C. E. BATHRICK.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

APPLICATION FILED MAY 20, 1909.

1,013,109

Patented Jan. 2, 1912.

4 SHEETS—SHEET 1.

Fig. 2

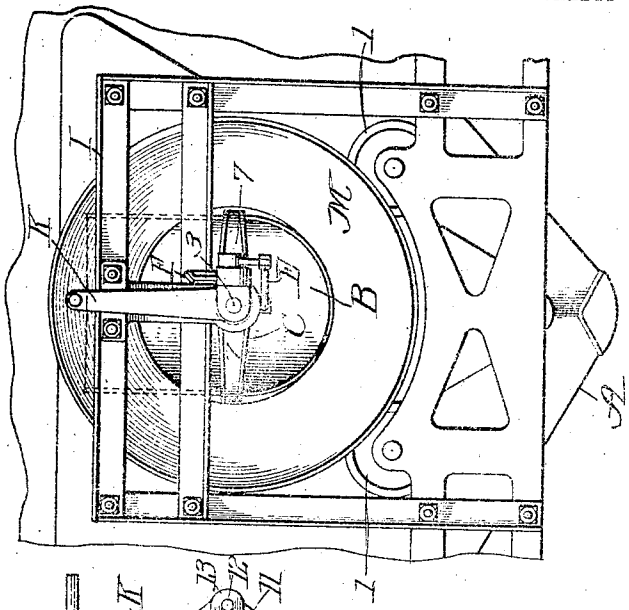
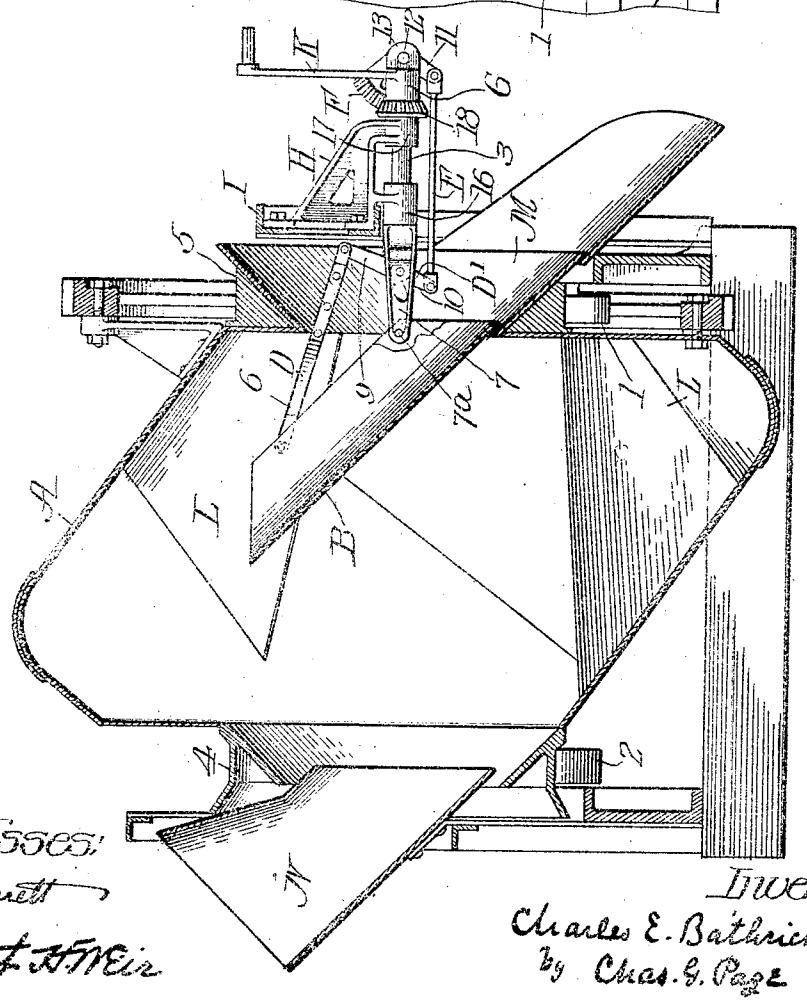


Fig. 1



Witnesses:

A. Barrett

Robert H. Weir

Inventor:

Charles E. Bathrick

by Chas. G. Page Atty.

