Jan. 7, 1941. D. E. WILLARD 2,227,614

EXPANSION JOINT

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Fig. 1.

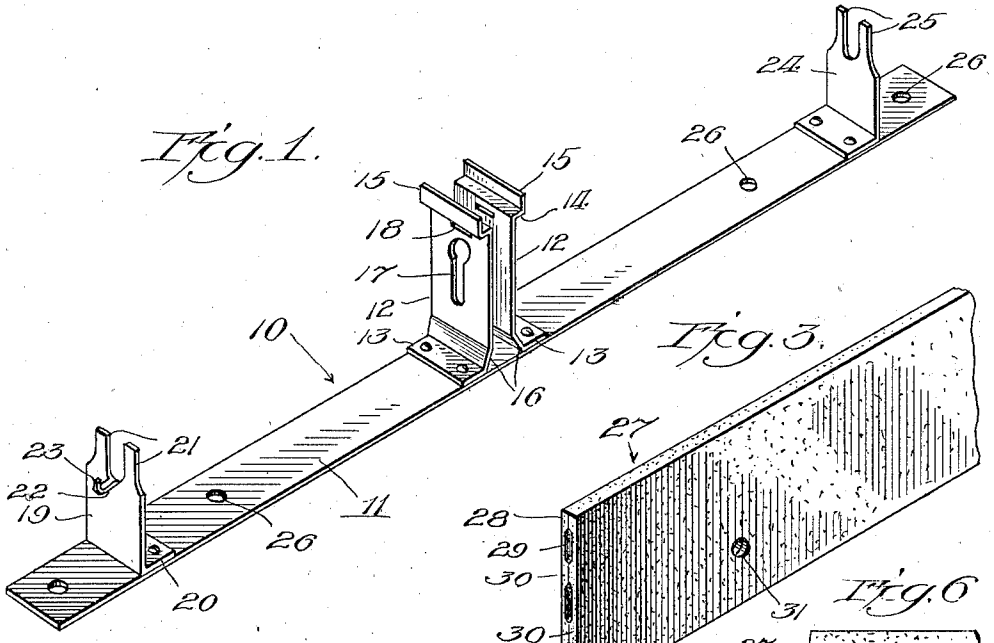


Fig. 3.

Fig. 6

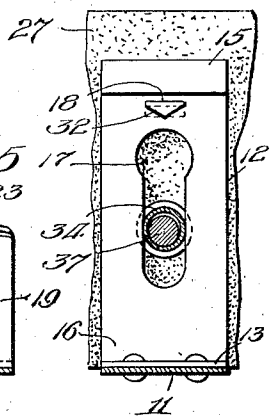


Fig. 2.

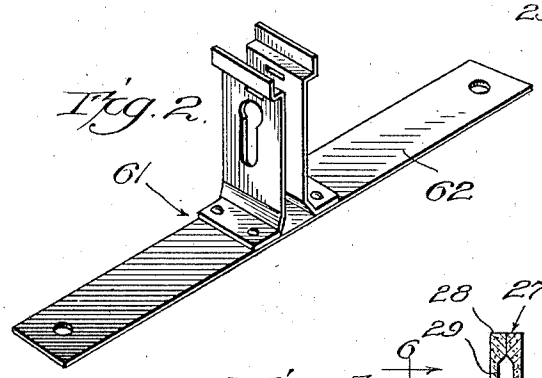


Fig. 5

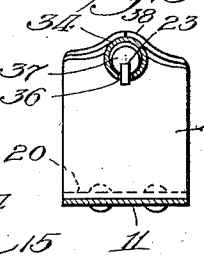
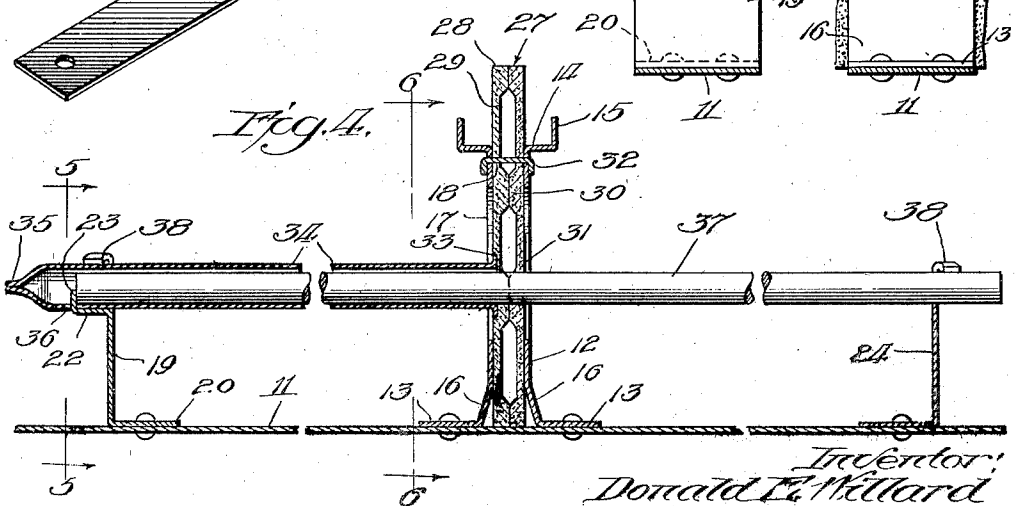


Fig. 4.

