Dec. 10, 1935. J. N. HELTZEL 2,023,472

ROAD MAKING MACHINE

Filed Aug. 15, 1930 3 Sheets-Sheet 1

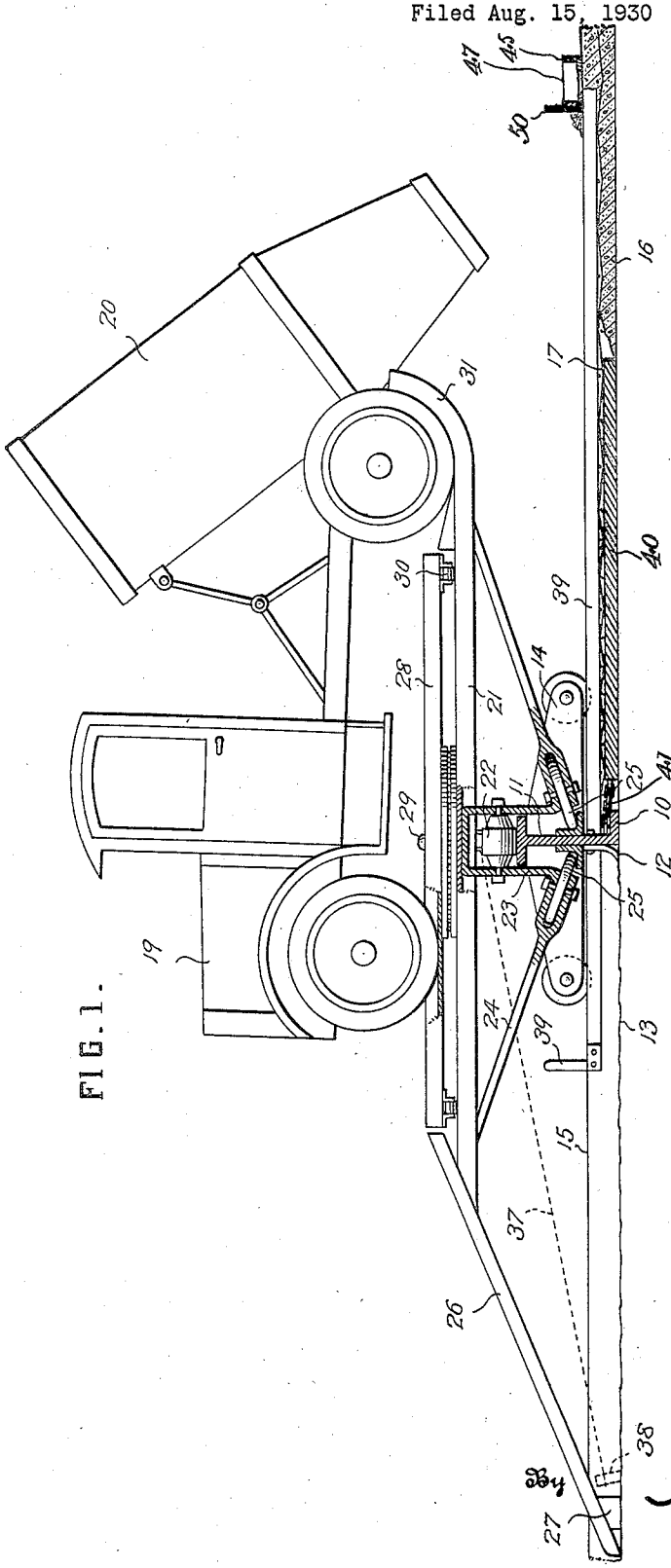

FIG. 1.

