

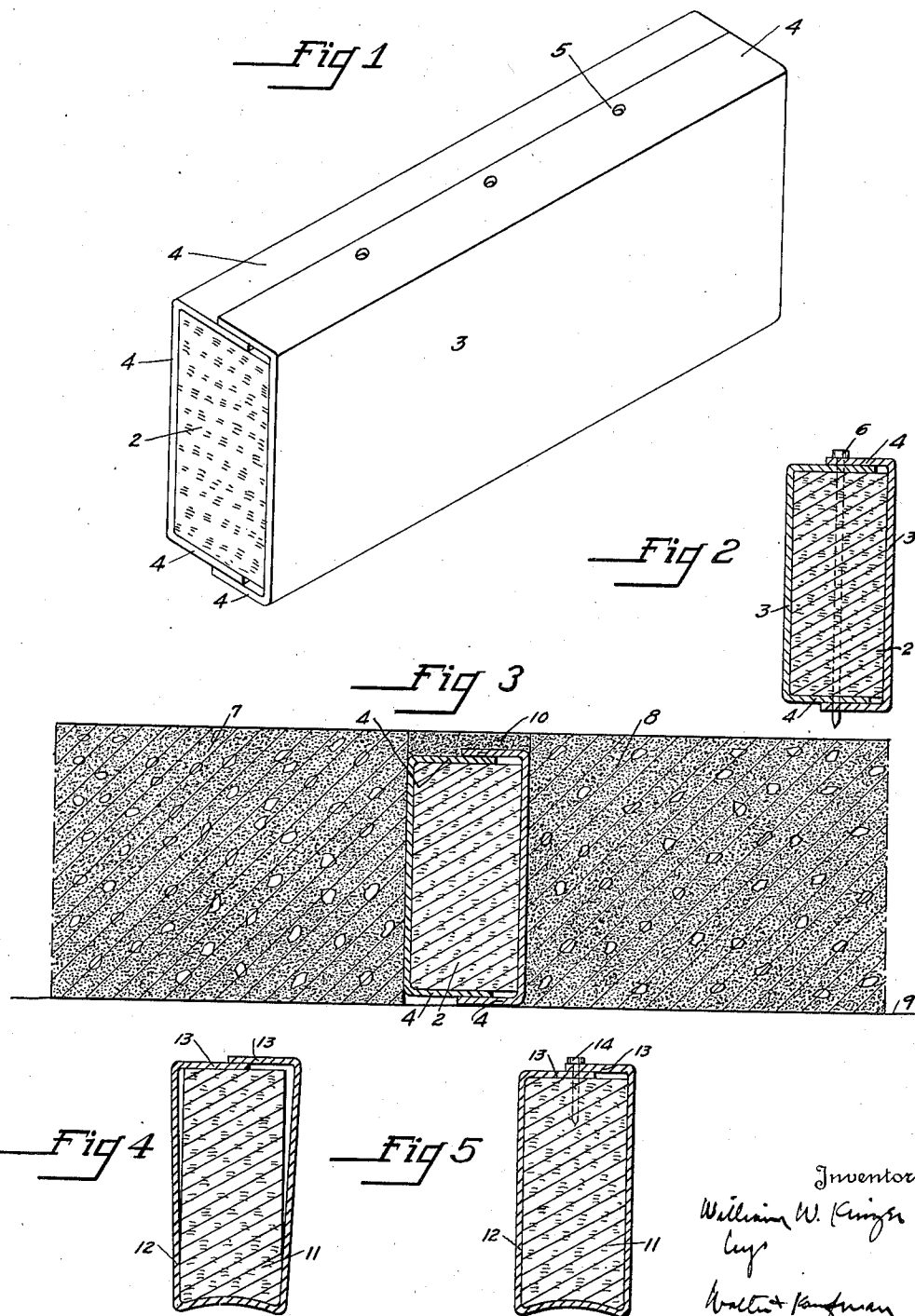
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W. W. KINZER

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EXPANSION JOINT FOR SECTIONAL PAVING

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Inventor
 William W. Kinzer
 by
 Walter Kaufman
 Attorney

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EXPANSION JOINT FOR SECTIONAL PAVING

William W. Kinzer, Lancaster, Pa., assignor to
Armstrong Cork Company, Lancaster, Pa., a
corporation of Pennsylvania

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This invention relates to expansion joints for sectional concrete paving and similar structures and to the method of making the same. More particularly, this invention relates to preformed expansion joints for such structures which permit free expansion and contraction of adjacent sections of paving without permitting openings to exist in the structure for the entrance of water or other deleterious matter and to the method of constructing such structures.

This invention has for its chief object to provide a preformed expansion joint of resilient compressible material which yields to absorb stresses of expansion and which expands to seal the space between adjacent sections occasioned by contraction thereof. An object of my invention is to provide a preformed expansion joint of resilient compressible material which will not deteriorate and lose its resilient compressible characteristics upon exposure to weather or severe traffic conditions and which may be easily, economically and quickly assembled. A further object is to provide a sectional concrete structure in which the sections are free to expand and contract in accordance with weather conditions without permitting openings therebetween for the entrance of foreign matter. A still further object is to provide an economical and efficient method of making expansion joints possessing the above mentioned characteristics.

