E. W. BRACKENBURY.

CONCRETE MIXER.

APPLICATION FILED JAN. 20, 1916.

1,335,934.

Patented Apr. 6, 1920.

4 SHEETS—SHEET 1.

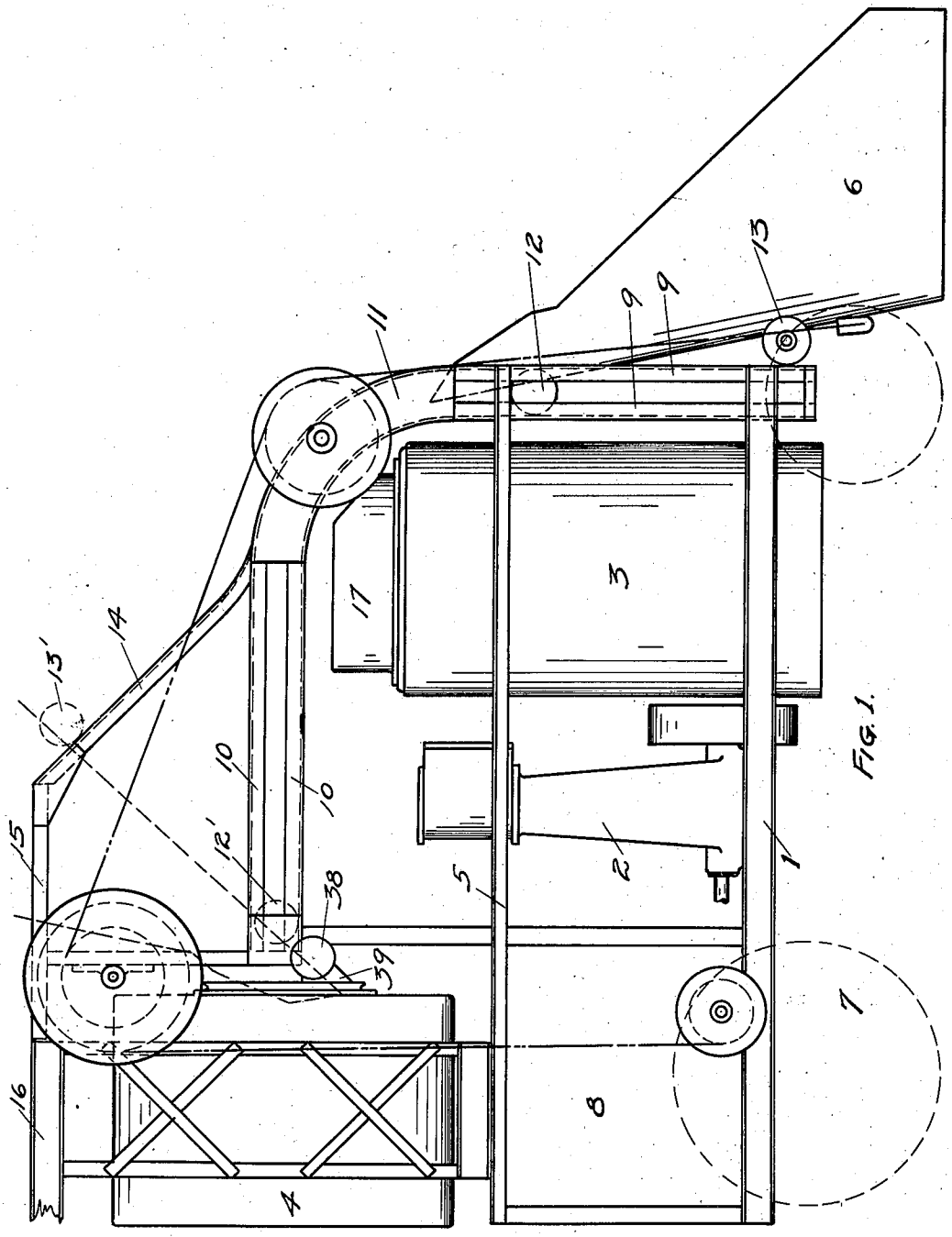


FIG. 1.

