Dec. 1, 1925.

1,564,180

C. L. WILLARD

CONCRETE HANDLING MACHINE

Filed June 4, 1925

Fig. 1

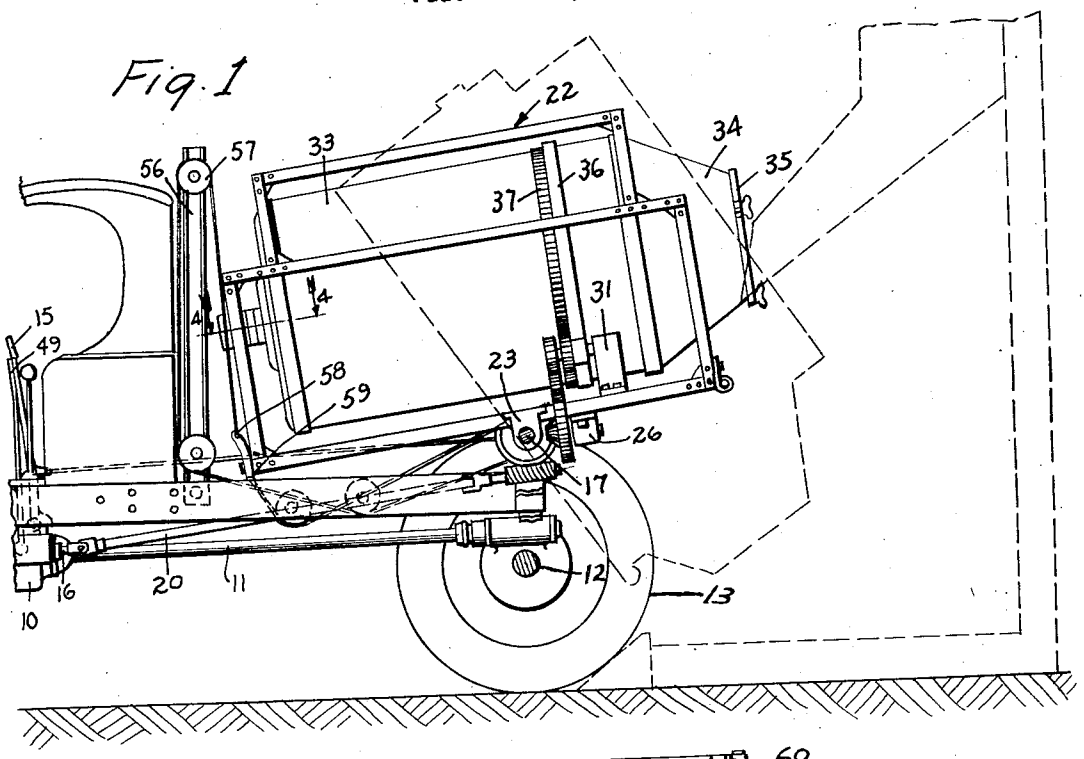


Fig. 2

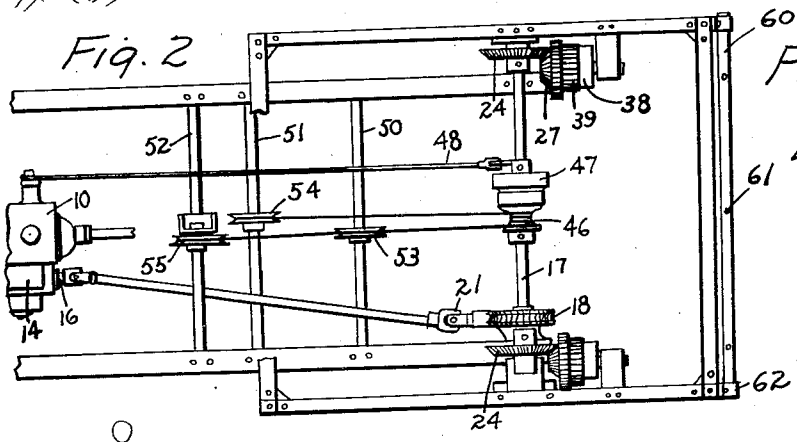


Fig. 4

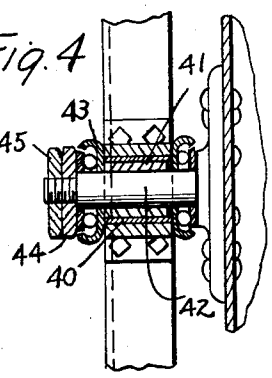
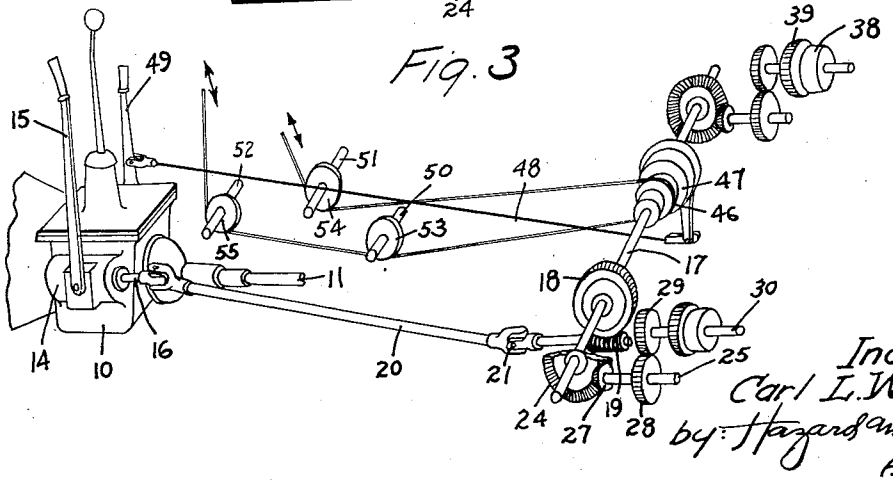


Fig. 3



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Patented Dec. 1, 1925. 1,564,180

UNITED STATES PATENT OFFICE.

CARL L. WILLARD, OF LYNWOOD, CALIFORNIA.

CONCRETE-HANDLING MACHINE.

Application filed June 4, 1925. Serial No. 34,797.

To all whom it may concern:

Be it known that I, CARL L. WILLARD, a citizen of the United States, residing at Lynwood, in the county of Los Angeles and State of California, have invented new and useful Improvements in Concrete-Handling Machines, of which the following is a specification.

This invention relates to improvements in concrete handling machines.

An object of this invention is to provide a machine which consists of a combined vehicle, such as a truck, which is self-propelled, and a concrete mixer, and to provide means for operating the concrete mixer upon the truck by the motor or propeller means of the vehicle.

It has been customary for contractors and the like, in building concrete structures, such as roads, streets and other constructions requiring concrete, to mix the concrete at a central plant or at some definite location, and after the concrete has been mixed to carry it to that location where the concrete is to be poured. This procedure has been generally followed for the reason that it saves labor, time and waste. One disadvantage of this procedure results in the fact that when there is a long haul, the concrete, after being mixed, becomes partially set in the conveying vehicle, so that when the concrete is poured, it is necessary to mix it up again so as to break the partial set. In some instances where city ordinances require that concrete be poured within a definite time after it is mixed, this question of a long haul and the partial set becomes an important matter for consideration.

By the improved device it is possible to place the ingredients of the concrete in the mixer and mix it while it is being conveyed. In this manner the concrete can be continually mixed while it is being carried without becoming partially set, and furthermore the time element is materially reduced. As previously explained, it has been customary to first mix the concrete, taking some time, and then convey the concrete, taking additional time. By the improved machine the concrete is mixed at the same time that it is being conveyed, thus reducing the time which has before been used for mixing alone. Furthermore, it will be readily appreciated that in a long haul, the mixer can be used continually, permitting a more efficient and thorough mixing of the ingredients without taking up additional time.

