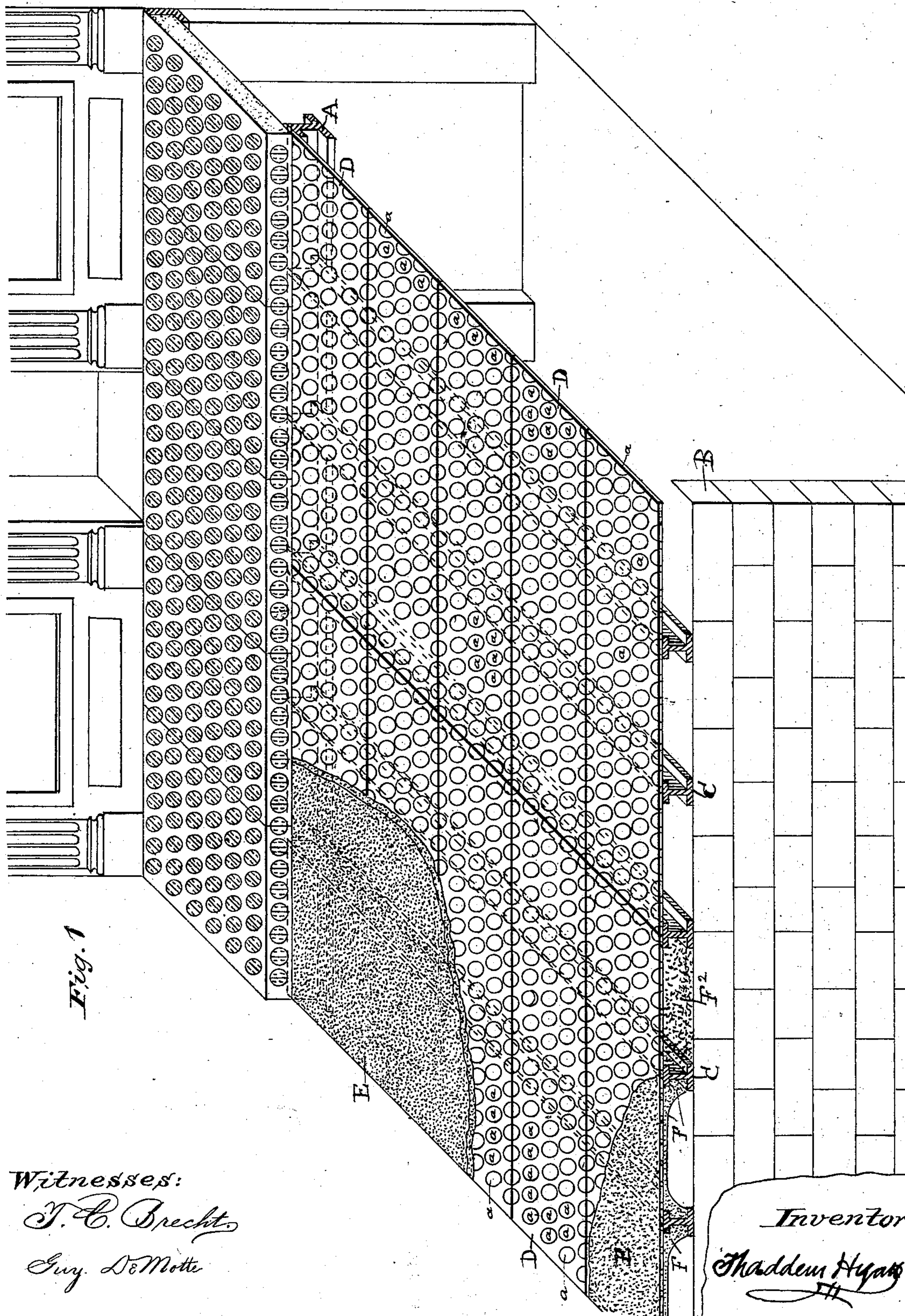
T. HYATT.

2 Sheets—Sheet 1.

CONCRETE AND CONCRETED PAVEMENT AND ROOF PAVEMENT, AND
SUBSTRUCTURE FOR THE SAME.

