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CROWNING DEVICE FOR EXPANSION JOINTS

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My invention relates in general to expansion joints as used to compensate for expansion and contraction in concrete constructions, and has particular reference to a crowning device for expansion joint installation in connection with concrete roadways.

Expansion joint installation in concrete roadways is usually accomplished in either of two ways, one way being to leave a space between sections of the concrete which is later filled in with expansion joint material, usually by pouring the material in the space. Another way being to use preformed strips of expansion joint material, and install the same in the space between the concrete sections by supporting the strip on edge and pouring the concrete around both sides of the same. The last mentioned method of producing the joint is perhaps the most practical in the majority of cases. However, difficulty is experienced very often in warm weather in handling preformed joints and installing the same with a straight edge. These difficulties are the result of the mastic structure of the joint strip yielding to the effect of high temperature, so that the strip becomes more or less soft and flabby. I do not mean that ordinary atmospheric conditions in warm weather will destroy the preformed structure of the joint strip, but in handling the joint it is naturally subjected to strains and stresses, which very often distort the same, but after once installed, if the strip is properly constructed, ordinary high temperatures will not destroy its functioning qualities.

To avoid the possibility of the joint becoming misshapen during handling in warm weather I have devised a crowning device which will resist the effects resulting from handling the joint in warm weather and enable the joint to be installed with a straight edge.

The salient features of a crowning device of this character are fully explained in my Patent No. 1,588,717, issued June 10, 1926, and Patent No. 1,588,718 issued June 15, 1926. The present application is a continuation in part of these applications, and includes a means attached to the crowning device where-by it may be readily engaged by a removing tool.

In the present case, as in the two cases referred to, one object of the invention is to protect the edge of the strip and reinforce the same. Another object, and perhaps the most important so far as the present case is concerned, is to provide means for developing a rounded, curved or the like edge or end along parts of the concrete sections which terminate in abutting relation to the joint.

A still further object of the invention is to equip the crowning device with means whereby the device may be conveniently pulled off or removed from the joint strip after the strip has been installed.

With these and other objects in view the invention will be further described with reference to the illustrative embodiment shown in the accompanying drawing, in which:

Figure 1 is a perspective view illustrating the application of one form of the invention.

Figure 2 is a perspective view of a joint installation developed with the aid of the device shown in Figure 1.

Figure 3 is a perspective view illustrating the application of a modified form of the invention.

Figure 4 is a perspective view of a joint installation developed by the use of that form of device shown in Figure 3; and

Figure 5 is a view in section showing the finished joint installation as accomplished by the invention.

Before proceeding further with a description of the drawing I think it best to point out that the embodiments of the invention shown in the drawing have simply been selected as a means of explaining the construction and application of the idea. The drawing in this respect is in the most part more or less exaggerated. Nevertheless it explains the principle involved, and will serve in this respect to clearly show the novel features as pointed out in the subjoining claims.

Referring now to the drawing in detail. A and B represent portions of a concrete construction, a roadway as an example, with the spaces between the same equipped with a strip of expansion joint such as —5—. This
strip having been previously formed from material suitable for the purpose, with a length, say of 5 feet, 1/2 inch thickness and a 4 or 5 inch depth when standing on end as shown. The strip —5— may be offered for sale with the crowning device —6— snugly fitting over the crowning edge 5' thereof, or else the crowning device —6— may be marketed separately and applied to the crowning edge of the strip prior to its installation in the joint, or just prior to the time when the joint will be subjected to considerable handling, loading or unloading, and after being delivered on the job.

In manufacturing the crowning device —6— I would suggest that the same be produced from light sheet metal, the same being rolled, stamped, or otherwise formed to produce a channel cap or the like structure, having preferably a flat top —7— with downwardly depending side flanges —8— and —9— for the spaces between the flanges —8— and —9— being equal to the width of the joint so that the cap may be applied to the joint as shown in Figures 1 and 3.

While the cap is not to be formed as a permanent part of the strip it should snugly fit the same, or else other means may be provided for securing the cap to the strip, such as shown in my Patent No. 1,688,718 above referred to. As heretofore practised in expansion joint installation, the ends of the concrete sections abutting the joint are simply finished off. The joint in this respect acts as a moulding abutment, so that the sides of the end wall of the concrete section and the traffic surface form a sharp corner at the end of the sections. This method and the concrete structure developed by the same is perfectly satisfactory so far as the functioning of the expansion joint is concerned, except difficulties are very apt to arise later on due to the effect of traffic passing over the joint. This frequently results in cracking the sharp corners of the concrete sections, chipping pieces of the concrete off, and as a result of this continued destruction of the concrete corners not only is the functioning action of the joint impaired, but in many cases also leaves a bad surface for traffic.

