(No Model.)

C. F. RAPP.

CONCRETE PAVEMENT.

No. 312,897. Patented Feb. 24, 1885.

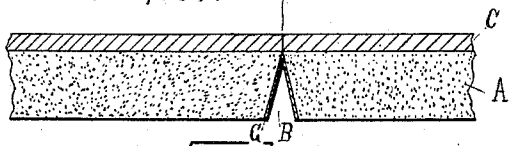


fig. 1.

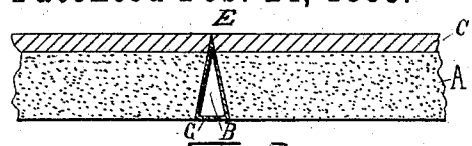


fig. 2.

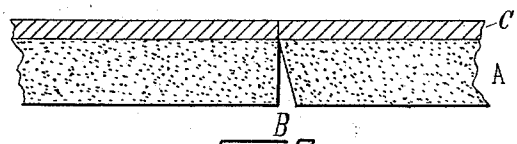


fig. 3.

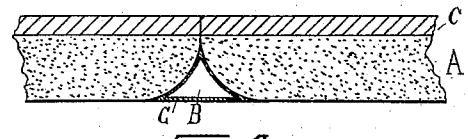


fig. 4.

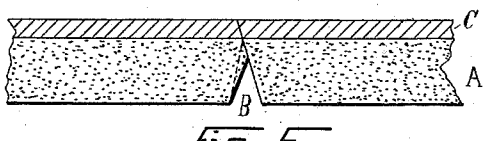


fig. 5.

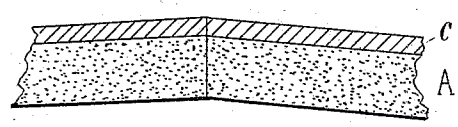


fig. 6.

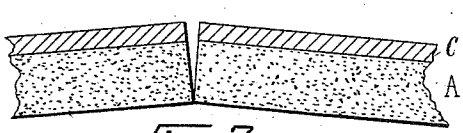


fig. 7.

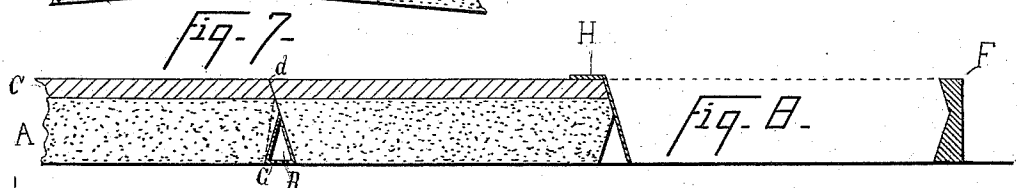


fig. 8.

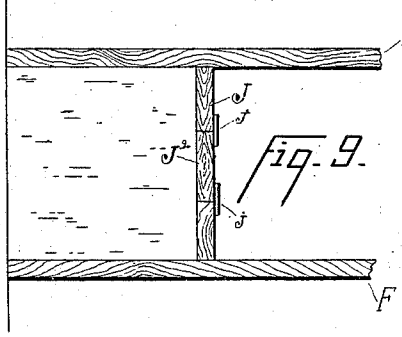


fig. 9.

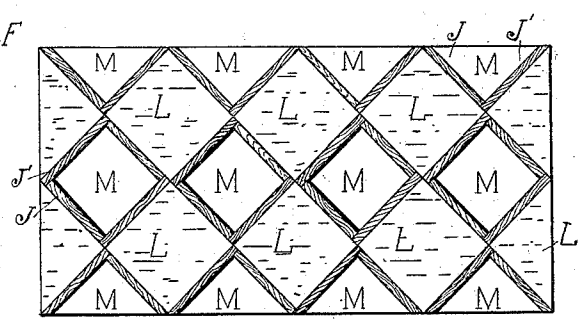


fig. 10.

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UNITED STATES PATENT OFFICE.

CHRISTIAN F. RAPP, OF CINCINNATI, OHIO.

CONCRETE PAVEMENT.

SPECIFICATION forming part of Letters Patent No. 312,897, dated February 24, 1885.

Application filed October 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN F. RAPP, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Concrete Pavements, of which the following is a specification.

