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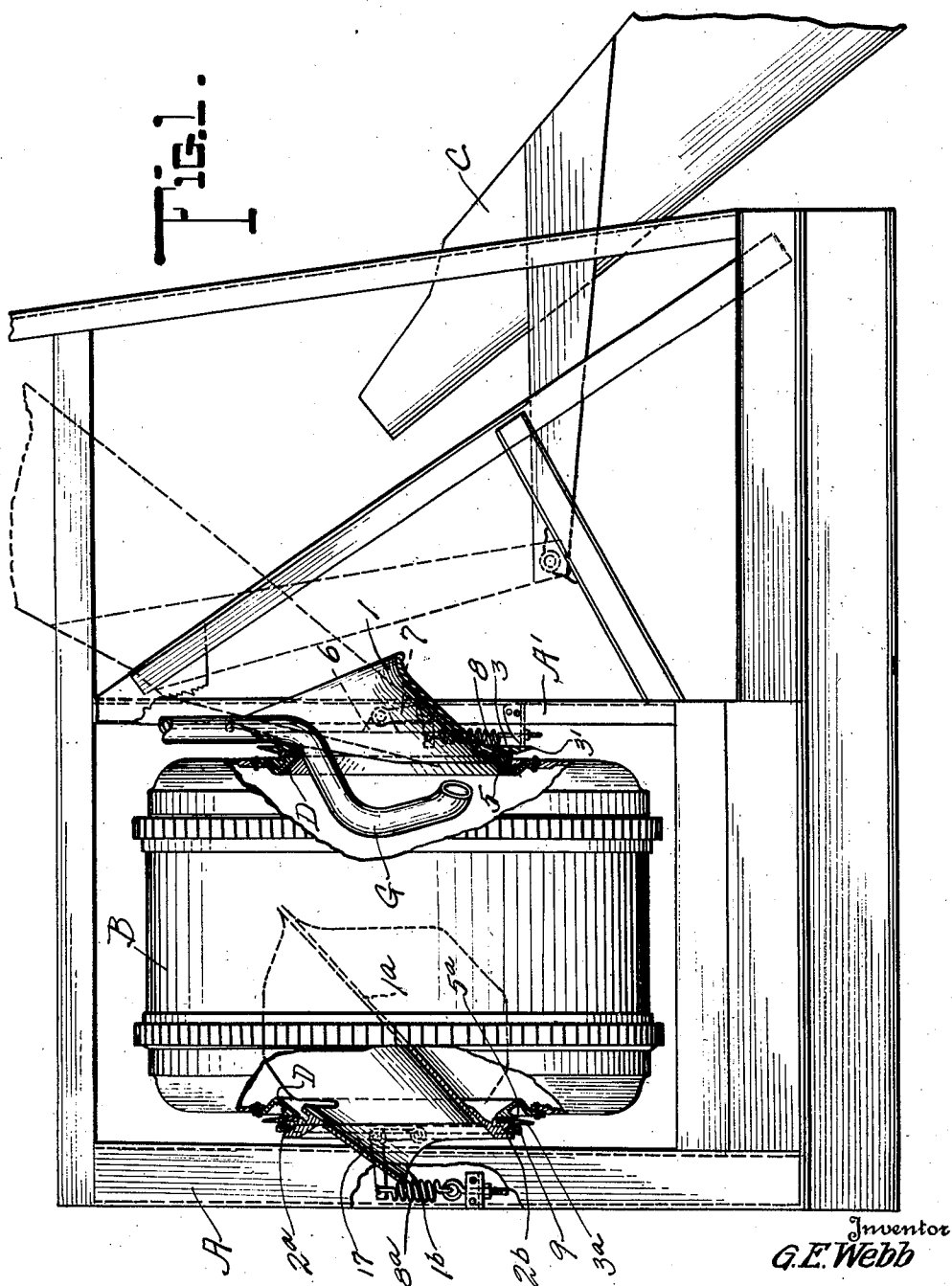
1,665,519

G. E. WEBB

CONCRETE MIXING MACHINE

Filed Sept. 25. 1926

3 Sheets-Sheet 1



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April 10, 1928.

