March 5, 1940. D. H. BITNEY 2,192,571

JOINT AND DOWEL ASSEMBLY UNIT

Filed Nov. 27, 1936

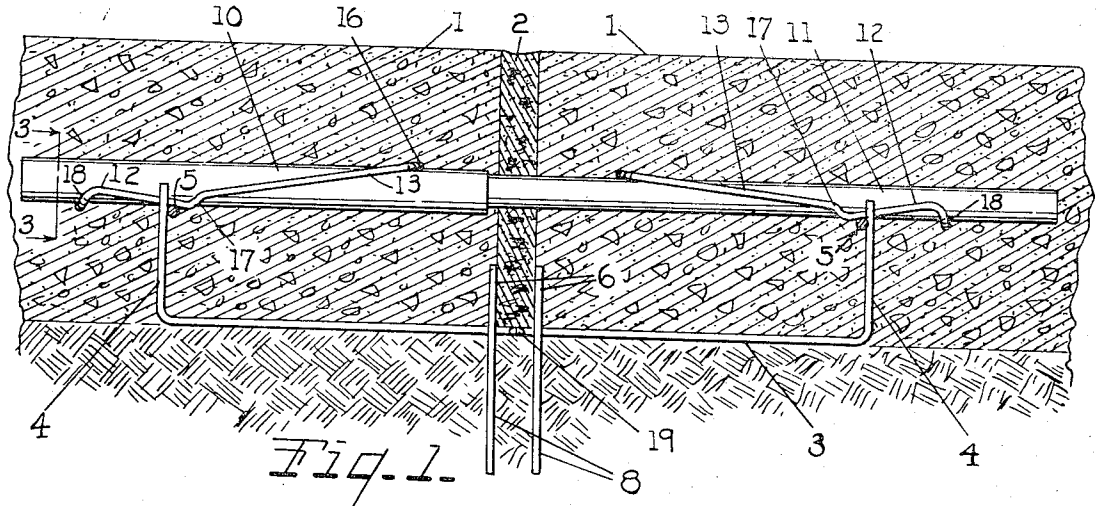


Fig. 1.

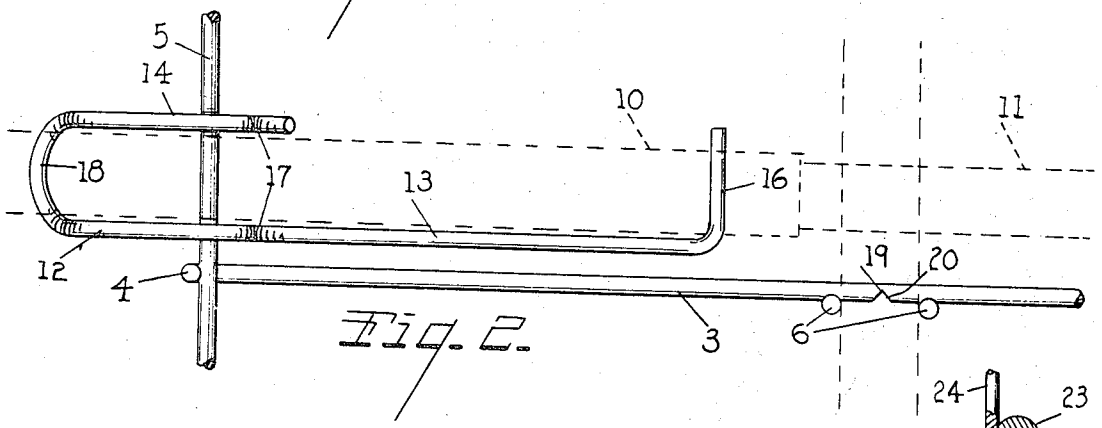


Fig. 2.

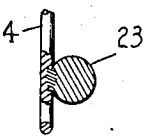


Fig. 7.

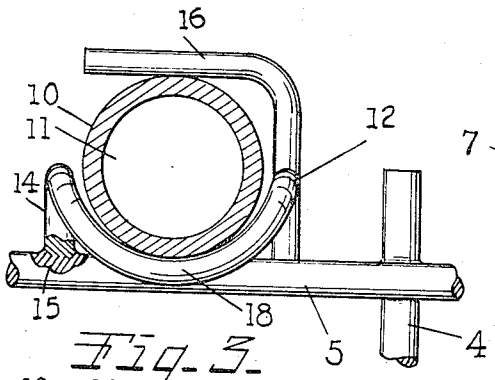


Fig. 3.

