Sept. 24, 1940. R. R. ROBERTSON 2,215,653

DOWEL PLATE JOINT AND SUPPORT

Filed June 16, 1939

Fig. 1.

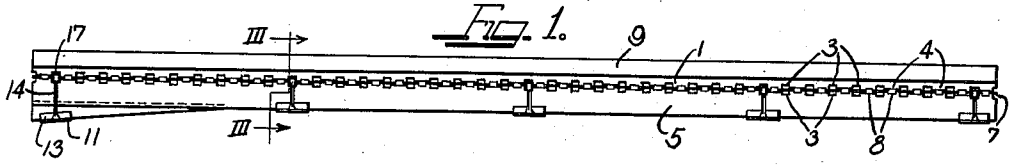


Fig. 2.

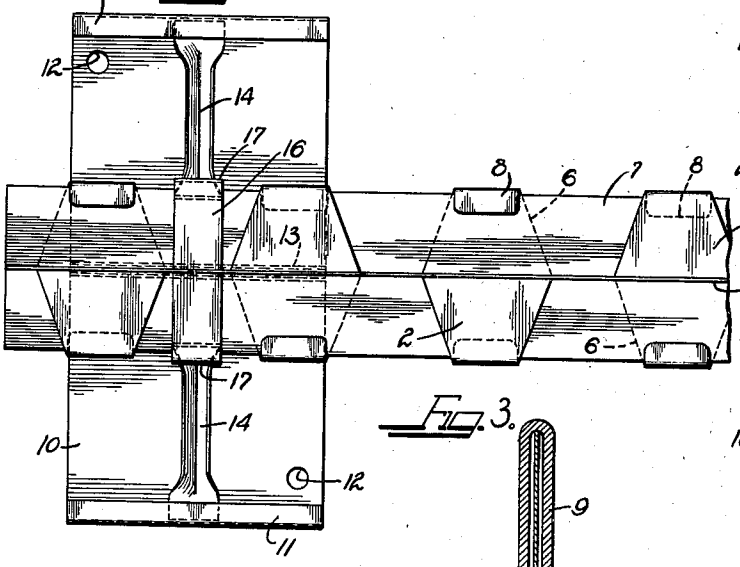


Fig. 4.

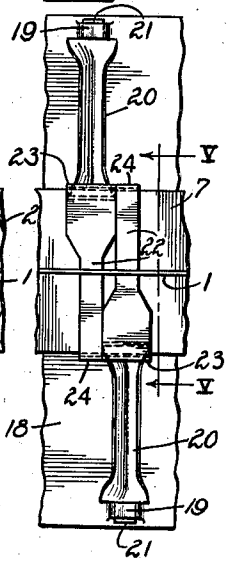


Fig. 3.

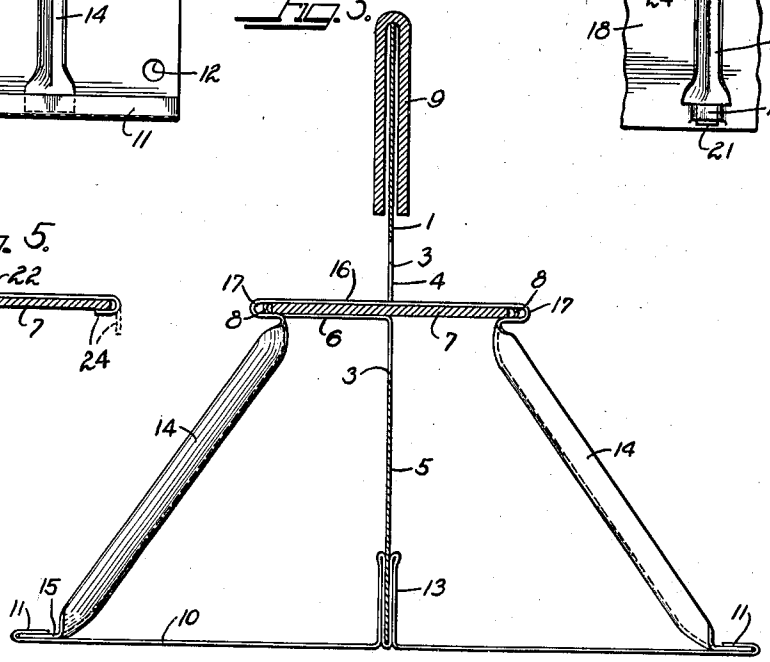
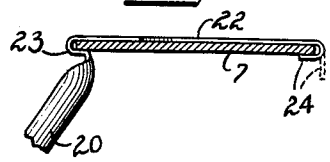


Fig. 5.



