April 29, 1941. R. R. ROBERTSON 2,239,933

EXPANSION JOINT

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Fig. 1.

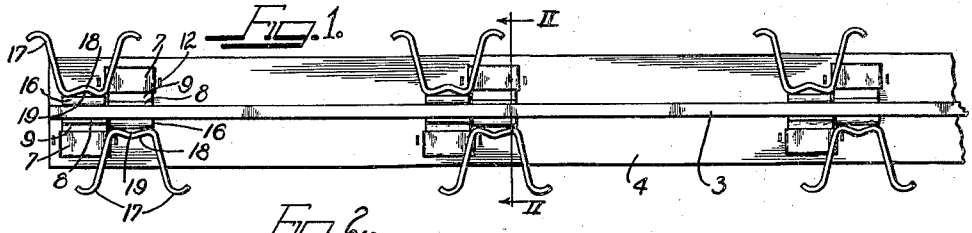



Fig. 2.

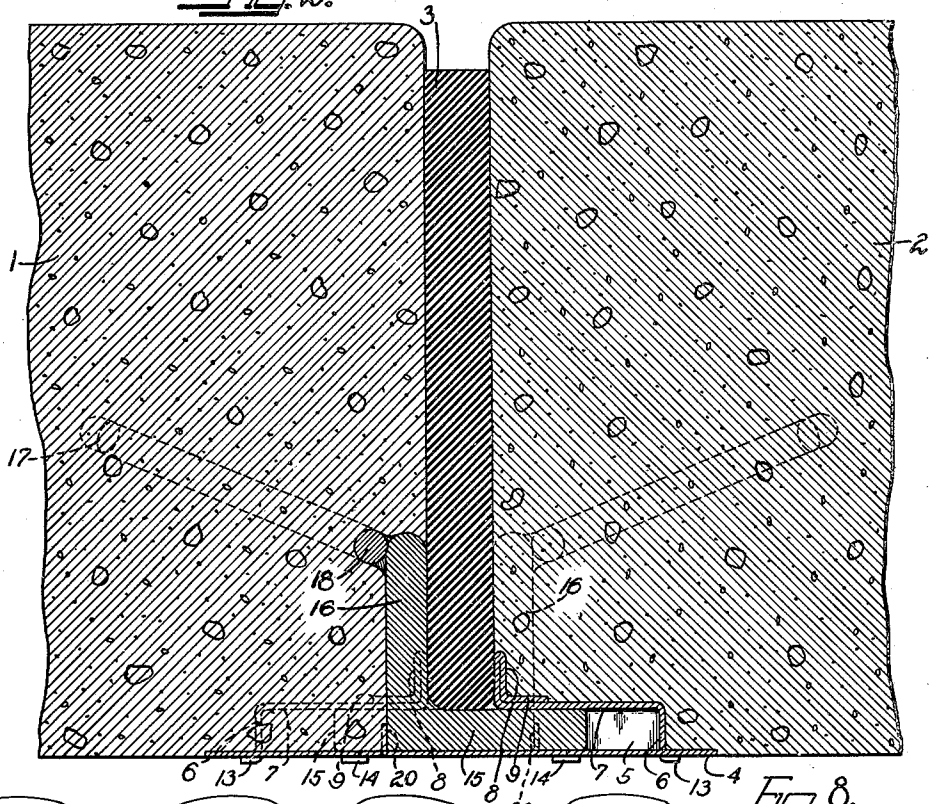



Fig. 3.

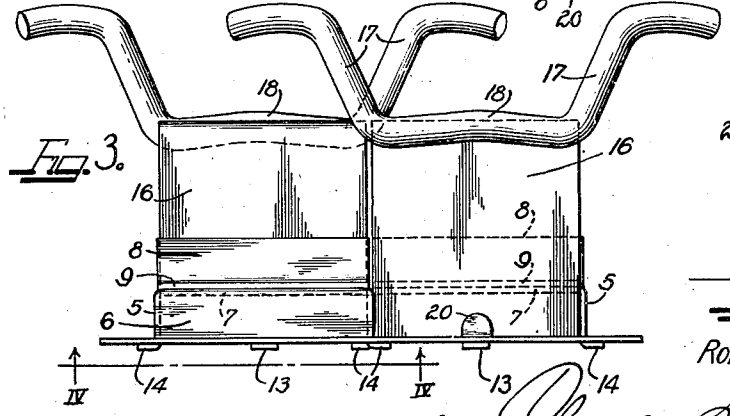
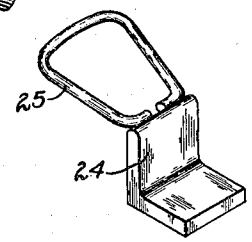



Fig. 8.




