

June 24, 1930.

S. SHAFER, JR

1,766,552

DISCHARGE CHUTE FOR CONCRETE MIXERS

Filed Feb. 11, 1929

3 Sheets-Sheet 1

Fig. 1

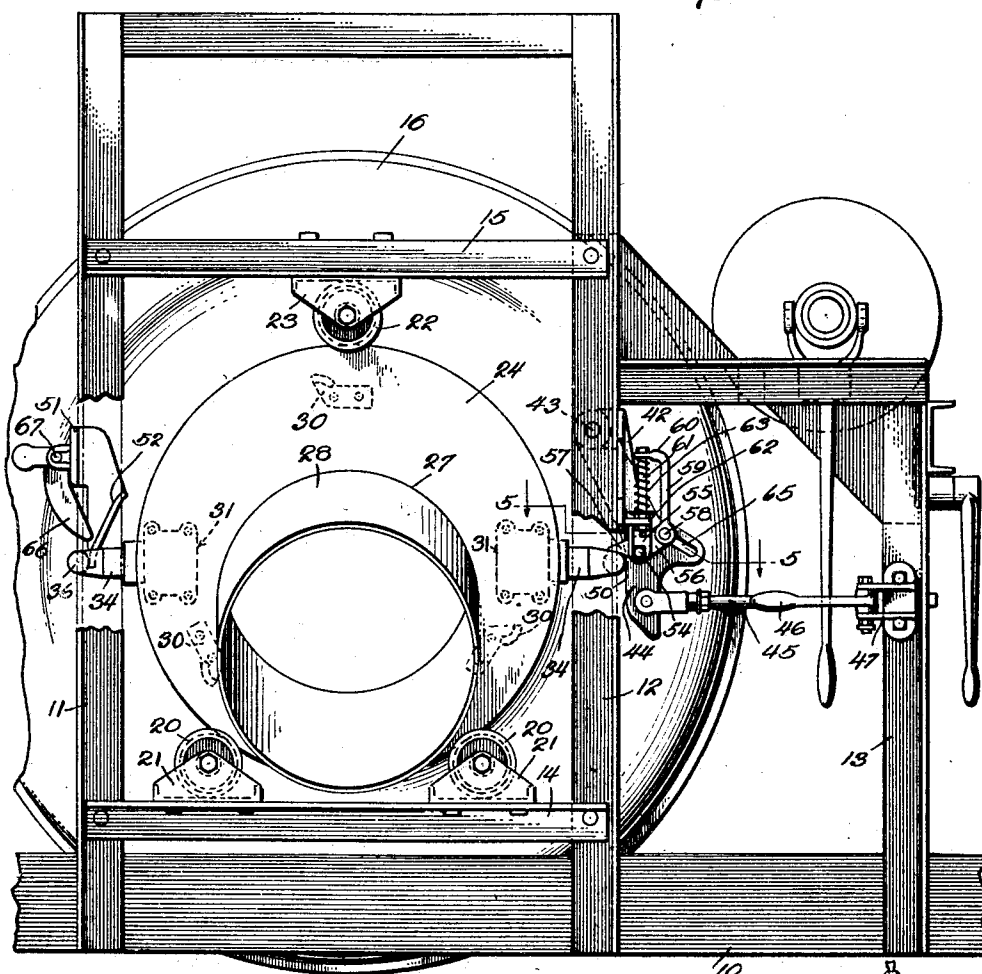
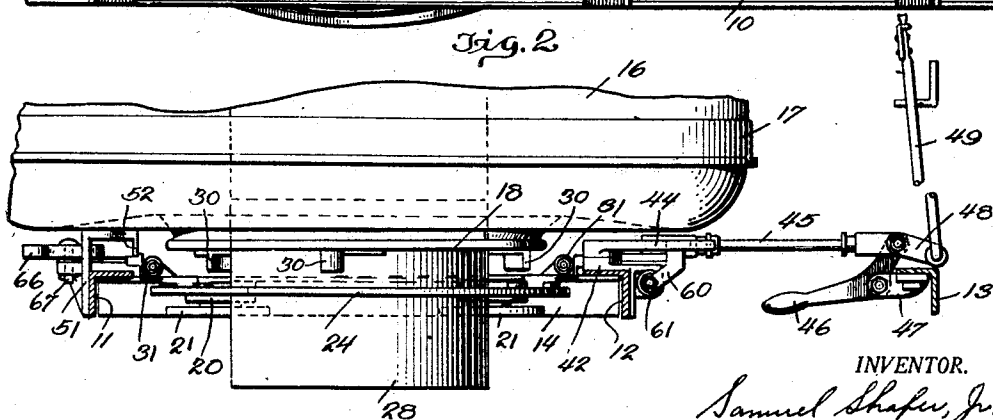


