Feb. 21, 1933.

A. C. FISCHER

1,898,943

EXPANSION AND CONTRACTION JOINT

Filed Oct. 19, 1925

Fig. 1.

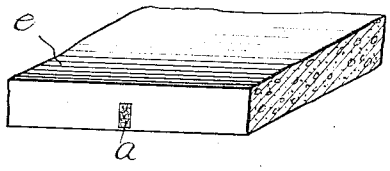



Fig. 2.

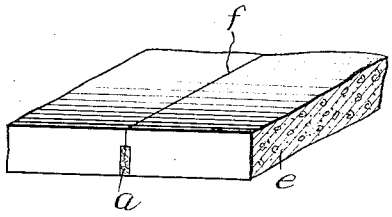



Fig. 3.

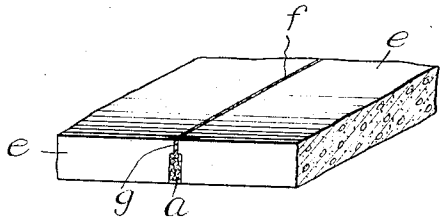
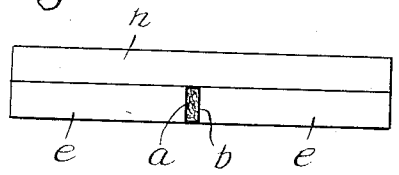



Fig. 4.




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# UNITED STATES PATENT OFFICE

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## EXPANSION AND CONTRACTION JOINT

Application filed October 19, 1925. Serial No. 63,362.

This application is a continuation in part of application Serial No. 526,742 filed January 3, 1922, and which matured into Patent No. 1,655,835 on January 10, 1928.

My invention relates primarily to utilizing a preformed piece of expansion joint as an expansion contraction joint, by properly staking said expansion joint in position and pouring the concrete over the top as well as the sides, it being preferable that the material over the expansion joint should not exceed 1½ inches in thickness, the purpose of which will be hereinafter explained.

This invention has to do largely with a control of the material and a correction of a fault which was apparent in the prior art, especially where a two course pavement was laid. It has been customary to lay expansion joint in a trough like form in the base, and, at a distance from such underlying layer, expansion joint in the upper course.

It was not the intention or purpose that the expansion material thus provided be used as a contraction joint and placed in such a manner that the concrete would be likely to break over the top of said expansion material. By controlling the flow of the expansion material in warm weather to reduce its oozing qualities to a minimum, viz., by incorporating approximately fifteen (15) or twenty-five (25) per cent of fibrous matter, the oozing properties can be greatly controlled, and when this is done, when the concrete cracks above the expansion contraction joint, the warm temperature will cause a sufficient amount of the material in the base to come to the surface thru the crack thus formed.

Where an asphalt top is placed over the concrete base this expedient has proved defective and harmful to the road, inasmuch as where readily deformable expansion joint is used the joint would ooze between the concrete layer and the asphalt layer forming a ridge in the pavement.

This can readily be corrected by placing in the pavement an entirely non-oozing expansion material, which would remain in the base, and would thus allow the surface of the material to remain uniform and even.

The invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in the claims and illustrated by the accompanying drawing, in which—

Figs. 1, 2 and 3 are perspective views of paving structures embodying my invention; and Fig. 4 illustrates a modified type of paving structure.

My invention can best be understood by referring to Figure 1, in which —*a*— represents a preformed expansion joint and —*e*— the concrete mass formed about it. This illustration shows the position of the joint and the relationship of the concrete about it previous to a crack forming.

At the top of the material —*a*— Figure 2 illustrates this same mass showing the expansion material —*a*— with the concrete poured about it, the expansion material reaching thru the greater part of the concrete mass, and upon contraction of the material a crack being formed as at —*f*— in the concrete mass —*e*—. This crack does not widen rapidly and is a very narrow crevice, so that when the mass is heated up by the rays of the sun or the temperature, the slight flow of the material —*a*— works its way thru the crevice to the surface —*f*— of the street, thus keeping the crevice waterproof.