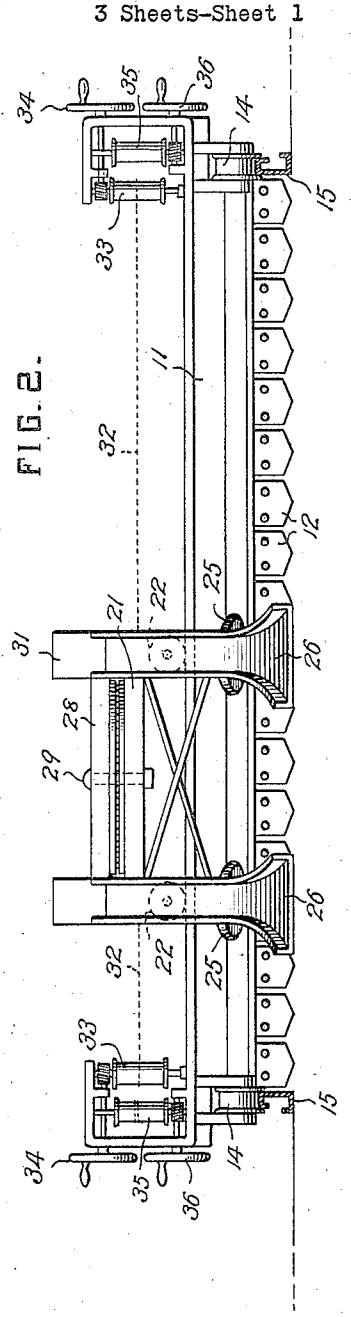

FIG. 2.

Inventor:
J. N. HELTZEL

By Monroe E. Miller
Attorney.

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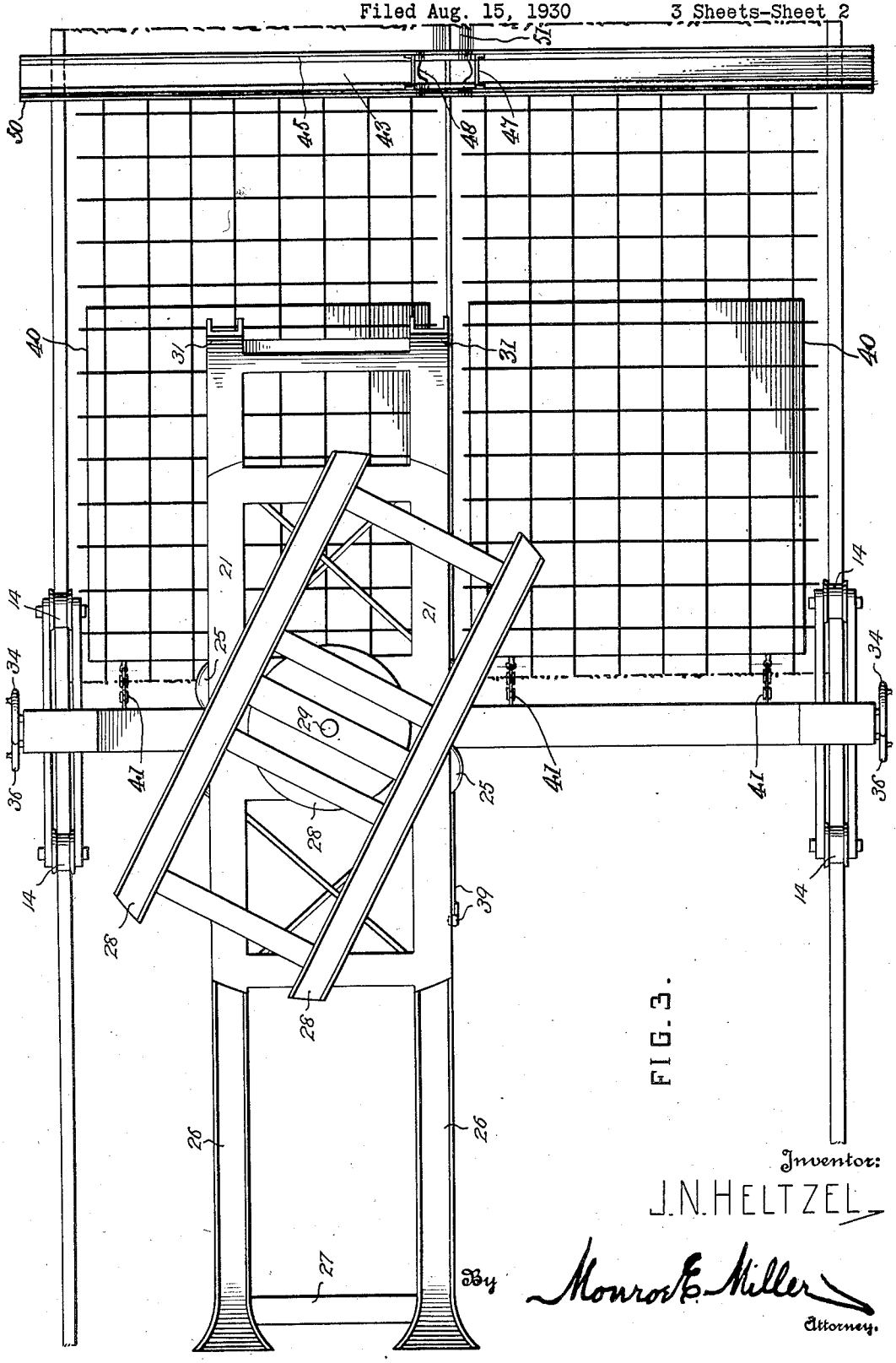

FIG. 3.