With the foregoing and other objects in view which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a side elevation of a portion of a truck to which the invention has been applied,

Fig. 2 is a plan view of the chassis or operating mechanism of the truck, showing the mechanism for driving the concrete mixer,

Fig. 3 is a diagrammatical view illustrating the operating mechanism, and

Fig. 4 is a sectional view illustrating a detail of construction, and may be considered as taken upon the line 4—4 of Fig. 1.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, it will be understood that the improved invention may be embodied upon any form of self-propelled vehicle, but as the machine was primarily designed to be embodied upon a Ford truck, it may as well be described as being in connection with a Ford truck for simplicity of disclosure. In Fig. 1 there is shown a portion of a Ford truck, on the forward end of which is mounted a motor, not shown. Behind the motor there is mounted the conventional Ford transmission, commonly known as the planetary transmission, and which is so constructed as to permit reversing. Behind the Ford transmission there is mounted upon the truck a secondary transmission, indicated generally at 10. The secondary transmission forms no part of the present invention other than its association. The secondary transmission 10 is provided with a counter shaft, not shown, and is a speed change transmission, enabling the drive shaft 11, which is connected through the rear axle 12 to the rear wheels 13, to be driven by the Ford motor. The secondary transmission 10, which I preferably employ, is a transmission which is primarily designed to increase the number of speeds on a Ford truck. Such a transmission is constructed and placed upon the market under the name

of Warford transmission, and is manufactured by the Warford Corporation of New York city, N. Y. A power take-off, indicated at 14, is also provided, which enables power to be taken off of the counter shaft of the secondary transmission 10 for various purposes. The power take-off 14 is provided with a handle 15 whereby its secondary drive shaft 16 may be connected to the counter shaft of the secondary transmission 10. All of the above is of conventional construction, and is believed to require no further description.

Adjacent the rear of the truck above the axle 12, there is mounted a secondary axle 17. This axle carries a worm wheel 18 driven by a worm 19, which in turn is connected by the rod 20 to the secondary drive shaft 16. Suitable universal joints 21 may be provided. A suitable frame work, generally designated at 22, is provided with bearings 23 which are rotatable upon the secondary axle 17, permitting the frame work to be tilted with respect to the truck, as indicated by dotted lines in Fig. 1. Beveled gears 24 are mounted upon the secondary axle 17 adjacent its ends and small shafts 25, which are mounted as by bearings 26 upon the frame work 22, carry beveled pinions 27 which mesh with the beveled gears 24. Spur gears 28 are also mounted upon the small shafts 25, which mesh with spur gears 29 mounted upon shafts 30. The shafts 30 are rotatably mounted in bearings 31, also mounted upon the frame work 22.

Within the frame work 22 there is disposed a mixer barrel 33 which may be of any desired construction similar to the conventional concrete mixer, which has its rearward end reduced, as at 34, to form a spout. The rearward end of the mixer barrel 33 is adapted to be closed by a removable closure 35. On the mixer barrel 33 there is provided an annular track 36 adjacent which is formed an annular gear 37. The track 36 is adapted to roll upon or ride on the cylinders or rollers 38 mounted upon the shafts 30, and gears 39, which are mounted upon the shafts 30 adjacent the rollers or cylinders 38, mesh with the annular gear 37. At the forward end of the frame work 22 there is mounted a bearing box, indicated at 40, containing roller bearings 41, which bear upon the sides of a trunnion 42 mounted on the forward end of the barrel 33. Upon both sides of the bearing box 40 there are positioned bearing races 43, between which are disposed balls 44, providing thrust bearings for the barrel. Lock nuts 45 are threaded onto the trunnion 42 to maintain the races 43 and the balls 44 together.