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DOWEL PLATE JOINT AND SUPPORT

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17 Claims. (Cl. 94—18)

The present invention pertains to concrete road joints and more particularly to contraction and center joints of the dowel plate type and improved means for supporting the joint on a road subgrade, said means or joint supports arranged at predetermined spaced intervals along the joint and including a dowel plate engaging and holding section supported on leg members engageable in a base which includes a support for receiving the lower margin of the lower body plate forming part of the road joint.

It is an object of this invention to provide an improved type of support for a concrete road contraction or center joint of the dowel plate type, said support being formed to engage the dowel plate and both the upper and lower dividing or body plates of the joint for supporting the same in position upon a road subgrade in proper position for embedding in concrete.

Another object of the invention is to provide a support for a dowel plate type of road joint, said support consisting of a base or shoe for the reception of the lower margin of the joint dividing plate, said shoe also being formed to receive the feet of supporting legs which are integral with either a connecting brace or with bridge pieces which project through the upper dividing plate of the joint and engage around opposite marginal edges of the joint dowel plate to brace the same in place.

It is also an object of this invention to provide an improved type of contraction or center joint support in the form of a combination holder including a base or shoe formed for the reception of the lower margin of the lower joint dividing plate and also formed to receive a dowel plate supporting bracket, the lower ends of the supporting legs of which are adapted to be sprung or forced into stop pockets forming a part of the base or shoe of the support.

It is an important object of this invention to provide an improved and simplified form of support, a selected number of which are adapted to be used in spaced parallel relation with respect to one another for supporting a dowel plate type of contraction or center joint in position on a road subgrade, said supports being formed to engage through the joint to support the same in position for embedding between concrete road slabs.

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

The invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

In the drawing:

Figure 1 is a fragmentary side elevation of a concrete road joint supported in position by improved supports embodying the principles of this invention.

Figure 2 is an enlarged fragmentary top plan view of a portion of the joint shown in Figure 1 and illustrating the top of one of the improved supports.

Figure 3 is an enlarged transverse sectional view taken on line III—III of Figure 1.

Figure 4 is a fragmentary top plan view of a modified form of joint holder including a pair of clamping brackets.

Figure 5 is a fragmentary detail section of the modified holder taken on line V—V of Figure 4 showing the upper portion of one of the bracket members engaged on the joint dowel plate.

As shown in the drawing:

In the formation of a concrete road in which improved dowel plate types of either contraction or center joints are to be used, it is necessary to support the joint mechanisms in proper position upon the road subgrade so that the joint mechanisms are held in position during the pouring of the concrete to form the concrete road slabs between which the road joint is embedded.

In the present showing of the invention a dowel plate contraction joint mechanism is illustrated in Figure 1 and is supported upon a road subgrade transversely of the road by means of a plurality of the improved joint supporting units of this invention.

The joint mechanism, which is to be supported in position by the improved supports, is of the dowel plate contraction type and comprises a main body portion consisting of an upper dividing plate 1, the lower portion of which is stamped out or cut to provide a plurality of tapered flanges of gripping members 2 which are alternately deflected outwardly in opposite directions at substantially right angles to the upper plate 1 to provide a staggered flange arrangement leaving spaces between the flanges 2 on each side of the upper dividing plate 1. In the formation of the tapered flanges 2 out of one of the longitudinal marginal portions of the upper dividing plate 1, spaced openings or notches 3 are provided which extend from the line of deflection of the flanges 2 upwardly toward the upper edge of the upper dividing plate 1 to form separated sections or panels 4 between said openings.

Also forming part of the main body portion of

the joint is a bottom dividing plate 5, the upper longitudinal marginal portion of which is cut out or stamped to provide a plurality of tapered flanges or gripping members 6 which are bent outwardly at substantially right angles to the plate 5 with alternate flanges projecting in opposite directions to provide a staggered arrangement of the flanges as clearly illustrated in Figure 2. The flanges or gripping members 6 of the lower dividing plate 5 are arranged to be positioned beneath the spaces between the upper flanges 2.