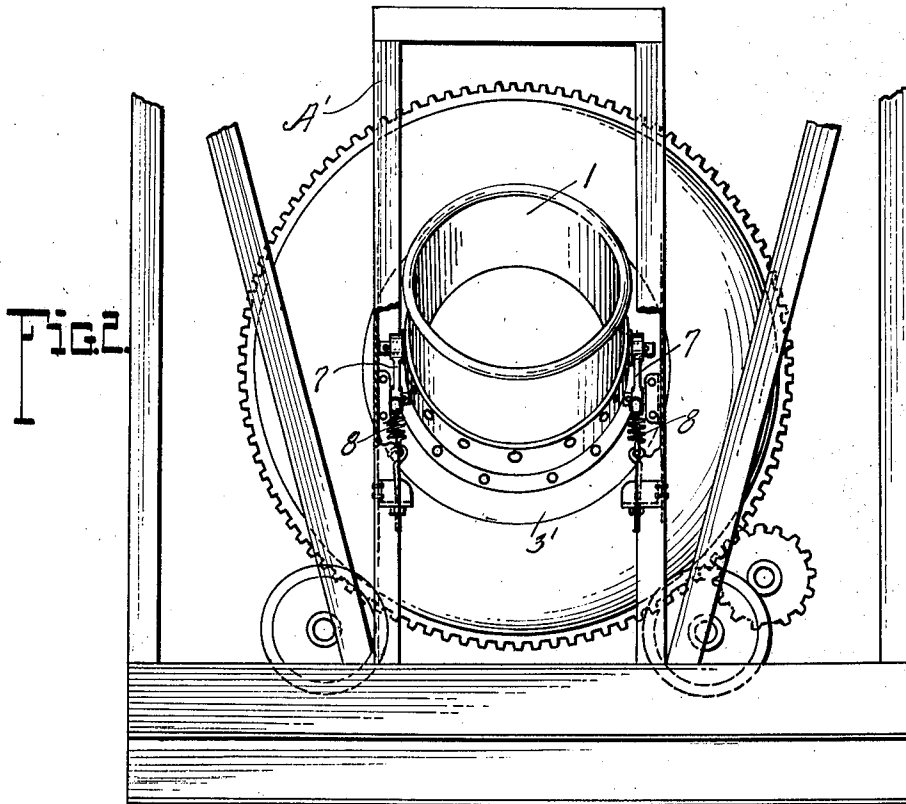
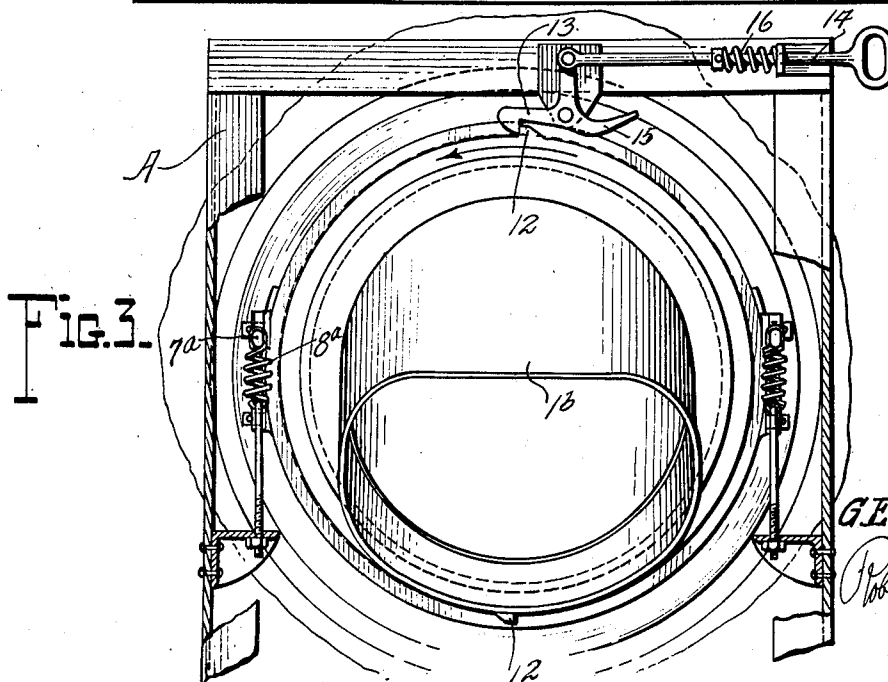
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3 Sheets-Sheet 2



