

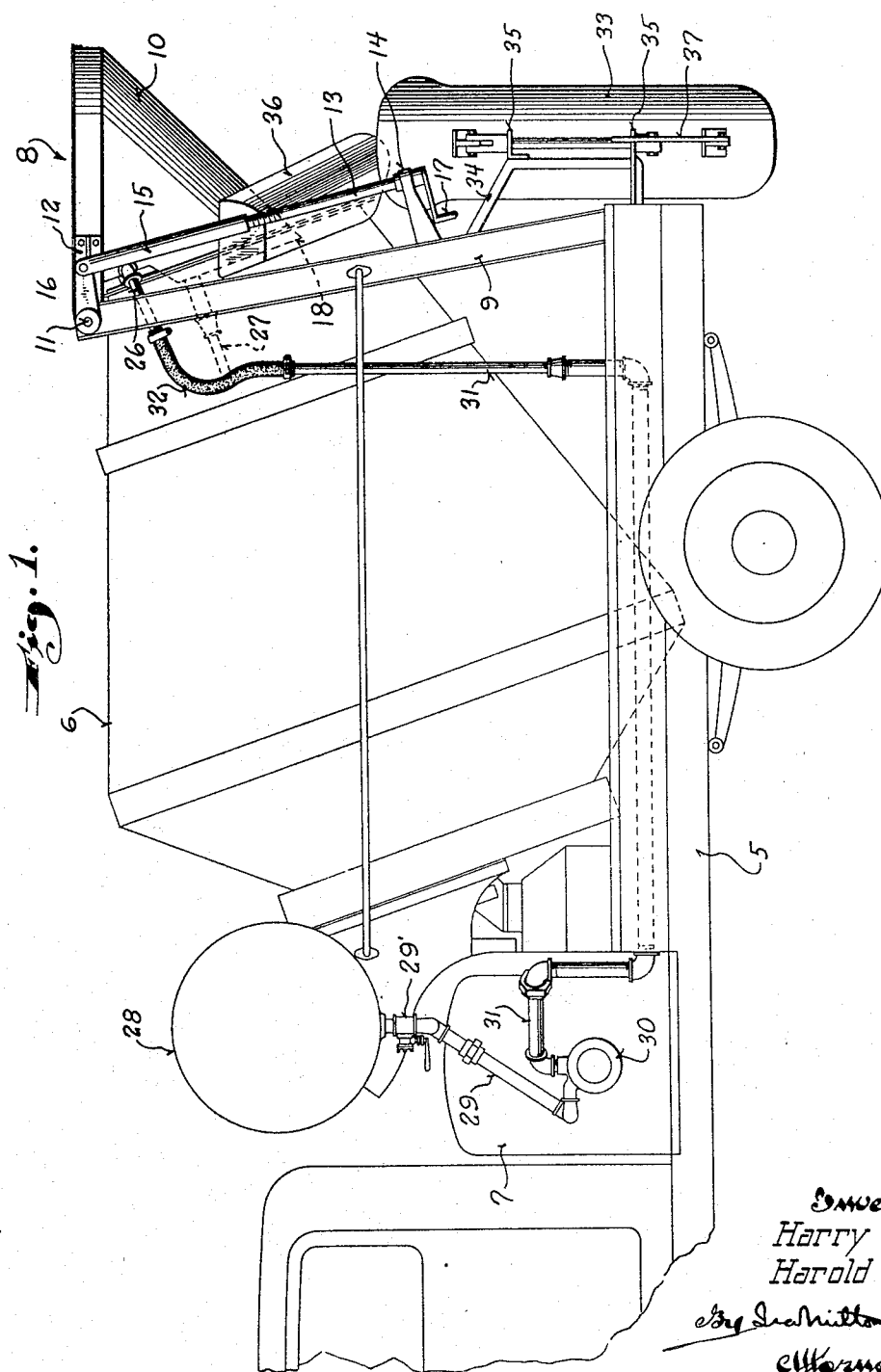
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H. C. PETERS ET AL
TRANSIT CONCRETE MIXER

2,267,801

Filed Aug. 14, 1939

3 Sheets-Sheet 1



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Dec. 30, 1941.

