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Trieste

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[54] **ELASTOMERIC SEAL POSITIONING SUPPORT CONSTRUCTION**

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[51] **Int. Cl.** **E01c 11/04**

[58] **Field of Search** 404/68, 67, 66, 65, 64, 69, 404/47, 50, 53, 56

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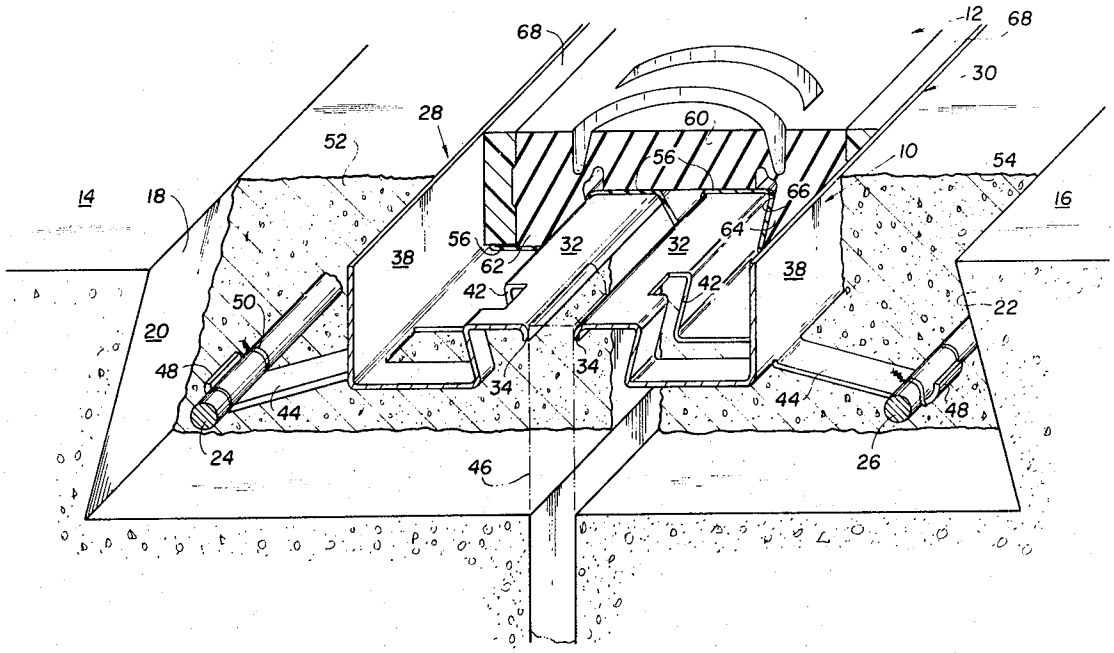
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[57] **ABSTRACT**

A mounting support for a shaped elastomeric seal for a roadway or the like, wherein the support is readily mounted in a clearance position within the roadway expansion joint or void and cement is poured in situ about said support preparatory to the positioning of the elastomeric seal thereon. Eliminated are pre-cast cement blocks and the like which heretofore complicated field installation of the elastomeric seal.