Fig. 2



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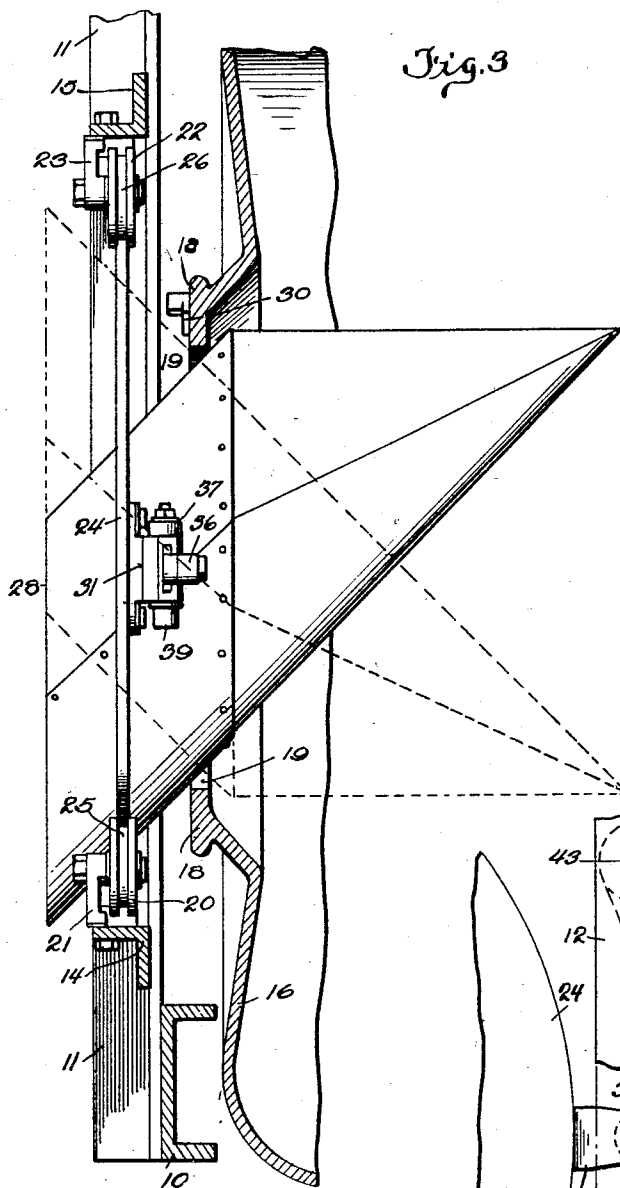