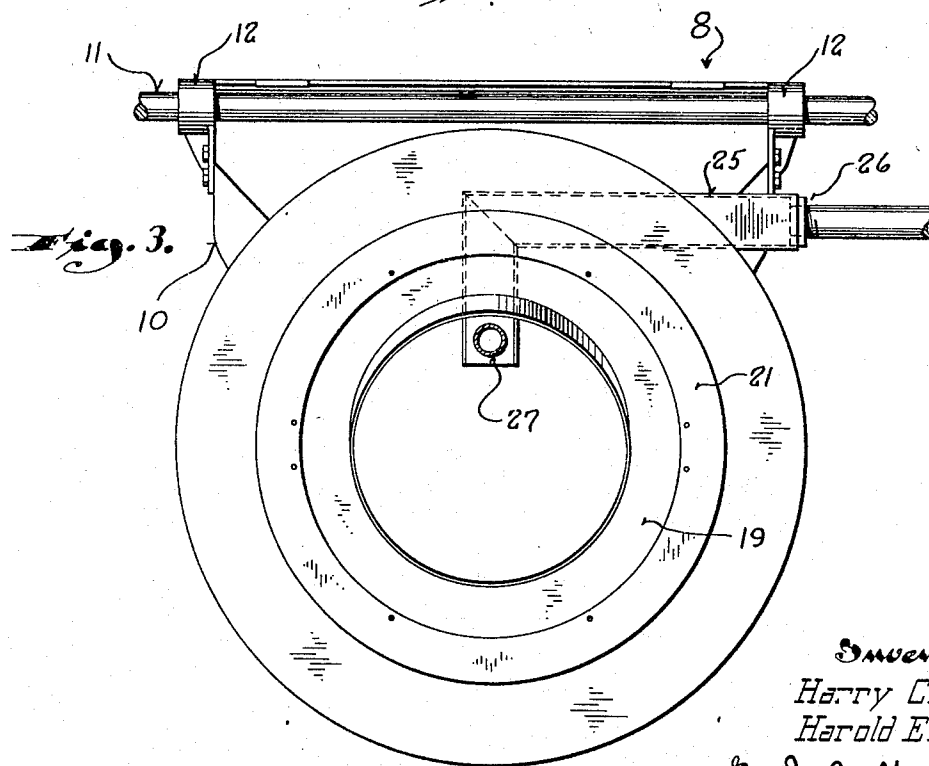
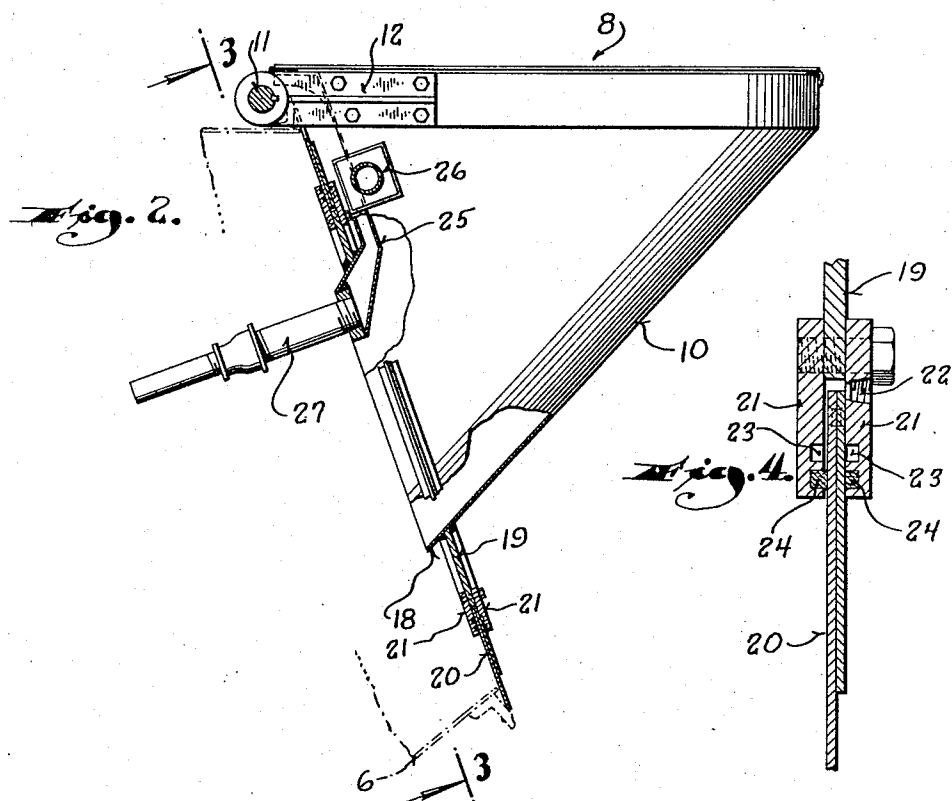
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TRANSIT CONCRETE MIXER

