June 24, 1941. J. MacK. SPEARS 2,246,903

EXPANSION JOINT

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Fig. 1.

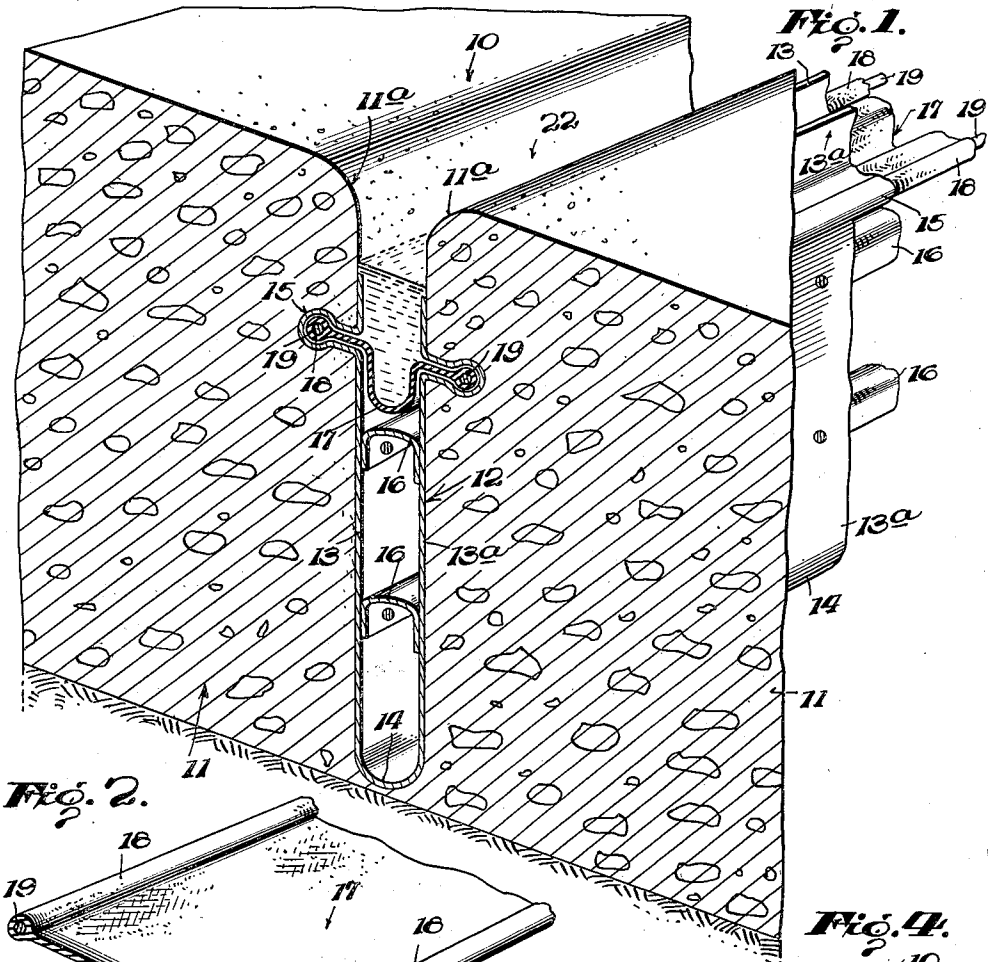


Fig. 2.

Fig. 3.

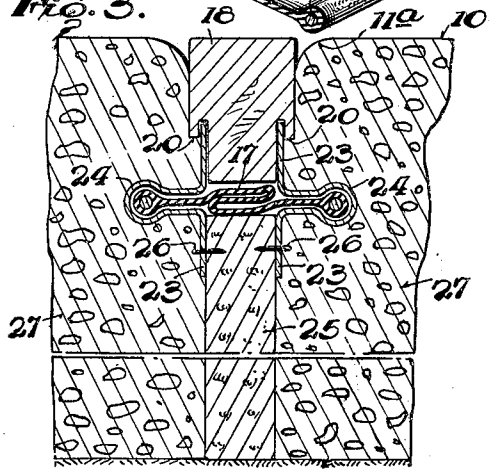
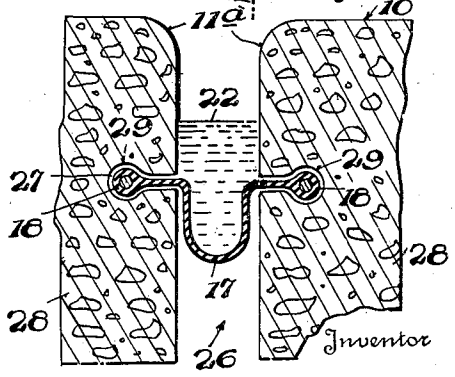


Fig. 4.



