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CONCRETE MIXER.

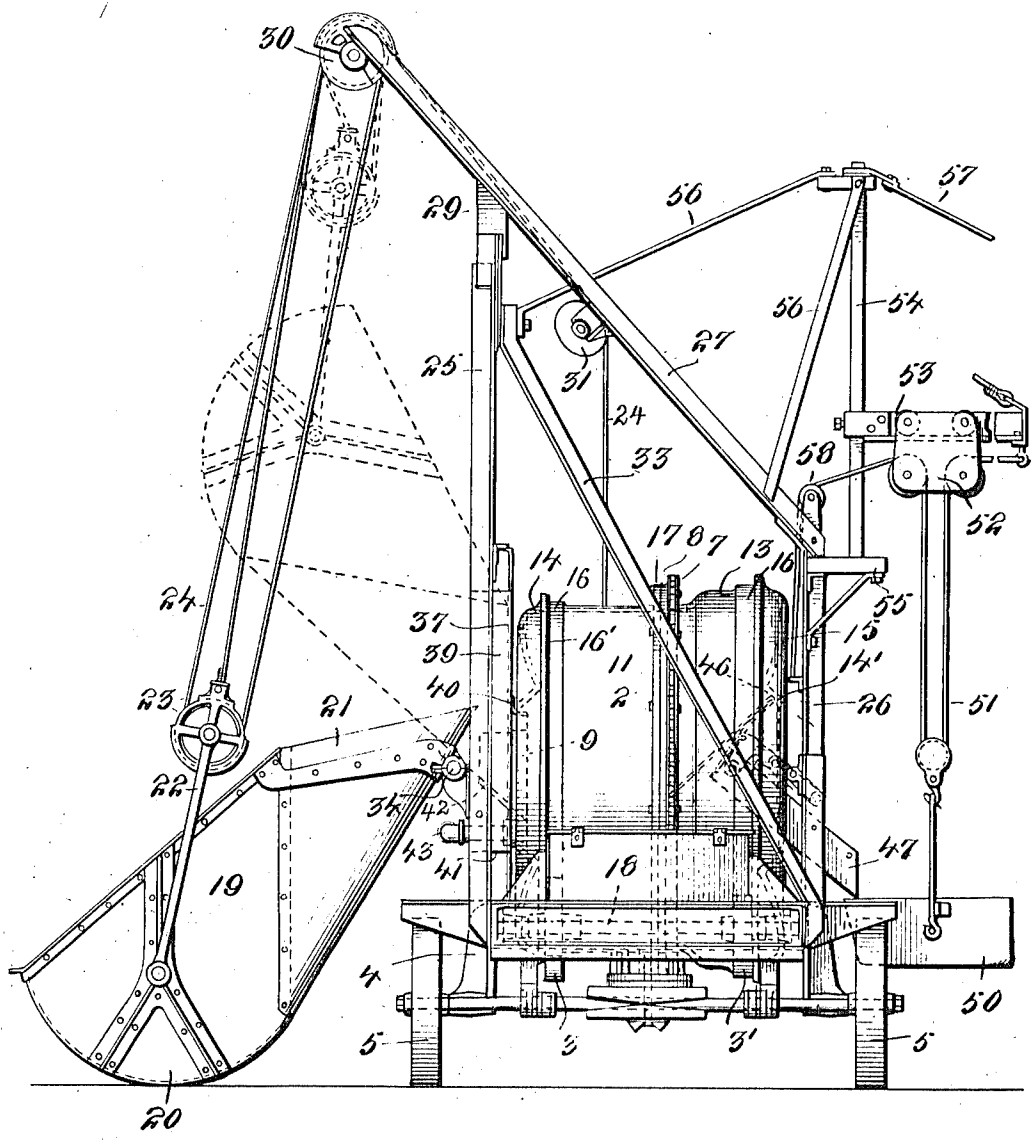
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1,067,041.

Patented July 8, 1913.

3 SHEETS—SHEET 1.

FIG. 1.