C. E. BATHRICK.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

APPLICATION FILED MAY 20, 1909.

1,013,109.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 2.

Fig. 4

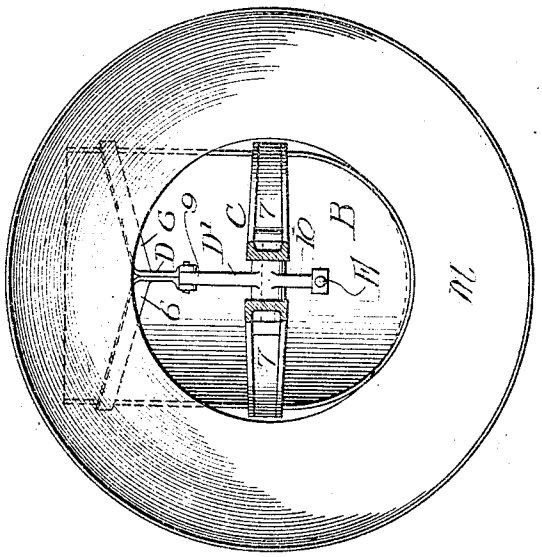
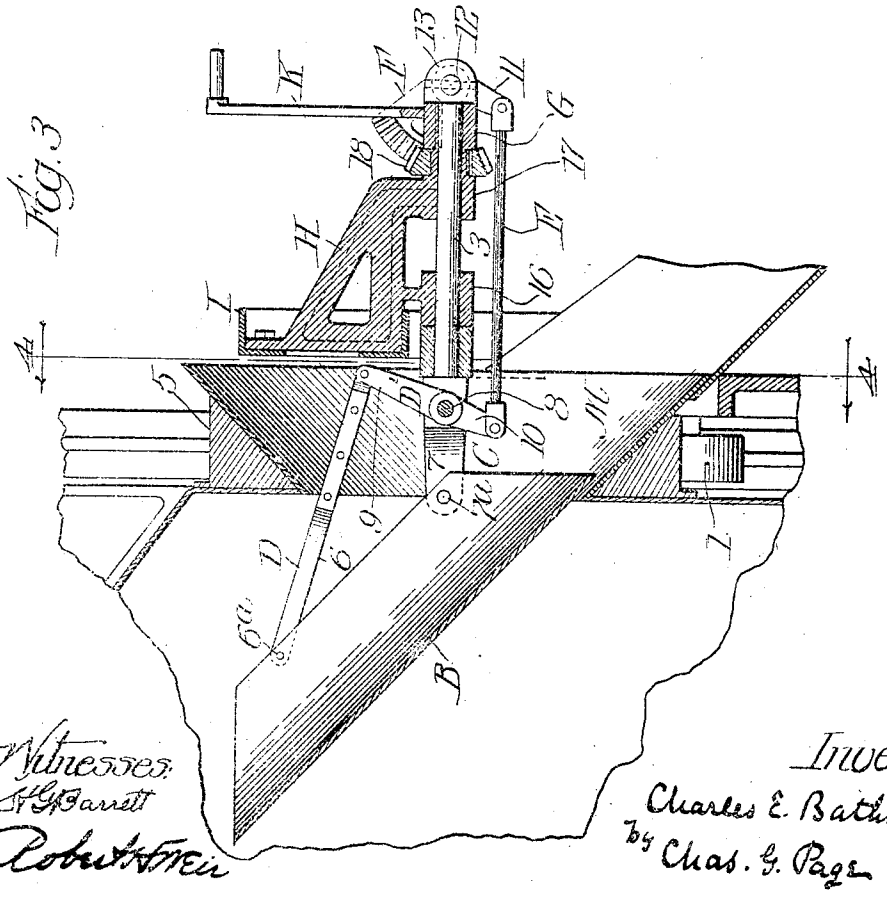


Fig. 3



Witnesses:
H. G. Barrett
Robert Weir

Inventor:
Charles E. Bathrick
by Chas. G. Page Atty.

