

**No. 618,956.**

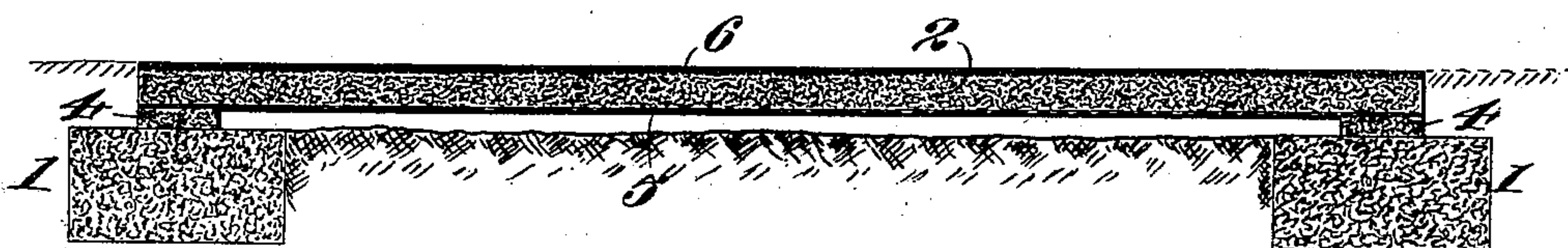
**Patented Feb. 7, 1899.**

**A. L. JOHNSON.**  
**CONCRETE PAVEMENT.**

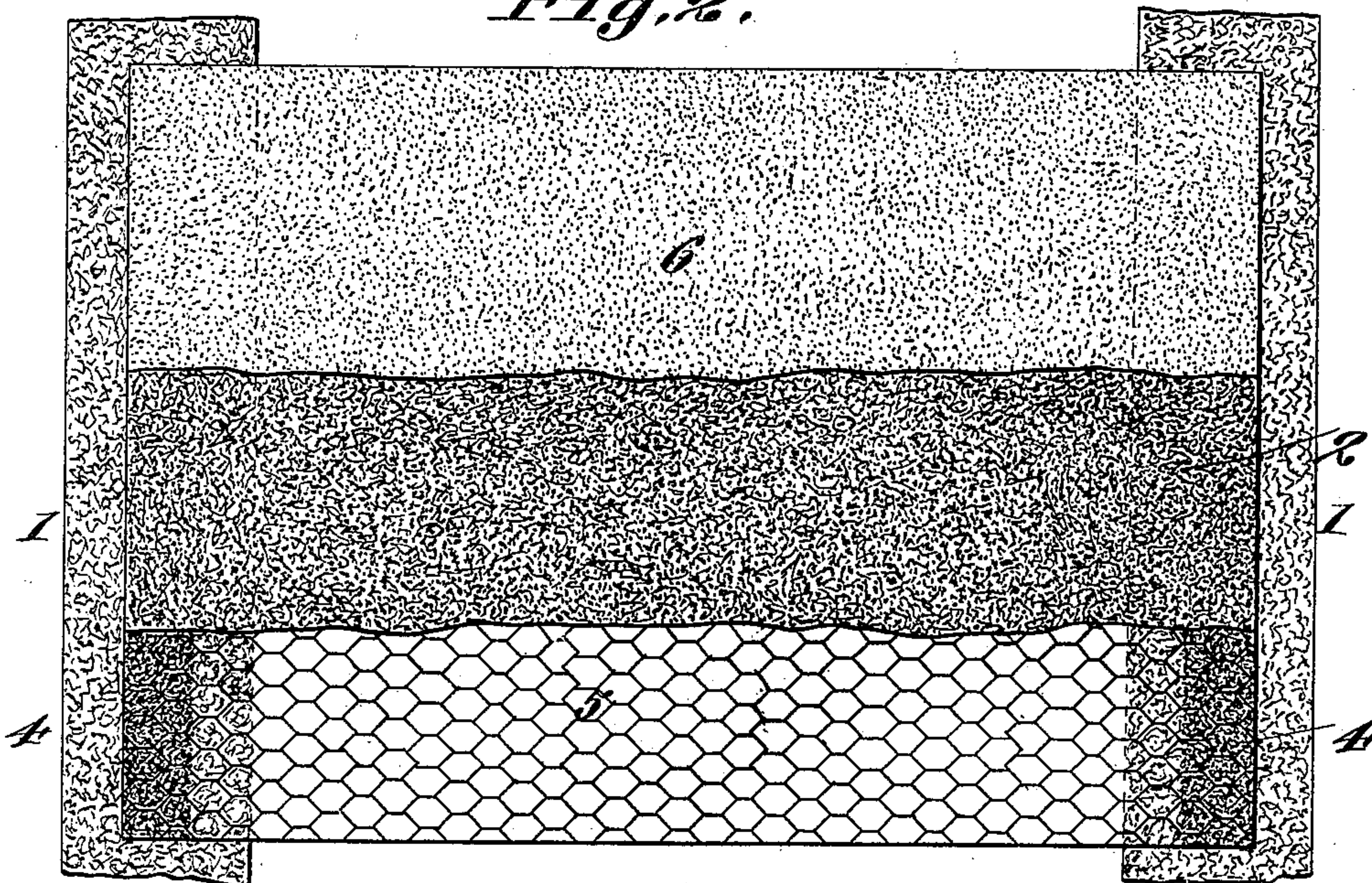
(Application filed Apr. 28, 1897.)

