Sept. 2, 1941. D. H. BITNEY 2,254,769

PAVEMENT JOINT ASSEMBLY UNIT

Filed Nov. 25, 1938 2 Sheets-Sheet 1

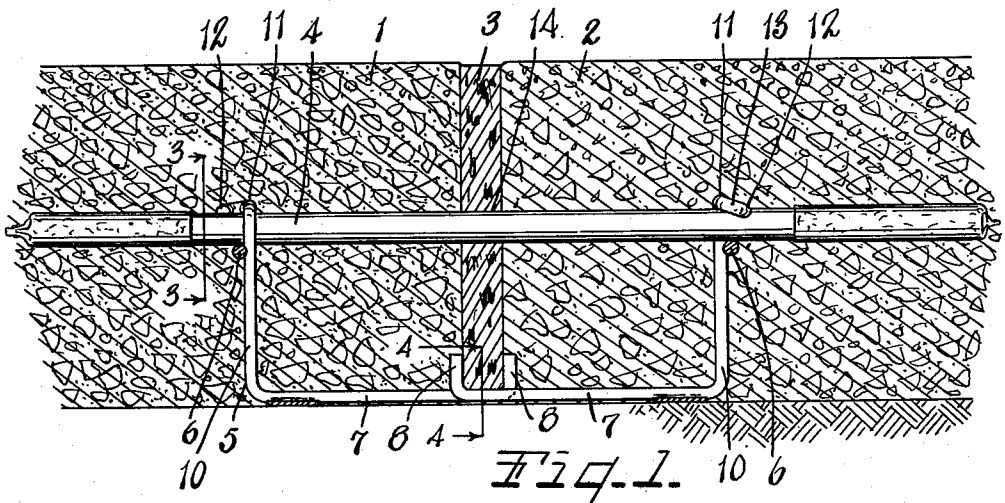


Fig. 1.

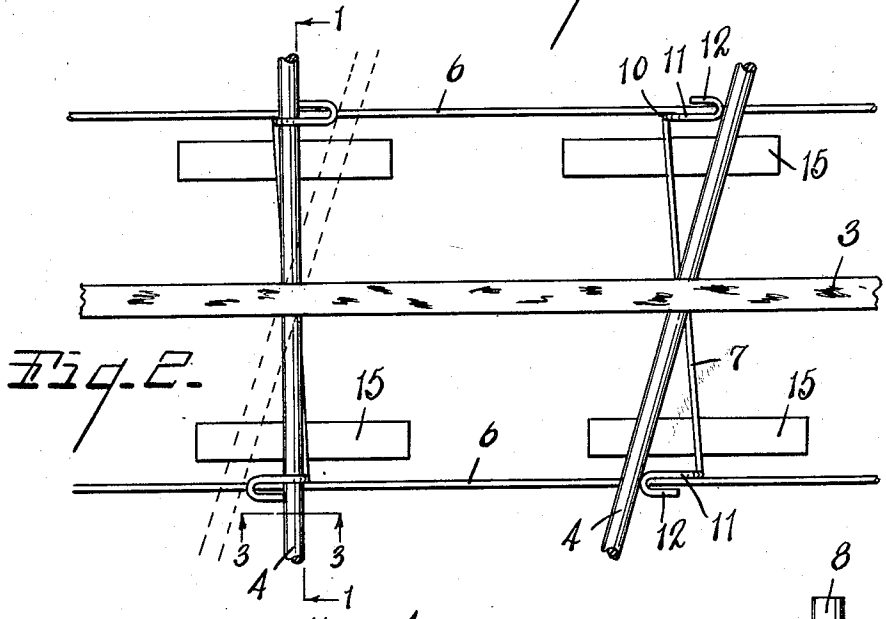


Fig. 2.

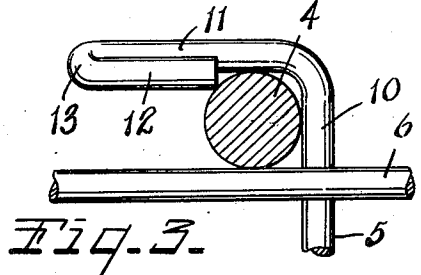


Fig. 3.