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3 Sheets-Sheet 2



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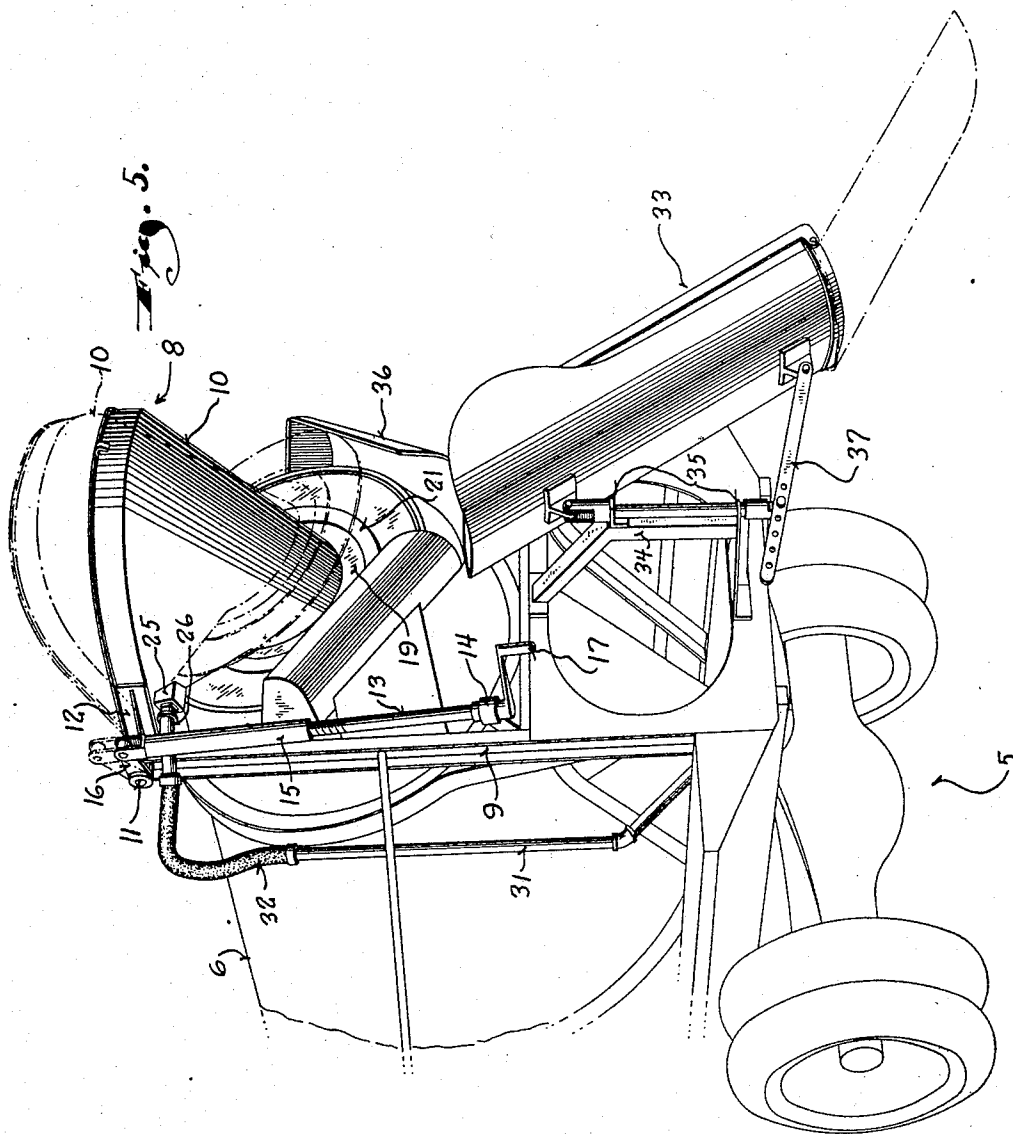
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H. C. PETERS ET AL
TRANSIT CONCRETE MIXER

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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TRANSIT CONCRETE MIXER

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9 Claims. (Cl. 259—165)

This invention relates to concrete mixers, and refers particularly to the so-called truck mixers or transit mixers wherein a mixing drum is rotatably mounted on an automobile truck chassis.