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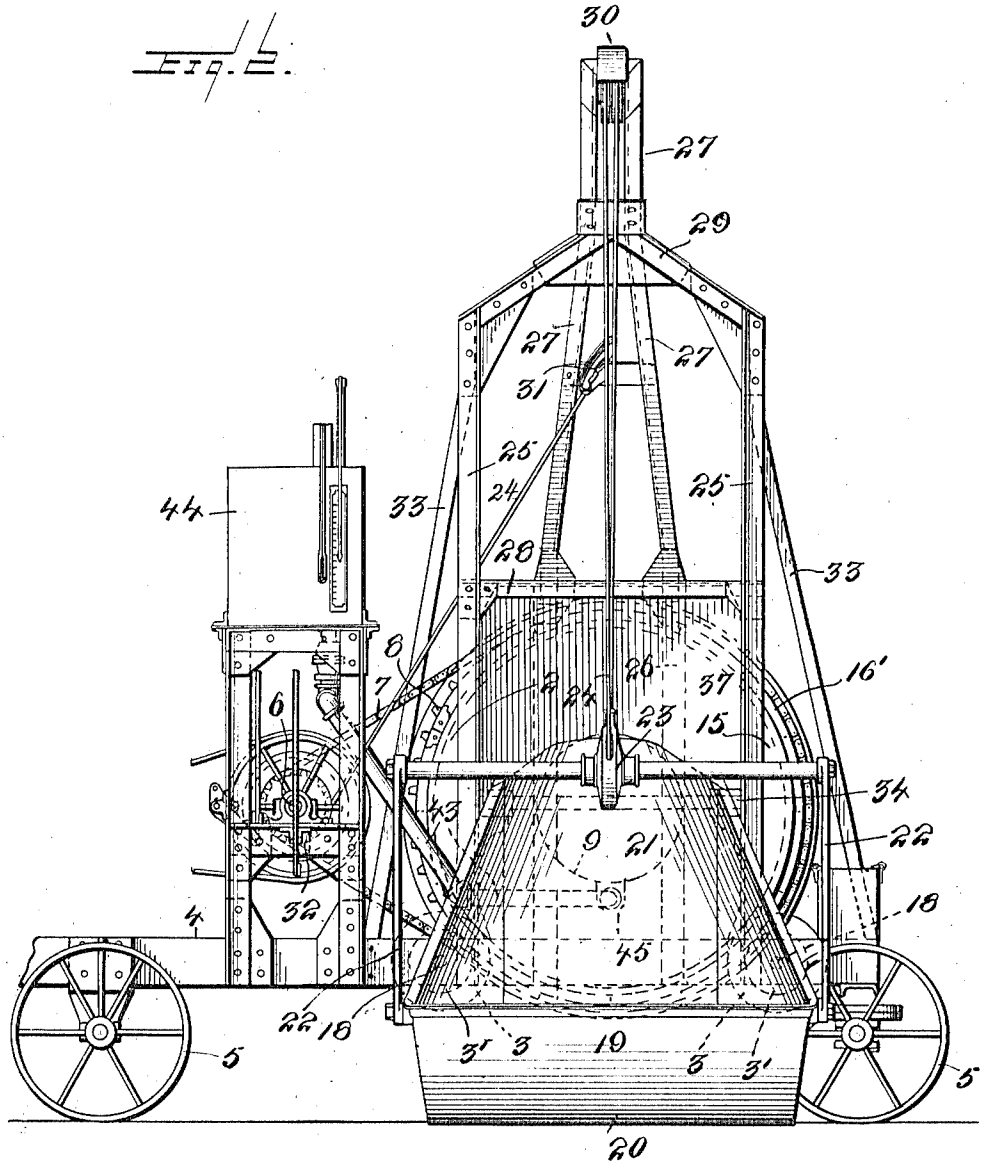
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Fig. 2.



