W. R. TUTTLE.

DRUM BATCH MIXER.

APPLICATION FILED JAN. 23, 1909.

939,762.

Patented Nov. 9, 1909.

4 SHEETS—SHEET 1.

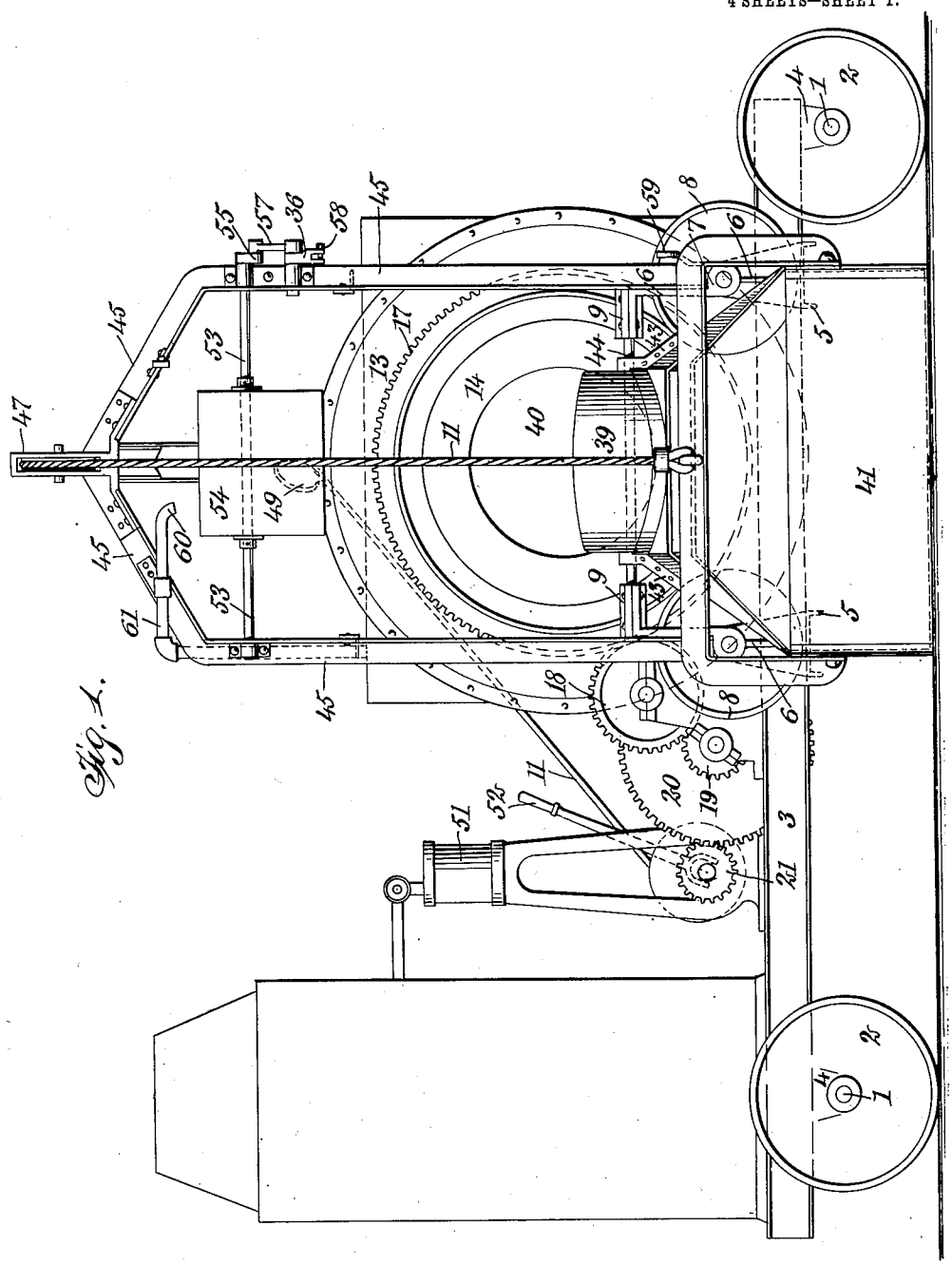

Fig. 1.