This invention relates to a preformed expansion joint adapted for use in sectional concrete paving comprising a resilient compressible filler of predetermined original thickness seated in a casing enclosing the same, the walls of the casing compressing the filler to less than its original thickness and being locked in fixed position to maintain the filler in compressed condition therein.

The invention further relates to a method of making such expansion joints in which a resilient filler is formed having a predetermined original thickness and is positioned within a casing, the walls of the casing being forced toward one another to compress the filler to less than its original thickness, and being then locked in fixed position to retain the filler in compressed form. It will be understood when the joint is placed in a paving structure such casing is unlocked to release the filler and to permit it to expand and recover as much of its original thickness as is permitted by adjacent concrete sections.

The accompanying drawing illustrates a preferred embodiment of my invention in which—

Figure 1 is an isometric view illustrating the

expansion joint prior to compression of the filler; Figure 2 is a sectional view of the expansion joint of Figure 1 in which the filler is held in compressed form;

Figure 3 is a fragmentary sectional view of a sectional concrete paving structure embodying my invention;

Figure 4 is a sectional view of a modified form of expansion joint illustrating the filler in uncompressed condition; and

Figure 5 is a sectional view of the joint shown in Figure 4, in which the filler is compressed and held in such condition.

Referring to the drawing, there is shown a preformed expansion joint comprising a resilient filler strip 2 of compressible material enclosed in a casing formed by wall members 3. The wall members 3 forming the casing are similar in structure and may consist of any suitable flexible metal. If desired, such members may be reinforced with stiffening ribs or other forms of reinforcement designed to provide rigidity and strength to the members and to aid in anchoring or bonding the joint between adjacent sections of paving. The wall members 3 terminate in upper and lower inwardly extending flanges 4 positioned in spaced relationship to similar flanges of the opposite wall member and to the filler strip 2. Openings 5 are provided in the flanges 4 in predetermined relationship to openings in the adjacent flange, such openings 5 in the flanges 4 being aligned when the filler strip 2 is compressed, to receive a pin 6 adapted to lock the casing in fixed position. Openings may likewise be provided extending through the filler strip 2 in alignment therewith, if desired, to assist in the easy application of the pin 6.

Preferably, the resilient filler strip 2 is composed of granulated cork agglomerated with a thermo-setting binder and formed in any suitable shape. A strip so formed is compressible to substantially fifty percent of its original thickness and is capable of rapid recovery after the compressing force is removed. If desired, the strip 2 may be composed of any other resilient or compressible material possessing the property of rapid and approximate return to its original thickness after deformation, such as natural cork, cork and rubber compositions, rubber or similar materials.

A composition suitable for use for the manufacture of filler strips may comprise comminuted or granulated cork bound together by a thermo-setting binder consisting of a phenolic condensation product formed by the reaction of phenol

and paraformaldehyde in the proportions of 1 mol of phenol to 1½ mols of paraformaldehyde. The binder sets under the application of heat and the resulting composition is compressible and resilient but not plastic or displaceable under pressure. As a plasticizing and softening agent in the composition, I may use glycerine in an amount 5-15% by weight of the amount of comminuted cork.

The composition may be manufactured as follows: Phenol, paraformaldehyde, sodium hydroxide as a catalyst for the condensation product, and glycerine are mixed together and heated to about 200° F. and held at such temperature until test shows that a sample of the liquid will set when held at 300° F. for three minutes. The reaction is then interrupted, and the intermediate product is mixed with the comminuted cork. The mixture is confined in an appropriate mold at a temperature of about 300° F. which completes the reaction and causes the comminuted cork to be agglomerated by the binder, providing a cohesive mass of desired shape.

In assembling the joint, the metal wall members 3 are positioned about the strip 2 forming a casing enclosing the same. The wall members 3 are forced toward one another by any suitable means of pressure (not shown) to compress the strip 2 to any predetermined extent, thereby aligning the openings 5 in the flanges 4. In other words, the filler is initially compressed sufficiently to compensate for contraction of adjacent paving sections with which it will be used. The casing is locked in fixed position by placing pins 6 through the openings 5 and forcing them through the filler 2 to extend through similar openings 5 in the lower flanges 4, thereby maintaining the strip 2 in compressed condition in the casing.

In Figure 3, I have shown the expansion joint in use filling the space between adjacent sections 7 and 8 of concrete paving positioned in spaced relationship to one another on a road bed illustrated diagrammatically by the line 9. The sections 7 and 8 are cast in spaced relationship to one another leaving a space between such sections slightly greater in width than the width of the expansion joint to be positioned therein. When the sections have set, the joint is positioned in such space and the pin 6 removed, permitting the filler 2 to recover as much of its original thickness as is permitted by the sections and completely filling the space therebetween. Preferably, such sections are cast slightly greater in depth than the joint in order to provide space for a plastic or semi-plastic material 10 which may be placed over the joint to conceal the joint and prevent distortion or breakage of the upper flanges 4 by vehicular traffic. Such plastic or semi-plastic material may be composed of asphalt, rubber with a vermiculite filler, fibrous material with an asphaltum binder or similar materials.