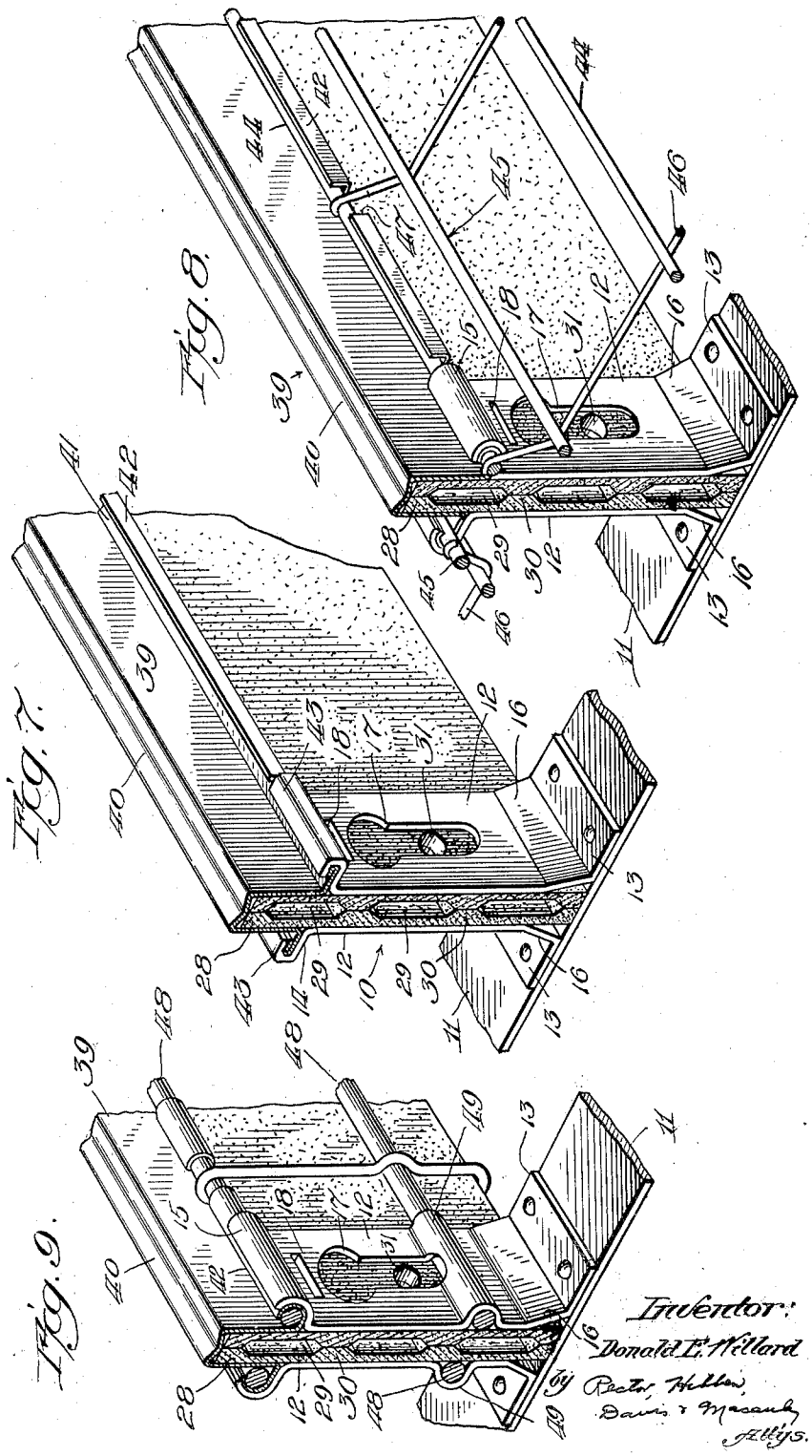


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Fig. 10.

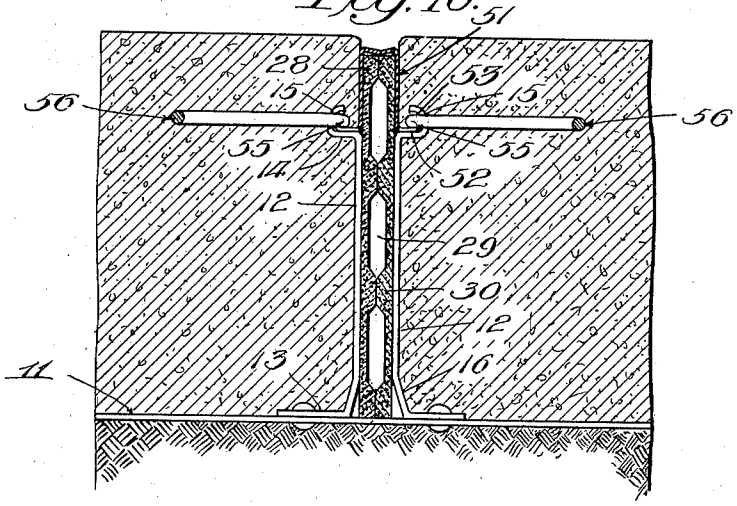


Fig. 11.

