Aug. 8, 1933. J. N. HELTZEL 1,921,081

ROAD REENFORCEMENT AND JOINT

Filed March 28, 1929

FIG. 1.

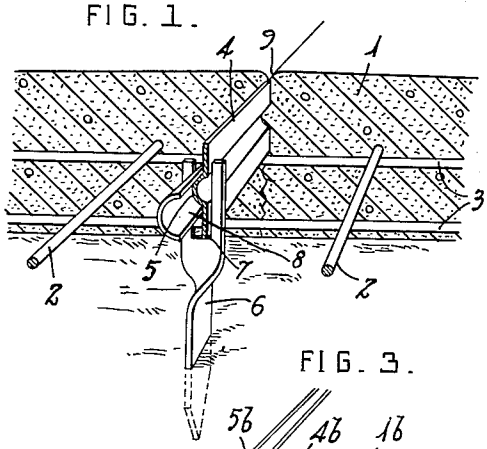

FIG. 2.

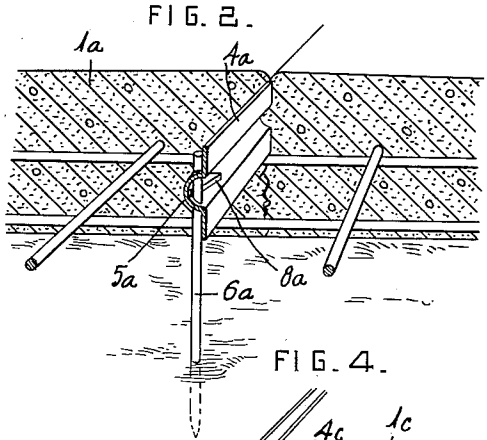

FIG. 3.

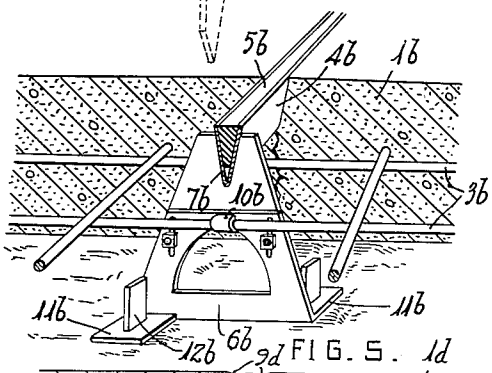

FIG. 4.

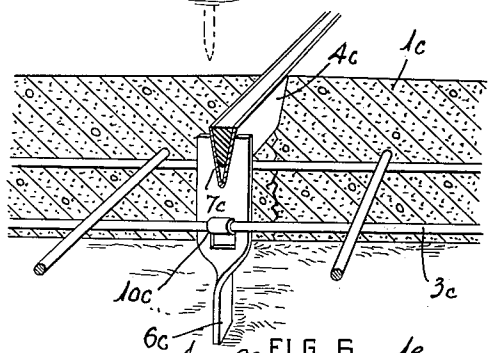

FIG. 5.

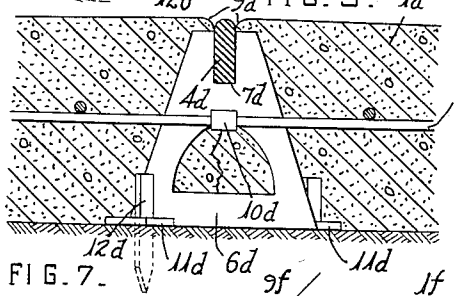

FIG. 6.

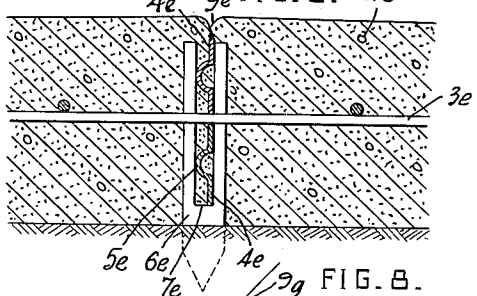

FIG. 7.

