

April 23, 1940.

M. E. CAPOUCH

2,197,786

EXPANSION JOINT

Filed Aug. 30, 1937

2 Sheets-Sheet 1

FIG. 1.

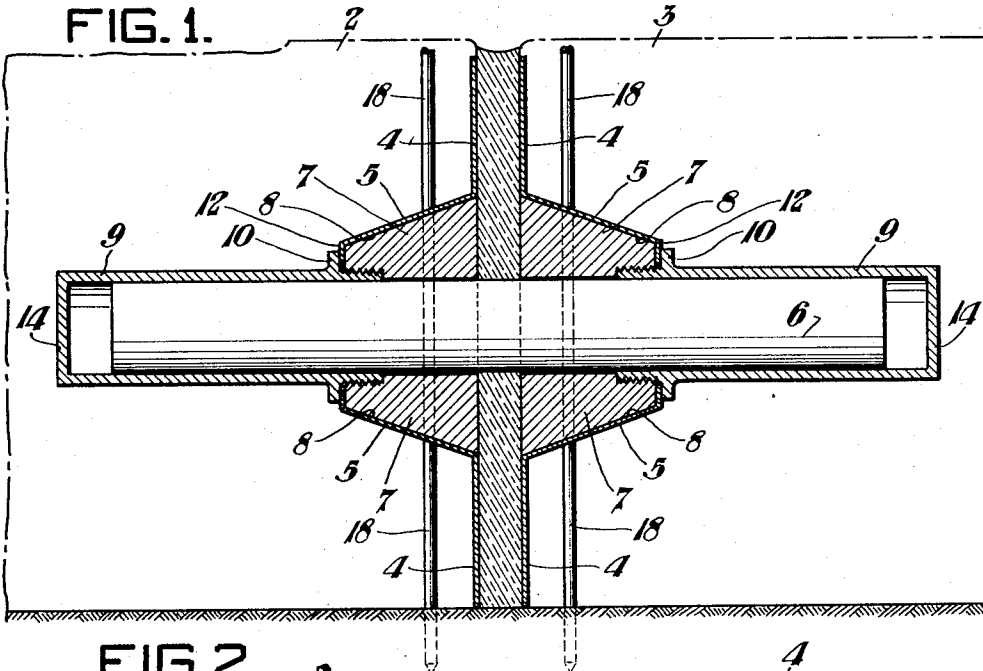


FIG. 2.

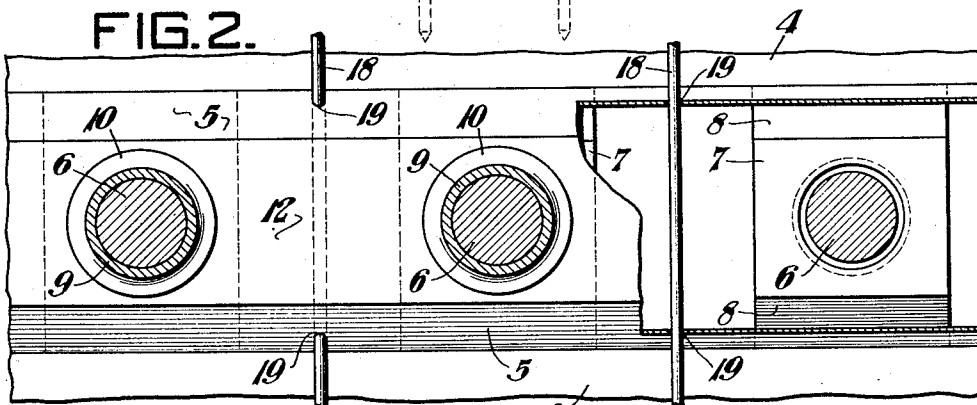
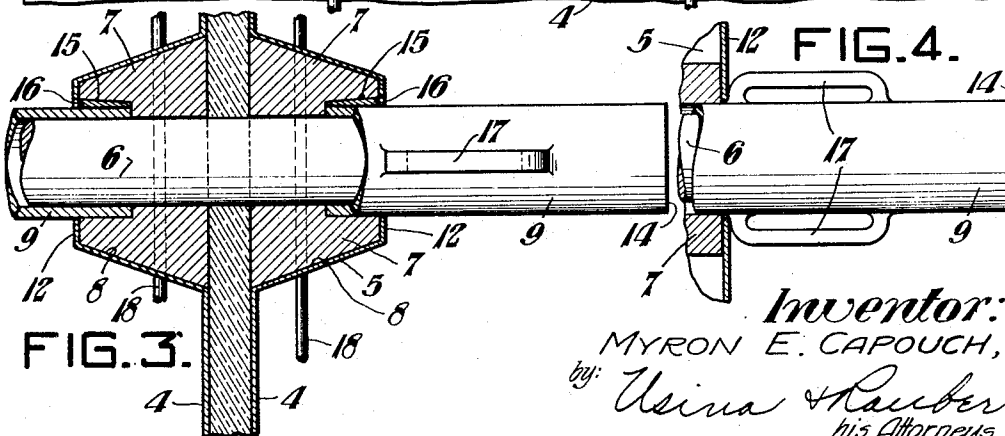


