

(No Model.)

W. H. WINSLOW.
PAVEMENT FOR STREETS.

No. 541,140.

Patented June 18, 1895.

Fig. 1.

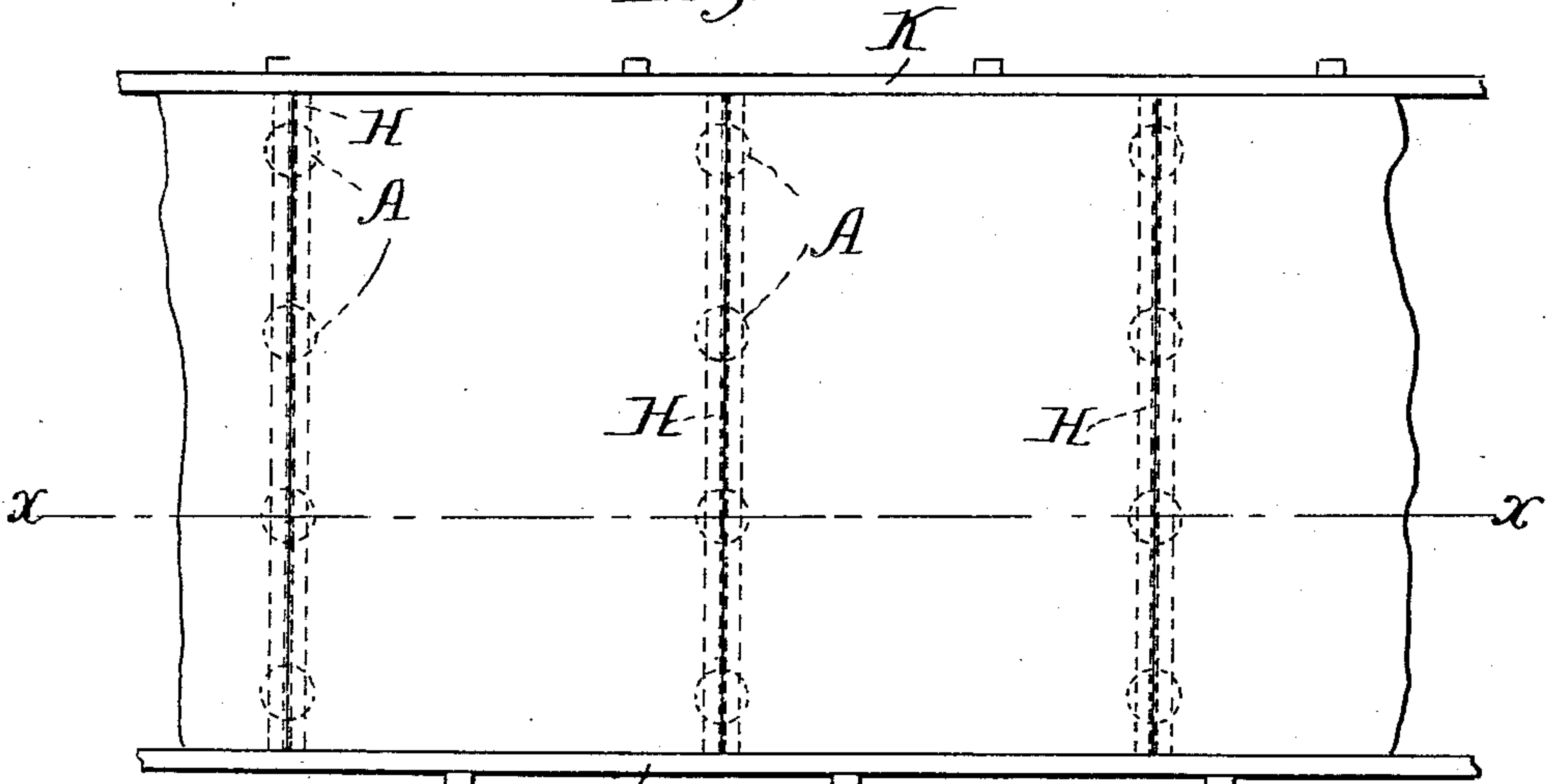


Fig. 2.

