June 10, 1930. A. C. FISCHER 1,762,682

COMBINED CONTRACTION AND EXPANSION JOINT

Original Filed Jan. 3, 1922

Fig. 1.

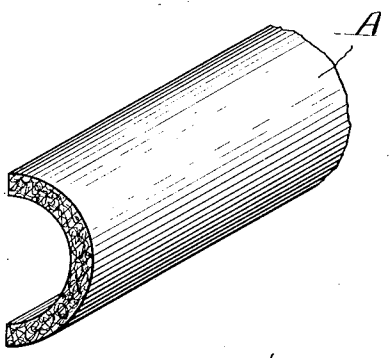
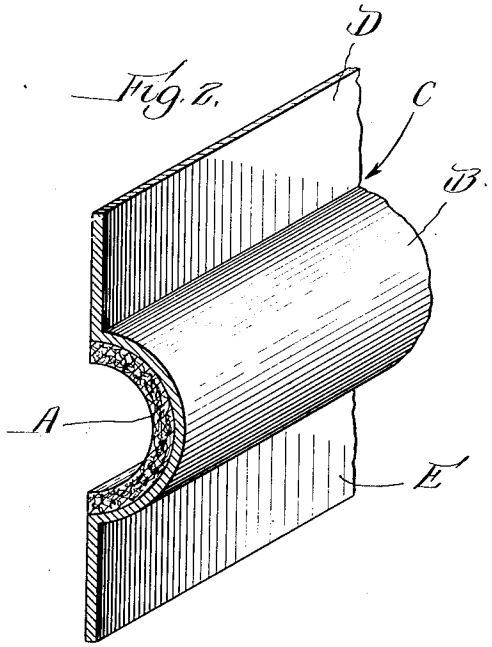


Fig. 2.



Inventor:
Albert C. Fischer,
By Ballard Moore atty.

Patented June 10, 1930 1,762,682

UNITED STATES PATENT OFFICE

ALBERT C. FISCHER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PHILIP CAREY MANUFACTURING COMPANY, A CORPORATION OF OHIO

COMBINED CONTRACTION AND EXPANSION JOINT

Original application filed January 3, 1922, Serial No. 526,742. Divided and this application filed May 9, 1927. Serial No. 190,084.

This application is a division of my application Serial No. 526,742, filed January 3, 1922, for Expansion-contraction joint, which matured into Patent No. 1,655,835 on January 10, 1928.

Heretofore in concrete pavements where contraction was to be provided for, it has been the practice to insert a piece of metal longitudinally or transversely below the surface, so that when the concrete block or slab is poured and completed the contraction joint is not visible at the surface. After the concrete sets and contracts the function of these pieces of metal is to cause a very fine crevice to develop thru the entire slab, so that it becomes visible on the surface, and functioning in this way it is styled a contraction joint.

Further developments in this style of allowing for expansion and contraction in concrete pavements can be made in which an angular or tongue and groove formation is provided, so that the projections thus developing in one concrete slab, by reason of filling in these projections in the contracting joint, penetrate the other slab so that resistance is caused to any lifting action on the part of the concrete slabs. Some of these formations have been angular and some half hexagonal in shape, with straight flanges extending on either side in a vertical position when the joint is installed. These contraction joints, while causing the crevice to develop along a straight line across the concrete slab or in the surface above which the joint is inserted, do not prevent the ingress of water, street acids or the like, which would tend to hastily corrode the metal contraction joint, and also enter the subsoil underneath the slab, keeping the subsoil in a constantly wet or damp condition.

Another object of my invention resides in providing an improved combination expansion and contraction joint, which, when imbedded in the slabs of concrete or other material, not only serves as a contraction joint but also serves to waterproof from within crevices which may develop about it.

My invention provides for an improved joint which has many advantages over the heretofore practiced methods, and also provides for the waterproofing of the joint automatically. These advantages are realized by insertion of a bituminous slab of varying thickness, depending upon the requirements. The contraction joint flanges are imbedded in the bituminous slab on either side of the projecting center. This not only tends to preserve the metal flanges but also has a tendency to protect the projecting part of the joint, because in expanding in warm weather some of this bituminous material will ooze along the surface of the uncovered metal.

It may be readily understood, of course, that a metal contraction joint may be coated with paint or bituminous material in addition to the projecting slabs of bituminous material acting both as expansion and contraction joints.

Expansion joints have usually been placed so that the upper edge of the joint was visible on the surface of the pavement, and in many cases were allowed to project above the surface, so that the traffic would form a sort of mushroom top over the crevice.