WITNESSES

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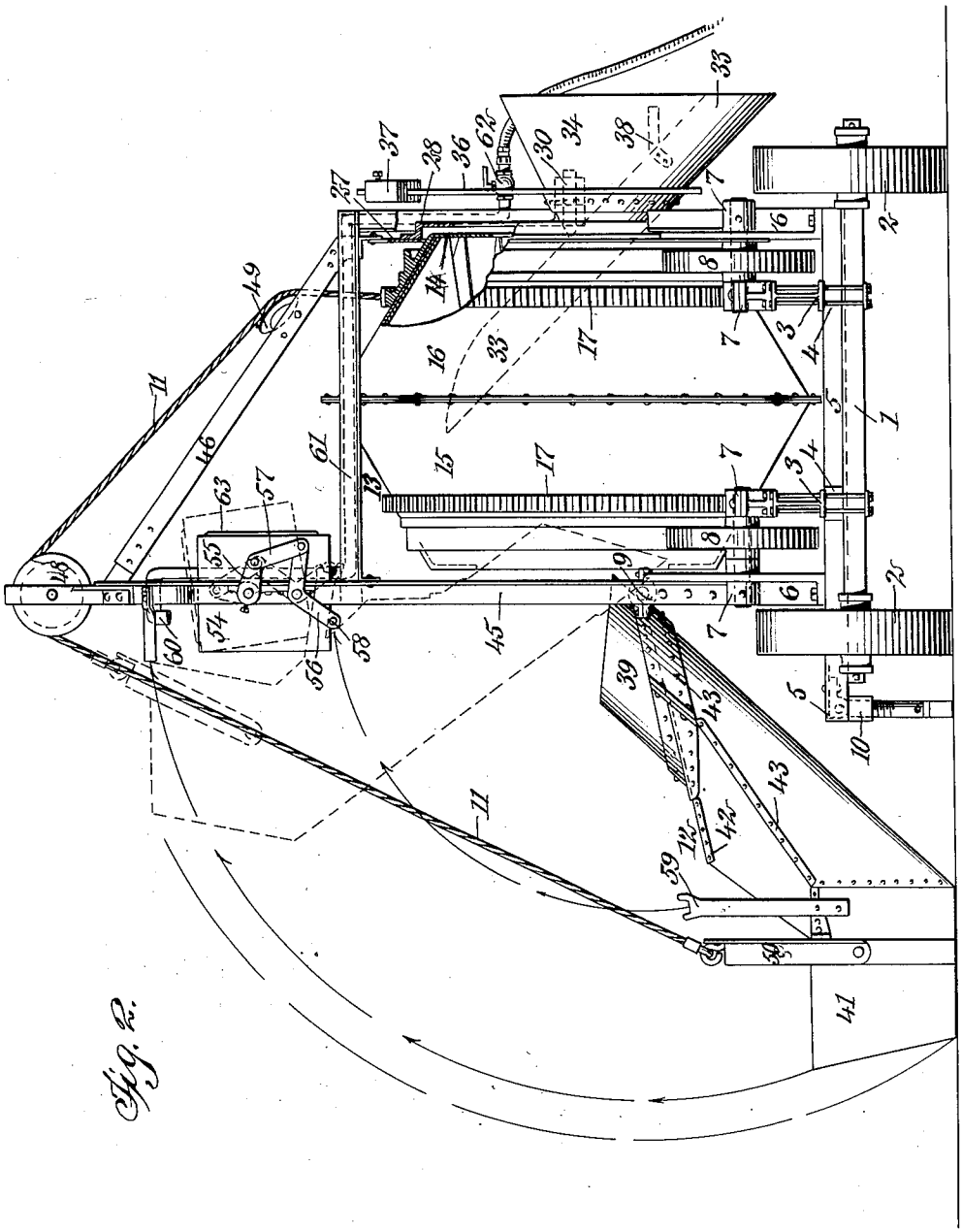

Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 4.

