

C. M. WHITNEY & E. C. VAN LEUVEN.

CONCRETE MIXER.

APPLICATION FILED MAR. 13, 1909.

1,038,698.

Patented Sept. 17, 1912.

3 SHEETS—SHEET 1.

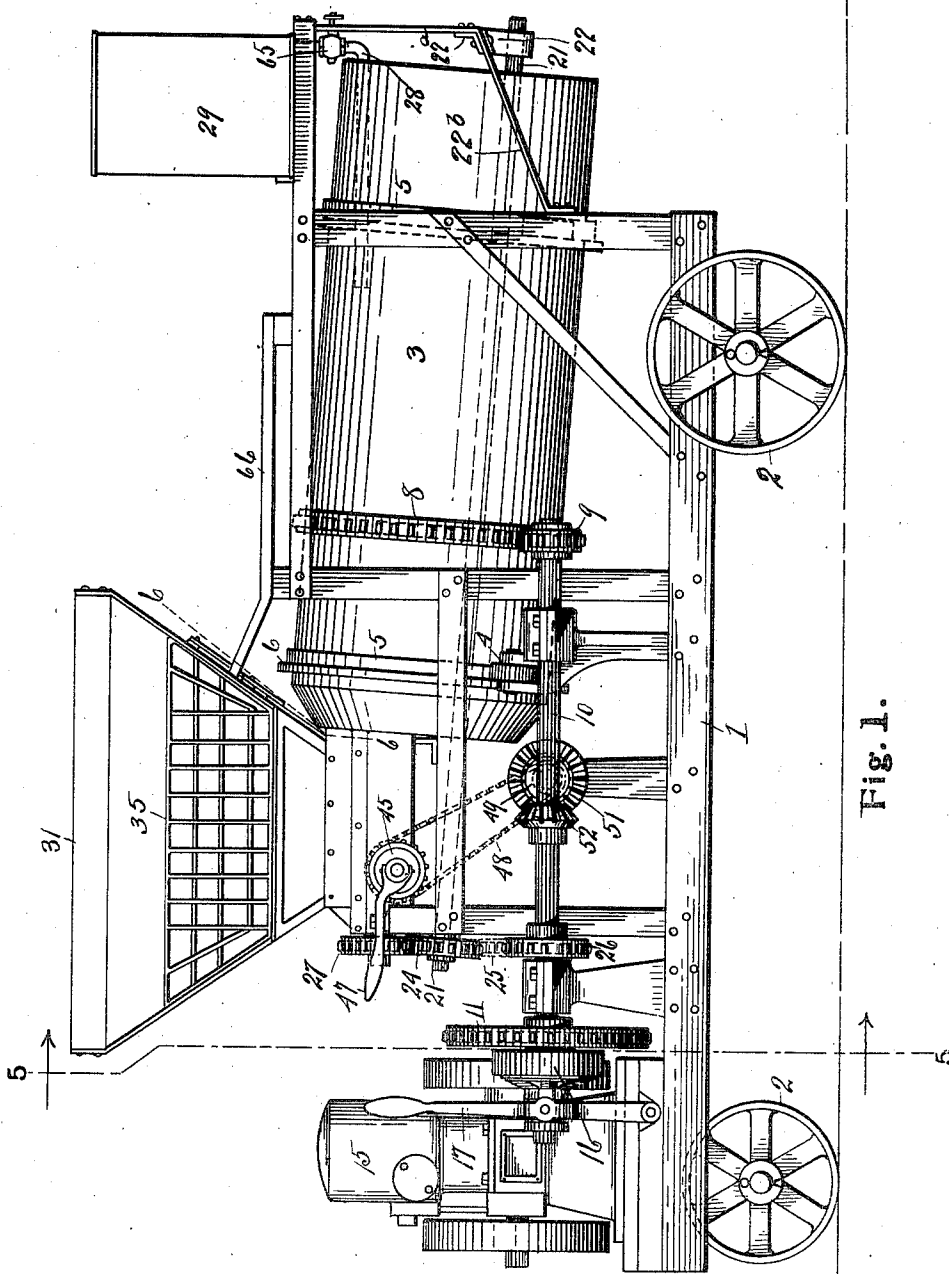


Fig. 1.