(No Model.)

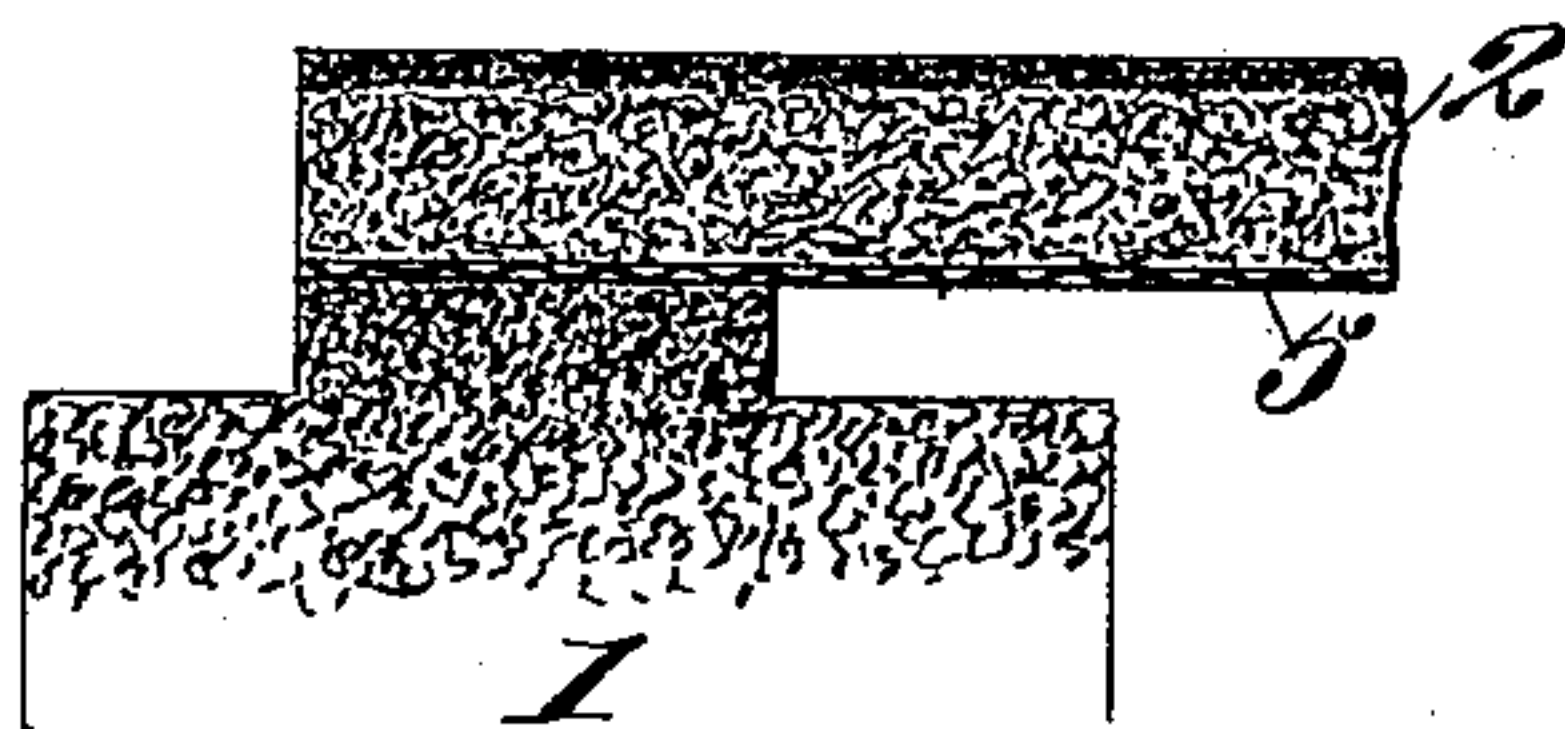
*Fig. I.*



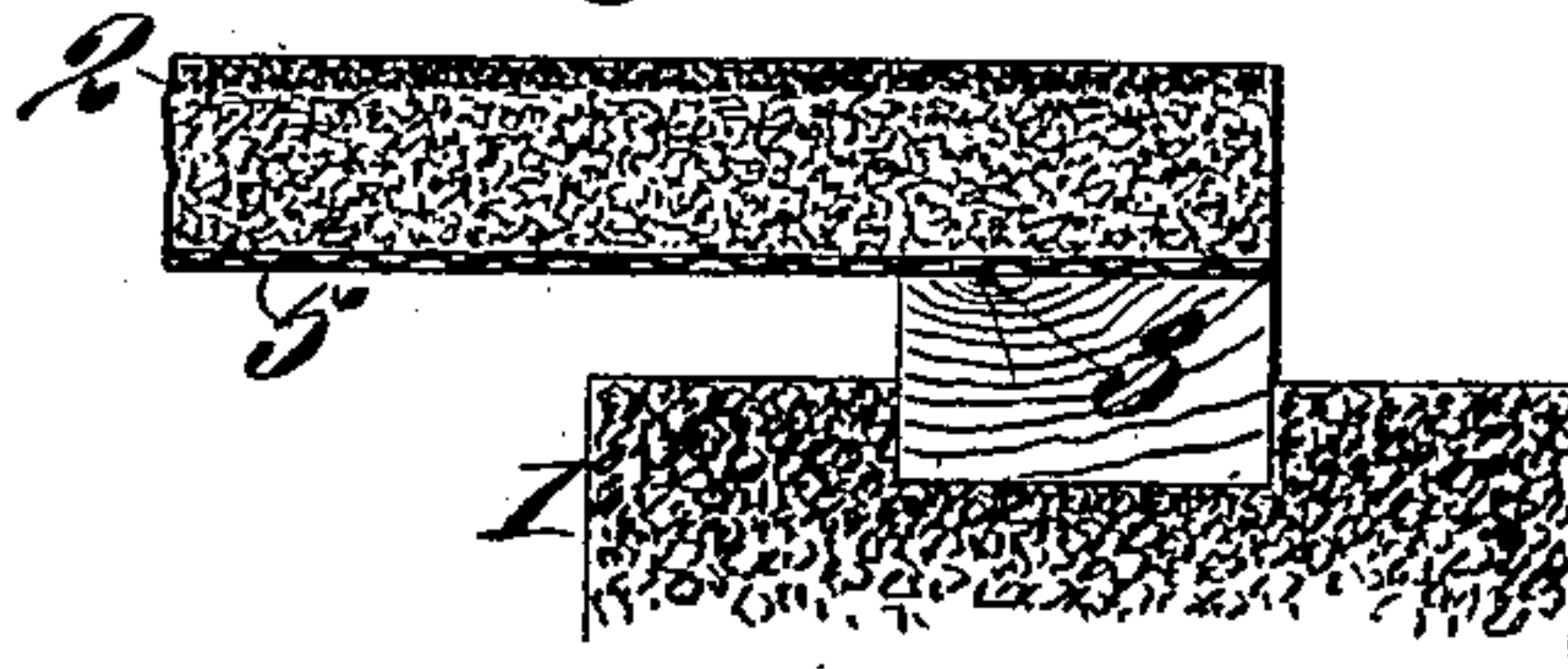
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Attest!*

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# UNITED STATES PATENT OFFICE.

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## CONCRETE PAVEMENT.

SPECIFICATION forming part of Letters Patent No. 618,956, dated February 7, 1899.

Application filed April 28, 1897. Serial No. 634,215. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT L. JOHNSON, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented  
5 a new and useful Improvement in Concrete Pavements, of which the following is a specification.

My invention relates to concrete pavement, and has for its principal objects to prevent  
10 cracking, to lessen the amount of material used, and to utilize a less expensive material than that commonly employed.

To these ends it consists in arranging the foundation and groundwork so that the slabs  
15 or flags of concrete rest thereon only at the side edges of the pavement.

It also consists in embedding a sheet of expanded metal or similar device of great tensile strength in the under side of the concrete  
20 slab or flag.

It also consists in the details and in the arrangements hereinafter described and claimed.

In the accompanying drawings, which form  
25 part of this specification, Figure 1 is a transverse section of a pavement embodying my invention. Fig. 2 is a horizontal view thereof, showing the top layer and the main body of concrete broken away at different lines. Fig.  
30 3 is a sectional detail view showing a modification of the slab and of the foundation. Fig. 4 is the same form of slab as Fig. 3 with a wooden block used in the foundation.