Fig. 3

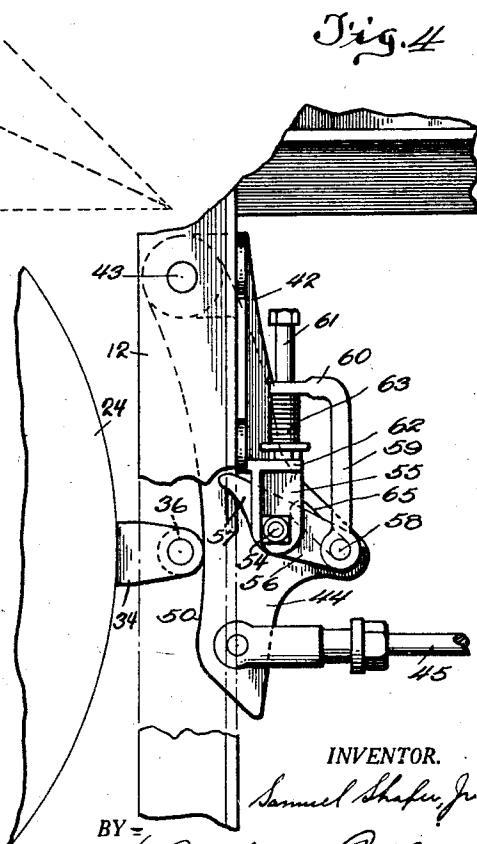


Fig. 4

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3 Sheets-Sheet 3

Fig. 7

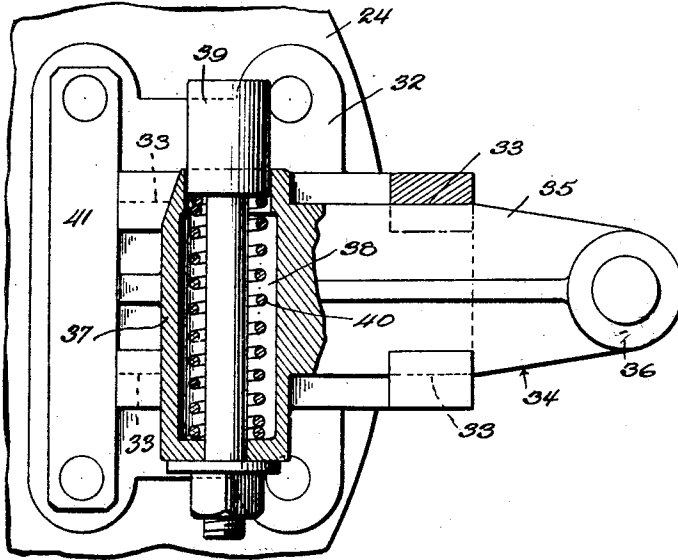


Fig. 8

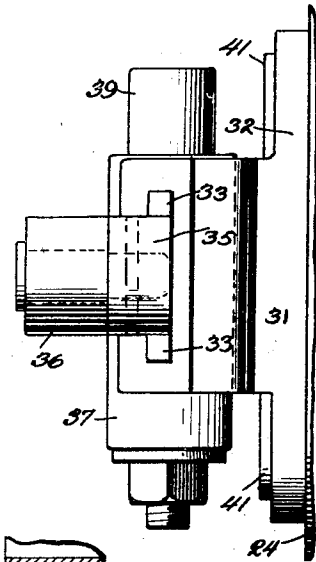


Fig. 9

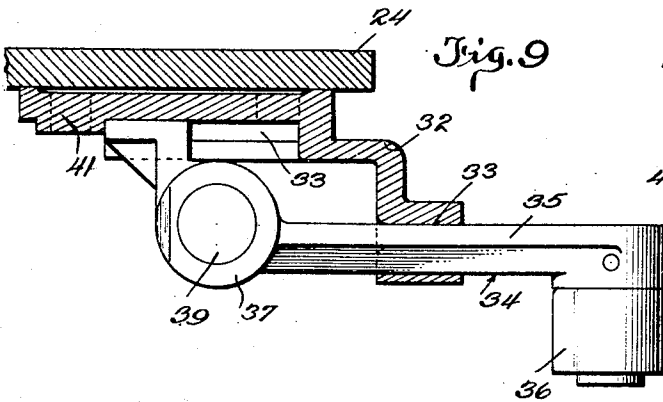


Fig. 5

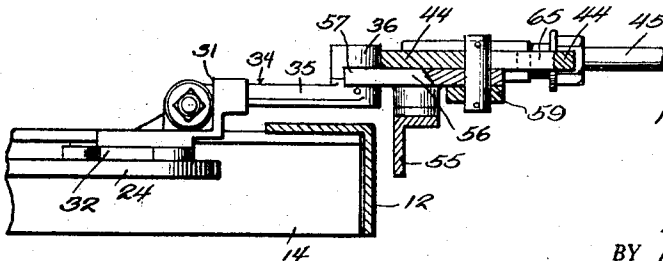
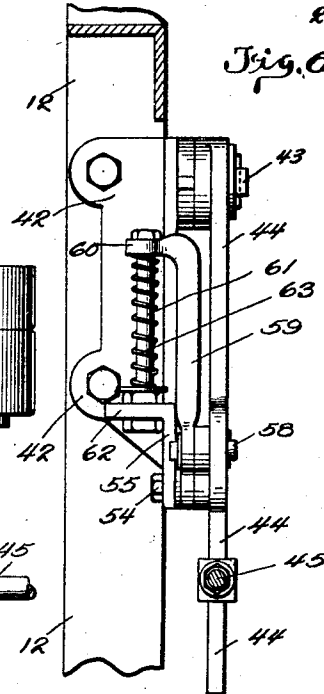


Fig. 6



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DISCHARGE CHUTE FOR CONCRETE MIXERS

Application filed February 11, 1929. Serial No. 339,199.

This invention relates to rotary discharge chutes for concrete mixers and has for one of its objects to provide an apparatus of this character which will be simple in construction, comparatively inexpensive to manufacture and install, and more efficient in use than those which have been heretofore proposed.

A further object of the invention is to provide a simple and effective means whereby the discharge chute may be rotated from discharging to non-discharging position and vice versa by means of the mixing drum.

A still further object of the invention is to provide simple and effective means for engaging and disengaging the discharge chute with the rotating mixing drum, and also to provide means for cushioning the chute as it is stopped, as well as to prevent any backward motion of the chute as a result of this cushioning action.

A still further object of the invention is to provide a simple and effective mounting for the rotating discharge chute which mounting lies entirely without the circumference of the mixing drum discharge opening whereby it is possible to employ a relatively large discharge chute.

With the above and other objects in view, which will appear as the description proceeds, the invention consists in the novel details of construction and combination of parts more fully hereinafter disclosed and particularly pointed out in the appended claims.

Referring to the accompanying drawings forming a part of this specification in which like reference characters designate like parts in all the views:

Fig. 1 is a fragmentary side elevational view of one well known form of concrete mixer showing the invention applied thereto.

Fig. 2 is a fragmentary sectional plan view of the parts shown in Fig. 1.

Fig. 3 is a vertical sectional elevational view of the parts shown in Fig. 1.