4 Claims, 6 Drawing Figures



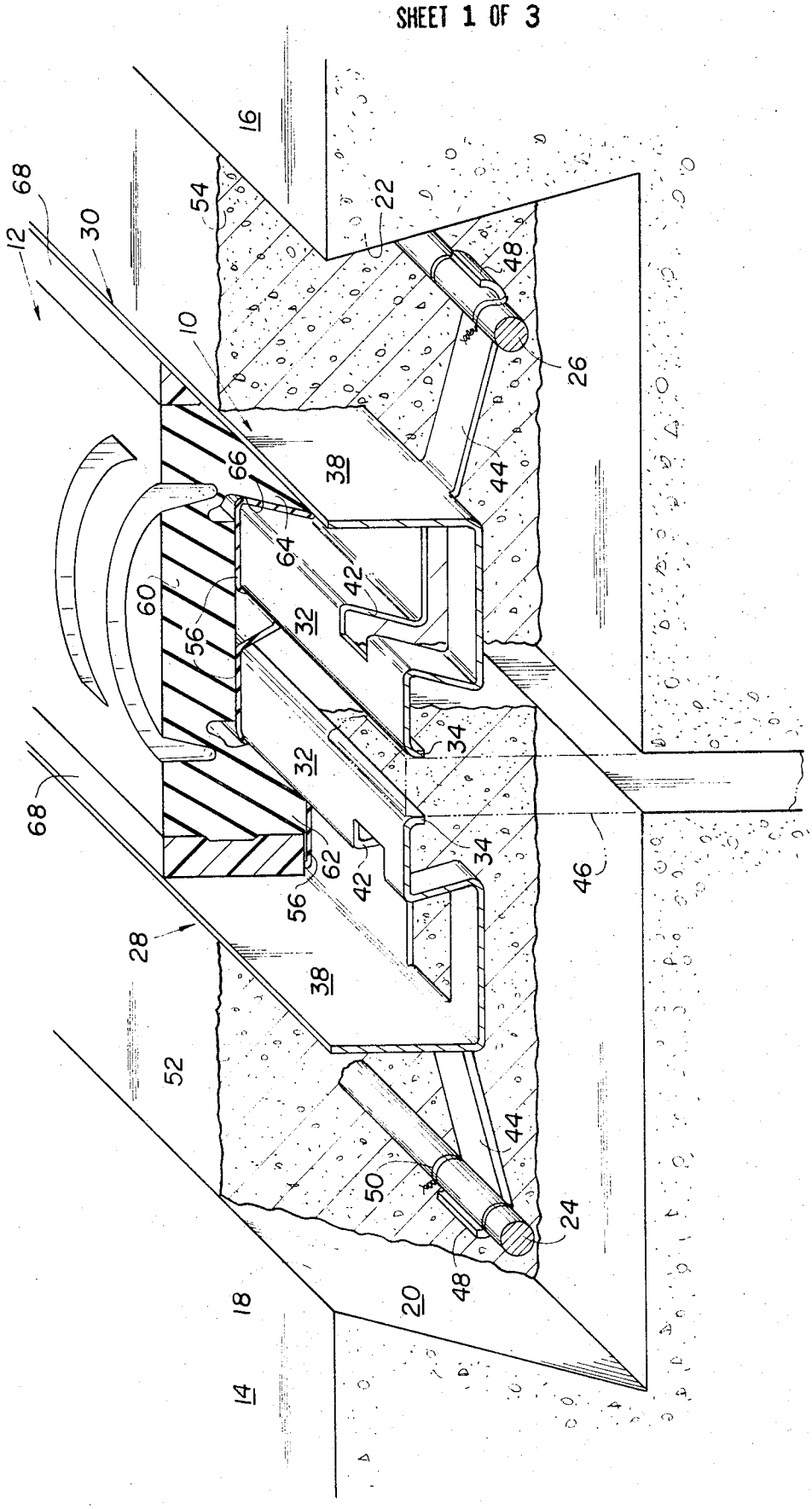

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12
30
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66
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64
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60
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FIG. 1