C. E. BATHRICK.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

APPLICATION FILED MAY 20, 1909.

1,013,109.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 3.

Fig. 6

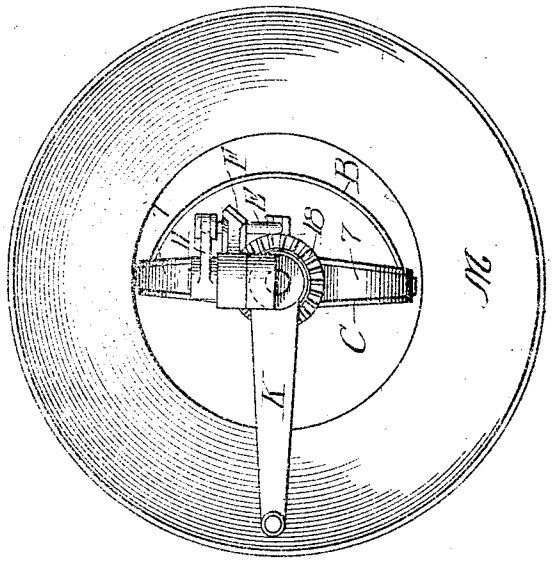
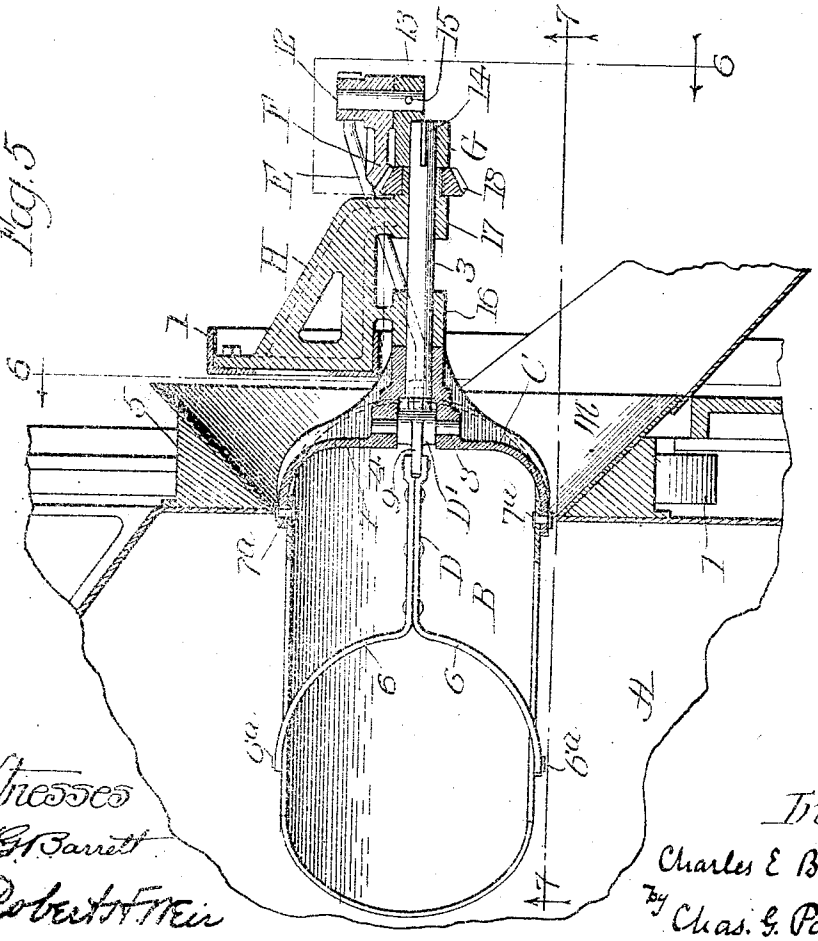


Fig. 5



Witnesses

H. G. Barrett

Robert F. Weir

Inventor:

Charles E. Bathrick

by Chas. G. Page Atty.

C. E. BATHRICK.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

APPLICATION FILED MAY 26, 1909.

