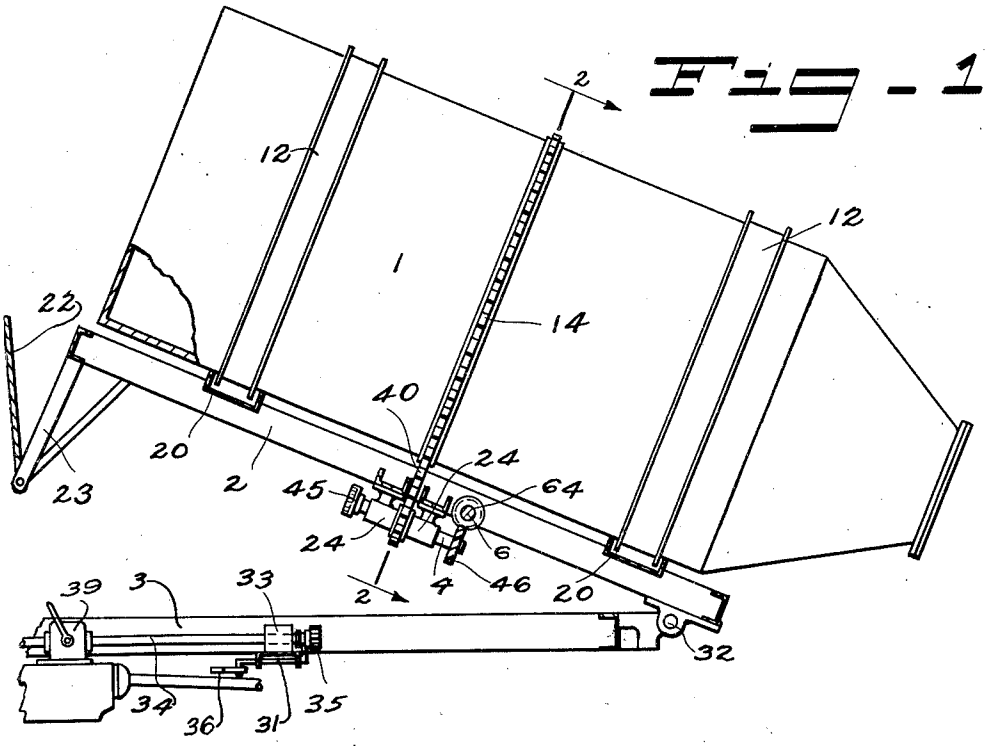
Jan. 31, 1928. 1,657,764

H. P. PARIS

TRANSIT CONCRETE MIXER DRIVE

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Fig - 1



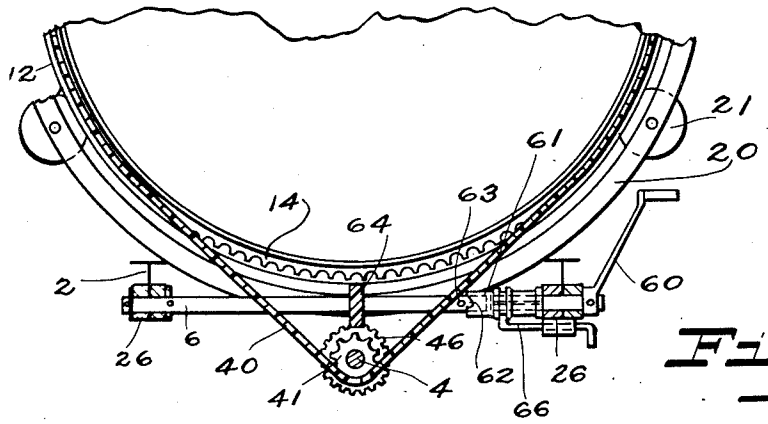


Fig - 2

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TRANSIT CONCRETE MIXER DRIVE

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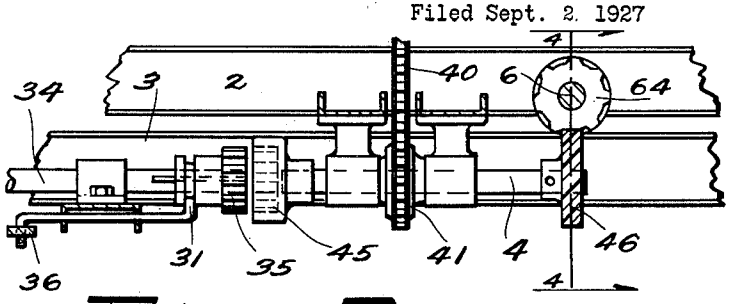