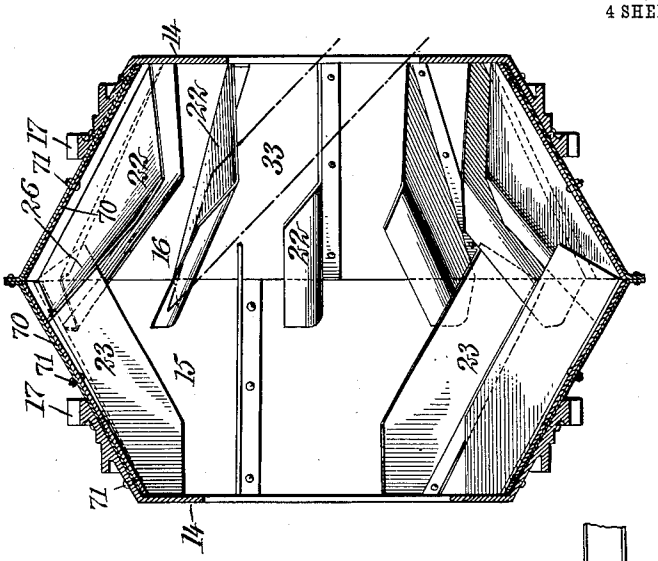

Fig. 3.

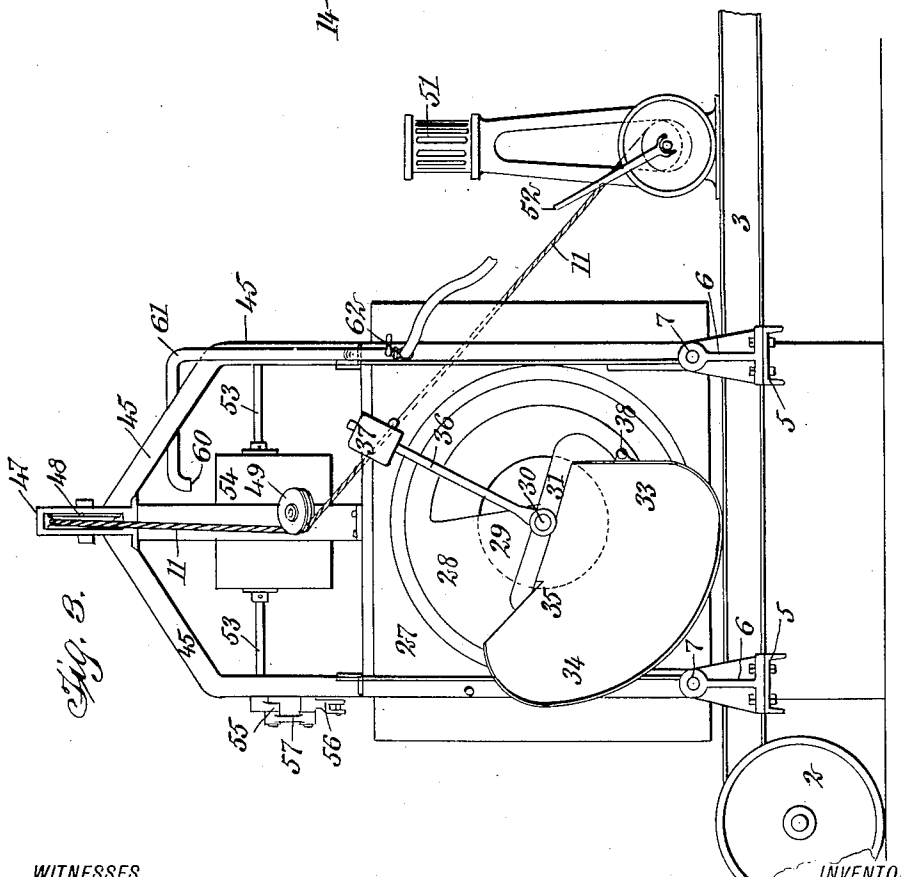

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Fig. 6.

