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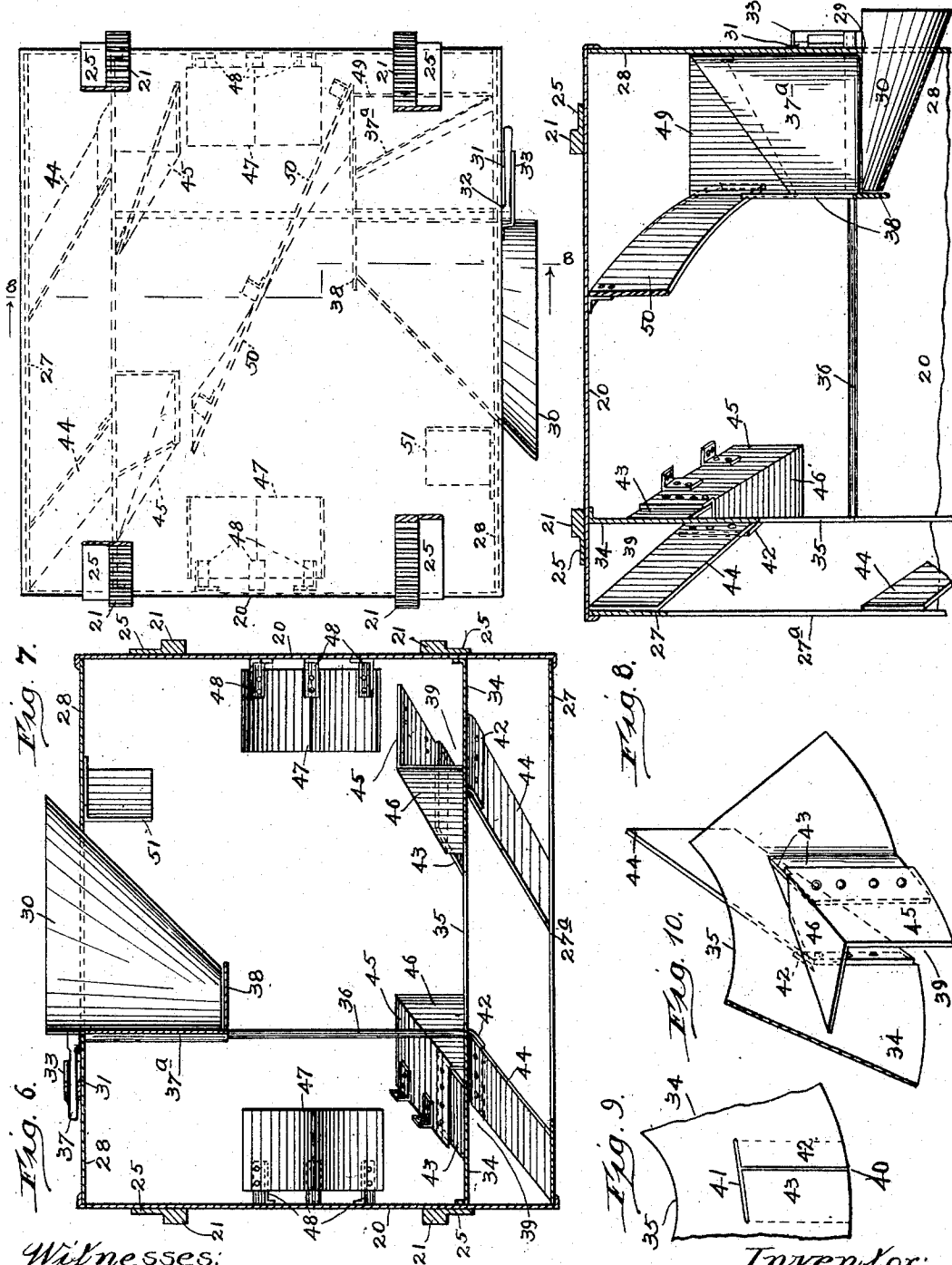
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MIXING MACHINE.
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3 SHEETS—SHEET 2.



