May 8, 1951 W. E. BRADBURY 2,552,365

DOWEL ROD AND SEALING MATERIAL SUPPORTING UNIT FOR JOINTS IN CONCRETE

Filed Nov. 12, 1946 2 Sheets-Sheet 1

Fig. 1.

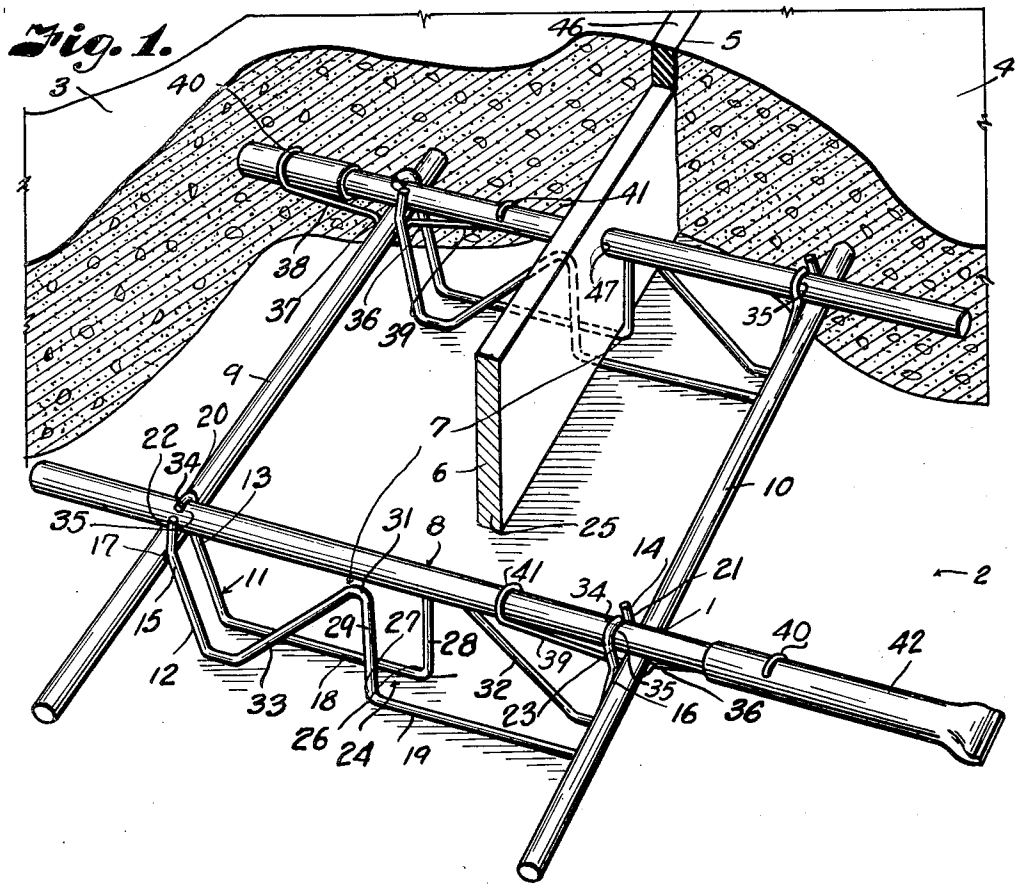
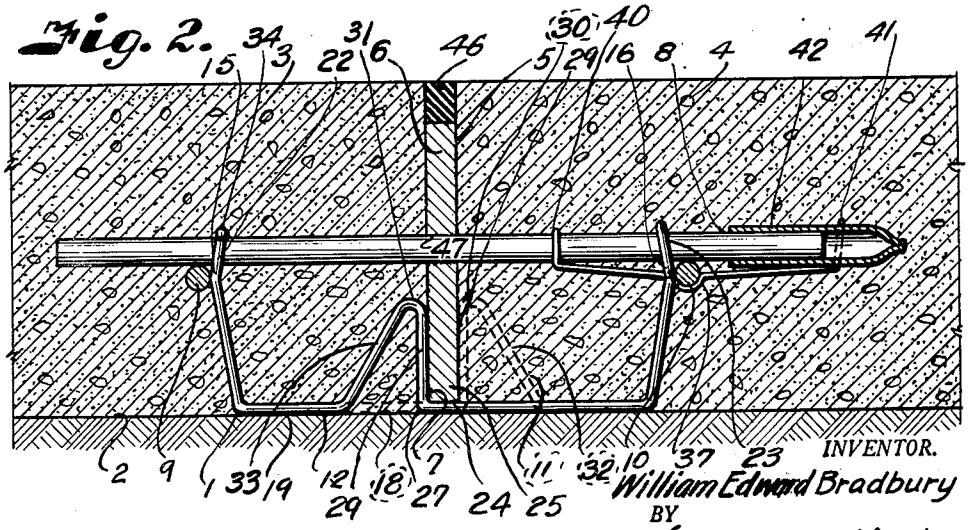


Fig. 2.