FIG. 3.

FIG. 4.

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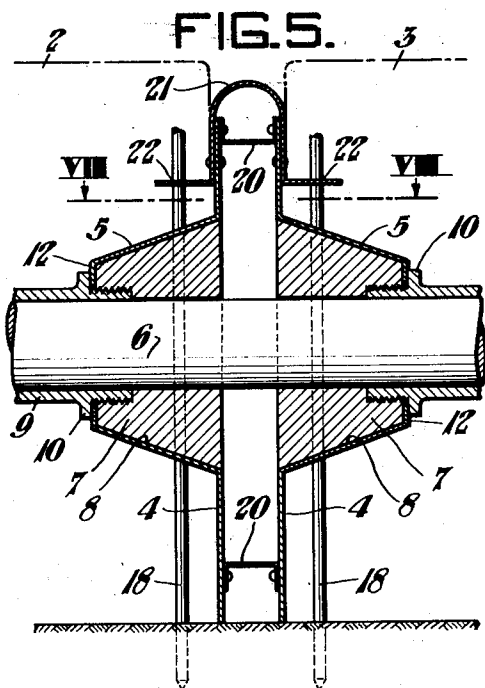
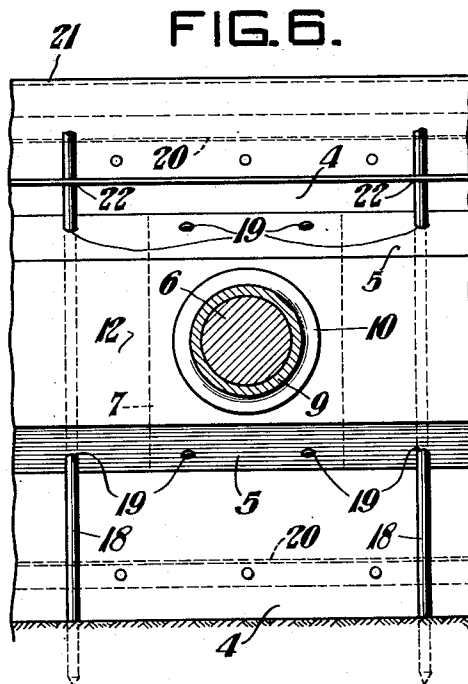
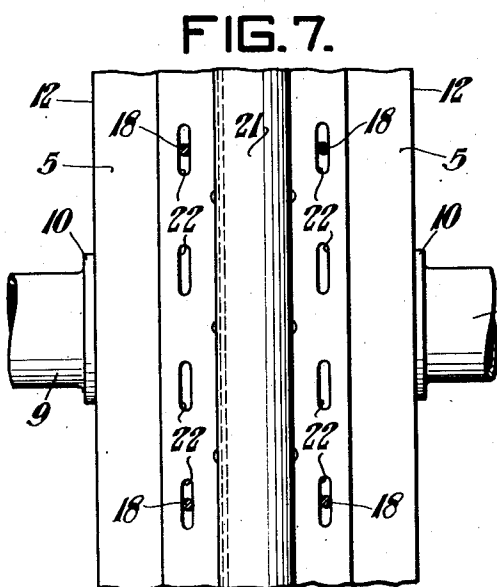
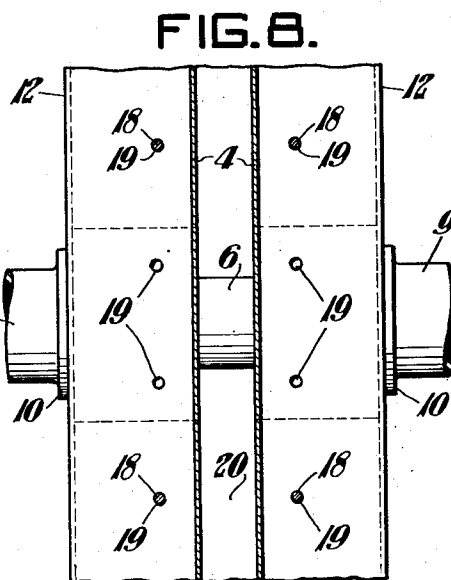
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EXPANSION JOINT