Witnesses
Lloyd Dieseger
Arnold Reuse

Edward W. Brackenbury,
by
Albert E. Smith Atty

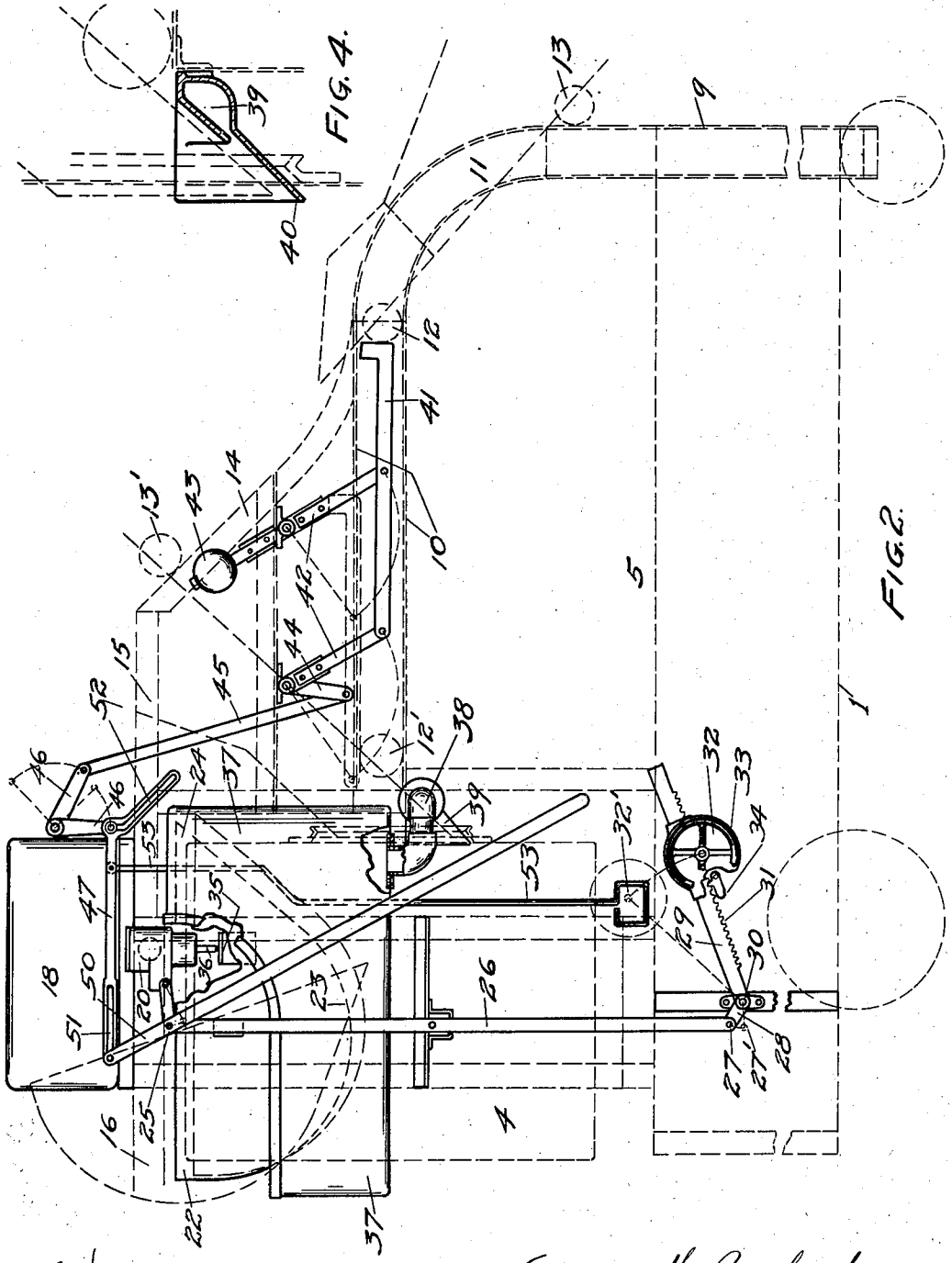
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4 SHEETS—SHEET 2.