This invention relates to that class of concrete or artificial-stone pavements which are put down in the plastic state on the place where they are to remain, and which are formed while being put down into separate blocks or sections. Its object is to form an open joint below the upper surface, to permit it to heave freely should the foundation or any part of it be raised by the action of frost or by settling of the foundation, and also to form a close joint on top, which gives the pavement a better appearance, and also prevents the percolation of water through the joints. Pavements of this class are usually made about four inches in thickness, and composed of a lower course of about three to three and a half inches of coarse gravel or broken stone, with a small percentage (about one-fourth) of Portland cement, and an upper course of from one-half to one inch of fine sand and Portland cement in about equal proportions. If a sufficiently close joint is made between the blocks and extended entirely through the material, it is evident that while these blocks might rise perpendicularly, when the raising of the foundation is directly under the center of the block or blocks, yet they could not heave diagonally unless the joints are wide and the blocks separated more than is desirable, and even should they heave without injury to the blocks they would cause an open V-shaped joint on top, which would quickly fill up with dust and sand and prevent the blocks settling when the frost went out of the ground. Another objection to the straight or close joint arises from the fact that the lower course, having but a small portion of cement, is not strong, and when heaving the lower course, by the force exerted underneath, is crushed or crumbled off, the portions falling under the block preventing it from settling back. All these objections are overcome by my invention, as will be fully understood from the following description of the accompanying drawings, in which—

Figures 1, 2, 3, 4, and 5 are vertical sections of concrete pavements embodying my improvements. Fig. 6 is a vertical section of part of a pavement, showing the position the adjacent blocks will assume when raised by frost. Fig. 7 represents a section of the old form of pavement as it appears when raised by frost. Fig. 8 is a vertical section of a partially-formed pavement, illustrating the method of putting down my improved pavement. Fig. 9 is a plan view of my preferred method of forming my pavement. Fig. 10 is a similar view, on a smaller scale, of my preferred method of laying concrete pavement, which method may be employed either in laying the old-style pavement or my new open-joint pavement.

In forming my pavement I prefer to separate the lower course, A, by inverted-V-shaped joints B, and separate the upper course, C, by a close joint, *d;* but the V-shaped joint may extend to the top of the pavement, as shown at E, Fig. 4. The open joint is formed by thin sheet metal bent into a V shape and left permanently in the joint. The feet of this metal trough may rest upon a strip of wood, tin, or other suitable material, to prevent the ground from working up between the inclined sides; or the piece of sheet metal may be bent over in the form of a triangle, the lower side or base extending under the loose foot. The metal or other material used should be just heavy enough to admit of the material being tamped down without crushing it, and yet light enough to crush together in case the blocks should heave, as shown in Fig. 6.

My preferred method of forming the blocks is as follows: The forming-strips F are grooved or shaped with a triangular depression upon one side, as seen at Fig. 8. The blocks are formed between these strips. The strips are then removed to form the next row of blocks. The edges of the blocks just formed will have their edges beveled back on top and bottom. Against the upper beveled edges of these blocks I place in an inclined position the metal pieces H. These form the V-shaped open joints between the blocks. The frame or strips

being placed in the proper position, a new row of blocks is formed, after which the metal pieces are withdrawn and the open bottom and closed top joint formed. The same result may be accomplished by placing a properly-shaped piece of some elastic or yielding material, G, between the blocks to be left permanently between them, as seen in Figs. 1, 2, and 7. This piece is a tin or sheet-metal tube triangular in cross-section, or curved to the form shown in Fig. 4, with the bottom either open or closed.

I have now described my improved pavement as put down by the methods ordinarily employed for laying this class of pavements.

I will now describe my new method of laying concrete pavements, which is especially applicable to pavements having my improved joint, but which may be also used to advantage with the old form of joint. This method consists in placing upon the foundation of the proposed pavement a frame-work of strips, J J'. These may be either straight-sided strips or strips such as described for forming my improved joints. After these strips are laid, forming the frame-work, I proceed to form blocks in the spaces L and let them remain until fully set—say until the next day. I then remove the strips J, which are formed in three parts. The center piece, J^2, being held in place by buttons *j*, is first removed, then the strips J', and then I fill in the vacant spaces M, thus completing the pavement. When the metal pieces H are used, two of them must be beveled upon their edges to pass between the inclined strips at right angles to them, when the blocks are formed by placing between them the V-shaped gutter extending only through the lower course. The new blocks formed against the edges of the already-set blocks will not adhere firmly to the old blocks, and a shallow line mark or groove will be sufficient to control the cracking. Thus a very close joint will be formed upon the upper surface.

When the open joint below the surface is formed, it is obvious that the triangular forming-strip G may be removed, and in this case the strip or tube G need not be hollow; but this would be a tedious operation, and I do not recommend it.

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

1. A concrete pavement laid in detached blocks on the place where it is to remain, and having the open joints below the upper wearing-surface to admit of the blocks heaving or settling without injury to the blocks, substantially as specified.

2. The method of laying concrete pavements in the plastic state and in separate blocks, which consists in placing a frame-work of separate strips having spaces for forming one-half of the blocks, then filling in the spaces, and after the blocks so formed are set then removing the strips and filling in the remaining spaces to form the pavement.

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