It can be readily understood that the purpose of this invention is to totally submerge both the contraction and expansion parts of this joint beneath the surface, so that when the concrete is finished and poured it will not be visible on the surface but will accomplish the same function, in causing a crevice to form across the surface, due to contraction. It will further function by waterproofing this crevice from within, and upon expansion of the bituminous material, and also the pavement, it will cause the asphaltic substance to work its way up to the crevice, so that after a hot period the bituminous material may often work its way to the surface, while the base part will have a tendency to prevent moisture from coming up, filling the crevice from below, and in this manner the entire crevice will be kept waterproof, and at the same time perform both the functions of an expansion joint and a contraction joint.

In the accompanying drawing, which illustrates the preferred form of the invention herein referred to, Figure 1 is a detailed perspective view of a grooved strip of expansion joint material which fits the grooved side of the contraction joint shown in Figure 2; and

Figure 2 is a perspective view of a portion of such contraction joint with which the strip just referred to is used.

Referring now to the drawings in detail A represents the expansion joint strip which is made to correspond to the semi-circular tongue and groove intermediate portion B of the metal contraction joint C, the joint also embodying in its construction upper and lower flat portions D and E. The strip A is applied preferably to the grooved side of the intermediate tongue and groove portion B and covers the same completely, so that its ends terminate flush with the surface of the upper and lower portions D and E.

The strip A, so far as the showing made is concerned may just as well be a preformed strip of bituminous material, or else, as heretofore stated, the groove on the intermediate portion B may be coated with bituminous or other waterproofing material. In any event the strip A provides not only a cushion against which the concrete slab may abut, but upon expansion of the concrete slabs between which the joint is installed the pressure imposed upon the strip A will cause the same to ooze and flow to an extent that it will cover the side of the upper and lower portions D and E, and otherwise perform as hereinbefore pointed out.

Since the strip A is preferably made from bituminous material it will adhere to the sides of the groove, and the shape of the groove will enable the strip to be securely wedged in place.

For all practical purposes it is only necessary that the strip A adhere to the groove until the concrete is poured around the joint, as after the concrete is poured there is no possibility for the strip to work loose.

I claim:

1. A preformed contraction joint comprising a preformed piece of sheet metal carrying a preformed expansion joint composed of waterproofing material mounted on one face of the sheet metal, and being adapted to be freely exposed to the concrete when assembled in position between two concrete sections.

2. A preformed combined contraction and expansion joint comprising a single thickness of sheet material having inherently mounted thereon a preformed strip of resilient waterproofing material adapted to flow under pressure.

3. A metallic contraction joint having a portion forming an expansion joint, consisting of a strip of resilient waterproofing material mounted directly to the side face of the metallic joint.

4. A metallic contraction joint of sheet metal carrying a relatively thick coating of bitumen containing material mounted on the face of the sheet and adapted to flow along the metallic portion.

5. A metallic contraction joint having flat flanged portions and a lateral extending portion, and an expansion joint carried directly on and by the lateral extending portion.

6. A metallic contraction joint having lateral flanges and an intermediate arcuately shaped portion carrying an expansion joint directly thereon so as to be exposed to contact with a concrete section.

7. A metallic contraction joint comprising sheet metal formed with oppositely disposed flanges and a semi-cylindrical portion, and an expansion joint mounted in said semi-cylindrical portion, said expansion joint containing a bituminous ingredient.

8. A combined construction and expansion joint comprising a metal plate having a comparatively flat flange and an adjacent pocket, and a relatively thick layer of bitumen containing material adherently disposed in said pocket, whereby said bitumen containing material may flow along the flat portion of the plate.

9. A contraction joint having a semi-circular center and extending flanges of the same material, the semi-circular center having inserted therein an expansion joint to co-operate therewith.

10. A combined expansion and contraction joint comprising a sheet formed with flat flanges, adapted to lie between concrete slabs and to separate the slabs, said flanges being connected with a resilient and integral contracting and expanding portion and a preformed strip of waterproofing, resilient material, adjacent the connecting portion adapted to flow under pressure.

11. A combined expansion and contraction joint comprising an integral piece of sheet material, adapted to be inserted between two concrete sections to separate them, said sheet being provided on one face with a tongue and on the opposite face with a corresponding groove, adjacent flat portions on the face, and a preformed strip of compressible waterproofing material attached to one face of the sheet.

12. In a device of the class described, the combination of an integral piece of sheet metal, provided intermediately of flat projections with a substantially semi-spherical outward bend to provide a resilient, contractible and expansible portion adapted to interlock with the concerte sections, and carrying on its inner wall a preformed curvilinear strip of resilient preformed material adapted to flow under pressure.

13. In a device of the class described, the combination of an integrally formed piece of sheet material having flat projections and a portion offset from the plane of the flat projections for providing a resilient contractible and expansible portion adapted to interlock with concrete sections, and a preformed strip of waterproofing material, which is resilient and flowable under pressure, facing the offset portion.

Signed at Chicago, Illinois, this 3rd day of May, 1927.

ALBERT C. FISCHER.