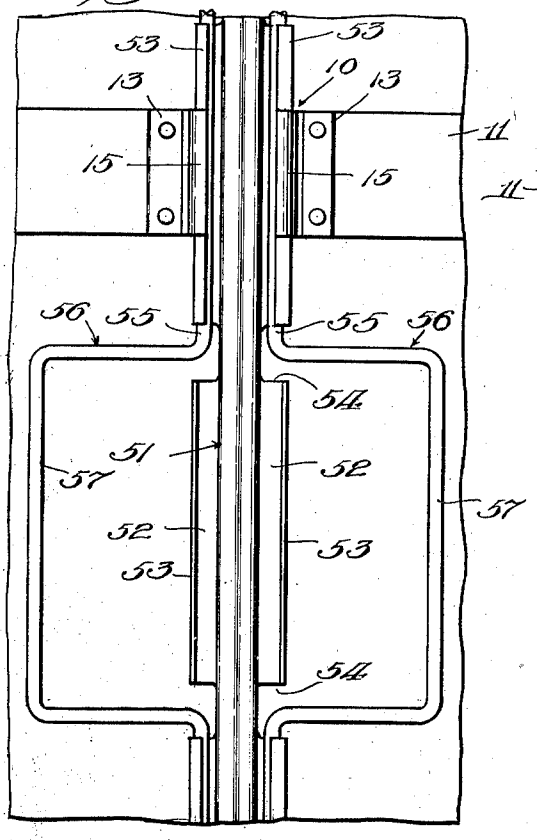
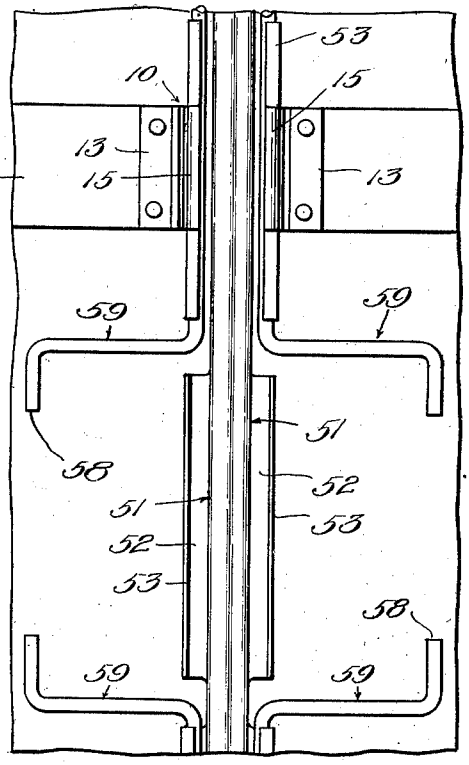


Fig. 12.



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Fig. 13.

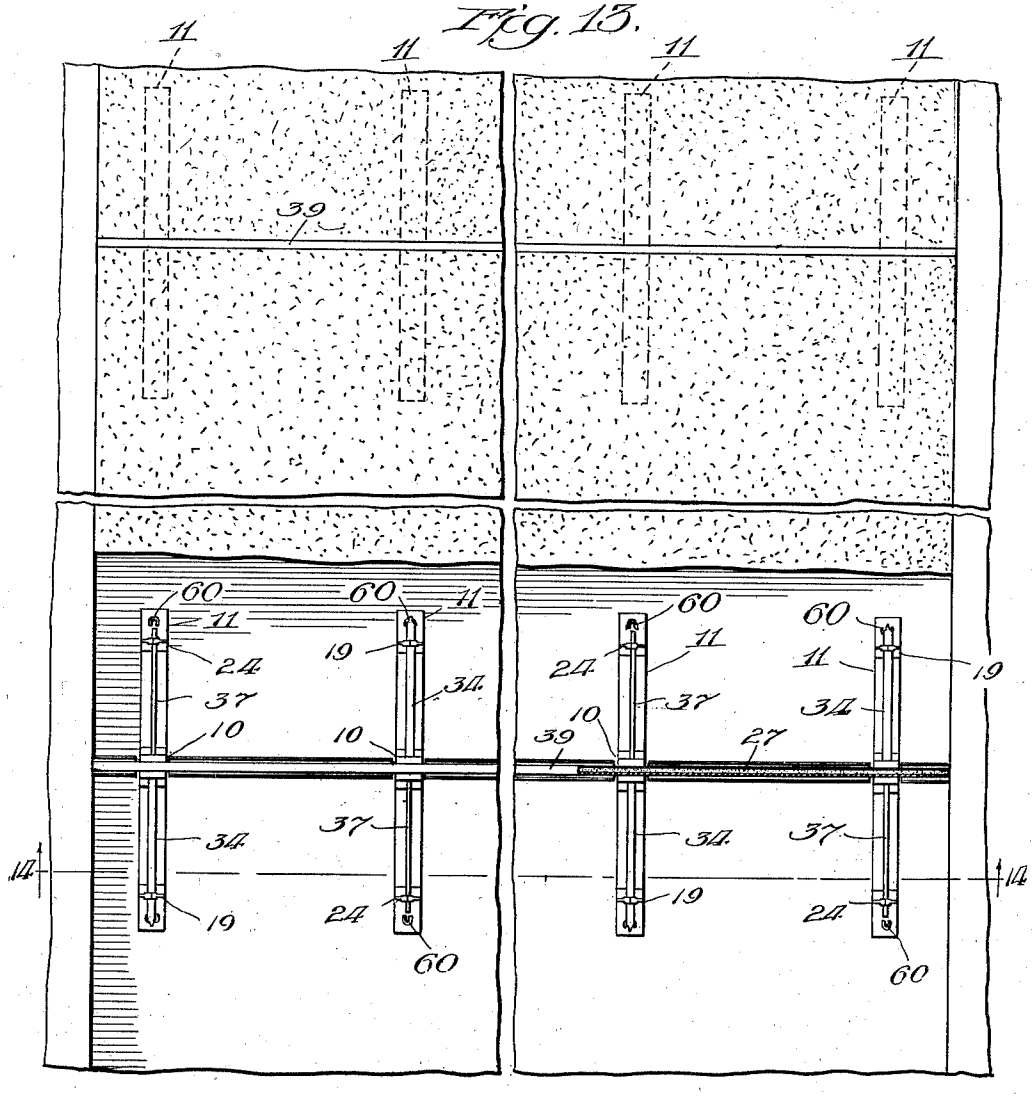
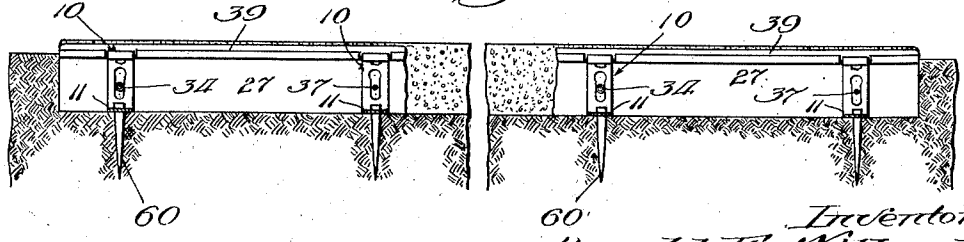


Fig. 14.



