July 17, 1934. A. E. MILLER 1,966,866

APPARATUS FOR DISCHARGING CONCRETE TRANSPORTING VEHICLES

Filed Oct. 10, 1930 5 Sheets-Sheet 1

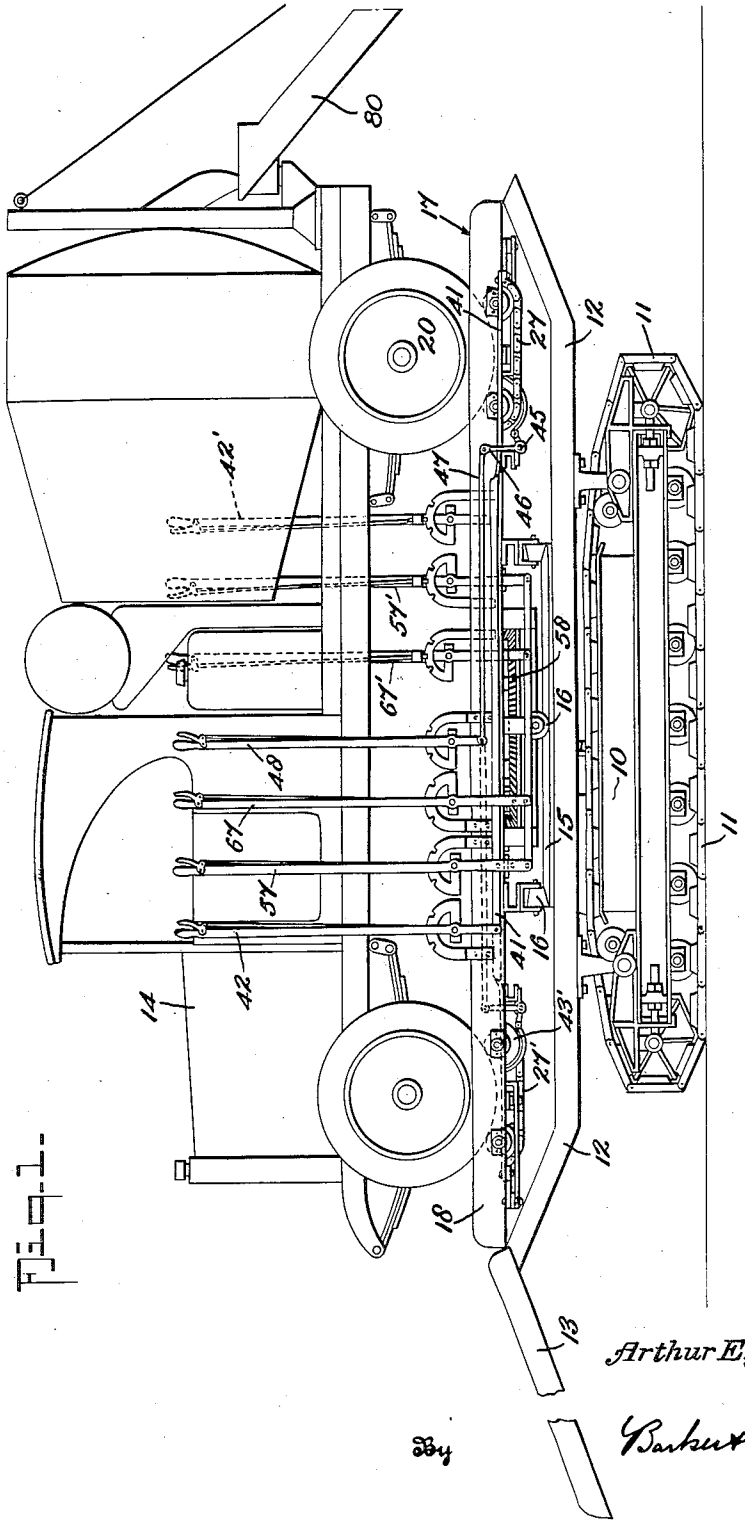


Fig. 1.