INVENTOR.
William Edward Bradbury
BY
Fishburn & Mullendore,
ATTORNEYS

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Fig. 3.

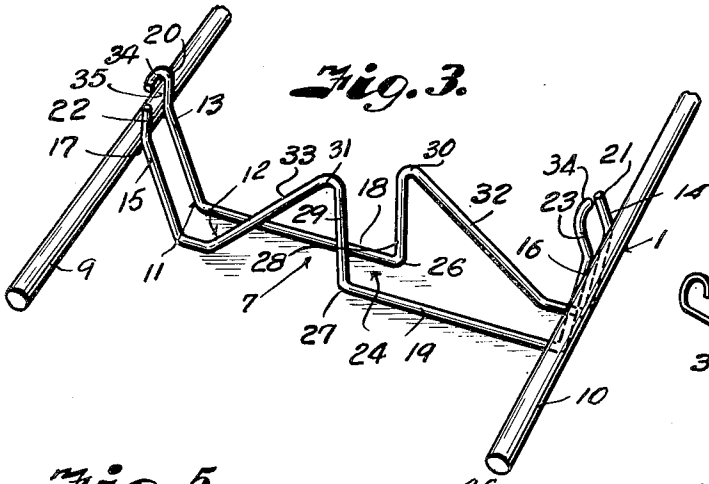


Fig. 4.

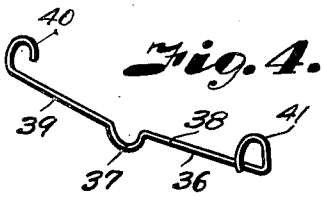


Fig. 5.

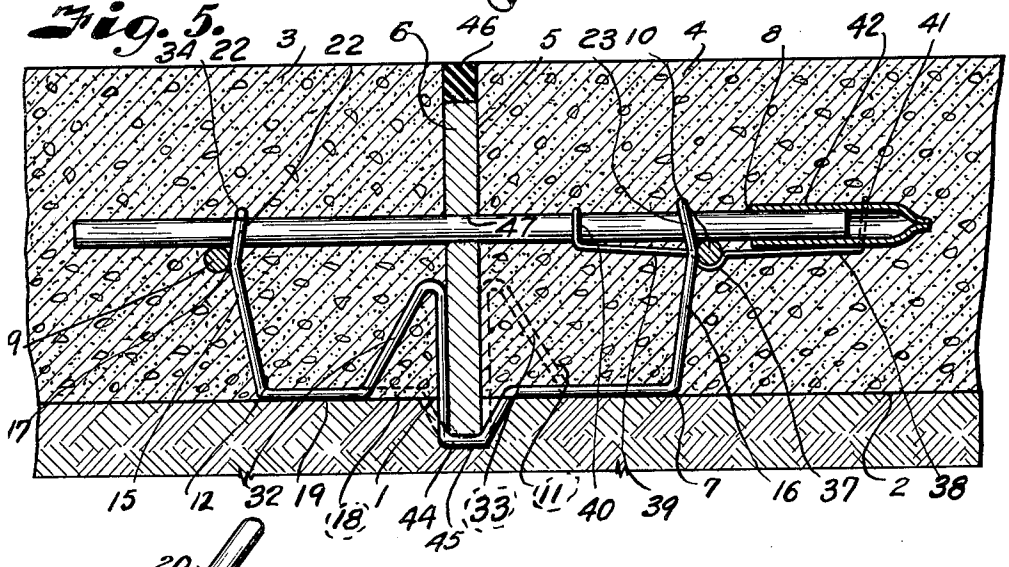
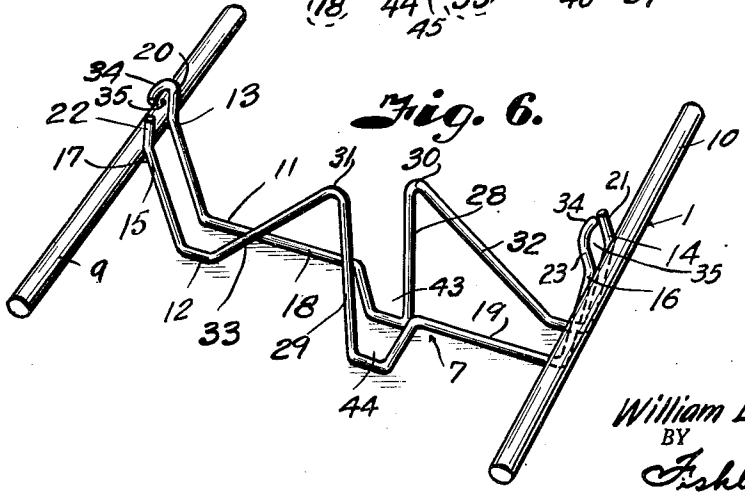


Fig. 6.