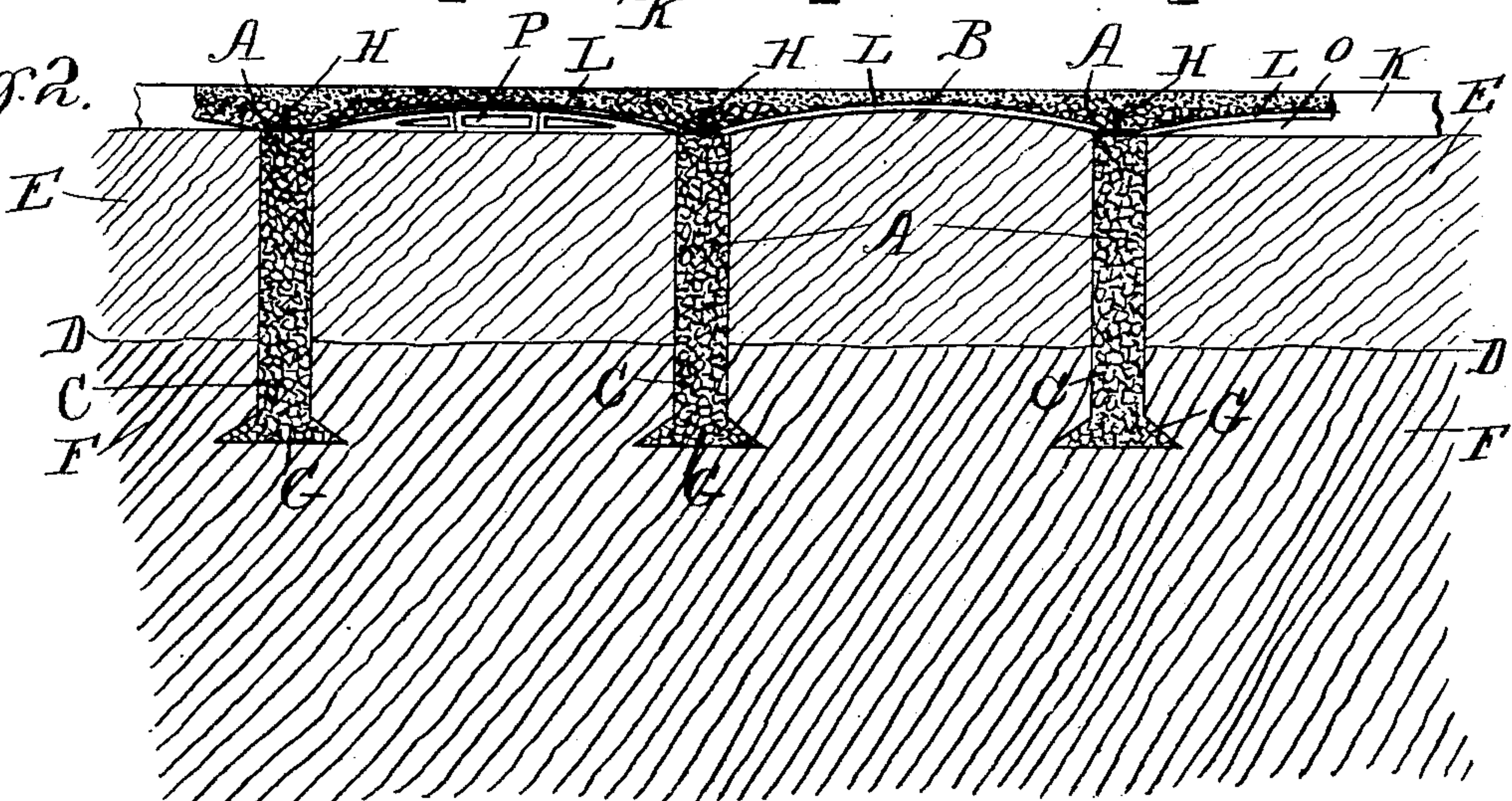


Fig. 3.