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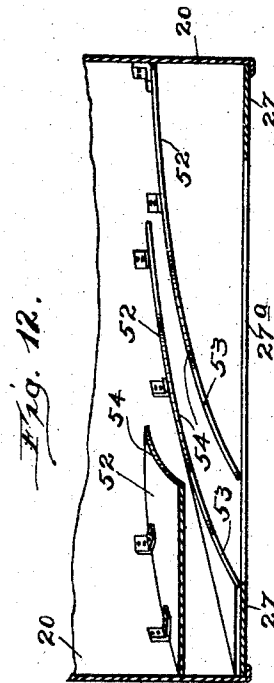
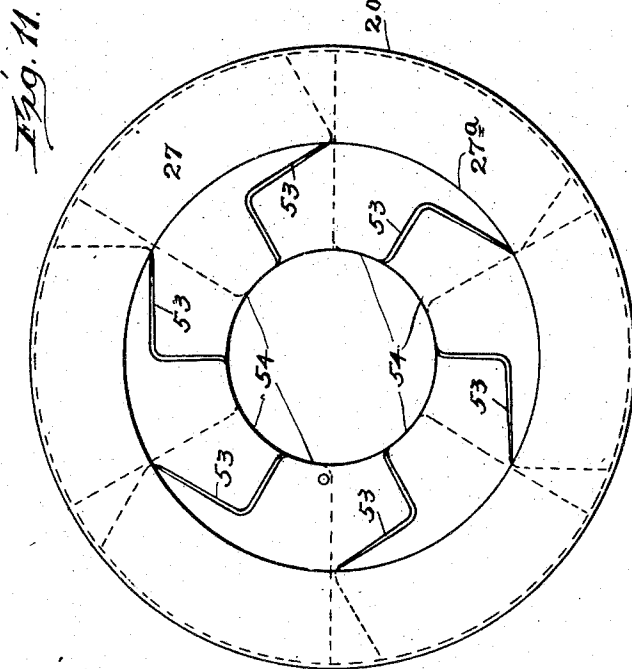
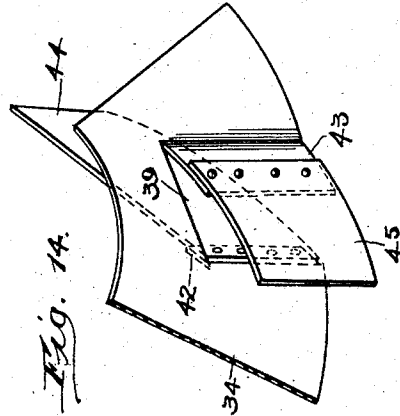
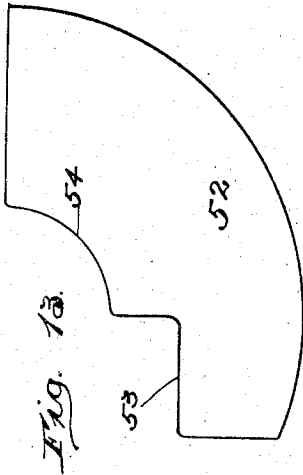
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ANDREW J. CROPP, OF CHICAGO, ILLINOIS, ASSIGNOR TO CROPP CONCRETE MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MIXING-MACHINE.

947,196.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDREW J. CROPP, 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 Mixing-Machines, of which the following is a specification.

This invention relates to improvements in a mixing machine, and has for one of its objects to provide simple, efficient and durable means for thoroughly mixing or intermingling ingredients of various kinds to be used for different purposes, but more particularly for mixing ingredients or materials employed for the production of concrete for any of the usual purposes.

Other objects and advantages of the invention will be disclosed in the subjoined description.

In order to enable others skilled in the art to which my invention pertains, to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in elevation of the discharging end of the mixer, showing the door, by dotted lines, to the discharging chute in its open or elevated position; Fig. 2 is a view in elevation of the receiving or charging end of the machine; Fig. 3 is a detached perspective view of the discharging chute and the door therefor, showing the latter in a partially raised position; Fig. 4 is a perspective view of a portion of the segmental guard and keeper for the handle used for raising and lowering the door of the chute; Fig. 5 is an inner perspective view of a portion of the discharging end of the rotatable drum; Fig. 6 is a horizontal sectional view taken on line 6—6 of Fig. 2; Fig. 7 is a plan view of Fig. 1 showing a portion of the gear bands broken away and illustrating the parts by dotted lines in the positions they will occupy when the mixer is being discharged; Fig. 8 is a longitudinal sectional view taken on line 8—8 of Fig. 7 looking in the direction indicated by the arrows; Fig. 9 is a detail view of a portion of the partition of the drum, showing the flanges thereon to which the deflectors for the material is secured; Fig. 10 is an inner perspective view of a portion of the partition, showing the deflectors or blades secured to the flanges thereof; Fig. 11 is a view in elevation of the receiving end of the mixing drum, showing