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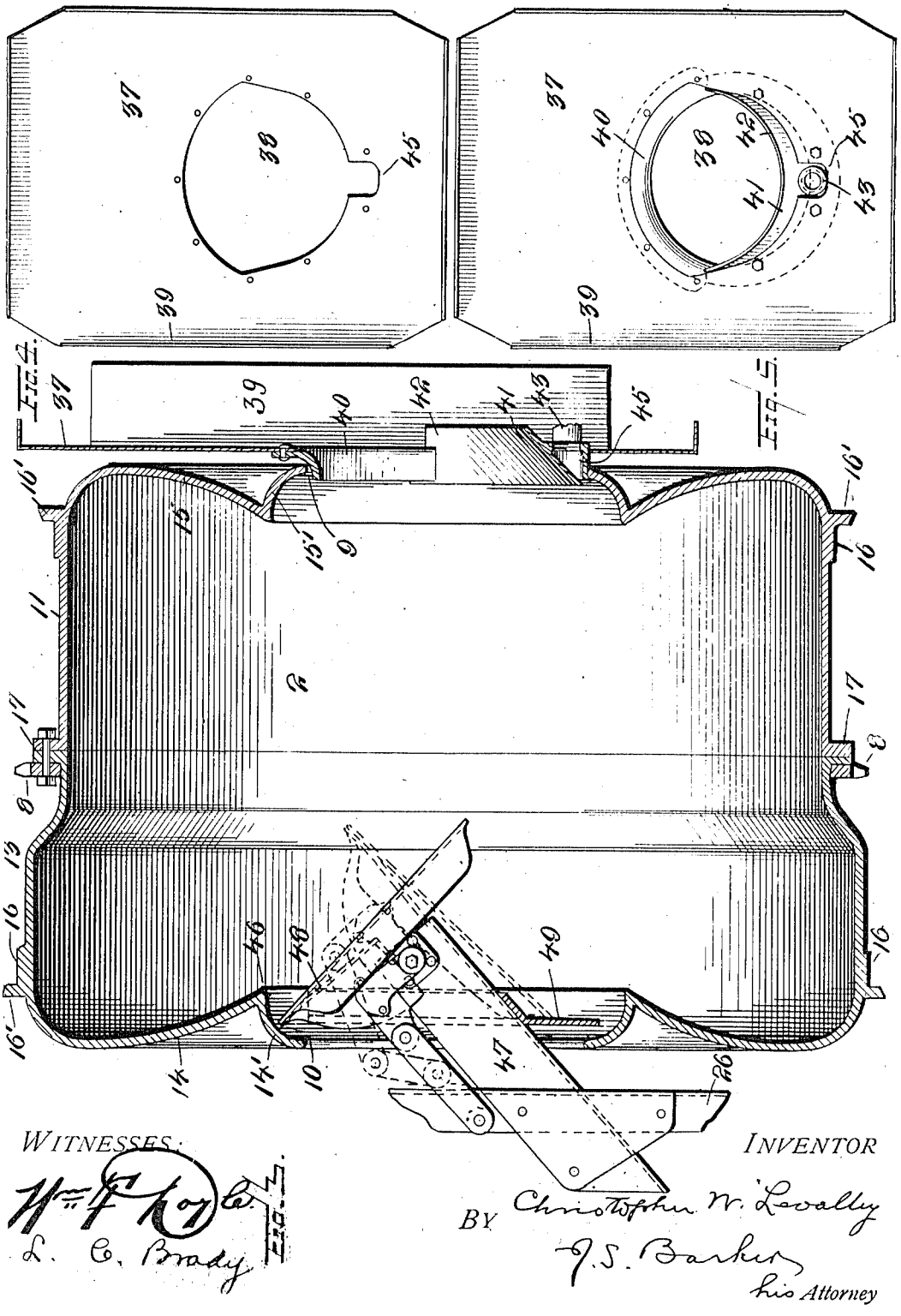
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3 SHEETS—SHEET 3.



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CONCRETE-MIXER.

1,067,041. Specification of Letters Patent. Patented July 8, 1913.

Application filed June 5, 1909. Serial No. 500,349.

To all whom it may concern:

Be it known that I, CHRISTOPHER W. LEVALLEY, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Concrete-Mixers, of which the following is a specification.

This invention relates to mechanism adapted to be used in the mixing of concrete and wherein is employed a revolving drum in which the mixing operations take place; and it has for its object to improve machines of this character in the particulars hereinafter to be pointed out.

In the accompanying drawings—Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end view of the same taken from its feed or charging end. Fig. 3 is a longitudinal sectional view taken through the revolving mixing drum. Fig. 4 is a face view, from the outside, of the guard plate located at the feed end of the mixing cylinder. Fig. 5 is a similar view to Fig. 4 showing the flange which surrounds the feed opening therein secured in place.

In the drawings 2 designates, as a whole, the mixing drum or cylinder, which is supported so as to be rotatable, upon wheels, 3, 3′, mounted on shafts 18 in a frame 4. This frame may be of any preferred construction, either portable or stationary, that illustrated being of the former type and mounted upon wheels 5. The drum receives its motion from a driven shaft 6 with which it is connected by a sprocket chain 7 or other means of power transmission, the chain engaging with a sprocket wheel or rim 8 on the drum. The drum is formed with central or axial openings, that through which the material is charged or fed into the cylinder being designated 9, and one through which the mixed concrete is discharged being designated 10. The interior of the cylinder is provided with mixing flights not shown in the drawings, of any usual or preferred construction and so disposed that they carry upward and then let fall the material within the cylinder, and at the same time advance it longitudinally through the machine.