Fig-3

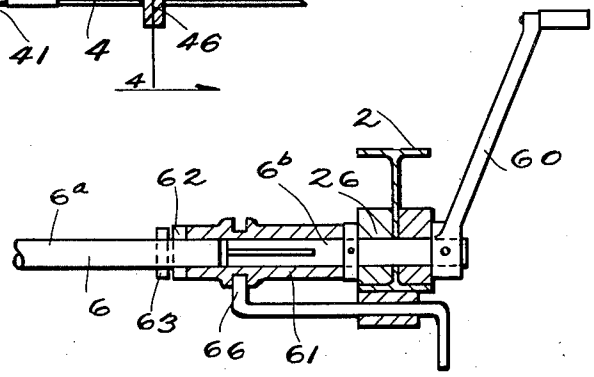


Fig-4

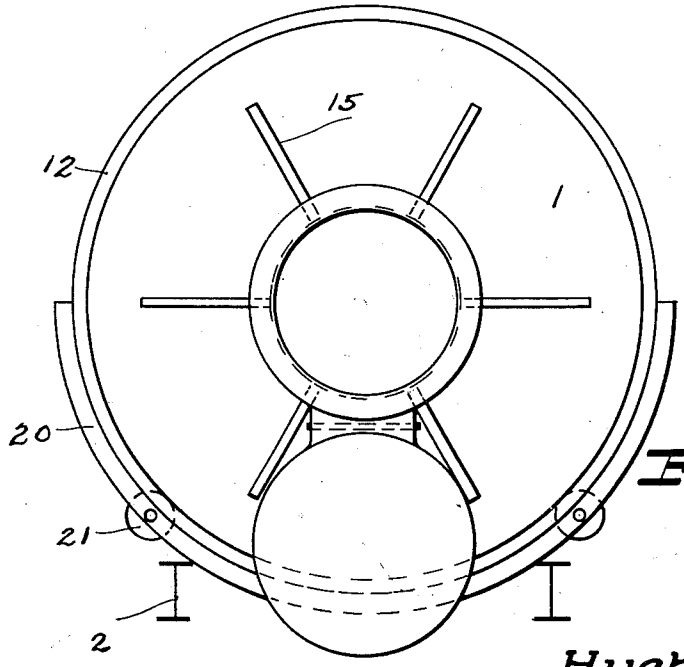


Fig-5

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Patented Jan. 31, 1928. 1,657,764

UNITED STATES PATENT OFFICE.

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TRANSIT-CONCRETE-MIXER DRIVE.

Application filed September 2, 1927. Serial No. 217,244.

My invention relates to a transit concrete mixer of the general type shown in my co-pending application, Serial Number 67,128, filed November 5, 1925, and the present invention is directed particularly to the mechanism by which the mixer element may be rotated, if of the revoluble drum type, or otherwise operated while in dumping position and disconnected from the power drive connection, whereby such rotation or other operation may be utilized to clean the materials from the mixer more thoroughly than may be done by dependence purely upon gravity.

A particular object of the present invention, therefore, is to provide a simple auxiliary drive means, which can be operated when the power drive means is disconnected, to rotate the mixer drum or to operate any other mixer element which may be substituted therefor, thus to assist in cleaning the machine of the materials.

A further object is the provision of a simple means adapted for the above purpose, and one which can be easily installed on various models of trucks.

A still further object is the provision of such an auxiliary drive means, including an automatic throw-out, whereby, when the power drive means is brought into operation, the auxiliary drive means is brought into operation, the auxiliary drive means is thrown out of operation, if, by chance, it has not theretofore been placed in inoperative position by the operator.

Other objects, and especially those which relate to structural details, will be clear from a study of the drawings and this specification.

My invention comprises the novel parts and the novel combination and arrangement thereof, as shown in the accompanying drawings, described in the specification, and particularly defined by the claims terminating the same.

In the accompanying drawings, I have shown my invention, and in this specification I will describe it, in a form which offers one convenient embodiment of the underlying idea, but it is understood that the invention is particularly concerned with the drive mechanism, though not with the specific form thereof, but rather the arrangement thereof, as illustrated and described, and it should be borne in mind that the mixer element, itself, the means for energizing or operating it, and the auxiliary drive means, may take various mechanical forms.

Figure 1 is an axial section through the chassis and sub-frame, illustrating in association therewith a mixer element similar to that shown in my application referred to, and illustrating the auxiliary drive means in condition for operation.

Figure 2 is a section substantially on the line 2—2 of Figure 1.