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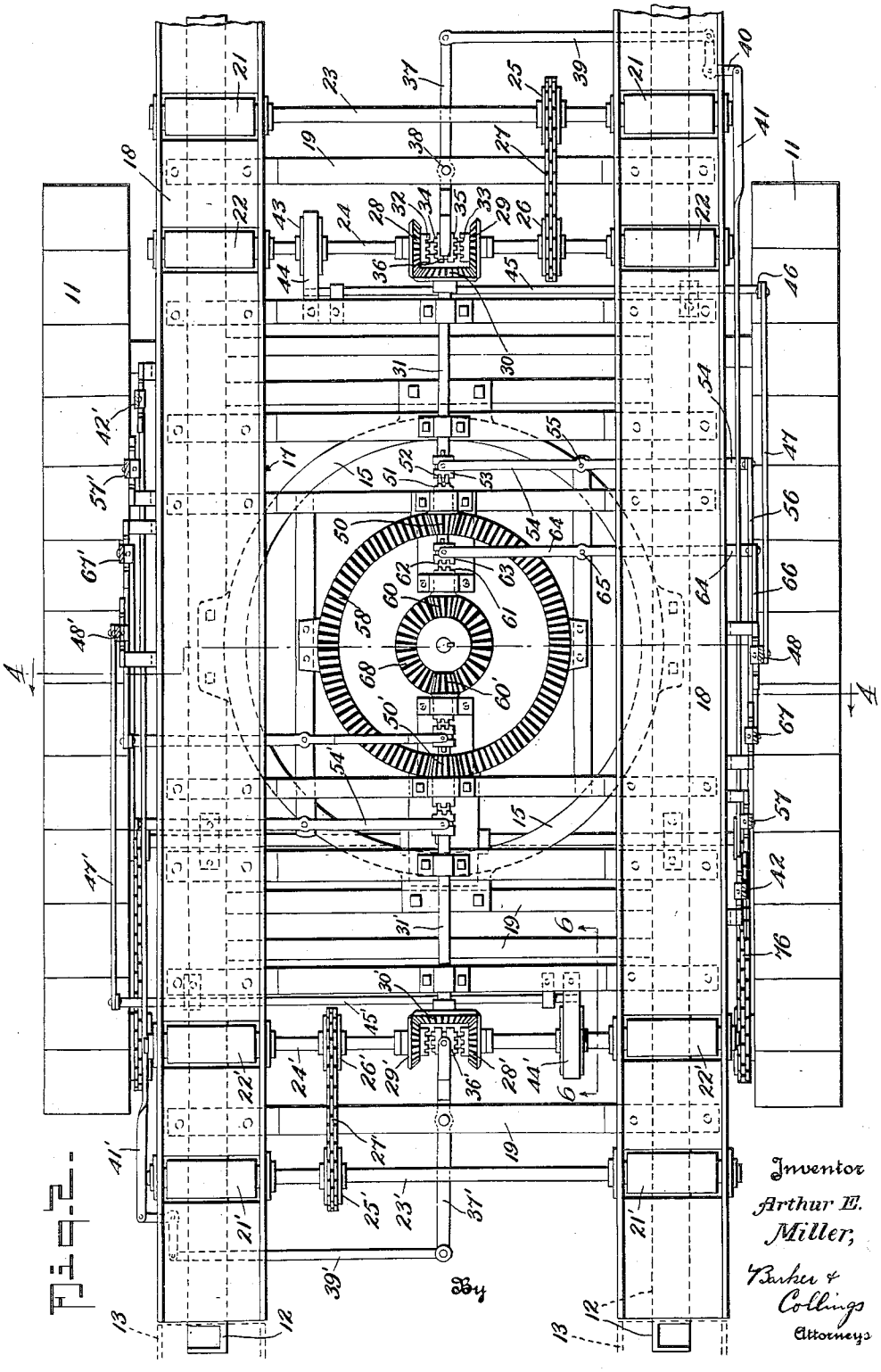


Fig. 2.