The drum or mixing cylinder is preferably formed of two parts or sections, 11, 13. These may be made of cast metal and each is about half the length of the entire cylinder and is formed at its inner end with an outturned flange 17. These flanges are brought together face to face and united by bolts or rivets. The segments which constitute the sprocket rim 8 are preferably placed against the outer face of one of the flanges 17 and are united thereto by the bolts or rivets passing through the flanges and employed for uniting the sections of the drum. This has been found to be a very desirable construction as it permits the drum sections 11, 13, to be easily separated, thus opening the drum on a central transverse plane which is sometimes desirable, as when, through carelessness or otherwise, a batch of concrete has been allowed to harden within the drum, necessitating its removal by hand. Again, one section of the cylinder may wear out or become broken, while the other remains in workable condition and the easy separation of the parts as described, permits the removal of the worn or broken section and the substitution of a new one without requiring an entirely new drum to be furnished. Should the sprocket rim or any section thereof become worn or broken, it can be easily replaced by a new one, as will be readily understood. The supporting wheels on which the drum rests engage with tracks 16, which are preferably formed integral with the drum sections and are located near the respective ends thereof. An outward extending flange 16′ is located along the outer edge of each track and serves both to guide the drum in its movements and also as a guard to prevent concrete from getting upon the track, these flanges being located between the tracks and the end walls, 14, 15, of the drum, in which are formed respectively the discharge and feed openings. The rear or discharge end section 13 is preferably larger in diameter than the section at the other end of the machine, as the materials within the drum are gradually fed toward this section and it is often desirable that they should remain therein for a time to be repeatedly mixed and remixed. Accordingly the wheel, 3′, that engages with the track on the section 13 is of smaller diameter than the wheel, 3, that engages with the other track, and the said wheels are loosely mounted upon the shafts 18 that support them, so that they

may turn independently of each other, since by reason of their difference in size they do not revolve in unison.

In connection with the mixing apparatus disclosed I employ a loader adapted to receive the ingredients which are to enter into a batch of concrete and deliver them through the feed opening into the mixing drum. This loader is designated, as a whole, by 19, and consists of a receptacle having a bottom 20, and an elongated spout section 21, arranged to direct the material into the drum when the loader is turned into discharging position. The loader is open toward the front or away from the drum so that the materials it receives, such as cement, sand and broken stone, may be easily dumped therein from wheel barrows or otherwise deposited. The loader is provided with a pivoted bail 22, the cross bar of which carries a sheave or pulley 23, around which passes the rope or cable, 24, by means of which the movements of the loader are controlled.

The apparatus is preferably provided with a framework for supporting the loader and the stationary sheaves with which the cable 24 engages. This framework is constructed as follows: 25, 25 designate a pair of uprights supported at the front end of the apparatus adjacent to the feed opening into the drum, one upright being on either side of the latter. Another pair of uprights 26, 26, preferably of less height and located closer together than the uprights 25, are mounted near the rear end of the drum. The front uprights are united and braced by intermediate cross pieces, 28, and top cross pieces, 29. The front and rear uprights are united at their upper ends by a pair of tie pieces, 27, 27, which rest upon and are secured to the top cross pieces, 29, and, extending beyond the latter, constitute an overhanging support for the head sheave, 30. The intermediate guiding sheave 31, between the head sheave and the winding drum, 32, for the cable, is preferably supported by a cross piece extending between the tie bars 27. 33, 33 are other braces which may be employed when circumstances seem to warrant their use.

34 is a shaft seated in bearings carried respectively by the uprights 25 and the spout portion of the loader, 19, and constituting a pivotal connection between the loader and the framework of the mixing apparatus.

In Fig. 1 the loader is represented in full lines as occupying the position to receive a charge of material, it resting firmly upon the surface on which rests the entire apparatus. When it is desired to discharge the contents of the loader into the drum the cable is wound upon the drum 32, lifting the loader into the position represented in dotted lines in Fig. 1, when it will discharge through the feed opening into the mixing drum. This discharge having been effected, the loader can be returned to its normal position by allowing the cable to unwind and the loader to return, swinging about the shaft 34 in so doing, to the position represented in full lines in Fig. 1.