Inventor:
J. N. HELTZEL

By Monroe E. Miller
Attorney.

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Fig. 4.

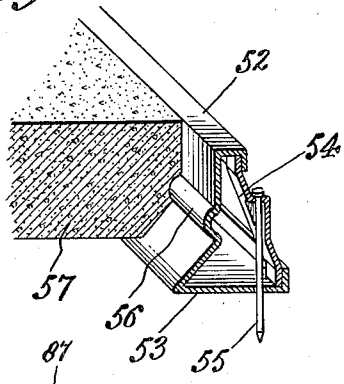


Fig. 5.

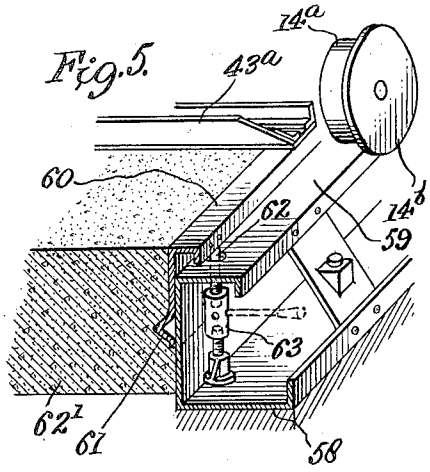


Fig. 9.

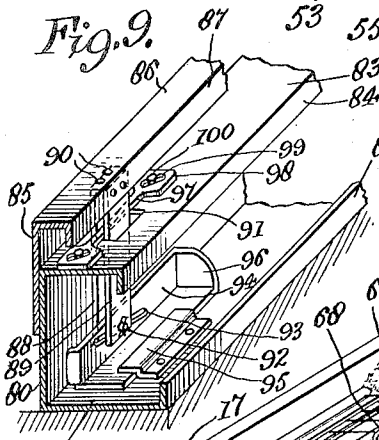
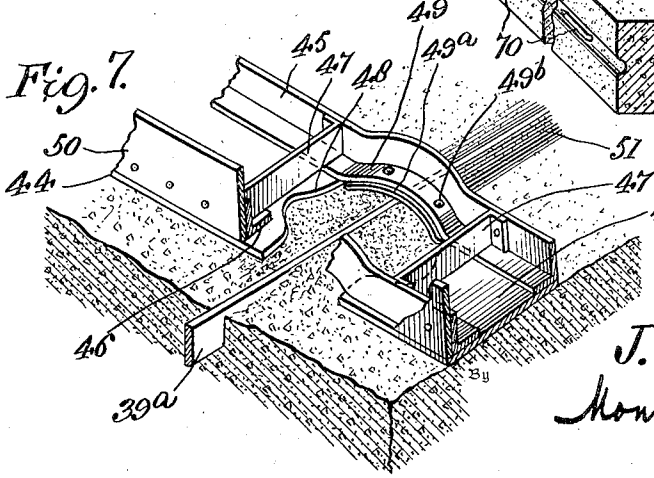


Fig. 6.

Fig. 8.

Fig. 7.



Inventor:

J. N. Heltzel

Monroe & Miller

Attorney.

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UNITED STATES PATENT OFFICE

2,023,472

ROAD MAKING MACHINE

John N. Heltzel, Warren, Ohio

Application August 15, 1930, Serial No. 475,492

11 Claims. (Cl. 94—39)

The present invention relates to improvements in road making machines and has for an object to provide an improved road making machine for receiving trucks or what are at present known as "transit mixers" for supporting the same in a favorable position above the roadway for the deposit of concrete without interfering with the action of the subgrader and without involving the usual difficulties encountered in the laying of the surface course by the use of transit mixers on the base course and reinforcement.