1,013,109.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 4.

Fig. 8

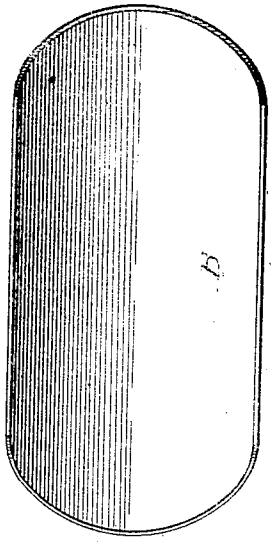


Fig. 9

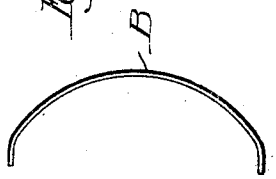
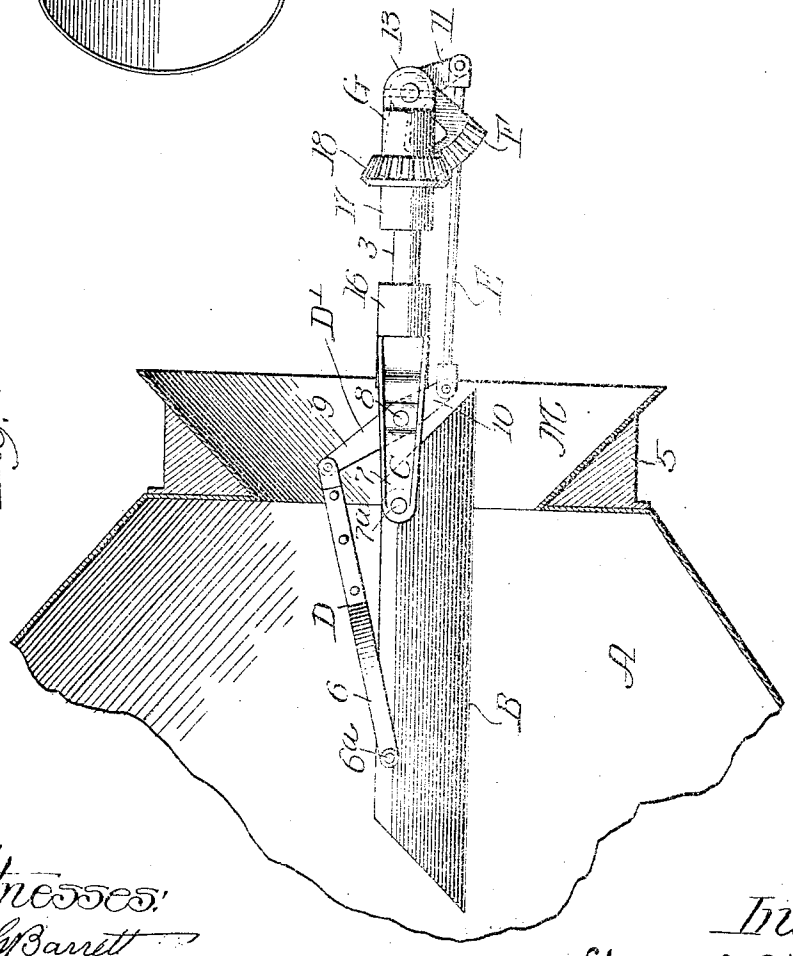


Fig. 7



Witnesses:
H. G. Barrett
Robert A. Meir

Inventor:
Charles E. Bathrick
by Chas. G. Page
Atty.

UNITED STATES PATENT OFFICE.

CHARLES E. BATHRICK, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK C. AUSTIN, OF CHICAGO, ILLINOIS.

MACHINE FOR MIXING CONCRETE AND THE LIKE.

1,013,109. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed May 20, 1909. Serial No. 497,149.

To all whom it may concern:

Be it known that I, CHARLES E. BATHRICK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Mixing Concrete and the Like, of which the following is a specification.