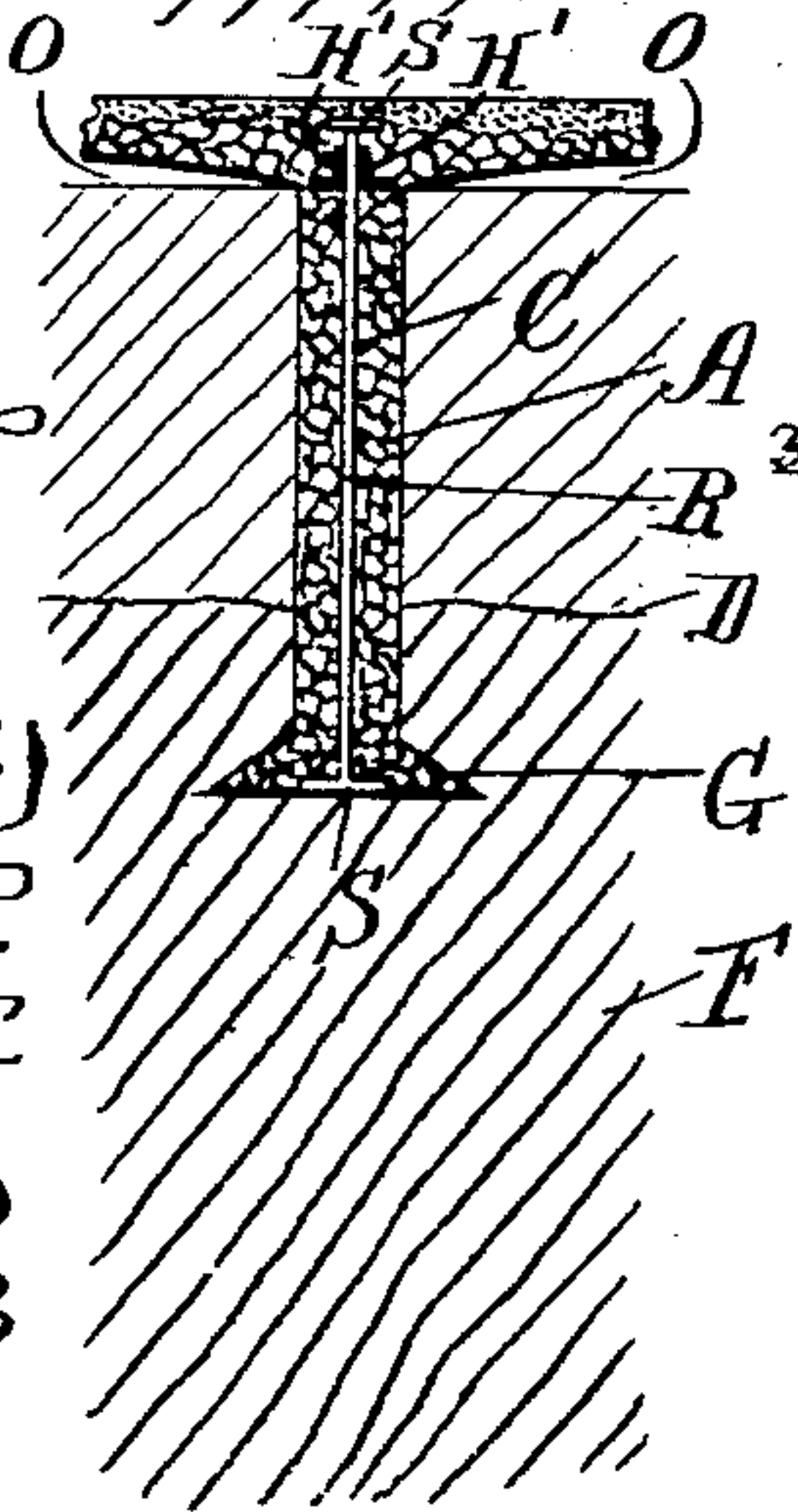