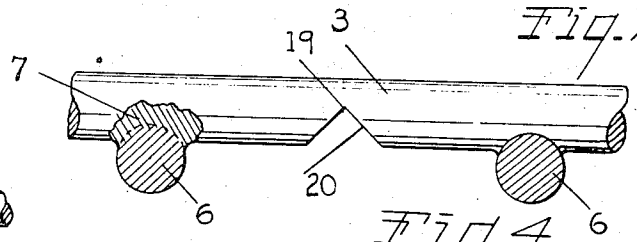


Fig. 4.

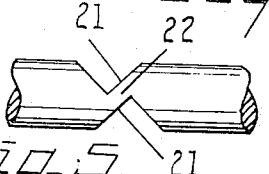


Fig. 5.

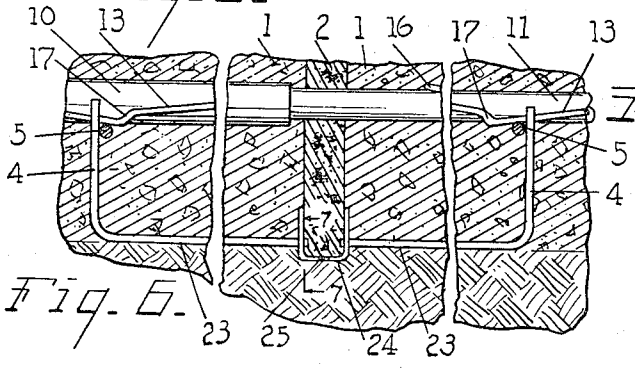


Fig. 6.

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JOINT AND DOWEL ASSEMBLY UNIT

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11 Claims. (Cl. 94—3)

This invention relates to improvements in joint and dowel assembly units.

The main objects of this invention are:

First, to provide a pavement joint and dowel assembly unit suitable to space and support joint dowels 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 reinforce support of the type described, characterized by the fact that it accommodates the movement of adjacent slabs or sections of pavement due to the effect of heat and cold.

Fourth, to provide a device of the character described, which is simple in its construction and very convenient to use.

Fifth, to provide a pavement joint assembly unit equipped with novel and improved means for securing the dowel bars in proper position.

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

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

Fig. 1 is a fragmentary sectional view of a pavement through the joint of adjacent paving slabs, illustrating the improved joint assembly in operative relation thereto.

Fig. 2 is a fragmentary plan view, a dowel and the joint filler being shown in dotted lines.

Fig. 3 is an enlarged fragmentary view sectioned on line 3—3 of Fig. 1 and with parts broken away to better illustrate structure.

Fig. 4 is an enlarged fragmentary view partially in horizontal section.

Fig. 5 is a detail plan view of a modified form of cross bar or chair.

Fig. 6 is a fragmentary sectional view partially broken away and illustrating a modified form of my invention.

Fig. 7 is an enlarged fragmentary view in section on line 7—7 of Fig. 6.

A common difficulty in highway or pavement construction is encountered in an endeavor to locate and maintain in horizontal position and at right angles to a pavement joint the dowel bars which are used for holding adjoining sections of the pavement in alinement.

My improved joint assembly for supporting the joint dowels comprises a structure formed of wires or light rod so arranged or assembled and welded or fixedly secured together as to provide a supporting, spacing and locking device for such dowels.

One of the major advantages of the invention resides in the fact that an assembly unit will permit the complete assembly of the dowels with the unit and also with the 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 arranged in position without further adjustment or labor.

In the drawing, the reference numeral 1 indicates adjacent pavement sections or slabs spaced to permit expansion and contraction, the joint space being filled with the filler 2 commonly of asphalt or other suitable material or composition. The filler illustrated is a pre-molded filler.

My assembly unit comprises a plurality of cross bars or transverse members 3 spaced at regular intervals—in practice approximately one foot spacing is found suitable—lengthwise of the pavement joint or transversely of the pavement.

The cross bars are formed of heavy wire or light rod and are provided with upstanding legs or supports 4 to which the longitudinal bars 5 are welded, these longitudinal bars being connected to a series of the legs of the cross bars, holding the cross bars in upright position.