My method of installing the joint will overcome this disadvantage, since I provide means for forming a rounded or curved edge A' on the ends of the concrete sections, as shown. This rounded or curved effect may be realized by making the depending flanges —8— and —9— of the crowning device —6— concave, so that a joint having this crown applied thereto and installed prior to the pouring of the concrete sections will provide a rounded, moulding abutment against which the concrete is formed.

After the installation has been accomplished the crown may be removed. This will leave a structure somewhat on the order shown in Figures 2 and 4.

In some cases I would prefer to make the joint strip —5— of a height sufficient to leave an excess of material projecting above the road surface, so that this excess material of the joint may be rolled down so as to fill in the space left by the removal of the crowning device. This would leave a completely filled joint, as shown in Figure 5. The spreading or rolling of the crown of the joint to fill in this space may be accomplished in any convenient way, or else it may be left to the traffic. In reality the space left by the removal of the crowning device would not be as large as shown in the drawing, since, as heretofore pointed out, the drawing is more or less exaggerated in order to conveniently show the installation.

The construction just referred to in the preceding paragraph refers primarily to the forms shown in Figures 3 and 4. In this connection I wish to make comparison with the forms shown in Figures 1 and 2. In the latter form the top —7— is made much lower than in the form shown in Figure 3. This would be preferable since it will leave the top —7— of the crowning device flush with the surface of the concrete, so that a finishing machine may have an unobstructed sweep across the same. Of course this would be more or less impractical in the form shown in Figure 3, due to the fact that the top of the crowning device projects considerably above the surface of the concrete; while in the forms shown in Figures 1 and 2 there would not be as much of the expansion strip projecting above the surface of the roadway, consequently there would not be as much material to roll down to fill up the crown of the joint, as shown in Figure 4 there will still be a sufficient amount to fill up the space. If in some cases it is found that there is not enough material to be rolled out, the insufficiency may be supplied by pouring. This is, of course, more or less immaterial so far as the principle of the invention is concerned.

In order to aid in removing the cap from the joint after the joint strip has been installed, I will use some pulling connection or lifting connection, such for instance as the lugs —10—, the same being struck from the metal of the cap in the top —7— thereof and adapted to be engaged by a pulling tool which may be used as a handle.

As a convenient way of producing these lugs the metal of the top —7— may be cut as shown at 11 in Figure 1, with the area within the cut made with a perforation 12. The lug will normally lie flush with the top, so as to be out of the way until it is needed. When the crowning device is to be removed a tool may be inserted in the perforation 12, a pull on the same will raise the lug up, as
shown in Figure 3, and by continuous pulling the crowning device may be removed.

These lugs may be provided at spaced intervals along the top, and are simply illustrative of one way in which the crowning device may be conveniently pulled off with a tool. Another practical way would be to use only perforations or openings 13, see Figure 1, and engage the same with a tool, as in the case of the perforation 12, Fig. 3.

From the above description it would be readily seen that I can accomplish two important objects with the crowning strip, one being to reinforce the strip so that it may be properly handled prior to installing, and as a second object form the rounded edges in the concrete sections.

I claim:

1. A crowning device for a preformed expansion joint strip, comprising means adapted to embrace and extend laterally from the crowning edge of the strip and having downwardly depending sides overlying the sides of the strip, and means for pulling the crowning device from the strip after the strip has been installed.

2. In a crowning device for a preformed expansion joint strip, a cap adapted to embrace and extend laterally from the crowning edge of the strip, downwardly depending portions on said cap adapted to embrace the sides of the strip, and means on the top of the cap for pulling the cap from embracing relation with the strip.

3. In an expansion joint installation including a preformed strip of expansion joint material, means for installing said strip having a straight crowning edge comprising means embracing the crowning edge of the strip and having a downwardly depending concave side wall overlying the side of the strip, and means carried by the installing means for removing the device from embracing relation with the strip.

4. In combination in an expansion joint including a preformed strip of composition material arranged between adjacent pavement sections, a crowning device having depending sides, each of which are of less extent than the width of the strip for embracing a portion of the sides of said preformed strip, and means carried by the crowning device for pulling same from embracing relation with the preformed strip.

Signed at Chicago, Illinois, this 8th day of May, 1926.

ALBERT C. FISCHER.