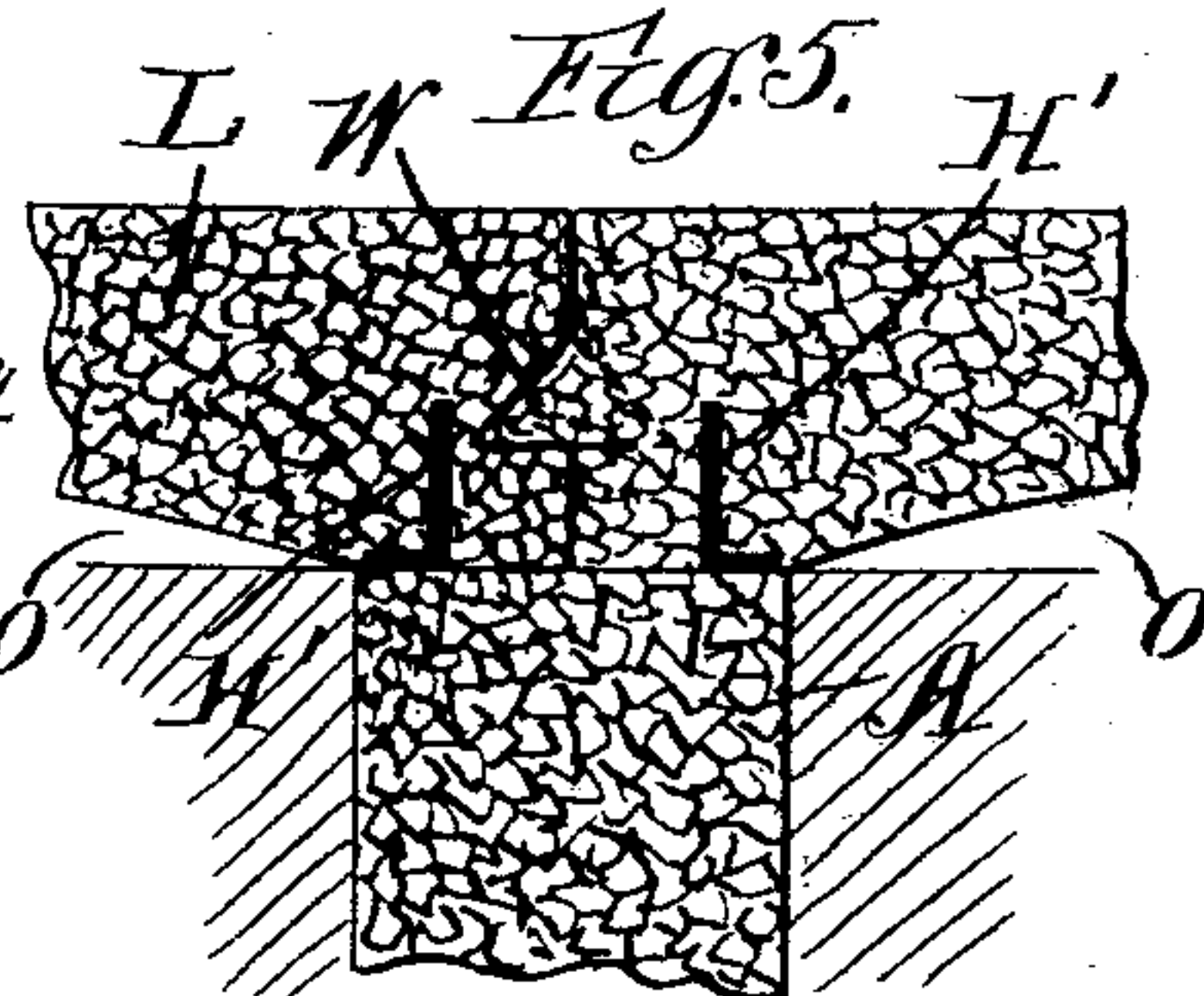
