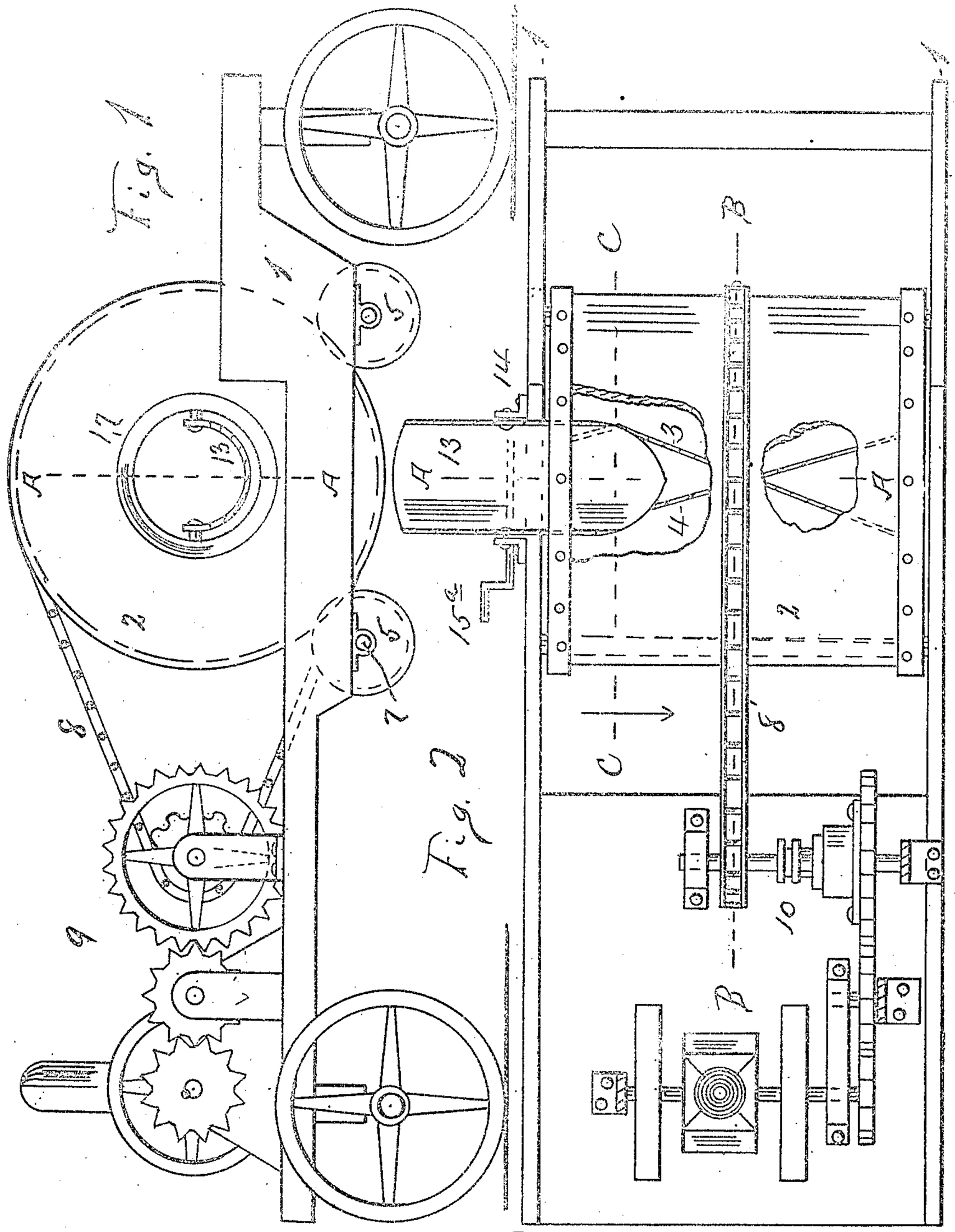
No. 843,273. PATENTED FEB. 5, 1907.

E. E. JACKSON.

CONCRETE MIXER.