No. 292,559.

Patented Jan. 29, 1884.



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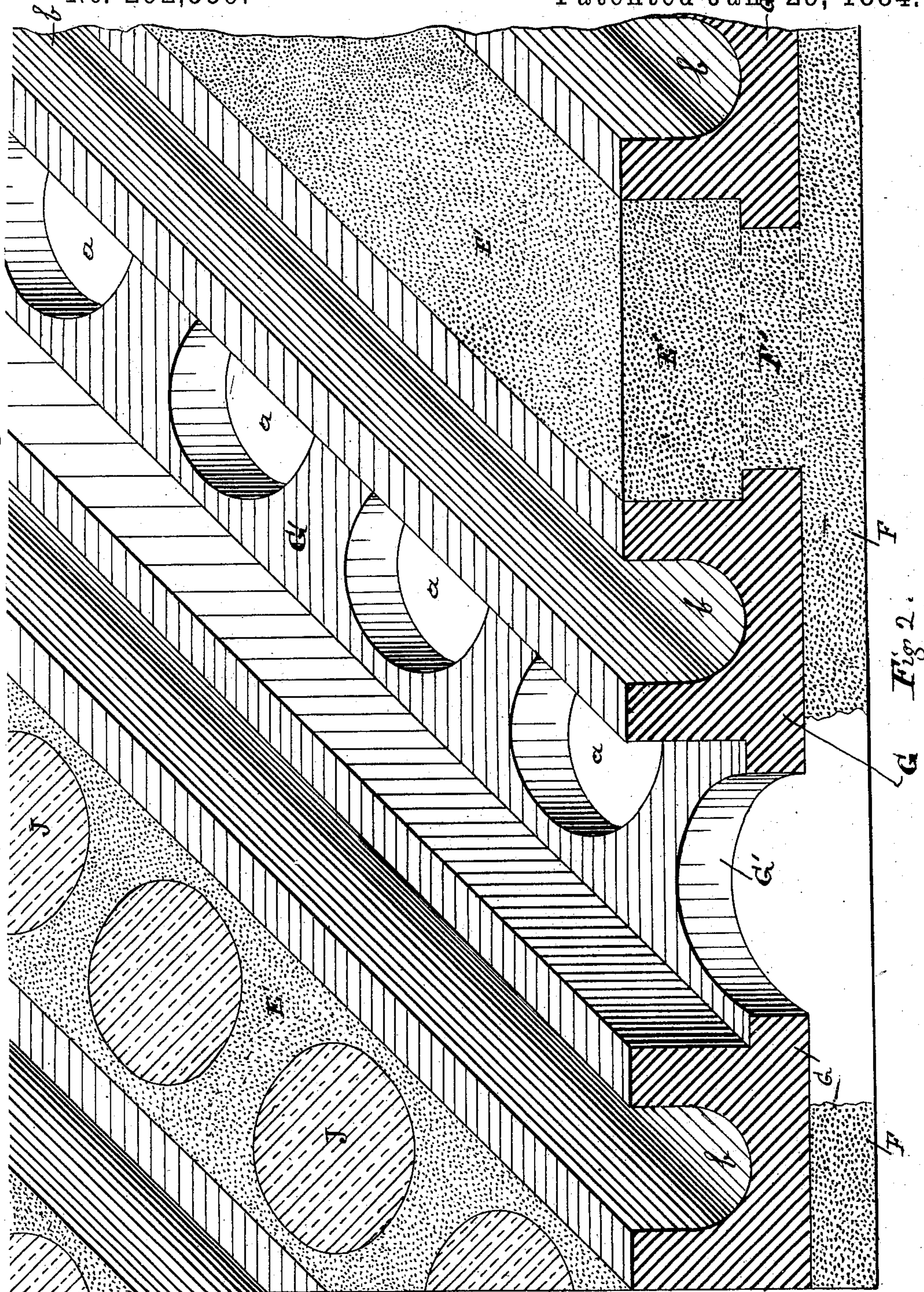
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No. 292,559.