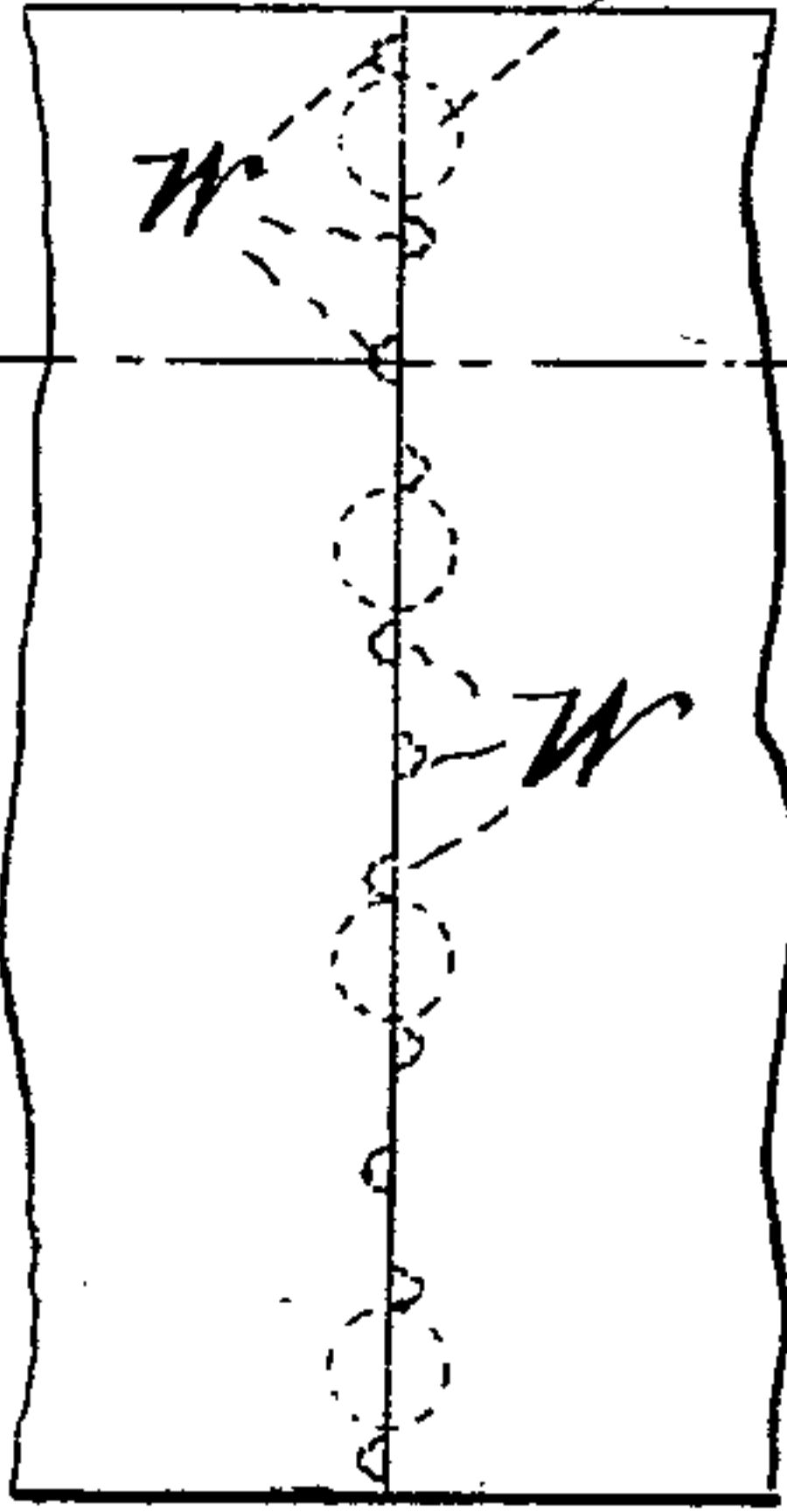