APPLICATION FILED MAY 31, 1905.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

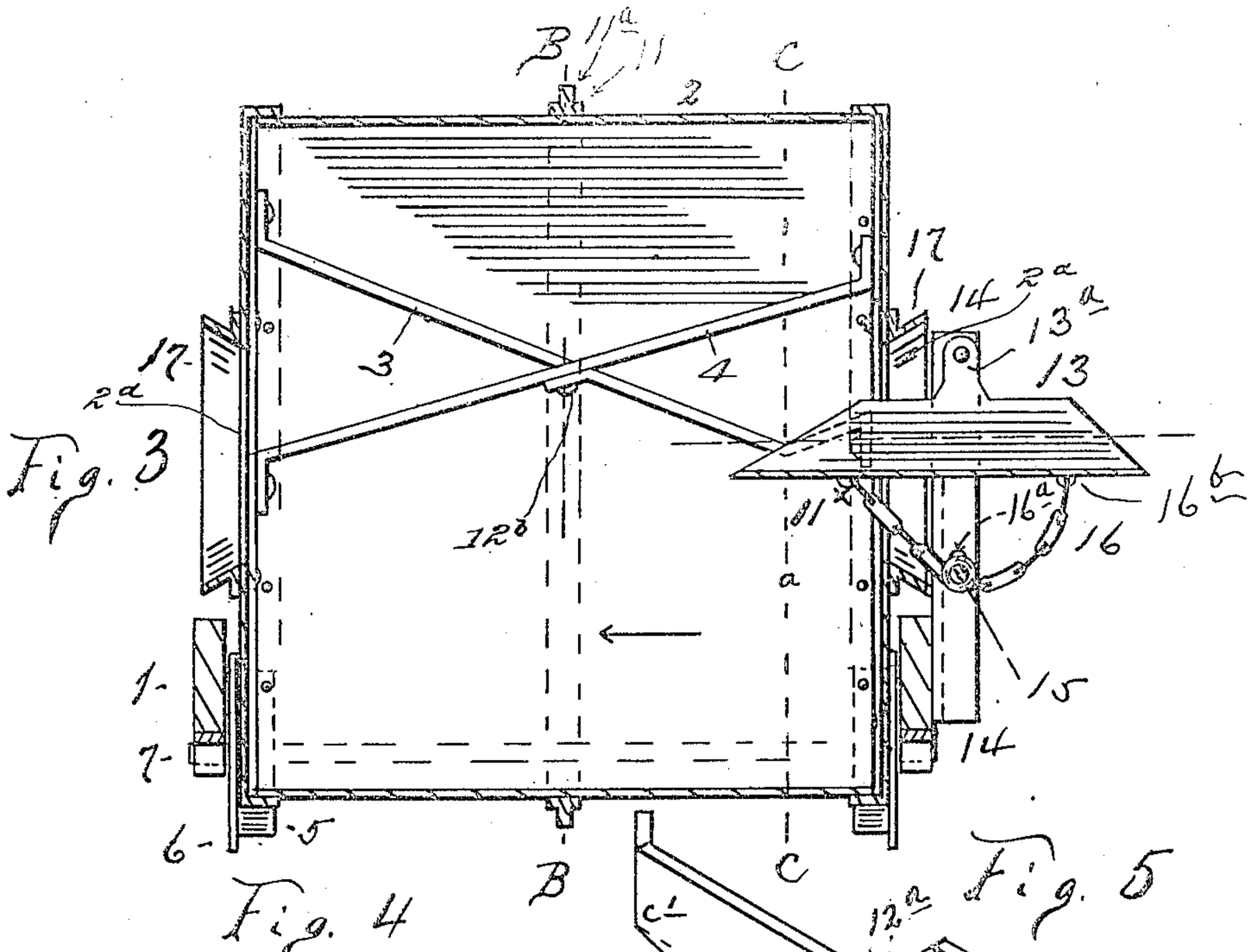

Fig. 3

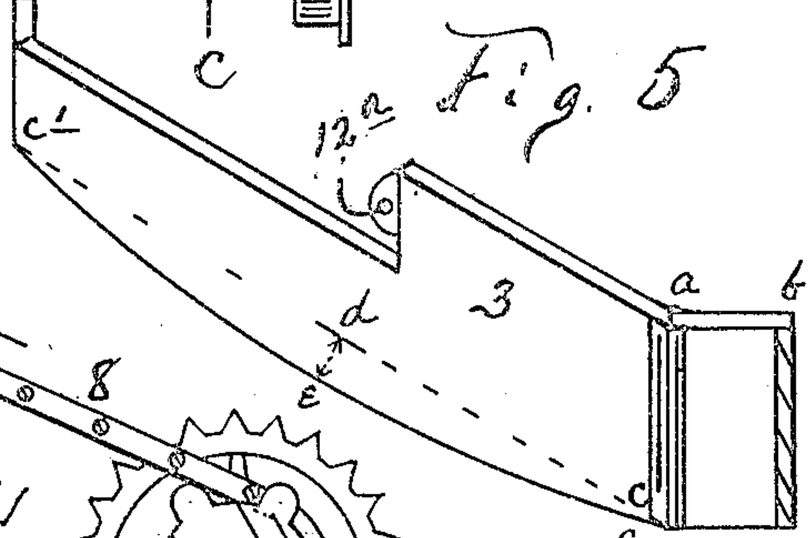

Fig. 5

Fig. 4

Fig. 1

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3 SHEETS—SHEET 3.