a modification in the construction and arrangement of the deflectors or blades; Fig. 12 is a plan sectional view of a portion of the drum, showing a modified form of deflectors; Fig. 13 is a detached view of one of the deflectors of the modified construction; and Fig. 14 is a perspective view of a portion of the partition of the drum, illustrating another modification in the construction of the deflectors.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawings.

The reference numeral 20 designates the mixing receptacle, which is in the form of a drum or cylinder and may be made of any suitable size and material, and has circumferentially mounted on its outer surface near each of its ends a band or circular gear 21 which mesh with gears 22 mounted on a driving-shaft 23 which is suitably journaled on a supporting-frame 24, of the ordinary or any preferred construction, and which shaft may be driven by any suitable means. Each of the gear-bands or rings 21 is provided with a circular or band-like portion 25 which are adapted to rest on rollers 26 journaled on the upper portion of the supporting-frame 24 and in pairs on each side of the mixing drum or receptacle. This drum or receptacle has at its receiving or charging end a circular disk 27 with a central opening therein and at its other or discharging end a head 28 which is provided at about its center with a segmental opening 29 for the reception of the discharging chute 30 which extends some distance into the interior of the drum and preferably projects a slight distance outwardly from the head 28, as is clearly shown in Figs. 6 and 7 of the drawings.

Secured to the outer surface of the head 28 near one of the ends of the opening 29 therein is a segmental keeper and guard for the handle used for raising the door for the discharging chute, which consists of a curved piece 31 having near one of its ends a recess 32 (see Fig. 4) and a correspondingly curved strap or portion 33 connected at its ends to the piece 31, yet so as to be held at a distance therefrom. Located within the drum 20 at a suitable distance from the disk 27 at the charging end thereof is a partition 34 which is secured at its outer edge to the inner periphery of the drum and

is provided with a central opening 35 of considerably less diameter than the opening 27^a of the said disk 27.

Journalled at one of its ends on the partition 34 near the opening 35 therein and at its other end in the head 28 near one end of the opening 29 therein is a shaft 36 which has on its outer end a handle 37 which is extended between the members 31 and 33 of the keeper and guard therefor, and is adapted to engage the recess 32 in the member 31 when it is desired to hold the door 37^a in its closed position, which door is mounted on the shaft 36 and has at its edge adjacent to the inner end of the chute 30 a flange 38 which is adapted to close the inner end of the chute when the door is in its lowered position, and to assist the door in guiding the material to the chute when the door is in its raised position, as shown by dotted lines in Fig. 1 of the drawings. As shown, the chute 30 is segmental or substantially semi-circular in cross-section and tapers from its inner end outwardly, and may be supported at one of its edges on the shaft 36 to which it is loosely connected, so that said shaft may be turned independently thereof. The enlarged or outer portion of the chute 30 is located in and extends through the segmental opening 29 in the head 28, and may be secured thereto in any suitable manner, thus forming out of said head a support for the chute which will prevent it rocking. The partition 34, which as before stated is located at a suitable distance within the drum 20 from the disk 27 thereof, is provided with a series of openings 39 which are preferably located at equal distances apart and in the present instance are shown as being produced by means of radial incisions 40 and incisions 41 at right angles to the inner ends of the first-named incisions, thereby forming flanges 42 and 43 which are deflected in opposite directions and produce the openings 39 above referred to.