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Fig. 4.

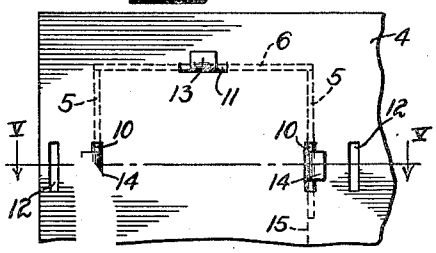



Fig. 5.

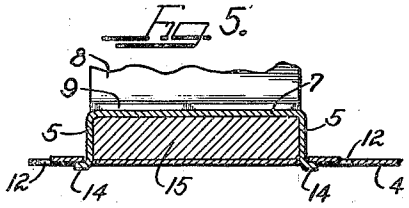



Fig. 6

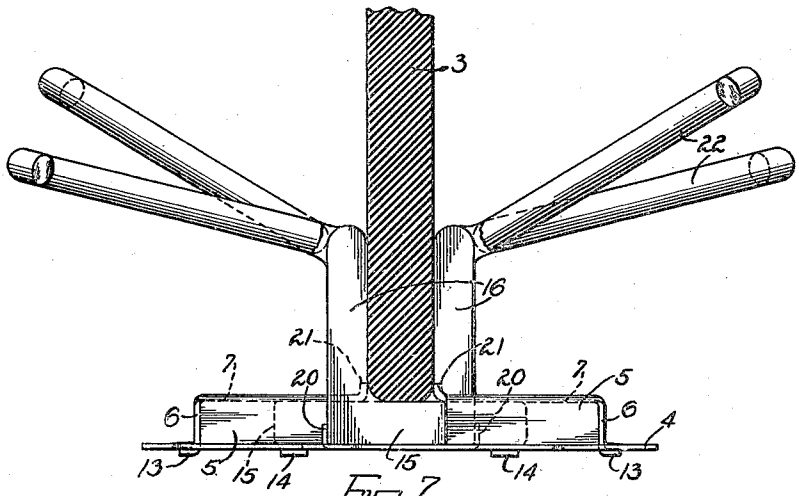
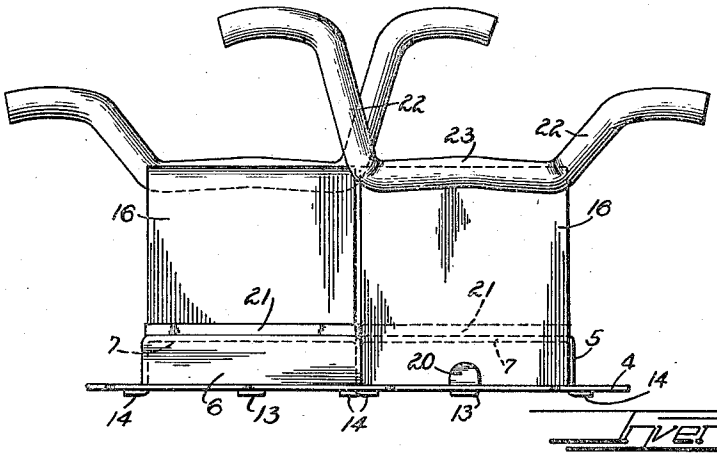



Fig. 7.




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# UNITED STATES PATENT OFFICE

2,239,933

## EXPANSION JOINT

Robert R. Robertson, Chicago, Ill.

Application March 3, 1939, Serial No. 259,581

6 Claims. (Cl. 94—18)

This invention relates to road joints, and more particularly to an expansion joint of the load distributing type, adapted to be supported transversely on a road subgrade to be imbedded between adjacent concrete road slabs and supporting or holding expansion fillers, stacking plates, removable cores or the like supported in position. The improved expansion joint includes a continuous base having pairs or sets of diagonally positioned pockets secured thereon in spaced relation for the slidable reception of reversed angle holders or shoes having anchoring units secured thereto for imbedding in the concrete road slabs on opposite sides of the joint.

