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METERING AND CLOSURE LOCKING MEANS FOR CONCRETE MIXERS

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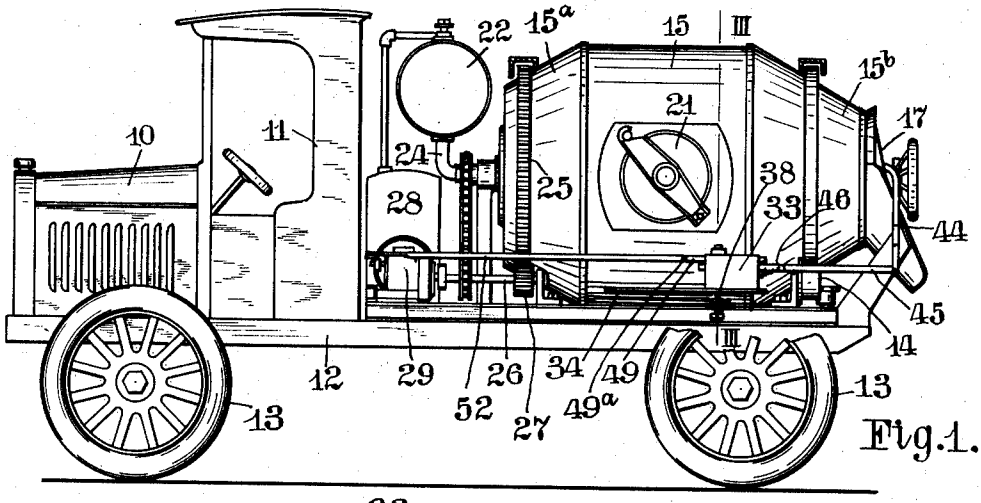


Fig.1.

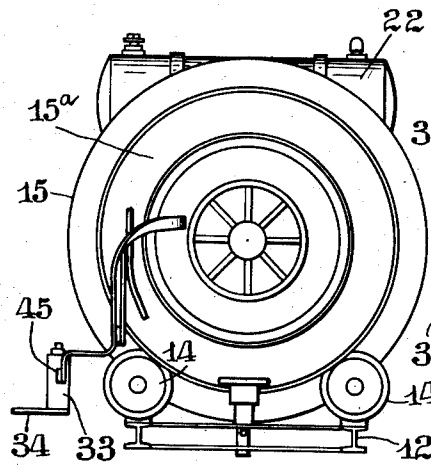


Fig.2.

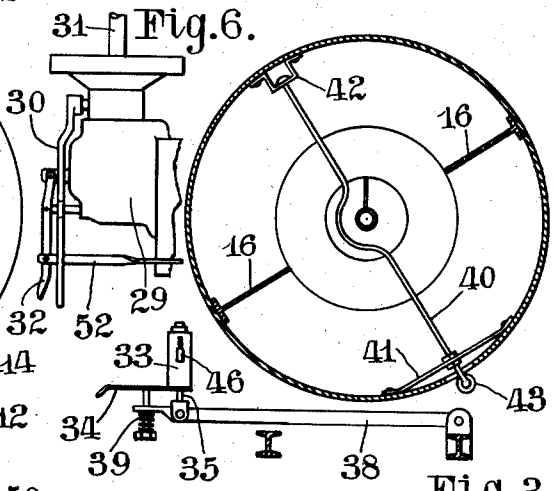


Fig.3.

Fig.6.

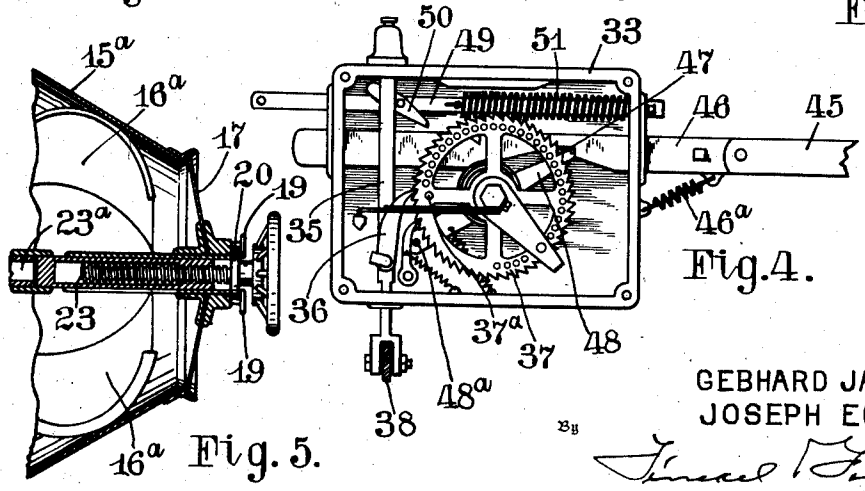


Fig.5.