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

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PAVEMENT FOR STREETS.

SPECIFICATION forming part of Letters Patent No. 541,140, dated June 18, 1895.

Application filed January 25, 1895. Serial No. 536,172. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WINSLOW, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pavements for Streets, Sidewalks, and the Like, of which the following is a specification.

This invention relates to pavements for streets, sidewalks and the like, and the method of constructing the same.

The object of the invention is to provide a pavement of novel and useful construction, which will effectively resist the upheaving action of frosts, freezing and thawing.

A further object is to construct a pavement cheaply and in a manner adapting it to long continued use without impairment of its efficiency.

A further object is to so construct a pavement that it will resist enormous stress and strains.

Further objects of the invention will more fully hereinafter appear.

With these objects in view the invention consists substantially in the construction, combination, arrangement, location of parts and method of procedure, all as will be more fully hereinafter set forth, shown in the accompanying drawings, and finally pointed out in the appended claims.

Reference is had to the accompanying drawings, and to the various views and reference signs appearing thereon, wherein—

Figure 1 is a plan view of a portion of pavement constructed in accordance with my invention as applied to a sidewalk. Fig. 2 is a vertical longitudinal section of the same, taken on the line *x x*, Fig. 1. Fig. 3 is a detail view in vertical section, showing a slightly-modified form of construction. Fig. 4 is a plan view of a portion of pavement embodying a form of my invention and showing a method of connecting the meeting edges of adjacent pavement-sections. Fig. 5 is a vertical sectional view of the same, taken on the line *y y*, Fig. 4.

The same reference sign is employed throughout the several views to designate the same part wherever it occurs.

In carrying out my invention, I first drill, bore or otherwise form a series of holes in the

ground forming the bed of the pavement, as indicated at A. In the form shown in the drawings, and preferably, the holes A are formed transverse in rows with respect to the length of the pavement, but it will be evident that these holes may be arranged in any desirable manner and still fall within the spirit and scope of my invention. In the form shown, I have provided four of such holes in each transverse row, which is usually sufficient for a pavement six feet in width; but it is evident that the number of holes may be varied at pleasure and their spacing relatively to each other, and the spacing between adjacent rows, are matters of details which may be left to the judgment of persons skilled in the art, as they are dependent, in a large measure, upon the needs and requirements of each particular case. In practice the holes A are formed of a depth sufficient to extend below the frost line of the earth. As is well known, the frost line of the earth, varying somewhat according to the latitude, is about two feet below the surface, and the earth above the frost line is subjected to the upheaving action of frost or freezing and thawing, thereby warping or breaking the surface of streets, sidewalks and the like erected thereon. In order to avoid this danger and objection, I extend the holes A to a suitable depth below the frost line, as indicated in the drawings, wherein reference sign D designates a conventional frost line, E, the earth above the frost line which is effected by frosts, and F, the earth below the frost line, which is usually of a clayey nature, and is not affected by frosts or changes in temperature. I provide the holes with a flaring or extended bottom, as indicated at G, for a purpose presently to be described. I next fill the holes, prepared as described, with cement of any desired or suitable composition, as indicated at C. The surface of the earth forming the bed is then formed into an arching or convex surface between adjacent rows of holes, A, as shown at B, Fig. 2. I next arrange a suitable metallic beam, preferably a T-beam, as indicated at H, to extend along and to rest upon the holes formed in a row. In the form shown, where the holes are arranged in transverse rows with respect to the length of the road or walk, I also arrange the beam to extend across the

road or walk. Side boards or scantlings, K, are then arranged along the edges of the roadway, in order to act as eveners, and suitable cement is placed upon the bed, prepared as
 5 above, and leveled down to a flat upper or walking surface, the beams, H, becoming embedded in the cement, and the cement with which the holes are filled forming a homogeneous mass with that constituting the surface layer. If desired, suitable arched rods
 10 or wires, L, may be arranged to extend from a hole in one row to the corresponding hole in an adjacent row, the ends thereof resting upon the rails or beams H, or merely upon the top of the column of cement contained in
 15 the holes. The object of these rods or wires, and also of the beams or rails, H, is to act as a binder, to preserve the arch form of the span, and to more evenly distribute the strains or
 20 crushing stress to which the walk or road may be subjected in use, throughout the greatest amount of space, thereby enabling the walk or road to resist enormous strains or stress. It will be understood, however, that, if desired, the wires or rods L and also the beams
 25 H, may be omitted without altering the scope of my invention. If desired, when the arched span has become hardened and set, that part of the surface of the earth which has been
 30 used to form the convex surface may be removed, as indicated at O, Figs. 2, 3 and 5. This may be accomplished by first removing the side boards K, and then raking out or otherwise removing the earth that has been
 35 previously bedded up into an arching surface, from the side of the structure.