Separating the flanges 2 of the upper dividing plate 1 and the flanges 6 of the lower dividing plate 5 of the joint, is a transverse seal or dowel plate 7 which forms the middle portion of the joint. The staggered flanges 2 of the top dividing plate 1 of the joint seat against the top surface of the dowel plate 7 while the staggered flanges 6 of the lower dividing plate 5 seat against the bottom surface of the dowel plate 7 beneath the spaces between the flanges 2. This arrangement positions the flanges 2 and 6 diagonally with respect to one another on opposite sides of the dowel plate 7. For the purpose of engaging and holding the dowel plate 7 in position the ends of the upper and lower flanges 2 and 6 are respectively bent downwardly and upwardly around the margins of the dowel plate and form gripping clips or clamps 8 which grip against opposite surfaces of the longitudinal portion of the dowel plate 7 to securely hold the plate members of the joint unit in assembled relation ready for use.

As clearly illustrated in Figures 1 and 3, the joint unit also includes a continuous metal top cap 9 of U-shaped cross section which is engaged over the top margin of the upper dividing plate 1 and extends throughout the length of the joint and is left in position until after the pouring of concrete. When the concrete has partially been cured, the cap 9 is removed to leave a top opening in the joint which is adapted to be filled with a filling of a bituminous material.

For the purpose of properly supporting the joint unit in place transversely upon the road subgrade prior to the pouring of concrete, said joint unit is held supported in position by a plurality of selectively spaced supporting units which are positioned to extend across the joint. Each of the improved supports comprises a base plate or shoe 10, constructed of sheet metal or other suitable material. The end margins of the base plate 10 are bent upwardly and inwardly to provide U-shaped pockets 11. As shown in Figure 2, the base plate or shoe 10 is provided with diagonally positioned openings or apertures 12 for receiving pins or pegs for securing the base of the support on the road subgrade in a selected position. The middle portion of the base plate or shoe 10 is bent upwardly and downwardly several times to form a transverse middle or intermediate plate holder 13 consisting of two upwardly projecting loop portions and an intermediate downwardly projecting loop portion in which the lower margin of the joint dividing plate 5 is adapted to be seated for holding the joint unit in position on a road subgrade prior to the pouring of concrete to form the road. The joint holding support includes an upper section adapted to be supported upon the base section or shoe 10, said upper support section comprising a pair of grooved or channel-shaped legs 14 the lower end of each of which is twisted and extends outwardly at an angle to form a flat mounting foot or flange 15 adapted to be slidably inserted in one of the base or shoe pockets 11 to hold the lower end of the supporting legs 14 in position and to prevent the same from sliding outwardly beyond a certain distance with respect to the base or shoe 10. The upper ends of the two inclined brace legs 14 are integrally connected by means of a connecting plate or bridge piece 16 the end portions of which are rounded to form channel-shaped pockets or loops 17 between the bridge piece 16 and the upper ends of the legs 14 as clearly illustrated in Figure 3 to permit the side pockets of the bridge piece to engage around the opposite longitudinal margins of the dowel plate 7 forming part of the joint unit. After the lower dividing plate 5 of the joint unit is engaged in the plate holders 13 of the support bases or shoes 10, the upper sections of the support are mounted in position by inserting one of the legs through a selected opening 3 of the top dividing plate 1 after which the supporting feet 15 of the support top section are slidably engaged in the receiving pockets or sockets 11 of the base 10.

As shown in Figure 1, a series of the improved joint unit supports are placed in position at spaced intervals on the road subgrade transversely of the location where the joint is to be formed so that the joint forming unit may be securely positioned upon the road subgrade transversely of the road in a selected location ready for the pouring of concrete to form the concrete road.

The improved contraction and center joint unit supports engage beneath and project through the joint forming unit and engage the lower joint dividing plate and the transversely disposed dowel plate and also project through the openings 3 in the top dividing plate of the joint unit. Attention is also called to the spring-like action of the bridge members 16 and 17 of each of the upper support sections, permitting the supporting legs 14 of the supports to be sprung outwardly away from one another, so that when the upper support section is placed upon the base section 10, the supporting feet 15 of the leg members are adapted to spring or be forced into the sockets or pockets 11 of the base plate 10 to hold the top support section braced in position.

