

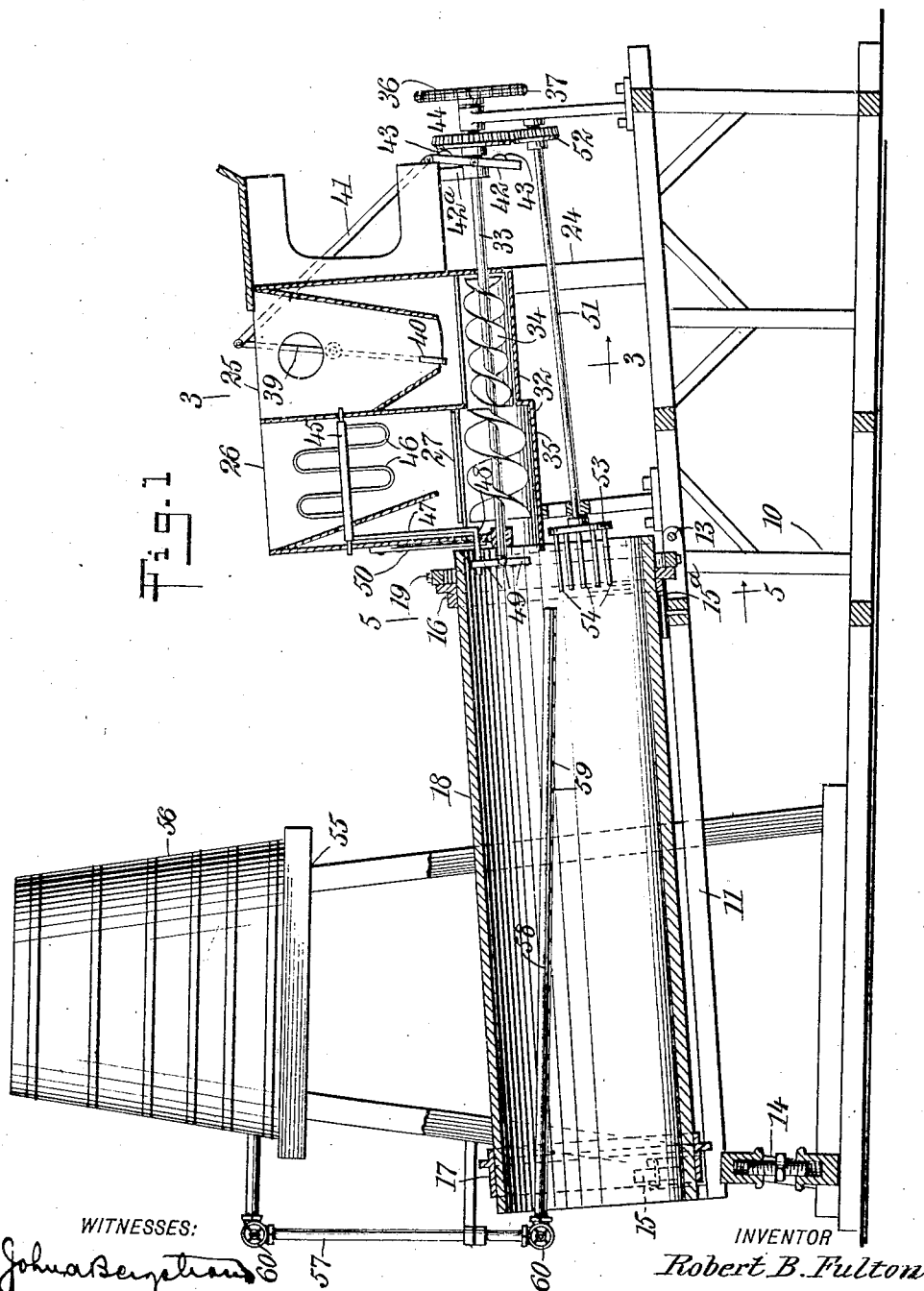
No. 876,270.

PATENTED JAN. 7, 1908.

R. B. FULTON.
CONCRETE MIXER.

APPLICATION FILED JAN. 11, 1906.