Instead of utilizing the earth itself to form the arching surface or base to receive the cement, the road bed may be first provided
 40 with a flat surface, and a removable block, P, having an arching upper surface and a flat lower surface, may be placed between adjacent rows of holes to form the surface to receive the cement, and after the cement has
 45 become hardened or set the block may be removed, thereby leaving a space between the arching cement. The removal of block P may be effected in a similar manner to that above described with reference to the removal of
 50 the earth when no block is used to form the arching surface—that is, the side boards K are first removed, and then the block P is withdrawn from the side of the structure. In order to facilitate the removal of block P, it
 55 may be made in sections, as indicated in Fig. 2.

In Fig. 3 I have shown a slightly modified arrangement wherein a rod, R, carrying a plate, S, at each end thereof is placed in the
 60 holes A before the cement is introduced therein, the cement serving to bind said rod firmly in place, the upper end thereof projecting a sufficient distance for the plate S carried thereby to become embedded in the mass of cement forming the sidewalk or roadway, thereby acting
 65 as an additional stay or binder to resist any upward strain or stress. In this form I prefer to use a pair of L-beams or rails H', as

shown to extend along the rows of holes, and arrange the rod R to project between said plates.

In Figs. 4 and 5, I have shown a convenient way of forming the meeting edges of adjacent blocks or sections of roadway, where it is not
 70 desired to form the entire road of a continuous homogeneous mass. In this form I provide each meeting edge with corresponding
 75 and alternating interlocking projections and depressions, as indicated at W, Figs. 4 and 5. These depressions may be easily formed on the end of one section when still in a plastic
 80 state by any suitably constructed mold, and the end of the next section will conform thereto when the cement or other composition is applied, as will be readily understood. In this construction, should a break occur in one
 85 section it will not extend to an adjacent section, but will be arrested at the seam.

It will be understood that the flaring or enlarged bottom of the holes enables the columns of cement contained therein to maintain a
 90 broad supporting base, thereby forming a support the power of which to resist crushing strain is practically without limit.

It will be seen from the construction above described that the entire pavement is supported from a point beneath the frost line.
 95 The sections of the pavement are arching, and therefore capable of being subjected to severe strains without injury. Any strains or stresses to which the pavement is subjected is distributed throughout a large area. No base
 100 of cinders or ashes or broken stone or rubble is required, and very little preliminary preparation of the road bed to receive my improved pavement is necessary.

Any upheaval of the earth beneath a pavement constructed upon the principles of my invention, on account of the frost and the like, will be accommodated in the spaces O,
 105 without being imparted to the pavement, and hence, without subjecting the pavement to injurious strains. By arching the under surface of the sections I effect a large saving in the amount of material required without detracting in any way from the strength or efficiency of the pavement.

If desired, a layer of asphaltum or other suitable material, or of bricks, may be placed upon the upper surface of the roadway or sidewalk constructed as above described.

Having now fully ascertained the nature and object of my invention, and having described a construction embodying the same, it will be understood that many variations and changes would readily suggest themselves
 115 to persons skilled in the art and still fall within the spirit and scope of my invention.

What I claim as new and of my own invention is—

1. The method of constructing pavements, which consists in forming a series of holes in
 120 the road bed, then arching the surface of the road bed between said holes, and finally filling said holes and covering the entire surface

of said road bed with a suitable cement composition; as and for the purpose set forth.