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Fig. 5.

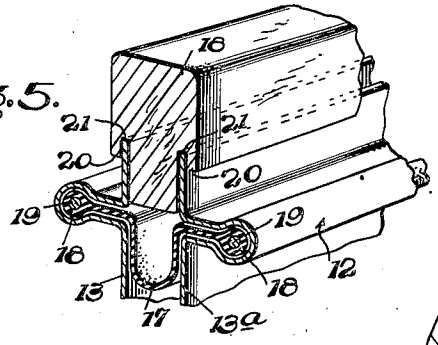


Fig. 6.

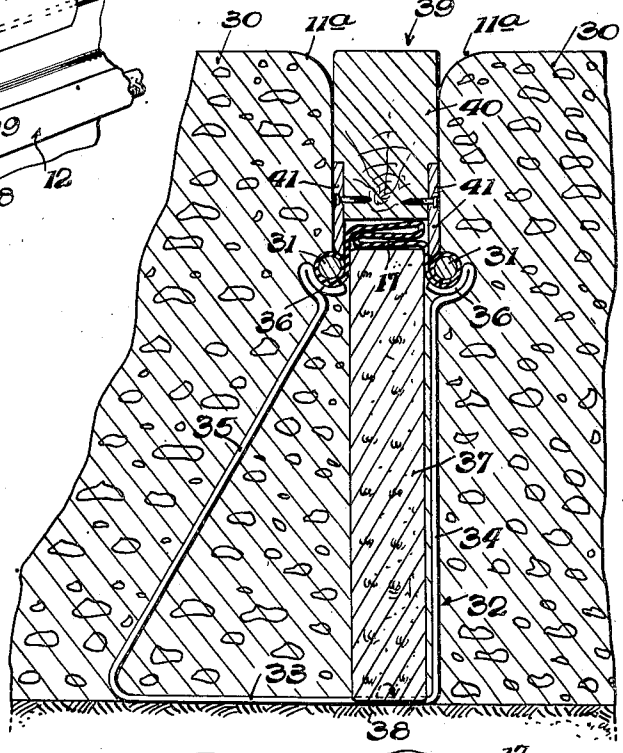


Fig. 8.

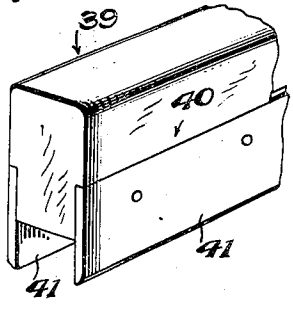
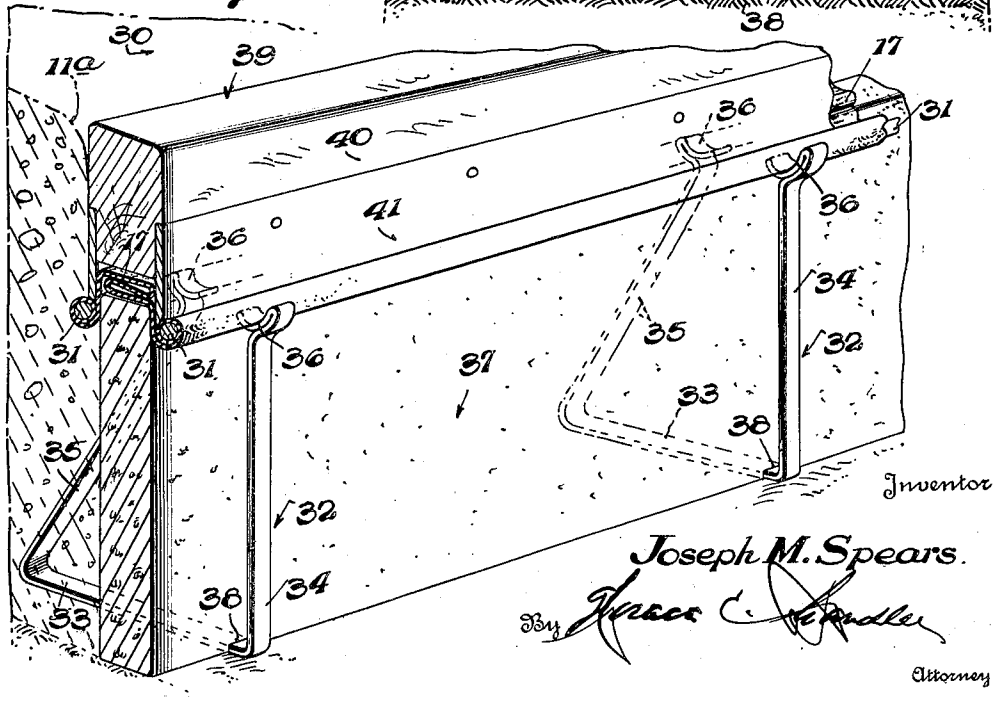


Fig. 7.



