Nov. 4, 1958 A. F. CRONE 2,858,749

HIGHWAY JOINT CONSTRUCTIONS

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Fig. 1.

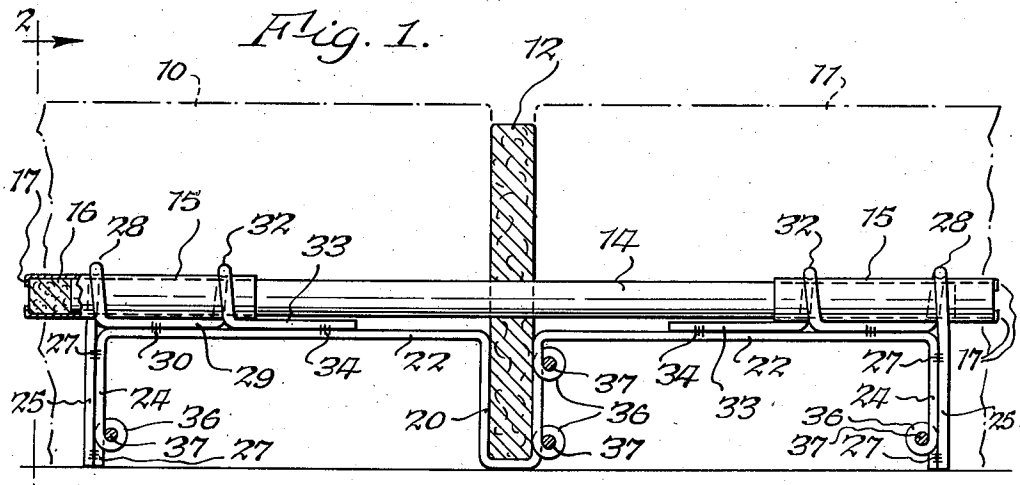
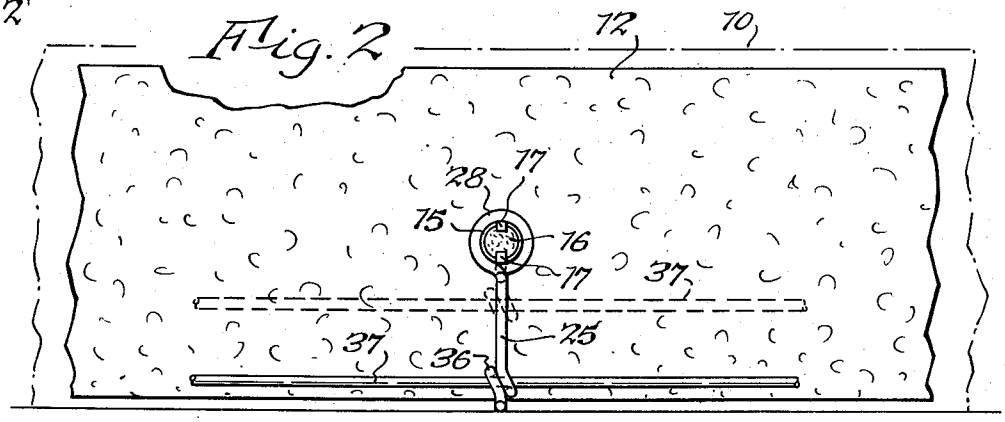


Fig. 2



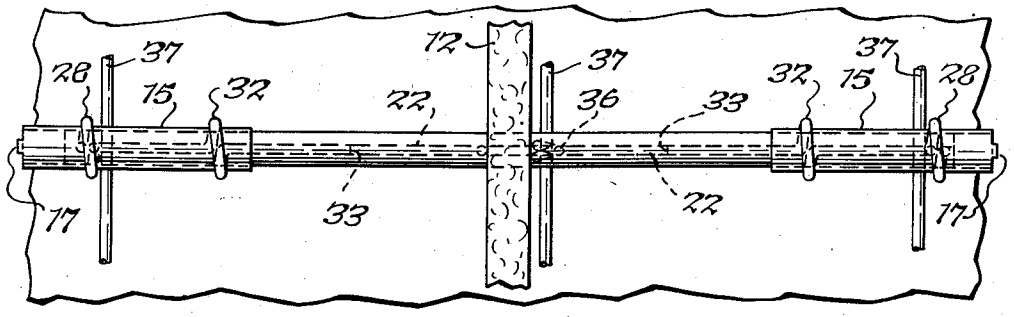


Fig. 3.