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APPARATUS FOR DISCHARGING CONCRETE TRANSPORTING VEHICLES

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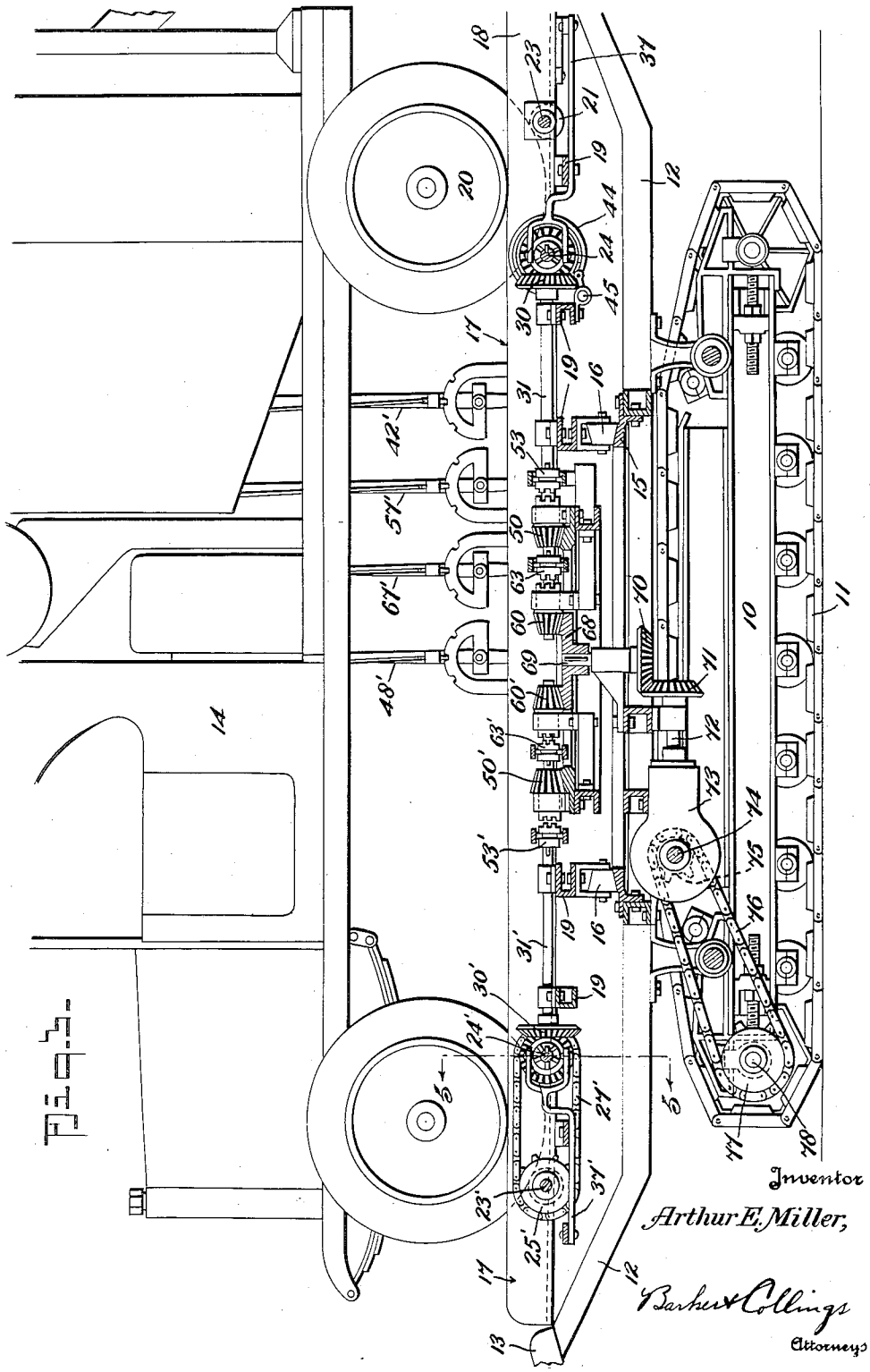


Fig. 5.

