W. E. LEACH.

EXPANSION JOINT FOR CONCRETE SECTIONS.

APPLICATION FILED FEB. 27, 1917.

1,241,405.

Patented Sept. 25, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

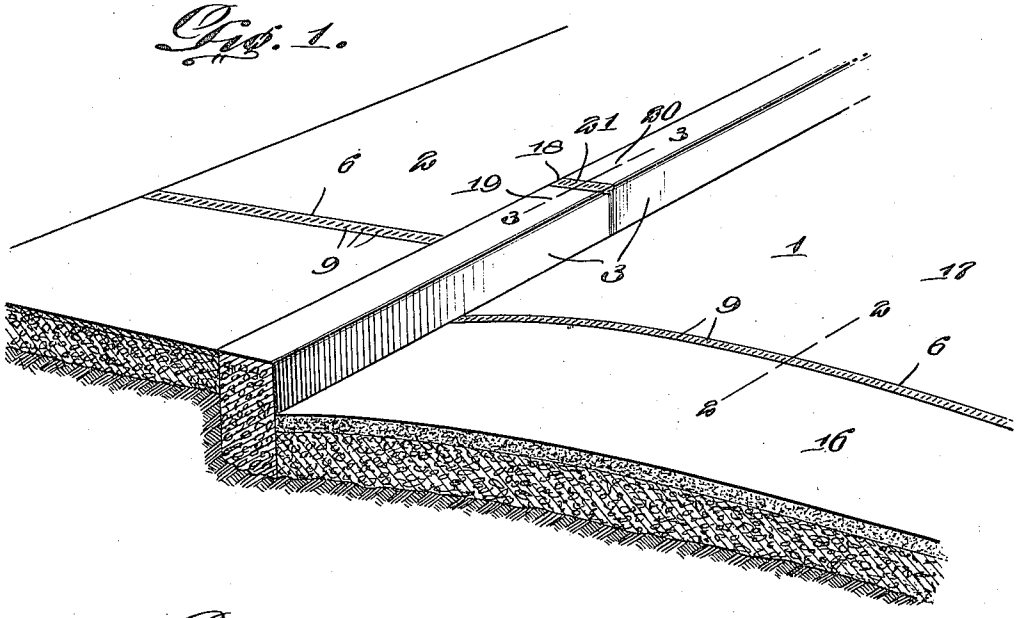


Fig. 2.

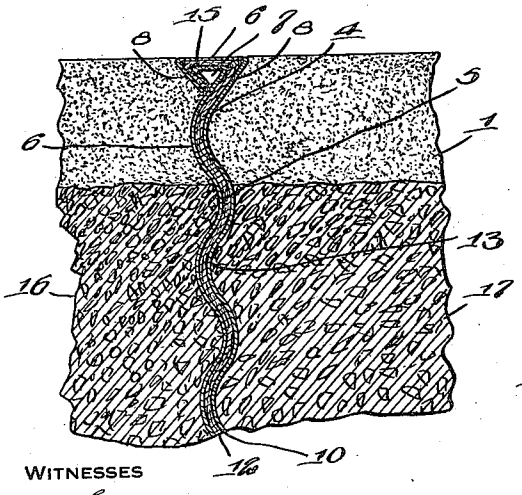
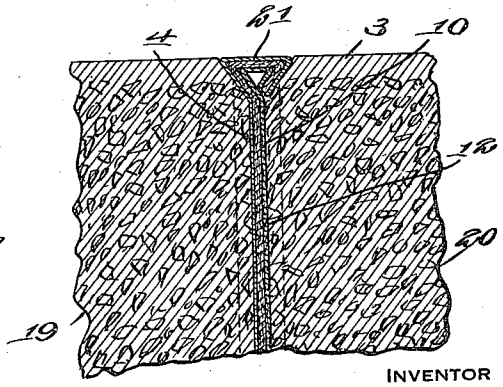