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,197,786

EXPANSION JOINT

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Application August 30, 1937, Serial No. 161,667

4 Claims. (Cl. 94—18)

The present invention relates to a joint employed between adjacent slabs, such as used extensively for highway or pavement construction, to allow for the expansion and contraction of the slabs due to temperature changes.

It has often been the practice to extend a deformed metal strip running down through the center of the roadway or pavement transversely as a contraction joint. However, said metal center strip or a device of similar shape has not been used extensively as an expansion joint, due to the fact that the particular formation of transverse portion of the metal strip has left too great an unsupported length for the usual dowel-bar. As a result, due to this unsupported length, excessive bending stresses are set up in the dowel-bar. Under the present invention, the excessive bending stresses of the dowel-bars are substantially eliminated.

An object of the present invention is to provide steel plugs positioned around the dowel-bar and held in place by metal housings.

Other objects and advantages will become apparent as the description proceeds, in which:

Figure 1 is a section through adjacent concrete slabs showing the present invention in assembled position;

Figure 2 is an end elevation, partly in section;

Figure 3 is a detailed sectional view similar to Figure 1 but showing another means for maintaining the plugs in position;

Figure 4 is a fragmentary detailed top plan view of Figure 3;

Figure 5 is a section similar to Figure 1 but showing an air cushion joint having a metal separator and sealing member;

Figure 6 is an end elevation, partly in section, of the showing of Figure 5;

Figure 7 is a top plan view of Figure 5, and

Figure 8 is a section on line VIII—VIII of Figure 5.

In the drawings, the numerals 2 and 3 represent adjacent slabs of a concrete roadway or pavement. Plates 4 are positioned against the edges of each concrete slab or section and extend downwardly through the center of the pavement or roadway. The usual space between these plates 4, as illustrated in Figure 1, is provided with the conventional type of joint filler which may be capped or sealed, on the top and ends, as desired; or it may be left open.

Each plate 4 is provided with a laterally extending portion 5 adapted to extend transversely across the roadway or pavement. Positioned and arranged at spaced intervals across the trans-

verse area of the roadway or pavement are dowel-bars 6. These dowel-bars are embedded in the concrete sections. Steel plugs 7, having a centrally arranged opening, are positioned on said dowel-bars 6 and are provided with a smooth or tapered surface 8 adapted to support the laterally extended portions 5 of the plates 4.

As shown in Figure 1, the inner bore of said plugs 7 may be provided with a threaded area for receiving the threaded end of a metal housing 9. The housings 9, which are positioned on each side of the joint, may be provided with a collar or flange 10 extending outwardly beyond the outer periphery thereof. These collars or flanges 10 engage the side walls 12 of the extensions 5 which abut against the ends of the said steel plugs 7 so as to hold said plugs rigidly in position on said dowel-bars, thereby eliminating the possibility of having an unsupported length of said dowel-bars. The metal housings 9 may be either a cylindrical metal pipe or a casting of such shape as to permit the dowel-bar 6 to fit snugly against its inner walls, and may be hollow or part hollow and the remainder of solid metal. If the housing is hollow, the ends 14 opposite the threaded portion may be an integral part of the housing, or they may be closed by a metal disk welded or frozen into the opening in the end thereof.