Fig. 4 is an enlarged fragmentary detail view of the mechanism for moving the chute driving jacks into engagement with the driving lugs carried by the mixer drum, the parts being shown in the positions they assume when the said jacks have been moved into the path of the said driving lugs.

Fig. 5 is an enlarged fragmentary horizontal sectional view of the engaging mechanism taken approximately on the plane indicated by the line 5—5 of Fig. 1, looking down.

Fig. 6 is an enlarged end elevational view of the engaging mechanism as viewed from the right in Fig. 1.

Fig. 7 is an enlarged fragmentary sectional elevational view of one of the driving jacks.

Fig. 8 is an end elevational view of the parts shown in Fig. 7.

Fig. 9 is a horizontal sectional view through the jack shown in Fig. 7.

Referring more particularly to Figs. 1, 2, and 3 of the drawings there is illustrated the essential portions of one well known form of concrete mixer which may be of the portable type and which comprises a framework composed of a sill 10 and upright members 11, 12, and 13, to which are secured the horizontal members 14 and 15. The usual mixing drum 16 is mounted for rotation in the frame in the well known manner upon rollers, not shown, which engage trackways 17 formed on the outer periphery of the drum. The said drum is provided with a drip ring 18 having a discharge opening 19, all as is well known in machines of this character. A pair of grooved rollers 20 are journaled in suitable bearing blocks 21 mounted upon the horizontal frame member 14, see Fig. 1, and a similar roller 22 is journaled in a bearing block 23, carried by the horizontal frame member 15. A circular

metal disk or plate 24 is received in the grooves 25, 26 of the rollers 20 and 22 respectively, and is free to rotate therein with the said rollers serving as bearings for the said plate. This plate, as will be clear from the drawings, is mounted co-axially with the discharge opening 19 of the drum 16 and it is provided with an eccentric opening 27 through which projects the discharge chute 28, which latter is preferably welded to the plate at the requisite number of points. As clearly shown in Figs. 1 and 3 the axis of the chute is inclined in a vertical plane relative to the axis of the plate 24 and the said chute projects through the discharge opening 19 and into the interior of the drum 16.