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EXPANSION JOINT

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5 Claims. (Cl. 94—18)

This invention relates to expansion joints for concrete roadways. More particularly, the invention relates to that type of expansion joint for concrete roadways and the like wherein asphalt or similar plastic material is employed as a filler for the upper portion of the space between adjacent road sections.

An object of the invention is to provide a simple and efficient expansion joint whereby any expansion or contraction in a roadway may be provided for so as to avoid cracking of the concrete, the arrangement being such as will not only prevent dirt and similar foreign matter from entering the space between the road sections, but will also effectively prevent water from passing down between the sections and accummulating thereunder, this being a highly important characteristic of the device because of the damaging effect of the freezing of such water in winter.

A further object is to provide an expansion joint embodying means for supporting the joint filler, which means may be repaired or entirely replaced with a minimum of labor and expense.

Another object is to provide an expansion joint having a relatively wide range of expansion and contraction without danger of rupture.

In the drawings, wherein the invention is illustrated as applied to a concrete roadway,

Figure 1 illustrates a fragmentary perspective view of a longitudinal section of a concrete roadway including the present expansion joint, a portion of the roadway being broken away,

Figure 2 is a perspective view of the filler-supporting element,

Figure 3 is a vertical longitudinal sectional view illustrating a portion of a concrete roadway embodying a modified form of the invention,

Figure 4 is a fragmentary view illustrating the upper portion of a concrete roadway in vertical longitudinal section embodying a further modified form of the invention,

Figure 5 is a fragmentary perspective view of the upper portion of the joint shown in Figure 1, having a top cap applied thereto such as is used during the installation of the joints illustrated in Figures 1, 3 and 4,

Figure 6 illustrates a further modified form of the invention, and is a fragmentary longitudinal vertical section of a roadway wherein the expansion joint is applied between two adjacent road sections in the course of construction, and wherein the cover cap is yet in position,

Figure 7 is a fragmentary perspective view showing an end portion of the joint shown in Figure 6, with a road section poured at one side thereof, and

Figure 8 is a fragmentary perspective view of the cover cap used in connection with that form of the invention illustrated in Figures 6 and 7.

Referring to the drawings, 10 indicates generally a concrete roadway and 11 indicates adjacent sections between which is shown an expansion joint made according to the present invention. The expansion joint includes a spacing unit designated generally at 12 and comprising a pair of parallel wall plates 13 and 13*a* connected at their lower ends by a downwardly curved web portion 14. Adjacent their upper ends, the wall plates are bent throughout their entire length to form laterally extending and oppositely disposed elongated eyes 15. Between the wall plates 13 and 13*a* are metal channel members 16 having a cross section in the shape of an inverted U, one leg of which is attached to the plate 13 by welding or otherwise, while the other leg bears against the plate 13*a*.

Referring to Figure 2, 17 designates generally the filler-supporting strip which is preferably made of heavy canvas and each longitudinal edge of which is provided with a bead 18. This bead may be formed by stitching the canvas around a cord or rope of a suitable size, or it may be formed in any other suitable manner.

In Figure 5, there is illustrated a removable cover cap which is used during the installation of the forms of the expansion joint illustrated in Figures 1, 3 and 4 to prevent concrete, while being poured, from falling on the strip 17. This cover cap comprises a strip of wood 18 sufficiently long to extend entirely across the roadway and having its lower portions 19 reduced in thickness resulting in shoulders 20 at its opposite sides. These shoulders are grooved as at 21, the grooves being adapted to receive the upper edges of the wall plates 13 and 13*a*, as shown in Figure 3.

When using the joint shown in Figure 1, the supporting strip is first placed in position within the spacing unit 12 by threading its beads 18 into the eyes 15 of the wall plates 13 and 13*a* so that the strip 17 will extend the full length of the eyes. The spacing unit is then placed in a vertical position transversely of the roadway, at the desired point, in which position it is held with the use of pegs at its sides, in the usual manner. The cover cap illustrated in Figure 5 is then placed over the upper end of the spacing unit 12 so that the upper edges of the wall plates 13 and 13*a* will be seated within the grooves 21. The concrete is then poured and when it is sufficiently hard the

confronting ends of the road sections are rounded at their upper edges, by troweling or otherwise, as shown at 11*a*, after which the cover cap is withdrawn. The asphalt or other joint-filling material 22 is then poured into the space between the road sections 11 and upon the strip 17 until it reaches a height just above the tops of the plates 13 and 13*a*. The top of the filler will then be somewhat below the surface of the roadway so that when it is compressed due to the expansion of the road sections, it will not be forced above the roadway and form a ridge thereacross.