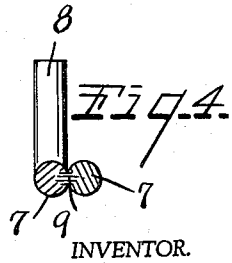


Fig. 4.

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PAVEMENT JOINT ASSEMBLY UNIT

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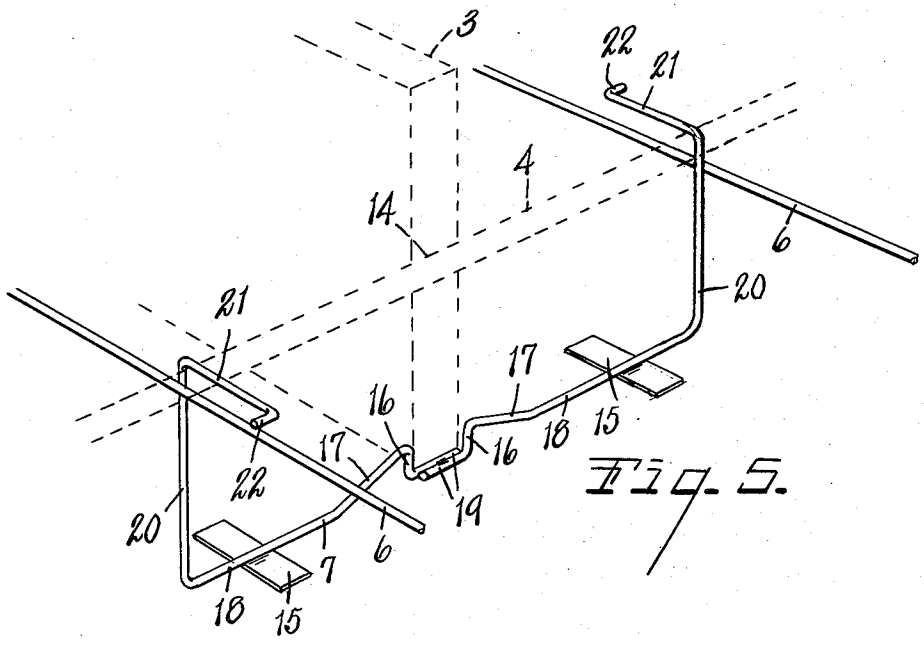


Fig. 5.

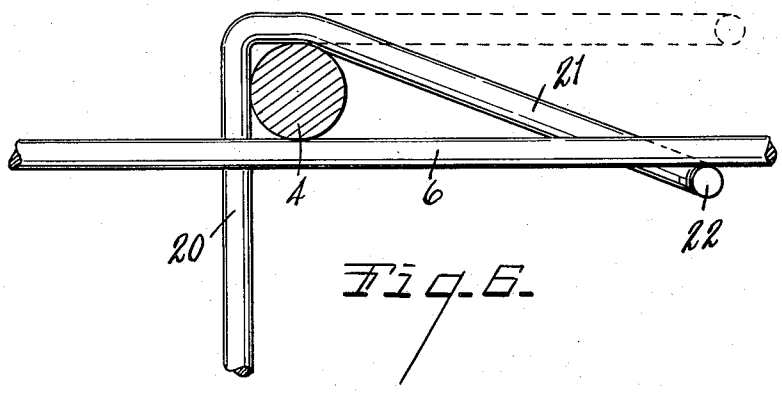


Fig. 6.

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UNITED STATES PATENT OFFICE

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PAVEMENT JOINT ASSEMBLY UNIT

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Application November 25, 1938, Serial No. 242,138

10 Claims. (Cl. 94—8)

This invention relates to improvements in pavement joint assembly units.

The main objects of my invention are:

First, to provide a pavement joint assembly unit including means to support and secure in spaced relation dowel bars extending between adjacent pavement sections.

Second, to provide a unit of the type described which is economical, comparatively light in weight, and at the same time is not easily distorted in handling or positioning.

Third, to provide a unit of the type described which positively, accurately, and lockingly supports the pavement dowel bars.

Fourth, to provide a unit of the type described having provision for fracturing to permit expansion and contraction of a pair of adjacent pavement sections under the influence of heat and cold.

