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CONCRETE MIXING SYSTEM

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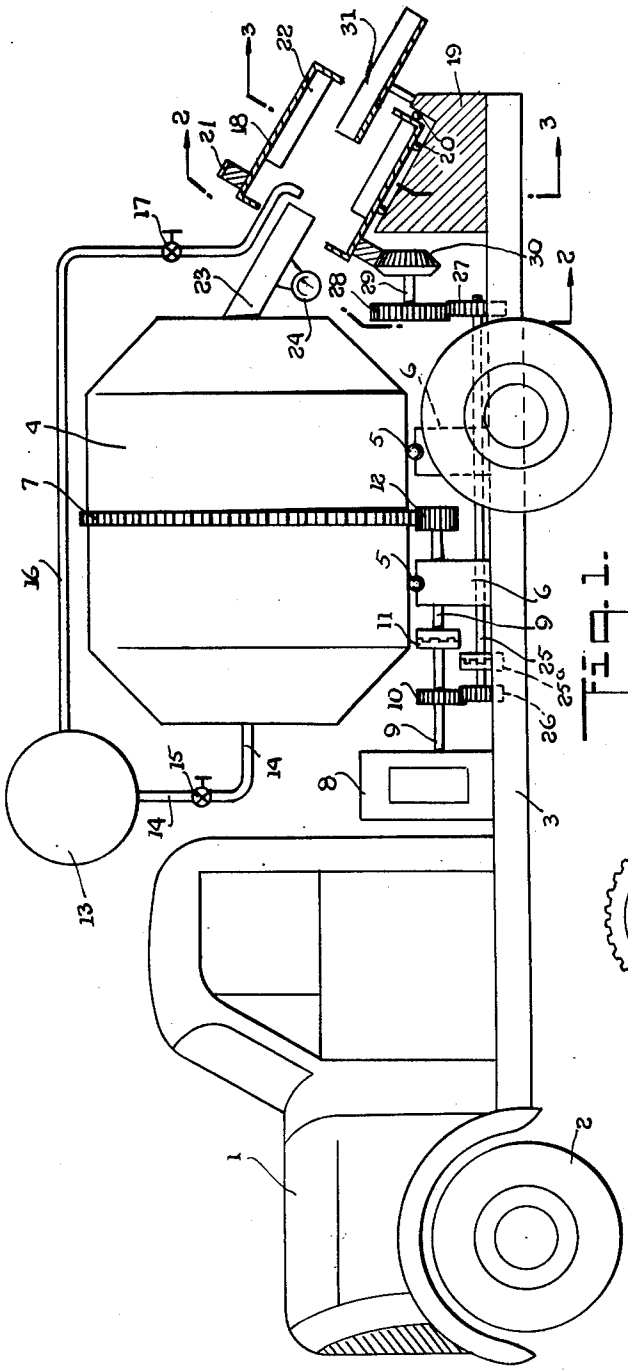


FIG. 1.

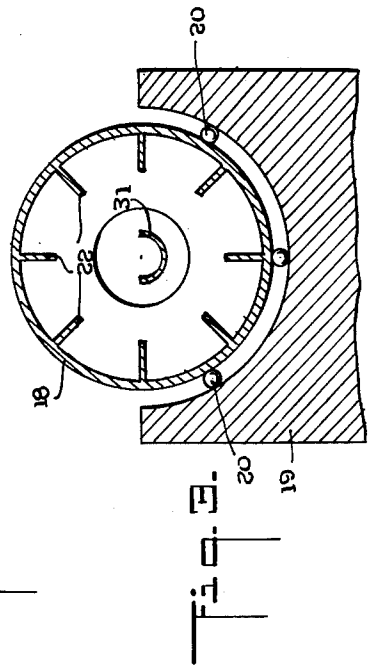


FIG. 3.

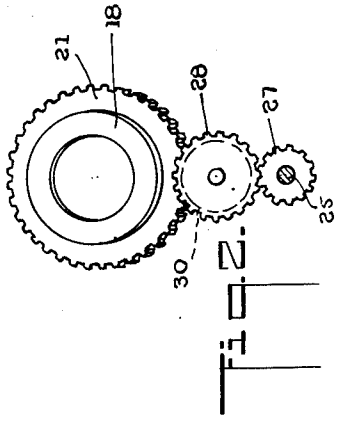


FIG. 4.