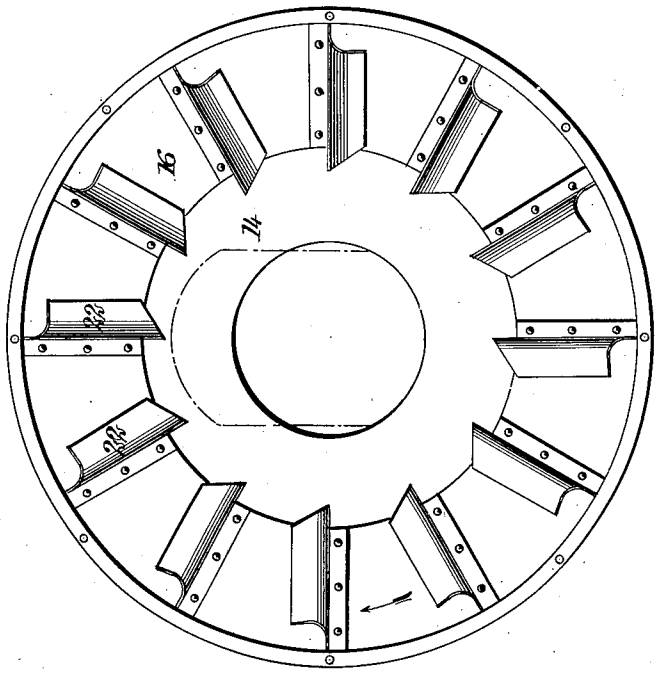
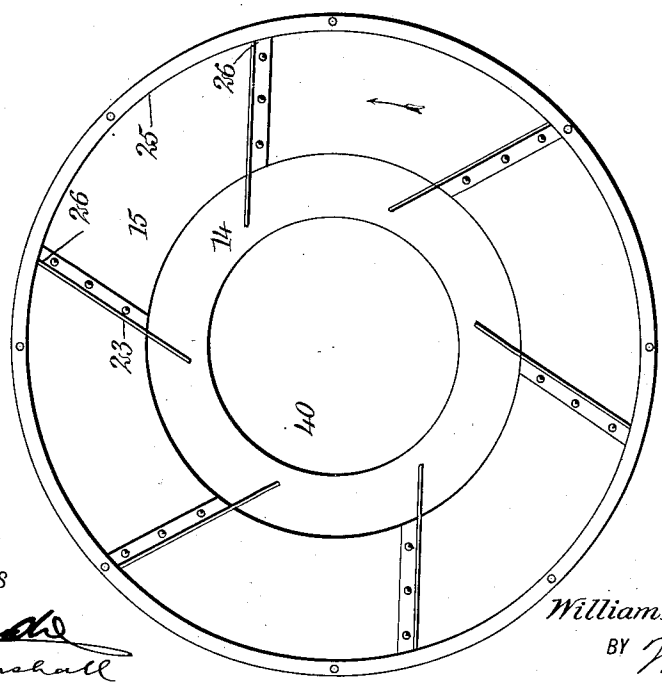


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM RAYMOND TUTTLE, OF NUNDA, NEW YORK.

DRUM BATCH-MIXER.

939,762. Specification of Letters Patent. Patented Nov. 9, 1909.

Application filed January 23, 1909. Serial No. 473,837.

To all whom it may concern:

Be it known that I, WILLIAM RAYMOND TUTTLE, a citizen of the United States, and a resident of Nunda, in the county of Livingston and State of New York, have invented a new and Improved Drum Batch-Mixer, of which the following is a full, clear, and exact description.

My invention relates to drum batch mixers, and it has for its object to provide one which may be charged and discharged more quickly and thoroughly than those now in use; one which will thoroughly mix and knead concrete and other materials, and one which has its members so constructed and disposed that the greatest strength and efficiency will be obtained.

Still other objects of the invention will appear in the following complete description.

In this specification I will describe the preferred form of my drum batch mixer, it being understood that the scope of the invention is defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures in which—

Figure 1 is a side elevation of my invention; Fig. 2 is an end elevation; Fig. 3 is an elevation showing the arrangement of the discharge chute; Fig. 4 is a transverse section of the mixing drum; Fig. 5 is an interior view of the charging side of the mixing drum; and Fig. 6 is an interior view of the discharging side of the mixing drum.

By referring to the drawings, it will be seen that axles 1 are provided, on which are journaled wheels 2, longitudinally disposed I-beams 3 being provided which serve as sills, the I-beams 3 being secured to the axles 1 and being supported on them by blocks 4. Secured under the sills 3 are transverse members 5 and to these transverse members 5 are secured brackets 6, bearings 7 being mounted on the sills 3 and on the brackets 6, supporting rollers 8 being journaled in the said bearings. At the charging side of the batch mixer the brackets 6 are continued upwardly and inwardly, there being bearings 9 on the upper terminals of the brackets 6 and in these bearings 9 the loading device 12 is journaled. The transverse members 5 project at the charging side of the batch mixer beyond its body and to the projected terminals of the transverse members 5 are pivoted jacks 10 which serve as supports and which also extend the base of the mixer to counteract the strain to which the mixer is subjected when the loading device 12 is raised by its cable 11.