My invention relates to mixing machines or mixers involving a rotary mixing drum or drum-like mixing receptacle provided with an end discharge opening concentric or substantially concentric with the axis of rotation of the mixing drum, the mixed material, such as concrete, being discharged from the revolving mixing drum by a chute extending therein, and the drum being provided with internally arranged means for elevating the material therein and directing or discharging it from a suitably elevated point or points into the portion of the chute which is in the mixing chamber.

In my application serially numbered 454,665, and filed September 24, 1908, I have provided at what may be farther away from the sides of the chamber and thus termed the delivery end of the mixing drum, a rotary chute support arranged for rotative action about an axis which is longitudinal as to the drum and desirably coincident or substantially coincident with the axis of rotation of the mixing drum, and to this rotary chute support I have attached a chute which is held oblique to the axis of rotation of its rotary support, the result being that the support can be turned to bring the chute right side up and in a downwardly and outwardly inclined position, so as to receive material carried up and dropped within the drum and discharge the same by way of the discharging opening of the drum. With such construction, the chute can be shifted or moved out of said active position and moved into an inactive position by giving to the chute support a partial turn about its axis, a quarter turn thereof serving to laterally turn the chute about the axis of rotation of the drum to an extent to place the chute horizontally oblique to such axis and therefore in diagonal position within the drum chamber, the chute in such position being edge up, that is to say—having one longitudinal edge portion above the other longitudinal edge portion.

The objects of the present invention are to avoid the diagonal disposition of the chute when it is in an inactive position and to cause it when in such inactive position to extend longitudinally along the central zone or portion of the mixing drum chamber so as to be more out of the way of falling material, and to secure greater clearance between the chute and side walls of the drum when the chute is in such inactive position. To the attainment of these ends I support the chute for combined laterally rotative and end tilting motion, whereby the chute can be laterally turned to place it right side up for receiving material, and in alternation therewith laterally turned from such position toward an inverted condition so as to place it in an inactive position, and also whereby the chute can be tilted so as to cause it to incline downwardly and outwardly when right side up, and in alternation therewith, tilted so as to place it parallel or substantially parallel with the axis of rotation of the drum or the rotary support to which it is hinged.

In the accompanying drawings: Figure 1 is a longitudinal central section on a vertical plane through the mixing machine or mixer, as it is hereinafter termed, the section being taken so as to show in side elevation the main portions of the means employed for turning and tilting the collecting and discharging trough-like chute, the latter being in longitudinal section with the exception that a portion of its near side at one end is left in elevation so as to show the near fork arm pivoted thereto. Fig. 2 is a front end elevation of the mixer with its members in the position shown in Fig. 1. Fig. 3 is a longitudinal central section on a vertical plane through a portion of the mixer, the plane being taken through the chute operating means shown in side elevation in Fig. 1. Fig. 4 is a section on line 4—4 in Fig. 3. Fig. 5 is a section similar to that shown in Fig. 3, except that the chute is shown in inoperative position. Fig. 6 is a section on line 6—6 in Fig. 5. Fig. 7 is a section on line 7—7 in Fig. 5. Fig. 8

is a top plan view of the chute. Fig. 9 is a section taken transversely through the chute on a line between its ends.

A indicates a rotary mixing drum or receptacle supported upon anti-friction rolls 1 and 2, understood to be arranged in pairs respectively at opposite ends of the drum which is provided with any suitable or desired construction of end bearings 4 and 5 arranged to engage upon these anti-friction supporting rolls. The mixing drum shown is of the cube type having receiving and discharge openings respectively at diagonally opposite corners, it being understood however that I do not confine my invention to this particular type of mixing drum or receptacle, and that I may employ any other known or suitable type consistent with my improvements in means for discharging at will, all or a portion of the contents of a non-tilting rotary mixing drum during its rotation.