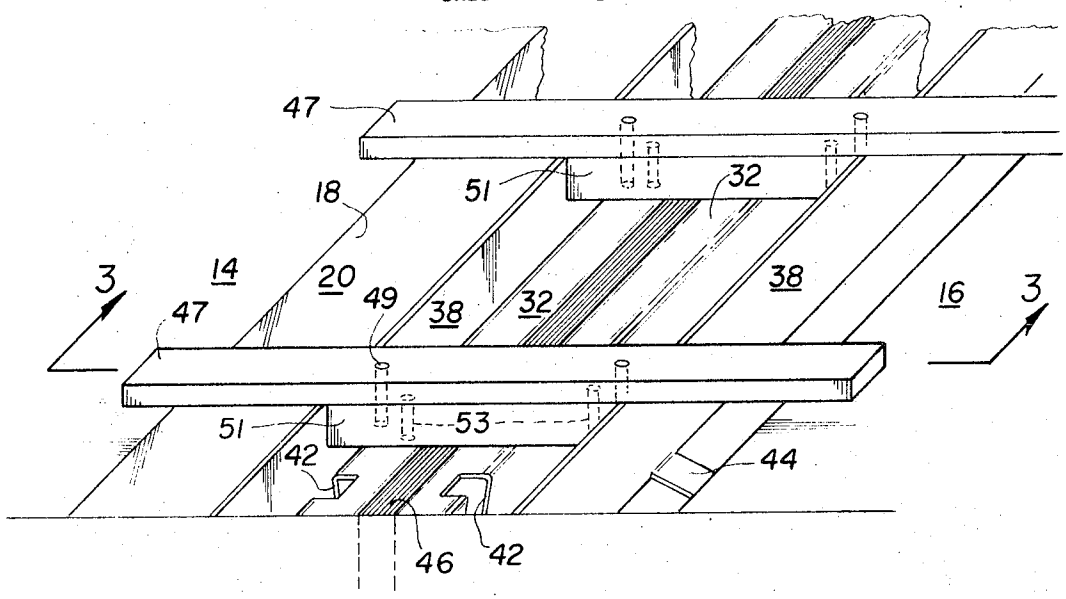

47
18
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FIG. 2

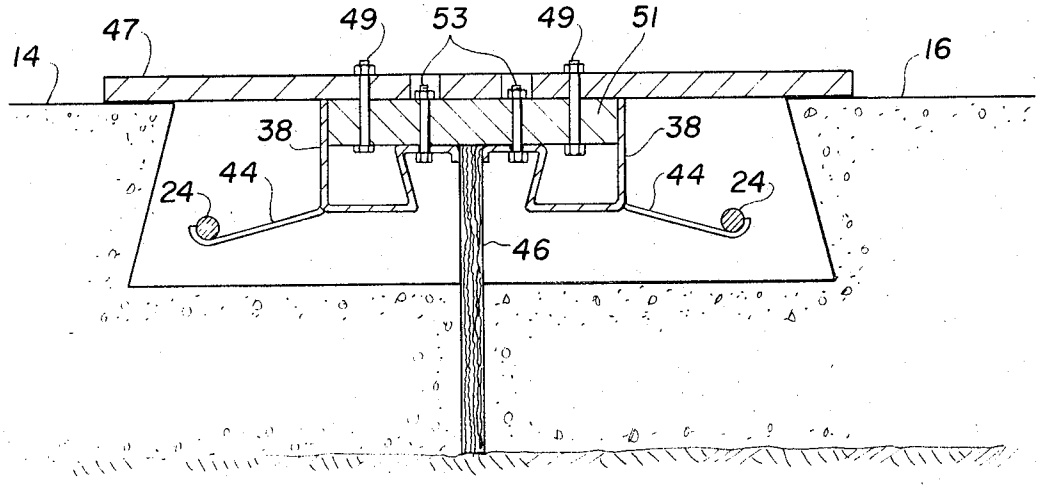

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FIG. 3

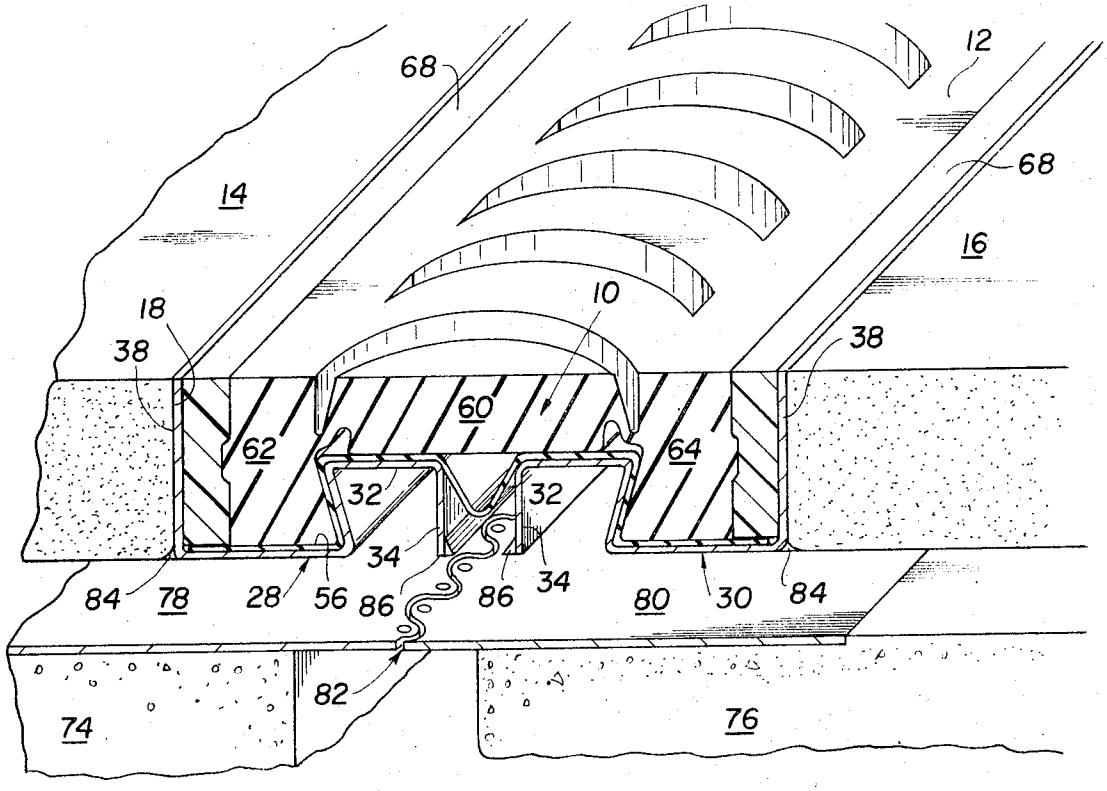


FIG.5