In some respects, the present invention is like Patent No. 2,029,126 issued to Adolph W. Rybeck January 28, 1936. As in this patent, the present invention contemplates a truck mixer having a rotatable mixing drum mounted with its axis inclined and having but a single charging and discharging opening at the elevated rear end of the drum.

One of the objections present in most transit mixers heretofore in use has been the difficulty of maintaining an unobstructed water inlet into the drum interior. Many different schemes of introducing the water have been tried, but invariably it was difficult, if not impossible, to keep the discharge nozzle open and unobstructed at all times.

This invention therefore has as one of its objects to provide an improved manner of introducing water into the batch whereby the water is uniformly and quickly distributed throughout the entire batch, and in such a manner that it is impossible for concrete or grout to come in contact with the discharge nozzle.

Another object of this invention is to provide means for introducing water into the drum under substantial pressure to thereby insure a more uniform and faster distribution of water in the batch.

Another object of this invention is to provide an improved and simplified manner of closing or sealing the open end of the mixing drum.

In this connection, it is a further object of the invention to provide a combined charging hopper and sealing door movably mounted adjacent the open elevated end of the rotatable mixing drum to be swung toward and from the drum by a conveniently operated manual actuator.

Another object of this invention is to provide a combined charging hopper and sealing door for the purpose described, wherein that portion of the door which contacts the drum is freely rotatable, and wherein free rotation is insured through the provision of an adequate lubricated connection between the rotatable and nonrotatable portions of the door.

Another object of this invention is to provide an improved manner of mounting the distributing chute so that it is at times instantly ready for use.

With the above and other objects in view which

will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention, constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view in side elevation of a truck mixer embodying this invention;

Figure 2 is a side view of the combined charging hopper and sealing door, with parts broken away and in section;

Figure 3 is a sectional view taken through Figure 2 on the plane of the line 3—3;

Figure 4 is an enlarged detail view illustrating the manner in which the nonrotatable and rotatable portions of the sealing door are connected; and

Figure 5 is a perspective view showing the rear end of a truck mixer to illustrate particularly the manner in which the materials expelled from the mixing drum enter the distributing chute.

Referring now to the accompanying drawings in which like numerals indicate like parts, the numeral 5 designates the chassis of a conventional automobile truck or other suitable vehicle upon which a mixing drum 6 is rotatably mounted with its axis inclined, as more particularly described in the aforementioned Adolph W. Rybeck Patent No. 2,029,126.

The drum may be driven from the power plant of the truck or a separate power plant 7 may be provided. In either instance, suitable transmission mechanism is provided to permit the drum to be rotated in both directions.

The elevated rear end of the drum is open, and the charging as well as the discharging of the drum is effected through this open end. When the drum revolves in one direction, its blades (not shown) produce the mixing action, and when the drum revolves in the opposite direction, the same blades, being arranged spirally, act as conveyers to carry the concrete upwardly to the open rear end of the drum.

Inasmuch as it is desirable to close the drum as much as possible against the free ingress of air, the open rear end of the drum is adapted to be substantially closed by a combined charging

hopper and sealing door, indicated generally by the numeral 8. This unit is pivotally mounted on a frame 9 carried by the chassis of the truck and including two upright sidewise spaced supports, one on each side of the drum.

The charging hopper per se comprises a funnel-like hopper 10 having an open top and having its discharge spout pointing down into the drum when in its normal position. The hopper 10 is hung on a transverse shaft 11 journaled in bearings carried by the upper ends of the upstanding side members of the frame 9. Brackets 12 fixed to the shaft 11 are secured to the sides of the hopper to provide the actual connection between the shaft and the hopper. Being thus secured non-rotatably to the shaft 11, it follows that by rocking the shaft, it is possible to swing the hopper toward and from the open end of the mixing drum.

Such swinging movement is conveniently effected by means of a screw 13 rotatably but non-longitudinally movably journaled in a bearing 14 carried by the frame 9. The screw 13 threads into a sleeve or tube 15, the upper end of which is connected with the outer end of a lever 16 fixed to the shaft 11. The lower end of the screw 13 carries a crank or other suitable actuator 17.

Encircling and secured to the lower discharge end 18 of the hopper 10 is a disc-like plate 19. The outer diameter of this plate is less than the diameter of the open end of the drum, and the space therebetween is spanned by a rotatable ring 20 which engages the periphery of the drum opening so that the drum opening is closed except for the restricted passage through the charging hopper.