The rotary mixing receptacle is internally provided with means for taking and carrying up mixed material to a point suitable for dropping the material upon a trough-like chute B when such chute is in position for receiving and discharging. This chute is arranged within the mixing drum and supported for combined end tilting and side or lateral turning or rotary action, thereby being capable of a compound action permitting it to be moved from an active to an inactive position, and conversely for permitting a reversal of such movement. To such end the chute is hinged to a rotary support which permits end tilt on the part of the chute, whereby the latter can be moved into receiving and discharging position, as shown in the first four figures, and which also permits the chute to be moved into an inactive position, as shown in Figs. 5, 6 and 7. When the chute is in an active position, it inclines downwardly and forwardly and is right side up so as to receive material which is carried up and dropped within the mixing chamber, and to then discharge such collected material downwardly to and out through the discharge opening of the rotary mixing drum. As a means for thus hinging the chute, a rotary shaft or axle 3 (see particularly Fig. 3) is provided with a forked end C which straddles the outer end portion of the chute, the opposite sides of this portion of the chute being respectively pivoted to one and the other of the two arms of the forked or yoke-shaped member C which is rigid with and which therefore practically forms an end portion of the axle 3. The rotary shaft or axle 3 is arranged to revolve about an axis which broadly considered is a longitudinal axis relative to the rotary mixing drum and which is preferably coincident or substantially coincident with the axis about which the drum revolves, the desirability of this feature being hereinafter more particularly explained. Broadly considered therefore, the chute is for the purpose of end tilt pivoted or hinged to a rotary support arranged to revolve about an axis coincident with a line extending longitudinally through the drum and preferably coincident or substantially coincident with the axis about which the drum revolves.

As a means for tilting the chute, D indicates a chute tilting member pivotally attached at its inner end portion to the chute and having its outer end portion attached to a vibratory member D'. The member D has its inner end portion formed as a yoke or bail, the arm portions 6 of which straddle the chute and are pivoted to the sides of the latter as at 6^a, 6^a. These pivotal connections 6^a, 6^a, are toward the rear or inner end of the chute, and the pivotal connections 7^a, 7^a, between the arms 7, of the fork C and the chute are toward the forward or outer end of the latter. When the chute is in active position, as in Figs. 1 and 3, it is maintained in inclined position by the member D. As a means for controlling this chute tilting member D, the vibratory member D' extends through the rotary fork C and is attached thereto by a transverse pivot 8, having its end portions forming journals which are suitably mounted in the rotary chute supporting member C, as best shown in Fig. 5. The vibratory member D' is formed with arms 9 and 10 respectively extending in opposite directions from the axis of the pivot 8. The outer end of the chute tilting member D is pivoted to the arm 9 of the vibratory member or lever D', and to the other arm 10 of said vibratory member or lever is pivotally attached the inner end of a connecting rod E. The outer end of this connecting rod E is pivoted to an arm 11 on or forming part of a vibratory rack or gear segment F. This vibratory rack or gear segment F is attached by a pivot 12 (see Fig. 5) to an end portion 13 of a hub or sleeve G which is in turn secured to the outer end portion of the rotary shaft or axle 3, its securement thereto being for example attained by means of any suitable key or spline 14. The axis of pivot 12 is at right angles to the axis of the axle 3, and said pivot 12 is secured to the sleeve or hub portion 13 in any suitable way, for example, by pin 15. The bearings 16 and 17 for the axle 3, are conveniently provided by a bracket H secured to a stationary frame portion I outside of and opposite the discharge end of the mixing drum, and the bearing 17 thus referred to is provided with a bevel gear 18, which is keyed or splined on said bearing so as to remain stationary. The rack or gear F engages the bevel gear 18, and the outer end portion forming the major length of rod E is oblique relatively

to the axis of axle 3, so that its outer end may conveniently engage arm 11 of the member which forms the oscillatory rack or gear F. The axle 3 is capable of reversible rotative action and is provided with a handle K which is rigid with the sleeve or hub G on said axle.

In Figs. 1 and 3 in which the chute is in active position, that is to say—in position for receiving and discharging, the gear segment F is shown in a vertical plane opposite the "far side" of the hub C, and when thus positioned, the arm 11 depends from the gear segment or rack device. In said Figs. 1 and 3 (as well as in Fig. 2), the handle K is shown extending upwardly from the sleeve or hub G which is in turn secured upon the axle 3. While the handle K is held in such position, the connecting power transmitting means between the handle and the chute will remain stationary, the lower end portion of the chute being sustained and held by the revoluble support C, and its desired inclination being secured by the reciprocative member or pitman D. When the chute is thus held in active position, the material which is to be discharged from the revolving mixing drum, and which is carried up and dropped by any suitable means, for example, by blades L arranged within the mixing drum, falls into the chute which in turn discharges the material thus received by it.