One of the principal objections to using transit mixers in connection with road work is the fact that it is difficult to discharge the material from the drum on two-course work. In accordance with such work, a base course or a first course of concrete is laid roughly. Next the mesh reinforcing is placed on top of the first course. The surface course of concrete must then be spread over the mesh reinforcing. Considerable difficulty arises in the laying of this surface course, it being necessary to provide some means whereby the truck mixer can be elevated and projected over the top of the mesh to discharge the drum of the mixer over the mesh without the wheels of the truck or vehicle coming in contact with the mesh reinforcing.

Another objection to the transit mixer is that a subgrader is required to be used on all highway work to do the final shaping of the subgrade before the concrete is placed. This subgrader must be carried immediately preceding the laying of the concrete and this has been found impractical because it interferes with the free movement of the trucks back and forth on the subgrader to transport the mixed concrete.

It is the object of the present invention to eliminate the above difficulties and objections and to provide a supporting device for receiving the truck mixers whereby they may deposit the concrete above and upon the mesh reinforcing without injury thereto and without any interference with the movement and activity of the subgrader.

With the foregoing and other objects in view, the invention will be described more fully hereinafter and will be pointed out in the appended claims.

In the drawings, in which like parts are denoted by like reference characters throughout the several views,

Figure 1 is a side elevation, with parts broken away and parts shown in section, of an improved road making machine constructed in accordance with the present invention.

Fig. 2 is a front elevation of the same with the side forms shown in section.

Fig. 3 is a top plan view of the improved machine.

Fig. 4 is a fragmentary section taken through a modified form and the concrete lying adjacent thereto.

Fig. 5 is a fragmentary perspective view of still another construction of side form showing the concrete lying adjacent thereto.

Fig. 6 is a fragmentary perspective view of the road in process of formation.

Fig. 7 is a fragmentary perspective view of the recessed screed.

Fig. 8 shows in fragmentary perspective a section of the improved roadway.

Fig. 9 is a fragmentary perspective view of a modified form.

Referring more particularly to the drawings the subgrader is designated generally at 10 and involves a beam 11 which extends transversely of the roadway and carries blades 12 for engaging the subgrade indicated at 13. The ends of the subgrader beam 11 are carried upon trucks or rollers 14 which are preferably flanged, as indicated in Fig. 2, and travel upon the side forms 15. The base course or first course is indicated at 16, and over this base course is laid the mesh reinforcing 17 prior to the laying of the surface course indicated at 18.

The truck or transit mixer is designated generally at 19 and is provided with a mixing and discharge drum 20 by which the concrete is mixed during transit.

In accordance with the present invention a platform 21 is provided carried upon the subgrader beam 11 and having a transverse movement thereon. Rollers 22 carried by the platform 21 are adapted to roll upon the upper portion of the beam 11. If desired these rollers 22 may be carried by the guides 23 projecting down on opposite sides of the head of the beam 11, and cooperating with braces 24 to support thrust rollers 25 for engaging at opposite sides of the beam 11 to steady and facilitate the movement of the platform 21 laterally across the roadway. A ramp 26 is carried by the platform 21 to enable the vehicle to reach the platform. This ramp may be composed of the spaced flanged tracks, as shown in Fig. 3, connected at their lower end portions by a transverse shoe 27 which moves transversely in contact with the subgrade 13. On the platform 21 is a turntable 28 rotatable in a substantially horizontal plane about a central pivot 29, and having roller supports 30 at its outer

end. Beyond the turntable 28, that end of the platform 21 opposite to the ramp 26 is formed with upturned ends 31 providing stops for the rear wheels of the truck or transit mixer as indicated in Fig. 1.

As shown in Fig. 2, drums 33 are mounted on opposite end portions of the subgrader on which are wound cables 32 connected to opposite sides of the platform 21 for the purpose of moving the device laterally to new positions. The drums 33 may be rotated by the use of hand wheels 34 through appropriate gearing. The end portions of the subgrader also carry drums 35, operable by hand wheels 36, on which are wound cables 37, indicated in Fig. 1, which cables may be attached to stakes 38 driven in the subgrade 13 or ground. By winding the cables 37 upon the drum 35, the subgrader 11 may be moved forwardly along the subgrade 13. A longitudinal joint installing device 39 is shown as attached to the subgrader 11 as by passing through a slot in the intermediate portion of the subgrader beam.