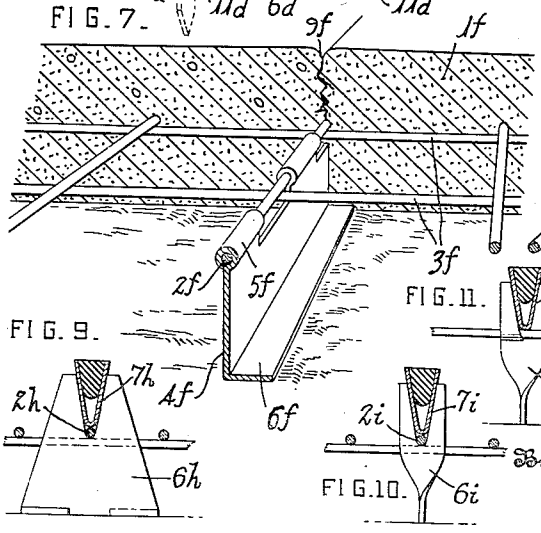

FIG. 8.

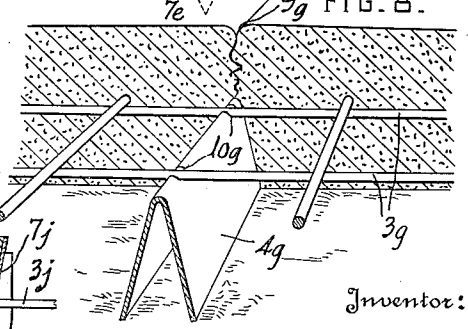

FIG. 11.

FIG. 9.

FIG. 10.

Inventor:

John N. Heltzel

Monroe C. Miller

Attorney.

Patented Aug. 8, 1933

1,921,081

UNITED STATES PATENT OFFICE

1,921,081

ROAD REENFORCEMENT AND JOINT

John N. Heltzel, Warren, Ohio

Application March 28, 1929. Serial No. 350,674

10 Claims. (Cl. 94—8)

The present invention relates to concrete roads and similar surfacing structures, and aims to provide joint producing means or members associated with reenforcement for the purpose of dividing the concrete along a predetermined line into slabs tied together by the reenforcement.

Another object of the invention is the provision of a joint installing means to be used with reenforcing steel of mesh extending across the joint, for example, when the reenforcing mesh extends the width of the road across the longitudinal joint.

A further object of the invention is to provide a joint and reinforcing supporting member to be positioned in contact with the sub-base of the roadway and capable of being stabilized or held in position by the reinforcing material, which is being supported.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein—

Figures 1, 2, 3 and 4 are perspective views illustrating different embodiments of the invention, the slabs and joint members being shown in cross section.

Figs. 5 and 6 are cross sections depicting other modifications.

Figs. 7 and 8 are perspective views showing still further modifications, with the slabs and joint members shown in cross section.

Figs. 9, 10 and 11 are elevations of other supporting members, showing the joint members and mesh in cross-section.

Fig. 1 illustrates the concrete body 1 having embedded therein the longitudinal and transverse reinforcing rods 2 and 3, respectively, with the rods 3 extending across the joint which divides the concrete body into slabs.

A joint or division plate 4 is embedded in the concrete during the building of the road, and extends from the surface of the road down substantially to the reenforcement or mesh, so as to divide the concrete above the mesh or reinforcement, and the concrete will acquire a natural break below the reinforcement or mesh and along the line of the joint plate, so as to separate the concrete into slabs which are tied together by the transverse rods 3, thereby permitting the slabs to flex relatively to one another but preventing them from separating.

When using the supporting means in Figures 1, 2, 4, 10 and 11, a bottom layer of concrete approximately to the height of the mesh or reinforcing may be spread and the mesh or reinforcing then laid and the supporting stakes may then be driven in place and reinforcing material and joint member may be attached to the supporting member, after which the top layer of concrete may be poured or spread and finished over the reinforcing and joint member, it being understood that the joint member may remain in place or may be removed as might be required in practice. Figures 3, 5, 7, 8 and 9 represent a type of support which will be required to be positioned on the sub-base prior to pouring of any concrete, and when using these supporting members, the reinforcing or mesh may if desired be attached to the supporting members before any concrete is poured.

The joint plate 4 has a longitudinal offset 5 between its upper and lower edges to provide a tongue and groove engagement between the slabs above the reinforcement, although the joint plate may be of various cross-sections.