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

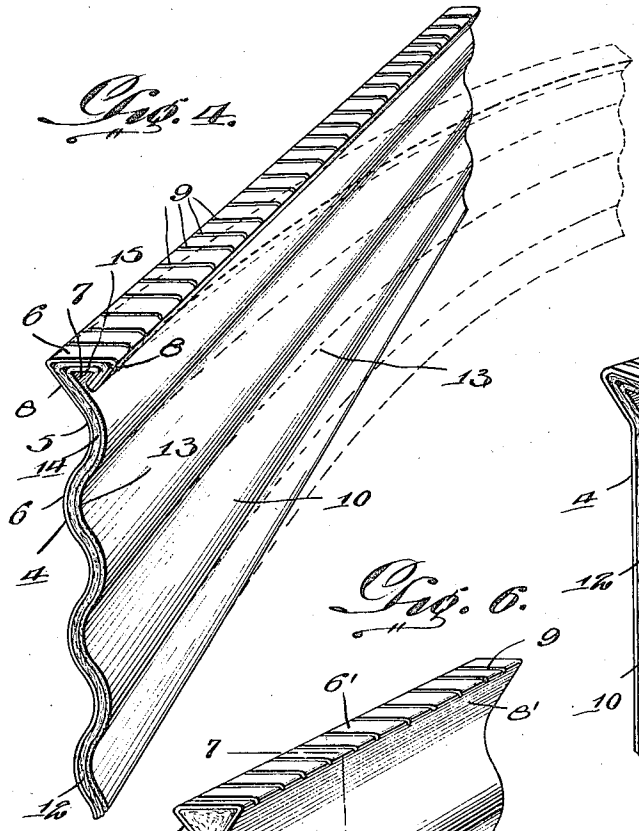


Fig. 5.

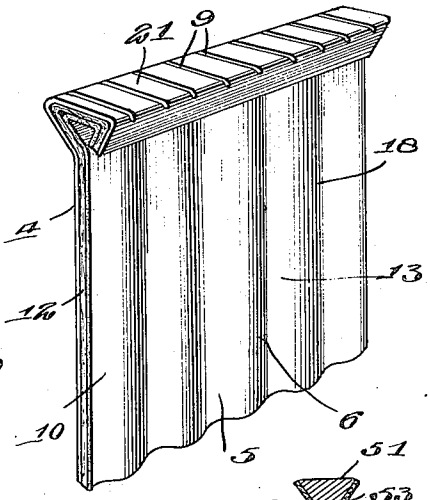
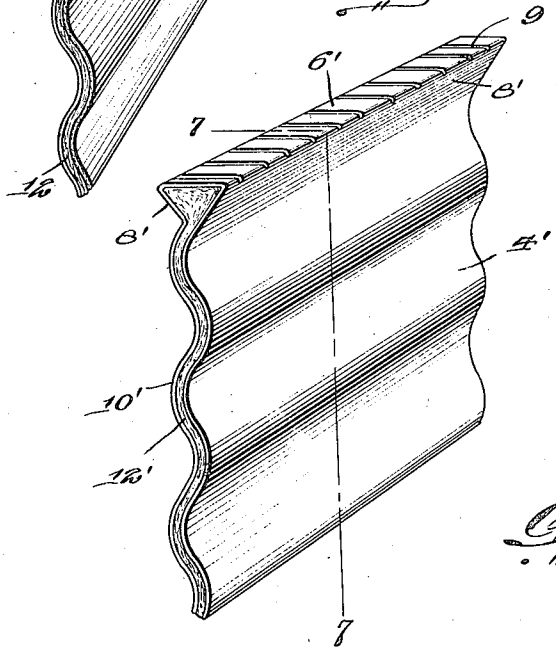


Fig. 6.



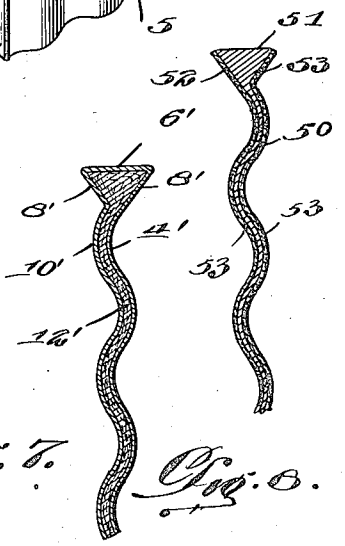


Fig. 7.

Fig. 8.

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EXPANSION-JOINT FOR CONCRETE SECTIONS.

1,241,405. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed February 27, 1917. Serial No. 151,317.

To all whom it may concern:

Be it known that I, WILLIS E. LEACH, a citizen of the United States, residing at Litchfield, in the county of Medina and State of Ohio, have invented new and useful Improvements in Expansion-Joints for Concrete Sections, of which the following is a specification.

This invention has reference to an expansion joint for concrete sections, such, for instance, as a joint for adjacent sections of concrete roadways, pavements, curbing or the like.

An object of the invention is to produce means of a simple nature which shall have an interlocking engagement with the adjacent concrete section to prevent one of the sections moving out of alinement with the other section and which shall include a yieldable element to provide for the expansion and contraction of the concrete sections incident to weather conditions.

It is a further object of the invention to produce a joint to be arranged between the meeting ends of concrete sections which shall include a compressible member and which is so constructed and arranged as to interengage with the meeting ends of the concrete to hold the same in alinement, the said joint member having its upper edge provided with an enlargement or head which further aids in preventing the movement of the concrete sections in a vertical direction or one out of alinement with the other, the said head or enlargement being kerfed whereby to permit of the bending or rounding of the said joint member so that the same may be successfully employed upon curbs if desired.