In the several views like symbols refer to  
35 like parts wherever they occur.

It is a very common fault with concrete pavements laid on the open ground—that is, on ground whose surface is exposed to the action of the elements—to crack longitudinally  
40 near the middle. In order to overcome this fault, it is the usual practice to make the body of the pavement of a rich mixture of crushed granite and cement and of a thickness estimated to be sufficient to resist the force which  
45 tends to crack it. In the present invention this force is offered no resistance, but its tendency to crack the slab is obviated.

My theory of the cause of the cracking of concrete pavement laid on the open ground is  
50 as follows: There is more water and it per-

meates deeper into the soil at the sides of the pavement than near the middle. When a freeze occurs, the pavement becomes frozen tight to the ground along its whole width and the pavement is at first heaved up evenly. 55  
As the frost penetrates deeper the soil under the sides continues to upheave, while the soil under the middle portion being dry ceases to rise. The consequence is that the sides of the pavement are heaved up, while the middle 60  
portion is held down tight. The heaving force at the sides is thus converted into a tensile stress on the lower side of the concrete, and as the tenacity of the concrete is slight a crack is started on the under side. More or less dirt 65  
gets into the crack and thus not only prevents it from closing when the sides go back, but causes the crack to spread through to the top of the pavement. In my device this operation is avoided by keeping the middle portion 70  
of the pavement out of contact with the ground.

The foundations of my pavement consist of two beds of cinders or other suitable material filled into trenches dug therefor in the ground below the side edges of the proposed pavement. The ends of the flag or slab 2, of concrete, rest on these two beds, with its middle portion elevated above the ground. 75

In the modification shown in Fig. 3 the foundations are made of concrete and project 80  
above the surface of the intermediate ground. The like construction is shown in Fig. 4, except that the projecting portion is a wooden plank or block 3. In the construction shown in Figs. 1 and 2 the elevating-blocks 4 are 85  
made integral with the slab itself.

In the lower part of the concrete flag strips or bars of metal or sheets of woven wire or expanded metal 5 are embedded. Expanded metal is preferable because the concrete fills 90  
the interstices and by its resistance to compression prevents distortion of the metal, and thereby develops its full tensile strength. By reason of the great tensile strength of the metal and the great resistance of concrete to 95  
compression the slab may be made much thinner than it is now usual to make concrete pavement. As there is no tensile stress on the concrete in my construction, the slab may be made of a much smaller proportion of ce- 100



ment and a lower grade of cement may be used. So, also, limestone may be used in place of crushed granite in the main body of the slab. The thin top layer or dressing 6 is the same as heretofore.

In addition to the saving of materials and the practicability of substituting a cheaper grade of materials, as above described, the amount of excavation and filling with cinders is limited to the two trenches at the sides instead of the whole width of the pavement, as heretofore. Another advantage of great practical value is that the slabs may be made at a factory, and therefore under the most economical conditions, and especially without being affected by atmospherical conditions.

Another advantage is that the open space admits of the circulation of air, and thus furnishes enough respiration for the roots of trees even on streets paved with asphalt.

What I claim is—

1. A concrete pavement laid on the open ground and consisting of foundations embedded in the ground and arranged in two lines along the respective sides of said pavement, and concrete slabs supported entirely by said foundations and having the portion thereof between said foundations free, substantially as and for the purpose set forth.

2. A concrete pavement laid on the open ground and consisting of foundations embedded in the ground and arranged in two lines along the respective sides of said pavement,

and concrete slabs supported entirely by said foundations and having the portion thereof between said foundations free, each of said slabs having metallic strips embedded transversely in its under side, substantially as and for the purpose set forth.

3. A concrete pavement laid on the open ground and consisting of foundations embedded in the ground and arranged in two lines along the respective sides of said pavement, and concrete slabs supported entirely by said foundations and having the portion between said foundations free, each of said slabs having strips of expanded metal embedded transversely in its under side, substantially as and for the purpose set forth.

4. A concrete pavement laid on the open ground and consisting of foundations embedded in the ground and arranged in two lines along the respective sides of said pavement, and concrete slabs supported entirely by said foundations and having the portion thereof between said foundations free, each of said slabs having strips of expanded metal embedded transversely in its under side and having downwardly-projecting blocks resting on said foundations and thereby elevating the rest of the slab above the ground, substantially as and for the purpose set forth.

A. L. JOHNSON.

Witnesses:

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