The cross bars are provided with vertical pins 6 which are welded to the cross bars as indicated at 7 with their upper ends projecting above the cross bars and suitably spaced to receive and position the filler 2. In the embodiment illustrated in Figs. 1 to 4, these pins are extended below the cross bars to provide anchoring prongs or members 8 adapted to be forced into the roadbed or the bed upon which the paving slabs are laid. The cross bars are adapted to rest upon the roadbed. The extension of these pins below the rods is, however, an optional matter and in some instances they are not desired, but in all instances the unit is very stable because of the several cross bars being connected together and held in properly spaced relation.

The dowels illustrated are of the telescoping type, the section 10 being tubular to receive the section 11. Dowels of this type are well known in the art and are designed to permit relative movement of the adjacent paving slabs or sections as results from expansion and contraction due to substantial changes in temperature.

To provide means for quickly and securely retaining the dowels in position, the unit is pro-

vided with a pair of opposed spring clips for each dowel, these spring clips having loops 12 at their outer ends formed with a long arm 13 and a short arm 14. The short arms are secured to the longitudinal bars by welding as at 15, the long arms not being secured, which permits a greater spring action and minimizes the tendency for the joint to be broken when the long arms are sprung up and outwardly to engage the dowels. The long ams are provided with fingers or laterally disposed terminals 16 adapted to engage the top of the dowels as is clearly shown in the drawing.

The arms of the clips are suitably spaced to receive the dowel between them and have upward offsets 17 disposed at the inner side of the longitudinal bars, the bights of the clips being downwardly offset at 18 so that in assembling the dowels it is only necessary to lift up the clip fingers 16 and place the dowels in these seats provided by the clips. This enables the rapid assembly of the dowels, and at the same time they are very securely anchored in position.

To permit movement of the adjacent paving slabs or sections as they contract and expand, the cross bars are formed with a fracturing point 19 located in the zone of the filler strip or in the zone of the joint. This fracturing point is preferably provided by notching the cross bars 3 as shown at 20. It will be understood that the portion of the cross bars embedded in the concrete will move or tend to move with the paving sections or slabs as they expand and contract.

By providing the bars with their fracturing points in the zone of the joint, the bars are fractured when a substantial relative movement of the slabs occurs without fracturing or breaking the concrete in any way, and this fracturing does not in any wise affect the function of the chair structure which is of course mainly the supporting of the dowel bars and location of the joint strip preliminary to and during the pouring of the concrete.

In the embodiment shown in Fig. 5, two notches 21 are provided slightly offset from each other, leaving a fracturing portion 22. These notches are preferably on the sides of the cross bars, considered relative to the vertical, so that the cross bars are not likely to be broken in handling or in positioning in use. The notches might be in the form of saw kerfs, and other means of weakening the bars at the proper point would be recognized by those skilled in the art to which this invention relates.

In Figs. 6 and 7, I illustrate a further form of my invention embodying a pair of cross bar members 23 each carrying an upstanding leg or support 4, which members may be in the form of heavy wire or light rods. The dowels are carried on longitudinal bars 5 welded to legs 4 as described above.

The members 23 have the horizontal portions thereof in mutually facing relation and joined by a U-shaped wire element 24 whose legs are welded to the cross bars as indicated in Figs. 6 and 7. Element 24 is weakened at a fracturing point 25 by notching the base of the U-shaped element as indicated in Fig. 6. Movement of the concrete in either direction will cause fracturing of the wire element so that the cross bars 23 may move likewise. The upstanding legs of the U-shaped element serve to locate and support the joint strip 2.

My improved pavement joint assembly promotes uniformity of pavement construction inasmuch as it permits the assembly of the whole unit at the side of the pavement prior to the placing thereof in position on the roadbed and avoids the necessity for making individual adjustments at each point of support of the dowel. The assembly may be very economically produced, is light in weight, and can be made in proper lengths for use in highways of different widths. I preferably secure the parts by welding, which further leads to uniformity of results.

I have illustrated and described my improvements in embodiments which I have found highly satisfactory. I have not attempted to illustrate or describe other embodiments or adaptations which I contemplate as it is believed that 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 roadbed and having legs upstanding at their ends, pins welded to said cross bars in spaced relation and adapted to serve as joint filler supports, said cross bars being weakened between said pins providing fracturing points at the joint, longitudinal bars welded to the legs of the cross bars and constituting dowel supports, and spring clips having loops at their outer ends disposed transversely of said longitudinal bars, said clips having relatively long and short arms, the short arms only of said loops being welded to said longitudinal bars, the long arms of the clips terminating in laterally turned dowel engaging members, the arms of the clips being spaced to receive a dowel between them and being upwardly offset at the inner sides of the longitudinal bars and the bights of the loops being downwardly offset providing dowel seats.