Fifth, to provide a unit of the type described which is sufficiently strong and rigid to fulfill all of the requirements of various highway department specifications.

Sixth, to provide a unit of the type described which is adapted to be previously assembled as a unit and placed in position on the job and having means whereby pavement dowel bars are readily and quickly positioned and secured thereto.

Further objects relating to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a fragmentary view partially in vertical section illustrating the pavement joint assembly unit of my invention in operative relation to a pair of pavement sections and a joint filler therebetween.

Fig. 2 is a fragmenatry top plan view illustrating the elements of my assembly and the manner of positioning pavement joint dowel bars in supported relation thereto.

Fig. 3 is an enlarged fragmentary view in section on line 3—3 of Figs. 1 and 2, illustrating a detail of the dowel clip or locking means.

Fig. 4 is an enlarged view in section on line 4—4 of Fig. 1, illustrating the fracturable provision in the dowel bar support whereby to permit expansion or contraction of the pavement sections under the effects of heat and cold.

Fig. 5 is a fragmentary perspective view illustrating a modified embodiment of my invention, a pavement joint filler and dowel bar being illustrated in dotted lines in operative relation thereto.

Fig. 6 is an enlarged fragmentary view in vertical section illustrating details of the construction of Fig. 5.

The present invention relates to improvements in the pavement joint assembly units illustrated and claimed in my copending applications, Serial No. 74,719, filed April 16, 1936, and Serial No. 112,899, filed November 27, 1936. The present construction is concerned particularly with the simplification of a unit of the type described in the aforesaid applications, being characterized by all of the advantages of rigidity and accuracy of the same.

Referring to the drawings, the reference numerals 1, 2 indicate a pair of adjacent concrete pavement slabs or sections spaced by a joint filled with a filler 3 of asphalt or other suitable material or composition, in the preferred construction, a premolded one. The assembly unit of my invention, which is placed in position on the roadbed prior to pouring the concrete of sections 2 and which serves to support filler 3 in desired upright position, as well as to lockingly support the dowel bar 4 extending between the sections 2, is designated generally by the reference numeral 5.

This unit consists of a pair of longitudinal bars 6 extending parallel to the joint between the sections. These bars are supported by a plurality of cross members 7 which are generally U-shaped in form, each being made up of a pair of opposed, overlapping L-shaped elements of wire or rod stock of suitable gauge terminating in upturned lugs 8. The elements are disposed with lugs 8 adjacent one another and spaced sufficiently to receive therebetween the filler 3. In such arrangement the elements are welded at 9 at the overlapping portions thereof between the lugs so as to connect the two L-shaped members in the general U shape of the cross member and to hold the same in this shape during shipment and assembly of the dowels thereon. The welded joint, however, is desirably sufficiently weak to permit fracturing thereof upon movement of the pavement sections 2 under the influence of heat and cold so as to permit expansion or contraction of the sections without damage thereto. In this manner I secure a yieldable dowel supporting cross member having all of the advantages of those described and claimed in my copending applications referred to above.

The upstanding legs 10 of the cross members 5 terminate in arms 11 offset laterally in opposite

directions relative to the plane of the cross member, the said arms being spaced above the longitudinal rods 6 sufficiently to receive the dowels 4 on the rods in the manner illustrated in Fig. 3. Each of the arms 4 is itself bent through 180° to provide a reverse lug-like detent 12, which detent 12 is in addition offset vertically downwardly at 13 to effectively engage a dowel bar, preventing lateral movement of the same on the longitudinal rod 6 once it is operatively engaged beneath arm 11. It will be noted that the rod securing members of the supports project oppositely.

In assembling, the dowel bars 6 are inserted in transverse holes 14 in the filler 3 as a preliminary step in erecting or assembling. Referring to Fig. 2, it will be observed that the cross pieces 5 are cocked slightly relative to the dowels 4; i. e., the cross pieces 5 are offset slightly from a plane normal to the two longitudinal rods 6 of each unit. The purpose of this cocking or offsetting is to permit the dowel bars to be arranged normal to the filler 3. The dowels are rested on rods 6 and inserted beneath arms 11 by a single angular shifting movement of the dowels from the position indicated in dotted lines in Fig. 2 to the final position illustrated in the full lines. The extent of the offsetting or cocking of the cross members 5 is only the diametral dimension or thickness of the dowels.