From what has been thus far disclosed it will be apparent that the inclined discharge chute 28 is mounted for rotation relative to the drum from the discharging position shown in full lines in Fig. 3 to the non-discharging position shown in dotted lines in the said figure, and for the purpose of producing such rotation the following mechanism is provided:

Upon the face of the drip ring 18 of the frame there is secured a plurality (here shown as 3) of driving lugs 30, which are adapted to be engaged at suitable intervals under control of the operator by driving jacks 31 secured upon the rear face of the plate or disk 24. Preferably two of these driving jacks are mounted upon the said plate at substantially diametrically opposite points adjacent its outer periphery. As best shown in Figs. 7, 8 and 9, these jacks comprise castings or brackets 32 which are secured to the rear face of the disk 24, which brackets are provided with guide ways 33, in which is slidably mounted the jack member 34. The said jack member comprises an arm 35, which carries at one end a rotating roller 36, and at its other end an angular barrel 37, in the recess 38 of which is slidably mounted a plunger 39, normally pressed outwardly by a coiled spring 40—all as will be clear from Fig. 7. The said plunger 39 is adapted to be projected into the path of the driving lugs 30, whereby motion of the mixing drum 16 may be transmitted to the rotatable discharge chute, all as will appear more fully below. A stop plate or member 41 is secured upon the bracket 32 to limit the inward sliding movement of the jack member 34, as will be readily understood.

The normal position of the driving jacks, when the discharge chute is stationary, is illustrated in Fig. 1, the jack members 34 being moved outwardly away from the center. In this position the plungers 39 have been moved out of the path of the travel of the driving lugs 30 and therefore no motion will be transmitted from the mixing drum 16 to the said chute.

For the purpose of moving the said jacks

34 into the path of travel of the lugs 30, there is provided the following mechanism:

A bracket 42 is secured to the upright frame member 12, and to this bracket there is pivotally secured, as at 43, an engaging cam or member 44. The said member 44 is connected by means of a rod or link 45 to a hand lever 46, which is pivotally mounted in a bracket 47 carried by the upright frame member 13, all as clearly shown in Figs. 1 and 2. The said lever 46 may be provided with an extension 48 to which is connected a rod or link 49, extending to the opposite side of the machine whereby it is possible to actuate the discharge mechanism from either side.

From what has just been disclosed it will be clear that if the hand lever 46 be moved in a counter-clockwise direction from its position shown in Fig. 2 its motion will be transmitted through the link or rod 45 to the engaging member 44, causing the latter to move in a clockwise direction about its pivot 43, and, through the contact of its face 50 with the roller 36 of the driving jack, it will cause the said jack 34 to be slid radially inwardly toward the center of the disk 24, whereby the spring-pressed plunger 39 carried by the said jack will be moved into the path of travel of the driving lugs 30. Upon contact being established between one of these said lugs and said plunger 39 motion of the mixing drum 16 may be transmitted to the disk 24 and discharge chute 28, thereby moving the said discharge chute from the position shown in full lines in Fig. 3 to that shown in dotted lines therein. As will be readily understood this motion is through an arc of substantially 180°, and when the chute has reached the dotted line position shown in Fig. 3 the driving jack will be withdrawn from engagement with the driving lug 30 by the following mechanism:

Upon the upright frame member 11 there is provided a bracket 51, which carries an inclined cam extension 52, which is adapted to be engaged by the roller 36 of the driving jack 34. Obviously as the said roller moves downwardly as viewed in Fig. 1 the jack 34 will be drawn radially outwardly, thereby moving the spring-pressed plunger 39 before the path of travel of the driving lug 30, disconnecting the chute from the drum.

