Aug. 23, 1960 F. D. CARNES 2,949,828

ROAD JOINTS

Filed Oct. 25, 1957

Fig. 1

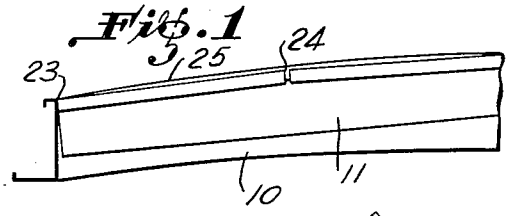


Fig. 2

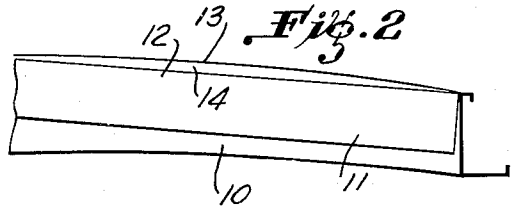
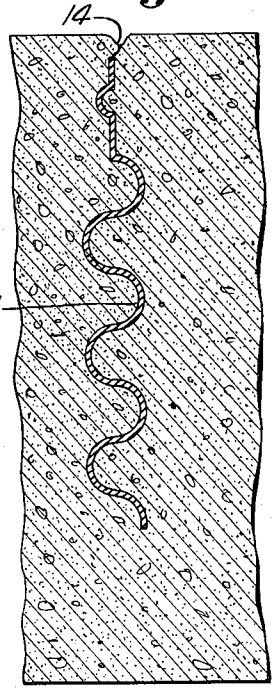