Figure 3 is a detail view similar to Figure 1, showing parts, however, in the position of rest, but with the main drive clutch disconnected.

Figure 4 is an enlarged section, substantially along the line 2—2 of Figure 1, and illustrating the hand crank and its connection to the transverse shaft.

Figure 5 is an end elevation of a modified form of auxiliary drive means.

As noted above, the device is illustrated in conjunction with a transit concrete mixer of the type shown in my application referred to above, and consisting in general of a mixer element, as the drum 1, mounted upon a sub-frame 2, which, in turn, is mounted on the chassis 3 of an automobile truck in such manner that it may be tilted for dumping, as shown by the pivot 32. The drum 1 is typical of a mixing element, and is cradled upon rollers 21, supported in stanchions 20 carried by the sub-frame 2, and bearing upon circular tracks 12 encircling the ends of the mixer drum 1. The sub-frame 2 is adapted to have its closed forward end raised for dumping through the open rear end, as, for example, by a cable 22 connected to a depending arm 23, the cable being connected to a suitable hoist (not shown), preferably a hydraulic hoist operated in the usual manner.

To rotate the mixer drum shown, it is provided with a large sprocket wheel 14, and a chain 40 connects this sprocket 14 with a sprocket wheel 41 secured upon shaft 4. As shown, this shaft 4 is journaled in bearings 24 upon the sub-frame 2, and the shaft 4 forms in effect a longitudinal continuation of the main drive shaft 34, which is journaled in bearings, as 33, upon the chassis 3, and which is connected by any suitable means with the motor of the truck, or with

a suitable power take-off 39, which is driven from the transmission gears within the casing 30. Inasmuch as like elements are common in truck design and practice, I have not illustrated them in detail, and it may be understood that the shaft 34 is a drive shaft connected by any suitable means to the power plant of the truck.

To connect the shafts 34 and 4, it is only necessary to provide co-operating clutch elements 35 and 45 on the shafts 34 and 4, respectively, and inasmuch as these shafts, when in position of rest, are aligned, it is convenient to employ a male and female jaw clutch arrangement, as best illustrated in Figure 3. The member 45 is secured upon the shaft 4, and the member 35 is slidable on the shaft 34 and is suitably controlled, as, for example, by a finger 31 operated by a suitable link or lever, of which an end 36 only is shown.

It will now be clear that when the members 35 and 45 are in engagement, the mixer drum 1 is directly connected with the power plant of the truck, although ordinarily another clutch of the friction type is employed, so that the drum may be started and stopped without disengaging the clutch members 35 and 45. Thus connected, the drum may be rotated while the vehicle is in transit or stationary after arrival at the point where the material is to be deposited. However, in the arrangement shown, when it is desired to dump the material, it is necessary to disconnect the clutch elements 35 and 45, inasmuch as one is secured upon the chassis 3 and the other upon the sub-frame 2, to permit tilting of the sub-frame for dumping of the load. It is, therefore, impossible to rotate the drum by the connection just described, and it has been found in practice that unless the drum is rotated when tilted, the material will tend to adhere to its walls and will in time harden and coat the walls of the shell with a hard coating of concrete. Furthermore, inasmuch as all of the material is not delivered, it is evident that the purchaser of the concrete is not getting all that he has contracted for.

Thus it becomes necessary to provide some means, whereby the drum may be rotated while in dumping position with the power drive disconnected, or, if the mixer is of the type employing paddles rotating within a fixed shell, it becomes necessary to rotate the paddles to break loose the material which tends to adhere to the walls of the mixing hopper. Where the mixer element is a drum, such as is illustrated herein, this may be done by providing spokes or handles 15, as best illustrated in Figure 5, which can be grasped to rotate the shell, although this is not the preferred way. Inasmuch as the shell when tilted is relieved of much of its load, and as its mounting upon the rollers 21 permits it to roll easily, the weight of the operator pulling upon the spokes 15, which are shown as surrounding the mount of the shell, is sufficient to turn the shell over a few times and thus to loosen the material which tends to cling. However, to insure that the auxiliary drive means is provided with sufficient power to turn the shell, even with a considerable portion of the load remaining in it, I have provided the preferred means shown in Figures 1 to 4 inclusive.