In order to stop the chute in the correct position for discharge, or non-discharge, as the case may be, when one of the jacks has been disengaged from a driving lug, the following mechanism is provided:

Pivotally mounted as at 54 upon a lower extension 55 of the bracket 42 is a dog 56 having a finger 57 which normally projects into the path of the outer extremity of the jack arm 35, as will be clear from Fig. 1. The opposite end of the dog 56 carries a pin

58, which projects to either side of the said dog, and upon one projecting end of which is pivotally mounted an upwardly extending rod or link 59 having a horizontal extension 60, which is slidably received about a vertical pin or bolt 61, rigidly carried by a shelf 62 formed upon the bracket 42. A coiled spring 63 surrounds the pin or bolt 61 and serves to cushion the movements of the arm or rod 59 and of the dog 56, as will be readily understood. The other projecting end of the pin 58 is slidably received in an angularly disposed slot 65, formed in the engaging cam or member 44, as clearly shown in Figs. 1, 4 and 5.

It will be clear from the foregoing that when one of the driving jacks 34 reaches the position shown at the right of Fig. 1 the roller 36 on the outer extremity of its arm 35 will contact with the finger 57 of the dog 56 at substantially the same time that the companion driving jack is being disengaged from driving connection with one of the lugs 30. This engagement between a jack 34 and dog 56 will tend to rock the dog upon its pivot 54, thereby drawing the rod 59 downwardly against the pressure of the spring 63, which, of course, will cushion the stopping of the chute.

In order to prevent back lash or reverse rotation of the chute under the influence of this cushioning action, a weighted pawl 66 is pivoted as at 67 upon the disengaging bracket 51. This pawl is so proportioned that it will normally hang in substantially the position illustrated in Fig. 1, but obviously being free to move to permit the passage of the rollers 36 of the driving jacks, so long as these are moving in a counter-clockwise direction. However, any tendency of the chute to reverse this direction of movement will bring the said rollers into engagement with the pawl 66, thereby effectively preventing such back lash.

When the engaging cam or member 44 is moved from the position shown in Fig. 1 to that shown in Fig. 4, for the purpose of engaging one of the jacks for the driving lug, its arcuate movement will be transmitted through the slot 65 and pin 58 to the dog 56, thereby rocking the latter about its pivot 54, to the position shown in Fig. 4, and moving its finger 57 away from the jack, 34, so as to permit free movement of the latter and rotation of the chute, should one of the driving lugs be in position to immediately pick up the chute. Unless such provision for automatically moving the dog out of the path of the jack is made, should a driving lug contact with the jack before the operator has time to manually return the engaging element 44 to its position, as shown in Fig. 1, damage might result to the jack or to the stop dog.

The operation of the device will be clear

from the foregoing, but may be briefly summarized as follows:

With the parts in the positions shown in Fig. 1, wherein the discharge chute is shown in discharge position at the end of the discharge period, the operator grasps the hand lever 46 and moves it in a counter-clockwise direction. Its motion is transmitted through the rod or link 45 to the engaging element 44, which latter moves the finger 57 of the dog 56 away from the jack roller 36, while at the same time the jack 34 is moved toward the left, as viewed in Fig. 1, to bring its plunger 39 into the path of the approaching driving lug 30. As soon as the said lug contacts with the plunger 39, which contact is of course cushioned by the spring 40, the rotating drum 16 picks up the discharge chute and the latter is rotated through an arc of substantially 180°, at which time the roller 36 of the driving jack engages the cam 52, whereby the said jack is withdrawn radially outwardly to disengage the plunger 39 from the lug 30. As this occurs the second jack is brought into contact with the finger 57 of the dog 56, it of course being understood that in the meantime the operator has returned the engaging member 44 to its normal position illustrated in Fig. 1, and such engagement of the said jack with the dog will stop the rotation of the chute as a predetermined position, such stopping movement, however, being cushioned through the action of the spring 63. Any tendency of the chute to rotate in a reverse direction, under the action of this cushioning spring, will be prevented through the stop pawl 66.

It will be noted that through the peculiar mounting of the discharge chute upon the three rollers 20 and 22, which bear only upon the outer periphery of the disk 24, the central portion of the said disk is left entirely free and unobstructed so that it is possible to provide a relatively large discharge chute 28. This is of great importance in the present state of the art, where the time of discharge is measured in seconds and it is highly desirable to provide as large a discharge chute as possible in order to get the contents of the drum out in as short a time as possible.

