March 5, 1940. D. H. BITNEY 2,192,570

PAVEMENT JOINT ASSEMBLY UNIT

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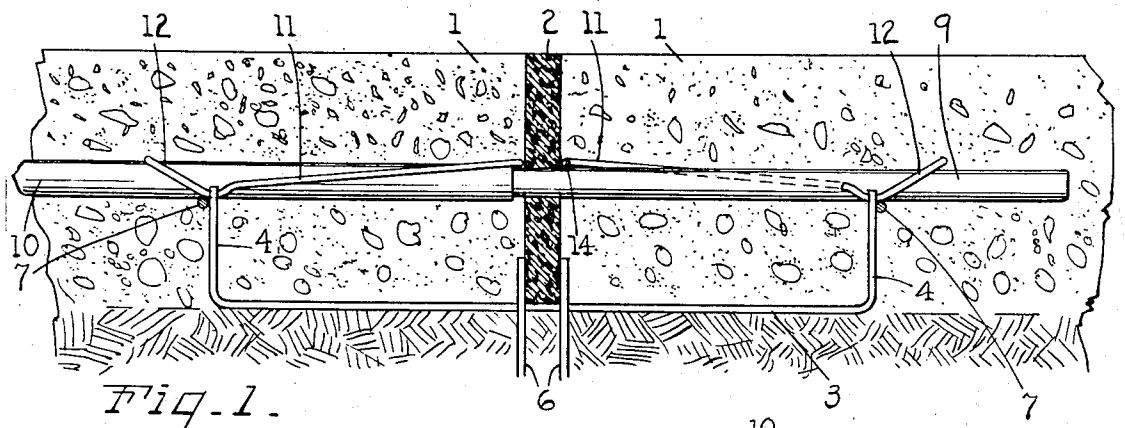


Fig. 1.

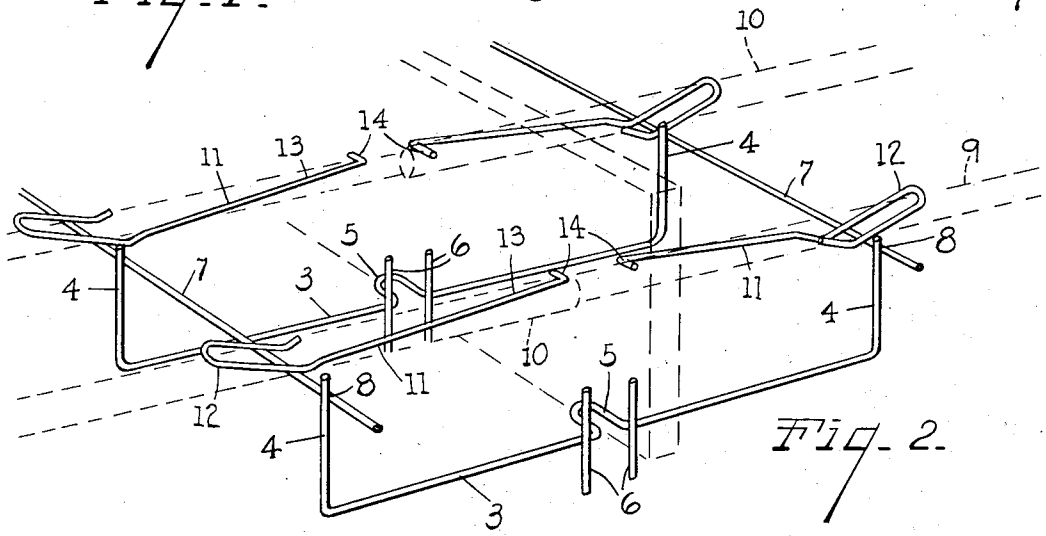


Fig. 2.