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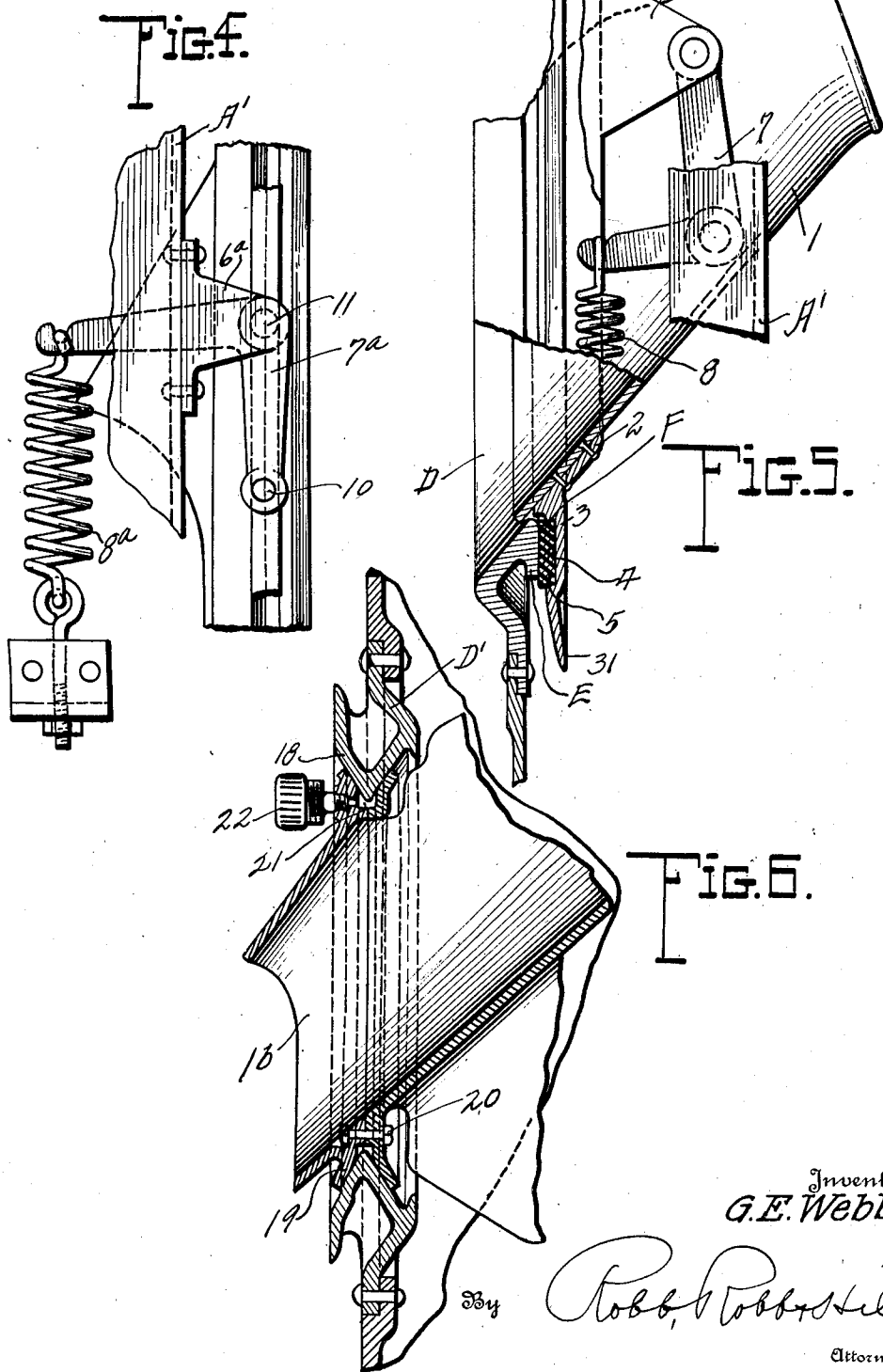
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CONCRETE MIXING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

GEORGE E. WEBB, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO KOEHRING COMPANY,
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CONCRETE-MIXING MACHINE.

Application filed September 25, 1926. Serial No. 137,665.

The present invention incorporates novel improvements in concrete mixer apparatus, speaking particularly with reference to the provision of what may be termed for the purposes of this application a sealing device for the mixer drums thereof.