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APPARATUS FOR DISCHARGING CONCRETE TRANSPORTING VEHICLES

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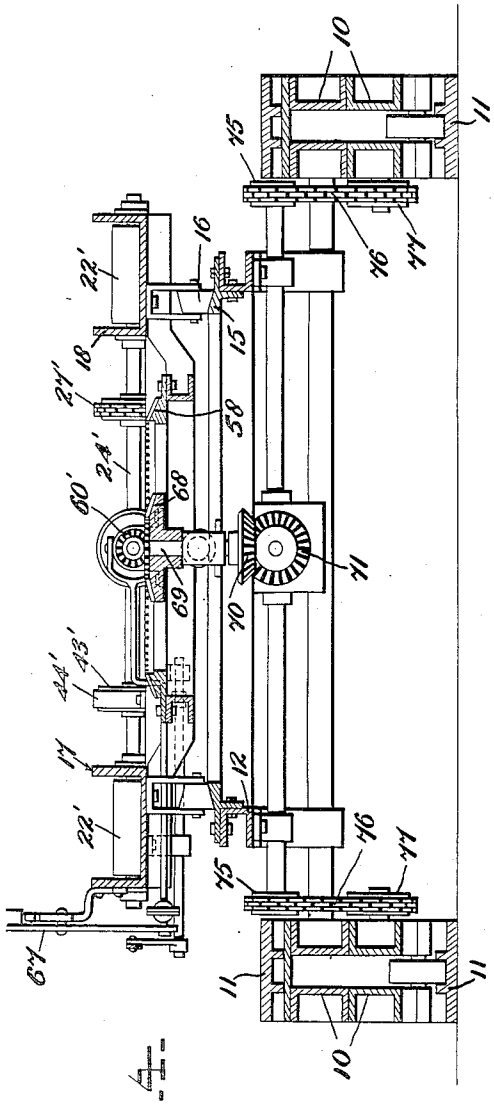


Fig. 4.

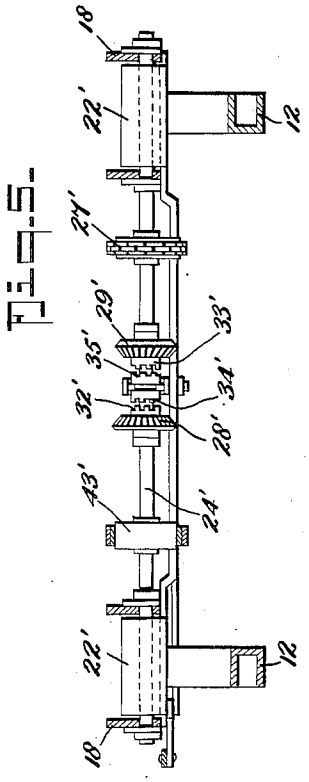


Fig. 5.

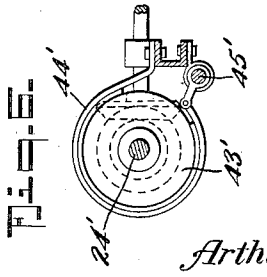


Fig. 6.

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APPARATUS FOR DISCHARGING CONCRETE TRANSPORTING VEHICLES

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Fig. 7.