Figures 4 and 5 illustrate a modified form of a joint holder comprising a base plate 18 having two margins thereof cut and formed to provide offset or staggered arched straps or pockets 19. The base plate 18 is also formed with a joint holder, similar to the holder 13 shown in Figure 3, for receiving the lower plate 5 of a contraction joint.

To hold the upper portion of the contraction joint braced in position, each of the modified forms of joint holders includes a pair of offset, reversed and staggered bracket members or spring-like bridge sections, each comprising a single leg 20 the lower end of which is formed with a flange or foot 21 for insertion into one of the base plate pockets or straps 19. The upper end of the leg 20 has integrally formed thereon a bridge piece or brace arm 22 including a wide end which is bent to form a channel-shaped pocket or loop 23 for engagement over one longitudinal margin of the joint dowel plate 7. The opposite end of the brace arm 22 is of reduced width and normally has the free end thereof bent at an angle to form a finger piece 24 as illustrated in dotted lines in Figure 5. After the foot 21 of a bracket member is engaged in a base plate pocket 19, the spring-like loop 23 permits

the clamping arm 22 to be inserted through one of the upper joint plate openings 3. The clamping arm is thus positioned to extend through the joint with the loop 23 clamped around one margin of the dowel plate 7. The arm 22 is thus engaged over the top of the dowel plate, and the finger piece 24 is then bent downwardly and inwardly to hook around the opposite margin of the dowel plate 7. A second bracket member is then engaged through the joint from the opposite direction to clamp around the dowel plate, as illustrated in Figure 4, to hold the joint unit braced in position at spaced intervals along the joint.

It will, of course, be understood that numerous 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 forming mechanism for embedding between adjacent concrete road slabs, said joint forming mechanism comprising a transverse dowel plate, upper and lower dividing plates disposed on opposite sides of the dowel plate, gripping members integrally formed on the dividing plates and alternately engaging around opposite longitudinal margins of the dowel plate, and a plurality of spaced supports for the joint forming mechanism, said supports each comprising a base shoe for receiving and supporting the lower dividing plate, and a top section projecting through the upper dividing plate and engaging around the dowel plate and including supporting members interfitting with the base shoe.

2. A road joint forming mechanism for embedding between adjacent concrete road slabs, said joint forming mechanism comprising a transverse dowel plate, upper and lower joint dividing plates disposed in substantially the same plane above and below the dowel plate, said upper and lower dividing plates having openings therein adjacent the dowel plate, and a plurality of supporting units for the road forming mechanism, each of said supporting units comprising a base shoe having the ends thereof shaped to form pockets, a plate holder formed on the base plate for receiving the lower plate, a bridge piece extending transversely over the dowel plate and projecting through an opening in the upper dividing plate, U-shaped portions formed on the ends of the bridge plate and engaged around opposite longitudinal margins of the dowel plate, supporting legs integrally connected with the U-shaped portions of the bridge plate, and feet integrally formed on the lower ends of the legs and engaged in the pockets of the base shoe.

3. A road joint forming mechanism for embedding between concrete road slabs, said joint forming mechanism comprising upper and lower dividing plates, a dowel plate disposed transversely therebetween, means integral with each of the dividing plates for gripping around the opposite longitudinal margins of the dowel plate, and a plurality of supports each engaged beneath and also projecting through the joint forming mechanism to support the same in place for embedding between the concrete road slabs.

4. A road joint forming mechanism for embedding between concrete road slabs, said joint forming mechanism comprising upper and lower dividing plates, a dowel plate separating the dividing plates, gripping means on the dividing plates for engaging opposite margins of the dowel plate to hold the same in position, and a plurality of supports engaged beneath and projecting through the joint forming mechanism for supporting the same in place for embedding between concrete road slabs, said supports each comprising a lower base section positioned to project across the joint beneath the road slabs, and including a holder for receiving the lower dividing plate of the joint forming mechanism, and spring-like upper means projecting through the joint forming mechanism above the dowel plate, and including supporting members interfitting the base section.

5. A road joint forming mechanism for embedding between concrete road slabs, said joint forming mechanism comprising a dividing plate section, a dowel plate section projecting therethrough, a plurality of supporting base sections having means formed thereon for receiving the dividing plate section seated therein, and spring-like bridge sections projecting through the dividing section and engaging the dowel plate section and said supporting base section.