It is an object of this invention to provide expansion joints wherein a continuous base plate is provided with spaced groups or sets of oppositely directed pockets for the slidable reception of reversed adjacently disposed road transmission units anchored in the road slabs on opposite sides of a joint.

It is also an object of this invention to provide improved type of road expansion joints for imbedding between concrete road slabs, said joints including reversed adjacently positioned sets of load transmission members anchored in the road slabs and having portions thereof slidable in receiving pockets secured to a supporting base, with said pockets having filler supporting members formed or secured thereon for the purpose of holding a core or filler in position seated upon portions of the load transmission members which are transversely movable with respect to the core or filler, with the movement of the road slabs due to temperature changes or other causes.

Another object of the invention is the provision of an improved and simplified type of road expansion joint, including a base having separated sets of pockets secured thereto for the slidable reception of load transmitting units which are arranged for supporting a road filler or core between flange members or projections formed on the pockets to prevent sidewise shifting of the core or filler with the shifting of the load transmitting units with the movement of the road slabs.

A further object of the invention is the provision of expansion joints wherein sets of filler supporting load transmitting members are shiftably supported on a base plate and slidable in housings or pockets provided with fastening lugs which are projected through slots in the base member.

It is furthermore an object of this invention to provide an improved type of road expansion joint including a plurality of pairs or sets of load transmitting members each of which is provided with anchoring members or arms which are integrally connected by means of a bridge piece for securing the same to a load transmitting member and providing a recess for the reception of concrete forming a part of the road slabs between which the expansion joint is imbedded.

It is an important object of this invention to provide an improved and simplified type of road expansion joint and load distributor, including a base strip having staggered sets of pockets secured thereto in spaced relation for the slidable reception of sets of reversed adjacently disposed filler supporting load transmitting shoes each of which is provided with anchoring arms connected by means of a bridge piece, with the anchoring arms disposed in the same plane or offset with respect to one another.

Other and further objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

In the drawings:

Figure 1 is a fragmentary top plan view of an expansion joint embodying the principles of this invention and disclosing a continuous base and filler, and a plurality of spaced sets of load transmitting members having interfitting slidable relationship with pockets formed on the base.

Figure 2 is an enlarged vertical detail section taken on line II—II of Figure 1, showing the joint imbedded between concrete road slabs.

Figure 3 is an enlarged side elevation of one of the sets of load transmission members and the supports therefor.

Figure 4 is a fragmentary bottom plan view taken on line IV—IV of Figure 3, illustrating the details of the pocket fastening means.

Figure 5 is a fragmentary detail section taken on line V—V of Figure 4.

Figure 6 is an end view of a modified form of road expansion joint, showing a modified offset arrangement of the anchor arms of the load transmission members.

Figure 7 is a side view of one of the sets of load transmission members of the type illustrated in Figure 6.

Figure 8 illustrates a modified form of load transmission unit, provided with a looped anchoring member.

As shown in the drawings:

The present invention is adapted not only for use in holding expansion joint fillers or cores in place transversely of a road, but is also adapted for use as a contraction joint and load dis-

tributing device for holding metal cracking plates in place transversely of a road, or longitudinally in a road if the improved joint is adopted to serve as a center joint.

In the form of expansion joint illustrated in Figures 1 to 5 inclusive, Figure 2 illustrates concrete road slabs 1 and 2, which are formed on a road subgrade and which imbed the expansion joint therebetween transversely in a road. Supported in position between the concrete road slabs 1 and 2 is an expansion joint core or filler board 3, which, before the pouring of the concrete, is held in position by the improved expansion joint of this invention.

The improved joint unit comprises a sheet metal base plate 4, the length of which corresponds with the length of the joint, which, in the ordinary form of expansion road joint, extends from the center joint of the road transversely across the subgrade to the side of the road.

Supported in spaced relationship to one another upon the top of the base plate 4 are a plurality of sets or pairs of metal housings or pockets, each of which is open at the bottom and at the rear and consists of side walls 5, a front wall 6, and a top wall 7. The top 7 of each of the housings or pockets is continued and is bent upwardly on itself to form an upwardly projecting flange 8 which terminates in a base flange 9 which projects outwardly and rests upon the top surface of the top wall 7 of the pocket.