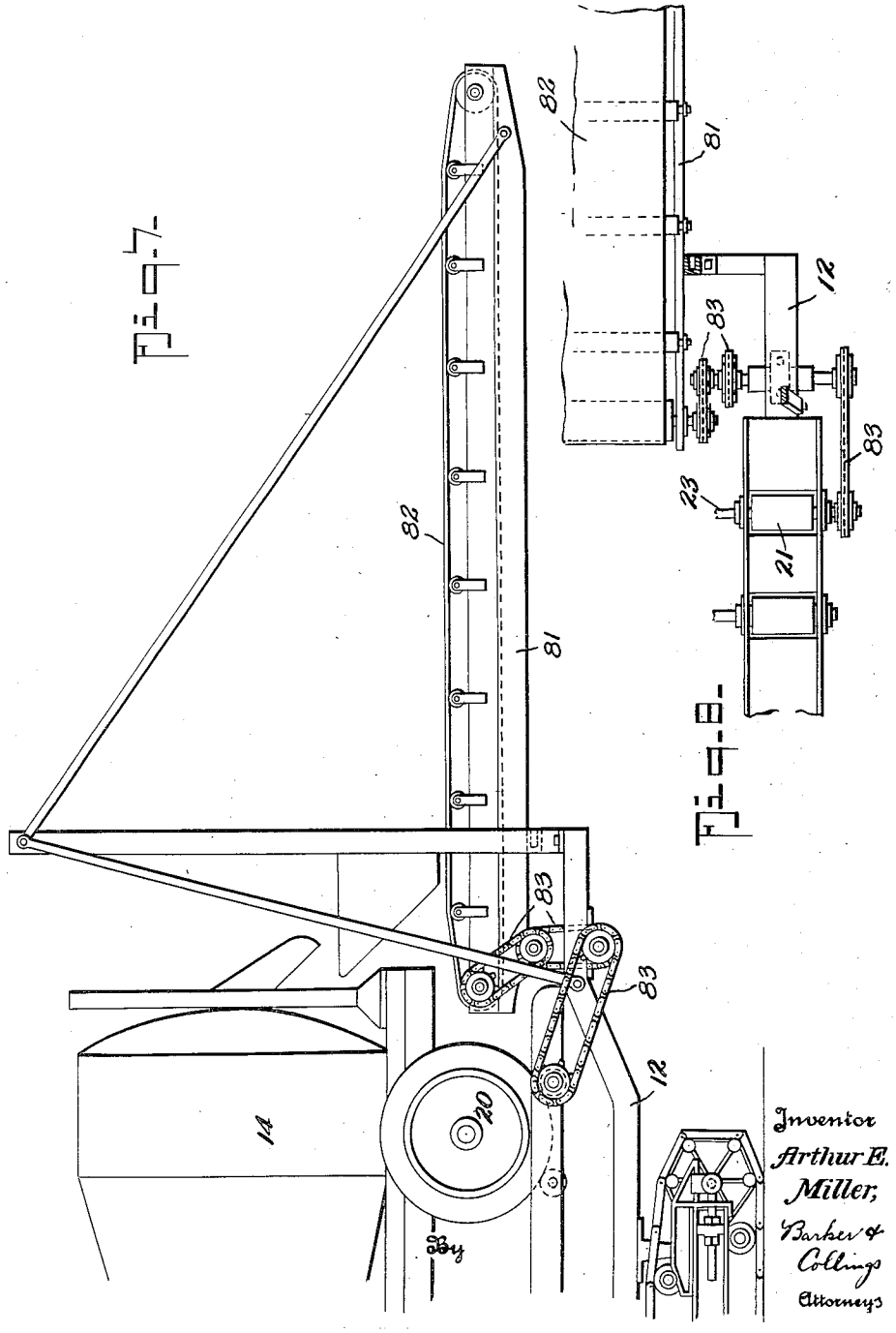


Fig. 8.

Patented July 17, 1934 1,966,866

UNITED STATES PATENT OFFICE

1,966,866

APPARATUS FOR DISCHARGING CONCRETE TRANSPORTING VEHICLES

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Application October 10, 1930, Serial No. 487,877

2 Claims. (Cl. 214—44)

This invention relates to apparatus for and method of discharging concrete transporting vehicles and distributing the contents thereof and has for one of its objects to provide an apparatus and method of this character which are particularly adapted for use in the making of concrete roads.

In the building of such roads it is now a common practice to first prepare the sub-grade after which a portable concrete mixer of the so called paving type is positioned upon the said sub-grade and the raw materials from which the concrete is made are transported to such portable mixer through the medium of motor trucks and their contents deposited in the charging skip of the mixer which elevates them into the mixing drum. Since it is of course not feasible to drive the loaded trucks over the freshly laid portions of the concrete road the trucks must approach the mixer on the rear thereof and over the prepared sub-grade. They are ordinarily driven in head first but since they must be reversed in order to dump their contents into the mixer charging skip, the trucks are ordinarily backed and turned upon the sub-grade with material damage thereto. It thus results that under the present practice it is necessary to keep men constantly employed near the front of the mixer repairing the damage done to the sub-grade through this movement of the trucks thereon, with consequent delay in the paving operation.