3 SHEETS—SHEET 1.



WITNESSES:

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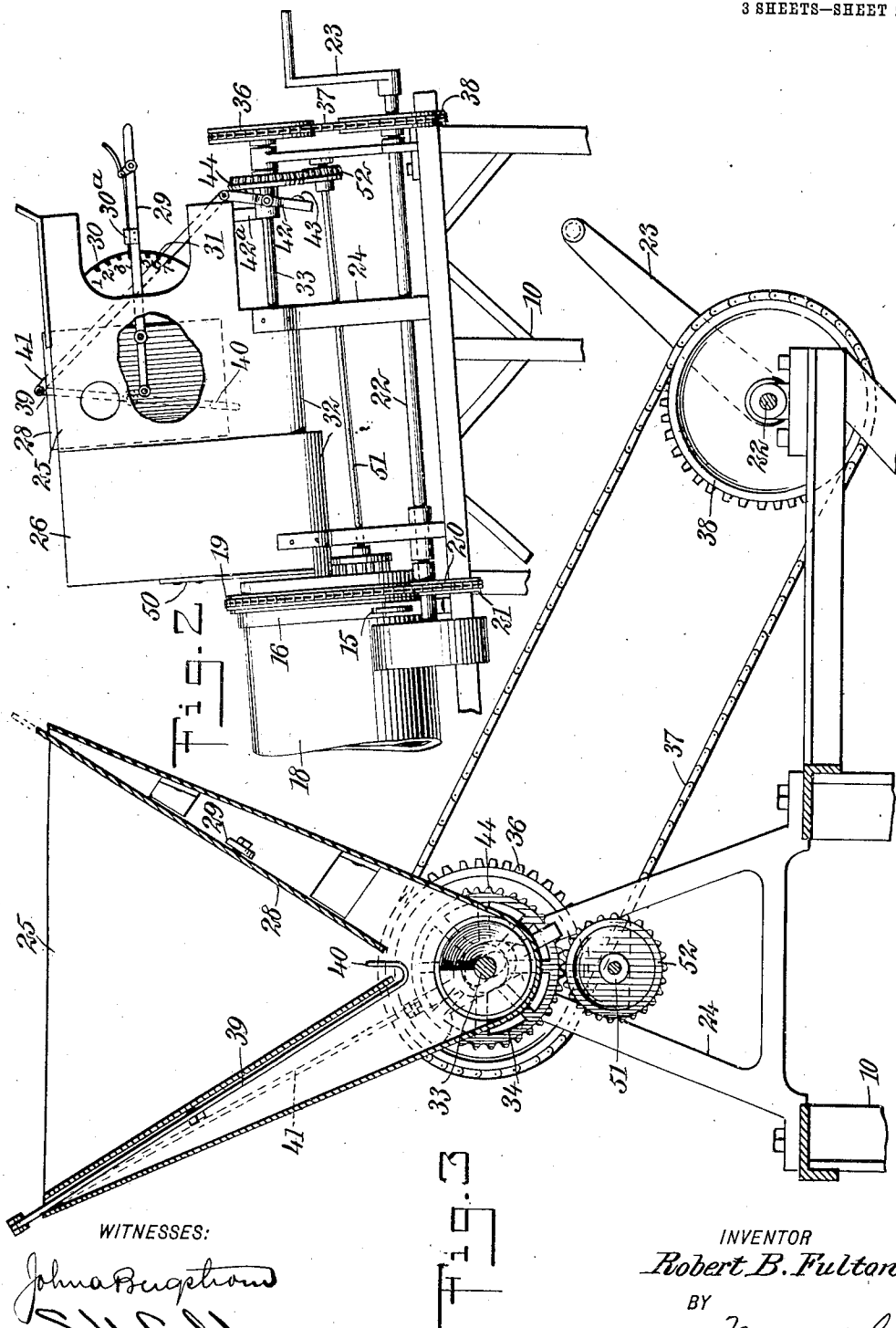
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3 SHEETS—SHEET 2.