It will be clear from the above description that when the concrete has set the eyes 15 will be tightly anchored therein so that the wall plates will be held securely against the confronting ends of the adjacent road sections at all times. The curved web 14 and the channel member 16 will be sufficiently resilient to expand and hold the wall plates against the concrete as the road sections contract. It is to be further understood that the fabric strip 17 will be so wide between its beaded edges as to permit of considerable slack between the wall plates and thus allow for any natural contraction of the road sections.

Should the asphalt filler become so damaged as to permit water to seep therethrough, such water will be trapped by the canvas strip 17 and will not be permitted to settle beneath the roadway. Should any amount of water collect upon this strip it will flow into and along the eyes 15 and be thus discharged at one side of the roadway or the other. Should the supporting strip 17 become so damaged at any point as to permit water to leak therethrough, the filler 22 may be removed and the damage repaired by means of a canvas patch held in place by asphalt. If desired, however, the entire filler support may be drawn from the eyes 15, after the filler has been removed, and a new supporting strip threaded into the eyes.

In Figure 3 there is shown a form of the invention wherein the wall plates 23 extend but a short distance above and below the eyes 24 and are not connected at their lower ends, nor are they separated by members corresponding with the channel members 16, as shown in Figure 2. Instead, the wall plates 23 are spaced apart by a core 25 in the form of a slab of cork or other resilient material having a thickness equal to the space desired between the adjacent ends of the road sections, and having a length sufficient to extend entirely across the roadway. The lower portions of the wall plates 23 are disposed at opposite sides of the core 25 and are attached thereto by pins 36. When this form of the expansion joint is put to use the strip 17 is threaded into the eyes 24, the core 25 supporting the wall plates 23 is secured in upright position transversely of the roadway by means of pegs, the cover cap illustrated in Figure 5 is placed over the upper edges of the wall plates 23, and the concrete 27 is then poured in the usual manner.

After the concrete is set to a sufficient degree the cover cap is removed and the filler is then poured between the road sections onto the strip 17, as heretofore explained.

In the form of the invention illustrated in Figure 4, 28 indicates adjacent sections of the concrete road. In this construction, eyelets 29 are formed in the confronting ends of the road sections by removing the core 25 and wall plates 23 shown in Figure 3. This is accomplished by drawing these parts from the side of the roadway when the concrete has set to a sufficient degree. The supporting strip 17 is then threaded into the eyelets 29 after which the filler 22 is poured onto the strip 17 until it has reached a height somewhat below the level of the roadway.

In the form of the invention illustrated in Figures 6 and 7, 30 designates opposite ends of road sections between which the expansion joint is placed. This form of the invention also includes the filler-supporting canvas strip 17 employed in the other forms. Instead of being supported in eyes at opposite sides of the space between the road sections, as in the forms heretofore described, the longitudinal edge portions of the strip 17 are stitched or otherwise secured around metal bars 31 which are embedded in the mutually adjacent faces of the road sections. In order that these bars 31 may be positioned at the proper height, when the concrete is poured, several substantially triangular supporting members indicated generally at 32 are employed and are equally spaced across the roadway, as shown in Figure 7. The supporting members are preferably formed of metal and each includes a base portion 33 having arms 34 and 35 extending upwardly from its opposite ends, the former being substantially at right angles to the base and the latter being inclined towards the former. The upper or free ends of these arms are the same distance from the base 33, are spaced apart, and are each provided with a terminal seat 36.

This form of the joint also includes a strip of cork or other resilient material 37 which extends entirely across the roadway, as shown in Figure 7, and which is provided with equally spaced notches 38 in its lower edge to receive the bases 33 of the supporting members 32. The cork strip 37, which is of a thickness equal to the distance between the ends of the road sections, has its upper edge portion disposed between the canvas-covered bars 31, and its upper edge face supports the slack of the canvas strip 17 in the manner illustrated.

In Figure 8, there is illustrated a cover cap, designated generally at 39, to be used in connection with that form of the invention just described. This cover cap consists of a strip of wood or similar material 40 having a length equal to that of the expansion joint and having its lower portion rabbeted at opposite sides to receive metal strips 41 which are attached to the strip 40 and extend downwardly beyond the lower face thereof in spaced relation.