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Fig. 15.

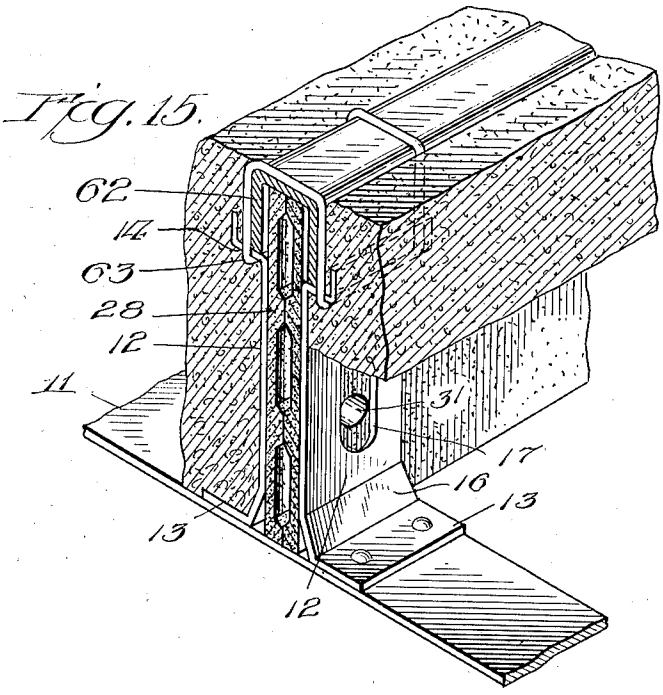


Fig. 17.

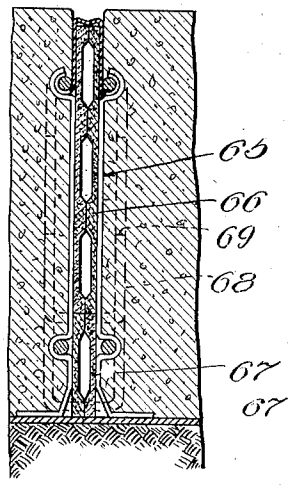
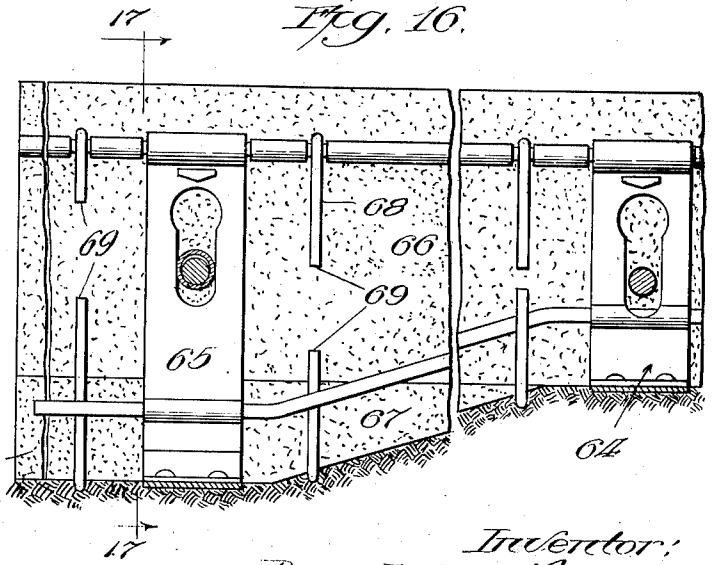


Fig. 16.



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UNITED STATES PATENT OFFICE

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EXPANSION JOINT

Donald E. Willard, Danville, Ill.

Application October 9, 1933, Serial No. 692,735
Renewed November 10, 1937

15 Claims. (Cl. 94—18)

My invention relates to expansion joints for roadways, pavements, concrete slabs, wall sections and similar structures where it is desired to provide a yielding filler of some kind between adjoining sections that will enable the latter to expand and contract under temperature changes without buckling or cracking, and is concerned more particularly with devising a chair or support for a simple strip having yielding and expansion characteristics which can be positioned at the time of laying a roadway, for example, and forms a permanent part thereof.

A common type of expansion joint now employed in the building of roadways, for example, takes the form of a simple bituminous composition strip, or a sponge wood strip, or some type of compressible material. In building roadways equipped with strips of these types, wooden planks are located transversely of the road in the positions to be subsequently occupied by the expansion strips and the concrete is poured into the spaces between pairs of the planks. After the concrete has hardened, the planks are removed, the expansion strips are driven into the cavities between adjacent sections, and a substance, such as pitch and the like, is poured along the cracks above the strips.

The foregoing practice is attended with many disadvantages, such as the use and cost of the temporary dividing planks between adjoining slab sections, the necessity for withdrawing these planks after the concrete has hardened, and the subsequent inserting of the expansion strips.