In order to overcome this objectionable feature to the present method of road construction, I propose to eliminate the use of a paving mixer and in lieu thereof to either premix the concrete materials at a central mixing plant and transport said premixed concrete to the point of use in any form of the recently developed transit mixers and agitators, or to load such transit mixers at a central plant with the properly proportioned batches of concrete making material and to mix the same in transit to the point of use. In either event upon arrival at the point of use I drive the transporting vehicle upon apparatus designed to reverse its direction and then to bodily oscillate or move the vehicle laterally while it is being discharged with the result that the contents are distributed over a relatively wide area of the sub-grade instead of being dumped in a heap to be later distributed by hand labor. The employment of the apparatus for the purpose of reversing the direction of the vehicle while the latter is elevated above the sub-grade reduces to a minimum damage done to the sub-grade due to the movement of the vehicle over it, and as a consequence the labor necessary to repair such damages may be dispensed with.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel details of construction and combinations of parts constituting the apparatus as well as in the novel steps and combinations of steps constituting the method all as will be more fully disclosed below and particularly pointed out in the appended claims.

Referring to the accompanying drawings forming a part of this specification in which like reference characters designate like parts in all the views:—

Figure 1 is a side elevational view of an apparatus constructed in accordance with the present invention illustrating a transit mixer in operative position thereon and ready to discharge its load;

Figure 2 is an enlarged top plan view of the reversing and oscillating means;

Figure 3 is an enlarged longitudinal sectional view through the apparatus shown in Figure 2;

Figure 4 is a transverse vertical sectional view taken approximately on the plane indicated by the line 4—4 of Figure 2 looking in the direction of the arrows;

Figure 5 is a detail transverse sectional view taken approximately on the plane indicated by the line 5—5 of Figure 3 looking in the direction of the arrows;

Figure 6 is a detail sectional view taken approximately on the plane indicated by the line 6—6 of Figure 2;

Figure 7 is a fragmentary elevational view illustrating a somewhat modified form of conveying and depositing mechanism; and

Figure 8 is a fragmentary plan view of the driving mechanism for the conveyer shown in Figure 7.

Referring more particularly to Figures 1 to 6 inclusive, 10 indicates a chassis for supporting the reversing and oscillating apparatus which is preferably mounted for longitudinal movement upon the endless tracks or crawlers 11 which may be of any well known construction. The said chassis 10 supports the spaced longitudinal frame members 12 which at one end have detachably secured to them inclined runways or ramps 13 upon which the transit mixer or other concrete transporting vehicle 14 may be driven as will be readily understood.

Suitably mounted upon the sub-frame members 12 is an annular track 15 upon which run

the rollers 16 which in turn support the rotating platform 17 comprising the spaced channeled track-ways 18 which receive the wheels of the vehicle 14. The said spaced channel members 18 are connected by suitable laterally extending members 19 as will be clear from the drawings.

The platform 17 is thus rotatably mounted upon the chassis 10 and its rotating and oscillating movements may be accomplished through power derived from an internal combustion engine or other suitable prime mover carried by the apparatus. I prefer, however, that the rotating and oscillating movements of the platform as well as the longitudinal movement of the entire apparatus be accomplished through the medium of the motor and driving wheels of the concrete-transporting vehicles, and to this end I provide means whereby when a vehicle is properly positioned upon the platform continued operation of its motor and driving wheels will supply all necessary power for the operation of the distributing apparatus.

Since it is necessary that the platform together with each vehicle driven upon it be first rotated through an arc of 180° after which the vehicle leaves the platform without reversal of this movement, it is necessary that power transmission mechanism be provided at either end of the platform so that power may be derived from the vehicle drive wheels regardless of which end of the platform such wheels may occupy. However, since the mechanism provided at one end is a duplicate of that provided at the other, only one will be disclosed in detail, with the corresponding parts at the opposite end being designated by corresponding reference numerals with primes attached thereto. Considering the right hand end of Figures 1, 2 and 3 since it is at this end that the drive wheels 20 of the transit mixer are shown for purposes of illustration, 21 and 22 designate respectively pairs of rollers mounted upon shafts 23 and 24 extending across and suitably journalled on the platform 17. These rollers as will be clear from Figure 2 are positioned in line with the trackways 18 so that when a vehicle is driven upon the latter its drive wheels 20 may be received between the said rollers 21 and 22 and may rest thereon so that the said wheels may be rotated from the truck motor in the usual manner and such rotation will be transmitted to the rollers 21 and 22 through their frictional contact with the tires of the wheels 20. The shafts 23 and 24 are provided respectively with sprockets 25 and 26 around which passes a chain or belt 27 whereby power delivered to both shafts 23 and 24 may be utilized, as will be readily understood.