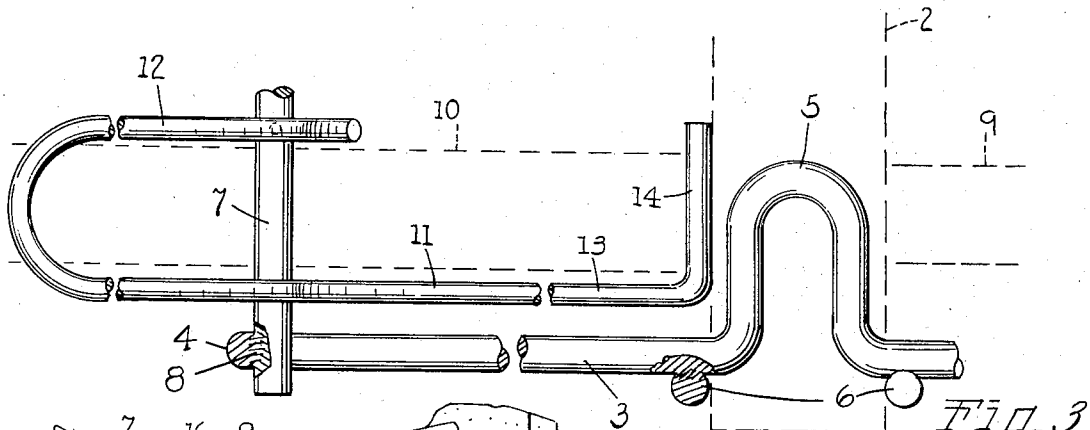


Fig. 3

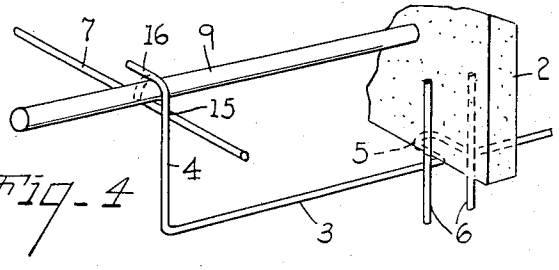


Fig. 4

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PAVEMENT JOINT ASSEMBLY UNIT

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19 Claims. (Cl. 94—8)

This invention relates to improvements in pavement joint assembly units.

The main objects of this invention are:

First, to provide a pavement joint assembly unit suitable to space and support dowel bars such as are commonly used in conjunction with pavement joints of the expansion and contraction type.

Second, to provide an assembly unit of the type described, which may be completely assembled as a unit and then placed in position.

Third, to provide a pavement joint assembly of the type described, characterized by the fact that it accurately locates and positively holds dowel bars in their operative position.

Fourth, to provide an assembly unit of the type described, having means for permitting expansion and contraction of the unit due to the effects of heat and cold on adjacent sections of the pavement.

Fifth, to provide a device of the type described, which is simple in its construction and readily and quickly assembled.

Sixth, to provide a pavement joint assembly unit which is characterized by a rigidity which fulfills the requirements of various highway department specifications.

Seventh, to provide a pavement joint assembly equipped with novel and improved spring tie clip means for locking dowel bars associated therewith, in proper position.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawing, wherein:

Fig. 1 is a fragmentary transverse sectional view of a pavement, illustrating my improved joint assembly in connection therewith.

Fig. 2 is a fragmentary perspective view illustrating details of the invention.

Fig. 3 is a fragmentary detail view in plan illustrating the specific features of the construction of the invention.

Fig. 4 is a fragmentary perspective view illustrating a modified form of my invention.

A common difficulty in highway or pavement construction is encountered in the endeavor to locate and maintain in horizontal position and at right angles to a pavement joint, dowel bars which are used to hold adjoining sections of pavement in proper alinement. The unit which constitutes the subject matter of this invention comprises a system of wires or light rods so arranged or assembled and welded together as to provide a spacing and locking device for the dowels commonly used in conjunction with pavement joints of the expansion and contraction type of modern highway construction. At the same time, my improved unit provides a positive support for the dowel bars.

A significant advantage of my invention lies in the fact that the unit will permit the complete assembly of the dowels with the asphalt joint filler material commonly employed, at the side of the highway or street, so that the entire assembly can be carried from the place of assembly and placed directly in position without further adjustment or labor. Accurate location and positive holding of the dowel bars and the joint filler are assured.