Fig. 7

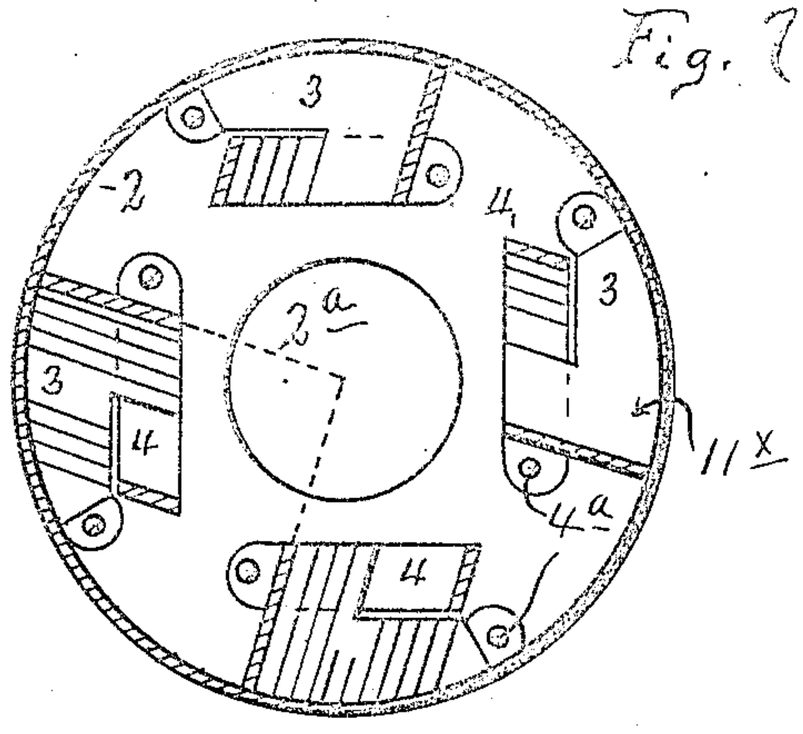
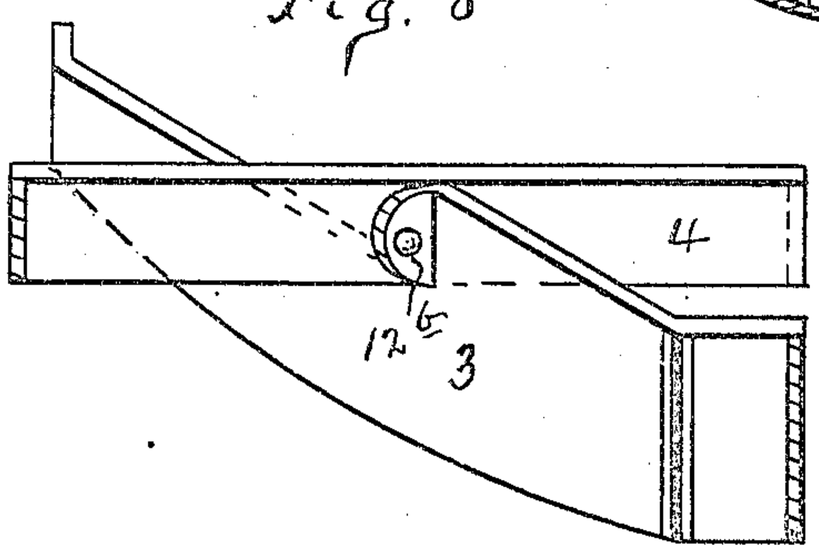


Fig. 8



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UNITED STATES PATENT OFFICE.

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CONCRETE-MIXER.

No. 843,278. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed May 31, 1905. Serial No. 263,023.