Loosely mounted upon the shaft 24 is a pair of bevel gears 28 and 29 which mesh with a companion gear 30 rigidly carried by a longitudinally extending shaft 31. The gears 28 and 29 are provided with clutch elements 32 and 33 respectively, which may be alternately engaged by companion clutch elements 34 and 35 provided upon a clutch member of collar 36 splined to the shaft 24. The said member 36 is adapted to be moved longitudinally on the shaft 24 by means of a lever 37 pivoted as at 38 to one of the transverse members 19 and connected through suitable linkage 39, 40 and 41 to a hand lever 42 which occupies a position closely adjacent the operator's seat of the vehicle when the latter is positioned upon the platform 17. It is thus possible for the vehicle operator to manipulate the clutch members 34 and 35 from the vehicle seat through the medium of the hand lever 42 to cause the said members to engage either of their companion members 32 and 33 and to thereby control the direction of rotation of the shaft 31, and by disengaging both clutch members, to stop such rotation.

The shaft 24 is also provided with a brake drum 43, see Figs. 2, 5 and 6 which is surrounded by a brake band 44, which latter is controlled through the jack shaft 45 connected through suitable linkage 46 and 47 to a hand lever 48 also positioned closely adjacent the operator's seat. Braking friction may thus be applied to the brake drum 43 to retard or prevent rotation of the shaft 24 at will.

The longitudinal shaft 31 is provided with a loosely mounted bevel pinion 50 having a clutch element 51 adapted to be engaged by a companion clutch element 52 provided upon the clutch collar 53 which is splined to the said shaft 31. Longitudinal movement of the collar 53 is accomplished through a lever 54 pivoted as at 55 on the frame work and connected through suitable linkage 56 to a hand lever 57 positioned adjacent the operator's seat of the vehicle. The pinion 50 meshes with an annular bevel gear 58 which is rigidly secured to frame members of the platform 17 so that when motion of the shaft 31 is transmitted to the pinion 50 through the clutch elements 51 and 52 the entire platform 17 may be rotated or oscillated as will be readily understood. Such rotation or oscillation is readily controlled by the vehicle operator without leaving his seat through the medium of the hand levers 42 and 57 above described.

The longitudinal shaft 31 extends completely through the pinion 50 and is further provided with a second loosely mounted bevel pinion 60 which carries a clutch element 61 adapted to be engaged by a companion clutch 62 formed upon a clutch collar 63 splined to the shaft 31. Engaging and disengaging movement of the collar 63 longitudinally of the shaft 31 is accomplished through a lever 64 pivoted as at 65 on one of the frame members and connected through linkage 66 with a hand lever 67 extending upwardly adjacent the operator's seat. As is best shown in Figures 2, 3 and 4 the pinion 60 meshes with a bevel gear 68 carried by the vertical shaft 69 journalled upon the chassis frame, which shaft 69 carries a second bevel gear 70 meshing with a companion gear 71 mounted upon the horizontal drive shaft 72 of a suitable reduction gear mechanism 73 of any standard or well known make. The driven shaft 74 of this reduction gear mechanism is provided with sprockets 75 about which pass the sprocket chains 76 which also engage the sprockets 77 mounted upon the drive shaft 78 of the crawler or endless track mechanism 11. Power from the driving wheels of the vehicle may thus be transmitted to the endless track mechanism for producing longitudinal movement of the entire apparatus over the ground and the transmission of such power may be readily controlled by the vehicle operator from the seat through the medium of hand levers 42 and 67.

The operation of the apparatus as thus far described is as follows: A concrete transporting vehicle 14, whether it be of the transit mixer type or of the type which merely agitates premixed concrete, upon arriving at the place where the concrete is to be used is driven head first up the ramps or inclined runways 13 onto the platform 17 until its driving wheels 20 are received between and rest upon the rollers 21 and 22. At this time the brake band 44 has been