Fig.4.

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METERING AND CLOSURE LOCKING MEANS FOR CONCRETE MIXERS

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3 Claims. (Cl. 83—73)

This invention relates more especially to what are called concrete mixers in which the mixing and discharge are effected by rotations of the drum.

The object of the invention is to provide improved means whereby the discharge cannot be effected until after a predetermined number of rotations of the mixing drum, said improved means including a metering means actuated by the weight or movement of the materials in the drum and means controlled by the metering means to prevent the reversal of the rotations of the drum to cause the discharge until the required predetermined number of rotations in the mixing direction have taken place. Another object of the invention is to provide improved means whereby a closure for the discharge opening cannot be removed until after the metering device has registered the predetermined mixing rotations. Other objects of the invention will appear from the disclosure herein.

The invention is embodied in the example herein shown and described, the features of novelty being finally claimed.

In the accompanying drawing—

Figure 1 is a side view of a truck concrete mixer according to the invention with parts broken out.

Fig. 2 is a view of the rear end of the mixing drum with parts broken out.

Fig. 3 is a cross section of the mixing drum on the line III—III, Fig. 1, illustrating the meter actuating means.

Fig. 4 illustrates in side view the metering means for the rotations of the mixing drum.

Fig. 5 is a sectional view of the rear end of the mixing drum showing the movable closure therefor.

Fig. 6 is a plan detail view showing the clutch and drum controls.

In the views the mixing and transporting drum is shown as mounted on an ordinary motor driven chassis having an engine within the usual hood 10, a driver's cam 11, a truck bed 12 supported by wheels 13, the rear pair of which is driven through a change speed gearing, not shown, but as usual.

On the chassis is mounted on suitable roller bearings 14 to turn on a horizontal axis the mixing and transporting drum, said drum having a cylindrical portion 15 extending forwardly and rearwardly as tapered portions 15^a and 15^b. The forward end of the drum is closed while its rear end is open for the discharge of the mixed concrete. Said drum has within it to rotate with it two oppositely disposed spiral mixing blades 16, 16 extended as portions 16^a, 16^a in the rear tapered portion to function as discharging blades when the motion of the drum is reversed.

The character 17 designates a closure for the discharge opening of the mixing drum, said closure having a hub provided with a central tube that fits around and slides on the tube. The closure is moved toward and from closing position by means of a screw 23 and hand wheel, said screw engaging a nut in a tubular extension fixed to the end of a water supply pipe 24. The hub of the closure is provided with lugs 19 engaged by a collar 20 on the hand wheel to open and close the closure by turning the hand wheel.

The side of the mixing drum is provided with a charging opening, said opening being provided with a removable cover 21 with suitable means for holding it closed after the drum has been charged with materials to be mixed.

The dry materials of the concrete are supplied with water from a tank 22 connected with the hollow shaft 23^a by means of a pipe 24 that is extended rearward in the drum to afford a support for the discharge closure.

Near its forward end the mixing drum is provided with a peripheral gear tooth rack 25. Mounted longitudinally in a suitable bearing on the truck bed is a shaft 26 having at its rear end a pinion 35 engaging said rack to turn the drum.

The power for driving the shaft 26 may be derived from the vehicle propelling engine but in the instance shown there is installed on the truck bed an engine 28 distinct from that of the vehicle propelling engine, said engine 28 being preferably of the petrol type for said purpose. There is provided for applying, stopping and reversing the direction of motion of the drum and shaft 26 a suitable power translating mechanism. This mechanism is generally of the usual reversing type and is contained in a housing 29. The handle 30 is employed to operate the clutch to connect and disconnect the power from the engine shaft 31 for rotating the drum, while the handle 32 is employed to control the direction of rotation of the drum.