As shown in Fig. 9, the incisions or slots 40 in the partition 34 extend from the outer edge thereof inwardly and communicate with the incisions or slots 41 at their inner ends. Secured at one of its ends to each of the flanges 42 is a blade 44 which has its other end secured to the inner surface of the disk 27, and said blades are located diagonally across the space between the disk 27 and the partition 34, as is clearly shown in Figs. 2, 6 and 8 of the drawings. Secured to each of the flanges 43 on the partition 34, which is deflected inwardly as shown, and also to the inner surface of the drum 20, is a blade 45, which blades and the flanges 43 to which they are secured have substantially the same diagonal inclination as the blades 44 and the flanges 42 to which the last-named blades are secured. Secured to the free or inner edge of each of the blades or

deflectors 45 and to the inner surface of the partition 34 is a plate 46, which, together with said parts, form pockets. Mounted on the inner surface of the drum 20 and about midway between the disk 27 and head 28, and diametrically opposite each other, are two V-shaped plows 47 each of which presents its apex in the direction of the rotation of the drum. Each of these plows is secured to the drum 20 and supported at a slight distance from the inner surface thereof by means of a series of brackets 48, one of which is secured at about the middle or apex of the plow and another one at each of the rear portions or ends thereof. While I have shown two of such plows and will ordinarily use said number, yet I do not desire to be limited thereto, as I may employ one or more of the same. Secured to the inner surface of the head 28 and to the drum 20 at a point near the shaft 36 is a plate 49 against which the door 37^a of the chute 30 will rest when in its raised position as shown by dotted lines in Figs. 1 and 7 and by continuous lines in Fig. 8 of the drawings. Extended diagonally and partially across the inner surface of the drum and secured thereto is a plate 50 which, as shown by dotted lines in Fig. 7 and by continuous lines in Fig. 8, projects inwardly from the drum 20, and extends from the inner edge of the plate 49 diagonally to near the inner end of one of the deflectors on the inner surface of the partition 34 at the charging end of the cylinder. On the inner surface of the head 28 and on the inner surface of the drum 20 at a suitable point is secured a plate 51 which projects inwardly of the drum and toward the discharging chute, and also extends inwardly toward the disk 27 in the charging end of the drum.

In Figs. 11, 12 and 13 of the drawings is shown modifications in the construction of the drum and of the deflectors, which consists in providing the drum 20 with a disk 27 as in the other construction, but omitting the partition 34. In this modified construction the drum 20 has secured thereto near the disk 27 a series of plates 52 which are extended diagonally from points at suitable distances apart inwardly from the disk 27 to the inner surface of said disk and may have their outer ends secured thereto by any suitable means. These plates, as shown in Figs. 12 and 13, are spaced apart and have substantially the same diagonal inclination toward the interior of the drum, and have their outer portions cut away as at 53, so as to be of about the same width as that of the disk 27, from the opening therein to its periphery, while their inner portions are widened and provided with curved parts 54, as will be clearly understood by reference to Fig. 13 of the drawings.

In Fig. 14 of the drawings I have shown

still another modification in the construction of the inwardly directing deflectors or plates for the material, which consists in providing the partition 34 with a series of openings 39, as in the first described construction, and flanges 42 and 43 and plates 44 and 45 secured thereto, respectively, which plates and flanges have substantially the same diagonal inclination, but in the modification now under consideration the plates 46, which consists in forming the pockets above referred to and clearly shown in Figs. 6 and 10, are omitted.

From the foregoing and by reference to the drawings it will be clearly understood and readily seen that the drum or mixer may be rotated by means of power supplied to the driving-shaft 23, the rotation of which will, through the instrumentality of the gears 22 and band-gears 21, impart rotary movement to the drum, which, as before stated, is supported by means of the band extensions 25 on the rollers 26 which are mounted on a suitable supporting-frame. As the front or receiving end of the drum is provided with the disk 27 having the central opening 27^a therein, it is apparent that the material, such as sand, gravel, crushed stone and cement may be dumped into the drum over the edge of the disk 27 from wheel-barrows trundled along the supporting-frame or otherwise. When the material shall have been placed into the drum over the disk 27, and when the partition 34 is employed, it is apparent that the material will be caused, in the rotation of the drum, to pass through the openings 39 in said partition by reason of the deflector plates 44 and 45, and will be directed diagonally toward the middle of the drum where it will be separated and a portion thrown toward one head of the drum and a part toward the other head thereof by means of the V-shaped plows 47, which, as before stated, have their points or apexes presented in the direction of the rotation of the drum. In this operation the plates 46 which, in conjunction with the partition 34 and deflector plates 45 form pockets, will serve to somewhat retard or retain the material between the plates 45 and partition 34 until the material has been carried upwardly by the rotating drum, when, by reason of the gravity of the material, it will be discharged from said positions inwardly toward the plows, which act thereon, as above described. While the mixing of the material is thus carried on the door 37^a to the chute may be held in its closed position by placing the handle 37 in the recess 32 of the keeper for said handle, and when it is desired that the material may be discharged from the drum the door 37^a may be raised to the position shown by dotted lines in Figs. 1 and 7, when it is apparent that its outer portion will rest

