June 17, 1941. B. F. FRIBERG 2,245,972

DOWEL ASSEMBLY FOR PAVING JOINTS

Filed July 5, 1938

FIG.1.

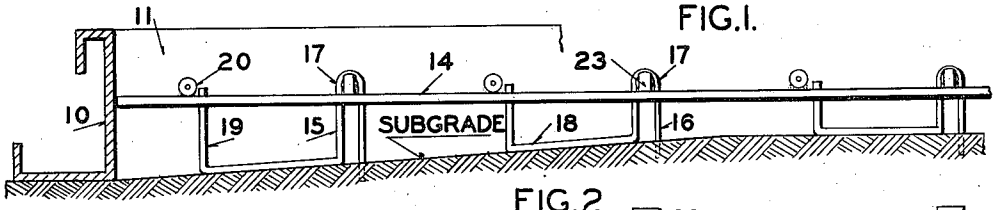


FIG.2

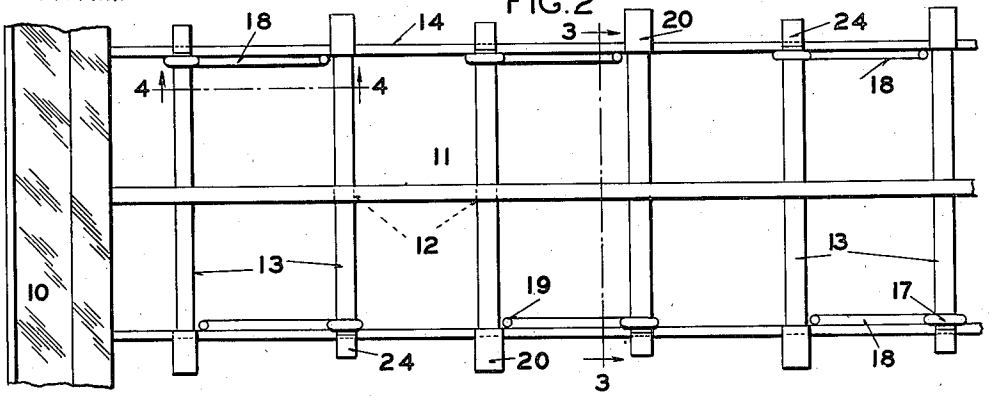


FIG.3.

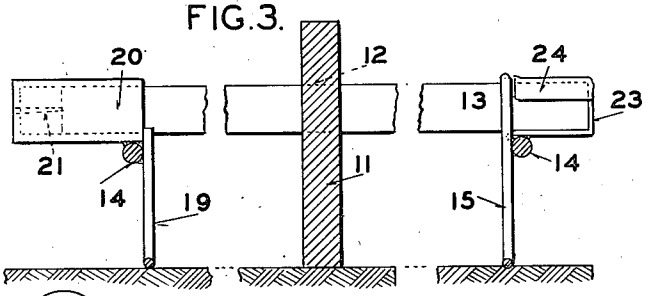


FIG.6

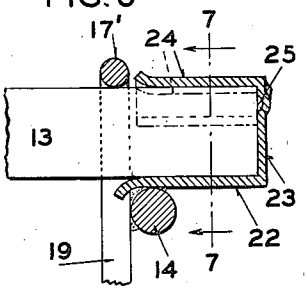


FIG.4.

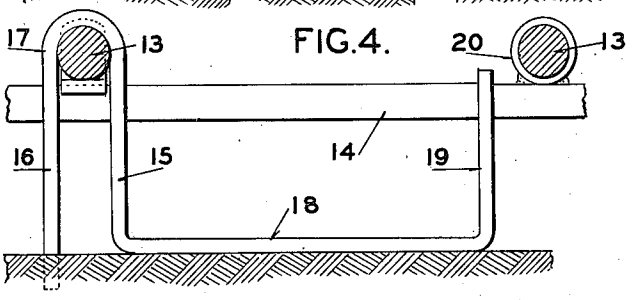
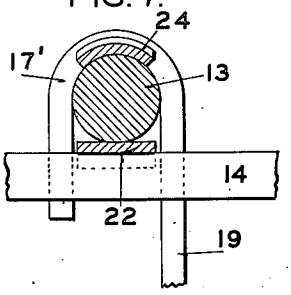
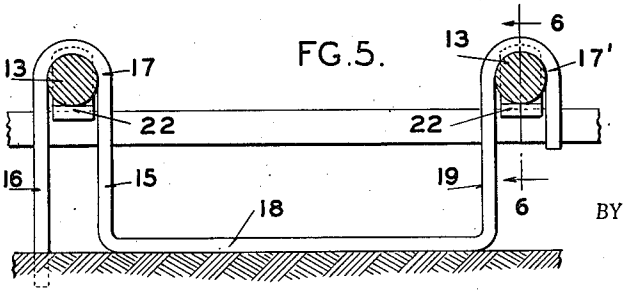