In the operation of the machine, it will be understood that when the trucks approach the ramp 26, the truck is driven with the front end facing the ramp and is run up in position on the turntable 28. The turntable is then revolved either manually or by power until it is in the position as indicated in Fig. 1. The trucks 19 or transit mixer may then be backed whereby the rear wheels engage the stops 31. The drum 29 is then elevated and the material discharged without the wheels of the truck coming in contact with the mesh reinforcing 17 or with the lower part of the concrete 16.

After the contents has been dumped on the subgrade, the truck is in position with the fore part facing the direction of travel, and the truck is run off of the ramp. Thereupon, the ramp and platform 21 may be moved laterally of the roadway to a new position to receive additional trucks to discharge material substantially in correct position so as to avoid the necessity of using manual labor to distribute the material. This lateral movement is accomplished by winding upon the drum 33 at one side and unwinding the cable on the drum at the opposite side. From time to time or as required the rollers 35 are rotated whereby to wind thereupon the cable 37 and thus to advance the subgrader 10 whereby the blades 12 thereof cut down the rough subgrade 13.

The improved device will thus in no wise interfere with the action of the subgrader and it will cooperate therewith to place the trucks or transit mixers in a convenient and favorable position for the deposit of the concrete material. The construction is such that the trucks may be driven forward both in running the same upon the device and driving the same off the turntable and down the ramp 26.

Referring more particularly to Figs. 1, 3 and 6, platforms 40 are shown with the reinforcing mesh 17 supported thereon. The platforms 40 are linked, as by the chains or other connections 41 to the subgrader 10, as indicated in Fig. 1. The mesh 17 may be laid on the platforms 40 and, as the pouring of the concrete progresses, the platform or platforms 40 are drawn from under the mesh.

After the concrete has been poured and the mesh reinforcing installed, the screed member 42 follows, which screeds off the concrete.

The screed is shown more particularly in Fig. 7 and is composed of divided base plates 43 and 44 having the side angle irons 45 and 46, between which are arranged the braces 47. The base plates 43 and 44 are separated and indented, as indicated at 48; and the angle bars are arched upwardly at a central point between the two base plates, as indicated at 49. At 53 is shown the screeding bar which encounters the concrete, this bar resting upon the base plate 43 and against the vertical web of angle iron 46.

The recessed and arched screed will supply a surplus of material in the center of the road along the joint blade 39a. In both Figs. 6 and 7 the raised central portion of the concrete is indicated at 51, this raised portion being formed after the screed has passed over the concrete.

While this invention covers the installation of a center joint, provision must also be made to support the heavy machine which rolls on the side forms—particularly the heavy weight which is placed on the side forms when the mixer is run up on the turntable 28. For this use I provide a specially designed form, shown more particularly in Fig. 4, where the top tread 52 of the form is located centrally above the base flange 53 of said form. This provides for an equal distribution of the load on the form. A stake pocket 54 is provided for the stake 55, which is driven into the subgrade or ground. The form is provided on its inner surfaces with a longitudinal rib 56, which produces a longitudinal groove along the edge of the concrete, which concrete is indicated at 57; so that, when additional slabs are constructed adjacent to the edge of the concrete, the same will have an interlocking engagement. Such slab is indicated in Fig. 8 and will be further described. The wheels 14 of the subgrader are adapted to travel upon the tread surface 52 of this improved form.

In Fig. 5 I have shown a modified type of side form, in which a bottom form member is provided having a wide base 58. The tread portion 59 is wide so as to permit the wheels 14a having a single flange 14b of the subgrader or other equipment to roll on the structure. The extreme weight of the turntable or subgrader rolling on the tread portion 59 of this bottom form member, will tend to depress the same, and consequently I provide an adjustable rail member 60 carrying a bead 61 adapted to form a groove in the concrete slab 62. The adjustable rail member 60 carries a depending bolt 62 threaded to receive sleeve 63. The bolt is adapted to screw through threaded members 64 on the lower form member. The wrench is adapted to extend through a hole in the bolt 62 and also the lower form and to engage beneath the lower edge of the adjustable rail member 60. When the bottom rail 58 is depressed, the bolt member 63 may be turned, which tends to raise the top tread 60 to the proper elevation to compensate for the depression of the sub-rail 58. It will be understood that this type of form will be used where excessive weights are carried on the structure, the screed member 42a operates on top tread 60 of the adjustable form, which is adjusted to proper elevation to define the screed line without disturbing the base form 58.