Such improvements are designed to take care of one of the troublesome problems encountered in the use of the majority of conventional or standard concrete mixers of the present day, namely the leakage from the openings of the mixer drum due to one reason or another such as the lifting action incident to the rotation of the drum, excess in the quantity of the batch, failure to secure the closest connection between the charging device and the mouth of the drum, etc. One has but to observe the operation of any of these concrete mixers to note the splash and the tendency of the mixers to overrun or trickle out over the edge of the charging and discharging openings of the drum, and while the quantity of overrun of the grout (cement and water) may be apparently small, yet in the long run it involves an undesirable and expensive waste of the cement. This waste is particularly noticeable when it is attempted to operate the mixer at full capacity and occurs in spite of the employment of drip and splash rings, plates etc. which have been heretofore used.

Certain reasons may be mentioned for the ineffectiveness of present sealing means, if they may be called such, namely the use of large sized drum openings to provide for saving of time in the charging and discharging of materials and the provision of clearance to accommodate the usual endwise movement of drums which is provided for in all types of mixers. Any effective sealing device must take the "wobbly" movement of the drum into consideration if this leakage is to be prevented.

It is the object, therefore, of the present invention to overcome these difficulties by providing a sealing device which is so constructed and arranged as to enable use of maximum size openings at the charging and discharging ends of the drum as well as to maintain a continuous leak-proof contact with the mouths of the openings in the rotative or shifting movements of the drum.

To this end the invention comprises a spout or chute-like adjunct for the mixer which is yieldingly mounted in contact with

the drum at the opening thereof, providing a slip joint arrangement which takes care of the drip or splash and prevents accidental overflow of the contents. This unitary device constitutes a secondary chute positioned in the opening of the drum and having means closing the space between the chute body and the edge of the opening, substantially closing the opening, whether this be the charging or discharging opening of the mixer drum.

There is a further objective of importance which resides in the provision of a mounting for such sealing device which cooperates with one of the drum openings, whereby it can partake of the rotary movement of said drum to effect a reversal of its position, the device in this instance comprising an assembly chute unit which in one position constitutes a mixer element and in another a discharge chute, means being provided to at will initiate or interrupt the rotation of the device.

A few of the many advantages for such construction may be referred to before proceeding with the description of the device. In the first place, elimination of the loss of grout is accomplished, and while this loss itself may not be considered to be much of a factor, nevertheless when it is taken into consideration that splash and overflow of the cementitious material causes a gradual building up of deposits on adjacent parts which must be continually or periodically removed, there is not a little saving in time and labor incident to such elimination. Further, drum openings may be increased in size without what usually occurs now, the reduction in capacity or output of mixed concrete. On the contrary, increase in size enables a speeding up of charging and discharging operations as well as increase in capacity and this particularly applies when my features are used in a rotary type of chute.

In the accompanying drawings:

Figure 1 is a side elevation of a mixer apparatus, portions being broken away and shown in section to disclose the detail features of this invention applied to the mixer drum;

Figure 2 is an elevation of the charging end of the mixer drum showing the invention applied thereto;

Figure 3 is an elevation of the discharg-

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ing end of the mixer showing the application of the invention to this end of the apparatus;

Figure 4 is a fragmentary view in elevation of the mounting for the rotary chute construction used at the discharge end of the apparatus;

Figure 5 is an enlarged detail, partly in section, showing the construction of the device applied to the charging opening of the chute; and

Figure 6 is an enlarged sectional view of a slightly modified form of construction used for the rotary chute type of the device.

Referring to the drawings, A designates a frame structure of a conventional concrete mixer apparatus, B the mixer drum mounted thereon, and C the charging skip for charging the materials into the drum. The mixer drum is provided as customary with an axial opening at each end of the same, one of these constituting the charging opening and the other the discharge opening. These usually are of the same size and each is provided with a splash ring D which is attached to the edge of the drum opening in any desired manner. Each of these rings forms a partial closure for the opening in conjunction with the device which constitutes the special feature of this invention. The ring is provided with an outwardly turned flange E which is formed with a flat annular face F preferably in the present instance a finished or ground face, for reasons which will appear more particularly hereinafter. As a matter of fact, this face is chilled to harden the same and ground in order to offer a long-lived wear face.