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Witnesses:

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CONCRETE AND CONCRETED PAVEMENT AND ROOF-PAVEMENT, AND SUBSTRUCTURE FOR THE SAME.

SPECIFICATION forming part of Letters Patent No. 292,559, dated January 29, 1884.

Application filed December 27, 1883. (No model.)

To all whom it may concern:

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

My invention relates to the construction of roof-pavements made of iron beams and metal plates, and is an improvement upon the original construction laid down by me in the year 1852. My 1852 construction was a combination of beams and plates, the plates being laid upon the bottom flanges of the beams. Upon these plates, which were cast with strengthening-blades upon their top sides, a heavy layer of concrete made of mortar and brick-bats, with smaller pieces, was laid. Upon this bed a layer of sand, in the usual way of making pavements, was spread, and then stone flagging was bedded upon it. The second roof-pavement laid by me was made as follows: Plates of iron about twelve feet long and three feet wide, cast with blades or webs about eight inches high and about ten inches apart, were laid on the tops of iron beams the plates crossing the beams and running parallel with the curb. The spaces between the blades were filled with concrete and sand, and narrow flagstones laid between the webs, the top edges of the blades being seen upon the surface of the construction, and with the flags forming the trottoir or footway. At the end of thirty years I resume my work with the object of doing what no one in the meantime has done—viz., first, to make a metallic roof-pavement, which, while securing the greatest amount of benefit to the owner of the property employing it, shall at the same time give to the public who are compelled to walk over it absolute security against slipping on account of the wear of its surface; second, to make a metallic roof-pavement which, while securing the greatest amount of benefit to the owner of the property employing it, shall at the same time prevent fruit-skids and such like slippery de-

bris thrown upon it from causing injury to the public; third, to make a metallic roof-pavement which, while securing the greatest amount of benefit to the owner of the property employing it, shall at the same time secure for the public a footway comparatively dry in the wettest of rainy weather; fourth, to make a metallic roof-pavement which, while securing the greatest benefit to the public, as above enumerated, shall at the same time secure to the property owner employing it a construction at the least cost; free from deterioration by rust; free from dripping condensed moisture; free from transmitting rumbling sounds; not liable to leak, either from original bad joints or subsequent ones, owing to alternate expansions and contractions; occupying the least amount of head-room, and possessed of sufficient *vis inertiae* to safely and permanently resist impact and concussions.

The features of my invention set forth as above relate, first, to the interests of the public, and relate, secondly, to the interests of owners of property.

Under the first head, or public interests, my invention consists in covering over the iron plates and supporting-beams with material not liable in itself to become slippery by wear, and which at the same time conceals the metal, so that it cannot become dangerous and slippery by wear; but this was done by my 1852 construction, and in the succeeding one sufficiently so as to be in this respect substantially the same; but the covering material in those constructions, being ordinary flagging bedded in sand and laid substantially in the ordinary manner of flagging sidewalks, used up, as a consequence of the method, a considerable amount of head-room—that is to say, owing to the thickness of the sidewalk (from sixteen to twenty inches) the height of the room below it was less between floor and ceiling by as many inches as the sidewalk was unnecessarily thick. By my present invention I am able to make a better and handsomer sidewalk inside of ten inches thickness, my improvement consisting in combining hydraulic cement or concrete with the iron plates when in plastic condition, first, to obtain a safe foot-surface for the public; second, to protect the

iron against deterioration from rust; third, to deaden sound; and, fourth, as a non-conductor, to prevent condensation and dripping of moisture, and to make a roof cool in summer and 5 warm in winter.

My improvement also consists in the further combination of concrete with both plates and beams in the form of concrete cantilevers to strengthen and stiffen the plates.

10 My invention also further consists in combining the concrete with the structure as a load between the beams under the plates, to produce *vis inertiae* for resisting impact and concussions.

15 My invention consists, further, in keying the concrete trottoir or foot-surface of the structure to the protecting under face of concrete, put on to prevent condensation and rusting, by means of plates cast or formed with 20 openings for letting the plastic pass through in sufficient mass to firmly unite and hold the under facing to the top overlayer.