INVENTOR.
William Edward Bradbury.
BY
Fishburn + Mullendore,
ATTORNEYS.

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DOWEL ROD AND SEALING MATERIAL SUPPORTING UNIT FOR JOINTS IN CONCRETE

William Edward Bradbury, Kansas City, Kans., assignor to Sheffield Steel Corporation, Kansas City, Mo., a corporation of Ohio

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2 Claims. (Cl. 94—8)

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This invention relates to joints between sections of concrete slabs and particularly to a dowel rod and sealing material unit that is adapted for supporting adjacent slabs or sections of concrete in surface alignment during expansion and contraction and to support a joint sealing material.

The principal objects of the present invention are to provide an efficient, strong, light-weight unit of simple construction and which supports and maintains dowels in parallel alignment so as to effect free action during expansion and contraction.

Other objects of the invention are to provide for better side support of the slab division member during pouring of the concrete; to provide a dowel chair assembly which is adapted to be nested for shipping; and to provide ready insertion and anchorage of the dowel assemblies in the chair unit.

Other objects of the invention are to provide a paving joint structure which simplifies manufacture of the parts and assembly thereof; and to provide structural parts that are readily adapted to divider boards of various thicknesses as well as to dowel rods of various spacing and size.

In accomplishing these and other objects of the invention hereinafter pointed out I have provided improved structure, the preferred form of which is illustrated in the accompanying drawing wherein:

Fig. 1 is a perspective view of a portion of a dowel rod and sealing material supporting unit embodying the features of the present invention, portions of the adjacent concrete slabs being broken away to better illustrate the construction.

Fig. 2 is a cross section through the unit showing installation thereof.

Fig. 3 is a fragmentary perspective view of a portion of the unit showing one of the dowel rod chairs with the dowel rod and sealing material removed.

Fig. 4 is a perspective view of one of the spring clips for retaining the dowel rods.

Fig. 5 is a cross section similar to Fig. 2 but showing a modified form of the invention.

Fig. 6 is a fragmentary perspective view of the modified form of unit shown in Fig. 5.

Referring more in detail to the drawings:

1 designates a dowel rod and sealing material unit adapted to be supported on a subgrade 2 on which adjacent concrete sections or slabs 3 and 4 are poured as in standard highway construction. The slabs 3 and 4 are spaced apart

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as indicated at 5 to compensate for expansion and contraction, the division being maintained by a divider member 6 carried by dowel chairs 7 and through which dowel rod assemblies 8 are adapted to extend when the unit is assembled preparatory to pouring of the concrete.

The chairs are connected by laterally spaced rods 9 and 10 that are supported above the surface of the subgrade at the desired level by means of the chairs the chairs being located at suitably spaced intervals along the length of the rods 9 and 10. Each chair includes laterally spaced substantially parallel rod wire-like members 11 and 12 having ends or leg portions 13—14 and 15—16 welded to the rods 9 and 10 on the facing sides thereof as indicated at 17 and which extend downwardly and inwardly to terminate in connecting bar portions 18 and 19 adapted for support on the surface of the subgrade. The portions 13—14 and 15—16 thus diverge outwardly to permit nesting of the units as later described. The terminals of the wires 11 and 12 extend upwardly above the welds and form fingers 20, 21, 22 and 23 to support the dowel rod assemblies 8. When the welds are made the rods and wires press into each other and in order to nest the units the fingers are inclined inwardly as shown in Fig. 2 at a suitable angle; for example, 10 degrees relative to the perpendicular. The leg portions 13—14 and 15—16 may extend at a similar angle so as to facilitate nesting of the chair units. The cross bar portions 18 and 19 are formed to provide seats 24 for receiving the lower edge 25 of the divider 6. The seats 24 are formed by providing the bar portions with upward bends on the respective sides of the median line of the seats as at 26 and 27 to form vertical portions 28 and 29 to engage the respective side faces of the member 6. The upper ends of the portions 28 and 29 curve outwardly as at 30 and 31 to join with the horizontal portions near the legs 14 and 15 in brace portions 32 and 33. The brace portions thus provide for substantial support of the seat forming portions and maintain perpendicular position of the member 6. The height of the portions 28 and 29 may vary according to the requirements but preferably extend upwardly along sides of the divider member 6 a distance to maintain the stability thereof.