Witnesses
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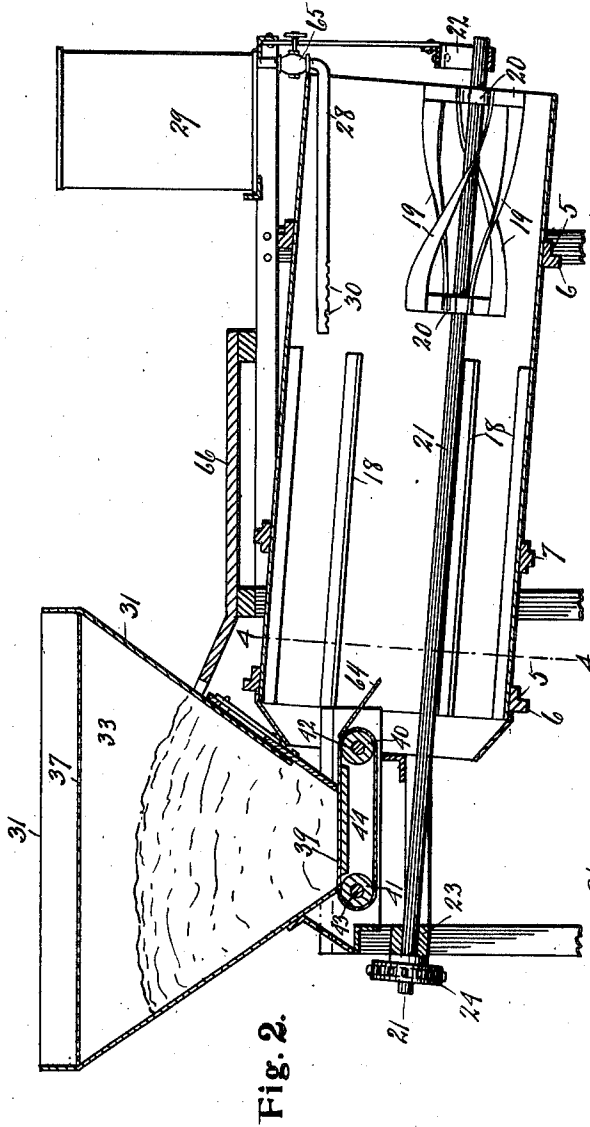


Fig. 2.

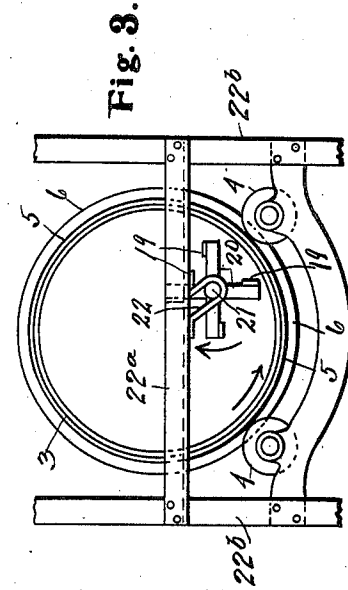


Fig. 3.

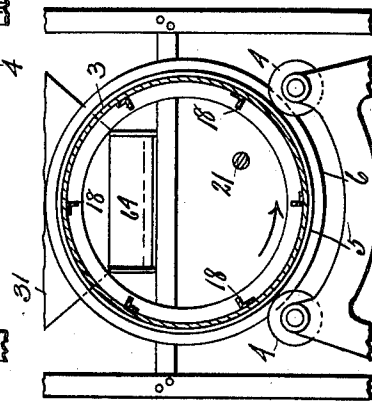


Fig. 4.

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3 SHEETS—SHEET 3.

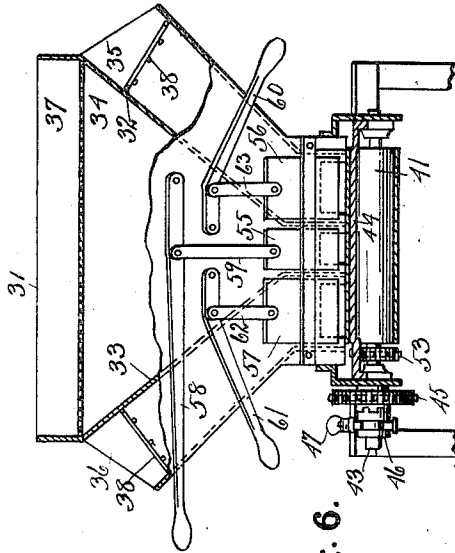


Fig. 6.