The operation of the above described construction is as follows: The truck may be backed up to a bulwark, as indicated in dotted lines in Fig. 1, to receive its charge of rock, sand, cement and water, or such ingredients as are desired in the mix. The removable cover 35 can then be positioned upon the barrel 33 and the truck driven away. Before driving the truck away the handle 15 can be manipulated to cause the secondary drive shaft 16 to be driven by the counter shaft in the secondary transmission 10. This causes the worm 19 to be rotated while the vehicle is moving, and thus drives the secondary axle 17, causing the shafts 25 and 30 to rotate and thus produce rotation of the barrel 33, causing the mixing of the ingredients of the concrete therein. If desired, the handle 15 can be manipulated to cause the drive shaft 16 to be disengaged from the counter shaft in the secondary transmission 10, so that the truck can travel without causing the mixer barrel 33 to rotate.

As a means for tilting the barrel 33 to discharge its contents, a spool or reel 46 is loosely mounted upon the secondary axle 17. A clutch mechanism 47 is associated with the spool 46 upon the secondary axle 17 and is capable of rigidly holding the spool 46 against rotation thereon. The clutch mechanism 47 which may be of conventional construction is adapted to be operated by a rod 48 which is connected to a lever 49 pivoted upon the side of the housing of the secondary transmission 10. Transverse shafts 50, 51 and 52 are mounted upon the frame of the vehicle and these shafts carry pulleys 53, 54 and 55 respectively. An upright 56 is mounted upon the vehicle forwardly of the barrel 33, and this upright has pivotally mounted thereon a pulley 57. A cable or other flexible element is wound about the spool 46 and has one end passing beneath the pulleys 53 and 55, this end extending upwardly over the pulley 57 and being fastened to the frame work 22, as indicated at 58. The other end of the flexible element passes beneath the pulley 54 and is fastened to the frame work 22, as indicated at 59.

The operation of tilting the concrete mixer at the desired location is as follows: The secondary transmission 10 is placed in neutral position, and the planetary transmission of the Ford truck is caused to be placed in gear, so that the counter shaft of the secondary transmission 10 will be rotated by the motor without causing the drive wheels 13 of the truck to turn. The handle 15 is manipulated so as to cause the secondary drive shaft 16 to be rotated, thus rotating the secondary axle 17. The rotation of the secondary axle 17 produces rotation of the mixer barrel 33, as above described. The lever 49 is then manipulated, causing the clutch mechanism 47 to engage,

thus causing the spool 46 to rotate with the secondary axle 17. Rotation of the spool winds up one end of the flexible element or cable, and unwinds the other end, producing the tilting movement of the frame work 22 and the barrel 33 into the dotted line position shown in Fig. 1, causing the contents to be discharged. In order to return the frame work 22 and the mixer barrel 33 to their initial positions, the planetary transmission of the Ford truck is merely placed in reverse, thus reversing the rotation of the counter shaft in the secondary transmission 10 and reversing rotation of the secondary axle 17. The clutch mechanism 47 is then caused to engage and force the spool 46 to rotate with the secondary axle 17, returning the frame work 22 and the mixer barrel 33 to their initial positions.

If desired, the frame 22 may have its rearward end provided with a transverse member 60, in which are formed holes 61. The transverse member 60 is rotatably mounted upon the frame work 22 as by bearings 62. The holes 61 are adapted to receive pins or spikes upon trough sections, which enable the sections of a trough to be detachably fastened to the frame 22 so as to receive the contents of the mixer barrel 33, when this barrel is tilted. It will be understood that the troughs are adapted to convey the mixed concrete from the mixer to the exact location where it is poured.