My invention, with reference to public interests, consists, furthermore, in forming a 25 trottoir or foot-surface on the sidewalks of public streets made with water-courses or gutters, the same serving, also, as *débris*-stops to fruit-skins, to arrest sliding and consequent falling of persons when caught stepping upon 30 such things carelessly thrown in the public footway—a feature in this part of my invention consisting in forming the gutters to run diagonally across the sidewalk for the purpose of making walking across them easy.

35 My invention consists, further, in combining metal plates with beams to form metallic roof-pavements by so uniting concrete and metal plates as to produce beam strength and rigidity by the union, and thus render webs or 40 blades of metal on the plates unnecessary, this union being effected by the perforations in the plates, which so interlock the concrete with the metal as to bring into play the compressive resistance of the concrete simultaneously with the tensile resistance of the metal 45 when the structure is weighted and under strain.

Figure 1 is a perspective view representing one of my improved sidewalks. Fig. 2 is a 50 perspective view representing in full size a piece of a plate when made of cast-iron, and designed for a dry foot-surface and a safety one, as against slipping on fruit-skins or similar *débris* endangering life and limb.

55 A indicates the main girder that carries the area-covering on one side and the sidewalk proper, or trottoir, on the other. B indicates the street-wall at the curb; C, cross-beams, resting at one end upon the wall and at the 60 other upon the girder A; D, metal plates that form the surface of the structure; E, concrete trottoir or foot-surface; F, protecting under layer of concrete; F', concrete keys between E and F; F², between-beam concrete under D to 65 weight structure; G, safety-guttered surface, water, and *débris* channels; G', between-gutter spaces for concrete filling; E', concrete

filling between gutters; J, glasses for giving light; *a a*, keying-holes for concrete to pass through; C C, *débris*-channels or water- 70 courses.

Fig. 1 represents but a small part of the sidewalk as coated with concrete. This is done in order to more clearly show the naked metal plates—ten in number—which cross the 75 beams that are underneath them, after the manner of laying wood floors. The bolts that fasten the plates are not shown, the drawings being on too small a scale.

The cantilever form of the under-surface 80 concrete is indicated by the letter F, where the concrete is brought down in a curve to and rests upon the bottom flanges of the beams.

The between-beam concrete filling underneath the plates to weight the structure and 85 produce a *vis inertiae* sufficient to enable the structure to withstand impact and concussion is indicated by the letter F².

I have represented the area between the girder A and the building as covered in the or- 90 dinary manner, where grating, tiles, or plates set with small glasses are bolted to supports underneath them, and the joints are made good by bedding, bolting, and packing; but my invention herein set forth is independent 95 of the light construction, and the glasses may be either bull's-eyes or large glass plates, according to fancy.

The end beam of the construction shown by Fig. 1 is purposely omitted in order to bet- 100 ter show the edges of the iron plates and the thickness at this point.

F', Fig. 2, shows in full size the strength of the key of concrete which unites the concrete trottoir to the under face of concrete, that 105 protects against rust and prevents condensation and dripping of moisture.

a a, Figs. 1 and 2, indicate the keying-holes that form a feature of the invention, those of full size in Fig. 2 giving a clear idea of their 110 size and formation. The thickness of metal represented may be varied.

b b, Fig. 2, clearly represent the gutters, and show the diagonal lay of the same across the 115 plate.

E', Fig. 2, indicates the between-gutter concrete, that here takes the form of strips or bands, and where light is desired these concrete bands are set with glasses, as indicated 120 by the letter J.

Where the trottoir is formed of plates cast with a safety-surface such as is represented by Fig. 2, I propose to make the width of the concrete strips about three inches and the width of the gutters one inch. Such a sur- 125 face in a rain would be measurably dry, and gutters only three inches between would be sure to arrest any sliding banana-skin or other fruit *débris* under the foot of an unfortunate pedestrian and prevent a fall. I design these 130 safety-plates to be employed both for making pavements and roof-pavements.