On the supporting rollers 8 is disposed a drum 13, the drum having heads 14, the sides of the drum diverging from the heads toward the center of the drum, the drum being preferably made in two sections, one of which is referred to by the reference character 15 as the charging side of the drum and the other referred to by the reference character 16 as the discharging side of the drum. The angle of the sides of the drum is preferably 30° with reference to the drum's axis, each side of the drum being frusto-conical in shape. Gear teeth 17 are mounted on the drum and with these gear teeth 17 mesh gear wheels 18 mounted on a shaft journaled in the frame by which the drum is rotated, the gear wheels 18 meshing with the gear wheel 19 which is fastened on a shaft to which a gear wheel 20 is also secured, this gear wheel 20 being driven by a gear wheel 21 connected with the engine.

By referring to Fig. 6 of the drawings, it will be seen that the interior of the discharge side of the mixing drum has secured to its sides concave wings 22, the wings 22 being disposed from a point in close proximity to a head of the drum to a point beyond the greatest diameter of the drum, the sides of the wings diverging toward the head of the drum and being disposed radially of the axis of the drum, the inner terminals of the wings being secured to the charging side of the drum beyond the drum's greatest diameter. The outer terminals of the wings are cut obliquely so that the outer end will form an obtuse angle with the inner sides of the wings.

To the interior of the charging side of the drum are secured wings 23, the wings 23 being disposed at such angles leading inwardly that when material is dumped in the charging side of the drum, the wings 23 will direct the material to the center of the drum during the drum's rotation. As shown in Fig. 5, when the drum is rotated in the direction of the arrow, the wings 23 will lead the material from the head 14 to the greatest diameter of the drum at a point 25. This is accomplished by disposing the wings at an angle to the head with their outer ter-

minals in advance of their inner terminals, so that the outer terminals of the wings will engage the material which will be led inwardly as the drum rotates, and the outer terminals are raised upwardly in advance of the inner terminals of the wings. The wings 23 are secured to the head 14 of the charging side of the drum, and inwardly the wings 23 project at 26 beyond the center of the drum so that the wings 23 and the curved wings 22 will lap each other.

At the discharging side of the drum the head 14 projects through an opening in a face plate 27 secured to the frame. To this face plate 27 is secured a casting 28, the casting 28 having an arm 29 which projects beyond the axis of the drum 13. On the arm 29 is disposed a hub 30 to which a discharge chute casting 31 is journaled. To this discharge chute casting 31 is riveted or otherwise secured a discharge chute 33, which is disposed at an angle to the discharge chute casting 31 which is journaled to rotate on the hub 30 as stated. This discharge chute 33 is disposed partly within and partly without the drum 13 and it is constructed in the usual manner with a concave surface. To one side of this discharge chute 33 is secured a cone-shaped flange 34, which, however, if desired, may be constructed integral with the discharge chute 33. An apex 35 of the cone-shaped flange extends slightly within the drum 13 so that the material mixed in the drum will be led to the cone-shaped flange 34 when the said flange is downwardly disposed.

The radii of the outer terminal of the discharge chute and of the cone-shaped flange are substantially the same from the plane of the axis of the discharge chute casting, so that when the discharge chute casting is rotated and the discharge chute 33 is moved to a position at right-angles to its position for discharge, the cone-shaped flange 34 will be disposed in a position previously occupied by the outer terminal of the discharge chute. To the discharge chute casting 31 is secured an arm 36 disposed opposite the outer periphery of the discharge chute and to this arm 36 is secured a counterweight 37. To the outer terminal of the discharge chute 33 is secured a handle 38 by which it may be operated. The inner portion 39 of the loading device 12 is elliptical in shape in cross section and the inner terminal is cut obliquely so the form of the inner terminal will be in the shape of an ellipse, an opening 40 in the charging side of the drum being annular.

The bottom of the loading device from a hopper 41 to its inner terminal is straight, but the top of the device at the outer terminal of the cylindrical portion is raised at 42, this raised portion 42 being inclosed so that the material not only when passing through the cylindrical portion 39 but also for a period before it reaches the cylindrical portion will be completely inclosed by the loading device, to prevent any material from dropping at the side of the mixer. The loading device is strengthened by straps 43, trunnions 44 being secured to these straps, the trunnions being journaled in the bearings 9.