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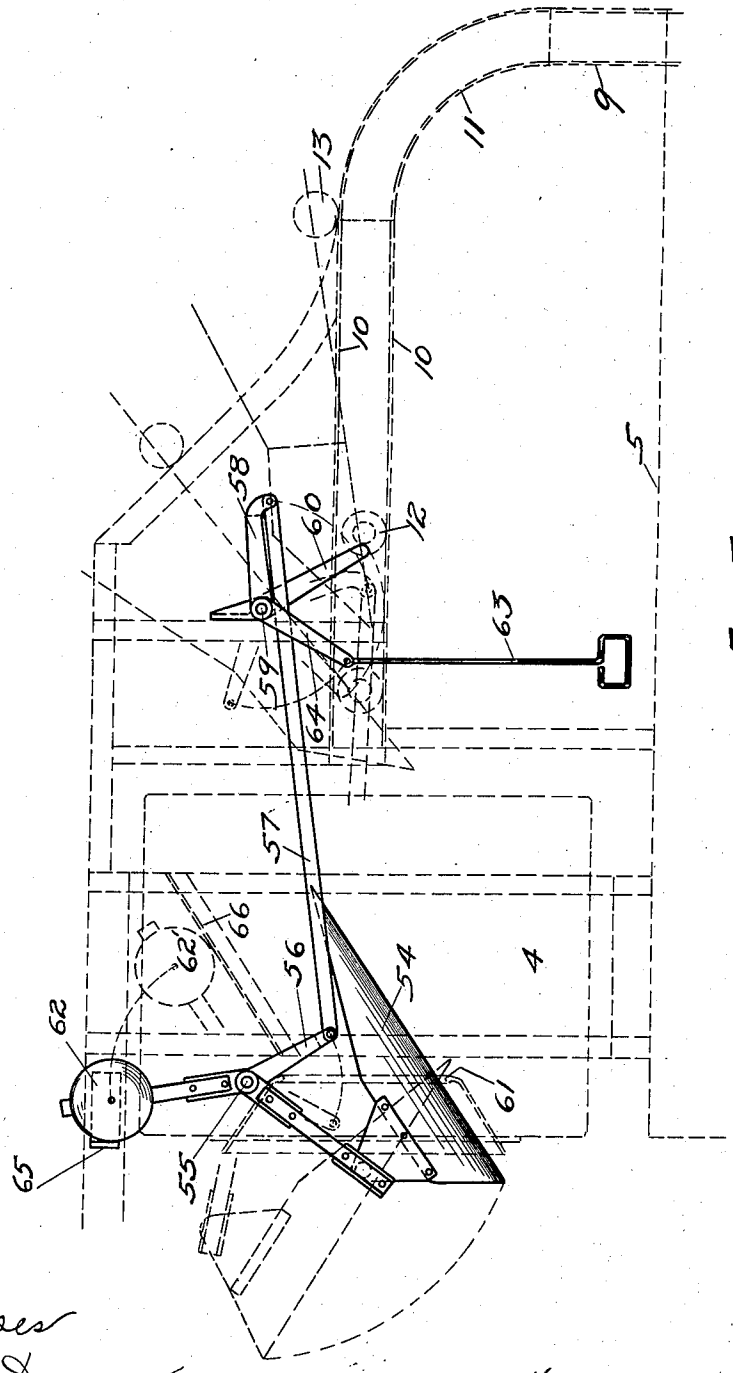


FIG. 3.

Witnesses
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4 SHEETS—SHEET 4.

