No. 684,917. Patented Oct. 22, 1901.

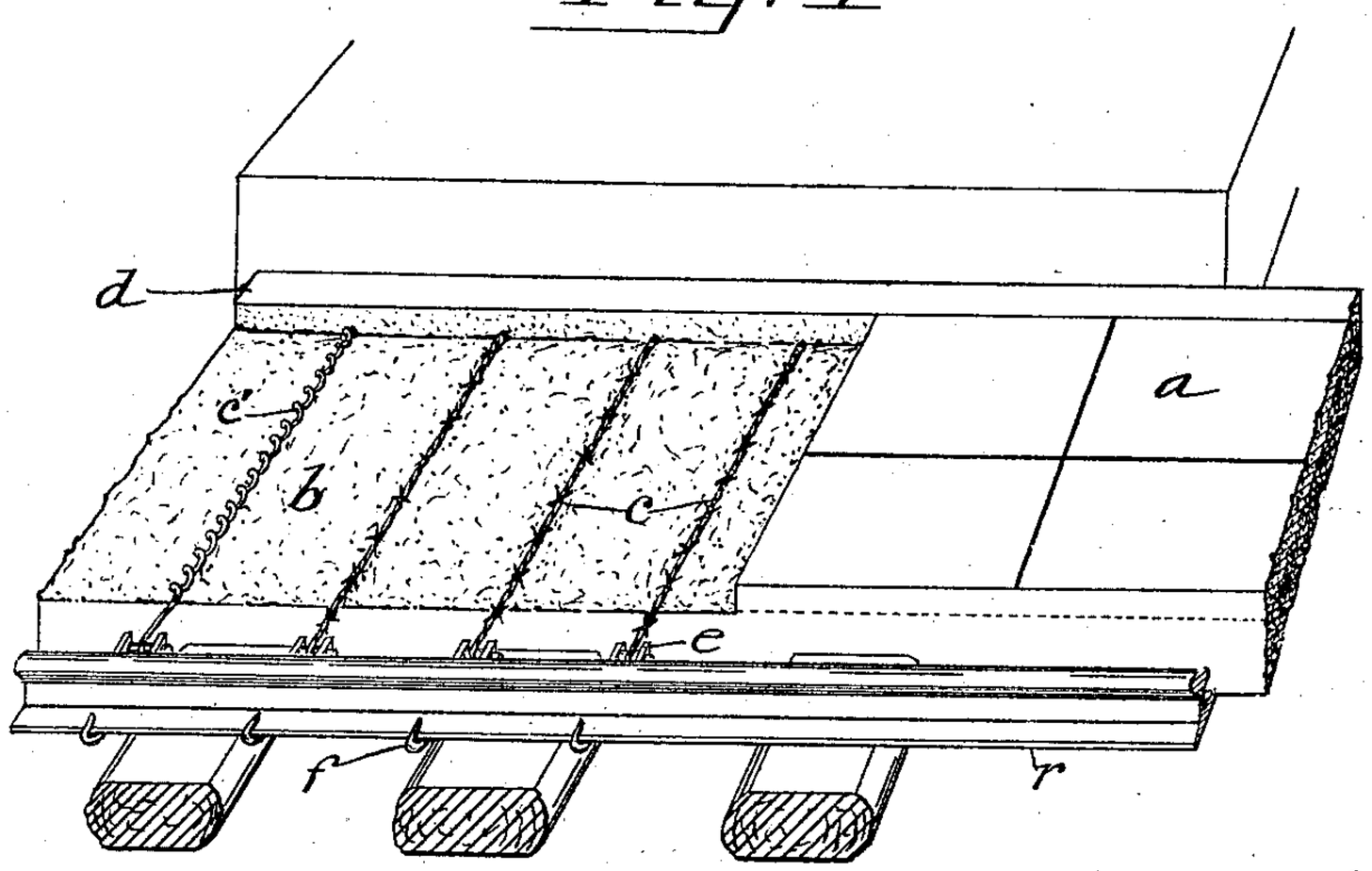
C. H. DAVIDSON.