6. A road joint forming mechanism for embedding between concrete road slabs, said joint forming mechanism comprising a dowel plate, upper and lower apertured dividing plates gripped around opposite margins of the dowel plate to hold the same connected to the dividing plates, and a plurality of spaced supports for holding the joint forming mechanism in position, each of said supports comprising a base shoe having receiving pockets formed thereon and a plate holder formed intermediate the ends thereof for receiving the lower dividing plate of the joint forming mechanism, said supports also including a dowel plate supporting section including bridge means projecting over the dowel plate and through the upper dividing plate, and legs formed on the bridge means on opposite sides of the lower dividing plate and having the lower ends resting on the base shoe and projecting into the pockets thereof.

7. The combination with a road joint forming mechanism and a dowel plate projecting therethrough, of a plurality of supports engaging beneath and projecting through said mechanism and formed with a holder to receive the road joint mechanism seated therein with portions of the supports engaged around the dowel plate of said mechanism.

8. The combination with an apertured road joint forming mechanism and a dowel plate thereof, of a plurality of supports engaged beneath and through the mechanism for supporting the same in place, each of said supports comprising an apertured base plate having receiving pockets formed thereon and having a plate receiving holder formed intermediate the ends thereof, and an upper support section releasably engaged in the pockets of the base plate and including looped gripping means projecting through the joint forming mechanism and engaged around opposite longitudinal margins of the dowel plate of said mechanism.

9. A contraction and center joint support comprising a base plate having the ends thereof formed to provide receiving pockets and having the intermediate portions thereof shaped to provide a plate receiving holder, and an upper support section on the base section and including a pair of legs having integral feet supported on the base section and projecting into said pockets, and

a looped gripping means integral with the upper ends of the supporting legs.

10. A contraction and center joint support comprising a base plate having the ends thereof bent upwardly and inwardly to provide receiving pockets and having the intermediate portion looped to provide a plate holder, and a top section above the base plate, said top section comprising a looped bridge piece, channel-shaped legs integrally formed thereon and projecting downwardly and outwardly in opposite directions, and feet formed on said legs seated upon the base plate and projecting into the base plate pockets.

11. The combination with an apertured road joint forming mechanism, of a plurality of supports therefor disposed transversely at spaced intervals along the length of the joint forming mechanism, each of said supports comprising a joint supporting base section, and a joint gripping upper section projecting through the joint forming mechanism and sprung into engagement with the base section of the support.

12. A road joint forming mechanism including in combination a plurality of supports each comprising an apertured base plate, end pockets integrally formed thereon, a plate holder integrally formed intermediate the ends of the base plate, a bridge plate, looped portions integrally formed on the ends of the bridge plate, supporting legs integrally connected with the looped portions of the bridge plate, and feet integrally formed on the legs and projecting into the pockets of the base plate.

13. A road joint forming mechanism including in combination a plurality of supports each of which consists of a base having a plate holder and pockets integrally formed thereon and an upper section projecting through the joint forming mechanism and including supporting legs resting on the base plate and expandible into the pockets of said base plate.

14. A dowel plate joint support comprising a bridge piece, a pair of legs, spring-like members integrally connecting the bridge piece with said legs, feet formed on said legs, and a base plate having the ends thereof formed to receive the feet.

15. The combination with a dowel plate joint, of a plurality of base supports therefor, and a plurality of dowel plate supports projecting through the joint to engage over the top and around the side margins of the dowel plate, and including outwardly inclined supporting legs engaged in the base supports to limit the spread of said legs.

16. A dowel plate road joint support comprising a base plate provided with receiving pockets and formed with a plate holder, and a top section above the base plate comprising a pair of reversed staggered brace members engaged in the base plate pockets and including top pieces for projecting through the road joint in opposite directions for engagement around both longitudinal edges of the dowel plate of the joint.

17. The combination with an apertured dowel plate road joint, of a plurality of supports therefor each comprising a joint supporting base extending beneath the joint, a pair of leg members engaged therewith on opposite sides of the joint, and reversed staggered top pieces on said leg members projecting through the apertured joint from opposite sides of the joint and engaged around both longitudinal edges of the joint dowel plate.

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