Suitable stakes 18 may be provided for holding the joints rigid during installation of said joint. As illustrated in Figures 1 and 2, the stakes are placed through holes 19 punched in the tapered surfaces 8 of the extended portion 5 in between the metal plugs 7. These stakes may be placed in between every dowel-bar or so placed as desired, depending upon how rigid the joints are to be staked.

In Figure 5, there is shown an expansion joint without the resilient filler of Figure 1 but having metal separator plates 20. The metal separator plates are made of extremely light metal which, when the pavement expands and contracts, the force of the expansion and contraction will crush the metal so that the joint may act. These metal separator plates 20 may be connected at spaced intervals, if desired, to the side walls of the plates 4 by welding or riveting or in any other conventional manner.

A metal sealing member 21 having a curved upper surface is adapted to be positioned down over the upper walls of the plates 4, as shown in Figure 5, and is welded, riveted or secured in any conventional manner, at spaced intervals, if desired, thereto. The free edge portions of said

sealing member 21 are bent at right angles throughout the length of the joint and are provided with slots or openings 22 through which the stakes 18 pass for securing the joint as hereinbefore described.

In Figure 3, the castings or metal plugs are shown provided with a slot 15 into which is driven a wedge 16 for holding the housing 9 and plug 7 in position on said dowel-bars. The housing 9 may be provided with lateral projections 17 which abut the side walls 12 of said plates instead of having the flange 10 shown in Figure 1. While I have disclosed two ways of securing the casting and housing rigidly in position, various other constructions could be provided, and, while the drawings show the castings or metal plugs as being trapezoidal in cross-section, such castings or metal plugs may be, if desired, V-shaped, semi-circular or rectangular in cross-section.

The drawings show the extended portions 5 of plate 4 to be a trapezoid in cross-section. This extended portion 5 may also be, if desired V-shaped, semi-circular or rectangular in section.

Figure 2 shows the expansion joint of constant depth; such a joint, however, may have tapered ends, or be a parabolic section or any other section necessary to conform to the cross-section of the adjacent pavement slabs.

It is to be understood that the expansion joints may be constructed and arranged to conform to the parabolic curvature of the surface of the roadway or pavement and the thickened edge thereof.

While I have shown and described two specific embodiments of the present invention it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention, as defined by the following claims.

I claim:

1. An expansion joint comprising oppositely disposed metallic plates, said metallic plates positioned and arranged vertically between adjacent concrete slabs, said metallic plates each provided with oppositely directed laterally extended portions positioned transversely across said concrete slabs, plugs for supporting each of said metallic plates, a hollow tubular housing connected to each of said plugs, said housing including means for securing said plates tightly against said plugs

and a dowel-bar positioned within said housings and through said plugs for supporting the same.

2. An expansion joint comprising oppositely disposed metallic plates, said metallic plates positioned and arranged vertically between adjacent concrete slabs, said metallic plates provided with laterally extending portions and positioned transversely across said concrete slabs, plugs for supporting each of said metallic plates, a hollow tubular housing rigidly connected to each of said plugs, a dowel-bar positioned within said housings, a filler between said metallic plates whereby said concrete slabs can expand and contract, and a metallic seal on the top and bottom of said metallic plates.

3. An expansion joint for concrete roadways and pavement comprising spaced metallic plates each of which is provided with laterally extending portions, said laterally extending portions of the respective plates extending in opposite directions, plugs having tapered outer surfaces for supporting said laterally extending portions, the ends of said laterally extending portions bent to extend over the ends of said plugs, housings rigidly secured to each of said plugs and provided with means for holding the ends of said laterally extending portions against said plugs for maintaining said plates in position, a dowel-bar positioned within said housings and through said plugs, a filler between said metallic plates, and removable means for staking down said joint during installation.

4. An expansion joint for concrete roadways and pavement comprising spaced metallic plates each of which is provided with laterally extending portions, said laterally extending portions of the respective plates extending in opposite directions, plugs having tapered outer surfaces for supporting said laterally extending portions, the ends of said laterally extending portions bent to extend over the ends of said plugs, housings rigidly secured to each of said plugs and provided with means for holding the ends of said laterally extending portions against said plugs for maintaining said plates in position, a dowel-bar positioned within said housings and through said plugs, a filler between said metallic plates, removable means for staking down said joint during installation, and a metallic seal on the top and bottom of said metallic plates.

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