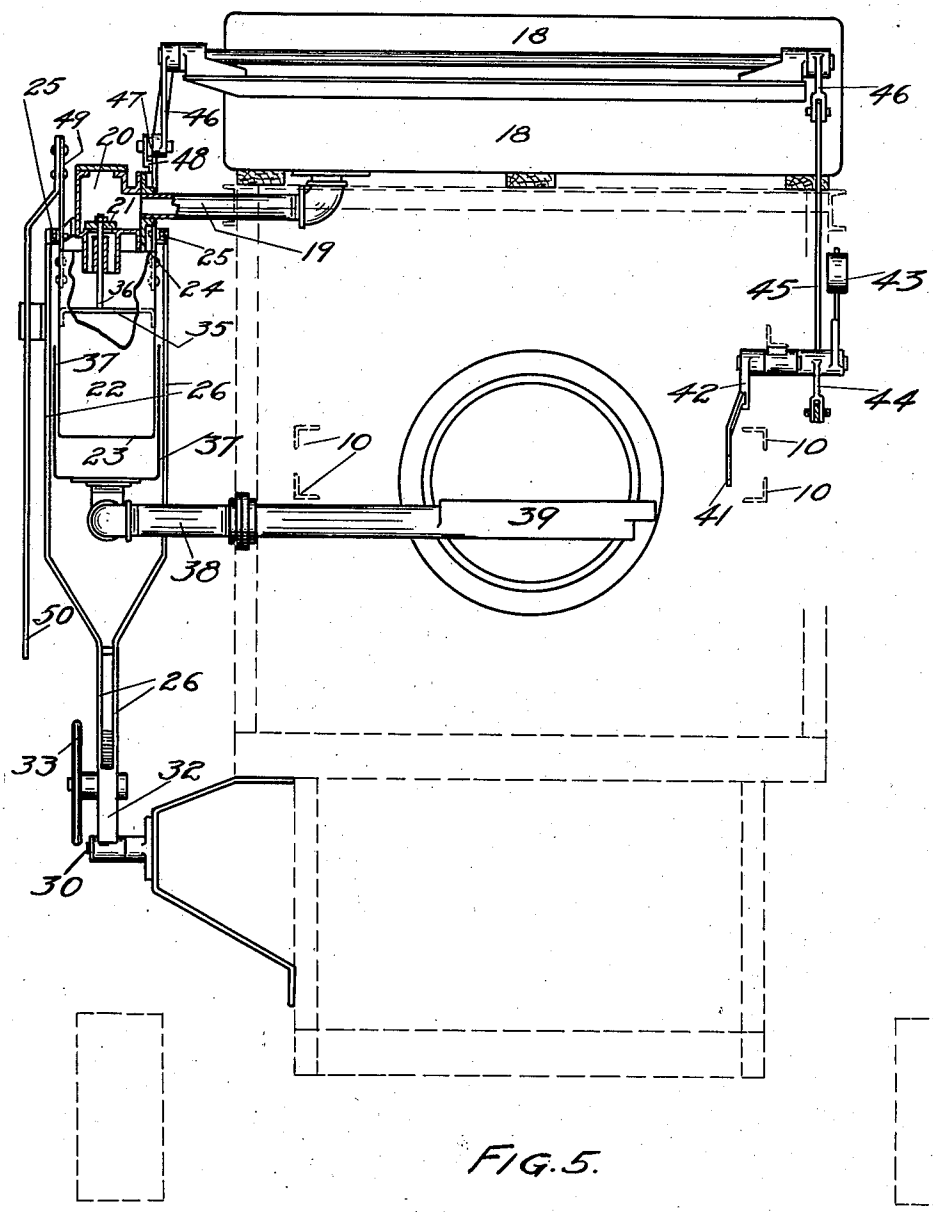


FIG. 5.

Witnesses
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Atty.

UNITED STATES PATENT OFFICE.

EDWARD W. BRACKENBURY, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE T. L. SMITH COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

CONCRETE-MIXER.

1,335,934. Specification of Letters Patent. Patented Apr. 6, 1920.

Application filed January 20, 1916. Serial No. 73,144.

To all whom it may concern:

Be it known that I, EDWARD W. BRACKENBURY, a subject of the King of England, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in or Relating to Concrete-Mixers, of which the following is a specification.

This invention relates to concrete mixers of the kind that are especially adapted to road paving, although of course the machine may be used for other kinds of work, and is primarily concerned with devices for facilitating the rapidity of the work having due regard for the quality thereof.