It is therefore one object of my invention to devise an expansion joint which eliminates the use of temporary planks, which can be located with accuracy in advance of pouring the concrete, and which forms a permanent part of the roadway, or other structural condition.

A further object is to devise a joint of the character indicated which is additionally adapted to prevent relative vertical shifting of adjoining slab sections, which is further provided with parts which interlock with the concrete, and which may be arranged to support reenforcing members that are embedded in the slabs.

A further object is to provide a pair of supports for a simple strip member having expansion characteristics which can be positioned by the usual ground locating stakes prior to pouring of the concrete, which has sufficient strength to withstand the heavy impact of the poured concrete, and which, because of its fabricated construction, can be made from rolled steel strips that are punched and bent into definite shape and secured by welding, riveting, or other desirable fastening means.

These and other objects of my invention will be set forth in the following specification, reference being had to the accompanying drawings, and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawings:

Figure 1 is a perspective view of the improved chair or support utilized for the positioning of the expansion strip.

Fig. 2 shows a modified type of chair in which no provision is made for the support of reenforcing bars which resist relative vertical shifting of adjoining slab sections.

Fig. 3 is a perspective view of the expansion strip.

Fig. 4 is an elevation, partly in section, of the type of chair shown in Fig. 1, showing the expansion strip in position and the mounting of the reenforcing bar which extends between adjoining slab sections.

Figs. 5 and 6 are sections along the lines 5—5 and 6—6, respectively, in Fig. 4, looking in the direction of the arrows.

Figs. 7 to 9, inclusive, are perspective views, partly in section, of the central portion of my improved chair, showing the expansion strip in position and the association therewith of a strip for covering the upper edge of the expansion strip and other parts for facilitating bonding of the chair with the concrete. Fig. 8 additionally shows the manner in which the chair may be utilized to support, in conjunction with an adjoining chair, a reenforcing grid which is embedded in the concrete of the associated slab section.

Fig. 10 is a vertical section showing a still further modification of parts which may be associated with the chair to improve its bond with the concrete of adjoining slab sections.

Figs. 11 and 12 are plan views of the construction shown in Fig. 10, Fig. 12 differing from Fig. 11 in that a portion of the offset reenforcing member is eliminated.

Fig. 13 is a plan view of a roadway, partly in section, showing my improved expansion joints in position and a suggested arrangement for alternatively reversing the positions of the chairs on opposite sides of the expansion strips across the width of the roadway.

Fig. 14 is a section along the line 14—14 in Fig. 13, looking in the direction of the arrows.

Fig. 15 is a perspective view showing the use of a temporary cover strip in connection with my

improved chair to protect the upper edge of the expansion strip against the hazards of the roadway laying operation.

Fig. 16 is an elevation of a portion of my joint as modified for use with a roadway in which the thickness at the center thereof is less than that obtaining at the shoulders.

Fig. 17 is a section along the line 17—17 in Fig. 16, looking in the direction of the arrows.

For the purpose of illustration and as exemplifying one use of my expansion joint and the support therefor, the same will be described in connection with a roadway. It will be understood, however, that the essential conception involved is likewise susceptible of adaptation to structural sections in general, regardless of their composing material, where such sections are subject to expansion and contraction and it is desired to prevent the buckling or cracking of adjoining sections by inserting a yielding member therebetween.

Referring to Figs. 1 to 6, inclusive, the numeral 10 designates my improved chair which comprises a footing strip 11, from the central portion of which projects upwardly a pair of spaced uprights 12 also preferably formed as simple strips, and whose lower ends are flanged to facilitate their securement to the strip 11, as by welding, riveting, or in any suitable manner. The upper ends of the uprights 12 are bent outwardly as at 14 and then upwardly to form the flanges 15. The lower ends of the uprights 12, instead of being bent sharply at right angles to form the attaching flanges 13, are first angled outwardly as at 16 and then bent to form the flanges 13 in order to provide a slight resilient or springy action between the lower ends of the uprights that greatly facilitates the insertion of the expansion strip member hereinafter described.

One of the uprights 12 is provided with a keyhole slot 17 and both of the uprights are provided with elongated slots 18 which are positioned above the slot 17. An upright 19 projects upwardly from and adjacent that end of the strip 11 nearest to that upright 12 which is provided with the keyhole slot and the lower end of the upright 19 is flanged as at 20 for securement to the strip 11. The upper end of the upright 19 is slit downwardly in two places to provide a pair of spaced tongues 21, while the intervening portion is bent to form a support 22 and then upwardly to provide a stop flange 23 for a purpose hereinafter explained. Adjacent the opposite end of the strip 11 is a fourth upright 24 which is identical with the upright 19 in that it is provided with a pair of spaced tongues 25, but is preferably not formed with parts corresponding to the support 22 and stop flange 23. Any number of apertures 26 may be located along the footing strip 11 in order to receive ground locating stakes when the chair is positioned prior to laying of the roadway.

In Fig. 3 is illustrated the preferred form of expansion strip 27 which is composed of a pair of strips 28 that are located with their faces in abutting relation. The inner face of each strip is provided with a plurality of longitudinally extending depressions 29 which are separated by ridges 30. When the strips 28 occupy the position shown in Fig. 3, the presence of the depressions 29 facilitate the yielding of the strip under compression. Preferably, the holes through the strip 27 which are formed by the depressions 29 have a total cross-sectional area equal to approximately one-half of the total cross-sectional area of the strip. With this arrangement, the strip can be compressed without forcing the upper edge thereof above the surface of the roadway. Any number of suitable apertures 31 may be appropriately disposed through both strips 28 to receive the reenforcing bars hereinafter explained. The expansion strip 27 may be composed of a bituminous composition mixture, such as is now commonly employed in the industry for strips of this nature. In any case, it is contemplated that the expansion member will be arranged to yield in response to movements of the concrete and will be composed of a material that is resistant to water, earth acids, or any other decomposing influences which are commonly met with in the use of structures of this type. The thickness of the strip may be varied as desired and may be as low as one-half inch. The strip 27 is generally representative of any of the commonly employed fillers or spacers that are positioned between roadway slabs and which possess yielding and expansion characteristics. Wherever the terms "yieldable strip," "yieldable spacer" or "compressible strip" appear in the accompanying claims, they are intended to encompass filler members having the indicated characteristics.