When building the road, the joint plates 4 are placed above the reinforcement after the latter has been installed above the sub-base, and stakes are used for supporting the joint plates. As shown, the stake 6 is formed from a flat bar or strip having a one-quarter twist between its ends substantially as shown in my application Serial No. 318,919, filed November 12, 1928. The lower pointed end of the stake is driven into the sub-base, and the upper terminal of the stake has an open slot 7 to receive the plate 4, and a transversely curved wedge 8 is preferably driven between the plate and stake astride the offset portion 5, thereby clamping the plate to the stake, so as to support the plate at the proper position.

The upper edge of the plate 4 is preferably spaced slightly below the crown surface of the road, and a groove 9 is formed in the surface over the upper edge of the plate to round off the adjacent edges of the slabs.

Fig. 2 illustrates a similar metal joint plate 4*a* in the concrete 1*a*, and the stake 6*a*, formed from a rod, passes down through apertures in the offset portion 5*a* of said plate, with the wedge 8*a* driven between the stake and said offset. By clamping the plate to the stake, the plate may be supported above the reenforcing

mesh, if the mesh is low, and if the mesh is too high it may be driven down with the stake and plate and held down.

Fig. 3 illustrates a joint member or form 4*b* of V-shaped cross-section seated in the slot 7*b* of a pedestal 6*b* having opposite feet 11*b* to rest on the sub-base and through which stakes 12*b* are driven into the sub-base to maintain the pedestal in position. The pedestal has a hook or seat 10*b* bent therefrom to receive and support one of the transverse rods or bars 3*b*, so that the reenforcement may be supported, at least partly, by the pedestals. The joint member, as shown, is supported slightly above the reenforcement, and a bar 5*b* is placed within the member 4*b* to close the space thereof during the pouring of the concrete. After the concrete has set the bar 5*b* may be removed and the walls or wings of the form 4*b* sprung toward one another to permit said form to be removed. The groove in the concrete 1*b* may be filled by tar or other suitable sealing material. The forms 4*b* may thus be used repeatedly while the pedestals remain in the structure. The pedestal 6*b* is an improvement over the pedestal shown in my application Serial No. 234,217 filed November 18, 1927, and as shown may be composed of adjustably connected section or plates, to permit of vertical adjustment of the member 4*b* above the reenforcing mesh. The slots will permit the top section of the support to be adjusted so as to position the plane in a vertical position in case the base portion of the pedestal is set on an uneven sub-base.

Fig. 4 illustrates a stake 6*c* of flat metal having a one-quarter twist, as seen in Fig. 1, and provided with a V-shaped slot 7*c* to receive the form 4*c* similar to that shown in Fig. 3. The stake has an outstruck hook or seat 10*c* to receive and support a transverse rod 3*c*.

Fig. 5 illustrates a pedestal 6*d* similar to that shown in Fig. 3, excepting that the slot 7*d* is of a different shape to receive a premolded joint strip or member 4*d* which remains in the concrete 1*d*, and the edges of the slabs are rounded off, as at 9*d*, adjacent to the strip 4*d*. The pedestal 6*d* has the feet 11*d* through which the stakes 12*d* are driven, and said pedestal also has a hook or seat 10*d* supporting a transverse rod 3*d*.

Fig. 6 illustrates upper and lower joint strips or plates 4*e* disposed below and above the reenforcement 3*e*, and said plates preferably have the offsets 5*e*. The lower plate is seated in the slot 7*e* of the stake 6*e* and the reenforcement is placed on the lower plate after the plastic concrete has been poured to complete the lower layer up to the level of the upper edge of the lower plate. The upper plate is then placed in the slot 7*e*, after which the upper layer of concrete is poured and finished. The groove 9*e* is then formed in the surface of the finished slab.

Fig. 7 illustrates a division or joint plate 4*f* below the reenforcement and having a base flange 6*f* to rest on the sub-base. Said plate has hinge sleeves 5*f* at its upper edge loosely embracing the longitudinal reenforcement rod 2*f* which extends along the line of the joint, so that the plate may be swung or folded against the reenforcement during shipment and handling. The plate is swung downwardly when the reenforcement is placed in position, and assists in supporting said reenforcement. The concrete 1*f* will break between the plate 4*f* and the groove 9*f* provided in the surface of the concrete.