To the brackets 6 on the charging side of the mixer are secured upwardly extending angle members 45, these members 45 uniting and being secured at their upper terminals, and to these members 45 is secured an upwardly extending brace member 46 which is secured to the frame at the rear of the mixer. A U-shaped standard 47 is secured to the members 45 and in this U-shaped standard 47 is journaled a pulley 48, a pulley 49 being journaled on the member 46. The cable 11 which is secured to a U-shaped member bail 50, pivoted to the hopper 41, passes over the pulley 48 and also over the pulley 49, the latter being disposed at such an angle that it will permit the cable 11 to be led to the drum of an engine 51, the drum being connected to the shaft of the engine by means of a clutch, not shown, and a lever 52, all of which is familiar to those acquainted with the art.

To the members 45 are journaled trunnions 53, the trunnions 53 supporting a bucket 54, and one of them passing through a member 45, and having secured to its terminal an arm 55, a bell crank lever 56 being pivoted to the arm 45 below the arm 55 and the arm 55 being connected to one of the arms of the bell crank lever 56 by a link 57. The other arm of the bell crank lever 56 has a boss 58 with which an arm 59 on the hopper 41 is adapted to engage. The bucket 54 is so mounted on the trunnions 53 with its center of gravity so disposed that it normally will remain in an upright position to retain the fluid. Over the bucket 54 there is a terminal 60 of a pipe 61, the bucket 54 being filled by water flowing through this pipe 61, the pipe 61 extending across the machine to the discharge side where it is controlled by a cock 22.

It will be seen that the lever 52, the cock 62 and the handle 38 on the discharge chute are all on the same side of the mixer so that one man may operate it.

The wings 22 and 23 may be riveted to linings 70 (see Fig. 4) which may be secured to the drum 13 by bolts 71. By this construction the wings 22 and 23 may be readily removed after the drum has been opened at its center and new wings secured to the linings may be introduced.

The rear of the bucket 54 is provided with a glass gage 63 in order that the operator in charge may, by means of the cock 62, fill the bucket 54 to the desired height. In the

operation of the mixer the hopper 41 is filled with the water, sand, lime, broken stone, or other ingredients in the customary manner and preferably the hopper is divided by partitions not shown, to assist in the loading of the hopper, as the practice is to dispose each one of the several materials in a separate compartment open toward the mixer.

When the materials are deposited in the hopper and the bucket 54 is filled to the desired height by means of water flowing through the pipe 61, which is commanded by the cock 62, the operator by means of the lever 52 connects the drum mounted on the engine with the shaft, thereby hauling the cable 11 and lifting the hopper 41 so that it will be disposed in the position shown by the dotted lines in Fig. 2 of the drawings. As the inner terminal of the loading device is elliptical in shape, it will contact at two points with the drum 13, as the loading device is raised, and the inner terminal of the loading device will be held firmly within the hopper by this frictional contact. As the material slides from the hopper along the chute which forms a part of the loading device, it will be surrounded by the chute from a point at some distance from the cylindrical portion 39 of the loading device, so that there will be absolutely no danger that the material will drop from the loading device to the side of the mixer. As the hopper is raised, the arm 59 will contact with the boss 58 on the bell crank lever 56, which by means of the link 57 will operate the arm 55, whereby the bucket 54 will be tilted to permit its contents to flow into the bucket 41 and that portion of the chute which is in close proximity thereto. The materials, including the water, having been dumped into the drum 13, the loading device 12 is lowered and the drum 13 is rotated, but it will be understood that it is unnecessary to stop the drum in order that it may be charged with material. When the material enters the drum and the drum is rotated, the wings 23 will move the material to the center of the drum and the concave wings 22 will lift the material from the bottom of the drum, permitting it to fall as the wings move to an elevated position. By this means the materials are thoroughly mixed and the frusto-conical shape of the drum permits the materials to be kneaded as they roll along its side, which is temporarily disposed to form the bottom. As the curved wings 22 and the wings 23 overlap each other, the wings will at all times direct the material so that it will be engaged by the curved wings 22. As the curved wings extend beyond that portion of the drum which has the greatest diameter, the material as it rolls down the side of the drum at its bottom, to be disposed at the middle of the bottom of the drum, the curved wings 22 will at all times be in position to engage the material and lift it as has been described.