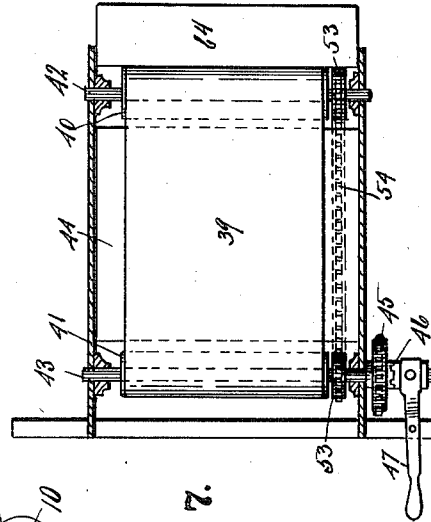


Fig. 7.

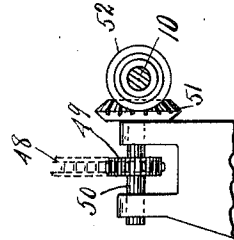


Fig. 8.

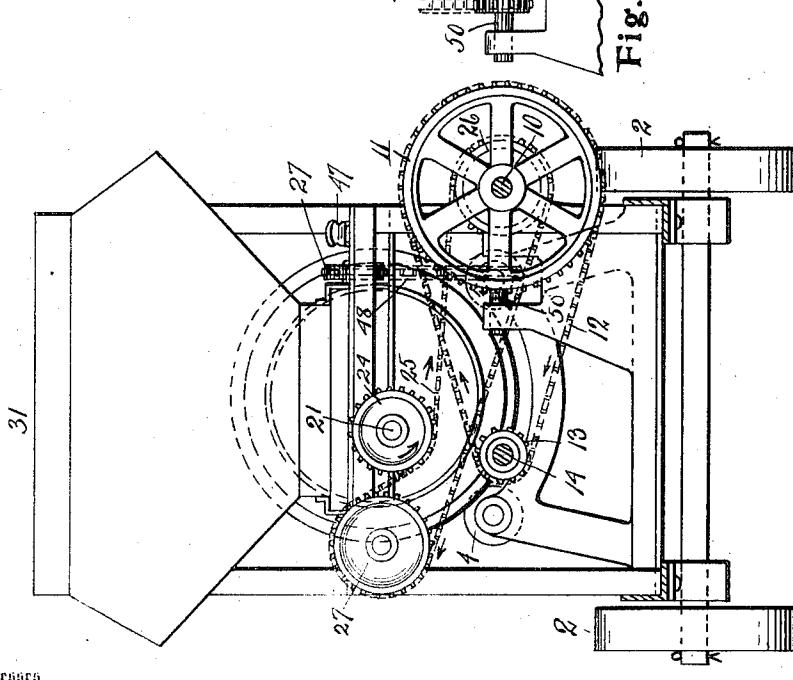


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

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CONCRETE-MIXER.

1,038,698.

Specification of Letters Patent.

Patented Sept. 17, 1912.

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To all whom it may concern:

Be it known that we, CALVIN M. WHITNEY and EDWARD C. VAN LEUVEN, citizens of the United States, residing at Jackson, in the county of Jackson, State of Michigan, have invented certain new and useful Improvements in Concrete-Mixers; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to machines for mixing concrete, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claim.

The object of the invention is to provide simple and efficient means for mixing concrete and discharging the mixture from the mixing drum, provision being made for preventing the clogging of the mixing drum during the mixing operation.

The above objects are attained by the mechanism illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a concrete mixer involving our invention. Fig. 2 is a central longitudinal section therethrough, the transportable frame carrying the mechanism, being broken away. Fig. 3 is a rear end elevation of the mixing drum. Fig. 4 is a transverse section through the upper end of the mixing drum, as on line 4—4 of Fig. 2. Fig. 5 is a sectional view as on line 5—5 of Fig. 1. Fig. 6 is a fragmentary view in section, as on line 6—6 of Fig. 1. Fig. 7 is a fragmentary view in horizontal section through the bottom portion of the hopper frame, showing a top plan of the positively driven feeding belt therein and the means for driving said belt. Fig. 8 is a fragmentary detail, partly in section, showing the stub shaft through the medium of which movement is imparted to the feeding mechanism below the hopper of the machine.