From the above it will be readily appreciated that a combined vehicle and concrete mixer is provided, which will enable the motor of a vehicle to drive the concrete mixer so that the concrete can be mixed while it is being conveyed. It will, of course, be understood that the invention is not limited to the embodiment upon Ford trucks, but other suitable self-propelled vehicles may be employed and other gear or transmission mechanisms can be employed, which will enable the secondary drive shaft 16 to be driven by the motor of the vehicle.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In combination with a self-propelled vehicle, a concrete mixer barrel tiltably mounted upon the vehicle, means for rotating the mixer barrel by the propelling means on the vehicle, whereby the mixer may be operated while the vehicle is traveling, and means operable by the propelling means upon the vehicle for tilting the mixer barrel and returning it to its normal position.

2. In combination with a self-propelled vehicle, a concrete mixer barrel tiltably mounted upon the vehicle, means for rotating the mixer barrel by the propelling means on the vehicle whereby the mixer may be operated while the vehicle is traveling, and means operable by the propelling means upon the vehicle for tilting the mixer barrel and returning it to its normal position while the mixer barrel is being rotated.

3. A combined vehicle and concrete mixer comprising a vehicle, a motor mounted upon the vehicle, a reversing transmission mounted adjacent the motor, a secondary transmission having a counter shaft mounted behind the first mentioned transmission, means connecting the secondary transmission to the drive wheels of the vehicle, a secondary drive shaft adapted to be driven by the counter shaft on the secondary transmission, a secondary axle mounted upon the vehicle, means for rotating said secondary axle by said secondary drive shaft, a frame pivotally mounted upon said secondary axle, a mixer barrel rotatably mounted upon said frame, and gear means associated with said secondary axle and said mixer barrel whereby the mixer barrel may be rotated by the motor of the vehicle.

4. A combined vehicle and concrete mixer comprising a vehicle, a motor mounted upon the vehicle, a reversing transmission mounted adjacent the motor, a secondary transmission having a counter shaft mounted behind the first mentioned transmission, means connecting the secondary transmission to the drive wheels of the vehicle, a secondary drive shaft adapted to be driven by the counter shaft on the secondary transmission, a secondary axle mounted upon the vehicle, means for rotating said secondary axle by said secondary drive shaft, a frame pivotally mounted upon said secondary axle, a mixer barrel rotatably mounted upon said frame, and gear means associated with said secondary axle and said mixer barrel whereby the mixer barrel may be rotated by the motor of the vehicle while the vehicle is moving.

5. A combined vehicle and concrete mixer comprising a vehicle, a motor mounted upon the vehicle, a reversing transmission mounted adjacent the motor, a secondary transmission having a counter shaft mounted behind the first mentioned transmission, means connecting the secondary transmission to the drive wheels of the vehicle, a secondary drive shaft adapted to be driven by the counter shaft on the secondary transmission, a secondary axle mounted upon the vehicle, means for rotating said secondary axle by said secondary drive shaft, a frame pivotally mounted upon said secondary axle, a mixer barrel rotatably mounted upon said frame, gear means associated with said secondary axle and said mixer barrel whereby the mixer barrel may be rotated by the motor of the

vehicle, there being a spool mounted upon said secondary axle, a flexible element wound upon said spool and having its ends connected to said frame, and clutch means for causing said spool to rotate with said secondary axle whereby said frame and mixer barrel may be tilted on the vehicle and returned to its normal position.

6. In combination with a self-propelled vehicle, a concrete mixer barrel tiltably mounted upon the vehicle capable of assuming a downwardly and rearwardly inclined dumping position, means for rotating the mixer barrel by the propelling means upon the vehicle whereby the mixer may be operated while the vehicle is traveling, and means operable by the propelling means upon the vehicle for tilting the mixer barrel and returning it to its normal position.

7. In combination with a self-propelled vehicle, a concrete mixer barrel tiltably mounted upon the vehicle capable of assuming a downwardly and rearwardly inclined dumping position, means for rotating the mixer barrel by the propelling means upon the vehicle whereby the mixer may be operated while the vehicle is traveling, and means operable by the propelling means upon the vehicle for tilting the mixer barrel and returning it to its normal position while the mixer barrel is being rotated.

In testimony whereof I have signed my name to this specification.

CARL L. WILLARD.