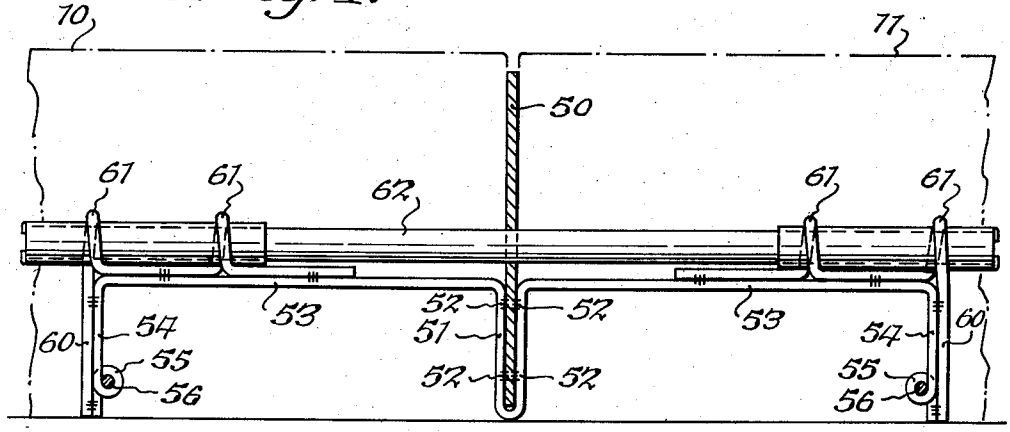
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Fig. 4.



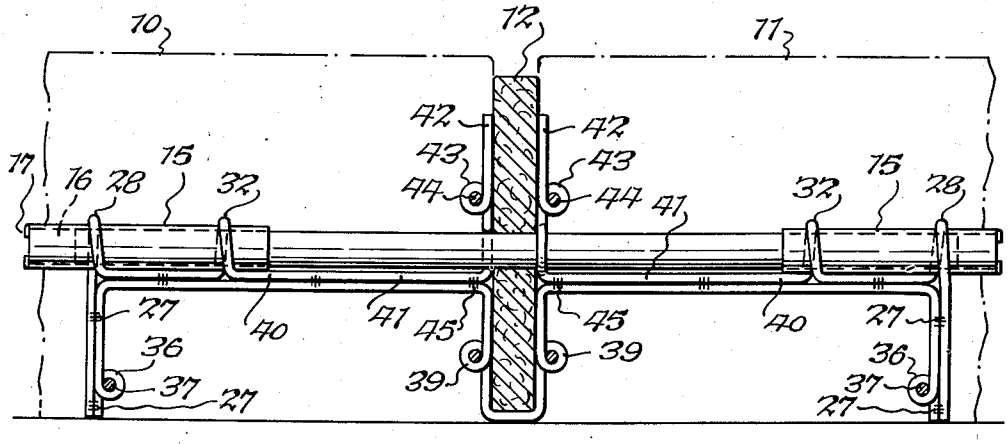


Fig. 5.

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HIGHWAY JOINT CONSTRUCTIONS

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6 Claims. (Cl. 94—17)

This invention relates to improvements in highway joint constructions of the type which includes dowels which are to be embedded in the ends of two adjacent pavement slabs to maintain surface alinement of the slabs, and a web extending crosswise of the highway between two slabs.

In highway constructions of this type it is necessary to provide means for supporting the web and the dowels in correct relation to the highway subgrade while the slabs are being poured. These supporting means for the web and dowels are not depended upon to impart any substantial strength to the finished pavement, but are merely temporary supporting means for the web and dowels and may become corroded or disintegrated after the highway has been completed. These supporting means also serve the purpose of forming with the web and the dowels a relatively rigid structure which can be easily picked up and moved into the desired position on the subgrade of the highway.

It is one of the objects of this invention to provide stable supporting means for the webs and dowels which can be readily and inexpensively produced and which can be easily assembled with the necessary dowels and the web.

A further object is to provide a supporting device of this type which may be made entirely of wire rod stock bent to receive the dowels and support the web.

A further object is to provide a supporting device of this type made of units, each of which has a saddle in which a web may be seated and loops through which the dowels may extend to simultaneously support the dowels and web.

Another object is to provide a supporting device of this type in which the units are also provided with loops through which rods may extend parallel to the web member for connecting a series of units to form the supporting means.

Other objects and advantages will be apparent from the following description of some embodiments of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompany drawings:

Fig. 1 is a transverse, sectional elevation of a highway joint construction provided with supporting means embodying this invention.

Fig. 2 is a sectional elevation thereof on line 2—2, Fig. 1.

Fig. 3 is a fragmentary, top plan view thereof before the concrete or other paving material has been poured.

Fig. 4 is a transverse sectional elevation of a load transfer device of modified construction showing my improved supporting member adapted for use in connection with a contraction joint.

Fig. 5 is a transverse, sectional view showing a supporting device of another modified construction.