The front wall 15 of the mixing drum is provided with an outward extending flange 15′ flaring toward the interior of the drum and surrounding the feed opening 9. A guard plate 37 is interposed between the mixing cylinder and the loader 19. It is provided with flanges 39 by which it is secured to the uprights 25, in position close to the front end of the cylinder. An opening 38 through the plate is situated opposite the feed opening 9 into the drum and surrounding this opening 38, and carried by the guard plate, is a flange that passes through the opening 9, and extends for a short distance into the cylinder or drum. The flange or flaring edge 15′ of the cylinder surrounding the feed opening runs close to the outer face of the said flange carried by the plate 37 and forms in connection therewith a close joint that prevents the materials within the drum from escaping at the feed end of the machine. This stationary flange is preferably formed of two parts bolted or riveted to the inner face of the plate, the upper part being designated 40 and the lower one 41. The latter has a portion, 42, that extends outward from the face of the plate 37, so as to constitute a short trough leading to the openings 38 and 9, into which the loader may discharge when lifted to dumping position, and upon which the edge of its spout section 21 may rest, as indicated in dotted lines in Fig. 1. The sections of the flange carried by the stationary guard plate are preferably bolted thereto or otherwise attached so as to be removable, in order that they may be separated to allow the plate to be removed when access to the interior of the drum is desirable, the making of the flange in two separate parts facilitating this.

It will be seen by reference to Figs. 3 and 5 that the section 40 of the flange, which surrounds the upper portion or segment of the opening 38, inclines inwardly and downwardly toward the interior of the mixing drum; and that the section 41, that lies in the lower segment or portion of the said opening and constitutes the short chute or trough as described, also extends downwardly and inwardly toward the interior of the drum. This arrangement not only produces the close running joint already referred to, which of itself to a large degree prevents the escape of material from the interior of the drum out through the feed opening thereof, but also insures that such material as may peradventure splash or fly outwardly and escape beyond the limits of

the feed opening into the drum shall be, by such flange members, directed backwardly into the drum. It will be understood that the splashing and flying action of the material principally takes place when the drum is being charged and that at such time the openings 9 and 38 are covered by the tilting loader 19, which thus serves as a guard to prevent escape of material directly through the feed opening. When the loader is tilted into position to discharge into the drum, as represented in dotted lines in Fig. 1, the guard plate 37 operates to close the end of the loader so that the material can escape therefrom only through the openings 38 and 9, preventing spilling and waste of the material in the charging of the machine, this being insured by properly shaping and locating the plate and loader so that they register as described when the charging position is assumed by the loader.

43 represents the water pipe leading from the tank 44 and opening into the mixing cylinder at its front end. It passes through the stationary plate 37 at a point below the feed chute 42 and is located under the loader. There are several advantages incident to this arrangement; the pipe thus located does not interfere with the free movements of the loader, and, by discharging at the point indicated, all danger of the loader becoming wet is removed.

45 is an opening formed in the stationary guard plate 37 in which the discharge connection of the water pipe 43 is seated, the lower section 41 of the stationary flange being also shaped to permit the passage of this connection.

The rear end wall of the cylinder is formed with a flange 14′, surrounding the discharge opening 10, and which is preferably curved on its inner surface, as indicated in Fig. 3, the curve being substantially concentric with the axis of the swinging section of the discharge chute, to be described. The end wall 14 where the flange 14′ thereof joins with the main section is formed on the inside into a sharp edge 46 so disposed that the mixed concrete which may be thrown against the inner surface of the end wall will freely drip from this edge instead of tending to run down the inner curved face of the flange 14′.