It will further be noted that in employing driving jacks of the character described there is no possibility of the said jacks becoming disengaged from the driving lugs, either through vibration or wear, after they have been once moved into the path of travel of the said lugs. This results from the fact that the said jacks move in radial lines and during the time they are engaged with the said driving lugs they are traveling through the upper half of their circular path. At this time gravity is constantly acting to pull the jacks inwardly toward the center of the disk and to hold them

against the stop member 41. It thus results that these jacks can never become disengaged from the driving lugs.

While one form of the invention has been illustrated and described it is obvious that those skilled in the art may vary the details of construction as well as the precise arrangement of parts, without departing from the spirit of the invention, and therefore it is not wished to be limited to the above disclosure, except as may be required by the claims.

What is claimed is:

1. In a concrete mixer, a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position and vice versa; driving means on said drum; a radially slidable driving jack carried by said chute; and means for moving said jack into and out of the path of travel of said drum-carried means.

2. In a concrete mixer, a rotatable mixing drum, having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position, and vice versa; driving means on said drum; a rectilinearly movable driving jack carried by said chute; means for moving said jack into and out of the path of travel of said drum-carried means; and a stop for positioning said jack in said path of travel, said jack being urged toward said stop by gravity throughout substantially the entire driving range of said jack.

3. In a concrete mixer, a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position, and vice versa; driving means on said drum; driving jacks carried by said chute; an engaging element for moving said jacks into the path of travel of said drum-carried means; a disengaging element for withdrawing said jacks from said path; and yielding means engageable by one of said jacks for stopping rotation of said chute when a companion jack is disengaged from said driving means.

4. In a concrete mixer, a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position, and vice versa; driving means on said drum; driving jacks carried by said chute; an engaging element for moving said jacks into the path of travel of said drum-carried means; a disengaging element for withdrawing said jacks from said path; yielding means engageable by one of said jacks for stopping rotation of said chute when a companion jack is disengaged from said driving means; and means for preventing reverse rotation of said chute.

5. In a concrete mixer, a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position, and vice versa; driving means on said drum; driving jacks carried by said chute; an engaging element for moving said jacks into the path of travel of said drum-carried means; a disengaging element for withdrawing said jacks from said path; yielding means engageable by one of said jacks for stopping rotation of said chute when a companion jack is disengaged from said driving means; and means for preventing reverse rotation of said chute, comprising a pivoted dog associated with said disengaging element.

6. In a concrete mixer, a frame; a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position and vice versa; driving means on said drum; driving jacks carried by said chute; an engaging element for moving said jacks into the path of travel of said drum-carried means; a disengaging element for withdrawing said jacks from said path; means engageable by one of said jacks for stopping rotation of said chute when a companion jack is disengaged from said driving means; and connections between said last-named means and said engaging element for moving said stopping means away from said jack as said engaging element moves toward it.

7. In a concrete mixer, a frame; a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position and vice versa; driving means on said drum; driving jacks carried by said chute; an engaging element for moving said jacks into the path of travel of said drum-carried means; a disengaging element for withdrawing said jacks from said path; a yieldable pivoted dog engageable by one of said jacks for stopping rotation of said chute when a companion jack is disengaged from said driving means; and connections between said dog and said engaging element, whereby movement of the latter for the purpose of moving a jack to driving position rocks said dog out of engagement with said jack.

8. In a concrete mixer, a rotatable mixing drum having a discharge opening; a discharge chute associated with said opening, rotatable from discharging to non-discharging position and vice versa; driving means on said drum; and a driving jack carried by said chute having a yielding member movable into and out of the path of travel of said drum-carried means.

9. In a concrete mixer, a rotatable mixing drum having a discharge opening; a dis-

charge chute associated with said opening, rotatable from discharging to non-discharging position and vice versa; driving means on said drum; and a driving jack carried by said chute, comprising a radial guideway, a slide member in said guideway, and a spring pressed plunger carried by said slide member, adapted to be engaged by said drum-carried means.

In testimony whereof I affix my signature.

SAMUEL SHAFER, JR.