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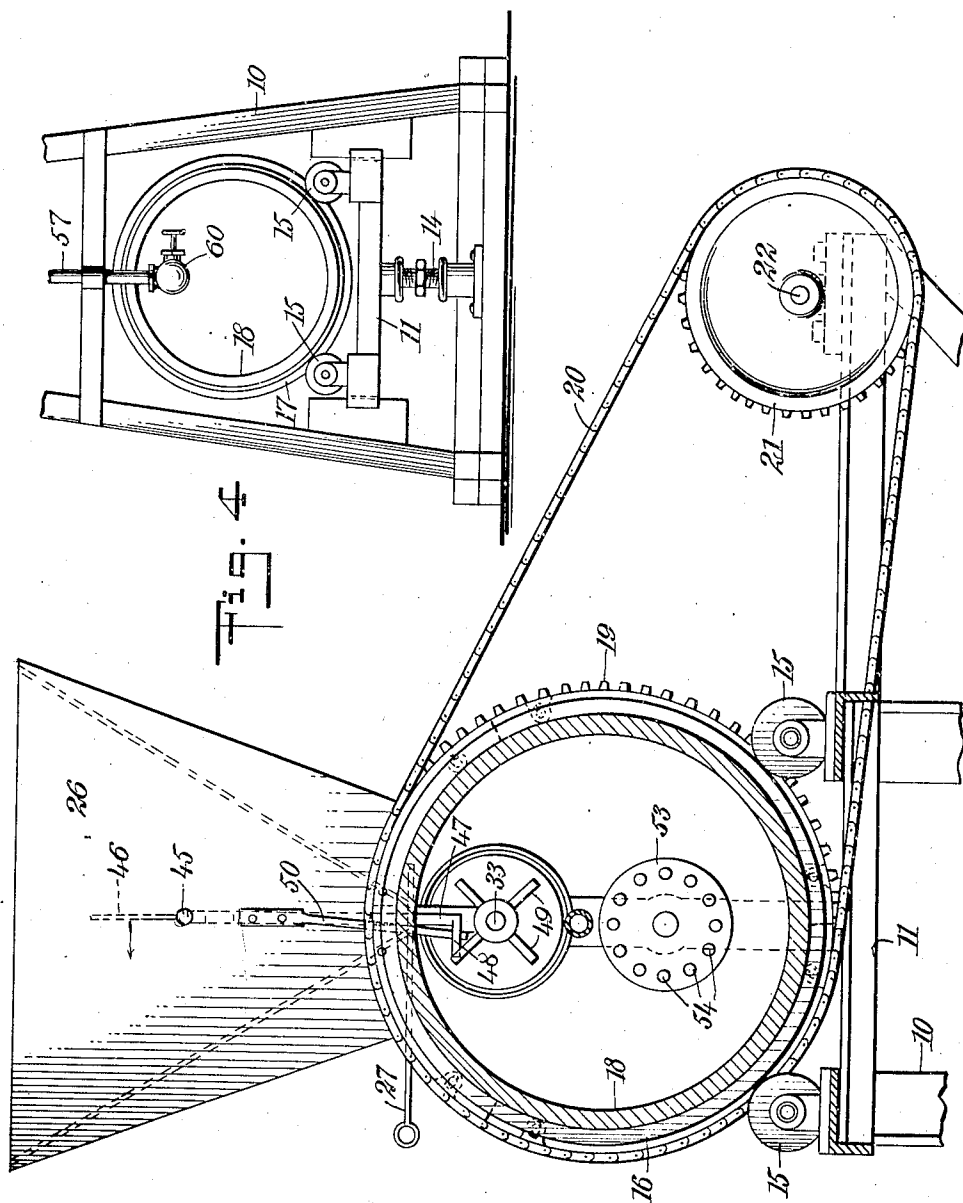
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ROBERT BARTON FULTON, OF RED CLOUD, NEBRASKA.

CONCRETE-MIXER.

No. 876,270.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed January 11, 1906. Serial No. 295,565.

To all whom it may concern:

Be it known that I, ROBERT B. FULTON, a citizen of the United States, and resident of Red Cloud, in the county of Webster and State of Nebraska, have invented a new and Improved Concrete-Mixer, of which the following is a full, clear, and exact description.

My invention relates to mixing machines, it being especially directed to apparatus for commingling the constituents of concrete. Its principal objects are to provide a simple, efficient, portable machine for attaining this end.

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 views.

Figure 1 is a central, vertical, longitudinal section through one embodiment of my invention; Fig. 2 is a side elevation of the feed-end of the machine, parts being broken away; Fig. 3 is a transverse section on the line 3—3 of Fig. 1; Fig. 4 is an end elevation looking from the left in Fig. 1, parts being omitted; and Fig. 5 is a transverse section on the line 5—5 of Fig. 1.

I provide a main-frame 10 which is preferably slightly inclined at its top from one end to the other, and made of angle iron. At the lower portion of the frame is a section 11 pivoted to the main-frame at 13. Means for adjusting the angle of the section 11 is provided, it being here shown as consisting of a screw 14 oppositely threaded to engage both the main-frame and the movable section. By rotating this screw, the section may be either raised or lowered about its pivotal point to retard or facilitate the passage of the sodden material in its passage to the discharge. Rotatably mounted near the extremities of the section 11 are pairs of separated rolls 15, 15, which serve as supports for track-rings 16 and 17 surrounding a mixing cylinder 18. Underneath the upper end of drum, is a horizontal wheel 15^a bolted to main frame, revolving on a short vertical shaft, bringing the periphery of said wheel into contact with the vertical rim of the track-ring 16 to prevent the drum from gravitating down the incline. Bolted to the track-ring 16 is a toothed ring 19, from which a chain 20 extends to a sprocket-wheel 21 fast upon a shaft 22. This shaft is journaled in an extension from main-frame and has connected to it power-applying means, which may be in the form of a crank 23. This enables the shaft to be ro-

tated at the desired speed and to, in turn, impart its movement to the mixing cylinder.