The sealing device for the charging opening of the drum will be first described. This consists of a unit comprising the chute or spout body 1, the lower end of which projects slightly into the mouth of the adjacent drip ring D and has secured thereto a supporting ring 2. This ring is preferably formed with a vertically disposed annulus 3 having its inner face grooved as indicated at 4 to provide a seat for a wear gasket 5 of friction or other material. This removable gasket at its inner face bears against the flat contact face E of the drip ring D hereinbefore mentioned and by virtue of the maintenance of the contacting relationship of these two faces a substantially leak-proof joint is secured at this point.

The manner in which the contact between the contacting faces just referred to is maintained during the operation of the drum is an important feature of my invention. Projecting laterally from the ring 2 at diametrically opposite points are the ears 6, to each of which is pivotally secured one arm of a bell crank lever 7; said lever in turn being mounted on the adjacent frame standard A'. The other arm of the bell crank

lever projecting inwardly toward the drum is engaged by a spring 8 made fast to the frame structure and capable of being adjusted for the purpose of regulating the tension, as will be apparent from a consideration of the corresponding element disclosed in Figure 4 of the drawings. The two springs, one at each side being generally provided if necessary, coact with the levers 7 to hold the ring 2 with wear annulus 4 firmly against the drip ring D and through the instrumentality of this yieldable mounting sufficient pressure is exerted to keep the contact faces tightly associated throughout the rotative movements of the drum, and any endwise movements of the drum are readily accommodated by such mounting.

The annulus 3 is formed with a flange extension 3' which is slightly inclined outwardly and tapered to provide a sharpened drip edge at its periphery, directing any drippings away from the drum and adequately protecting the contact faces from moisture.

The chute or spout body of this sealing device is given a desired length to span or surround the throat of the charging skip and is necessarily notched to receive the water supply pipe G leading from the water tank (not shown) forming a part of the conventional equipment. It will be observed from Figure 1 of the drawings that the device which has been described substantially seals or closes the charging opening and no splash or overflow of the material is allowed to pass through this opening.

Passing now to the discharge side of the drum, it may be mentioned that while the sealing device at the charging side is relatively stationary, so far as rotative action is concerned, that form of the device now to be described for the discharge opening is preferably mounted for rotation when desired. This is due to the dual function performed by the discharge chute.

Referring to Figure 1 of the drawings, the sealing device for the discharge opening comprises the reversible chute body 1^a and the ring 2^a. This ring is provided as in the case of the opposite sealing device with a gasket 5^a which coacts with the flat face of the adjacent drip ring and also with the drip flange 3^a. In addition the ring 2^a is formed with a substantially V-shaped annular groove 2^b into which is received the supporting ring 9. This ring is of split form as customary with devices of this character and provided with opposing trunnions 10. To each trunnion is pivotally connected an arm of the bell crank lever 7^a which is pivotally mounted at 11 on the bracket 6^a attached to the adjacent frame. A spring 8^a coacts with the other bell crank arm in each instance and provides the neces-

sary tension to press the contact face of the ring 2^a against the contact face of the adjacent drip ring.

Obviously with this form of mounting the sealing device would have a tendency to rotate during the rotation of the drum in view of the frictional contact of the contacting faces above referred to but I employ special means for controlling this rotative action which is desired in order to dispose the chute in one of its two positions, either that for discharging the contents of the drum or the second position wherein it acts as a mixing element. This form of rotative chute per se, is well known in the Koehring mixers to which this construction of device is applied. To this end, referring to Figure 3 of the drawings, opposing projecting lugs 12 are formed on ring 2^a with which a holding pawl 13 is adapted to coact. When the pawl is in engagement with one or the other of these lugs the sealing device is held against possibility of rotative movement and until the pawl is released the chute member will remain in either its discharging or mixing position. When it is desired for the chute member to be reversed the pawl is displaced by a manual operating member 14 which allows the member to revolve in the direction of the arrow by virtue of the frictional contact of the contacting faces until the opposite lug passes under the pawl. This pawl is provided with a tail extension 15 so that if the pawl is in disengaged position when the lug passes beneath the same said lug will contact with the tail extension and rock the pawl so that its hooked end will engage with the lug as it reaches said hooked end. A spring 16 coacting with the rod 14 may be employed to automatically maintain the pawl 13 in its engaging position but by virtue of the use of the tail extension on the pawl the action above described will take place whenever the operating member 14 is held out too long by the operator of the machine. Thus the arrangement provides a positive engaging operation for the holding means for the chute member. It will be understood that the outer end of this sealing device for the discharge opening is provided with a suitable extension 17.