It is a still further object of the invention to produce an expansion joint for concrete sections comprising two members which are arranged side by side and fluted throughout the length thereof whereby the depressed portions of one of the members will be arranged in the projecting portions of the other member, and also whereby the concrete will be received in the depressed portions of both of the said members, while between the members is arranged a compressible element designed to permit of the expansion and contraction of the joint member incident to varying climatic conditions.

With the above and other objects in view the improvement resides in the construction, combination and arrangement of parts set forth in the following specification and falling within the scope of the appended claims.

In the drawings:

Figure 1 is a perspective view of a portion of a roadway, curbing and sidewalk constructed of concrete and having the improvement arranged between the sections thereof,

Fig. 2 is a greatly enlarged sectional view approximately on the line 2—2 of Fig. 1.

Fig. 3 is a similar sectional view approximately on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of a portion of one of the joint members employed upon the roadway or sidewalk, the dotted lines indicating the manner in which the same may be rounded,

Fig. 5 is a similar view of one of the joint members employed upon the curbing,

Fig. 6 is a perspective view illustrating a slight modification,

Fig. 7 is a sectional view through the same approximately on the line 7—7 of Fig. 6,

Fig. 8 is a transverse section illustrating a slight modification.

In the drawings the numeral 1 designates a portion of a roadway constructed of concrete, 2 a sidewalk arranged adjacent to the said roadway, and 3 the curbing between the sidewalk and roadway, the sidewalk and curbing being also constructed of concrete.

As is well known in the art concrete constructions of this character are necessarily laid in sections, and in order to have the adjacent sections properly mated means in the nature of a joint member is arranged therebetween, either temporarily or as a permanent structure. The sections being susceptible to contraction and expansion by varying weather conditions, when expanded abut one against the other so that one of the sections will be bulged in an upward direction, while when the sections are contracted a space or gap is left between the same, and the edges of the spaced sections when contracted may become mutilated or the upper surfaces thereof brought out of proper alinement. Devices, in the nature of expansible joint members, have been produced to compensate for the expansion and contraction of the concrete sections, but as far as I am aware none of the said expansible joint members are arranged to so receive the concrete at the abutting ends of the sections as to at all times engage there-

with regardless of weather conditions, so that it will be impossible for one of the sections to be elevated above or otherwise brought out of alinement with the adjacent section, while at the same time properly yielding with the sections when the said sections are either expanded or contracted. Still again, as far as I am aware none of the expansible joint members for concrete sections are susceptible to be rounded upon themselves whereby to properly engage with concrete sections having curved meeting ends, and in carrying out my invention I provide a joint member including two substantially similar members arranged side by side and both fluted longitudinally or otherwise formed with communicating depressions and projections upon both of their faces, the outer depressions receiving the ends of the plastic roadway or curbing, and interposed between the said sections is a compressible element whereby to permit of the sections being moved toward each other or away from each other simultaneously with the movement of the concrete when the same is expanded or contracted.

With my improvement the temporary forms which are now used between the concrete sections of roadbeds and pavements and which require great care in their removal when additional concrete is to be applied to form the adjacent section, may be entirely dispensed with as my improvement serves the double purpose of both a form and a joint, and when the same is once positioned no future care of the same will be required by the contractor and danger of the breakage or uneven end portions of the concrete by the removal of the usual forms will be also prevented.