Fig. 6



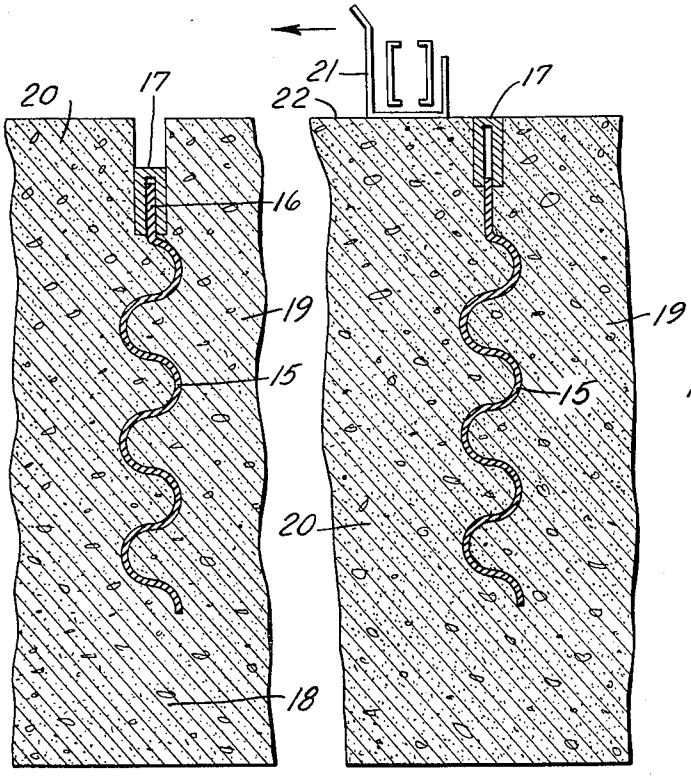


Fig. 4

Fig. 5

Fig. 7

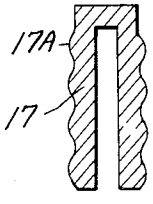
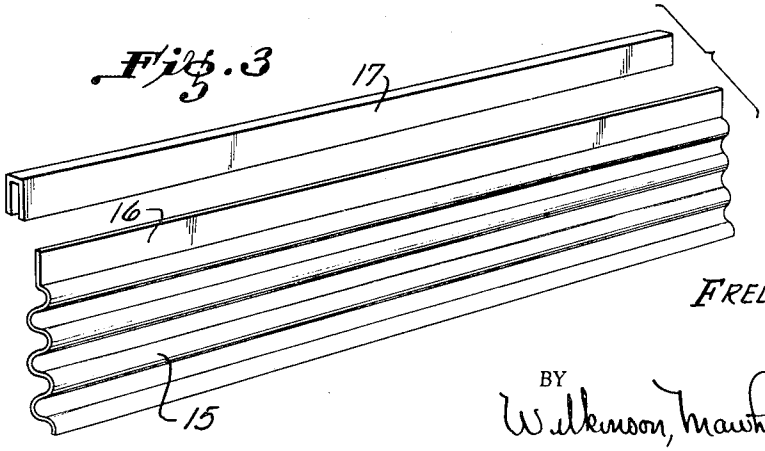


Fig. 3



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ROAD JOINTS

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2 Claims. (Cl. 94—22)

The present invention relates to road joints and more particularly to the type of road joint employing a corrugated load-transfer device. Heretofore, in constructing concrete highways in which corrugated load-transfer devices were installed by various methods or by a machine in accordance with United States Letters Patent No. 2,729,152, granted January 3, 1956, for "Apparatus for Placing Corrugated Joints in Concrete," it was necessary to recess the corrugated load-transfer device approximately a quarter inch below the surface of the slab. This caused objectionable spalling and the passage of the screed over the joint in the finishing operation displaced the metal. The load-transfer corrugated member itself did not provide even a partial sealing of the joint and the corrugated load-transfer member being straight from end to end contained no provision for crown.

By adopting the method and the process and apparatus of the present invention, namely adding the cap member of road joint material to the load-transfer device or road joint member, it can be seen that the major difficulties and objections set out hereinabove will be eliminated. The load-transfer member may be recessed to approximately a half inch or more below the slab surface where it will not be displaced by the finishing screeds or the longitudinal float in the final finishing operation. This will reduce spalling and provide a better seal joint. Easing of the tolerance factor will reduce the labor required on the machine to the extent that additional personnel will not be necessary and those heretofore necessary may be used for other work.

The cap member of road joint material when raised to the surface behind the longitudinal float will prevent spalling of the joint and provide a seal against moisture and water entering the joint, freezing, expanding and breaking the joint. The cap member of road joint material being in four sections more or less across the roadway may be raised flush with the slab surface at five or more points which will more closely match the crown of the finished slab surface. This will, of course, reduce spalling and provide much better seal.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views:

Figure 1 is a half-transverse section of a road bed in which a corrugated load-transfer device with cap member constructed in accordance with the present invention is shown installed.

Figure 2 is a complemental portion of a road bed section showing the installation of a corrugated load-transfer member in accordance with the prior art.

Figure 3 is a fragmentary exploded perspective view of a corrugated load-transfer member and cap member of road joint material.

Figure 4 is a fragmentary transverse section of a corrugated road joint member and cap vibrated into position in a plastic mix prior to finishing.

Figure 5 is a view similar to Figure 4 showing the cap member elevated behind a finishing screed wherein the cap is brought to substantially surface level to provide a sealed joint in accordance with the present invention.

Figure 6 is a fragmentary transverse section of the corrugated road joint member of Figure 2 in set position in a road bed in accordance with the prior art.

Figure 7 is a transverse section through one form of cap member of road joint material employed in accordance with the present invention.

Referring more particularly to the drawings and for the moment to Figures 2 and 6, it will be noted that a road slab **10** has been poured and a corrugated load-transfer or road joint member **11** has been set in place therein. The road joint member **11** due to its straight edge **12** does not proximate the contour of the surface of the slab **13** and therefore an area **14** permits spalling and permits moisture or rain or snow or the like to enter the joint. The most serious of these objections is the spalling as shown in Figure 6. The load-transfer member **11**, as shown in Figure 6, is not provided with any sealing member at the top and will permit the breaking down or spalling in the area **14**.

