

UNITED STATES PATENT OFFICE

1,956,046

ROAD FORM FOR ROAD WIDENING

Edward A. Robertson, La Grange, Ill.

Application December 16, 1931, Serial No. 581,282

12 Claims. (Cl. 25—118)

In the construction of concrete roads and the like provision must often be made to provide for future widening of the road with the additional strip or section of the road adapted to be formed with a bead or rib positioned to permit the same to project into a previously formed groove provided in the side edge of the original section of the road to provide an arrangement whereby the new strip of road will dovetail or interfit with the old portion of the road and be joined therewith by means of transversely positioned dowel bars which are connected with the projecting ends of the dowel bars forming a part of the original road. If desired the bent over ends of the dowel bars in the original road may be bent out straight to project into the new strip of the road.

To accomplish widening of a concrete road by means of an additional side strip formed to interfit with the old strips or sections of the road, this invention has been devised to provide an improved road form consisting of a main form, a reinforcing channel for supporting dowel bars, and suitable removable brackets whereby the reinforcing channel may be temporarily held in position against the inner face of the main form.

It is an object of this invention to provide an improved type of road form including a main form having associated therewith a plurality of removable supporting brackets for temporarily supporting groove forming channel members in position prior to the pouring of concrete to form the upper portion of a concrete road.

It is also an object of this invention to provide road forms with improved brackets for holding channel members in position against the inner sides of the road forms prior to the pouring of concrete, said brackets adapted to be removed before the concrete is permitted to set, leaving the channel bars embedded in the concrete or removing the bars to provide receiving grooves in the side surfaces of the road when the road forms are removed to afford a convenient arrangement whereby the road may be widened by side strips of concrete formed to have ridges or beads thereof projecting into the grooves to hold the old and new road sections interlocked with one another.

It is a further object of this invention to provide an improved road form whereby the side surfaces of a concrete road may be formed with channel members embedded therein to provide grooves to permit additional road widening sections to be added with the additional sections having a dovetailed interfitting relation with the

old sections of the road to obviate vertical shifting of the different sections of the road with respect to one another.

It is furthermore an object of this invention to provide a road form with a removable clamping bracket for supporting groove forming and dowel bar supporting members in position propped against the road form to permit a concrete road to be formed having the channel members embedded in the side surfaces thereof with said channel members opening outwardly to provide grooves or recesses for receiving portions of the concrete from road widening sections to permit the additional sections to interfit with the old sections to obviate vertical shifting of the additional road widening sections with respect to the old sections of the road.

Another object of the invention is to provide a removable clamping bracket adapted for removable association with a road form to permit channel reinforcing members to be temporarily held in position against the inner face of the road form until after the concrete has been poured and has been allowed to partially set allowing the clamping bracket to be removed with the channel members being retained in position by the partially set concrete.

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

On the drawing:

Figure 1 is a perspective view of a road form embodying the principles of this invention.

Figure 2 is an enlarged transverse sectional view taken on line II—II of Figure 1 with parts broken away.

Figure 3 is a fragmentary vertical detailed section taken through a road illustrating a method of interfitting the road widening section with the old section of the road.

As shown on the drawing:

In the construction of concrete highways, it has been the practice to construct roads which are comparatively narrow due mainly to the high cost of construction. In many instances it has been found necessary to widen old roads. This widening of roads has been accomplished by building road strips or sections on either one or both sides of the old road. In this method of widening roads considerable trouble has been experienced in that the new sections, due to temperature changes or other disturbances, very often shift vertically where they abut the old sections thereby producing irregularities in the top surface of the widened road.

This invention has been devised for the purpose of providing an improved road form for road widening including improved removable clamping devices whereby channel members may be supported in position on the main members of the road form whereby the channel members are adapted to be imbedded in the side surfaces of the road when the main form members and clamping devices are removed to provide a road having receiving grooves in the side surfaces for the reception of portions of additional road sections which are added to the side of the original road to widen the same by means of the additional sections which interfit the old road so that no vertical shifting of the new section with respect to the old can take place.