When it is desired to arrest the discharge and to place the chute in an inactive position either prior to the discharge of the entire contents of the drum or after the drum has been emptied so as to prevent discharge while materials are being mixed within the drum, the chute can be shifted from the active position shown in Figs. 1, 2, 3 and 4, to the inactive position shown in Figs. 5, 6 and 7, by giving the handle K a quarter turn in direction to bring it from the position shown in Fig. 2 to the position shown in Fig. 6. This action of the handle causes a like partial revolution of the axle 3, the rotary chute supporting member C thereon, and the sleeve or hub G which is also secured to axle 3 and which carries the pivoted rack or gear device F, and as said members are thus turned about an axis coincident with the axis of the axle or spindle 3, the connecting rod F, the vibratory member D′ and the pitman D will also be caused to make as a whole a partial revolution about the said axis. This partial revolution of the chute operating means about an axis coincident or substantially coincident with the axis of rotation of the drum, serves to laterally turn the chute so as to bring it edge up, that is to say—to partially invert it so as to bring one of its longitudinal edges uppermost, as in Figs. 5 and 6, and during such turning action, the pitman D moves inwardly so as to tilt downwardly the previously raised inner end portion of the chute and bring the chute into a horizontal or substantially horizontal position, as best shown in Fig. 7. This inward thrust on the part of pitman D is effected by the action of member D′ about the axis of pivot 8 by which it is attached to the rotary member C, the said action of member D′ being caused by the gear F which being pivoted on hub G and engaging the stationary gear 18 will turn about the axis of its pivot 12 as the hub G turns about the axis of spindle 3, and thereby cause arm 11 of the gear or rack F to swing in direction to draw the rod E outwardly and turn the member D′ in direction to thrust the pitman D inwardly. When therefore the handle K is turned as hereinbefore mentioned, the chute will be given a compound motion consisting of a combined tilting and laterally rotative action. As shown in Figs. 5 and 6, the chute when brought into an inactive position is parallel with the axis of rotation of the drum and arranged to extend substantially along the longitudinal central portion of the drum space or chamber, and hence, it is suitably remote from the side walls of the drum and any blades or the like which may be upon such walls. In other words, the chute may be said to be in a substantially longitudinal middle position when in an inactive position. A reversal of the said movement of the lever or handle K will effect the converse of the foregoing described action of the chute operating means so as to move the chute from its inactive position shown in Figs. 5, 6 and 7, to its active position shown in Figs. 1, 2 and 3. It is obvious however that the chute operating means could be turned to cause a complete inversion of the chute, or a further inversion than shown in Fig. 6, for example, to determine its inactive position, it being observed however that when the chute is edge up as or substantially as in Figs. 5 and 6, it will effectively shed off material carried up within the drum and dropping downwardly therein.

It is desirable that the discharge end of the chute should extend through or within the opening herein termed the discharge opening of the mixing drum or receptacle, this opening being herein shown bushed by an outwardly flaring mouth piece M, and by arranging the chute supporting and operating means to revolve about or substantially about the axis of rotation of the drum, said axis being extended centrally through the circular discharge opening, the outer end of the chute extending within such discharge opening will move in the arc of a circle concentric with the transverse outline of the discharge opening or passage when the chute is shifted from an active to an in-

active position, and also when subjected to the reverse of such movement.

With further reference to the details, the chute being hinged to the rotary supporting member C by pivotal connections 7^a, is adapted to tilt about a transverse axis extending through such pivots or pivotal connections 7^a, so that when the member C is turned about an axis coincident or substantially coincident with the axis of rotation of the mixing drum, the transverse axis upon which the chute is arranged to tilt is synchronously turned or revolved about the axis of rotation of the mixing drum, and during such action the chute is tilted by means which also permits it to revolve about a tilting axis extending from end to end of the chute. The mixing drum is shown provided with a feed opening and a feed spout N, and these may be made without reference to the chute which can be and preferably is entirely supported at the discharge end of the drum, and in this way the rear or inner end of the chute is free for swing and tilt within the mixing chamber.