As further illustrated in Figure 4, the base plate 4 around each of the housings or pockets is provided with side slots 10, a front slot 11, and auxiliary slots 12, which are parallel to the side slots 10 and are spaced a short distance therefrom to the outside of the side walls 5 of the pockets. Integrally formed on the lower edge of the front wall 6 of each of the pockets is a finger or lug 13 which projects downwardly through the base slot 11 and is bent over at right angles against the bottom of the base plate. Integrally formed on the lower margin of the side walls 5 of each of the pockets are fingers or lugs 14, which are projected downwardly through the slots 10 of the base plate and are bent over at right angles against the bottom surface of the base plate.

As clearly illustrated in Figure 1, it will be noted that the pockets or housings are arranged in staggered or offset pairs upon the base plate 4 and have the openings thereof positioned toward the center line of the base plate.

Associated with each pair of pockets on the base plate are a pair of load transmission units which are reversed with respect to one another and have sliding engagement with the respective pockets or housings on the base plate. Each of the load transmission units comprises a holder or shoe consisting of an angle member, including a base flange 15 and an integral upright holder flange 16. The holder or shoe is positioned with the base flange 15 projecting into a base pocket, thereby providing an arrangement wherein the two holders or shoes of each group are positioned adjacent one another, but are reversed with respect to one another, so that the holders or shoes have slidable engagement with the base pockets of the load transmission group. Brazed or otherwise rigidly secured to the upright flange 16 of each of the load transmission holders or shoes is an anchoring unit consisting of a pair of hook-shaped arms 17, the lower ends of which are integrally connected to one another by means of an arched or curved connector or bridge piece 18. As shown in Figure 1, each of the anchoring units has the bridge piece 18 thereof arched so that when the bridge piece is brazed or soldered to a flange 16, an opening is left between the flange 16 and the bridge piece 18 at 19 which is adapted to be filled with concrete when the concrete road slabs are formed. After the various pairs of holders or load transmission shoes are engaged in the pockets on the base, the filler or core 3 is engaged in position between the upright flanges 16 of the load transmission shoes, with the lower edge of the filler or core 3 resting upon the horizontal flanges 15 of the various holders or shoes which are then pushed inwardly toward opposite sides of the filler or core 3. It will also be noted that the filler or core 3, when seated upon the base flanges 15 of the shoes, is supported on opposite sides by means of the pocket flanges 8. To hold the holders or shoes in the filler holding position, fingers or lugs 20 are struck upwardly from the base 4 to seat against the outer faces of the upright flanges 16 of the holders or load transmission shoes.

Referring to Figures 6 and 7, a modified form of the expansion joint is illustrated and the parts which are similar to those illustrated and described in connection with Figures 1 to 5 of the drawings are designated by corresponding reference numerals. In the modified form of the joint structure the double thickness flanges 8 of the pockets or housings on the base plates are replaced by single thickness flanges 21. The flanges 21 are integral parts of the top plates of the housings or pockets and said flanges 21 are bent upwardly to form opposite side supports for the lower portion of the filler or core 3 when the same is placed in position upon the base flanges 15 of the load transmission shoes.

In the modified form of the transmission joint, modified anchoring units are brazed or otherwise rigidly secured to the upright flanges 16 of the load transmission shoes, and each consist of a pair of anchoring arms 22 which are integrally connected by means of an arched bridge piece 23, and, as clearly illustrated in Figures 6 and 7, the two arms of each anchoring unit are offset with respect to one another to extend in different inclined planes for imbedding in the concrete slabs of the road.

The improved expansion joint of this invention consists of the base plate with the sets or groups of load transmission mechanisms arranged in spaced relation for the reception of the filler or core 3 forming part of the expansion joint. The various parts comprising the joint may be assembled on location, that is, the base plate with the pockets secured thereto may be shipped as a unit, as well as the individual load transmission units and the filler or core. When the base plate is placed in position upon a road subgrade, the load transmission shoes with the anchoring arms forming a part thereof may be inserted in the base pockets, after which the filler or core 3 is adapted to be engaged in position to permit concrete to be poured on opposite sides of the joint mechanism to form the road slabs 1 and 2. It will be appreciated that even the pockets may be shipped separately from the base plate 4, and said pockets may be engaged to the base plate on location if desired. In cases where it may be more desirable to receive a complete expansion joint unit the various parts may be assembled before shipment.