Figure 3 illustrates expansion material which has worked up into the crevice —*f*— as shown at —*g*— the crevice being formed of the concrete mass —*e*—.

As previously explained, the difficulty with heretofore practised methods, particularly in instances where a pavement is laid in courses, is that the expansion joint material placed in the base course has been too readily flowable, so that at higher temperatures expansion of the concrete will cause the expansion joint material to ooze between the upper and lower course, with the result that the surface of the upper course is affected, and in some instances to the extent that a bump or enlargement is made. In accordance with my invention this condition can readily be prevented by utilizing a fibrous expansion material as at —*a*— (Fig. 4) which when placed in a concrete base —*e*— will allow the asphalt

top —*h*— to remain in condition, or prepared fibrous material —*a*—, as disclosed in this figure, is described elsewhere in the Patent Office, and is available for this special use, so it will not be necessary for me to describe its properties, except that it is important for this material to ooze, as in Figure 3.

Various types of expansion joints are on the market, from the asphalt joints to fibrated joints, all of which have comparatively similar percentages of asphalt in them, as described in figure —*a*— at Figure 4.

The utility of this product can readily be understood when the methods described and the proper materials are utilized for the respective purposes, as outlined in the figures shown and the materials employed.

I claim:

1. A paving structure comprising a monolithic layer of paving material, and a bituminous expansion joint embedded beneath the paving surface to provide a weakened area in the paving structure over which cracks are caused subsequently to develop, said joint being adapted to flow to fill the cracks as they develop.

2. A paving structure comprising a monolithic layer of concrete paving, and a fibrated bituminous joint embedded beneath the concrete surface to provide a weakening area in the structure over which cracks are caused subsequently to develop, said joint being adapted to flow into the cracks as they develop.

3. The method of forming a paving structure characterized by positioning a bituminous expansion strip in a section to be paved, and flowing a monolithic layer of concrete over the strip.

4. The method of forming a paving structure having weakened seams therein characterized by positioning a waterproofed expansion strip in a section to be paved, and flowing a monolithic layer of concrete over the strip.

5. A paving structure comprising a monolithic layer of paving material grooved to provide a weakened area adjacent which cracks are caused to develop, and a waterproofing strip inserted in the groove and formed of material adapted to ooze into the crack and seal the same.

6. A paving structure comprising a monolithic layer of paving material having a groove to provide a weakened area adjacent which cracks are caused to develop, and a strip inserted in the groove and containing a waterproofing material adapted to ooz into the crack and seal the same.

7. A paving structure comprising a monolithic layer of paving material grooved to provide a weakened area adjacent which cracks are caused to develop, and a waterproofing strip inserted in the groove, and formed of plastic bituminous material adapted to pass into the crack and seal the same.

8. A paving structure comprising a monolithic layer of paving material having a groove to provide a weakened area adjacent which cracks are caused to develop, and a strip inserted in the groove and containing a plastic bituminous waterproofing material adapted to pass into the crack and seal the same.

9. The method of forming a paving structure characterized by grooving a monolithic layer of paving material to provide a weakened area in which a crack may develop, and filling the groove with a waterproofing strip formed of material adapted to ooze into the crack and seal the same.

10. The method of forming a paving structure characterized by grooving a monolithic layer of paving material to provide a weakened area in which a crack may develop, and filling the groove with a strip containing a waterproofing material adapted to ooze into the crack and seal the same.

11. A paving structure comprising a monolithic layer of paving material grooved to provide a weakened area adjacent which cracks are caused to develop, and a waterproofing strip inserted in the groove and formed of material adapted to pass into the crack and seal the same.

12. A paving structure comprising a monolithic layer of paving material grooved to provide a weakened area in which a crack may develop, and a waterproofing strip inserted in the groove formed of material adapted to pass into the crack and seal the same.

Signed at Chicago, Illinois, this 13th day of October, 1925.

ALBERT C. FISCHER.