In the present embodiment of this invention the reference numeral 1 indicates the base flange of a main road form comprising in addition to the base flange a form wall 2 and a top flange 3. The members 1, 2 and 3 form a channel construction adapted when in position for use to rest on the base flange 1. As clearly illustrated in Figure 2, the top flange 3 is comparatively narrow when compared with the wide base flange 1. The channel forms are adapted for use in pairs with the forms positioned on opposite sides of a road bed or subgrade 4 to define the width of a concrete road which is to be constructed.

In order to take care of road widening at future dates and provide an arrangement whereby the new road section may interfit or interlock with the old road section, each of the road form channels is adapted to have removably engaged against the outer face of the form wall 2 a groove forming channel bar 5 with the open face of the channel bar positioned to be closed by means of the form wall 2 as clearly illustrated in Figure 1. The channel bar 5 is intended eventually to be imbedded in the side wall or surface of a concrete road section with the groove portion thereof accessible or opening through the side wall of the road when the main road form 1-3 is removed. The intermediate or connecting plate forming part of each of the channel bars 5 is provided with a plurality of spaced apertures 6 for receiving and supporting the outer ends of dowel bars or rods 7. The outer ends of the dowel bars 7 are bent over to lie in the channel bar 5 as indicated in dotted lines in Figure 1, so that they may eventually be bent out straight to be embedded in an additional road widening section to bind the new and old road sections together. The dowel bars 7 project transversely of the road and have the inner ends thereof supported in dowel bar supporting stakes 8. Each of the dowel bar stakes has the lower end thereof tapered to provide an end 9 which is adapted to project into the road sub-grade 4 a distance determinable by means of stop flanges or projections 10 forming a part of the stake.

For the purpose of holding a channel bar 5 in position against the outer surface of the form wall 2 a plurality of removable clamps or supporting brackets are provided to be supported at spaced intervals upon the main road form. Each of the supporting brackets or clamps comprises a looped or U-shaped rod or wire comprising a leg 11 the lower end of which is bent to form a clamping foot or hook 12 to engage around or hook beneath the outer flange edge of the base flange 1 of the main road form. The upper end of the leg 11 is bent to form a loop or bight 13. Integrally formed on one end of the curved or bight portion 13 of the clamping bracket

is a downwardly directed arm 14 which is shorter than the leg 11 as clearly illustrated in Figure 2. Rigidly secured on the lower end of arm 14 is a channel-shaped shoe or holder 15 which, when in use, is adapted to engage over the channel bar 5 to hold the same clamped against the main road form. Slidably mounted on the leg 11 is a notched spacing and clamping block 16 having a set screw 17 engaged in the end thereof and projecting diametrically into the passage of the block 16 to seat against the leg 11 to hold the block 16 clamped in position with the notched portion thereof seated on the outer corner or edge of the top flange 3 of the main road form. Slidably engaged on the upper tapered loop end of the clamping bracket is a clamping link or locking member 18 which is adapted to be forced downwardly over the upper end of the clamping bracket to cause the arm 14 and supporting shoe 15 to be resiliently forced or clamped against the channel bar 5 to hold the channel bar 5 in a set position of adjustment clamped against the outer surface of the form wall 2 thereby supporting the channel bar in position prior to the pouring of concrete upon the road sub-grade 4 to form the upper section 19 of the concrete road.

With the main road forms in position on a road sub-grade and with the groove-forming channel bars 5 clamped in position against the form walls 2 by means of the improved removable clamping brackets, the reinforcing bars or dowel rods 7 are mounted in position with the outer end of the dowel bars projecting through the openings 6 of the channel bars 5 and bent over to lie within said bars while the inner ends of the dowel bars are supported by means of the stakes 8. When a road is of sufficient width, say about twenty feet, to require a longitudinal center groove or crack, a center strip device is usually mounted on the road sub-grade half way between the road channel forms to cause a road center groove or crack to be formed after the concrete has been poured to form a crown or top section of a road. When a center strip is used the inner ends of the dowel bars 7 may if desired be supported in the center strip.