To freely rotatably mount the ring 20, which may be of one piece or of laminated construction, as shown, from the plate 19, two ring members 21 are clamped to opposite sides of the plate with their outer portions extending beyond the margin of the plate to define an annular passageway or channel in which the adjacent inner peripheral edge portion of the ring 20 is received.

The space between the ring members 21 is a bit greater than the thickness of the ring 20 so that free rotation of the ring 20 is permitted and a lubricant receptacle is provided. Heavy grease or other suitable lubricant may be injected into this receptacle through a port 22 (see Figure 4), which may be closed by a suitable plug or grease gun fitting (not shown).

The capacity of the grease receptacle is increased by the provision of annular grooves 23 in the inner faces of the ring members 21, and leakage of the grease out of the receptacle is prevented by packing rings 24 carried by the ring members and engaging the opposite faces of the ring 20. With this construction, the ring revolves freely with the drum when the combined charging hopper and sealing door are in their lowered closed position, and as the screw 13 is rotated, the combined charging hopper and sealing door is readily swung to an open position, indicated in dotted lines in Figure 5, permitting the discharge of the drum contents.

One of the important features of the invention resides in the manner in which the water is introduced into the mixing drum. This is effected through the provision of a water passage 25 formed in the charging hopper with its inlet 26 at one side of the hopper and its outlet provided with an injection nozzle 27 pointed toward the closed front end of the drum.

As best shown in Figures 2 and 3, this nozzle

is positioned above the path of the dry aggregates entering the drum through the charging hopper and is so located that concrete or grout will never contact the mouth of the nozzle. The objections of past constructions are thus entirely obviated with this improved manner of introducing the water.

Water is conducted to the inlet 26 of the passage 25 from a measuring tank 28, under pressure. For this purpose the water measuring tank is connected through a pipe line 29 with a force pump 30 driven from the power plant 7, and the discharge of the pump is connected through a pipe line 31 and a flexible hose 32 with the inlet 26 of the water passage. A valve 29' controls the flow of water to the pump, and the flexible hose 32 enables swinging movement of the combined charging hopper and sealing door.

Inasmuch as the water is introduced into the drum at substantial pressure, it will be readily apparent to those skilled in the art that faster and more uniform distribution of the water through the batch is obtained.

For discharging the mixed concrete, a distributing chute 33 is provided. This chute is permanently pivotally mounted on a bracket 34 carried by the frame 9 and positioned beneath the elevated rear end of the drum. The bracket 34 has two vertically spaced bearings 35 in which a vertical shaft is mounted, this shaft having the distributing chute hung thereon. The upper end of the chute is thus at all times in position to receive mixed concrete from the elevated rear end of the drum.

To guide the discharging drum contents to the chute, a funnel-like collar 36 embraces the lower edge of the opening in the mixing drum. This collar of course is supported from the stationary structure and does not turn with the drum.

The distributing chute 33 preferably comprises two hingedly connected sections which are folded upon each other, as shown in Figure 5, during transit; and the angle of inclination of the chute is readily adjustable through the medium of a link 37 which supports the lower end of its upper section, as clearly shown in Figure 5.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent that this invention provides a truck mixer having many advantages over past constructions, and that it particularly improves the manner of introducing water into the batch and thus insures more efficient operation.

What we claim as our invention is:

1. In a transit mixer, the combination of: a mixing drum rotatable on a fixed axis and having a single opening through which the drum is charged and discharged; a combined charging hopper and sealing door; means movably mounting said combined charging hopper and sealing door for bodily movement from a position spaced from the opening in the drum to allow the discharge of the drum contents through said opening to a position at which the door closes the opening of the drum and the hopper is operable to direct dry aggregates into the drum; a water passage carried by and fixed with respect to the combined charging hopper and sealing door; a discharge nozzle for said water passage projecting through said opening into the interior of the drum when the combined charging hopper and door is in its charging position so that the discharge end of the nozzle is spaced a substantial distance from the discharge end of the charging hopper

and out of the path of material entering the drum; a source of water under pressure; and means connecting said source with the water passage, part of said connecting means being flexible to allow free movement of the combined charging hopper and sealing door.