PAVEMENT CONSTRUCTION.

(Application filed Apr. 20, 1901.)

(No Model.)

Fig. I



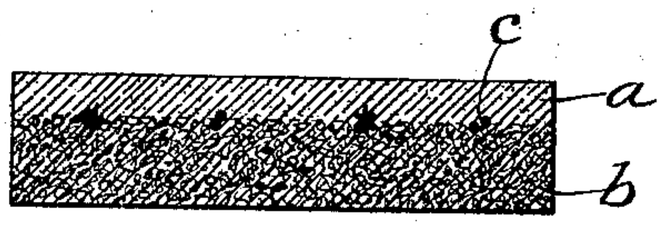


Fig. III

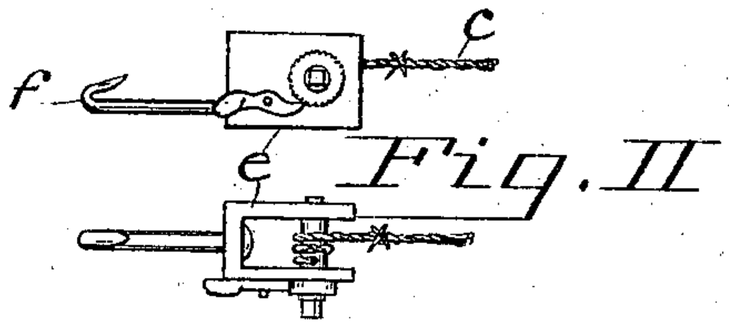


Fig. II

Fig. IV

Witness:

Bertha A. Ross

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UNITED STATES PATENT OFFICE.

CHARLES H. DAVIDSON, OF CINCINNATI, OHIO.

PAVEMENT CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 684,917, dated October 22, 1901.

Application filed April 20, 1901. Serial No. 56,705. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. DAVIDSON, a citizen of the United States, residing at Cincinnati, in the State of Ohio, have invented a certain new and useful Pavement Construction, of which the following is a specification.

My invention relates to the art of laying concrete and other composition pavements, and has for its object, primarily, to prevent separation of the blocks of concrete, to prevent settling and falling away of the same from the curbing, and to prevent the further opening of accidental cracks, &c., all as hereinafter set forth.

Pavements made of concrete especially are liable to contract after they are finished, and sometimes as a result of sinking ground they may settle and draw away from the curbing or crack with the contractions and expansions due to varying degrees of heat. This tends to separate the artificial blocks into which it is marked off and when a crack is once made to continue to open it wider and wider. Moreover, it sometimes happens that the outside edges are placed in proximity to other structures, and in consequence of this the support near the edge cannot always be as firm as under the central portion. This augments the danger of the pavement cracking and separating into pieces, in which case the edges of the cracks not being in contact they are the more liable to be chipped off. Now my invention seeks to correct these defects in a measure by introducing certain tension-filaments, such as are afforded by coiled or twisted barbed wires, into the mass of concrete in the act of laying it and while the wires are stretched and held in tension, so that when dry and the outside tension on the wires is relieved the natural and constant contraction of the elastic metal will evert a constant pull on the mass, insuring the curbing to stay close against the paving, the blocks of the paving to remain in close contact with each other even when they are accidentally broken apart, to prevent cracking as much as possible, and especially to prevent the cracks from opening wide when by accident they do occur. In some cases I may use coiled wires for this purpose in order to gain a greater degree of elasticity. In large areas, like the floors of freight-houses, the natural adhesion of the mass of concrete is not sufficient to prevent the pavement from cracking under the heavy vibrations and the great changes in temperature to which it is subjected, and once a crack is started it soon becomes widened out and wholly separated, so that the edges are knocked off and the whole floor ruined. This defect my invention is designed to correct by supplying an extra and elastic bond in the concrete, which by a constantly-exerted pull draws incipient fractures together again.