In the accompanying drawings, which form part of this specification, Figure 1 is a side elevation of the machine. Fig. 2 is a side elevation of the water serving devices. Fig. 3 is a side elevation of the discharge spout operating device. Fig. 4 shows a cross section through the water charging spout taken on the longitudinal and vertical central plane of machine, and Fig. 5 is a rear elevation of the water serving devices.

The same reference numerals refer to the same parts wherever shown in the different figures of illustration.

The main essentials of a concrete paving mixer are that the machine must be portable and provided with a distributing apparatus. To render the machine portable it must be mounted on wheels, the entire machine being self contained on a single truck. The distributing device must be capable of delivering the concrete as fast as it is mixed over a width of roadway from 20 to 40 feet wide. For this purpose I prefer to use a swiveled chute as the most expeditious and efficient as it distributes the concrete by means of the force of gravity only, without the aid of any power driven machinery. As concrete that does not contain any excess of water will not flow down a spout that is inclined to the horizontal at less than an angle of twenty degrees, I place the mixing drum in the machine with its center line at least nine feet above the ground in order to obtain a twenty degree angle of inclination on a sixteen foot spout.

With the mixing drum nine feet above the ground it becomes practically essential to provide a positive and automatic water feed as no personal inspection of the condition of the mixture in the drum can be made without difficulty and loss of time. Furthermore, in road paving excess of water is very detrimental as such excess flows into the ground underlying the concrete carrying with it a large part of the cement and thereby wasting it.

In Fig. 1, which shows the general arrangement of the machine, the main longitudinal beams of the truck frame are marked 1. The engine 2 and the boiler 3 are supported on these beams. The mixing drum 4, instead of being supported on the main frame 1 as heretofore, is now carried on an upper frame 5 and all the driving machinery, such as the clutches for operating the skip 6 and the traction wheels 7 is contained in the space 8 between the drum and the traction wheels. This machinery space 8 and also the part in which the engine is located is housed completely in sheet metal, thus strengthening the frame, protecting the machinery from dirt and still affording ready access to all parts through ample doors provided in the housing.

The tracks on which loading skip 6 travels also form an element of strength in the frame. Each track is formed of two vertical angles 9, 9, and two horizontal angles 10, 10, all connected together by the curved channel 11. The nose wheels 12 of the skip travel between the angles 9 and 10 and inside of the channel 11 while the body wheels 13 of the skip travel outside of the angle 9 and channel 11 while the skip is in vertical and horizontal position respectively. An inclined track 14 extends upward from the junction of angle 10 and channel 11 to the topmost level of the frame consisting of angle 15 and channel 16. The skip 6 is tilted to discharge into the drum 4, taking the inclined position shown in dotted lines in Fig. 1, on account of the body wheels 13 traveling up the inclined track 14, to the dotted position shown at 13′ while the nose wheels have traveled between the angles 10, to the position marked 12′.

The smoke pipe of the boiler is carried laterally from the smoke box 17 to the side of the machine in order to avoid the skip.

By this arrangement of the loading skip it extends entirely across the front end of the

machine unrestricted in width and in the larger machines is of such width that three barrows of stone or sand are wheeled into it and dumped simultaneously thus greatly facilitating the speed of loading.

In the embodiment of my invention here illustrated, the water supply is carried in a storage tank 18 at the top of the machine, supported on the angles 15 and channels 16. This tank has sufficient capacity for many batches of concrete and is filled by means of a hose as occasion requires. Water flows from tank 18 through pipe 19 into the valve chamber 20 which is supported on the machine frame. Through the valve 21 the water flows into the measuring tank 22 which has the semi-cylindrical bottom 23 and the discharge lip or spout 24. This tank is pivotally carried by the pin 25 which extends through both arms of the fork 26, which fork is pivoted by the pin 27 to the short arm 28 of the bent lever 29. This lever 29 is pivotally supported on the frame of the machine by the pivot pin 30, and the tank 22 is therefore ultimately supported by the pivot 30. Lever 29 is provided with rack teeth 31 and a slidable weight 32 movable along the lever by means of a pinion internal of the weight, engaging the rack teeth 31 and operated by the hand wheel 33. The pawl 34 also engages the rack 31, serving to hold the weight in any adjusted position, and this pawl may be sealed in place by the inspector in charge of the work thus taking the regulation of the water supply out of the hands of the operator.