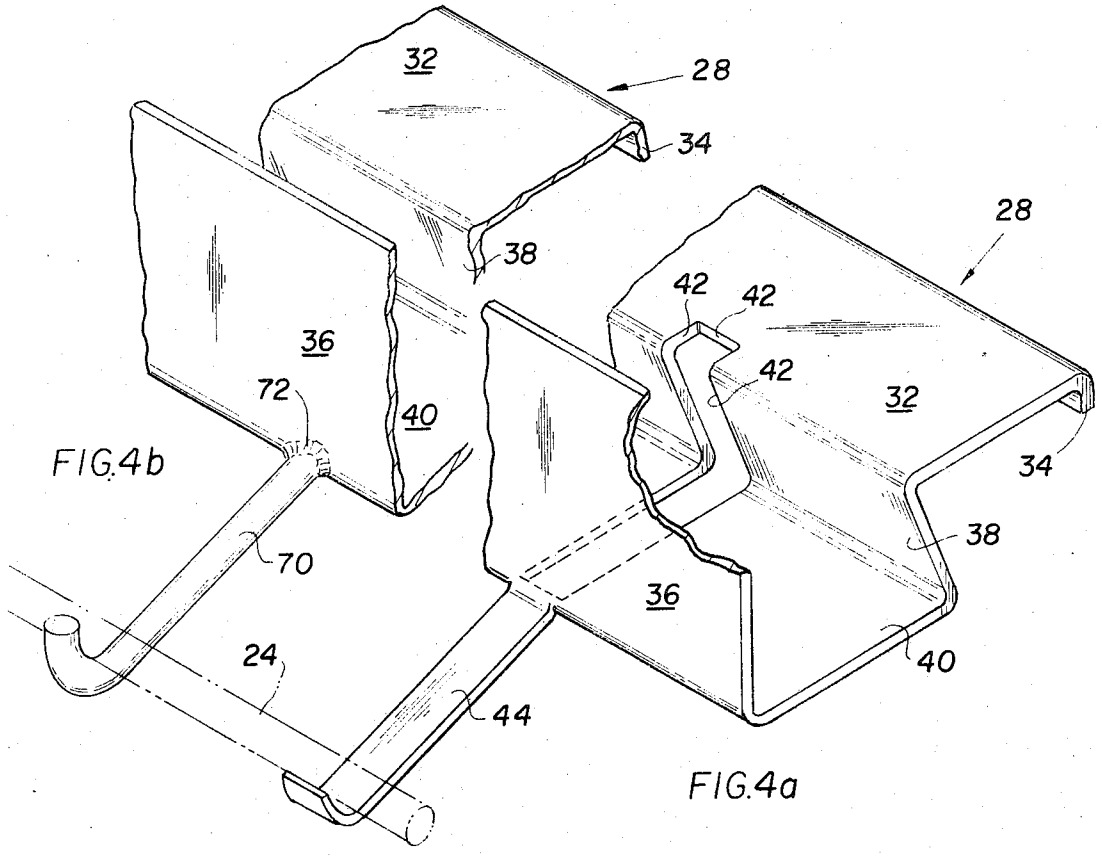


FIG.4b

FIG.4a

ELASTOMERIC SEAL POSITIONING SUPPORT CONSTRUCTION

The present invention relates to roadway expansion joints, and more particularly to improvements which significantly facilitate the field installation of roadway expansion joint seals.