FIG. 7.



FG.5.



INVENTOR.
BENGT F. FRIBERG

BY

ATTORNEY.

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DOWEL ASSEMBLY FOR PAVING JOINTS

Bengt F. Friberg, St. Louis, Mo., assignor to Laclede Steel Company, St. Louis, Mo., a corporation of Missouri

Application July 5, 1938, Serial No. 217,402

5 Claims. (Cl. 94—8)

My invention relates to a dowel assembly for paving joints, that is, to a unitary structure including pavement separating means, such as an expansion or contraction joint, and dowels, together with supporting and spacing means for holding the dowels in both horizontal and vertical alignment. Specifically, the present invention pertains to improvements in the form of dowel assembly shown and described in my copending application No. 32,528 filed July 22, 1935, now Patent No. 2,163,397 of June 20, 1939.

One object of my invention is to provide more adequate support for the dowels by means of chair elements carried by the spacing bars and provided with ground stops each extending along the ground from a point under one dowel to a point at least approximately under an adjacent dowel, the chair member being rigidly secured to the spacing bar at both ends. This construction imparts great rigidity to the assembly and provides a support for each end of every dowel thereof.

Another object of my invention is to provide the spacing bars with dowel engaging means at each end of each dowel, which means will effectively prevent any twisting movement between the bars and dowels, thus maintaining the perpendicular relation of the former to the latter.

In the accompanying drawing which illustrates a dowel assembly constructed in accordance with my invention Figure 1 is a side elevation; Figure 2 is a top plan view; Figure 3 is an enlarged section taken on the line 3—3 of Figure 2; Figure 4 is an enlarged section taken on the line 4—4 of Figure 2; Figure 5 is a view similar to Figure 4, but showing a modification; Figure 6 is a section taken on the line 6—6 of Figure 5; and Figure 7 is a section taken on the line 7—7 of Figure 6.

The numeral 10 indicates one of the side forms of a roadway, from which pavement separating means extends to a similar form (not shown) at the opposite side of the roadway. As shown in the drawing, this means consists of an expansion joint 11, conventionally illustrated. Formed in the joint at uniform intervals are openings 12 for the reception of dowels 13, the purpose of which, as is well known in the art, is to prevent relative vertical movement of the blocks of concrete at either side of the joint. At each side of the joint, a spacing bar 14 is located near the ends of the dowels.

Secured to each of the spacing bars are chair elements, the number of which required for each bar is one-half the number of dowels in the assembly. Each chair element comprises a pair of vertical members 15 and 16 forming one end of the chair and welded to the spacing bar. These members are connected by a loop 17 surrounding one end of one of the dowels. The member 15 terminates in a ground stop 18 which extends along the subgrade to a point nearly under the adjacent dowel, its end being bent up to form a vertical member 19 which is welded to the bar. The vertical member 16 is extended down a short distance below the ground stop in order to enter the subgrade a sufficient distance to provide anchoring means.