With the improved joint imbedded in the concrete forming the road, it will be noted that the road transmission shoes which are imbedded in the concrete slabs will move with the slabs with the contraction and expansion of the same due to temperature changes. When the road transmission shoes move, they also have slidable movement with the respective pockets on the base plate **4**. With the contraction or expansion of the road slabs, the pockets on the base plate may be caused to move with respect to the base plate, and if such movement is produced, the lugs **13** and **20** will be bent or sheared off, while the lugs **14** of the pockets will be permitted to slide in the slots **10**. The movement of the fingers or lugs **14** with respect to the base plate is facilitated by the provision of the slots **12** in the base plate permitting the material of the base plate between the slots **10** and **12** to be expanded upwardly sufficiently to permit movement of the lugs **14** therebeneath.

A modified form of load transmission unit is illustrated in Figure 8. The modified load transmission unit comprises an angle-shaped holder or shoe **24** having rigidly secured by brazing or other suitable means, to the back of the upper margin of the upright flange the ends of a looped anchoring member **25** which is disposed at an angle. The outer portion of the anchoring member **25** is wider than the attached end thereof. Modified forms of the load transmitting units, of the type illustrated in Figure 8, are adapted to be used to be slidably engaged in the base plate pockets of the joint, similar to the arrangement illustrated in Figure 2.

It will of course be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A road joint former for imbedding between adjacent concrete road slabs, said road joint former comprising a base plate, a plurality of spaced groups of staggered pocket members secured upon the base plate with the alternate pocket members opening in opposite directions, a filler member above the base member, flange means formed on the pocket members and contacting opposite sides of the filler member, and spaced groups of alternately arranged reversed load transmission units projecting in opposite directions beneath the filler member and slidably engaged in the pocket members.

2. A joint former for imbedding between adjacent concrete road slabs, said joint former comprising a base, a plurality of spaced sets of diagonally arranged reversed pockets secured upon the base, supporting flanges formed on said pockets, a filler member having opposite sides thereof contacting the flanges on said pockets, a plurality of holders transversely mounted on said base and slidable in said pockets, said holders projecting in opposite directions beneath the filler member to support the same in place, and multiple-armed anchoring means on said holders and alternately anchoring the holders in adjacent road slabs to slide the holders in said pockets transversely of the base to compress the filler member when the adjacent road sections are expanded due to temperature changes.

3. A road joint former for imbedding between adjacent concrete road slabs, said road joint former comprising a base plate, a plurality of pockets on said base plate with adjacent pockets opening in opposite directions, means for securing the pockets to the base plate, a filler member above the base plate, a plurality of staggered alternately reversed holders on said base plate and projecting into said pockets and supporting the filler in place, and anchoring means on each of said holders, each of said anchoring means comprising a plurality of anchoring arms integrally connected by a bridge member rigidly secured to a holder.

4. A road joint former for imbedding between adjacent concrete road slabs, said joint former comprising a base plate having groups of slots therein, a plurality of staggered pockets arranged on said base plate with adjacent pockets reversed with respect to one another, fastening means on said pockets engaged through the slots in said base plate, a filler member above the base plate, a plurality of angle-shaped holders projecting in opposite directions beneath the filler member and slidable in said pockets, and a plurality of anchoring arms on each of said angle-shaped holders and imbedded in adjacent concrete road slabs.

5. A load transmission joint comprising a base plate, having a plurality of groups of slots therein, a plurality of reversed diagonally positioned pockets on said plate, fastening means on said pockets engaged through the groups of slots in the base plate to hold the pockets in position, diagonally arranged and alternately reversed plate holders slidably engaged in said pockets, means struck from said base plate for limiting the outward movement of said holders with respect to said pockets, and anchoring units secured to said holders, each of said anchoring units comprising a pair of hook anchoring arms integrally connected by an arched bridge piece which is rigidly secured to a holder leaving an opening between the bridge piece and the holder.

6. An expansion joint unit including in combination a load transmitting device comprising an angle-shaped holder, a plurality of hooked anchoring arms, and an arched bridge piece integrally connecting said arms and rigidly secured to the holder leaving an opening between the holder and the arched bridge piece.

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