If desired, the joint may be positioned on a road bed, and adjacent sections of paving cast adjacent thereto. After the sections have set, the pins 6 may be removed releasing the filler so that it is free to expand to its original thickness if it were not restrained from such expansion by adjacent sections. If desired, lateral openings may be provided through the walls of the casing and the filler strip in order that the joint may be used with any of the usual dowel bar or load transference assemblies.

The modification shown in Figures 4 and 5 is

generally similar to the above described joint. In this case, there is shown a compressible filler 11 enclosed in a casing 12 formed of a single metal strip having a U-shaped form in cross section and terminating in inwardly directed flanges 13 in overlapping relationship with one another and with the filler strip 11. Preferably, the bottom of the casing is curved or bent inwardly in order that compressing forces may force it inwardly and upwardly toward the filler to avoid distorting or crumpling it when the filler strip is compressed. The filler strip 11 is compressed by forcing the walls of the casing toward one another, and held in compressed form by locking the walls in fixed position by means of pins 14 extending through openings (not shown) in the flanges 13 into the filler strip 11. Such joint may be positioned in paving structures in the manner illustrated in Figure 3.

It will be understood my invention may be embodied in other forms if desired. For example, the wall members may terminate in inwardly directed tabs having openings therein for the reception of pins rather than in the form of flanges as shown. If desired, means other than pins may be used to lock the casing to retain the filler in compressed form. For example, opposite flanges may be formed with interfitting notches, teeth, indentations or crimped portions of predetermined size so arranged as to engage and interlock with one another when the filler is held in compressed form.

The many advantages of the described joint are readily apparent. The device is economically manufactured and used, and may be readily, quickly and easily placed in a paving structure by relatively unskilled labor. It compensates adequately for expansion and contraction of adjacent sections of concrete and does not deteriorate under the impact of vehicular traffic or extended exposure to severe weather conditions.

While I have described and illustrated a preferred embodiment of my invention, it will be understood the invention is not so limited since it may be otherwise embodied within the scope of the following claims.

I claim:

1. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip, a casing U-shaped in cross section enclosing said strip and holding it under compression, said casing terminating in inwardly directed flanges positioned in overlapping relationship to one another and to said strip, and releasable means securing said flanges in fixed position thereby maintaining said strip in compressed condition.

2. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip, a casing U-shaped in cross section enclosing said strip and holding it under compression, said casing terminating in inwardly directed flanges positioned in overlapping relationship to one another and to said strip, said flanges having aligned openings therein, and a pin extending through said aligned openings holding said flanges in fixed position thereby maintaining said filler strip in compressed condition.

3. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip, separate wall members adapted to form a casing enclosing said strip and holding it under compression.

sion, each wall member terminating in inwardly extending top and bottom flanges positioned in overlapping relationship to similar flanges of the opposite wall member, said flanges having aligned openings therein, and a pin extending through the aligned openings in the top and bottom flanges holding said flanges in fixed position thereby maintaining said filler strip in compressed condition.

4. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip, a casing U-shaped in cross section enclosing said strip and holding it under compression, the base of said casing being bent inwardly toward the filler strip, the casing at its upper end terminating in inwardly directed flanges positioned in overlapping relationship to one another and to said strip, said flanges having aligned openings therein, and a pin extending through said aligned openings holding said flanges in fixed position thereby maintaining said filler strip in compressed condition.

5. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a preformed resilient filler strip, separate wall members adapted to form a casing enclosing said strip and holding it under compression, each wall member terminating in inwardly extending flanges positioned in overlapping relationship with similar flanges of the opposite wall member, and temporary means engaging said flanges to secure the wall members to one another to form a casing enclosing said strip and maintaining it in compressed condition.

6. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip of compressed cork agglomerated with a binder, said strip being compressible to substantially fifty per

cent of its original thickness and being capable of rapid recovery to its original thickness after the compressing force is removed, a casing enclosing said strip and holding it under compression, said casing comprising separate wall members, each wall member terminating in inwardly extending flanges positioned in overlapping relationship with similar flanges of the opposite wall member and with said strip, and releasable means securing the casing in fixed position thereby maintaining said strip in compressed condition.

7. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip of compressed cork agglomerated with a binder, said strip being compressible to substantially fifty per cent of its original thickness and being capable of rapid recovery to its original thickness after the compressing force is removed, a casing U-shaped in cross section enclosing said strip and holding it under compression, said casing terminating in inwardly directed flanges positioned in overlapping relationship to one another and to said strip, and releasable means securing said flanges in fixed position thereby maintaining said strip in compressed condition.

8. A preformed expansion joint adapted for use in sectional concrete paving or similar structures comprising a resilient filler strip, a casing U-shaped in cross section enclosing said strip and holding it under compression, the base of said casing being convex with respect to the filler strip, and terminating at its upper end in inwardly directed flanges positioned in overlapping relationship to one another and to said strip, and releasable means securing said flanges in fixed position thereby maintaining said strip in compressed condition.

WILLIAM W. KINZER.