Rising from the main-frame, beyond the cylinder, is an auxiliary-frame 24, upon which are mounted two hoppers 25 and 26 adapted to contain cement and sand, respectively. These hoppers are located at different distances from the receiving end of the cylinder, they being preferably mounted in substantial alinement with its axis, the cement hopper being farthest from the cylinder. Each of the hoppers has a contracted throat, that of the hopper 26 being provided with a slide 27 by which the area of the opening may be adjusted. The hopper 25 is shown as having one side 28 movable to control the area of the discharge-throat, and to this is connected a lever 29 fulcrumed upon the outer casing. The lever preferably moves over a segment 30, which may be engaged by detent mechanism 30^a and is provided with a scale 31, conveniently indicating ratios existing between the quantities of cement and sand delivered. Along the bottoms of the hoppers extend troughs 32, through which passes a shaft 33 journaled upon the auxiliary-frame. This shaft carries conveyers 34 and 35, which, as illustrated, are of the screw type and are situated beneath the hoppers 25 and 26, respectively. The conveyer 34 and its associated trough are of less diameter than the similar elements for the hopper 26, this being due not only to the fact that it customarily delivers a smaller quantity of material, but also because it handles only that falling from its hopper, while the conveyer 35 also operates upon the material delivered to it by the conveyer 34. Fixed to the outer extremity of the shaft 33 is a sprocket-wheel 36, from which a chain 37 passes over a sprocket-wheel 38 secured upon the shaft 22, thus causing the rotation of the driving means to be imparted to the conveyers.

Pivoted upon the opposite side of the hopper 25 from the controlling member 28 is a lever 39, which has at its lower extremity an agitating projection 40, turned upwardly to enter the hopper-opening. Through this opening it plays as the lever oscillates, the edge of said opening being preferably curved to conform to the arc through which it moves. Articulated to the upper end of the lever is a link 41, which, at its opposite extremity, is pivoted to an actuating lever 42 fulcrumed upon a depending arm 42^a. This lever 42

has at each side of its fulcrum a cam projection 43. These are alternately engaged by successive spokes of a gear 44 which is fast upon the conveyer-shaft. Its operation causes the actuating lever to be rapidly swung in opposite directions as the conveyer-shaft rotates, transmitting its motion through the link to the agitating lever, the projection of which prevents the contained material from packing in the throat of the hopper 25.

Extending across the hopper 26 is a shaft 45 rotatably mounted in the opposite walls and having agitating projections 46, which may be conveniently formed by loops of bent wire. From the inner end of the shaft, outside the hopper, depends an arm or lever 47, which has at its lower end an angular portion 48. With this arm portion contact revolvable arms 49 which project from the inner end of the conveyer-shaft. A spring 50 forces the arm 47 in the opposite direction to that in which it is moved by the arms 49, thus causing the shaft 45 and its projections to be oscillated in the hopper 26, so that the wet sand contained thereby may be stirred and kept from clogging. This movement is preferably slower than that of the agitating projection 40, since the sand feeds more freely than cement.

Journalled in the auxiliary frame, below the conveyer-shaft, it being shown as diverging therefrom toward the cylinder, is a shaft 51, which has secured upon it a pinion 52 meshing with the gear 44, both of these elements being preferably somewhat beveled to provide for the angularity of the shaft 51. To the end of the shaft, adjacent to the cylinder, is fixed a head 53 from which pins or projections 54 extend into said cylinder beneath the inner end of the trough 32. This head or disk revolves rapidly, and literally churns the descending sand and cement into a homogeneous mass before it reaches the revolving bottom of the drum.

Rising from the end of the main-frame, opposite the feed-hoppers, is a frame 55 supporting a tank 56 from which leads a pipe 57. The lower end of this pipe reaches a point opposite the open end of the mixing cylinder, and from it a pipe 58 extends into proximity with the feed end of the cylinder, terminating at a point beyond the projections 54. Throughout the length of the pipe 58 are comparatively minute perforations 59, by which jets the liquid may be delivered to the material as it passes through the cylinder. In the pipe 57 are valves 60 for controlling the flow from the jet-openings.