against the plate 49 while the flange 38 on the door will lie at the inner portion or edge of said plate and the inner end of the chute 30, and thus assist in forming a guide for directing the material into the chute from the diagonally disposed plate 50 which will accumulate material thereon in the rotation of the drum.

When the modified constructions shown in Figs. 11 to 14, inclusive, and above-described, are employed, substantially the same operation is performed.

By reference to the drawings it will be seen that the chute 30 is segmental in cross-section and is tapered inwardly, and that the door 37^a has its free end cut away to correspond with the taper of the chute and also to correspond with the cut away portion of the inwardly extending plate 49 (see Figs. 5 and 8 of the drawings.) By thus forming the chute and door it is apparent that in the rotation of the drum the material will not clog on the door, that is to say, the reduced portion of the door will present a very small area for any of the material to lodge on, thus enabling the door to be easily operated and to be made of lighter material, and also relieving it, as well as its keeper, of great strain.

I hereby disclaim the following claim, to-wit: In a mixer, in combination, a revoluble drum, means therein to agitate and mix the material, a continuous series of circularly arranged charging pockets located at one end of the drum within its cylindrical wall and closed at their outer ends, the open inlets of the pockets being turned toward the axis of the drum, a circular head having its periphery contacting with the tops of the pocket walls and set in from the adjacent end of the drum, and means to introduce material to the inlets of the pockets outside of said head.

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

1. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, means to direct the material inwardly of the receptacle from the disk thereof, an inwardly tapered discharging chute located in the opening of the discharging end and extended into the receptacle, a door tapered to correspond with the taper of the chute and pivotally mounted within the receptacle near one side of the chute and having at its inner portion a transversely disposed flange.

2. The rotary mixing receptacle having a centrally apertured disk at its receiving end and another at its discharging end provided with an opening at about its center, means to direct the material inwardly of the receptacle from the disk thereof, a discharge

chute located in the opening of the disk at the discharging end of the receptacle and extended into the latter, a door pivotally mounted within the receptacle near one side of the chute and having at its inner edge a flange, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door, and another plate diagonally disposed from the last named plate partially across the inner surface of the receptacle.

3. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, means to direct the material inwardly of the receptacle from the disk thereof, a discharge-chute located in the opening of the discharge disk and extended into the receptacle, a door pivotally mounted in the receptacle near one side of the chute, a diagonally disposed plate secured to the inner surface of the receptacle, and one or more V-shaped plows mounted on the inner surface of the receptacle about midway between its ends.

4. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, spaced apart and diagonally disposed deflector blades secured to the inner surface of the receptacle and extended inwardly from the disk thereof, a discharge chute located in the opening of the discharging end and extended into the receptacle, a door pivotally mounted within the receptacle near one side of the chute, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door, another plate diagonally disposed from the last-named plate partially across the inner surface of the receptacle, and means to hold the door in its closed position.

5. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, a centrally apertured circumferential partition located within the receptacle at a distance from the disk thereof and having openings, a series of deflector blades diagonally disposed between the partition and disk at one side of the openings in the former, a series of diagonally disposed deflector blades extended inwardly from the other sides of the openings in said partition, a discharge chute located in the opening of the discharging end and extended into the receptacle, a door pivotally mounted within the receptacle near one side of the chute and adapted to open and close the same and to assist in guiding the material thereto when in its opened position, one or more V-shaped plows mounted on the inner surface of the receptacle about midway between its ends, and a plate diagonally dis-

posed partially across the inner surface of the receptacle from the path of the door.

6. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, a circumferential partition located within the receptacle at a distance from the disk thereof and having openings, a series of deflector blades diagonally disposed between the partition and disk at one side of the openings in the former, a series of diagonally disposed deflector blades extended inwardly from the other sides of the openings in said partition, a discharge chute located in the opening of the discharging end and extended into the receptacle, a door pivotally mounted within the receptacle near one side of the chute, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door, another plate diagonally disposed from the last-named plate partially across the inner surface of the receptacle, and means to hold the door in its closed position.

7. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, spaced apart and diagonally disposed deflector blades secured to the inner surface of the receptacle and extended inwardly from the disk thereof, a discharge chute located in the opening of the discharging end and extended into the receptacle, a door pivotally mounted within the receptacle near one side of the chute and having at its inner edge a flange, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door, and another plate diagonally disposed from the last-named plate partially across the inner surface of the receptacle.

8. The rotary mixing receptacle having a centrally apertured disk at its receiving end and provided with an opening at about the center of its other end, a circumferential partition located within the receptacle at a distance from the disk thereof and having openings, a series of deflector blades diagonally disposed between the partition and disk at one side of the openings in the former, a series of diagonally disposed deflector blades extended inwardly from the other sides of the openings in said partition, a plate secured to the inner surface of the partition at the inner part of each of the openings therein and to each of the deflector blades extending inwardly from the partition to form pockets, a discharge chute located in the opening of the discharging end of the receptacle and extended into the same, a door pivotally mounted within the receptacle near one side of the chute, a plate secured to the receptacle at its discharging

end and extended radially thereinto within the path of the door, and another plate diagonally disposed from the last-named plate partially across the surface of the receptacle.

9. The rotary mixing receptacle having at its receiving end a charging device consisting of a centrally apertured disk secured to the receptacle, and a series of blades extended at their outer ends from the disk inwardly and diagonally with respect to the receptacle for a short distance from the disk for the purpose of directing the material into the receptacle, said blades having their portions adjacent to the disk of substantially the same width as said disk from the opening therein to its periphery and their inner portions widened.

10. The rotary mixing receptacle having a centrally apertured disk at its receiving end, a circumferential partition located within the receptacle at a distance from the disk thereof and having openings therein, a series of deflector blades diagonally disposed between the partition and disk and at one side of the openings in the former, and a series of diagonally disposed deflector blades extended inwardly from the other sides of the openings in said partition.

11. The rotary mixing receptacle having a centrally apertured disk at its receiving end, a circumferential partition located within the receptacle at a distance from the disk thereof and having openings, a series of deflector blades diagonally disposed between the partition and disk and at one side of the openings in the former, a series of diagonally disposed deflector blades extended inwardly from the other sides of the openings in said partition, and a plate secured to the inner surface of the partition at the inner end of each of the openings therein and to the inwardly extending deflector blades to form pockets.

12. The rotary mixing receptacle having an opening in its discharging end, a chute located in said opening and extended into the receptacle, a door pivotally mounted within the receptacle and adapted to open and close the chute and to assist in guiding the material thereto, and a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door.

13. The rotary mixing receptacle having an opening in its discharging end, a chute located in said opening and extended into the receptacle, a door pivotally mounted within the receptacle and adapted to open and close the chute and to assist in guiding the material thereto, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door, and another plate diagonally disposed from the last-named plate partially across the inner surface of the receptacle.

14. The rotary mixing receptacle having an opening in its discharging end, a chute located in said opening and extended into the receptacle, a door pivotally mounted within the receptacle near one side of the chute and having at its inner edge a flange, a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door.

15. In a mixer, in combination, a revolvable drum having an apertured disk at its receiving end, means within the drum to agitate and mix the material, a continuous series of circularly arranged charging pockets located at one end of the drum within its cylindrical wall and closed at their outer ends and having their outer portions of substantially the same width as the said disk from the opening therein to its periphery and their inner portions widened, and means to introduce material to the inlets of the pockets.

16. The rotary mixing receptacle having an opening in its discharge end, a tapered chute segmental in cross-section located in said opening and having its reduced end extended into the receptacle, a door pivotally mounted within the receptacle and adapted to open and close the chute and having its free end cut away to correspond with the taper of the chute, and a plate secured to the receptacle at its discharging end and extended radially thereinto within the path of the door and having its free end cut away to correspond with the cut away portion of the door.

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