It is understood that the gear device for operating the chute tilting member or pitman D is relatively timed to cause the chute to tilt from the position shown in Figs. 1 and 3, to the position shown in Figs. 5, 6 and 7, when the handle K is given a quarter turn, as hereinbefore described, and that if it is desired to augment the extent of lateral turn or rotative action, in order to bring it from an active into an inactive position, and the converse thereof, the gear device should be timed accordingly.

What I claim as my invention is:

1. A rotary mixing drum provided with an end discharge opening; a chute for receiving material within the mixing drum and for discharging such material therefrom by way of the end discharge opening or passage; means for elevating material within the mixing drum and discharging the same into the chute; a rotary device for laterally turning the chute into and out of receiving position, the chute being hinged to said turning device for end tilt in direction and to an extent to incline the chute downwardly and outwardly when it is turned into receiving position, and conversely to swing the chute toward a position parallel with its axis coincident with the axis of the turning device when the chute is turned by said turning device into an inactive position.

2. The combination with a rotary mixing drum, having an axial opening in one end, a discharge chute extending within said opening, a rotary member whereon said chute is pivoted and means for tilting said chute into and out of operative position as said member and chute are rotated, substantially as described.

3. A rotary mixing drum; a discharging chute extending within the rotary mixing drum; a rotary member to which the chute is hinged for end tilt, said member being rotative about an axis which is longitudinal as to the rotary drum; means for tilting the chute synchronously with its rotary action effected by rotation of the said rotary member to which it is hinged for end tilt; and means for raising material within the rotary drum and discharging the same into the chute when the latter is in active position.

4. A rotary mixing drum; a discharging chute extending within the rotary mixing drum; a rotary member for laterally turning the chute, the latter being hinged to said rotary member for independent end tilt; and power transmitting connection between the chute and said rotary member for tilting the chute synchronously with its lateral rotative action caused by rotative action on the part of its said turning member, and means for successively raising and downwardly discharging material within the rotary mixing drum.

5. A rotary mixing drum; a laterally rotative chute capable of end tilt and extending within the mixing drum; a rotary forked member to which the chute is hinged for end tilt; a pitman for tilting the chute, and a vibratory member pivoted to the pitman and also pivotally supported upon the forked member to which the chute is pivoted; means for vibrating the said member which is pivoted upon the forked member and attached to the pitman, and means for elevating and discharging material within the mixing drum.

6. A rotary mixing drum; a chute extending within the mixing drum and supported for laterally rotative and end tilting action; a rotary member to which the chute is hinged for end tilt, the chute being laterally turned by the rotative action of said member; a vibratory rack or gear pivotally connected with the rotative member; a fixed gear with which the vibratory rack or gear engages; and power transmitting connection between the vibratory rack or gear and the chute for tilting the latter.

7. A rotary mixing drum having an end discharge opening; means for raising and downwardly discharging material within the mixing drum; a rotary member consisting of a spindle provided at one end portion with a vibratory rack or gear and provided at its opposite end portion with a forked member to which the chute is hinged, a stationary gear engaged by the vibratory gear; a pitman for tilting the chute, a vibratory member for operating the pitman, said vibratory member being pivoted upon the rotary support to which the chute is hinged and a connecting rod between the vibratory member on said support and the vibratory rack or gear.

8. The combination with a rotary mixing drum having a discharge opening at one end, a discharge chute extending within said opening, a rotatable support having an axis substantially coincident with the axis of said drum, said chute being pivoted to said support to swing about an axis substantially at right angles with the coincident axis and said support and drum, and means for rotating said member and said chute and for tilting said chute, substantially as described

CHARLES E. BATHRICK.

Witnesses:
OTTILIE C. FREIBERG,
CATHERINE CRAVER.