In using the apparatus for the production of concrete, cement is supplied to the hopper 25 and sand to the hopper 26, and the driving-shaft 22 is rotated at the proper speed. The movement of the agitating mechanisms in the hoppers causes the contained material, however damp and sticky it may be, to fall

through the throats into the conveyers. Here the cement is mingled with the falling sand, thus getting a preliminary mixing, and the material so combined falls from the trough upon the rapidly rotating projections 54. These throw it outwardly against the wall of the cylinder, further commingling it, while it is still in a dry state. The mixture then passes along the cylinder by virtue of the inclination of the latter, this being adjusted to secure the proper rate of movement. In this travel it is carried up the cylinder by its rotation, falling over and over to complete the mixture. At the same time, the water or other liquid falling from the pipe 58 is mixed with it, so that when the material emerges from the delivery end of the cylinder it is ready for use. The lever 29 may be set upon the scale to give, for a definite area of throat of the hopper 26, a predetermined number of parts of cement to the sand, so that when this setting has once been made, no further attention need be paid to the proportioning, it being only necessary to keep the hoppers supplied with the material.

The element furnishing the mixing-chamber has, for convenience, been termed a cylinder, but it will be evident that this need not be of circular section, and the word is intended to designate any suitable container.

My improved machine contains no complicated parts, and, if broken, may be readily repaired by the class of laborer usually employed in work of this character. It can be readily moved from place to place and disassembled or knocked down for transportation to distant points.

The feeding portion of the apparatus is quite distinct from the mixing-chamber, and may be applied to existing machines.

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

1. A concrete mixer comprising a main frame, a drum rotatably supported in the frame and inclined with respect thereto, a tank supported adjacent to the drum, a pipe leading from the tank into the drum, said pipe being perforated within the drum, a shaft having a disk adjacent to the drum at the upper end thereof, said disk having pins projecting from the face thereof and extending into said drum, an auxiliary frame connected with the main frame at the upper end of the drum, a sand hopper and a cement hopper supported by the auxiliary frame, means for feeding cement and sand in unequal quantities, said feeding means delivering to the hopper immediately above the disk, and means for rotating the drum and disk.

2. A concrete mixer comprising a main frame, a drum rotatably supported in the frame and inclined with respect thereto, means for varying the inclination of the

drum with respect to the frame, a tank supported adjacent to the drum, a pipe leading from the tank into the drum, said pipe being perforated within the drum, a shaft having
 5 a disk adjacent to the drum at the upper end thereof, said disk having pins projecting from the face thereof and extending into said drum, an auxiliary frame connected with the main frame at the upper end of the
 10 drum, a sand hopper and a cement hopper supported by the auxiliary frame, means for feeding cement and sand in unequal quantities, said means delivering to the hopper immediately above the disk, and means for
 15 rotating the drum and the disk.

3. A concrete mixer comprising a main frame, a drum rotatably supported within the frame and inclined with respect thereto, an agitator comprising a rotating disk having
 20 pins projecting from the face thereof at the end thereof, a sand hopper and a cement hopper delivering to the drum at the upper end thereof and immediately above the agitator, means for feeding sand and cement in
 25 definite proportions, means for moistening the material during its passage through the drum, and means engaging the periphery of the drum for rotating the same.

4. A concrete mixer comprising a main
 30 frame, a drum rotatably supported within the frame and inclined with respect thereto, means for varying the inclination of the drum, an agitator comprising a rotating disk having pins projecting from the face thereof
 35 within the drum at the upper end thereof, means for feeding cement and sand in definite proportions to the drum, said feeding

means delivering immediately above the agitator, means for moistening the material during its passage through the drum, and
 40 means for rotating the drum.

5. A cement mixer, comprising a main frame, a drum rotatably supported in the frame and inclined with respect thereto,
 45 means for varying the inclination of the drum with respect to the frame, a gear ring on the outer surface of the drum, an agitator comprising a rotating disk having pins projecting from the face thereof within the drum at the
 50 upper end thereof, means for feeding sand and cement in definite proportions to the drum, said feeding means delivering immediately above the agitator, means for moistening the material during its passage through the
 55 drum, and means engaging the gear ring for rotating the drum.

6. A concrete mixer comprising a main frame, a drum rotatably supported within the frame and inclined with respect thereto, an agitator comprising a rotating disk having
 60 pins projecting from the face thereof at the end thereof into said drum, a sand hopper and a cement hopper delivering to the drum immediately above the agitator, means for feeding sand and cement in definite propor-
 65 tions, and means for rotating the drum.

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

ROBERT BARTON FULTON.

Witnesses:

D. B. SPANOGLE,
 FRED MAURER.