applied to the brake drum 43 through the medium of the hand lever 48 so that the said rollers are not revolved while the vehicle is being transported into place. The levers 42 and 57 are now manipulated to engage the clutch members controlled thereby and the lever 48 is caused to release the brake band 44 from the brake drum 43. If the driving wheels 20 of the vehicle are now driven from its motor in the usual manner the motion will be transmitted through frictional contact to the rollers 21 and 22, to the shafts 23 and 24, and through either of the gears 28 or 29 and gear 30 to shaft 31. Motion of this shaft will be transmitted through the clutch elements 51 and 52 to the pinion 50 and thence to the ring gear 58 thereby causing rotary movement of the platform 17 which is carrying the vehicle 14. This movement is continued until the vehicle has been turned through an arc of 180°, thereby bringing its rear or discharge end into proper position to discharge the concrete at the point of use. During such discharge it is preferred to shift the clutch collar 36 to alternately engage the clutch elements 34 and 35 with their companion elements 32 and 33, thereby moving the platform 17 together with the vehicle positioned thereon first in one direction and then in the other, whereby the concrete as it is discharged from the vehicle body will be distributed over a comparatively wide area of sub-grade rather than being or deposited in a heap where it must later be distributed by hand. It is also possible during such discharge, or subsequent thereto as occasion may require, to move the entire apparatus longitudinally through manipulation of the control lever 67 whereby the clutch elements 61 and 62 are brought into engagement and motion is transmitted from the shaft 31 through gears 60, 68, 70, 71, and 73, sprockets 75 and 77 and chain 76, to the endless track mechanism 11 whereby the entire apparatus is moved longitudinally.

In order to further facilitate the distribution of the concrete over relatively wide areas and more particularly at points removed from the apparatus, I may in some instances, provide inclined chutes 80 positioned to receive the concrete from the body of the vehicle, which chutes, as will be readily understood, will convey said concrete to points removed from the vehicle and its supporting mechanism.

In some cases it may be desirable to convey the discharged concrete to greater distances than is possible to accomplish with the inclined chute 80 in which event I make use of the modified form of the apparatus shown in Figs. 7 and 8. In this instance I extend the frame members 12 and mount thereon the frame 81 which carries an endless conveyor belt 82 which may be driven through suitable chain and sprocket gearing 83 from the shaft 23 and rollers 21 or directly from the truck wheels 20.

It will thus be seen that the invention provides mechanism whereby loaded concrete transporting vehicles may be elevated above the sub-grade and there have their direction reversed by rotating them through an arc of 180° thus eliminating the necessity for backing and turning upon the sub-grade with consequent damage to the latter. It also provides means whereby during the discharge of the vehicle the latter may be bodily moved laterally or oscillated so that concrete is automatically distributed during discharge over a relatively wide area, thus reducing or eliminating the necessity for subsequent hand distribution. Furthermore, as above pointed out the apparatus may be either driven by an independent motor mounted upon its frame work or preferably through frictional contact with the driving wheels of the vehicles as they are positioned upon it.

It is obvious that those skilled in the art may vary the details of constuction and arrangement of parts constituting the apparatus as well as the precise steps constituting the method and therefore it is not wished to be limited to the above disclosure except as may be required by the claims.

What is claimed is:

1. In an apparatus for facilitating the distribution of mixed concrete, a supporting chassis having means whereby it may be moved over the ground; a vehicle-receiving platform mounted for horizontal rotation upon said chassis; a shaft; means for supplying power to said shaft; power transmitting connections between said shaft and said chassis moving means; additional power transmitting connections between said shaft and said platform rotating means; independent means for connecting and disconnecting each of said power transmitting connections to and from said shaft; and means adjacent the operator's seat of a vehicle when on said platform for actuating each of said independent means.

2. In an apparatus for facilitating the distribution of mixed concrete, a supporting chassis having means whereby it may be moved over the ground; a vehicle-receiving platform mounted for horizontal rotation upon said chassis; a shaft carried by said platform having rollers adapted to support and receive power from the driving wheels of a vehicle when on said platform; a second shaft carried by said platform; reversible driving connections between said shafts whereby said second shaft may be driven in either direction at will; a gear rigid with said platform; means including a gear for transmitting power to said chassis-moving means; a pair of gears loosely mounted on said second shaft, meshing respectively with said two last named gears; and independent clutches for connecting and disconnecting at will said second named shaft and the loosely mounted gears thereon.

ARTHUR E. MILLER.