In assembling the dowels on the supporting units in the manner described, the arms 11 and their detents 12 are deflected upwardly and then snap downwardly with the detents in the retaining relation illustrated in Fig. 3, the detents 12 engaging the exterior side of the dowel at a point above its center and accordingly functioning as a cam or thrust member to urge the same inwardly against the upright leg 10 to effectively prevent outward displacement thereof. The aforesaid spring engagement of the arms or detents 12 with the dowel is an exceedingly satisfactory one and much more effective than the mere expedient of hammering the arms about the dowel, in view of the fact that there is always present a tendency for a hammered element to spring back slightly and therefore remain loose with reference to the dowel to be clamped. I consider this feature of my invention to be of primary importance. Moreover, by disposing the arms 11 in opposite directions the simultaneous engagement of both thereof with the dowel is made possible without the necessity of decreasing the spring frictional action exerted by the retaining arms on the dowels in order to permit slipping of the latter in place.

Sheet metal foot plates 15 are welded to the cross pieces 5 to afford greater stability therefor in the event the roadbed is uneven or soft.

Referring to Figs. 5 and 6, I illustrate a modified embodiment of my invention, wherein the fracturable joint for the unit and the filler engaging and positioning elements are constituted by shoulders 16 bent in the transversely extending or cross portions 17 of the L-shaped elements 7, and terminal fingers 19 which are welded together, as in the embodiment of Figs. 1 to 4, with the shoulders 16 spaced sufficiently to properly receive and position the filler 3 which is illustrated in dotted lines. The uprights 20 of cross pieces 18 terminate in oppositely disposed lateral spring arms 21 which in turn terminate in offset lugs or fingers 22 adapted to be deflected downwardly and sprung beneath the longitudinal rods 6 in the manner indicated in Fig. 6. The result is that the dowel 4 is continually clamped and urged to the left as viewed in Fig. 6 against upright 20. The dowel is assembled on the supporting rods by a swinging movement in the same manner as described above with particular reference to Fig. 2, the oppositely offset lateral arms 21 being spaced above rod 6 to receive the same. It will be apparent that the time required to complete the assembly is but slightly more than the time required to erect the construction embodied in Figs. 1 to 4 and that the same qualities of rigidity, strength, cheapness, and adaptability to different weather conditions characterize the same. In each case, the welded joint positioned between the filler 3 fractures readily enough to permit free expansion and contraction of the adjacent pavement sections without the likelihood of damaging the same.

I have illustrated and described my improvements in embodiments which are very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A pavement joint assembly unit for supporting and securing a dowel extending transversely of and embedded in a pair of adjacent pavement sections and through a filler placed between the sections, comprising a cross member formed of a pair of L-shaped elements having upstanding terminal lugs, said elements being welded together with said lugs spaced sufficiently to receive and position a joint filler, said elements each having an upstanding leg, and longitudinal dowel supporting rods welded to said legs intermediate the length thereof, each of said legs terminating in a laterally offset arm spaced sufficiently above the rod to receive a dowel between the arm and rod, said arms terminating in downwardly offset detents bindingly engaging the dowel to secure the same in the space between the arm and rod, the arms on each cross member being disposed in opposite directions whereby to permit assembly of the dowel relative thereto by swinging movement of the dowel.

2. A pavement joint assembly unit comprising a pair of longitudinal rods adapted to support dowel bars to extend through a joint, a plurality of cross members each having a pair of upstanding legs welded to said longitudinal rods, and laterally offset arms integral with the legs on opposite sides of the joint and having terminal dowel engaging detents offset relative to the arms, said arms of each pair of legs being disposed oppositely and yielding to permit insertion of the dowel bars between the arms and rods by swinging movement of the dowel bars, said detents thereafter exerting wedging retaining action on the dowel bars.

3. A pavement joint assembly unit comprising a pair of longitudinal rods, supporting members for the rods each including a pair of overlapping cross pieces extending transversely of the joint, said cross pieces being welded to one another at the overlap thereof to constitute a U-shaped support for the rods and to provide a fracturable connection between the constituent elements of the support, said members having terminal arms extending at an angle thereto and in opposite directions toward one another, and being

disposed above said rods to receive a dowel between the arms and rods by swinging movement of the dowel, and means for securing the dowel in position on said rods.

