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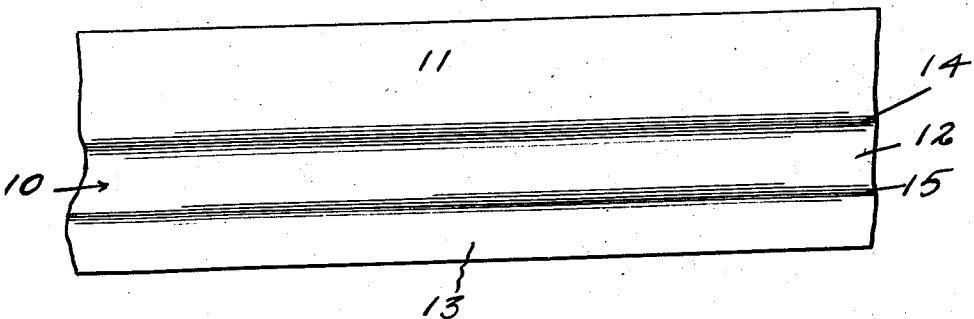
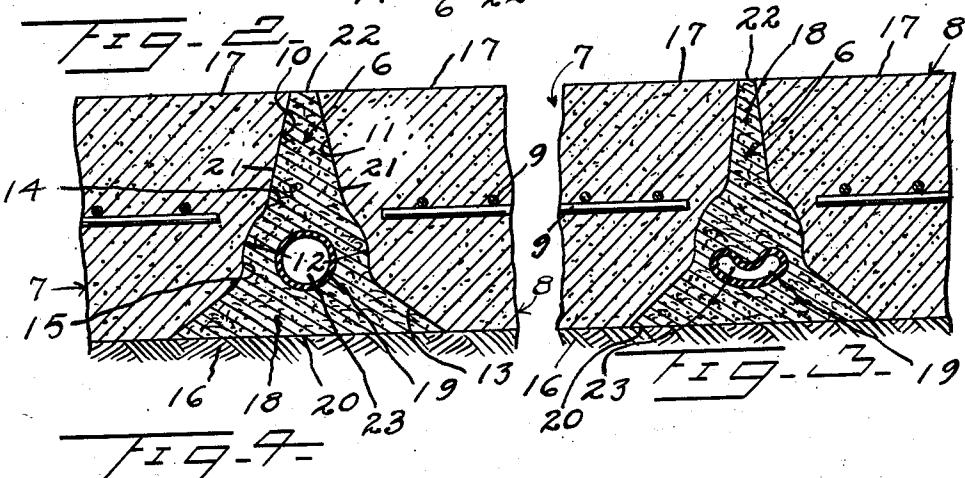
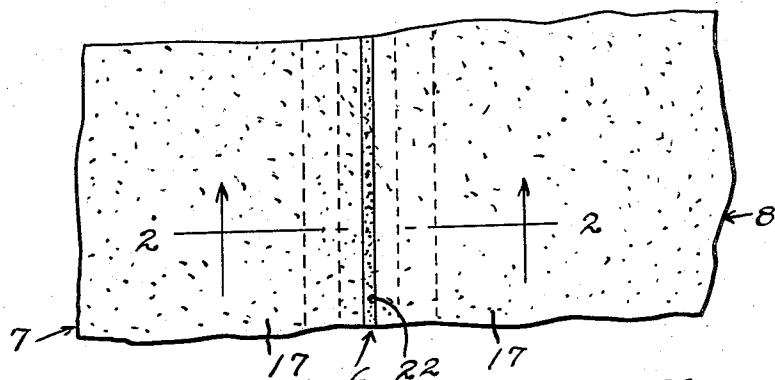
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EXPANSIBLE AND COMPRESSIBLE PAVING JOINT

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FIG-1-



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EXPANSIBLE AND COMPRESSIBLE PAVING JOINT

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This invention relates to an expandable and compressible paving joint primarily adapted to be interposed between sections of roadways for sealing the joint between adjacent edges of said sections, but which is equally well adapted for use between sections or slabs of other forms of paving.

Many roadways and other surfaces are constructed of sections or slabs of concrete or other materials which expand when heated and contract in response to a lower temperature. A joint member or filler is required between adjacent edges of such paving sections or slabs to keep out moisture and to prevent damage to the slabs in freezing temperatures. Such joint members or fillers must be capable of sealing the space between the sections or slabs in cold weather when contracted. Consequently, if the slabs or sections become heated and expand, the joint members or fillers are compressed and are normally displaced upwardly to form a rib above the upper surfaces of the sections or slabs. In hot weather, this creates a considerable annoyance to motorists since in driving over transverse joints a repeated bumping of the vehicle occurs creating an almost continuous vibration of the vehicle and an annoying sound. Additionally, the part of the joint member which is thus displaced above the roadway sections does not always resume a position in the joint space when the slabs become cooled and consequently the space will not be thereafter effectively sealed.