In the drawing, the reference numeral 1 indicates adjacent pavement sections spaced to permit expansion, the joint space being provided with a filler 2 of asphalt or other suitable material or composition. The filler illustrated is a premolded one. My assembly unit consists of a plurality of transverse cross members or bars 3 spaced at regular intervals of approximately two feet lengthwise of the pavement joint or transversely of the pavement. The cross bars are similar in construction, having upstanding legs 4 and a central expansion loop 5 which enables ready expansion and contraction of the unit when the adjacent pavement sections expand and contract. As illustrated, the joint filler 2 rests on the cross bars 3, being sustained centrally thereof by pins 6 rigidly attached to the cross bars as by a welded joint. The pins 6 extend downwardly from the cross bars and are adapted to be thrust into the foundation, thus holding the joint assembly in its proper position.

The several cross bars 3 are held in fixed spaced relation by means of a pair of tie rods or longitudinal bars 7 which extend parallel to and on opposite sides of the pavement joint. Longitudinal bars 7 are welded to the upstanding legs 4 of the cross bars at 8. While holding the cross bars in proper assembled position, the longitudinal bars 7 at the same time furnish supports for the dowels 9 which rest thereon and extend through the filler 2, as clearly indicated in Fig. 1. One end of each of the dowels is provided with a sleeve or sheath 10 which permits movement of the dowel with respect to one concrete section into which it extends, so that it will be seen that the unit is not subject to rupturing stresses of any kind. Suitably attached to the longitudinal bars 7, as by a welded joint, I provide means for

maintaining the dowels in their assembled position, consisting of U-shaped spring clips 11, the loops 12 of which receive the outer ends of the dowels. The free inner end 13 of the clip consists of an elongated leg extending toward the pavement joint and terminating in a hook 14 which rests on the top of the dowel and resiliently holds or grips it.

I have shown clips 11 as being welded to the rods 7; however, the clips may be welded to another part of the unit—for instance, to the upstanding legs 4 of the cross bars. Similarly, the free end 13 of the clip is shown as extending inwardly toward the joint, whereas it is clear that the loop 12 might be so positioned instead. The spring tie clip 11 has a function in addition to that of spacing the dowels along the rods 7 and locking them down securely—that is, the clip bears against the asphalt joint filler 2 to assist pins 6 in maintaining the same in proper vertical position during the pouring of the concrete.

From the above description, it will be seen that I have provided a pavement joint assembly unit which positively supports the dowel bars commonly employed therewith at a uniform height and which spaces the dowels at proper distances. My unit makes it unnecessary to use individual dowel bar supports on this type of construction, hence eliminates the unreliability and inaccuracy attending the use of such individual supports by unskilled laborers. The rods 7 effect considerable strengthening of the unit in addition to their function of supporting the dowel bars, and the spring clips 11 furnish means for very accurately spacing the dowel bars at proper intervals.

I consider the loops 5 in cross bars 3 to be of outstanding importance since the expansion or contraction of adjacent pavement sections does not cause damage to the unit or the sections themselves in which the unit is incorporated, such as might be incurred were the sections rigidly tied together.

Any suitable similar means may be substituted for loops 5 to permit yielding of the assembly under expansion or contraction of adjacent pavement sections. For instance, cross bars 3 may be corrugated or weakened by having a notch formed therein or by being partially severed or by other operations which will suggest themselves, whereby upon contraction of the adjacent sections the cross bars will be parted. It will be understood that this rupturing is not particularly objectionable inasmuch as after the concrete in the sections has hardened about the dowels and my supporting means therefor it is no longer requisite that the assembly be maintained in its original form.

My invention contemplates a modified form which is illustrated in Fig. 4 and consists of cross bars 3 similar in construction to those of the first embodiment and having upstanding legs 4, secured to rods 7, preferably by welding at 15, whereby the rods are supported in spaced relation to the roadbed. The legs 4 extend upwardly beyond rod 7 and are bent at right angles to provide lateral arms 16 extending parallel to the rods. In use, the dowels 9 are placed on rods 7 underneath arms 16 and the arms are bent downwardly by a hammer blow into the loop position shown in dotted lines in Fig. 4, to securely hold the dowel against the cross rod 7 which supports the same. In the case of the form illustrated in Fig. 4, pins 6 may be extended substantially upward to furnish support for the filler 2, inasmuch as the supporting function of clips 11 is absent from this modification. In other respects, the modification illustrated in Fig. 4 is similar to that shown in Figs. 1 to 3, being provided with a loop 5 or similar means permitting expansion and contraction.