With the groove-forming channel bars 5 clamped in position against the form wall 2 by means of removable clamping brackets, concrete is poured upon the road sub-grade 4 between the channel road forms to a required height or thickness with the poured concrete embedding the channel bars 5, the stakes 8 and the dowel bars 7 as well as the clamping shoes 15 forming part of the clamping brackets. After the poured concrete has been leveled off and rounded to form the top surface of the road the concrete is allowed to only partially set before the clamping brackets are removed. Each of the clamping brackets is adapted to be removed by merely pushing the locking link or member 18 upwardly on the looped tapered upper end of the clamping bracket thereby releasing the bracket arm 14. The set screw 17 which secures the block 16 in position on the leg 11 is also released and the block is pushed upwardly thereby permitting the entire clamping bracket to be easily removed from the main road form by pulling the lower portion of the arm 14 and the shoe 15 upwardly out of the poured concrete. After the removal of a clamping bracket from the main form, the openings or cavities left by the removal of the bracket arm 14 and the shoe 15 are adapted to be filled in by tamping the concrete in the

neighborhood of the recess to cause the concrete to flow into the recesses to fill the same. It will thus be noted that the clamping brackets are removed leaving the groove forming channel members 5 in position supported by the concrete which surrounds the same and abuts against the form walls 2.

The concrete is now left to set or harden before the side or main road forms 1—3 are removed. When the main forms are removed, side walls 20 are formed having the channel bars 5 embedded or seated therein with the open portions of the channel bars exposed to form grooves or channels in the side surfaces of the crown or upper portion of the concrete road. As clearly illustrated in Figure 2, the ends of the dowel bars 7 instead of being left long and bent over as shown in Figure 1, may project into the grooves formed by the channel bars 5 and if desired may be threaded. If, after the road of a predetermined width has been in use for some time and it becomes necessary to widen the road either on one side or on both sides of the old road, the improved road widening forms may again be used. A road form 1—3 is adapted to be positioned on a newly formed road sub-grade 21 at a required distance from the grooved side wall 20 of the old road and if required for still further road widening channel members 5 may be clamped in position against the form wall 2 by means of the improved clamping bracket. Where bent over dowel bars are in use, as illustrated in Figure 1, it is only necessary to bend the ends of the dowel bars outwardly to be in position to be embedded in the concrete of the additional road section. When dowel bars of the threaded type shown in Figure 2 are used in the old road, additional dowel bars may be engaged in the openings 6 of the channel bars 5 of the road widening form and the inner ends of the dowel bars may be connected to the outer threaded ends of the embedded dowel bars 7 in the old road 19 by means of coupling sleeves 22 or by the use of any other selected types of dowel bar couplers. After the road widening forms and the required dowel bars are mounted in position to determine the width of the concrete which is to be added to the side of the original road, concrete is poured between the road widening main form 1—3 and the side wall 20 of the old section of the road with the concrete embedding the channel forms 5 and the bent out ends of the old dowel bars or the additional lengths of dowel bars 7 coupled to the old dowel bars. The concrete is permitted to flow into the grooves or channels provided in the side wall 20 of the old road section thereby forming an interlocking arrangement between the old concrete sections of the road and the new road sections. When the concrete has partly set the clamping brackets are removed leaving the channel members 5 in position. The openings left by the removal of the clamping brackets and the shoes 15 forming a part thereof are adapted to be filled by the concrete. The newly poured concrete is permitted to harden or set before the main form is removed. After the concrete has hardened the road widening side form 1—3 is removed leaving the channel member 5 in position to form a groove or recess in the side wall of the additional concrete road section 23 which has just been formed for the purpose of still further widening the road if desired. It will thus be seen that if another section needs to be added to the side of the road to further widen the same at any future date the same can conveniently be accomplished. In case the added sec-