Fig. 1 represents a surface where the degree of safety is the difference between non-slip-

ping concrete and naked iron, liable to become polished and slippery as ice.

No curb is represented in the drawings, Fig. 1; but I propose to employ either cast-iron or stone, according to circumstances.

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

1. A metallic roof-pavement or sidewalk composed of metal beams and metal plates, in combination with a trottoir or foot-surface made of Portland cement or of hydraulic concrete combined in plastic condition with the plates, substantially as and for the purposes herein described.

2. A metallic roof-pavement or sidewalk composed of perforated or grating metal plates and metal beams, in combination with a trottoir or foot-surface made of Portland cement or of hydraulic concrete combined, when in a plastic state, with the metal plates, substantially as and for the purposes herein set forth and illustrated.

3. A metallic roof-pavement or sidewalk composed of perforated or grating metal plates and metal beams, in combination with a trottoir or foot-surface made of Portland cement or of hydraulic concrete combined with a protecting under face of like material, substantially as and for the purposes herein set forth and illustrated.

4. A metallic roof-pavement or sidewalk composed of perforated or grating metal plates and metal beams, in combination with a trottoir or foot-surface made of Portland cement or of hydraulic concrete combined with a protecting under face of like material brought down in cantilever fashion upon the bottom flanges of the beams, substantially as and for the purposes herein set forth and illustrated.

5. A metallic roof-pavement or sidewalk composed of perforated or grating metal plates and metal beams, in combination with a trottoir or foot-surface made of Portland cement or of hydraulic concrete combined with an under face of like material brought down between the beams under the plates in mass sufficient to weight the structure and produce the necessary *vis inertiae* to enable it to resist impact and concussions, substantially as and for the purposes herein set forth and illustrated.

6. A metallic roof-pavement or sidewalk frame or skeleton composed of metal plates and metal beams combined to form the foundation for a concrete metallic structure, substantially as and for the purpose herein set forth and illustrated.

7. A metallic roof-pavement or sidewalk frame or skeleton composed of metal plates and metal beams (wherein the plates are perforated or grating plates) combined to form the foundation for a concreted metallic structure, substantially as and for the purposes herein set forth and illustrated.

8. A safety-surface metallic roof-pavement or sidewalk composed of metal beams and perforated or grating metal plates cast with gutters between rows of perforations, in combination with a concrete trottoir or foot-surface laid between the gutters in strips, substantially as and for the purposes herein set forth and illustrated.

9. A safety-surface metallic roof-pavement or sidewalk composed of metal beams and perforated or grating metal plates cast with gutters between the rows of perforations, in combination with a concrete trottoir or foot-surface set with glasses between the gutters, substantially as and for the purposes herein set forth and illustrated.

10. A safety and dry sidewalk or pavement for the purposes of a public footway, wherein the safety and the dryness of the trottoir or foot-surface are obtained by a combination of metal gutters with concrete.

11. A safety and dry sidewalk or pavement for the purposes of a public footway, wherein the safety and the dryness of the trottoir or foot-surface are obtained by combining concrete with metal gutters laid or made to run in a diagonal direction to the sidewalk or line of travel over it.

12. A safety-surface metallic roof-pavement or sidewalk composed of metal beams and perforated or grating metal plates cast with gutters between rows or lines of perforations, in combination with concrete in strips put in between the gutters, wherein the gutters and strips run or lie in a diagonal direction to the sidewalk or course of travel over it, substantially as and for the purposes herein set forth and illustrated.

13. A safety-surface metallic roof-pavement or sidewalk composed of metal beams and plates cast with gutters, in combination with concrete in strips laid in between the gutters, the same lying or running diagonally (or otherwise) across the face of the pavement.

14. As a manufacture or article, a cast-metal pavement-plate formed with safety-channels, in combination with non-slipping or foot-holding material put between the channels, substantially as and for the purposes herein set forth and illustrated.

15. A cast-metal pavement-plate formed with safety-channels, in combination with non-slipping or foot-holding material between the channels combined with glasses to give light, 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:

S. BACON,

W. E. CHAFFEE.