In roadway construction, which may be a highway or on a bridge, provision is made for changes in ambient temperatures and the corresponding expansion and contraction in the roadway concrete caused by these temperature changes by including an expansion joint or void transversely of the roadway at strategic locations therealong. As generally understood, these expansion joints are filled with elastomeric seal members which allow for concrete expansion and contraction without adverse consequence to the load supporting attributes and commercial use of the roadway. All known methods and techniques of making field installation of these elastomeric seal members are not entirely satisfactory for a number of reasons, the primary reason being the need to use pre-cast concrete holding blocks. Such blocks are expensive to make, heavy to handle, and have to be transported from the manufacturing site to the installation site.

Broadly, it is an object of the present invention to provide an elastomeric seal positioning construction which greatly facilitates the field installation of said seal in a roadway or the like and otherwise overcomes the foregoing and other shortcomings of the prior art. Specifically, it is an object to effectuate the installation of a roadway elastomeric seal without any pre-cast cement blocks and using only cement poured in situ at the site of use of the seal.

An embodiment of a roadway seal supporting construction demonstrating objects and advantages of the present invention includes a pair of cooperating spaced support bodies having an appropriate shape, in cross section, to accommodate the seal thereon, said bodies being readily positioned in clearance positions within the expansion joint or void. After said positioning of these support bodies, cement is poured in situ about the same and completes the mounting of these bodies so as to in turn permit the subsequent positioning thereon of the elastomeric seal without any use of pre-cast cement blocks or the like.

The above brief description, as well as further objects, features and advantages of the present invention, will be more fully appreciated by reference to the following detailed description of presently preferred, but nonetheless illustrative embodiments in accordance with the present invention, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a front perspective view, partly in section, of a first embodiment of a combination positioning and support construction for an elastomeric seal for a roadway or the like;

FIG. 2 is a perspective view illustrating an exemplary manner of arranging the seal support construction of FIG. 1 within a roadway expansion joint preparatory to pouring cement in situ in holding relation about said construction;

FIG. 3 is a side elevational view, in section taken on lines 3—3 of FIG. 2, illustrating further details;

FIGS. 4*a* and 4*b* are perspective views of two embodiments of a support body forming a part of the construction of FIG. 1; and

FIG. 5 is a front perspective view, partially in section, of a second embodiment of a construction for positioning and supporting an elastomeric seal for a roadway or the like.

Reference is now made to the drawing, and in particular to FIG. 1 illustrating a first embodiment of a combination support and positioning construction, generally designated **10,** for a road bed, roadway or similar construction utilizing an elastomeric seal **12.** As generally understood, in the construction of a roadway, as exemplified by the concrete length portions **14** and **16,** there is a need for an expansion void between the adjacent blocks **14** and **16** to allow for expansion of the concrete comprising these blocks. In such an expansion void, designated **18** herein, which is bounded in part by the facing side walls **20** and **22** of the concrete road blocks or portions **14** and **16,** it is the customary practice to utilize an elastomeric seal, such as the previously noted seal **12,** to fill expansion void **18** and yet allow for expansion and contraction of the concrete blocks or road portions **14** and **16.** The expansion void or joint **18** is usually oriented transversely of the longitudinal direction of the roadway length portions **14** and **16.**

Heretofore, it was necessary to utilize pre-cast cement blocks (not shown) having a tapered surface matching the taper or inclination of the side walls **20** and **22.** Specifically, the prior practice contemplated the setting in place of these pre-cast cement blocks adjacent each cooperating side walls **20** and **22** and then placing the elastomeric seal in an interposed position between these two pre-cast cement blocks.