The foregoing method of connecting up the sealing means for rotation or arresting rotation of the same is merely one exemplification of the manner in which this coaction may be produced and therefore I do not desire to be restricted to this particular method of accomplishing this result.

A slightly modified form of the rotatable chute construction is disclosed in Figure 6 of the drawings. In this form the drip or splash ring D' is provided with a V-shaped retaining flange 18 about which engages the V-shaped ring 19 formed on the chute body 1^b. The ring 19 is a split ring the flanges of

which are suitably connected by the bolts 20. When the parts are in the assembled position disclosed in Figure 6, it will be observed that a groove 21 is provided in the base of the ring 19 with which a passage 70 leading from a grease cup 22 communicates. By means of this arrangement the contacting faces may be kept thoroughly lubricated in order to prevent undue wear. This form of device eliminates the provision of a gasket and assures against any possibility of leakage of liquid from the mouth of the opening.

It will be apparent from an inspection of the rotary form of the sealing device as above described that the drum opening is effectively closed about to the center of the same. Since the charging opening is also closed considerably above the center, the capacity of the drum is somewhat increased and larger charges, perhaps to the extent of ten per cent larger, may be mixed without the sacrifice of any of the desirable features of present practice. This provides a very advantageous construction which tends to materially reduce the time required now for charging and discharging of a concrete mixer and of course may by the same token reduce the cost of operation by increasing the output to a degree which would represent a substantial saving in the cost of all classes of concrete work.

Matters of invention disclosed herein, but not claimed, are claimed in my copending applications, one covering "improvements in discharge mechanism for concrete mixers," filed March 27, 1926, Serial No. 97,962, and the other covering "improvements in rotary discharge chutes for concrete mixers," filed March 27, 1926, Serial No. 97,963.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, a chute cooperating with and pivotally mounted at the said opening, and sealing means surrounding the chute and extending in contact with the edges of the opening.

2. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, and a sealing device pivotally mounted at the said opening in position to frictionally contact with the edges thereof to form a substantially leak-proof joint and to be turned pivotally by friction, said device constituting a mixer element in one position and a concrete discharging means in another position.

3. In concrete mixing apparatus, the combination of a rotative mixer drum having an axial opening, a unitary sealing device of chute-like form rotatively mounted at the said opening, and supporting means for

holding said drum in contact with the edges thereof to provide a substantially leak-proof joint, the sealing device being adapted to be moved through the rotative movement of the drum.

4. In concrete mixing apparatus, the combination of a rotative mixer drum having an axial opening, a unitary sealing device of chute-like form rotatively mounted at the said opening and having frictional contact therewith, and means for holding the device relatively stationary during rotation of the drum, said means being operative to permit the frictional contact between the sealing device and the drum to rotate the same.

5. In concrete mixing apparatus, the combination of a rotative mixer drum having an axial opening, a reversible chute device yieldingly mounted at said opening, means for holding the device relatively stationary during rotation of the drum, and manual means for at will operating the last named means to release the device for rotation with the drum to reverse the position of said device.

6. In concrete mixing apparatus, the combination of a drum having an axial opening, a drip ring secured to the drum about said opening and provided with a contact face, a sealing device for said opening comprising a chute-like body having an annular ring provided with a contact face cooperative with the contact face of the drip ring and adapted to have both co-incident and relative movement with respect to the drip ring, and means for supporting said sealing device with the contact faces in contacting relation during movements of the drum.

7. In concrete mixing apparatus, the combination of a drum having an axial opening, a drip ring secured to the drum about said opening and provided with a contact face, a sealing device for said opening comprising a chute-like body having an annular ring provided with a contact face cooperative with the contact face of the drip ring, and means for supporting said sealing device with the contact faces in contacting relation during movements of the drum comprising bell crank levers pivotally connected with the ring of the sealing device and springs co-acting with said bell crank levers for pressing the sealing device into operative position.

8. A unitary sealing device for mixing drums comprising a chute-like body having an annular ring secured thereto, and supporting means connected to said ring, said ring having a contact face at one side adapted to cooperate with the edge of the mixer drum opening, and said chute and ring being adapted to be moved to position for causing the chute to effect the sealing action.

9. A unitary sealing device for mixing drums comprising a chute-like body having

an annular member secured thereto, supporting means connected to said member, said ring having a contact face at one side adapted to cooperate with the edge of the mixer drum opening, and a drip flange surrounding and protecting said contact face.