In Fig. 6 is shown more fully the platform mesh supports 40, which are linked to the subgrader or other suitable means of trailing by means of the chain or link members 41. The platforms or mesh spotters 40 are provided with grooved slides 65 through which the mesh 17 is projected and held to the proper longitudinal elevation. These slides or slotted members 65

project rearwardly and enter into the concrete at 66 so that the mesh is held firmly in position while a truck, containing the concrete, may be run on top of the ramps or platforms 40 for projecting the concrete over the rear ends of the ramps or platforms 40.

A longitudinal joint installing member 39a is attached to the ramps or platforms by bolt or other connection 67 extending through a bracket 68 carried by the ramps or platforms 40. The pin 67 will allow for lateral adjustment. The longitudinal joint blade 39a is projected back into the concrete and beneath the screed member 42.

There is a longitudinal corrugated member 69 attached to the outside of each ramp. This member 69 projects longitudinally along the inside face of the form 15 whereby to produce a groove along the edge of the concrete slab which is formed against such form.

It will be understood that, after the concrete has been deposited and the truck or other vehicle removed from the ramp, the ramps or platforms 40 are trailed forwardly, and the subgrader blades 12 simultaneously cut down the subgrade to the proper depth. At the same time the joint member 39a is trailed through the plastic concrete. The corrugated grooving members 69 are also trailed longitudinally through the concrete, producing a groove along the edge. Thus the mesh is deposited and dowel bars 70 may be also deposited in this way.

The screed member 42 follows progressively back of the pouring. This screed member will preferably be a mechanically operated screed having an eccentric for reciprocating the screed transversely and also connected to the screeding machine, but as these features form no part of the present invention they are not shown herein.

The screed has the arched portion 49, as heretofore referred to. This arched portion may be completely closed on the bottom face so as to prevent any material from projecting through the screed or it may be provided with the opening 48 which will permit surplus mortar to project through the screed to be deposited in the rear of the screed as indicated at 51, the screed has adjusting screws 47a to vary the arched portion 49; there is an offset X at end of screed to produce a header X—1 along the edge of the road.

It is understood that, instead of using transit mixers or trucks for projecting the concrete over the ramps or platforms, standard mixing machines may be used and the ramps thereby trail back of the concrete mixers. The regular boom and bucket discharge may be used for projecting the mixed material over the rear of the ramps for depositing in the roadway.

In Fig. 7 I have shown more fully the opening in the screed, together with the arched members. The rear member 45 of the screed may be raised slightly more than the front member 46. It will be understood that the front member will depress the stone or coarse aggregate below the surface and the finer material will accumulate in the open space 48. As the screed moves forward, the finer material will project in the rear of the screed as shown at 51. The open space 48 may be provided with sides or braces 47 to retain the surplus of material within this space 48. The position of the joint member 39a is shown in Fig. 7 after the joint installing operation has been completed. This elevated joint 51 will eliminate the low joints which have been experienced from time to time where the plain or regular surface type of screeds have been used. The recess in screed may be varied by adding filler plates 49a secured by bolts or other suitable means 49b.

In Fig. 8 I have shown a slab of concrete mold as it would appear in complete form. The grooves 71 provide a means for interlocking adjacent slabs to the slabs 72. The dowel bars 70 may be installed by any of the various methods which are in vogue. The raised portion of the slab 72 along the longitudinal joint is indicated at 51. It will be understood that this raised screed member may be used in connection with any type of longitudinal joint.

Referring more particularly to Fig. 9, a lower form member or section is indicated at 80 having a wide base 81 for resting upon the ground, as indicated and formed with a strengthening and reinforcing flange 82. The tread portion of the form is represented at 83 having a downturned reinforcing flange 84 at its free edge. At 85 is represented the vertical wall of the top adjustable rail having the tread portion 86 and the depending flange 87. This top rail member is adjustable with respect to the lower form section 80, and for this purpose, the top rail carries the yoke bars 88 and 89, which may advantageously be formed in one piece of metal bent into substantially U-shape, with the upper connecting portion secured to the under side of the rail tread 86, as indicated at 90. It may be found desirable to distribute the surplus concrete when installing and finishing the joint so as to avoid depressions as shown at 51a by spreading the surplus concrete.