In the preferred construction shown by the drawings I have delineated a practical embodiment of my idea in which I provide a metallic plate 4 formed with longitudinally extending ribs or corrugations providing projections 6 and recesses 5 arranged between the said projections. The upper edge of the plate 4 is bent upon itself approximately at a right angle with respect to the longitudinal plane of the plate, forming the same with a head 6′. The head has its sides inclined toward the body of the plate as indicated by the numeral 8, providing a space or channel between the said sides 8 and the head 6′. By this arrangement it will be noted that the body of the device at the outer portion thereof is beveled outwardly to provide the inner sides of the head 6, and as these sides are arranged at an obtuse angle, the same will effectively engage with the concrete so that the corners of the head will not be mutilated, the said concrete also occupying the groove or channel 7 so that a plane surface at the joints of the concrete is provided, and the wheels of vehicles passing thereover will not be subjected to shock or jar, and no damage by the wheels will be imparted to the joint when the wheels pass from one of the sections of the concrete to the next section. The head 6, at spaced intervals, is kerfed laterally, as indicated by the character 9. These kerfs are designed to permit of the plate being rounded upon itself and to also permit of the tar or asphaltum with which the elastic felt is filled to escape when uneven pressure, as in very hot weather when the concrete expands. The manner in which the plate 4 may be rounded by the arrangement of the kerfs is indicated by the dotted lines in Fig. 4 of the drawings. In the said construction I provide a second member 10 which is of a size approximately equaling that of the member 4 and which is designed to be arranged against one of the sides or faces of the said member 4. The member 10 may be constructed from a sheet of some comparatively heavy material, such as tar-treated cardboard, paper, felt or the like and between the members 4 and 10 is arranged an elastic cushion, indicated by the numeral 12. The cushion 12 may be constructed of elastic felt and preferably has both of its faces provided with an adhesive substance whereby the same is connected with the members 4 and 10. The member 10, as well as the cushion member 12, is shaped or folded to correspond with the shape of the member 4, so that both of these said members 10 and 12 are of a cross sectional contour corresponding with that of the member 4, the projections 13 provided upon the said member 10 being received in the depressions 6 upon the inner face of the member 4, and likewise the projections 5 upon the inner face of the member 4 are received in the depressed portions 14 upon the inner face of the said member 10, it being, of course, understood that the cushion member 12 being interposed between the members 4 and 10 is thus shaped to correspond with the cross sectional contour of the said member. The member 10, and if desired, the member 12, at the outer ends of the said members, are bent or otherwise folded upon itself to be received in the head of the member 4, as indicated by the numeral 15. The joint members, as constructed above, are designed for the roadway or for the pavement 2, and as previously stated the concrete is received in the depressions provided by the numerals 4 and 10 and likewise contacted by the longitudinal projections in the said members. Still again, the angular portions 8 at the upper edge of the joint member form obstructions for the concrete sections 16 and 17 respectively in both the roadway and the sidewalk to prevent an upward movement of the said concrete sections at the meeting ends thereof.

In the device employed upon the joints of the curbing 3 the construction is substantially similar to that previously described, but the fluted or corrugated joint member 18 is disposed vertically between the abutting ends of the concrete curbing sections 19 and 20. Also the joint member 18 may, if desired, be provided with a head 21 which is similar to the said head 6 of the joint member previously described, but in this instance the head 21 is arranged transverse of the depressions in the plates providing the joint member 18 and the said head may be kerfed laterally if desired.

In the construction illustrated in Figs. 6 and 7 the member 4′ is of a construction similar to that described, and the member 10′ may be either integrally formed with the member 4′ or may comprise a separate plate, both of the plates 4′ and 10′, in this instance, being constructed of metal and between the same is arranged the compressible element 12′ shaped to correspond with the cross sectional contour of the joint member. Preferably, and as illustrated in the said Figs. 6 and 7, the joint has its body portion constructed from a single sheet of metal, the side 10′ depending from one of the inner angular walls 8′ of the head 6′.

The member 18, it will be noted, provides means for normally retaining the sections 19 and 20 of the curb against lateral disalinement but the head thereon holds the said sections against vertical disalinement, and while I have shown certain satisfactory embodiments it is to be understood that the same is susceptible to all such changes as fall within the scope of my claims.

In Fig. 8 of the drawings I have illustrated a slight modification falling within the scope of my claims.

In the said figure the numeral 50 designates a metallic member preferably constructed of pressed steel rounded, at intervals, in opposite directions from its vertical plane to provide intersecting ribs and grooves between the said ribs, the top of the device being formed with a head 51 which may be solid and the plate proper has its sides inclined, as at 52—52 to the flat upper surface of the head. To the opposite sides of the plate 50, and, of course, corresponding to the serpentine formation of the said plate, are elastic compression members preferably in the nature of felt, indicated by the characters 53, the said members 53 also engaging with the angular sides 52 of the head 51, a suitable adhesive substance being employed for connecting the felt to the steel or metallic body.

Having thus described the invention, what I claim is:

1. A joint for concrete sections comprising two members arranged side by side and fluted throughout the length thereof whereby the depressed portions of one of the members will be arranged in the projected portions of the other member and whereby the ends of the concrete will be received between the flutes in both of the members, and a compressible element between the said members.

2. A joint for concrete sections comprising two connected members arranged side by side and formed with longitudinal depressions and extensions between the said depressions, the extensions of one of the said members being received in the depressions of the other member and the concrete sections being received between the depressions and projections upon the sides of both of the members, and a compressible element between said members.

3. A joint for concrete sections comprising two connected plates arranged side by side and having longitudinal interengaging projections and depressions throughout the length and width thereof, a compressible element between the sections, adhesive means for securing the said element to the sections, and the abutting ends of the concrete sections being received in the projections and depressions upon the outer faces of the said sections.

4. An expansion joint strip comprising a compressible longitudinally corrugated body portion and a compressible V-shaped head portion, the corrugations of said body being adapted to form mating projections and depressions in the concrete sections of a pavement cast against said strip, whereby the pavement sections will be held against vertical displacement relative to each other.

In testimony whereof I affix my signature.

WILLIS E. LEACH.