tion for widening the road will be adequate for future traffic conditions and no further widening is to be done, the channel members 5 may be omitted and the main forms 1—3 used without the channel members 5. It will be noted that the improved removable clamping bracket may be conveniently used with road forms for the purpose of temporarily holding groove-forming channel members in position associated with the road forms until the concrete has been poured after which the clamping brackets may be removed leaving the groove forming channel members seated in position and supported in said position by the concrete. The channel members 5 which are embedded in the side wall of the concrete road not only afford recesses or grooves for the reception of concrete from additional road sections to interlock the new road sections with the old road, but also afford an arrangement permitting the dowel bars 7 to project into or be bent over to lie in the grooves or recesses provided by the members 5 so that the dowel bars of the additional road widening sections may be coupled with the projecting ends of the dowel bars of the main road section. In the case of the bent over dowel bars, said bars may be bent straight and embedded in the concrete of the new road sections to interlock the new road sections with the old road.

While the groove forming channel members 5 have been described as being left embedded in the sides of the road, it will of course be understood that said members may be removed and reused. The grooves formed by the removal of the channel members 5 may then be filled with concrete forming the added sections of the road.

As clearly illustrated in Figure 2 it will be noted that the improved clamping bracket, by means of the shiftable clamping block 16, is adapted to be fitted to road forms of different sizes. The latching member or locking link 18 is conveniently exposed so that it may be slipped downwardly over the upper tapered end of the clamping bracket to cause the clamping shoe 15 to tightly clamp around a channel member 5 to hold the same in position against a road form upon which the clamping bracket is engaged.

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 purposed to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. The combination with a road form, of a groove forming member, and a clamping device removably engaged on said road form for holding said member clamped against the road form.

2. The combination with a road form, of a groove forming member, a clamping device supported on the road form and engaging said member, and means on said clamping device to cause the same to clamp said member against the road form.

3. The combination with a road form, of a groove forming member having dowel bar receiving apertures therein, a clamping device, means for removably securing the same on the road form, and a locking means on said device for causing the same to clamp said member against the road form.

4. The combination with a road form, of a channel member, a clamping bracket secured on said road form and engaging said member, and means slidably engaged on said bracket for caus-

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

ing the channel member to be clamped on the road form.

5 The combination with a road form, of a device comprising a looped body member, a mounting block slidably engaged thereon for co-
action with the road form to hold the body mem-
ber in position, a holder carried by the body
10 member, and means adjustable on said body member for causing the holder to be clamped against the road form.

6. A road form clamping device comprising a looped body, a mounting member shiftably en-
15 gaged thereon, a holder secured to the body, and means slidably engaged on the looped body for moving the holder into a clamping position with respect to a road form on which the device is engaged.

7. A road form clamping device comprising a
20 looped body, a mounting member movably engaged thereon, a shoe on said looped body, and means slidably engaged on the looped body to compress the same for moving the shoe into a clamping position.

25 8. A road form clamping device comprising a leg member, a foot formed on one end there-
of, a mounting block slidably engaged on said leg member, means for securing the block in po-
sition, an arm, a looped section connecting said
30 leg with said arm, a holder on said arm, and a

link member slidably engaged over the looped section for adjusting said arm with respect to said leg.

9. A road form clamping bracket comprising a looped member, means for mounting the same
80 on a road form, a holder on the looped member, and locking means movably engaged on the looped member for clamping the looped member and said holder on the road form.

10. A road form bracket comprising a tapered
85 body, means thereon for engaging a road form, and a member movable on said tapered body for locking the body on a road form with said means clamped against said road form.

11. A road form bracket comprising a U-shaped
90 body having arms of different lengths, and means slidable thereon for clamping the bracket on a road form to hold a groove forming means in place against one side of the road form.

12. A road widening device comprising a road
95 form, a groove forming means, a clamping device removably engaged on said form for temporarily holding the groove forming means clamped against the form, dowel members partially sup-
ported by the groove forming means, and stake
100 members engaged by said dowel members to assist in supporting the dowel members in position.

EDWARD A. ROBERTSON.

35

110

40

115

45

120

50

125

55

130

60

135

65

140

70

145

75

150