When the tank 22 is empty, weight 32 swings lever 29 downward thus raising the tank 22. A cross bar 35 in the tank engages the valve stem 36, raising the valve 21 automatically, thus allowing the water to flow into the tank 22. When the quantity of water, for which the weight 32 has been set, has passed into the tank 22, it sinks by its weight, raising the lever 29, allows the valve 21 to close, and thus automatically measures the water in the tank 22 by weight according to the adjustment of weight 32. Tank 22 remains in its lower position, shown in dotted lines in Fig. 2, with the weight 32 elevated to the position 32′ and pivot pin 27 depressed to position 27′, until the tank is discharged by tilting on the pivot 25.

As the tank 22 is tilted and discharged the water flows into surrounding stationary tank 37 from which it flows through pipe 38 and water spout 39 into the drum 4. This water spout 39 has its discharge lip 40 located in the lower curve of the feed opening in the drum just below the discharge lip of the nose of the loading skip 6 when the latter is in its dotted discharging position shown in Figs. 1, 2, and 4. The tilting of the tank 22 is accomplished by the travel of the loading skip 6 into its discharging position and is so timed that the flow of water and dry material into the drum is simultaneous and the two streams commingle efficiently in falling from the feed opening to the bottom of the drum. This feed action insures the water being already well distributed through the mass of dry material when the mixing action begins which greatly facilitates the mixing action.

The discharge of tank 22 is accomplished as follows: The nose wheel 12 of the skip, as it is starting on its horizontal excursion between the angles 10, encounters the tappet bar 41. This bar is suspended on two links 42 pivotally supported on the frame. One link carries the counterweight 43 while the other is attached to the lever 44. Link 45 connects lever 44 to the bell crank lever 46 which in turn is connected by the link 47 to the lever 48 which is connected to the inside of tank 22 and is on the right hand side as shown in Fig. 5. A counterpart of lever 48 is attached to tank 22 on the left hand side thereof as shown in Fig. 5, and marked 49. This tank lever 49 is rigidly connected to the handle lever 50, and as 50, 49 and 48 are all in line with each other, only the lever 50 shows on Fig. 2. As the tappet bar 41 is engaged by the wheel 12 on the skip and is swung toward the drum into the dotted position shown in Fig. 2, the train of links and leevrs from 42 to 48 is operated to swing or tilt the tank 22 to discharge it.

As the links 42 swing, they raise the tappet bar 41 into the dotted position shown, and the wheel 12 continues its travel under the bar 41 until it reaches the position marked 12′. During this time, the water is flowing from tank 22 toward and through the water spout 39 so that as the discharge of dry material starts from the skip into the drum, it falls into and commingles with the water supply before either of them reach the bottom of the drum.

Link 47 is slotted at 51 so that handle lever 50 may be operated to discharge the tank by hand without operating the skip should such operation be thought desirable. Link 47 also is provided with the inclined slot 52 so that the link 47 may be raised by the handle 53, and the skip may be operated without operating the tank should it ever be desirable to do so. Either one or both of these slots may be closed by bolts when it is desirable to seal the weight 32 and take the water supply entirely out of the hands of the operator.

Fig. 3 shows the discharge spout operating mechanism. The discharge spout 54 is pivotally supported at the points 55 outside of and on each side of the drum 4 which is shown in dotted lines. The lever arm 56 is rigidly connected with the spout at its pivot point and is pivotally connected