In Fig. 4 is illustrated a characteristic employment of my improved chair in conjunction with a reenforcing bar which is intended to resist any relative vertical movements of adjoining slab sections, while permitting their lateral expansion and contraction with respect to each other. In this assembly, the expansion strip 27 is forced downwardly between the uprights 12 and a key 32 is passed through the slots 18 and is then bent downwardly to maintain the same in position. This key serves to prevent any lateral spreading of the uprights and also inhibits any tendency of the expansion strip to move upwardly. The flanged end 33 of a sleeve 34 is then inserted through the larger end of the keyhole slot 17 and then pressed downwardly into the narrowmost portion of the slot into substantially the position shown in Fig. 4, with the passage through the sleeve in substantial registration with an aperture 31 in the expansion strip. The opposite end of the sleeve may be pinched as at 35 to close the same against any tendency of the concrete to flow into the interior of the sleeve. The last noted end of the sleeve rests upon the support 22 of the upright 19 and the stop flange 23 extends upwardly through a slot 36 provided in the bottom of the sleeve. Resting within the sleeve is substantially one-half the length of a reenforcing bar 37 whose left end abuts against the stop flange 23 and which extends through the aperture 31 in the expansion strip and rests at its opposite end in the slot between the tongues 25 on the uprights 24. The tongues 21 and 25 are then bent over the sleeve and reenforcing bar, respectively, as generally indicated by the numeral 38, in order to prevent any tendency of the sleeve or bar to raise upwardly under the rising action of the concrete.

It will be apparent from an examination of Fig. 4 that, when the assembly shown therein is covered by concrete, the concrete which composes the slab section to the right of the expansion strip 12, as viewed in Fig. 4, will directly grip the surface of the reenforcing bar 37, while the concrete in the slab section to the left of the expansion strip will be completely shielded from the adjacent portion of the bar 37 by reason of the

sleeve 34. Accordingly, as the two slab sections move toward and away from each other due to temperature changes, the reenforcing bar will slip easily within the sleeve 34, so that this construction affords a simple arrangement for preventing any relative vertical shifting of the slab sections, while freely permitting their movement toward and away from each other.

In moving toward the left, from the position shown in Fig. 4, the bar 37 shears off the flange 23 whose only function is to limit the initial insertion of the bar in the sleeve in order to leave space for the subsequent movement of the bar to the left of the flange.

In order to provide a strong interlock with the concrete in the adjoining slab sections, reenforce the structural strength of the joint, or to act as a support for reenforcing members which are subsequently embedded in the concrete of the adjoining slab sections, the assembly shown in Fig. 4 is preferably associated with other parts which are more particularly illustrated in Figs. 7 to 12, inclusive.

Referring to Fig. 7 which shows the chair construction in the region of a joint, a cover strip 39 having an inverted channel section encases that portion of the expansion strip above the upright bent portions 14, the web portion 40 of this cover strip being slightly spaced above the top side of the expansion strip and the central portion of this web is deflected transversely towards the expansion strip and longitudinally of the cover strip to provide a web member that will readily yield under the expansive forces of the concrete. The sides of the cover strip extend downwardly along the sides of the expansion strip and are then bent laterally as at 41 and then bent upwardly to form the flanges 42. This cover strip is applied when the assembly has the appearance shown in Fig. 4 and the strip is pressed downwardly on the expansion strip with the flanges 42 located within and in abutting relation to the flanges 15. The flanges 15 and 42 are then bent or curled inwardly toward the expansion strip, as generally indicated by the numeral 43, thus firmly locating the cover strip in position. It will be understood that the cover strip 39 extends between at least a pair of chairs 10 along the roadway, and may extend across the full width of the road.

In Fig. 8 is shown a still further modification of the chair construction employing the cover strip 39. In this modification, after the cover strip is placed in position, but before bending the flanges 15 and 42 together, a reenforcing bar or wire 44 is laid along the cover strip flange 41, and this reenforcing bar forms one side of a reenforcing grid 45 composed of a number of bars or wires 44 disposed in parallel relation and which rest upon and are supported by a number of wires 46. The cover strip flange 42 may be slotted in suitable locations, as at 47, in order to permit the bending of the ends of the wire 46 around the reenforcing bar 44. It will be understood that Fig. 8 shows the chair supporting on opposite sides thereof the ends of a pair of reenforcing grids 45 and that similar chairs support the opposite ends of the same grids. After the reenforcing bars 44 have been positioned as noted above, the flanges 15 and 42 are curled over in order to firmly lock the indicated bars in position.

In Fig. 9, the cover strip 39 is also employed and the flanges 42 thereof, together with the upright flanges 15, are curled around a pair of longitudinally extending reenforcing wires which run the length of the expansion strip which forms the side of a wire grid or mesh 48 which is looped around the bottom of the strip. Intermediate wires which run parallel to the strip may be supported in bends 49 which are offset from the uprights 12. This mesh serves to stiffen the strip against sidewise deflection and also insures an adequate bond with the concrete.