It is a primary object of the present invention to provide an improved joint member which is expandable and compressible and which, when compressed, will yield inwardly with respect to itself so that no part thereof will be displaced above the upper surfaces of the slabs or roadway sections and which will thereafter readily expand as the slabs contract to maintain the joint space properly sealed under all temperature conditions.

A further object of the invention is to provide such a joint member or seal which will eliminate the aforescribed annoyance to motorists since no part of the joint member or seal will be displaced upwardly above the upper surfaces of the slabs when the joint space is reduced by expansion of the slabs for compressing the joint member.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a fragmentary top plan view of adjacent portions of two paving sections or slabs;

Figure 2 is an enlarged sectional view taken substantially along a plane as indicated by the line 2—2 of Figure 1, transversely through the joint of the slabs, and showing the joint member as it will appear when the slabs are contracted;

Figure 3 is a view similar to Figure 2 but showing the joint member as it appears with the slabs expanded, and

Figure 4 is a fragmentary edge elevational view of

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one of the paving sections against which a side of the joint member seats.

Referring more specifically to the drawing, for the purpose of illustrating a preferred application and use of the joint member or joint filler, designated generally 6 and comprising the invention, adjacent portions of two paving sections are illustrated and are designated generally 7 and 8. The paving sections or slabs 7 and 8 are of a type which expand when heated and thereafter contract when cooled or subjected to a lower temperature. Said paving sections or slabs 7 and 8 may be and usually are formed of concrete provided with suitable reinforcing means 9. The paving sections or slabs 7 and 8 differ from conventional paving sections or slabs only in reference to the edge portions thereof which form a joint with and are disposed in opposed relation to an edge portion of another slab or section. Each of said edge portions, as illustrated in cross section in Figures 2 and 3 and in elevation in Figure 4, is designated generally 10 and includes a substantially flat upper portion 11 which is inclined downwardly and inwardly relative to the slab of which it forms a part. Each edge face 10 includes an inwardly bowed intermediate portion 12 which is also inclined generally in the same direction as the upper face portion 11, and a lower substantially flat face portion 13 which is inclined in the same direction as the upper face portion 11 but preferably to a substantially greater extent. The adjacent longitudinal edges of the upper and lower portions 11 and 13 merge with the upper and lower 20 longitudinal edges, respectively, of the intermediate portion 12 to form convexly rounded longitudinally extending edge portions 14 and 15, respectively.

Thus, adjacent edge portions or faces of two adjacent paving sections or slabs, such as the slabs 7 and 8, when 30 positioned on a foundation 16 and in normally spaced relation to one another, form a joint space which in cross section, as seen in Figures 2 and 3, diminishes in width from the undersides of the slabs which rest on the foundation 16 to the upper faces 17 of said slabs. 40 The width of this joint space diminishes sharply from the bottom surfaces of the slabs, thereafter ceases to diminish upwardly adjacent the edge portions 15 and the lower halves of the intermediate portions 12, then diminishes in width more rapidly up to the level of the edge portions 14 and thereafter diminishes gradually and substantially uniformly in width upwardly to the upper surfaces 17.

The joint forming member 6, which in combination with the edge faces 10, which define the contour of the joint space, constitutes the present invention. Said joint member 6 includes a body portion 18 formed of a felt material, paper pulp or the like which is impregnated with an asphalt compound. Said body portion, designated 18, is capable of being compressed and of expanding when a compressive force exerted thereon is removed or diminished. The body portion 18 of the joint member 6 has a tube 19 of a resilient material, preferably rubber, molded therein, which extends from end-to-end thereof and which opens outwardly of the ends of the joint member 6, as defined by the ends of the body portion 18. The thickness of the wall of the tube 19 preferably is of approximately the thickness of a conventional garden hose and the hollow cavity or bore of said tube 19 is of relatively large diameter as compared to the wall thickness of the tube. The tube 19 is preferably molded into the part of the body portion 18 which is engaged by the portions 12 and 15 of the slab faces 10.