In Figs. 1–3 and 5, I have shown by way of example one type of pavement joint with which my improved supporting device may be employed, that shown being an expansion joint arranged between two pavement slabs **10** and **11**. These slabs are preferably separated by means of a joint filler or web **12** which may be made of any suitable or desired compressible material, so that when the pavement slabs expand, for example, due to the heating of the pavement, the web **12** will yield sufficiently to compensate for the reduction in the gap between the two pavement slabs, and when the slabs contract, the joint filler or web **12** will again resume its normal shape and fill the gap between the two slabs.

The load transfer device shown also includes a number of dowels **14** which extend through suitable holes in the web **12** and into the adjacent ends of the two slabs **10** and **11**. These dowels are generally arranged approximately midway between the upper and lower surfaces of the pavement slabs so as to transfer loads imposed on one pavement slab to the other pavement slab, and thus keep the adjacent surfaces of the two slabs substantially in alinement. These dowels may be provided at one or both ends thereof with caps **15**, two such caps being shown in the construction illustrated, although generally one cap is sufficient. These caps may be of any suitable construction but are tubular in shape to fit closely about the ends of the dowels and are provided at their outer ends with bushings **16** held in place by means of turned-over end portions **17** of the caps **15**. These bushings **16** may be made, for example, of the material punched out of the joint filler **12** to form holes through which the dowels **14** may extend.

Obviously it is necessary to provide means for supporting the web or joint filler **12** and the dowels in correct relation to the subgrade of the highway before and during the pouring of the concrete of the slabs **10** and **11**, and for this purpose I have provided supporting means which include a supporting unit for each dowel. These units are preferably made of rod stock and each unit includes a base member which is bent intermediate of its ends to form a U-shaped saddle **20**, the upper legs of which are spaced apart to the desired extent to receive the web **12**. The lower end of the U-shaped middle portion or saddlde **20** rests upon the subgrade of the pavement. At the upper ends of the sides of the U-shaped part or saddle, the rod or web, of which the base member of this support unit is made, is bent outwardly to form the raised parts **22** which extend approximately horizontally in opposite directions from the web or joint filler **12** and underneath a dowel **14**. The outer ends of these intermediate parts **22** of the base member are bent downwardly to form legs **24**, the lower ends of which also rest on the subgrade of the pavement.

Suitable means are also provided for supporting the dowel **14** on the base member and these means may be of any desired construction. As shown in the drawing, I have provided additional wire or rod members at opposite ends of the base member. Each of these securing members includes a straight, upwardly extending part **25** arranged in immediate proximity to a leg **24** of the base member and suitably secured thereto, for example, by means of welds **27**. These parts **25** consequently also serve to reinforce the legs **24** and thus make it possible to construct the base member of stock of smaller diameter. At their upper ends the parts **25** of the securing members are bent to form one or more loops **28** through which the dowel **14** may pass. These loops terminate in a horizontally extending path **29** arranged alongside and above the intermediate parts **22** of the base member and may be secured thereto by welding, as indicated at **30**.

If it is desired to further support the dowel, each securing member may be provided with an additional loop **32** terminating in another horizontally extending part **33** arranged in proximity to the part **22** of the base member

and welded thereto, as shown at 34. Each dowel therefore in the construction shown extends through two loops of each securing member and thus rigidly secures the dowel in correct relation to the supporting unit, and the dowel, because of its connection with the web 12, also cooperates with the saddle part 20 of the base member to securely hold the web and dowel in correct relation to each other on a unit.

In order to connect a plurality of these support units so that a complete load transfer member may be transported from the place in which it is assembled into accurate position on the road bed, I provide a plurality of stringers or rod members 37 which are suitably connected with each support unit. For this purpose I provide the base member of each unit with a plurality of loops 36 through which stringers 37 extend, two loops being provided on the legs 24 in the particular construction illustrated by way of example, and one or both sides of the saddle 20 may also be provided with these loops, two being shown at one side of the saddle in the construction shown in Figs. 1 and 3.

In Fig. 5 the saddle part 38 is provided with loops 39 on both of the upstanding legs thereof. The modification of my improved supporting unit shown in Fig. 5, shows securing members 40 which are similar to those shown in Figs. 1–3, except that the horizontally extending portions 41 of the securing members are elongated and extend to the web 12 and then upwardly around the dowels along opposite sides of the web. These upwardly extending parts 42 may, if desired, be provided with loops 43 for stringers or rods 44 extending substantially parallel with the web 12. The extensions 41 of the securing members may be welded to the horizontally extending portions 22 of the base member by means of welds 45. By means of this construction the web 12 is more securely supported against breakage due to pressure which may be exerted either during handling of the assembled joint support or during pouring of the pavement slabs.