with the link 57 which in turn is pivotally connected with the rigid lever arm 58 on the pivot pin or shaft 59. The arm 60 is also rigid with the shaft 59 and is engaged by the nose wheel 12 of the skip while said wheel is traveling toward the drum 4 in the tracks 10. The discharge spout is shown in full lines in its operative position in the drum 4 and the engagement of the skip wheel with the arm 60 occurs at about the time the skip commences to tilt upward to discharge. As the skip travels toward the drum and tilts, the discharge spout is swung out of the drum into its inoperative position shown in dotted lines with its tip just within the discharge opening 61 of the drum. During this swinging of the discharge spout, its counterweight 62 is swung into the position 62′ and holds the spout in its inoperative position. By this means the discharge spout is left in operative position discharging the drum until the instant the new charge is about to enter, when it is automatically moved to inoperative position. This prevents the spout being left in the drum and beginning the discharge of the new batch before it is properly mixed as is sometimes done by unscrupulous operators to improve their record for speed regardless of quality. The spout is again swung into operative position by the depending handle 63 connected to the lever 64 of the shaft 59. Stop 65 prevents the spout being swung too far into the drum, and stop 66 prevents it being swung too far out of the drum. The discharge spout cannot be swung into the drum until the skip has begun its downward travel and consequently it cannot be swung in until the skip is on the ground, as during the descent of the skip its movement must be continually controlled by the brake lever.

In the operation of the machine, as soon as the skip is loaded, the operator pulls down the handle 63 starting the discharge of the previous batch. He then hoists the skip and as soon as it is discharged lowers it again to the ground.

Having now ascertained one form and the operation of my invention, what I claim is—

1. In a concrete mixer, a rotary mixing drum, a movable charging device, a discharge spout, and means operated by contact with and movement of the charging device for moving the discharge spout to an inoperative position as the charging device moves to a position for introducing a new charge to the drum.

2. In a concrete mixer, a rotatable mixing drum, a discharge spout for said drum movable into operative and inoperative positions, a movable charging device, and means for moving the discharge spout to an inoperative position operated by contact with the charging device as it approaches its position for charging the drum.

3. In a concrete mixer, a rotary mixing drum, a charging device having a discharge lip and a water supplying device, means for causing a commingling of streams of water and dry materials during their introduction to the drum comprising a stationary water chute projecting into the drum and connected to the water supply device, said water chute being located adjacent to and underlying the discharge lip of said charging device when the same is in charging position, and means for automatically starting the flow of water through said chute as the charging device introduces its charge to the drum.

4. In a concrete mixer, a rotatable mixing drum having a feed opening in one end thereof and a discharge opening in the other end, a charging device adapted to deliver a stream of dry materials to the drum through the feed opening, a water supply spout projecting into said feed opening adjacent to its lower edge, a water measuring device adapted and arranged to discharge a measured quantity of water to said water supply spout, and means for discharging said measuring device operated by said charging device whereby the streams of water and dry materials will commingle within the mixing drum as they are introduced thereto.

5. In a concrete mixer, a rotatable mixing drum, a charging device for delivering a stream of dry materials to the drum, a pivotally mounted water tank, means for automatically measuring the water in said tank, means operated by the charging device for tilting said tank to discharge the water therefrom, and a conduit adapted to conduct the water from said tank into said drum and discharge the water in a stream beneath and commingling with the stream of dry materials.

6. In a concrete mixer, a rotary mixing drum, a charging device having a discharge lip, a water supplying device, means for introducing the water from the water supplying device to said drum immediately below the discharge lip of said charging device when the same is in charging position, and means automatically starting the flow of water into said drum at the same time as and in a mingling stream with the dry materials from said charging device.

7. In a concrete mixer, a rotary drum having a feed opening in one end thereof and a discharge opening in the other end, a charging device movable toward the feed opening, a discharge spout suitably mounted at the discharge opening, manually operated means for moving the discharge spout to its operative position, and means engaged by the charging means on its approach to the feed opening for moving the discharge spout to its inoperative position and to prevent the

return of the discharge spout to its operative position while the charging device is in position for charging the drum.

8. In a concrete mixer, a rotary mixing drum having a feed opening at one end thereof and a discharge opening at the other end, a charging device movable toward the feed opening, a pivotally mounted discharge spout passing through the said discharge opening, a lever connected with the discharge spout and positioned in the path of the charging device and adapted to be swung by the charging device as it approaches the feed opening, and manually operated means for swinging the lever when it is not engaged by the charging device.

In testimony whereof I have affixed my signature in the presence of two witnesses.

EDWARD W. BRACKENBURY.

Witnesses:

ARNOLD REUSS,

LLOYD DRAEGER.