In the accompanying drawings I illustrate the use of the invention as applied, for example, to making platforms for railroad-stations.

Figure I is a perspective showing a partially-constructed pavement with the wires laid on the coarse layer and stretched. Fig. II shows one means used for tightening the wires. Fig. III is a section of a block of concrete, taken perpendicular to the wires. Fig. IV is a section taken along the wire and showing the anchorage of the same in the curb-block.

Usually I first put in the curbing *d* and embed the wires—say about two to four to a block width—in the concrete as it is tamped solidly in place; otherwise I may simply run the wires through the curbing horizontally and attach them for stretching to pegs or other supports outside. When the first or coarser layer of grouting or broken stone *b* is laid, I place the elastic twisted barbed wires *c c'* across the surface, as shown, and by some tightening device, as that shown at Fig. II, which I may attach by the hook *f* to pegs or, as in the instance shown, to the near steel rail of the road, I draw the wires taut. They are thus held under tension until the paving is all finished and well set and dried, when the outside tension is relaxed. If the other ends of the wires are to be anchored in the curb-block *d*, a rod or other support may be placed under the bent angle of the wire for a better hold, as shown in Fig. IV. The wires are fully embedded in the coarse layer of concrete before the upper or wearing surface layer is put on. There is generally little danger of the pavement separating across its length, and ordinarily I use wires placed only in one direction; but I may use them in both

directions. Now the wires are always in tension. The barbs prevent their slipping at all, and the twisted or coiled condition of the wires allows for the necessary contraction and expansion due to changes in temperature without moving the barbs from place. When I use coiled wires, more elasticity is attained and a greater scope of pull on the concrete. If a block becomes loosened from its neighbor by a blow, it is still held by this tension in close contact therewith, and the crack therefore may not open wider. Though the action is something like that of the cow-hair commonly used by plasterers in making mortar, yet the stretching of the wire adds an additional function to that, and, moreover, I find that in unavoidable cases where cracks do occur the use of the wires causes the cracks to take a regular form along the wires, and therefore makes a less unsightly break. In these respects, as well as in the firm holding of the blocks against the curbing, my invention is essentially distinguished from those constructions wherein wire-netting not in tension is used, covering the whole area of the pavement, as shown, for instance, in the patent to Greene, No. 349,645, and other such forms. My device largely prevents cracking and separating in the first place, and, in the second place, when cracks do occur by extraordinary strains the parts are not only prevented from opening, but are constantly pressed close together. The effect of this in the case of its use with asphalt or other viscous pavements is to cause a pressing and welding together of cracks after they are made.

I do not restrict myself to concrete, nor to one row of wires, nor particularly to barbed and twisted wires; but,

Having thus described my invention and its use, what I desire to secure by Letters Patent and claim is the following:

1. The process of bonding a concrete pavement by placing first a bottom layer, then stretching elastic roughened wires over the same, holding the wires in tension from an outside attachment while the top layer of concrete is placed on and around them and releasing the wires from the anchorage after the concrete has set.

2. The process of bonding concrete pavements by first placing a bottom layer and part of the curbing, the latter having embedded therein elastic and roughened wires, stretching the wires across the bottom layer and filling in the top layer around and upon the wires, and then releasing all external anchorage of the wires, whereby the wires are left in a condition of stress along their entire length.

3. A pavement construction wherein is wholly embedded a series of independent elastic wires in a condition of stress throughout their length each exerting independently a constant pull toward the center from both sides of the pavement.

4. A concrete pavement having roughened and elastic stretched wires embedded therein, each wire being independent, being anchored only by friction in the concrete, and being in a state of tension throughout its length.

In testimony whereof I have hereunder signed my name in the presence of the two subscribing witnesses.

C. H. DAVIDSON.

Witnesses:
BERTHA O. ROSS,
CHAS. H. URBAN.