The unit of my invention, aside from serving to accurately space the dowel bars transversely of the road joint, is characterized by its very sturdy nature in assembled condition. Spring clips 11 and offset arms 16, in addition to holding the dowels in their proper spaced relation, also lock or snub the dowels against their supporting cross rods and resist shifting of the dowels relative to the cross rods to a remarkable degree. Hence, the unit, after being assembled, will maintain its desired assembled form through its resistance to accidental jolts prior to being placed in position.

My assembly structure fosters uniformity in pavement construction inasmuch as it permits the assembly of the whole unit at the side of the pavement prior to the placing thereof in the pavement and eliminates the necessity for making individual adjustments at each point of support of the dowels.

My improved pavement joint assembly unit is further characterized by the low cost of its production, since it is made throughout of inexpensive wire stock, the size of which will depend upon specifications of various highway authorities or upon other considerations. The steps of its assembly, which preferably consist simply of welding operations, further enhance the simplicity of the device.

I have illustrated and described my improvements in an embodiment which I consider very practical. I have not attempted to illustrate or describe other embodiments or adaptations which I contemplate, 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. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and adapted to rest on the road bed and having upstanding legs at their ends, pins welded to said bars adapted as anchoring members and as joint filler supporting members, longitudinal bars welded to the legs of said cross bars and constituting dowel supports, and spring clips welded to said longitudinal bars, said clips having U-shaped outer ends for resiliently engaging dowels, the inner arms of said clips constituting dowel engaging members, their inner ends being spaced to constitute supports for a joint filler.

2. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and having means permitting expansion and contraction thereof, pins welded to said bars adjacent the loops and adapted as anchoring members and as joint filler supporting members, longitudinal bars welded to the legs of said cross bars and constituting dowel supports, and spring clips welded to said longitudinal bars, said clips having U-shaped outer ends for resiliently engaging dowels, the inner arms of said clips constituting dowel engaging members, their inner ends being spaced to constitute supports for a joint filler.

3. In a pavement joint assembly for supporting joint dowels adapted to be embedded in adjacent

pavement sections, a plurality of cross bars spaced lengthwise of the joint having means permitting expansion and contraction thereof and having upright legs thereon, longitudinal bars welded to the legs of said cross bars and constituting dowel supports, and spring clips welded to said longitudinal bars for resiliently engaging dowels, said means being adapted to lie wholly between said sections and being free to expand and contract without fracturing said sections.

4. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and having an expansible portion lying wholly within the joint, longitudinal bars secured to the said cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars, said clips having U-shaped outer ends for receiving the outer ends of dowels, the inner arms of said clips constituting spring dowel engaging members, their inner ends being spaced to constitute supports for a joint filler.

5. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and having an expansible portion lying wholly within the joint, longitudinal bars secured to the said cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars, said clips having U-shaped outer ends for receiving the outer ends of dowels, the inner arms of said clips constituting spring dowel engaging members.

6. In a joint assembly, the combination of spaced longitudinal bars, cross bars having upturned ends welded to said longitudinal bars, spaced pins secured to said cross bars constituting anchoring members and joint filler positioning members, dowel clips having looped outer ends welded to said longitudinal bars and having inwardly projecting spring arms provided with dowel engaging hooks, joint fillers arranged in said assembly, and dowels arranged through said joint fillers in supporting engagement with said longitudinal bars, one end of each dowel being provided with a slip sheath or sleeve.

7. In a joint assembly, the combination of spaced longitudinal bars, cross bars having upturned ends welded to said longitudinal bars, spaced pins secured to said cross bars and constituting joint filler positioning members, and dowel clips having looped outer ends welded to said longitudinal bars and having inwardly projecting spring arms provided with dowel engaging hooks.

8. In a joint assembly, the combination of spaced longitudinal bars, cross bars having upturned ends welded to said longitudinal bars, and dowel clips having looped outer ends welded to said longitudinal bars, said cross bars having central horizontally disposed loops adapted to lie wholly within the joint, and dowel clips having looped outer ends welded to said longitudinal bars and having inwardly projecting spring arms provided with dowel engaging hooks.