The joint member 6 or more specifically the body portion 18 thereof, has a substantially flat relatively wide bottom surface 20 which is adapted to rest on the foundation 16 and corresponding side walls 21 which are generally shaped to conformably fit the adjacent edge faces

10 of the slabs 7 and 8. The normal height of the body member 18 corresponds to the thickness of the slabs 7 and 8 so that the relatively narrow top surface 22 of the body portion 18, which is substantially flat, will be disposed substantially flush with the upper surfaces 17 of the slabs 7 and 8. The joint member 6 is of a width to fit tightly between the slab faces 10 when said slabs are in normal positions relative to one another, as seen in Figures 1 and 2, and so as to be sufficiently compressed in the joint space formed by the slab faces 10 to effectively seal said joint space to exclude moisture therefrom to prevent an accumulation of liquid in the joint space and which could cause cracking of the slabs under freezing conditions. When the joint member 6 is thus disposed between the faces 10 and with the slabs contracted, as illustrated in Figure 2, the resilient tube 19 will be fully expanded crosswise and of circular shape.

Thereafter, when the paving sections or slabs 7 and 8 expand in response to heat so that the faces 10 thereof are displaced toward one another to restrict the size of the joint spaced therebetween which is filled by the joint member 6, said joint member will be compressed. However, due to the shape of said faces 10 and the cross sectional shape of the joint member 6, as the body portion 18 thereof is compressed crosswise the compressing force will be exerted inwardly thereof and also downwardly to the downwardly diverging construction of the faces 10. Consequently, the joint member 6 will not be extended or elongated upwardly so that the upper surface 22 of the joint member will remain flush with the upper surfaces 17 of the slabs, as seen in Figure 3, when the slabs are expanded. Additionally, as the bottom surface 20 of the joint member rests upon the foundation 16 it is prevented thereby from yielding downwardly. Consequently, while the body portion 18 is capable of being compressed, a greater force is required to compress said body portion 18 to any considerable extent than is required to deformably compress the resilient tube 19. Accordingly, the resilient tube 19 will be transversely compressed and deformed by the downward and inward pressure from the body portion 18 so that the upper part thereof will be collapsed downwardly to substantially restrict the cross sectional area of the bore 23 of said tube so that the tube will assume substantially the shape as illustrated in Figure 3. Obviously, the extent that the tube 19 is thus deformed downwardly will vary depending upon the extent that the slabs are expanded and the faces 10 thereof displaced toward one another. It will thus be apparent that even when the slabs 7 and 8 are heated to a considerable extent, as when subjected to the direct rays of a hot sun, that the expansion of the slabs will not cause any part of the joint member 6 to protrude above the upper surfaces 17 thereof. Thus, the joint member 6 in combination with the slab faces 10 overcomes the objectional feature of conventional paving joints which when compressed are displaced upwardly above the upper surfaces of the paving sections between which the joint member is disposed.

It will also be readily apparent that when the paving sections or slabs 7 and 8 subsequently contract due to being subjected to a lower temperature and the faces 10 thereof move away from one another, that the resilient

tube 19 will resume its normal circular cross sectional shape of Figure 2 to expand the body portion 18 to thus maintain the side walls 21 of the joint member in close fitting conformable engagement with the slab faces 10 so that the space therebetween will be effectively sealed at all times by the joint member.

It will be understood that the joint member 6 is adapted for use with other types of paving sections or slabs, and that various other modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. In combination with adjacent edge faces of a pair of expandible paving sections or slabs forming a joint space, said slab faces having complementary downwardly diverging upper portions, complementary downwardly diverging concave intermediate portions and complementary downwardly diverging bottom portions disposed at a substantially greater angle to one another than the angle formed by said upper portions, a joint member including an expandible body portion formed of a mass of a sealing material which is substantially uniform throughout, said body portion being capable of being compressed and having a bottom surface adapted to rest on a foundation on which said slabs are supported, said body portion having upwardly converging side walls shaped to conformably fit flush against said slab faces for sealing the space between said joint faces, and said body portion having a top surface substantially narrower than the bottom surface thereof and disposed coplanar with top surfaces of said slabs, said joint member including a resilient and relatively stiff tube embedded in and extending longitudinally through said body portion, said tube having a bore of a relatively large diameter as compared to the wall thickness thereof and the width of the joint member part surrounding the tube, said tube being collapsible downwardly in response to a compressive force exerted against the side walls of the joint member to accommodate a part of the compressed body portion.
2. In a paving joint as defined by claim 1, said tube being spaced equal distances from the side walls of the joint member and substantially nearer the bottom surface than the top surface thereof.
3. In a paving joint as defined by claim 2, said body portion being formed of a felt material impregnated with an asphalt compound.

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