The bars 88 and 89 extend down through a slot 91 made in the tread 83 of the lower form member 80. Near their lower ends the bars 88 and 89 carry a cross pin 92 extending through a diagonal slot 93 in a slide 94 which may be of angle iron or other construction guided by the guide member 95 secured upon the base 81 of the lower form member, and having a lug 96 projecting outwardly to receive blows from a hammer or other instrument for purpose of advancing the slide in the one or other direction. The diagonal or wedge slot 93, engaging the pin 92, will cause the top rail to be moved either up or down with respect to the lower form section 80 in accordance with the direction in which the slide 94 is driven. The top rail is also adjustable laterally, the bars 88 and 89 having a free lateral play in the relatively wide slot 91.

Between the bars 88 and 89, just above the tread 83, projects a rod 97 having large flat head plates 98 on opposite ends thereof, each plate being provided with a diagonal slot 99 engaged by a pin 100 projecting up from the tread surface 83. By driving the bar 97 in one or the other direction, this bar will be shifted laterally and will engage the bars 88 and 89, thus causing a limited transverse adjustment of the top rail.

As indicated in Fig. 8, the pins 70, or the projecting portions thereof, may be initially bent down against the concrete slab to avoid interference with the other mechanism in the making of the road. Afterwards these bent ends are straightened out so that they may cooperate with other adjacent slabs.

The arched portion 49 can be sprung or bent by appropriate means to various heights by use of a screw 47a or other suitable means.

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

1. An improved road making machine comprising a truck receiving and elevating device posi-

tioned above the roadway and movable transversely thereof, and a support for said device.

2. An improved road making machine comprising a beam mounted transversely of the roadway for longitudinal movement therealong, and a platform for receiving trucks transversely movable on said beam.

3. An improved road making machine comprising a beam mounted transversely of the roadway and movable longitudinally thereof, and a turntable for receiving trucks mounted on said beam and movable thereon transversely of the roadway.

4. An improved road making machine comprising a transverse support movable longitudinally of the roadway, a truck receiving device supported on said support for movement transversely of the roadway, and means for effecting transverse movement of said device.

5. An improved road making machine comprising a transverse support extending laterally of the roadway, a truck receiving device mounted on said support for transverse movement, and means supported on the end portions of said support and connected to said device for shifting the same transversely of the roadway.

6. An improved roadway making machine comprising a support extending transversely of the roadway, a truck receiving device supported for lateral movement on said support, and means carried by said device for engaging on opposite sides of said support to steady the movement of the device.

7. An improved road making machine comprising a support extending transversely of the roadway, a platform thereabove, rollers interposed between said platform and support for sustaining said platform for movement transversely of the roadway, and rollers supported by the forward and rear portion of said platform and engaging at opposite sides of said support for steadying the movement of the platform.

8. The method of building concrete roads, consisting in positioning a substantially flat, low platform on the subgrade of a road under construction, laying reinforcing on the platform, a portion of the mesh projecting rearwardly of the platform, running a truck containing mixed concrete over the platform, and discharging the concrete over the reinforcing substantially rearwardly of the platform to submerge the reinforcing and thereafter dragging the platform forward to repeat the operations.

9. A road building apparatus comprising a flat platform to be positioned on the subgrade of a road under construction, surfacing means carried by the platform to level the subgrade, means for dragging the platform longitudinally of the road, a second platform having a ramp like approach at its forward end to admit trucks to be run on the second platform to discharge mixed concrete over mesh reinforcing supported by the first platform.

10. An improved road making machine comprising a plurality of horizontally flat platforms placed side by side and resting directly on the subgrade with a space between the same in alinement with the zone of the longitudinal joint, subgrade members carried at the forward portions of said platforms, means to draw said platforms along the subgrade, supporting means extending upwardly from the platforms and spanning the zone between the platforms, and a joint-groove producing bar pivoted in said supporting means for free vertical movement.

11. An improved road making machine comprising a plurality of horizontally flat platforms placed side by side and resting directly on the subgrade with a space between the same in alinement with the zone of the longitudinal joint, subgrade members carried at the forward portions of said platforms, means to draw said platforms along the sub-grade, supporting means extending upwardly from the platforms and spanning the zone between the platforms, and a joint-groove producing bar pivoted in said supporting means above the upper surfaces of the platforms for free vertical movement and for limited lateral movement.

JOHN N. HELTZEL.