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CONCRETE MIXING SYSTEM

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3 Claims. (Cl. 259—152)

This invention relates to mobile mixers and more particularly to a concrete mixer such as is used to produce wet concrete, and a method of mixing small amounts thereof.

It is conventional to manufacture concrete in transit in drums disposed on mobile trucks which are adapted to mix large quantities of concrete at one time. This concrete, which may consist of several cubic yards of aggregate, sand, cement and water must be disposed of within a relatively short time after mixing as otherwise the cement might set within the drum. This factor has produced considerable problems in the production of concrete in small amounts as for a small job. In general, such an operation produces waste or shortage, it being extremely difficult to estimate a small quantity in a large drum.

According to the present invention, there is provided mechanism which facilitates the manufacturing of wet concrete in small quantities from a supply of materials in a concrete mixer truck, which supply is capable of producing a conventionally large quantity thereof. The mixer is thus adapted to dispense small and precisely measured quantities of wet concrete such as may be required, for example, by door to door sales to small homes. The invention is realized by providing a supplementary, smaller drum which is used in a system including the conventional larger drum and wherein the larger drum is employed for mixing large amounts of dry solid used in the manufacture of the concrete while the smaller drum produces a wet mix therefrom. The quantity of wet concrete produced and dispensed may be easily measured so as to provide the required amount. Water is piped to the supplemental or auxiliary mixing drum or tank so as to produce the wet concrete therein. The system herein does not disable the mixer from normal operation since the auxiliary mixing drum may be employed even when the truck is operating conventionally.

It will be found that the invention avoids the accumulation of a quantity of wet mix which must be disposed of and wasted through non-delivery. The invention has further benefits in that mixing is a continuous process effected upon delivery and the very important factor of clean-up time after delivery is limited to the relatively small drum.

The invention will be further understood from the following description and drawings in which:

Figure 1 is a side elevation of an automobile truck, partly in section, showing a conventional large drum used in the instant invention for mixing the dry solids used in the manufacture of concrete, and showing an auxiliary drum used in the manufacture of the wet concrete;

Figure 2 is a side elevational view of the auxiliary drum and speed reduction gears as taken along the line 2—2 of Figure 1; and

Figure 3 is a cross-sectional view taken along the line 3—3 of Figure 1 and showing the interior of the auxiliary drum with the baffle plates therein.

In the drawings, there is shown a conventional form of truck 1 having the usual wheels 2 and a frame 3 which has disposed thereon a large drum 4. The drum 4 is disposed behind the cab of the truck and is supported on a plurality of spaced apart ball bearings 5, said ball bearings being disposed in supporting blocks 6. The supporting blocks 6 rest upon the frame 3. The drum 4 is provided with a circumferentially disposed tire gear 7. A gasoline driven engine 8 is provided with a driven

shaft 9 and a first driven gear 10. A clutch 11 is disposed in shaft 9. Shaft 9 passes through the forward supporting block 6 and terminates in a driven gear 12 which gear is in mesh relationship with the tire gear 7. It will be noted that disengagement of the plates of clutch 11 will effectively disengage the gear 12 from the engine 8. The frame 3 is further provided with supporting means (not shown) to support a water tank 13 disposed at an elevation slightly above that of the drum 4 so that gravity feed of water may be effected into said drum. The water tank 13 is provided with a depending conduit 14 having a valve 15 therein, said conduit 14 being positioned to convey water into the interior of drum 4, if so desired.

It will be understood that the mechanism above described is largely conventional and no claim is made therein except insofar as the mechanism is in combination with the parts to be hereinafter described.

A second conduit 16 leads from the water tank 13 through valve 17 into the smaller, auxiliary drum 18. The auxiliary drum 18 is disposed upon a supporting block 19 having a sloped recess therein adapted to receive the drum 18 in a downwardly sloping position. A plurality of rollers 20 are disposed in the recess of block 19 and are adapted to support the weight and the end thrust of the drum 18.