10. In concrete mixing apparatus, the combination of a movably mounted container having a port, and a sealing discharge device mounted on the container at said port in substantially non-leaking engagement with the container to move relative to the container and also with the container, said sealing device being adapted to be stopped in its motion with the container at a position for closing said port.

11. In a concrete mixing apparatus, the combination of a mixing drum having an axial opening, and a sealing device swivelled to the edges of said opening to move therewith by friction or to remain relatively stationary.

12. In a concrete mixing apparatus, the combination of a mixing drum having an axial opening, a sealing device swivelled to the edges of said opening to move therewith by friction or to remain relatively stationary, and cushioning means stressing said sealing device at substantially opposite points for maintaining a sealing contact.

13. In concrete mixing apparatus, the combination of a rotatably mounted drum having a discharge opening, a sealing device of chute-like form rotatably mounted at the opening, supporting means for retaining the sealing device in contact with the edges of said opening, the sealing device being adapted to be rotated by frictional contact with said edges, and means for releasably locking the sealing device in various positions.

14. In concrete mixing apparatus, the combination of a rotatably mounted drum having a lateral opening formed with a V-shaped circumferential edge, and a chute extending through said opening and having spaced, inclined flanges corresponding to and engaging the faces of the V-shaped edge.

15. In concrete mixing apparatus, the combination of a rotatably mounted drum having a lateral opening formed with a V-shaped circumferential edge, and a chute extending through said opening and having spaced, inclined flanges corresponding to and engaging the faces of the V-shaped edge, said flanges being adjustable relative to each other for varying the frictional engagement with said V-shaped edge.

16. In concrete mixing apparatus, the combination of a rotatably mounted drum having a lateral opening formed with a V-shaped circumferential edge, a chute extending through said opening and having spaced, inclined flanges corresponding to and engaging the faces of the V-shaped edge, the

flanges being proportioned to leave an annular space inward of the apex of the V-shaped edge, and means for injecting lubricant into said annular space.

5 17. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, a sealing device swivelled to the edges of said opening to move therewith by friction or to remain relatively stationary, a
10 detent for detachably locking the sealing device against movement, and means carried by the sealing device for effecting the locking action of the detent.

15 18. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, a sealing device swivelled to the edges of said opening to move therewith by friction or to remain relatively stationary, a
20 detent for detachably locking the sealing device against movement, a projection carried by the sealing device, and means adapted to be moved by the projection for effecting a locking action of the detent.

25 19. In concrete mixing apparatus, the combination, with a mixing container having an opening, of a sealing device for said opening and means for frictionally actuating the sealing device for moving it to and from the sealing position.

30 20. In concrete mixing apparatus, the combination, with a mixing container having an opening, of a movable sealing device for said opening adapted to be moved to and from a sealing position, and means for frictionally
35 influencing the movement of the sealing device.

40 21. In concrete mixing apparatus, the combination, with a mixing container having an opening, of a movable sealing device for said opening adapted to be moved to and from a sealing position, means for frictionally influencing the movement of the sealing device, and means for varying said friction.

22. In concrete mixing apparatus, the combination, with a rotary mixing drum 45 having an opening, of a chute rotatably mounted to cooperate with said opening and to move to and from the sealing position for said opening, said chute having frictional engagement with a moving part of the drum 50 for being actuated thereby, and cushioning means for maintaining the said friction.

23. In concrete mixing apparatus, the combination, with a rotary mixing drum 55 having an opening, of a chute rotatably mounted to cooperate with said opening and to move to and from the sealing position for said opening, said chute having frictional engagement with a moving part of the drum for being actuated thereby, cushioning 60 means for maintaining the said friction, and means for varying the friction.

24. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, a sealing device swivelled to 65 the edges of said opening to move therewith by friction or to remain relatively stationary, a detent for detachably locking the sealing device against movement, and means adapted to be actuated by the movement of 70 the sealing device for camming the detent to locking position.

25. In concrete mixing apparatus, the combination of a mixing drum having an axial opening, a sealing device swivelled to 75 the edges of said opening to move therewith by friction or to remain relatively stationary, a locking pawl pivotally mounted and adapted to pivot to and from a locking position relative to the sealing device, said pawl 80 having a cam surface, and means on the sealing device adapted to engage the cam surface and swing the pawl into locking position.

In testimony whereof I affix my signature.
GEORGE E. WEBB.