Now referring to Figure 3, the load-transfer device constructed in accordance with the present invention is of corrugated construction shown at **15** and is provided along its upper surface with a flat or slightly deformed plate portion **16** which is adapted to receive thereover a cap member **17** which in the form illustrated is a U or other shaped member but which may be a V-shaped member having been made from bending a strip of road joint material upon itself.

Referring more particularly to Figure 4, it will be noted that the road joint member **15** is shown as having been placed in a monolithic slab or mix **18** and in effect divides the major portion of this monolithic slab into two adjacent slabs **19** and **20**. At this point of installation, the cap member of road joint material **17** is still down on or near the flange or plate **16** of the corrugated road joint member **15**. This installation of the corrugated road joint member **15** shown in Figure 4 is an installation prior to final finishing of the surface of the slab and the road joint member **15** has been vibrated into position by a machine similar to that shown and described in U.S. Patent No. 2,729,152. The joint member **15** may be set up in advance of the pouring of the slab and need not necessarily be vibrated into position but this is one way of installing the road joint member **15**.

As shown in Figure 5, a finishing screed **21** is finishing the surface **22** of the slabs **19** and **20** and this screed is headed in the direction of the arrow in Figure 5. This is to emphasize and illustrate that the cap member **17** is subsequently elevated to the position shown in Figure 5 after the slab surface has been finished. This cap member **17** may be raised with any suitable implement such as tongs or the like. The raising of the cap member **17** is done manually and the cap is elevated until the ends thereof come to the surface of the finished slab at points **23**, **24** which are tangent to the crown of the road, as best seen in Figure 1. This in effect makes the strip or cap member **17** the secant within a portion of the parabolic crown **25** which has been imparted to the slab surface by finishing. In installations where a flat crown rather than a parabolic crown is employed in finishing a slab, the cap member **17** of road joint material will give a complete protection against spalling.

The cap member **17** in its elevated position shown in Figure 5 is allowed to remain in this position permanently and the slab members **19** and **20** set up.

The cap member 17 may be of any suitable road joint material, for instance, it may be of a bituminous asphalt impregnated fiber, it may be of rubber, it may be of a suitable plastic composition. These main requirements are that it be impervious to water, that it be subject to compression and have a certain amount of resiliency to return to its original shape after being subjected to a shock, for instance, upon the passing thereover of a heavily loaded vehicle. As shown in Figure 7, it may be desirable to provide the outer surface of the member 17 with ribs or roughened portions 17A defining a bead-like construction to render the member more suitable as a sealing member against the entrance of moisture between the adjacent slabs.

While I have referred to slabs in this specification, it is to be noted that in effect the concrete roadway is a monolith and that these slabs are not completely out of communication at the time the road joint member 15 is installed. Practice shows that the road slabs beneath the road joint member will crack and form a plane of weakness to permit of expansion and contraction.

Although I have disclosed herein the best form of the invention known to me at this time, I reserve the right to all such modifications and changes as may come within the scope of the following claims.

What I claim is:

1. The process of forming and sealing pavement joints to protect the joints from moisture and the slab areas adjacent to the joint from spalling consisting of first installing in a leveled body of still plastic mix and below the surface thereof a joint member having a relatively vertically movable cap member of joint material carried by said joint member along the top portion thereof, finishing the slab having the joint member and cap member therein with the cap member in its retracted position relative to said joint member, and subsequently elevating the cap member to position the top surface thereof substantially flush with the finished surface of the slab and allowing the slab to harden with the cap member of road joint material permanently set therein to protect the joint against moisture and spalling of the slab areas abutting the joint.

2. The method of forming and sealing pavement joints to protect the joints from moisture and the slab areas adjacent the joint from spalling consisting of first installing in a leveled body of still plastic mix and below the surface thereof a joint member having a relatively vertically movable cap member along the top portion of the joint member, finishing the slab having the joint member and cap thereon while the cap member is in its retracted position relative to said joint member, and subsequently elevating the cap member to a position in which its top surface is substantially flush with the surface level of the finished slab and allowing the slab to harden with the cap member permanently therein to protect the joint against moisture and spalling of the slab areas abutting the joint.

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