At the discharge end of the machine is located a chute through which the mixed concrete may be delivered out of the machine. This discharge chute consists of a stationary section 47 supported by the uprights 26 and a pivoted portion 48. This feature of the machine is the basis of claims appearing in my pending application 461,891 and need not therefore be herein described in detail. Suffice it to say, the section 48 is pivotally connected with the stationary section 47 and is adapted to be moved into the position indicated in full lines in Fig. 3 when the material is being mixed within the drum, the inner pivoted section then occupying a position above the inner end of the stationary chute section 47 and serving as a cover or guard therefor as indicated in full lines Fig. 3 to prevent the concrete material which is raised and let fall by the mixing blades of the drum from passing into the chute and being discharged. When the batch of material in the drum has become thoroughly mixed the pivoted section is turned down into the position indicated in dotted lines in Fig. 3, when it constitutes, in effect, a continuation of the chute 47 and receives the material from the drum and delivers it to the section 47 by which it is carried out of the machine. The inner or free edge of the pivoted swinging section 48 is adapted to move close to the curved inner face of the flange 14′ surrounding the discharge opening, and effectually closes the upper segment of the opening. It also serves, as it is swung from one position to another, to remove any material which might tend to accumulate upon the said inner curved surface.

49 indicates a flange secured to the stationary section of the discharge chute and lying just inside the opening 10 through the rear end wall of the revolving drum. This flange or collar is substantially circular in outline, with the upper segment of the circle removed, and is arranged to close the opening between the feed chute or spout and the end wall of the drum, except at the top, the flange 14′ of the drum extending just outside of this collar and moving close thereto.

The discharge chute may be arranged to deliver directly upon the ground, or into wheel barrows, or to a collecting hopper, or into any other receptacle provided therefor. I have illustrated it as delivering to a bucket 50 supported by a cable 51 from a trolley 52 running upon the jib or track arm 53 of a swinging crane. The vertical post of the crane is stepped in a bracket 55 suitably supported by the uprights 26 and is supported and steadied by braces 56. A guy rope or cable or brace 57 extending between the upper end of the pivot post 54 and the end of the jib, supports and steadies the latter in a horizontal position. Suitable means for operating the cable 51 for raising and lowering the bucket are provided, but are not illustrated as they form no part of the present invention. By means of the crane attachment described, the mixed concrete can be delivered at all points over quite an extended area to one side of the mixing drum, while the mixing apparatus occupies a single position, an advantage under many conditions of use that will be apparent.

What I claim is:—

1. The combination with a revolving cyl-

inder having an axial feed opening at one of its ends, of a stationary guard plate supported adjacent to and opposite the feed end of the cylinder, and having in it an opening approximately coextensive with and opposite the said feed opening, and provided with a flange surrounding the opening therethrough, the flange entering the feed opening and forming with the edge thereof a close running joint, and inclining inwardly and downwardly toward the interior of the cylinder, substantially as described.

2. In combination with a revolving cylinder having an axial feed opening at one end, a stationary guard plate at the feed end of the cylinder having through it an opening approximately co-extensive with the feed opening of the cylinder and registering therewith, the plate carrying a flange section inclining inwardly and downwardly and overlapping the edge of the upper segment of the opening into the drum and constituting with such edge a close running joint, and a short downwardly and inwardly inclined chute carried by the plate and located in the lower segment of the opening therethrough, the chute extending through the opening into the cylinder, substantially as described.

3. The combination of a revolving cylinder having an axial feed opening at one end, a stationary upright plate supported close to the feed end of the cylinder and having an opening through it registering with the feed opening of the cylinder, a chute carried by the plate and located in the lower portion of the opening therein, the chute extending into the cylinder and a movable loader arranged to charge the cylinder, having an edge arranged to rest upon the said chute when the loader is brought into charging position, the said stationary plate being arranged to close the end of the loader when it assumes said charging position, substantially as described.

4. The combination of a rotary cylinder having an axial feed opening at one end, a stationary guard plate supported close to the feed end of the cylinder and having an opening through it registering with the feed opening into the cylinder, and a flange carried by the said guard plate formed of two sections, one surrounding the upper segment of the opening in the guard plate and the other surrounding the lower segment thereof, and each section inclining inwardly and downwardly toward the interior of the cylinder and together constituting with the edge of the feed opening into the cylinder a close running joint.

5. The combination with a revolving cylinder having an axial feed opening at one end, of a stationary upright guard plate supported close to the feed end of the cylinder and having an opening through it opposite the said feed opening, a chute carried by the plate and located in the lower portion of the opening therein, the chute extending into the cylinder, a movable loader arranged to charge the cylinder having an edge adapted to rest upon the chute when the loader is brought into charging position, and a feed water pipe arranged to deliver into the cylinder below the said chute, the chute extending inwardly beyond the end of the water pipe and being arranged to carry the material delivered by the loader across the open end of the water pipe.

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Witnesses:

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