2. In a concrete mixer: a rotatable mixing drum having an open end through which the drum is charged and discharged; a charging hopper; a stationary frame movably mounting the charging hopper adjacent to said open end of the drum for movement to and from a position directing aggregates into the drum; and a sealing ring encircling the discharge end of the charging hopper and rotatably carried thereby in a position to be engageable with the periphery of the drum opening when the hopper is in its charging position to direct aggregates into the drum.

3. In a concrete mixer: a rotatable mixing drum having an open end through which the drum is charged and discharged; a charging hopper; a stationary frame movably mounting the charging hopper adjacent to said open end of the drum for movement to and from a position directing aggregates into the drum; a sealing ring encircling the discharge end of the charging hopper and rotatably carried thereby in a position to be engageable with the periphery of the drum opening when the hopper is in its charging position to direct aggregates into the drum; and means carried by the charging hopper for introducing water into the interior of the drum.

4. In a concrete mixer: a rotatable mixing drum having an open end through which the drum is charged and discharged; a charging hopper; means mounting the charging hopper for movement to and from a charging position directing materials into the drum through its open end; a disc-like plate carried by the charging hopper; and a ring encircling the charging hopper and rotatably mounted on said plate in a position to be engageable with the periphery of the opening in the drum when the hopper is in its charging position, whereby said ring and plate close the open end of the drum and the ring revolves with the drum around the hopper.

5. In a concrete mixer: a rotatable drum having an open end; a charging hopper; means pivotally mounting the charging hopper adjacent to the open end of the drum; means carried by the charging hopper and forming an annular guideway; and a ring freely rotatable in said annular guideway and engageable with the periphery of the drum opening when the charging hopper is in one of its positions.

6. In a concrete mixer: a rotatable drum having an open end; a charging hopper; means pivotally mounting the charging hopper adjacent to the open end of the drum; means carried by the charging hopper and forming an annular guideway; a ring freely rotatable in said annular guideway and engageable with the periphery of the drum opening when the charging hopper is in one of its positions; and means for supplying lubricant to said annular guideway.

7. In a truck mixer of the character described:

a drum rotatably mounted with its axis inclined and its rear end elevated, said rear elevated end being open; a charging hopper; a stationary frame movably mounting the charging hopper for motion toward and from a charging position at which the discharge end of the hopper directs material into the elevated open end of the drum; a flange encircling the discharge end of the charging hopper; a sealing ring interposed between the periphery of the open end of the drum and said flange when the charging hopper is in its charging position, said ring being freely rotatable with respect to the flange so as to turn with the drum; and means for swinging the charging hopper upwardly away from the open end of the drum to enable discharge of the drum contents.

8. In a truck mixer of the character described: a drum rotatably mounted on an inclined axis and having its rear elevated end open; a charging hopper; a stationary frame pivotally mounting the charging hopper to swing toward and from the elevated open end of the drum; a sealing member carried by the charging hopper and engageable with the periphery of the open end of the drum when the charging hopper is in its lowered position; means for swinging the charging hopper upwardly away from the open end of the drum to enable discharge of the drum contents, said means including a screw adapted to be manually rotated; and a part connected with the charging hopper and having threaded engagement with the screw.

9. In a truck mixer having a frame and a power plant, the combination of: a drum mounted in the frame for rotation on a fixed axis and adapted to be driven by the power plant, said drum being chargeable and dischargeable through one open end; a combined charging hopper and closure; means for movably mounting said combined charging hopper and closure from the frame adjacent to the open end of the drum for movement from an operative charging position at which the hopper directs aggregates into the drum and the space between the hopper and the periphery of the open end of the drum is closed, to an inoperative position out of the path of material discharged from the open end of the drum; a water injection nozzle carried by the combined charging hopper and closure for introducing water into the interior of the drum; said water injection nozzle being fixed with relation to the combined charging hopper and closure in a position such that its discharge end is spaced outwardly a substantial distance from the discharge end of the charging hopper and out of the path of material entering the drum when the charging hopper is in an operative charging position; a water pump driven by the power plant; and means for connecting the outlet of the pump with said water injection nozzle, part of said means being fixed with respect to the frame and part thereof being movable to accommodate motion of the combined charging hopper and closure with respect to the drum.

HARRY C. PETERS.
HAROLD E. SMITH.

CERTIFICATE OF CORRECTION.

Patent No. 2,267,801.

December 30, 1941.

HARRY C. PETERS, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 47, claim 4, strike out the words "around the hopper" and insert the same after "drum" in line 46, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of February, A. D. 1942.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.