For convenience of manufacture and to provide a compact arrangement well adapted for shipping, the form now to be described has been adopted. The shaft 4 is provided with a gear 46, and a gear 64 upon a transverse shaft 6 meshes with the gear 46. As shown in the drawings, the gears 46 and 64 are spiral gears, though any other type suited to such a connection may be employed, and the gear ratio between these gears may be varied as is found desirable for the particular installation. The transverse shaft 6 is journalled wholly in the sub-frame 2, as is indicated at 26, and it is provided with some means for rotating it, preferably by hand, though power means may be employed if the particular installation requires it. For hand operation I may provide a crank arm 60, which is secured upon an end of the shaft 6, and which is accessible from the side of the truck to rotate the shaft 6, and thus to revolve the drum 1.

It is not desirable that the crank 60 should rotate while the drum is driven by the regular power drive means, and to eliminate this undesired movement of the crank, I form the shaft 6 in two sections, the section 6^a carrying the gear 64, and the section 6^b carrying the crank 60. These two sections may be connected together by a sleeve 61 embracing their adjacent ends. This sleeve is preferably keyed to the section 6^b and is longitudinally slidable. At one end it is provided with notches 62, engageable with a radially projecting pin 63 carried in the section 6^a. Thus by sliding the sleeve 61 through suitable means, such as the finger 66 (see Figure 4), it is possible to engage the notches 62 with the pin 63 and thus to connect the crank for operation of the gear 64. It will be evident that any other suitable clutch mechanism may be employed at this point, that illustrated being typical only of a simple form which has been found suitable for the purpose.

It will be noted further, particularly in Figure 2, that the notches 62 have one substantially longitudinally or axial and one inclined shoulder, so that in effect they form a ratchet co-operating with the pin 63. Engagement of the pin 63 with the longitudinal shoulders permits rotation of the shell or drum 1 in one direction, but reverse rotation of the sleeve 61, or rotation of the section

6[a] without corresponding rotation of section 6[b] will automatically throw this clutch out of engagement. Thus, if the operator forgets to disconnect this clutch after having rotated the drum by hand, and commences to rotate the drum by the power drive connection described, the rotation of the shaft 6 through the connection of the gears 46 and 64 will cause the pins 63 to ride over the inclined shoulders of the notches 62, and will force the sleeve 61 axially of the shaft 6 to disengage this clutch automatically, and the clutch being thus disengaged, the crank 60 will not rotate.

By means of this device, a simple and convenient drive for the mixer drum is permitted, that shown comprising only two aligned shafts, each securely journaled upon its respective frame and having separable clutch elements which are disconnected when the mixer is moved from the position of rest, yet the mixer is provided with means whereby it can readily be turned over to clean it of the residue which would otherwise cling to its walls. The entire device can be thrown into and out of operation with no trouble, and is, therefore, going to be used where a more complicated device might not be employed. The operator is saved the trouble of raking or hoeing out the residue, and can remove this with a few turns of the crank 60. Further, the device is fool proof and is automatically disengageable to prevent the crank 60 sweeping around and possibly injuring an attendant when the power drive connection is thrown into operation. The entire drive for mounting on the sub-frame forms a compact unit, easily shipped and easily mounted on any type of commercial truck.

I claim:—

1. In a transit concrete mixer, in combination with the chassis and the motor of an automobile truck, a sub-frame mounted on said chassis to move from a position of rest into dumping position, a movable mixer element carried upon said sub-frame, drive means for said mixer element connecting it with the truck motor, when the sub-frame is in position of rest, said drive means including clutch members disconnectible to permit movement of the sub-frame and mixer into dumping position, and supplemental means for driving said movable mixer element when said clutch members are disconnected.

2. In a transit concrete mixer, in combination with the chassis and the motor of an automobile truck, a sub-frame pivotally mounted on said chassis to move from a position of rest into dumping position, a revoluble drum cradled upon said sub-frame, drive means connecting said drum with the truck motor, when the sub-frame is in position of rest, a pair of clutch members in said drive means, one upon the chassis and the other upon the sub-frame, and disconnectible to permit movement of the sub-frame and mixer into dumping position, and auxiliary drive means for said mixer operable when said clutch members are disconnected.

3. In a transit concrete mixer, in combination with the chassis and the motor of an automobile truck, a sub-frame mounted on said chassis to move from a position of rest into dumping position, a movable mixer element carried by said sub-frame, power drive means connecting said mixer element with the truck motor, and including clutch members disconnectible to permit movement of the sub-frame and mixer from the position of rest, and auxiliary means for driving said mixer element mounted wholly on the sub-frame.

4. An organization as in claim 3, the auxiliary drive means including a clutch between the mixer element and the auxiliary source of power.

5. An organization as in claim 3, the auxiliary drive means including a clutch, and means for automatically throwing out said clutch when the main drive is operating.