4. A pavement joint assembly unit comprising a pair of longitudinal rods, supporting members for the rods each including a pair of overlapping cross pieces of round section having upstanding legs secured to the rods, and extending transversely of the joint, said cross pieces being welded to one another in a restricted area at the overlap thereof to constitute a U-shaped support for the rods and to provide a fracturable connection between the constituent elements of the support, and means for securing the dowel in position on said rods.

5. In a pavement joint assembly unit, in combination with a dowel extending transversely of a joint between a pair of adjacent pavement sections, a cross member having a pair of upstanding legs one on either side of said joint, a longitudinal dowel supporting rod secured to each of said legs in supporting relation to the dowel, said legs each having an arm offset laterally therefrom, said arms extending in opposite directions toward one another across the dowel when the latter is operatively associated with the rods, whereby to enable the insertion of the dowel between the arms and rods by swinging the same about a pivot point at the joint, and means on said arms to restrain the dowel from displacement from said inserted position.

6. In a pavement joint assembly unit of the type described, a cross member having a pair of upstanding legs adapted to be disposed one on either side of a pavement joint, a dowel extending across said joint, and longitudinal rods secured to said legs and supporting said dowel, said legs having arms offset laterally toward one another in opposite directions and vertically spaced from said rods for the insertion of said dowel in the space between the arms and rods by swinging movement of the dowel about a pivot point at the joint, said arms having elements restrainingly engaging the rods and being bindingly engageable with the dowel when the same is inserted to urge the same against the leg and rod whereby to maintain the dowel in place without looseness.

7. In a pavement joint assembly unit of the type described, a cross member having a pair of upstanding legs adapted to be disposed one on either side of a pavement joint, a dowel extending across said joint, and longitudinal rods secured to said legs and supporting said dowel, said legs having arms offset laterally toward one another in opposite directions and vertically spaced from said rods for the insertion of said dowel in the space between the arms and rods by swinging movement of the dowel about a pivot point at the joint, said arms having elements bindingly engageable with the dowel when the same is inserted to urge the same against the leg and rod whereby to maintain the dowel in place without looseness.

8. In a pavement joint assembly unit of the type described, a cross member having a pair of upstanding legs adapted to be disposed one on either side of a pair of adjacent pavement sections and a joint filler therebetween, and longitudinal rods secured to said legs and adapted to support a dowel extending between said sections and through the filler, said legs having arms offset laterally therefrom and disposed above and generally parallel to said rods, said arms being offset in opposite directions to enable insertion of the dowel into the space between the arms and rods by swinging the dowel about a pivot point at the joint, said arms terminating in downwardly offset reversely bent detent portions cocked downwardly toward the rod and engageable with the dowel at a point beneath the top thereof and between the top and the side of the dowel remote from the leg to wedgingly urge the dowel against the leg and rod on which it is supported.

9. In a pavement joint assembly unit of the type described, a cross member having a pair of upstanding legs adapted to be disposed one on either side of a pair of adjacent pavement sections, and longitudinal rods secured to said legs and adapted to support a dowel extending between said sections, said legs having arms offset laterally therefrom and disposed above and generally parallel to said rods, said arms terminating in downwardly offset reversely bent detent portions cocked downwardly toward the rod and engageable with the dowel at a point beneath the top thereof and between the top and the side of the dowel remote from the leg to wedgingly urge the dowel against the leg and rod on which it is supported.

10. In a pavement joint assembly unit of the type described, a cross member having a pair of upstanding legs adapted to be disposed one on either side of a pair of adjacent pavement sections, and longitudinal rods secured to said legs and adapted to support a dowel extending between said sections, said legs having arms offset laterally therefrom and disposed above and generally parallel to said rods, said arms terminating in downwardly offset detent portions cocked downwardly toward the rod and engageable with the dowel at a point beneath the top thereof and between the top and the side of the dowel remote from the leg to wedgingly urge the dowel against the leg and rod on which it is supported.

DEWEY H. BITNEY.