As a significant improvement over the foregoing practice involving the use of pre-cast cement blocks as a support and positioning construction for the elastomeric seal **12,** the present invention contemplates the use of a construction including spaced-apart support rods **24** and **26,** which in practice are oriented lengthwise of the void **18** and in adjacent position, as illustrated, to one of the side walls **20** and **22.** The opposite ends of each of the rods **24** and **26** will be understood to be secured, in an appropriate manner, in a peripheral portion of the roadway **14, 16,** so that each of the rods **24** and **26** occupies a suspended, clearance position in the expansion void or joint **18.**

The construction **10** also includes a cooperating pair of support bodies **28** and **30,** which will be understood to be identically constructed, such construction being either one of the two embodiments illustrated in FIGS. **4***a* and **4***b*. Using support body **28** as an example (i.e., that shown in FIGS. **1** and **4***a*), the same is an elongated member, preferrably fabricated of metal, having a horizontal wall **32** terminating in a downwardly turned ledge **34.** Formed integral with the wall **32** is a seal-accommodating compartment bounded by facing vertical walls **36** and **38,** the latter being slightly tapered. The walls **36, 38** are joined by a connecting horizontal wall **40.**

In the embodiment of the support body illustrated in FIGS. **1** and **4***a*, prior to the bending of the metal into the shape for the body **28** as illustrated, said body, in the flat, is subjected to a die-cutting or similar operation which severs therefrom, as along the three sides **42,** the portion of the body which is then bent out of the plane of the body **28** and effectively serves as a cement-engaging and as a connecting member or projection **44** for the support body **28.** That is, the die-cutting **44** is selectively performed at strategic locations along the

length of the support body **28** and, as will now be described, is advantageously used in completing a connection to the previously noted support rods **24, 26.** Such connection contributes to the proper positioning of the support bodies **28** and **30** in an adjacent relationship to each other so that the combined shape provided by the support bodies **28** and **30** is one which readily accommodates the elastomeric seal **12.** Also, and most important, the cement which fills the expansion joint channel **18** hardens about the projections **44** and this, in an obvious manner, firmly maintains the seal support bodies **28, 30** in place.

During initial positioning of the construction **10,** use may advantageously be made of an upstanding void-filling member **46,** disposed centrally of the expansion joint **18,** as a central support for the bodies **28, 30.** Thus, as is clearly illustrated in FIG. **1,** the respective ledges **34** on the support bodies **28, 30** are supported in an elevated position lengthwise of the expansion joint **18** on the member **46,** which may be a crushable plastic or may even be entirely removed so as not to inhibit roadway expansion or contraction.

The principal support for the bodies **38, 30** during the in situ pouring of the cement is, however, provided by transverse spaced members **47,** all as is clearly shown in FIGS. **2** and **3.** The members **47** are placed along the channel **18** in straddling relation therewith and are connected, as by bolt means **49,** to a member **51.** The bodies **28, 30** are each connected, as by bolt means **53,** in depending relation from the members **51,** and thus the bodies **28, 30** remain in place during the pouring of the cement thereabout.

Before the cement is poured, the present invention contemplates insuring a firm engagement between the cement and the bodies **28, 30.** To this end, each said body is provided with plural laterally extending projections **44,** preferrably at uniform intervals, such as every twelve inches. Moreover, the laterally extended connecting members or projections **44** are bent at an appropriate angle so that the free ends **48** of these projections are strategically located near the support rods **24** and **26.** The free ends **48** are then secured by wire ties **50** or other such connecting means which can be conveniently utilized in the field, to the support rods **24** and **26.** The cement thus hardens about the projections **44** and obviates the possibility of inadvertent disengagement of the bodies **28, 30** from the cement poured about these bodies.

With the support bodies **28** and **30** in their operative position, as just described, the present invention then contemplates the pouring of cement, in situ, around the support bodies **28** and **30** which, after a curing interval, solidify into blocks **52** and **54,** which securely hold and support the support bodies **28** and **30** in place. Any one of several techniques for insuring the flow of said in situ cement completely around the support bodies **28** and **30** may be employed, such as the use of vibrators or the like.

Assuming use of a removable void-filler **46,** the same is removed after the pouring of the cement. Removal of the filler **46** provides the necessary clearance for an extruded water-proof member **56.** That is, member **56** in cross section has a shape which is similar to the cross-section shape of the cooperating support bodies **28** and **30,** these two shapes being joined together by a depending V-shaped section **58.** During positioning, the section **58** is centrally located between the ledges **34** of the support bodies **28, 30,** and this effectively serves to center the water-proof member **56** in support bodies **28** and **30.** Of course, after hardening of the cement, the seal supporting structure **47, 51** can be safely unbolted from the bodies **28, 30** preparatory to the positioning of the seal **12** between the roadway sections **14** and **16.**