Welded to the spacing bar near the vertical member 19 is an expansion sleeve 20 provided with a distortable spacing member 21 (Figure 3). This sleeve is the same in construction and function as that disclosed in my prior application above referred to. Welded to the spacing bar between the sides of loop 17 is a dowel stop. This stop is formed from a strip or bar of metal bent into U-shape. It comprises a bottom 22 welded to the bar, an end 23 and a top 24 extending over the dowel. The top is bent transversely to conform to the periphery of the dowel. The stop thus not only prevents longitudinal movement of the dowel but also prevents any lateral turning or twisting movement of the dowel in the stop so that the axis of the dowel is maintained at an angle of 90 degrees to a vertical plane passing through the axis of the spacing bar. The distance between the bottom 22 and top 24 is made slightly less than the diameter of the dowel as indicated by broken lines in Figure 6. This construction provides for frictional engagement between the dowels and the spacing bars. To provide for this elastic expansion of the stop, the end 23 may be provided with a slight bend or crease 25. To facilitate the insertion of the dowel into the restricted opening of the stop, the inner ends of its top and bottom members are flared.

In case the assembly is used in cooperation with a contraction joint, the expansion sleeves are not necessary. In this case the modified form shown in Figure 5 is preferably used. In this form the upper end of member 19 is bent into a loop 17' between the arms of which one of the dowel stops is welded to the spacing bar. This stop performs the same function as sleeve 20 in the form first described.

In using my assembly, the dowels are first centrally located in the expansion joint or other pavement separating means. The spacing bars are then applied to the ends of the dowels to

form a complete assembly. This operation may be performed at any convenient point and the complete unit transferred to its ultimate position on the subgrade of the roadway. As the dowel stops are held in frictional engagement with the dowels, the assembly is maintained in proper relation during transfer without the use of tie wires or other fastening means. As both ends of each dowel are engaged by means preventing twisting or turning movement relative to the spacing bars, not only are the dowels maintained in strict parallelism but their rectangular relation to the joint is insured. The use of the chair elements with relatively long ground stops insures adequate support for both ends of each dowel. Further it imparts great rigidity to the supporting means and enables it to be adapted to conform accurately to the contour of the subgrade.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, the combination with pavement separating means, of a plurality of dowels extending through said means at right angles thereto, a spacing bar positioned a substantial distance from each side of said means, dowel stops arranged on the spacing bar to engage the ends of alternate dowels, and chair elements rigidly secured to the bar and engaging alternate dowels, said chair elements each including a ground stop conforming to the contour of the subgrade and extending a substantial distance along the subgrade.

2. In a device of the class described, the combination with pavement separating means, of a plurality of dowels extending through said means at right angles thereto, a spacing bar at each side of the means and spaced therefrom, dowel stops carried by the spacing bars and engaging the ends of the dowels, chair elements rigidly secured to the bar, said chair elements each including three supporting members extending downwardly from the bar, a ground stop integral with two of the supporting members and conforming to the contour of the subgrade, a loop extending above the spacing bar and formed integral with one of said pairs of supporting members and the third supporting member, and a dowel stop secured between the sides of the loop.

3. In a device of the class described, the combination with pavement separating means, of a plurality of dowels extending through said means at right angles thereto, a spacing bar at each side of the means and spaced therefrom, dowel stops carried by the spacing bars and engaging the ends of the dowels, chair elements rigidly secured to the bar, said chair elements each including three supporting members extending downwardly from the bar, a ground stop integral with two of the supporting members and conforming to the contour of the subgrade, a loop extending above the spacing bar and formed integral with one of said pairs of supporting members and the third supporting member, and a dowel stop secured between the sides of the loop, said third member projecting below the ground stop to form anchoring means.

4. In a device of the class described, the combination with pavement separating means, of a plurality of dowels slidingly mounted in and extending at each side of said means, a spacing bar positioned a substantial distance from said means, and a U-shaped dowel stop rigidly carried by said bar and comprising top and bottom plates, one of said plates being transversely curved to conform to the periphery of the dowel, whereby skewing movement between the dowel and the bar is prevented.

5. In a device of the class described, the combination with pavement separating means, of a plurality of dowels slidingly mounted in and extending at each side of said means, a spacing bar positioned a substantial distance from said means, and a U-shaped dowel stop rigidly carried by said bar and comprising top and bottom plates, one of said plates being transversely curved to conform to the periphery of the dowel, whereby skewing movement between the dowel and the bar is prevented, the distance between said members when the stop is disengaged from the dowel being less than the diameter of the latter, whereby said parts are held in frictional engagement.

BENGT F. FRIBERG.