6. An organization as in claim 3, the main drive means including a shaft journaled upon the sub-frame, and operatively connected to the mixer element, and said auxiliary drive means including a second shaft journaled upon the sub-frame, a crank secured upon said second shaft, and intermeshed gears upon said shafts.

7. An organization as in claim 6, the second shaft being broken between the gear secured thereupon and the crank, a sleeve including the adjacent ends of the two shaft sections, and keyed to the crank section, a pin projecting radially from the gear section, said sleeve having notches engageable with said pin to drive the gear section upon rotation of the crank section, and means for shifting said sleeve longitudinally to engage it with or disengage it from the pin.

8. An organization as in claim 6, the second shaft being broken between the gear secured thereupon and the crank, a sleeve including the adjacent ends of the two shaft sections, and keyed to the crank section, a pin projecting radially from the gear section, said sleeve having notches engageable with said pin to drive the gear section upon rotation of the crank section, one side of said notches extending substantially longitudinally of the shaft, and the other side extending at an angle to its axis, whereby rotation of the second shaft through rotation of the first shaft by the power drive means will disengage said sleeve from the pin, and means manually operable to shift said sleeve longitudinally to engage it with or disengage it from the pin.

9. In a transit concrete mixer, in combi-

nation with the chassis and the motor of an automobile truck, a sub-frame pivotally mounted on said chassis to move from a position of rest into dumping position, a revoluble mixer drum cradled upon said sub-frame, power drive means connecting said drum with the truck motor, and including a driving shaft journaled upon the chassis, a longitudinal shaft journaled upon the sub-frame, clutch elements connecting said shafts and adapted to be disconnected when the sub-frame and mixer are in dumping position, a sprocket wheel and a gear wheel upon said longitudinal shaft, a sprocket extending about said mixer drum, a drive chain connecting said sprockets, a transverse shaft journaled in said sub-frame, a gear on said shaft meshing with the gear upon said longitudinal shaft, and means at the outer end of said transverse shaft for rotating it independently of the truck motor.

10. A drive means for transit concrete mixers which include a dumping sub-frame and a mixer element carried thereby, said drive means comprising a shaft journaled upon the sub-frame, and operatively connected to the mixer element, means connecting said shaft to the truck motor and adapted to be disconnected therefrom, auxiliary means carried wholly by the sub-frame for driving said shaft, and clutch means for connecting and disconnecting the power drive means and the auxiliary drive means.

11. In a transit concrete mixer, the combination with the chassis and power-drive of an automobile truck, of a sub-frame carried by said chassis and a movable mixer element mounted thereupon, said sub-frame and mixer element being movable relative to the chassis from a position of rest into dumping position, manually operable drive means operatively connected to said mixer element, and power drive means connectible thereto to drive the mixer element.

12. In a transit concrete mixer, the combination with the chassis and power-drive of an automobile truck, of a sub-frame carried by said chassis and a movable mixer element mounted thereupon, said sub-frame and mixer element being movable relative to the chassis from a position of rest into dumping position, manually operable drive means operatively connected at all times to said mixer element, and power drive means connectible thereto at will, when the mixer is in position of rest, to drive the mixer element.

13. In a transit concrete mixer, the combination with the chassis and power-drive of an automobile truck, of a sub-frame carried by said chassis and a movable mixer element mounted thereupon, said sub-frame and mixer element being movable relative to the chassis from a position of rest into dumping position, drive means for said mixer including a section in operative connection thereto at all times, a normally inactive driving section, and means for connecting said sections at will to drive the mixer, and power drive means connectible at will to drive the mixer element.

14. In a transit concrete mixer, the combination with the chassis and power-drive of an automobile truck, of a sub-frame carried by said chassis and a movable mixer element mounted thereupon, said sub-frame and mixer element being movable relative to the chassis from a position of rest into dumping position, drive means for said mixer including a section in operative connection thereto at all times, a normally inactive driving section, means for connecting said sections at will to drive the mixer, power drive means connectible at will to drive the mixer element, and means for automatically disconnecting said sections of the first drive means when the second or power drive means is brought into operation.

15. In a transit concrete mixer, the combination with the chassis and power-drive of an automobile truck, of a sub-frame carried by said chassis and a movable mixer element mounted thereupon, said sub-frame and mixer element being movable relative to the chassis from a position of rest into dumping position, a drive means upon the sub-frame permanently connected to the mixer element, a manual drive means and a power drive means, and means operable to connect either of said manual or power drive means with the said drive means on the sub-frame.

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

HUGH P. PARIS.