The means to require a predetermined number of revolutions of the drum includes a metering mechanism confined in a normally securely closed housing 33 fixed on a shelf, such means being shown as exposed in Fig. 4. In said mechanism is a reciprocated rod 35 carrying a pawl 36 for intermittently turning against it a spring actuated ratchet wheel 37. The rod 35 is depressed by another rod 38 which is pivoted transversely

below the rotating mixing drum and forced up by a spring 39.

The mixing drum contains a diametrical rod 40 supported in a movable or resilient diaphragm 41 covering a hole in the wall of the drum and guided by a bracket 42 at its inner end, the outer end of said rod 40 extending through said hole in the wall of the drum and provided at its end with a roller 43 that, when the drum is rotated, strikes the rod 38 and depresses it to cause said rod 38 to actuate the metering device on the rebound of said rod by the action of the spring 39. The rotations of the drum therefore cause a step by step actuation of the toothed wheel. The weight or movement of the concrete materials being mixed on the flexible diaphragm 41 overcomes the resistance of the spring 39 and holds the roller down to wipe and depress the rod 38. The construction is such that when the drum is empty the rod and its roller do not operate the metering mechanism, thereby insuring that the metering device shall not be operated unless the mixing drum is charged with the concrete materials and thus making it seem that the materials have been adequately mixed.

To prevent discharge of the materials before they have been properly mixed means are provided for locking the discharge closure, said means including a pivoted lever 44, the end of the longer arm of which stands, when the cover is closed against or in proximity to said closure 17. The shorter arm of said lever 44 is connected by a link 45 with a locking bar 46 slidable in the meter housing 33. Said bar 46 is provided with a notch 47 engaged by a spring actuated lever dog 48, said dog being released by a pin 37^a projecting from the ratchet wheel 37 when that wheel has been operated the predetermined number of times.

In this operation said pin 37^a strikes said lever dog 48 and removes it from said notch in the bar 46, thereby permitting the lever 44 to be removed by the action of spring 46^a from proximity to the discharge cover and the manual opening of the latter by the operation of the hand wheel and screw. The locking bar is manually reset after an operation of the metering device by means of a bar 49 carrying a dog 50 movable to engage a notch 51 in the upper edge of the bar 46. The ratchet wheel is returned to starting position when the lever dog 48 is released as before described upon the release of the actuating pawl 36 and its companion stop pawl by a pin 48^a on the lever dog 48. This action takes place practically simultaneously with the release of the lever dog 48.

The bar 49 is hingedly connected at 49^a with the gear shifting lever 32 by means of link 52 so that when said lever 32 and link 52 are moved to reverse the rotation of the drum the meter is reset as shall now be described.

In practice the parts as shown in Fig. 1 and Fig. 4 are in the position indicated when the mixing operation is taking place. When the drum has turned in the mixing direction for the predetermined number of times for which the meter is set the dog 48 is released thereby releasing the lever 44, after which the closure may be opened and the rotation of the drum reversed by moving the lever arm 32 to the left as shown in Fig. 6. After the discharge of the drum said lever arm 32 is moved to the right and the meter mechanism reset for another mixing operation and locking the bar 46 which holds the lever 44 in position to prevent the opening of the closure until after another operation of the mixing drum in the mixing direction.

The forms of the parts can be changed without departing from the gist of the invention as claimed.

What we claim is:

1. In a concrete mixer, a rotary mixing drum, a metering element for the rotation of the mixing drum, means movably mounted within the drum and extending through an opening in a wall of the drum, said means projected by the contents of the drum, and an operating device for said meter located in the path of said projected means and cooperating therewith to cause operation of the metering element by the rotation of the drum.

2. In a concrete mixer, a rotary mixing element, a metering element for the rotations of the mixing element, and means in the mixing element consisting of a resilient diaphragm having means thereon for actuating the metering element, said diaphragm actuated by the materials being mixed in the mixing element.

3. In a concrete mixer, a rotary mixing element, having an opening in its side, a metering element for the rotations of the mixing element, and means for actuating said metering element carried by the mixing element consisting of a rod, a flexible diaphragm covering said opening and supporting said rod within the mixing element with an end of the rod projecting through said opening.

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