2. 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 roadbed and having legs upstanding at their ends, pins welded to said cross bars in spaced relation and adapted to serve as joint filler supports, longitudinal bars welded to the legs of the cross bars and constituting dowel supports, and spring clips having loops at their outer ends disposed transversely of said longitudinal bars, said clips having relatively long and short arms, the short arms only of said loops being welded to said longitudinal bars, the long arms of the clips terminating in laterally turned dowel engaging members, the arms of the clips being spaced to receive a dowel between them and being upwardly offset at the inner sides of the longitudinal bars and the bights of the loops being downwardly offset providing dowel seats.

3. 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 roadbed and having legs upstanding at their ends, pins secured to said cross bars in spaced relation and adapted to serve as joint filler supports, said cross bars being weakened between said pins providing fracturing points at the joint, longitudinal bars secured to the legs of the cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars and having loops at their outer ends disposed transversely of said longitudinal bars and secured thereto, one of the arms of the clips terminating in laterally turned

dowel engaging members, the arms of the clips being spaced to receive a dowel between them and being upwardly offset at the inner sides of the longitudinal bars and the bights of the loops being downwardly offset providing dowel seats.

4. 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 roadbed and having legs upstanding at their ends, pins secured to said cross bars in spaced relation and adapted to serve as joint filler supports, longitudinal bars secured to the legs of the cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars and having loops at their outer ends disposed transversely of said longitudinal bars and secured thereto, one of the arms of the clips terminating in laterally turned dowel engaging members, the arms of the clips being spaced to receive a dowel between them and being upwardly offset at the inner sides of the longitudinal bars and the bights of the loops being downwardly offset providing dowel seats.

5. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and provided with upstanding supports, said cross bars being partially severed at the zone of the joints providing fracturing points at the joint, longitudinal bars secured to the cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars and having loops at their outer ends disposed transversely of said longitudinal bars, said clips having relatively long and short arms, the long arms of the clips terminating in laterally turned dowel engaging members, the arms of the clips being spaced to receive a dowel between them and being upwardly offset at the inner sides of the longitudinal bars and the bights of the loops being downwardly offset to receive the dowels.

6. 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 weakened portions within the joint to permit expansion and contraction.

7. 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 roadbed and having legs upstanding at their ends, pins secured to said cross bars in spaced relation and adapted to serve as joint filler supports, said cross bars having notches between said pins providing fracturing points at the joint, longitudinal bars secured to the legs of the cross bars and constituting dowel supports, and spring clips having loops at their outer ends disposed transversely of said longitudinal bars, said clips having relatively long and short arms, the short arms only of said loops being secured to said longitudinal bars, the long arms of the clips terminating in laterally turned dowel engaging members.

8. 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 roadbed and having legs upstanding at their ends, pins secured to said cross bars in spaced relation and adapted to serve as joint filler supports, said cross bars having notches between said pins providing fracturing points at and entirely within the zone of the joint, and longitudinal bars secured to the legs of the cross bars and constituting dowel supports.

9. In a pavement joint assembly for supporting joint dowels, a plurality of cross bars spaced lengthwise of the joint and provided with upstanding supports, said cross bars being partially severed at the zone of the joints providing fracturing points at the joint, longitudinal bars secured to the cross bars and constituting dowel supports, and spring clips secured to said longitudinal bars and having loops at their outer ends disposed transversely of said longitudinal bars, said clips having relatively long arms terminating in laterally turned dowel engaging members.

10. A support for joint dowels comprising a bar adapted to rest on the roadbed transversely of the joint and having upstanding legs at its ends, dowel supports carried by said upstanding ends, and pins secured to said bar in spaced relation and adapted to serve as a joint filler support, said bar having a notch between said pins providing a fracturing point at and within the zone of the joint.

11. A support for joint dowels comprising a bar adapted to be disposed transversely of the joint and provided with dowel supports, and pins secured to said bar in spaced relation and adapted to serve as a joint filler support, said bar having a notch between said pins providing a fracturing point at and within the zone of the joint.

DEWEY H. BITNEY.