Referring to the characters of reference, 1 designates a suitable frame, preferably mounted upon wheels 2 to enable the apparatus to be readily moved from place to place. Mounted to rotate in the frame

about an inclined axis is a mixing drum 3 supported at its ends upon the antifriction rollers 4 which roll in peripheral contact with the rings 5 having the projecting flanges 6 which engage the sides of said rollers 4 and maintain the inclined mixing drum in position while rotating. A rotary movement is imparted to said drum through the medium of a sprocket ring 7 mounted thereon, around which passes a sprocket chain 8 driven by a pinion 9 on the end of the main shaft 10 supported in suitable bearings on the frame. The shaft 10 is rotated by means of a sprocket wheel 11 thereon over which passes a sprocket chain 12 driven by a pinion 13 on the shaft 14 of the motor which is herein illustrated as an ordinary type of gasoline engine 15. The sprocket wheel 11 is loose upon the shaft 10 and is made fast thereto for the purpose of driving the mechanism by means of an ordinary friction clutch 16 operated by a suitable lever 17.

Within the upper end of the drum and extending longitudinally thereof for a distance equal to about one-half of the length of the drum, are the inwardly extending flanges 18 which lie parallel with the axis of the drum, and which as the drum rotates on its inclined axis, successively lift and drop the materials, causing a constant shifting and sliding movement of said materials as they work longitudinally of the drum, effecting a thorough commingling thereof while in a dry state. At the lower end of the mixing drum is a mixer mounted to rotate rapidly and comprising the separately formed blades 19 secured at their ends to the radial arms of the heads 20 fixed to the shaft 21 which passes longitudinally through the drum near the lower arc thereof and at a point one side of the center. The lower end of the shaft 21 is journaled in a slotted hanger or bearing 22, supported exteriorly of the drum upon a cross bar 22^a carried by brackets 22^b secured to the frame, as clearly shown in Fig. 3, the upper end of said shaft extending some distance through the upper end of the drum and being supported in a suitable bearing box 23. Upon the extreme upper end of the shaft 21 is a sprocket wheel 24 adapted to be driven by a sprocket chain 25 which passes over the sprocket wheel 26 on the shaft 10 and over the idle sprocket wheel 27 jour-

naled on the frame, and so positioned as to cause the sprocket chain 25 to engage the under side of sprocket wheel 24 on the upper end of shaft 21. By this arrangement, the mixer upon the lower end of said shaft comprising the spiral blades, is caused to revolve rapidly and in a direction opposite to the rotation of the drum, whereby the materials within the drum which are carried by the rotation thereof into engagement with the spiral blades 19, are engaged by said blades and thrown upwardly and against the downwardly traveling inner wall of the drum which carries said materials again into contact with the blades 19, whereby the mixing of the materials is made thorough. It will be noted on referring to Fig. 2 that the water pipe 28 which leads from the water supply tank 29 mounted on the frame, terminates over the upper end of the rotary mixing blades 9 and is provided with suitable perforations 30 to permit the escape of water therefrom. By this arrangement the materials are mixed in a dry state by the flanges 18 and again mixed after the water has been applied thereto. By mounting the lower end of the shaft 20 in the slotted bearing or hanger 22, provision is made for allowing said shaft to spring inwardly should an unusually large stone be carried over by the rotary blades 19 so as to wedge between said blades and the wall of the drum, thereby allowing said obstruction to pass and obviating any damage to the machine.

The hopper 31 in which the materials are fed to the machine is mounted upon the frame at the upper end of the drum and is provided with dividing partitions 32 and 33 respectively which separate the hopper into three compartments, comprising the central compartment 34 and the side compartments 35 and 36 respectively. These compartments in the hopper afford separate retaining divisions therein, enabling the cement to be placed in the central division and sand and broken stone in the side divisions, or where only sand and cement are being used, enabling sand to be employed in either of the side divisions, or both of them as may be desired. The top of the central division of the hopper is provided with a suitable screen 37 and the openings through which the materials are introduced into the side divisions are provided with a coarse screen or grating 38 to prevent passage into the hopper of a stone or other object so large as to be likely to clog the machine or interfere with its perfect operation.