One finger on each wire of a chair is provided with hook-like lateral terminals 34 extending toward the opposite end of the other wire to provide loop-like guides 35 in which a dowel rod is supported. The dowel rods are retained from sliding movement in the guides 35 by spring clips

36 in the form of a wire having an arcuate portion 37 engaging under the bars 9 and 10 and which has resilient ends 38 and 39 terminating in oppositely directed hooks 40 and 41 for engaging over the dowel rods on opposite sides thereof as shown in Fig. 1. Each dowel rod is provided preferably on the end thereof with a tube 42 into which the rod is free to slide when the concrete expands and contracts.

The form of the invention shown in Figs. 5 and 6 is substantially the same as that just described with the exception that cross wires are provided with downset portions 43 and 44 that extend below the surface of the subgrade. Thus, when the divider member is placed therein the lower edge extends transversely through a groove 45 formed in the subgrade as shown in Fig. 5. The divider member 6 may be formed of any suitable material such as steel strip, composition treated material sold under the trade name of "Celotex," wood or the like and is preferably of a height to terminate short of the upper surface of the slabs to accommodate a plastic sealing material such as an asphalt product 46 therein and which is adapted to maintain the joint between the joints of concrete during the expansion and contraction.

In manufacturing, the chair wires are readily formed to provide the desired spacing of the bars 9 and 10 and to provide the spacing between the upward bends 26 and 27 to accommodate divider members of a certain specified thickness merely by changing the points at which the respective bends are made. The chair wires are also attached to the bars 9 and 10 to conform with a specified spacing and size of dowel rods. The units thus connected are shipped to the job in nested position which nesting is possible due to the angularity of legs and terminals of the chair wires. When nested the bars 9 and 10 of a superimposed unit are resting upon the corresponding bars of the underlying unit.

In installing the units, they are placed transversely across a highway in parallel registry with the joint to be formed in the concrete. The divider members 6 are then inserted in the seats 24 so that they are supported between vertical wire portions 28 and 29. The dowel rods 8 are then inserted by sliding the ends thereof through one of the guides 35, then through the openings 47 in the divider board and through the opposite guides 35. The dowel rods 8 are preferably inserted so that the socket carrying ends are arranged reversely on alternate dowel rods as shown in Fig. 1. The clips 36 are then applied to the socket carrying ends of the dowel rods so that the curved portion 37 engages under the transverse rods 9 and 10 with the hooks 41 extending over the dowel rods and the hooks 40 extending over the tubes 42 to prevent sliding of the dowel rods in the guides and the tubes 42 on the dowel rods.

When the unit is thus assembled, the divider boards 6 are firmly supported so that the concrete may be poured without danger of disarrangement. The concrete is poured and a groove is formed in alignment with the upper edge of the divider strip for receiving the plastic sealing material 46. Upon expansion of the concrete the slabs tend to move together and squeeze the sealing material 46 out of the groove during which movement the divider member is compressed. Upon expansion, the slabs of concrete move apart and the sealing material 46 adhering to the sides of the joint is drawn thereinto. It may be necessary to replace the sealing material from time to time as in present practice.

From the foregoing it is obvious that I have provided a dowel rod and divider member support which is of simple construction and adapted for nesting to facilitate shipping and handling and which effectively supports the dowel rods and divider board when the units are placed and during the time required for pouring and setting of the concrete.

What I claim and desire to secure by Letters Patent is:

1. A dowel rod and sealing material supporting unit for joints in concrete, including spaced parallel rods, and spaced transverse chairs interconnecting the rods, each chair comprising a pair of laterally spaced wire members, each wire member including leg portions having connection with and extending downwardly from the respective rods with one of said leg portions terminating in a horizontal footing portion having a right angle bend forming a vertical portion in said wire member, said other leg portion of the wire member terminating in a brace portion connected with the upper end of said vertical portion, said wire members of each pair being reversely arranged with respect to each other and the horizontal footing portions being of a length to lap each other and position said vertical portions in spaced apart relation to cooperate with the lapping portions in forming supports adapted to seat and embrace a joint sealing strip when said unit is in use, said leg portions of said wires having ends projecting above said rods to provide seats adapted to receive dowel rods therebetween.

2. A dowel rod and sealing material supporting unit for joints in concrete, including spaced parallel rods, and spaced transverse chairs interconnecting the rods, each chair comprising a pair of laterally spaced wire members, each wire member including leg portions having connection with and extending downwardly from the respective rods with one of said leg portions terminating in a horizontal footing portion having a right angle bend forming a vertical portion in said wire member, said other leg portion of the wire member terminating in a brace portion connected with the upper end of said vertical portion, said wire members of each pair being reversely arranged with respect to each other and the horizontal footing portions being of a length to lap each other and position said vertical portions in spaced apart relation to cooperate with the lapping portions in forming supports adapted to seat and embrace a joint sealing strip when said unit is in use, said leg portions of said wires having ends projecting above said rods to provide seats adapted to receive dowel rods therebetween, one of said projecting ends having a hook extending toward the other projecting portion.

WILLIAM EDWARD BRADBURY.

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