My improved supporting members may also be used in connection with contraction joints as shown in Fig. 4, in which the web 50 is in the form of a relatively thin steel plate which serves mainly the purpose of forming a plane of weakness in the pavement along which the two pavement slabs 10 and 11 will become separated from each other when these webs are contracted. When used in a construction of this type, my improved supporting units include a saddle portion 51 of U-shape into which the web or plate 50 may extend. In this construction the two sides of the saddle portion 51 may be welded or otherwise secured to the web, as indicated at 52. Consequently, longitudinal stringers need not be provided on the saddle portion since the web 50 is of ample strength to replace the stringers. The base member includes the horizontally extending portions 53 which terminate at their outer ends in downwardly extending legs 54, and these legs are preferably provided with loops 55 through which stringers 56 extend.

The members for securing the dowel to the base member may be similar in construction to that shown in Figs. 1–3, each securing member including an upwardly extending leg 60 preferably welded to a leg 54 and loops 61 extending about the dowel 62. The dowel, of course, extends through a suitable hole in the web, as in constructions heretofore employed. The horizontally extending portions of the securing members may be secured to the horizontal parts 53 of the base member by welding, as described in connection with Figs. 1–3.

The supporting units herein described are arranged at intervals lengthwise of the web so as to be located beneath the dowels, and these supporting units when connected with the longitudinal stringers and with the dowels extending through the loops thereof, form secure supporting means for the assembled load transfer members so that they can be readily carried about and accurately located on the subgrade of a highway. These supporting units can be accurately formed by means of bending machines so that they may be easily and efficiently produced. By welding parts of the securing members to parts of the base members, the latter members are reinforced so that they have ample strength to support the legs and greatly increase their resistance to bending about their connections with the horizontal, intermediate parts when subjected to rough handling.

It will be understood that various changes in the details, materials and arrangements of parts which have been herein described and illustrated in order to explain the nature of the invention may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. A highway contraction joint including an upright plate formed to extend between adjacent ends of adjacent pavement slabs, a plurality of dowels extending through holes in said plate into positions to be embedded in said slab, supporting means comprising a plurality of units made of bent wire each having a middle portion of U-shape having the upright sides thereof spaced apart and receiving said plate and secured thereto, said units each including downwardly extending legs spaced from said U-shaped part and intermediate parts formed integral with and connecting the upper ends of said legs with said U-shaped part and extending into close proximity to a dowel, securing means holding said dowel in fixed relation to said unit, said downwardly extending legs being provided with loops, and stringers extending through said loops and connecting said units in parallel spaced relationship.

2. A highway contraction joint according to claim 1 in which said securing means include securing members secured to opposite end portions of said units and each including an upright part welded to a leg of said unit and a horizontal part welded to said intermediate part of said unit connecting said U-shaped part and a leg, and including a loop through which said dowel extends.

3. Supporting means according to claim 1 in which said securing means include securing members secured to opposite end portions of said units and each including an upright part welded to a leg of said unit and a horizontal part welded to said intermediate part of said unit and including a loop through which said dowel extends, loops on said legs, and stringers extending through the loops of a plurality of units connecting said units in parallel relationship to form therewith said supporting means.

4. In a load transfer device for a road joint of the type having an upright web and dowels extending through the same, that improvement for supporting said web and dowels on a subgrade of a road prior to pouring slabs, which comprises a plurality of units each including a base member formed of a single piece of rod stock bent to form a central saddle which is adapted to receive parts of two sides and the bottom of said web and adapted to rest on the subgrade, a pair of legs spaced from said saddle and also adapted to rest on the subgrade, intermediate parts extending from the upper ends of said saddle to the upper ends of said legs and arranged to extend into close proximity to a dowel when said base member is assembled with said dowel, securing members for said dowels secured to said intermediate parts and provided with loops through which said dowels extend, said securing members each having a downwardly extending part secured to a leg, and means connecting a plurality of said units with each other in spaced parallel relationship to form a supporting member for the entire load transfer device.

5. A load transfer device according to claim 4, in which said securing members have upwardly extending portions which form substantially extensions of the upwardly extending legs of said saddle and which are provided with loops, and stringers passing through said loops and con-

necting a plurality of said units with each other in spaced parallel relationship to form a support for the entire load transfer device.

6. Supporting means for a load transfer device for a road joint having an upright web adapted to be arranged between pavement slabs and dowels extending through said web, said supporting means including a plurality of units each made of rod stock bent to form a central saddle of U-shaped form formed to rest on the subgrade, a pair of legs spaced from said saddle and adapted to rest on the subgrade, intermediate parts extending from the upper end of said saddle to the upper ends of said legs, dowel-securing members secured to said intermediate parts and provided with loops formed to extend about a dowel, said legs and said saddle being provided with loops, and stringers connecting a plurality of said units to each other in spaced parallel relationship and extending through said loops.

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