The sloping drum 18 is provided with an upper end opening through which water conduit 16 passes. A circumferential tire gear 21 is disposed adjacent said top end of drum 18. Drum 18 is further provided with a plurality of baffles 22 adapted to effect thorough mixing of dry mixed cement obtained through drum 4 and water obtained through conduit 16.

Leading from the rear end of drum 4 is a sloping, large trough 23 adapted to transport dry concrete mixture from drum 4. Disposed in trough 23 is a measuring device 24 of conventional design, for example, a plurality of vanes disposed on a rotatable shaft adapted to measure a quantity of flowing dry concrete mix in the manner that the flow of water is conventionally measured.

Means are provided to rotate the auxiliary drum 18. Such means comprises a second shaft 25 which is passed through both supporting blocks 6. The shaft 25 is provided at its forward end with a gear 26 and at its rear end with a gear 27, a clutch 25*a* being disposed along the shaft 25. The gear 27 connects with a reducing gear 28 supported on shaft 29. Disposed in opposed relation to gear 28 is a bevel gear 30, said bevel gear meshing with tire gear 21 so as to rotate the auxiliary drum 18. Drum 18 is provided with a delivery mouth 31 through which the wet concrete mixture is conveyed.

In the operation of the device of this invention, a large quantity of dry ingredients is introduced into the large drum 4 and, after connecting said drum through clutch 11 to engine 8, the dry ingredients are rotatably mixed in said drum. If the entire contents of the drum are desired to be delivered at one job location, the mixer may be used in conventional fashion and water may be introduced into the drum 4 through conduit 14. However, the primary purpose of applicant's invention is to permit the delivery of small amounts of wet concrete as above described. In such a case, the valve 15 is maintained closed and the dry ingredients are delivered into auxiliary drum 18 through trough 23 while the drum 18 is rotating. At this time, the valve 17 of conduit 16 is opened sufficiently so as to introduce a desired quantity of water necessary to suitably wet the concrete mixture. The auxiliary drum 18 is rotated by the transmission described and the small amount of material is discharged through the mouth 31 onto the desired site. Reference to meter 24 will determine the quantity of concrete delivered.

It will be noted from Figure 1 that the auxiliary drum 18 may be independently operated without operation of the large drum 4. This is accomplished, of course, by operating the clutch 25*a*. On the other hand, when the large drum is used for mixing as in conventional operation, the wet concrete will nevertheless be delivered through trough 23 into drum 18 and out of mouth 31. It will be seen, therefore, that the auxiliary drum does not affect normal operation.

What is claimed is:

1. A mobile concrete mixer comprising a first rotatable drum for rotatably mixing a large amount of dry solid ingredients used in the mixing of concrete, means for measuring and dispensing a quantity of dry mixed ingredients from said first drum, a second, rotatable smaller auxiliary drum having a filler opening disposed adjacent to said dispensing means so as to receive the dispensed amount of dry mixed ingredients, a water tank, first conduit means for introducing water into said smaller drum to produce a wet concrete mixture therein, second conduit means for introducing water into said first drum, means to selectively operate either of said conduit means, internal combustion engine means having a clutch therein adapted to operate said large drum, said engine means having a second clutch adapted to simultaneously operate said smaller auxiliary drum, said smaller auxiliary drum being disposed at a downward angle and having a discharge spout whereby wet concrete produced in said smaller drum may be discharged downwardly through said discharge spout.

2. A mobile concrete mixer, comprising a first rotatable drum having a circumferentially disposed tire gear thereon, said drum being adapted to mix a large amount of solid dry ingredients used in the manufacture of dry concrete, means for measuring and dispensing a flow of dry concrete mixture from said first drum, a second rotatable auxiliary smaller drum positioned to receive the flow of dry mixed concrete ingredients, a source of water supply, first conduit means for introducing water therefrom into said smaller drum, second circuit means for introducing a flow of water from said source of water supply to said first drum, means to selectively operate either of said conduit means, and means for rotating both of said drums

3. A mobile concrete mixer according to claim 2 and including a discharge spout on said smaller drum, said first drum having a horizontal axis, said smaller drum being disposed at a sloping angle so that wet concrete may be dispensed therefrom at a downward angle, and a source of motive power including clutch means for rotating said smaller drum.

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