The elastomeric seal **12** will be understood to be of the type having a central body **60** and opposite depending legs **62** and **64,** which legs bound a mounting notch **66.** Thus the seal **12** is conveniently positioned on the side-by-side support bodies **28** and **30** by snapping notch **66** over the central portions of the support bodies and with the respective depending legs **62** and **64** located in the compartments bounded by the walls **36, 38** and **40.** Seal **12** is then loaded or placed under the requisite compression by forcing wedge blocks **68** into an interposed position between the respective legs **62** and **64** and the vertical wall **38** of each of the support bodies **28** and **30.**

Reference is now made to the second embodiment or construction for the support body hereof which is illustrated in FIG. **4***b*. Comparable or similar structural features to those already described in reference to FIG. **4***a* are designated by the same reference numerals as is used in FIG. **4***a*. Thus it can be seen that the embodiment of FIG. **4***b* differs from the embodiment of FIG. **4***a* only in that in lieu of the struck-out connecting member **44,** the FIG. **4***b* embodiment has a rod-like equivalent rod **70** which is welded, as at **72,** at strategic spaced locations along the base of the vertical wall **36.**

Reference should now be made to another embodiment of a construction for accommodating the elastomeric seal **12** which is illustrated in FIG. **5.** Structural features of this embodiment which are similar to the previously described embodiment of FIGS. **1, 4***a* and **4***b* are designated by the same reference numerals. The significant differences between the embodiments are dictated by the differences in the structural environment of the construction **10.**

Specifically, in FIG. **5,** the deck of the old roadway which is represented by the adjacent cement blocks **74** and **76** are bridged by horizontally oriented plates **78** and **80** which form a conventional expansion joint **82** at their confronting edges. The situation depicted in FIG. **5** is typical for a bridge roadway. In such a situation, the resurfacing of the old roadway, as exemplified by the cement blocks **74** and **76,** results from the pouring of cement, in situ, which ultimately provides the adjacent cement blocks **14** and **16.** Since the expansion joint or void **18** is bounded at the bottom by the plates **78** and **80,** the support bodies **28** and **30** are readily placed on theplates **78** the plates **80** and secured in place thereto in any appropriate manner, as by weld joints **84.** Thus, in the embodiment of FIG. **5,** the connecting rods **24** and **26** are dispensed with, as are the connecting means **44** extending from the support bodies **28** and **30.** Additionally, the downwardly turned ledge **34** is extended to a necessary size to properly position the wall **32** horizontally without use of a central support means, such as the previously noted support **46.** As illustrated, the lower edge of the walls **34** are advantageously secured by a weld **86** along opposite sides of the expansion joint **82** of the plates **78** and **80.**

From the foregoing description, it should be readily appreciated that both embodiments of a positioning

and support construction **10** hereof for an elastomeric seal **12** (such as for example the Giustra Z seal, commercially available from Societa Applicazioni Gomma Antivibranti, of Milano, Italy) can be readily installed in the field without any pre-cast cement holding blocks. Instead, the holding cement blocks, such as the blocks **52** and **54**, are poured in situ and thereby provide significant savings in both money and effort required in installing the elastomeric seal **12.**

A latitude of modification, change and substitution is intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What is claimed is:

1. In combination, an elastomeric seal having an operative position in an expansion void bounded by facing side walls of a concrete roadway that is subject to expansion and contraction, and a positioning support construction for said elastomeric seal comprising at least two support rods disposed in spaced relation lengthwise of said void adjacent each said bounding wall thereof, a pair of cooperating spaced apart support bodies having a combined shape to accommodate said elastomeric seal thereon, support means disposed in said void beneath said support bodies so as to provide an elevated operative position to said support bodies lengthwise of said void, and connecting means on said support bodies extending from spaced lengthwise locations therealong into connected relation with a cooperating one of said support rods, whereby cement subsequently deposited in situ in said void hardens about said connecting means to contribute to the engagement of said support bodies by said cement.

2. The elastomeric seal positioning support construction as defined in claim **1** wherein each said support body is fabricated of metal and each said connecting means is partially severed and then bent into said extending relation therefrom.

3. The elastomeric seal positioning support construction as defined in claim **2** including a waterproof member in covering relation over said support bodies to prevent seepage of said in situ cement through openings in said bodies formerly occupied by said connecting means.

4. The elastomeric seal positioning support construction as defined in claim **2** wherein each said support body has a pair of facing vertically oriented walls defining a tapered elastomeric seal-engaging compartment therebetween.

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