2. The method of constructing pavements, which consists in forming a series of rows of holes in the road bed, then arching the surface of said road bed between adjacent rows of holes, and finally filling said holes and covering the entire surface of said road bed with a suitable cement composition; as and for the purpose set forth.

3. The method of constructing pavements, which consists in forming a series of rows of holes transversely across the road bed, then arching the surface of said road bed between adjacent rows of holes, and finally filling said holes and covering the entire surface of said road bed with a suitable cement composition; as and for the purpose set forth.

4. The method of constructing pavements, which consists in forming a series of holes in the road bed of a depth to extend below the frost line of the earth, then providing the road bed with an arching surface between adjacent rows of holes, and finally filling said holes and covering the entire surface of said road bed with a suitable cement composition; as and for the purpose set forth.

5. The method of constructing pavements, which consists in forming a series of rows of holes in the road bed, then arching the surface of said road bed from one row of holes to the next adjacent row of holes, then filling said holes with a suitable cement composition, then arranging a suitable rail to rest upon the columns of composition contained in said rows of holes, and finally covering the road bed with a suitable cement composition, thereby embedding therein said rails; as and for the purpose set forth.

6. The method of constructing pavements, which consists in forming a series of rows of holes in the road bed of a depth to extend below the frost line of the earth, then arching the surface of the road bed from one row of holes to the next adjacent row of holes, then filling said holes with a suitable composition, then placing suitable rails to rest upon the columns of composition contained in said holes, then arranging arching ties or rods to span the space between adjacent rows of holes, and finally covering the entire road bed with suitable composition, thereby embedding therein said rails and ties or rods; as and for the purpose set forth.

7. The method of constructing pavements, which consists of forming a series of rows of holes in the road bed, of a depth to extend below the frost line, then arching the surface of the road bed from one row of holes to the next adjacent row of holes, then filling said holes and covering said road bed with a suitable cement composition, and finally removing said arching surface; as and for the purpose set forth.

8. The method of constructing pavements, which consists in providing a series of holes

in the road bed, then arching the surface of said road bed between said holes, then arranging tie rods in said holes, and finally filling said holes and covering said road bed with suitable cement composition; as and for the purpose set forth.

9. A pavement comprising a road bed having a series of rows of holes formed therein and a suitable composition introduced into said holes and arranged to arch the span between adjacent rows of holes, said composition having a flat upper or wearing surface; as and for the purpose set forth.

10. In a pavement, the combination with a road bed, having a series of rows of holes therein of a depth to extend below the frost line, adapted to receive a suitable cement composition, of rails arranged to rest upon the columns of composition and a suitable composition arranged to cover the entire road bed and to arch over the space between adjacent rows of holes and having a level upper or wearing surface; as and for the purpose set forth.

11. In a pavement, the combination with a road bed having a series of rows of holes therein of a depth to extend below the frost line of the earth, of tie rods arranged in said holes and provided at the upper and lower ends thereof with binding plates, and a suitable cement composition arranged to fill said holes and to cover said road bed; as and for the purpose set forth.

12. In a pavement, the combination with a road bed, having a series of rows of holes formed therein, said holes provided with a widened or flaring base, of a suitable composition arranged to fill said holes and to cover said road bed, said composition arranged to span with an arch the space between adjacent rows of holes, and having a level upper or wearing surface, and rails embedded in said composition and arranged to rest upon the columns of composition contained in said holes; as and for the purpose set forth.

13. In a pavement, the combination of a road bed having a series of holes therein, arranged in rows transverse to the length of said road bed and of a depth to extend below the frost line, of a composition adapted to fill said holes, rails arranged to rest upon the columns of composition formed by a row of said filled holes, arching tie rods arranged to span the space between adjacent rows of holes, and a composition arranged to cover the entire road bed, thereby embedding therein said rails and tie rods and having a level upper or wearing surface, and an arching under surface between adjacent rows of perforations.

In witness whereof I have hereunto set my hand this 21st day of January, 1895.

WILLIAM H. WINSLOW.

In presence of—

CHAS. P. SAXE,

C. J. WILSON.