In Figs. 10 to 12, inclusive, a slightly modified form of covering strip 51 is employed. This strip is likewise provided with laterally extending, support flanges 52 and vertically extending flanges 53, corresponding to the flanges 41 and 42, respectively. The former flanges are periodically notched as at 54. Resting on the support flanges 52 are the wires 55 of a reenforcing member 56 and connecting these wires are other wires 57 which are preferably offset laterally from the sides of the expansion strip so that they will be embedded in the concrete of the adjoining slab section. As with the other modifications, the flanges 53 and 15 are curled over to hold the reenforcing member 56 in position. Fig. 10 shows the relation of the expansion joint to the adjacent slab sections of a roadway. The cover strip is depressed slightly below the surface of the road, preferably at least one-quarter of an inch. With this construction it is unnecessary to cover the strip with pitch, so that the road surface is free from objectionable bumps. The modification shown in Fig. 12 differs from that shown in Fig. 11 only in a slight change made in the reenforcing member. Instead of employing a continuous offset wire 57, the intermediate portion thereof is removed as at 58, so that the reenforcing member 59 is composed of a plurality of individual wires having a substantially U-shape appearance, as shown in Fig. 12.

In Figs. 13 and 14 is shown a suggested method of arranging my improved chairs and the accompanying expansion strips in a roadway. These chairs preferably extend lengthwise of the roadway and are disposed in parallel, spaced relation across the width thereof.

In positioning these chairs, they are preferably located by simple ground stakes 60 which enable the chairs to be located with great accuracy. The expansion strip 27 may be placed in the chairs either before or after the latter have been located on the ground and any one of the before described modifications may be employed in connection therewith, dependent upon the nature of the roadway. Whichever of the modifications, as illustrated in Figs. 7 to 12, inclusive, is adopted, it will be apparent that the chairs will rigidly hold the expansion strips in position against the pouring impact of the concrete and that, after the concrete has hardened, the roadway is substantially completed, since it is unnecessary to remove any part of the chair thereafter. The latter becomes a permanent part of the roadway and it provides a very efficient means for locating the expansion joint from the very commencement of road building operation. The relation of the height of the chair to the thickness of the roadway bed is preferably such that the web of the cover strip is substantially flush with, or a short distance below, the surface of the roadway. This strip therefore protects the expansion strip against wear and it is preferably composed of a material that will resist corrosion.

As indicated in Fig. 13, the chairs are preferably located transversely of the roadway with the sleeves 34 located in alternating relation on

opposite sides of the expansion strip. If the reenforcing grid member, as illustrated in Fig. 8, is employed, it will be obvious that this member will extend between adjacent pairs of the chairs across the width of the roadway, each grid member being supported by the adjacent pairs of chairs.

Under certain conditions, it is contemplated that the nature of the roadway or the pavement may be such, considering the weight of traffic carried, that it may be possible to eliminate any necessity for the reenforcing bars **37**. Under these conditions, a chair **61**, as illustrated more particularly in Fig. 2, may be used. This chair is substantially identical with chair **10**, except that the footing strip **62** is somewhat shortened and the end uprights are eliminated.

In Fig. 15 is illustrated a method of protecting the upper edge of the expansion strip against the hazards of the road laying operation. These strips are rather easily damaged and it is important to provide some means for protecting its upper edge, whether or not the cover strip **39** is employed.

Fig. 15 shows a portion of the chair in the condition as illustrated in Fig. 4, it being assumed that the joint is not being associated with any form of bond-forming agency. Under these conditions, a temporary channel strip **62** is placed in inverted position along the upper edge of the expansion strip, the distance between the flanges of this channel being sufficient to also include a cover strip **39**, if the latter is employed. The channel **62** is held in position by looping wire **63** therearound and under the flanges **14**. The concrete is then poured on opposite sides of the expansion joint and just before the concrete is in condition for finishing, the wires are cut and the temporary channel **62** is removed. It will be understood that this channel will have sufficient strength to effectively protect the expansion strip proper from being damaged by the bucket which delivers the concrete, or the boom which carries the bucket, in the event that either of these parts are rested on or come in contact with the strip.

In Figs. 16 and 17 is illustrated a further modification of my improved expansion joint which is intended for use in connection with that type of roadway which is provided with a greater thickness along the shoulders thereof than in the center of the road. Under these conditions, it is obvious that some form of expansion strip must be provided at the portions of increased thickness. This requirement can be adequately met without requiring any special shape of expansion strip, except to the extent presently noted.

Referring to Fig. 16, the numeral **64** designates a chair having uprights whose length is suitable for the cross-sectional width of the center of the road and other chairs **65** whose uprights are somewhat longer and which are intended to be placed adjacent the outer edges of the roadway. The uprights for the chairs **64** and **65** are exactly alike as regards their details of construction and embody generally the features as hereinbefore described, their only difference being one of length. The chairs **64** and **65** are placed along the supporting surface for the roadway in the manner above described and between these chairs are located the expansion strips **66** which extend across the width of the roadway and which may have a uniform width as determined by the slab thickness of the intermediate portion of the roadway. Along the shoulders or edges of the road, the additional slab thickness is provided for by a substantially sector-shaped piece of expansion strip **67** which is placed under the outer ends of the principal expansion strip. A wire mesh or grid **68** is supported by the chairs in the manner generally indicated in Fig. 9 and is looped around the lower edges of the strips, including the piece **67**. To permit this action, certain of the vertical wires of the mesh are cut, as indicated at **69**, so that the intermediate portions of the same wires may be shifted sufficiently to accommodate the increased width of expansion strip.

I claim:

1. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable strip for inclusion within the adjacent slab section, and uprights carried by the footing strip means remote from the yieldable strip for supporting the ends of the sleeve and bar, respectively.

2. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrtee when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable strip for inclusion within the adjacent slab section, and uprights carried by the footing strip means remote from the yieldable strip for supporting the ends of the sleeve and bar, respectively, and having parts bent around the sleeve and bar to maintain the same against movement by the concrete.

3. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights secured to the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, the upper ends of the uprights being outwardly flanged, and a reenforcing member supported by the flanges for embedding in the concrete.

4. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, the upper ends of the uprights being out-

wardly flanged, a covering part extending along the upper edge and downwardly along the sides of the yieldable strip, the lower edges of the covering part being outwardly flanged in abutting relation to the flanges on the uprights, and a reenforcing member supported by the flanges for embedding in the concrete, said flanges being bent around the reenforcing member.

5. In roadway construction, the combination of a plurality of expansion joints spaced along the roadway and adapted for locating in advance of pouring the concrete, each joint comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights secured to the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, and reenforcing means for embedding in the concrete carried by the uprights of and extending between adjacent pairs of joints.

6. In roadway construction, the combination of a plurality of expansion joints spaced along the roadway and adapted for locating in advance of pouring the concrete, each joint comprising a yieldable strip for positioning between adjacent slab sections, means engaging the strips to maintain the same against the pouring impact of the concrete when the slab sections are laid, and reenforcing means for embedding in the concrete supported by an adjacent pair of said means and extending between adjacent pairs of joints.

7. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections and adapted to substantially filll the space therebetween to accommodate expansion of the slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable strip for inclusion within the adjacent slab section, and an upright carried by the footing strip means remote from one of the spaced uprights for supporting the end of the sleeve.

8. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable strip for inclusion within the adjacent slab section, a frangible stop extending into the sleeve adjacent the end thereof remote from the spaced uprights and adapted to engage the end of the reenforcing bar to limit the initial insertion thereof, and an upright carried by the footing strip means for supporting said remote end of the sleeve.

9. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable strip for positioning between slab sections and adapted to substantially fill the space therebetween to accommodate expansion of the slab sections, footing strip means resting on the supporting surface of the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable strip for inclusion within the adjacent slab section, an upright carried by the footing strip means remote from one of the spaced uprights for supporting the end of the sleeve, and a frangible stop carried by the last named upright and extending into the sleeve adjacent said remote end thereof to engage the end of the reenforcing bar to limit the initial insertion thereof.

10. In roadway construction, the combination of a plurality of expansion joints spaced along the roadway and adapted for locating in advance of pouring the concrete, each joint comprising a yieldable strip for positioning between adjacent slab sections, footing strip means resting on the supporting surface of the roadway, a pair of spaced uprights carried by the footing strip means and engaging limited portions of the opposite sides of the yieldable strip to maintain the same against the pouring impact of the concrete when the slab sections are laid, the upper ends of the uprights being outwardly flanged, a covering part extending along the upper edge and downwardly along the sides of the yieldable strip, the lower edges of the covering part being outwardly flanged in abutting relation to the flanges on the uprights, and reenforcing means supported by the flanges and extending between adjacent pairs of joints for embedding in the concrete.

11. An expansion joint for a concrete roadway having a reduced thickness between the shoulders thereof and adapted for locating in advance of pouring the concrete, comprising a yieldable strip for positioning between adjacent slab sections and having a uniform width slightly less than the reduced thickness of the adjacent slabs, a yieldable strip part insertable below and in alignment with each end of the yieldable strip, the yieldable strip and strip parts being adapted to substantially fill the space between adjacent slab sections to accommodate expansion thereof, spaced footing strips resting on the supporting surface for the roadway across the width thereof, a pair of spaced uprights carried by each of the footing strips and engaging limited portions of the opposite sides of the yieldable strip including the strip part to maintain the same against the pouring impact of the concrete when the slab sections are laid, the upper ends of all of the uprights being outwardly flanged, and a reenforcing member supported by the flanges for embedding in the concrete.

12. In a structure for installing a joint in a pavement, the combination of a compressible strip adapted to be placed along a line of the proposed joint, plate means for holding the strip in place during a pouring of pavement material, a dowel bar for limiting vertical movement of the pavement adjacent the joint, the plate means having a base portion, and members extending outwardly from the plate means for supporting the dowel bar.

13. In a structure for installing a joint in a pavement, a dowel bar for connecting adjacent slabs of the pavement, plate means interposed between adjacent slabs of the pavement, means extending across the joint and supporting opposite portions of the dowel bar during a pouring of the pavement material, the plate means being apertured to receive the dowel bar substantially centrally thereof.

14. An expansion joint for concrete roadway construction adapted for locating in advance of pouring the concrete comprising a yieldable spacer for positioning between adjacent slab sections, footing strip means resting on the supporting surface for the roadway, a pair of spaced uprights carried by the footing strip means and engaging the opposite sides of the yieldable spacer to maintain the same against the pouring impact of the concrete when the slab sections are laid, a sleeve extending laterally from one upright, a reenforcing bar slidable in the sleeve and extending through the yieldable spacer for inclusion within the adjacent slab section, and uprights carried by the footing strip means remote from the yieldable spacer for supporting the ends of the sleeve and bar, respectively.

15. A dowel joint construction for concrete road sections having juxtaposed faces in spaced relation comprising a pair of end supports and a pair of intern ediate supports, the supports being adapted for alignment longitudinally of the roadway and having horizontally aligned openings, a dowel socket member extending through the openings of one end support and the adjacent intermediate support and having its outer extremity carried by said one end support, and a dowel in telescopic engagement with the socket member and extending through the openings of the other supports and having its outer extremity carried by the other end support, the supports, dowel and socket member being arranged for embedment in the concrete of adjacent sections.

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