When the material has been thoroughly mixed, the operator by turning the discharge chute 33 so that it will be in the position shown in Fig. 3, will be able to discharge the contents of the drum, for the curved wings 22 which lift the material, as has been described, are so disposed that they dump the material just above the inner portion of the discharge chute 33, and the material therefore slides along the discharge chute into a receptacle disposed under its outer terminal. As the discharge chute is disposed at an angle to the bearing 30 of the discharge chute casting 31, by turning the discharge chute casting 31, 45° the discharge chute 33 may be disposed parallel with the axis of the drum so that it will no longer be in position for discharge and will not interfere with the operation of the curved wings 22 in the mixing of the materials in the drum. When the discharge chute 33 is disposed horizontally, the flange 34 will occupy the position previously occupied by the outer terminal of the discharge chute and it will serve to convey the last of the material which may be sliding on the discharge chute when the discharge chute is thrown into an inoperative position. The counterweight 37 on the arm 36 will balance the discharge chute so that it may be easily moved by means of its handle 38.

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

1. In a batch-mixer, a drum having heads, the sides of the drum converging toward its heads, and wings secured to the inside of the drum, the wings being disposed from a point in close proximity to one of the heads of the drum to a point beyond the greatest diameter of the drum.

2. In a batch mixer, a drum converging toward its ends, and radially disposed wings secured to the inside of the drum, the wings being disposed from a point in close proximity to one of the ends of the drum to a point beyond the greatest diameter of the drum.

3. In a batch-mixer, a drum converging toward its ends, and concave wings spaced apart disposed in the drum from a point in close proximity to one of its ends to a point beyond the greatest diameter of the drum.

4. In a batch-mixer, a drum converging toward its ends, and concave wings spaced apart disposed in the drum to rotate therewith from a point in close proximity to one of its ends to a point beyond the greatest diameter of the drum, the outer ends of the wings being cut obliquely to form obtuse angles with their inner sides.

5. In a batch-mixer, a drum converging

toward its ends, and radially-disposed wings spaced apart disposed in the drum to rotate therewith, the wings extending from a point in close proximity to one of the ends of the drum to a point beyond the greatest diameter of the drum, the outer ends of the wings being cut obliquely to form obtuse angles with their inner sides.

6. In a batch-mixer, a drum converging toward its ends, and wings spaced apart disposed inwardly from the sides of the drum from a point in close proximity to one of the ends of the drum to a point beyond the drum's greatest diameter, the planes of the wings being disposed at an angle to the radii of the axis of the drum.

7. In a batch-mixer, a drum, concave wings spaced apart disposed inwardly from the side of the drum, the oppositely-disposed wings converging toward one of its ends, and wings disposed inwardly from the side of the drum, the said wings converging toward the other end of the drum with their planes disposed at an angle to the radii of the axis of the drum, the inner terminals of the two sets of wings lapping each other.

8. In a batch-mixer, a drum converging toward its ends, concave wings spaced apart disposed inwardly from the side of the drum, the sides of the concave wings diverging outwardly, and wings disposed from the side of the drum, the planes of the said wings being disposed at an angle to the radii of the axis of the drum, the inner terminals of the two sets of wings lapping each other.

9. In a batch-mixer, a drum converging toward its ends, radially-disposed concave wings spaced apart disposed inwardly from the side of the drum, the sides of the concave wings diverging toward one of the ends of the drum, and wings disposed inwardly from the side of the drum, the planes of the said wings being disposed at an angle to the radii of the axis of the drum, each set of wings extending inwardly beyond that portion of the drum having the greatest diameter.

10. In a batch-mixer, a drum converging toward its ends, radially-disposed concave wings spaced apart disposed inwardly from the side of the drum, the sides of the concave wings diverging toward one of the ends of the drum, wings disposed inwardly from the side of the drum, the planes of the said wings being disposed at an angle to the radii of the axis of the drum, each set of wings extending inwardly beyond that portion of the drum having the greatest diameter, and means to rotate the drum.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM RAYMOND TUTTLE.

Witnesses:
F. G. Olp,
R. E. Balty.