Fig. 8 illustrates a doubled joint member or plate 4*g* of inverted V-shaped cross section, the edges of which are adapted to rest on the sub-base, and the bend of the plate may have notches 10*g* to receive the transverse rods 3*g*, for supporting them, and the concrete is broken between the plate 4*g* and groove 9*g* in the surface of the concrete. The plate or member 4*g* will provide a groove in the lower portion of the road, between the slabs, which will permit the adjacent portions of the slabs to heave or rise, or the opposite edge portions of the slabs to be depressed, without placing undue tensile strains on the rods 3*g*, inasmuch as the lower adjacent portion of the slabs move toward one another by the clearance or space provided between them below the rods 3*g*.

The joint member 4*g* also provides a passage or conduit in the concrete over the sub-base, which will serve as a drain for surplus water during the pouring, finishing and setting of the concrete.

Fig. 9 illustrates one of the longitudinal rods 2*h* of the reenforcement seating in the slot 7*h* of the pedestal 6*h*, so that the pedestal assists in supporting the reenforcement, and the reenforcement assists in holding the pedestal in place.

Fig. 10 similarly shows the longitudinal rod 2*i* of the reenforcement seating in the slot 7*i* of the stake 6*i*, whereby the stake assists in supporting the reenforcement, and the reenforcement aids in holding the stake in position.

Fig. 11 illustrates a transverse rod 3*j* of the reenforcement seating in the slot 7*j* of the stake 6*j*, the arms of the bifurcation of the stake being offset to permit said rod to pass between them.

Having thus described the invention, what is claimed as new is:

1. A stake formed from a flat strip and having a one-quarter twist between its ends, the lower end of the stake being adapted to be driven into the ground, and the stake having a slot in its upper end to receive an elongated joint member so that said joint member will lie in a plane substantially parallel to the lower end of the stake.

2. A stake formed from a flat strip and having a lower end adapted to be driven into the ground, said stake having a slot in its upper end to receive a joint member, and having a struck-out portion below the slot adapted to embrace a reinforcing rod.

3. A stake formed from a flat strip and having a one-quarter twist between its ends, the lower end of the stake being adapted to be driven into the ground, the stake having a slot in its upper end to receive a joint member, and the stake having a struck-out portion between said slot and twist and adapted to embrace a reinforcing rod.

4. A supporting member for a joint member and reinforcement formed from flat metal and having an upper slot to receive a joint member, said supporting member having a struck-out portion below the slot adapted to embrace a reinforcing rod.

5. A road reenforcement and joint comprising a member having a notch at the upper end thereof and forming a vertically adjustable support, and a joint member carried by said support and wedged into the notched portion of the latter.

6. A road reenforcement and joint supporting member adapted to be supported on the sub-base of a road, means on said member for supporting reenforcing, and means on said member for supporting a joint strip above said reenforcing.

7. A combination joint and reenforcing supporting member to be positioned on the sub-base of a roadway under construction, said member having a vertical portion extending from the sub-base and having means for receiving a supporting reenforcing and an upper portion adjustably secured to the lower portion for vertical adjustment, the upper portion having a slot to receive the joint strip so that the joint strip is capable of being adjusted up and down with respect to the lower portion of the supporting member.

8. A reenforcing and joint supporting member, comprising a lower portion to be seated on the sub-base of the roadway and means on the lower portion to receive a supporting reenforcing and an upper portion adjustably secured to the lower portion so that the upper portion is capable of being adjusted vertically to elevate the joint strip seated in the upper portion of the supporting member.

9. A road reenforcement and joint comprising a joint plate having a longitudinal offset between its upper and lower edges, stakes supporting the ends of said joint plate, the upper end of each of said stakes having a slot adapted to receive the joint member, and means for wedging said joint plate with the offset portion thereof in contact with a side of the slot of each stake to compensate for disalinement of the stakes with respect to each other.

10. A road reenforcement and joint comprising a joint plate having a longitudinal offset between its upper and lower ends, stakes supporting the ends of said joint plate, each of said stakes being formed from a flat strip having a one-quarter twist between its ends and having a slot at its upper end to receive the joint plate, and means for wedging said joint plate with the offset portion thereof in contact with a side of the slot of each stake to compensate for disalinement of the stakes with respect to each other.

JOHN N. HELTZEL.