When this form of the invention is placed in position for use, the bases of the supporting members 32 are placed in the notches 38 of the cork strip 37 after which the latter is secured in a vertical position transversely of the roadway by means of pegs, in the usual manner. The supporting members 32 are also secured with pegs so that their legs 34 and 35 extend vertically upward. The bars 31, having the strip 17 attached thereto, are then positioned in the seats 36, after which the slack of the strip is folded as illustrated in Figure 6.

When the expansion joint has been placed in position as just described, the cover cap illustrated in Figure 8 is applied to the upper portion thereof in the manner illustrated in Figure 6; that is to say, with the lower faces of the metal strips 41 resting on the marginal edge portions of the filler-supporting strip 17 so that the intermediate or slack portion of said strip 17 will be housed within a pocket formed by the metal strips 41, the lower face of the strip 40, and the upper face of the strip 37. In this way, the filler-

supporting strip will be protected against contact by the concrete. When the latter has set to a sufficient degree, the confronting ends of the sections are rounded at their upper edges by troweling or in any other suitable manner, after which the cover cap 39 is withdrawn. The joint-filling material 22 is then poured into the space between the road sections onto the supporting strip 17 until the filler has reached a height somewhat below the level of the roadway.

From the foregoing, it will be seen that when the concrete of the roadway has become firmly set the bars 31, together with their encircling portions of the supporting strip 17, will have become firmly embedded in the face of the road sections at opposite sides of the joint. The road sections may then expand and contract due to the resiliency of the strip 37 and the slack in the filler-supporting strip 17.

What is claimed, is:

1. An expansion joint for a concrete roadway formed of longitudinally spaced sections, said joint including strip-supporting means in the confronting faces of the road sections, said strip-supporting means including channels having bulbous bottoms, a fabric filler-supporting strip bridging the space between the road sections, said strip having beads at its longitudinal edges, said beads being removably supported in the strip-supporting means, the width of said strip being such as to provide a slack portion between the road sections, and joint-filling material supported by said slack portion.

2. An expansion joint for a concrete roadway formed of longitudinally spaced sections, said joint including wall plates having laterally extending supporting members intermediate their ends, each of said supporting members having a channel with a bulbous bottom, said plates being disposed against the confronting faces of road sections with their supporting members embedded therein, a fabric filler-supporting strip bridging the space between the road sections, said strip having beads at its longitudinal edges, said beads being removably supported in said bulbous bottoms and being adapted to be threaded thereinto transversely of the roadway, the width of the strip being such as to provide a slack portion between the wall plates, and joint filling material supported on said strip.

3. An expansion joint for a concrete roadway formed of longitudinally spaced sections, said joint including a spacing unit comprising spaced wall plates, a resilient member between the wall plates for holding the same in spaced relation, said wall plates having oppositely disposed laterally extending supporting members intermediate their ends, each of said members having a channel with a bulbous bottom, a fabric filler-supporting strip bridging the space between the wall plates, said strip having a bead at each of its longitudinal edge portions, said beads being removably held in said bulbous bottoms and being adapted to be threaded thereinto transversely of the roadway, the width of the strip being such as to provide a slack portion between the wall plates, and said strip being adapted to support joint-filling material.

4. An expansion joint for a concrete roadway formed of longitudinally spaced sections, said joint including a spacing unit comprising spaced wall plates connected at their lower ends by a curved web portion, a resilient member connected to the inner face of one of the wall plates and bearing against the other wall plate, said wall plates having oppositely disposed laterally extending supporting members adjacent their upper ends, each of said supporting members having a channel with a bulbous bottom, a fabric filler-supporting strip bridging the space between the wall plates, said strip having a bead at each of its longitudinal edge portions, said beads being removably held in said bulbous bottoms and being adapted to be threaded thereinto transversely of the roadway, the width of the strip being such as to provide a slack portion between the wall plates, and said strip being adapted to support joint-filling material.

5. An expansion joint for a concrete roadway formed of longitudinally spaced sections, said joint including wall plates having flat end portions and intermediate portions bent to form members provided with channels having bulbous bottoms, said members being embedded within the confronting faces of the road sections and said flat end portions being disposed against said confronting faces, a fabric filler supporting strip bridging the space between the road sections, said strip having beads at its longitudinal edges, said beads being removably supported in said bulbous bottoms and being adapted to be threaded thereinto transversely of the roadway, the width of said supporting strip being such as to provide a slack portion between the road sections, and joint-filling material supported by said slack portion.

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