9. In a joint assembly, the combination of spaced longitudinal bars, cross bars secured to said longitudinal bars, spaced pins secured to said cross bars and constituting anchoring members and joint filler positioning members, dowel clips secured to said longitudinal bars and having inwardly projecting spring dowel engaging arms, joint fillers, and dowels arranged through said joint filler in supporting engagement with said longitudinal bars, one end of each dowel being provided with a slip sheath or sleeve.

10. In a joint assembly, the combination of spaced longitudinal bars, cross bars secured to said longitudinal bars, spaced pins secured to said cross bars and constituting anchoring members and joint filler positioning members, dowel clips secured to said longitudinal bars and having inwardly projecting spring arms engaging a dowel supported by said longitudinal bars, said arms extending into engagement with a joint filler to support the same, and a joint filler arranged in said arms.

11. A pavement joint assembly unit comprising rods extending longitudinally of the joint for supporting joint dowels, means for supporting the rods having yieldable provision for expansion and contraction, and a plurality of spring dowel engaging clips welded to said rods, said clips having looped outer ends for engaging the dowel bars at one side of the rods, the clip on the other side of the rods extending towards the pavement joint and engaging a joint filler to support the same.

12. A pavement joint assembly unit comprising rods extending longitudinally of the joint for supporting joint dowels, means for supporting the rods having yieldable provision within the joint for expansion and contraction, and a plurality of spring dowel engaging clips welded to said rods, said clips having looped outer ends for engaging the dowel bars at one side of the rods.

13. In a pavement joint assembly, longitudinal rods adapted to be disposed parallel to a joint filler, a plurality of spaced dowels supported by said rods at right angles thereto and adapted to pass through said filler, means for holding said dowels in assembled position, comprising spring tie clips looped about the dowels and resiliently pressing them against said rods, said clips being welded to the rods, and means for supporting said rods, comprising U-shaped cross bars adapted to rest on the roadbed, said cross bars being welded to said rods.

14. In a pavement joint assembly, longitudinal rods adapted to be disposed parallel to a joint filler, a plurality of spaced dowels supported by said rods at right angles thereto and adapted to pass through said filler, means for holding said dowels in assembled position, comprising U-shaped spring tie clips looped about the dowels and resiliently pressing them against said rods, and means for supporting said rods, comprising U-shaped cross bars adapted to rest on the roadbed, said cross bars being welded to said rods and having U loops centrally thereof to permit expansion and contraction.

15. In a pavement joint dowel support, the combination with longitudinal bars, of cross bars secured thereto having upturned legs to which said longitudinal bars are secured, said cross bars having centrally disposed expansion loops and being provided with joint filler positioning members, and spaced dowel clips secured to said longitudinal bars and having dowel engaging parts at their outer ends and inwardly projecting resilient dowel engaging members extending into contact with a filler in the joint to position and support the filler.

16. In a pavement joint dowel support, the combination with longitudinal bars, of cross bars secured thereto having upturned legs to which said longitudinal bars are secured, said cross bars having centrally disposed expansion loops, and spaced dowel clips secured to said longitudinal bars and having dowel engaging parts thereon.

17. In a pavement joint assembly, the combi-

nation of longitudinal bars spaced for positioning on opposite sides of a joint, means for supporting said bars having provision at and within the joint for expansion and contraction, and a plurality of dowel securing clips secured to said longitudinal bars, said clips having dowel engaging outer ends and inwardly projecting resilient dowel engaging arms, the inner ends of said arms being spaced to engage opposite sides of a joint filler to support the same.

18. In a pavement joint assembly, the combination of longitudinal bars spaced for positioning on opposite sides of a joint, means for supporting said bars having provision at and within the joint for expansion and contraction, and a plurality of dowel securing clips secured to said longitudinal bars, said clips having dowel engaging outer ends and inwardly projecting resilient dowel engaging arms.

19. In a pavement joint coupling, longitudinal rods adapted to be disposed parallel to a joint filler, a plurality of spaced dowels supported by said rods at right angles thereto and adapted to pass through said filler, means for holding said dowels in assembled position, and means integral with said means for supporting said rods, comprising U-shaped cross bars adapted to rest on the roadbed, said bars being welded to said rods and having yieldable portions within the joint to permit expansion and contraction.

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