Forming the bottom of the several divisions of the hopper and common to all of said divisions is an endless feeding belt 39 which passes over the rollers 40 and 41 mounted upon the shafts 42 and 43 respectively. The upper side of the feeding belt

between said rollers is supported upon a table 44 to prevent the weight of materials in the hopper causing the feeding belt to sag. The shaft of the roller 41 is driven through the medium of a sprocket wheel 45 which is loosely mounted thereon but adapted to rotate said shaft through the medium of a clutch collar 46 which is splined thereon and adapted to be actuated to engage with and disengage from the clutch members on the hub of said sprocket wheel, by means of a lever 47. When the clutch is disengaged from the hub of said sprocket wheel, said wheel will turn idly on the shaft 43 of roller 41 without imparting movement to the feeding belt 39. The sprocket wheel 45 is rotated by means of a sprocket chain 48 driven by a sprocket pinion 49 on the stub shaft 50 carrying the beveled wheel 51 which meshes with a beveled pinion 52 on the main shaft 10. To drive the rollers 40 and 41 in unison and render positive the travel of the feeding belt passing thereover, the shaft of each roller is provided with a sprocket wheel 53 and said sprocket wheels connected by a sprocket chain 54, as clearly shown in Fig. 7.

It is designed to place the cement in the central division of the hopper and the sand and broken stone in the side divisions thereof, respectively. In cases where the mixture is only of sand and cement, the sand may be placed in either of the side divisions, or both of them, if desired. To provide for regulating the quantity of the materials fed from the hopper upon the feeding belt 39, suitable gates are employed which are mounted to slide vertically upon the side of the hopper and which are adapted to be independently actuated to permit of the passage from the hopper of the desired quantity of material from the several divisions thereof. These gates comprise the central gate 55 which controls the passage of material from the central division of the hopper, and the side gates 56 and 57 respectively which control the passage of the materials from the side divisions thereof. The central gate is actuated through the medium of a lever 58 connected to said gate by a pivoted connecting rod 59. The side gates are actuated by means of the levers 60 and 61 connected thereto by the pivoted connecting bars 62 and 63 respectively. By raising and lowering said gates through a manipulation of said levers, the quantity of material fed from any of the divisions of the hopper, may be regulated to give the mixture such proportions as may be desired. The materials which are fed from the hopper upon the traveling feeding belt are discharged onto the inclined table 64 at the end of said belt and from said table into the upper end of the drum, where they are mixed in a dry state, as said drum rotates, by means of the flanges

18 projecting inwardly from the wall of said drum. The mixing of the ingredients in the upper end of the drum is so thorough as to evenly distribute the cement there-
 5 through, so that a further mixing of said ingredients after reaching the point where the water is applied, is only necessary to thoroughly and evenly wet the materials forming the slush or mass, the quantity of
 10 water being varied according to requirements by means of the controlling valve 65 in the water supply pipe 28. The rotation of the drum during the operation of mixing causes the materials to steadily feed there-
 15 through until the mixed mass is finally discharged from the rear end of the drum in condition for use.

By means of the clutch 46, the feeding mechanism may be stopped to prevent a
 20 further feeding of the materials into the drum, while the drum is permitted to continue its rotation in order to work all of the materials therefrom, thereby enabling the drum to be thoroughly cleaned at the cessa-
 25 tion of work to obviate the possibility of the concrete becoming hardened therein.

The platform 66 supported by the frame above the rotary drum is for the purpose of affording a convenient place for placing the
 30 bags of cement preparatory to use.

By locating the bearings of the shaft 21 exterior to the drum, as shown, all obstructions are removed from the interior of the drum which might cause a clogging of the
 35 materials therein.

Having thus fully set forth our invention,

what we claim as new and desire to secure by Letters Patent, is:—

A concrete mixer comprising a rotary, inclined drum, means for feeding the materials
 40 into said drum, means mounted upon the inner wall of the drum at its upper end for mixing the materials dry and feeding them longitudinally therethrough, a rotary shaft
 45 passing through the drum and projecting beyond the ends thereof, means at the extreme upper end of said shaft for supporting it and imparting a rotary movement thereto, said shaft lying near the lower wall
 50 of the drum and at one side of the vertical center thereof, mixing blades mounted on the lower end of said shaft within the lower end of said drum, said blades standing ad-
 55 jacent the inner wall of the drum below the horizontal center and at one side of the vertical center thereof, a bearing exterior of the lower end of the drum for supporting the lower end of said shaft, said lower bearing being slotted radially of the drum allowing
 60 the lower end of the shaft to move radially to permit said mixer to move away from the wall thereof when the blades of the mixer encounter obstructions between their edges and the wall of the drum.

In testimony whereof, we sign this specification in the presence of two witnesses.

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Witnesses:

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