To all whom it may concern:

Be it known that I, ELMER E. JACKSON, a citizen of the United States, and a resident of Fremont, county of Sandusky, and State of Ohio, have invented certain new and useful Improvements in Concrete-Mixers, a full and complete description of which is hereinafter set forth.

The purpose and object of this improvement is to provide a mixer of the rotary type and of such peculiar construction that when it is properly loaded with any desired proportion of sand and cement and the same is then made to operate the two ingredients will become perfectly mixed, and then when water is added in suitable proportion and the same is continued to operate the dry mixture becomes a perfect mortar, and then upon the addition of any desired proportion of suitable gravel or stone and gravel and the machine continued to operate the entire mass becomes a perfectly-mixed concrete or beton.

It is the further purpose of this improvement to provide such a machine that the same may be made to receive the several ingredients of concrete or beton while the machine is in operation and then after a given batch is sufficiently mixed to discharge the same either in part or in whole without either being compelled to tilt the mixer or stop the operation of the machine.

The manner in which I do this will be presently described.

Referring to the drawings herein, and which are made a part hereof, Figure 1 represents a side elevation of my machine as seen from the receiving end. Fig. 2 represents said machine as seen in top plan. Fig. 3 represents a section of my improvement along the line A A of Figs. 1 and 2 and is made at such a time in the revolution of the drum as shows a radial line to pass transversely through the blade 3 at the point of deflection. Fig. 4 represents a vertical section along the line B B of Figs. 2 and 3 looking in the direction of the arrows shown by those figures. Figs. 5 and 6 represent details of the blades or webs which belong inside the drum. Fig. 7 represents a cross-section of the drum and blades on the line C C of Figs. 2 and 3 looking in the direction of the arrow seen in those figures. Fig. 8 represents a pair of blades in detail.

Coming now to a more specific description of my invention it is sufficient to say that said machine is mounted upon a suitable truck or other frame 1, and the same essentially consists of a cylindrical drum 2, having within it a series of blades or webs in pairs which extend from end to end thereof and are suitably secured thereto. One of said blades 3, which is represented in detail by Fig. 5, is so formed that when in place its outer edge conforms to the inner surface of the drum. Oppositely said blade is formed with a recess, across one end of which the companion blade 4 is placed. Said blade 4, which is represented in detail by Fig. 6, is a flat strip of suitable material having parallel edges and of width equal to the depth of the recess of its companion blade 3. Said blades have their ends suitably flanged and adapted to be secured to said drum, as by rivets 4^a, Fig. 7. Said drum is preferably mounted upon bearing-rollers 5. Said rollers are preferably in form of wheels having a flange 6. Said rollers are represented in Fig. 1 with journals 7. Said drum is made to rotate by rack engagement with a chain 8, which is driven by a motive power 9 and preferably arranged with some form of friction-clutch 10 as any mechanic may suggest, so as to disconnect the movement of the power from the machine proper. Said rack 11 with teeth 11^a is shown best in Fig. 4. Said blades are so set within the drum that the contents is moved alternately from end to end of the drum and is repeatedly thrown upon itself, so as to thoroughly mix the contents. To accomplish this, I set each pair of blades so as to cross each other, (see Fig. 3,) thus giving to their planes an angle both with reference to each other and with reference to a plane which is in line with the axis of the drum. Referring to Figs. 3, 4, and 5, it will be seen how said blades are so located that one of them, 3, becomes an outer blade and the other, 4, an inner blade. The former, as seen, is given a suitable curvature *c e c'*, so as to follow the inner surface of the drum. Said blade being made to conform to the inner surface of the drum and being given a suitable angle it forms toward the discharge end of the drum, or at the right of the point of intersection, Fig. 3, a sort of bucket or receptacle 11^x for the material as it is being carried from the lowest to the highest position. (See Figs. 3 and 7.) The latter or inner blade is of practically uniform width from end to end, and having its width only

equal to the depth of the recess formed in its companion blade and being given a suitable incline for the purpose the material is caused to be divided, (see Fig. 7,) so that as said material or contents is being lifted the upper portion or half thereof is made to move along the incline of said blade 4, while in the position seen in Fig. 3 the lower or outer half of said contents being at the same time retained within the bucket is lifted, and finally dumped or made to fall over the point *a* of the blade 3 as the drum continues to rotate.

Manifestly the angle made by the intersecting planes of the two blades may be varied and should be varied with the length of the drum, so as to give sufficient incline to move the material from end to end of the drum as it is made to rotate.

In practice I am now successfully using a machine of this construction which has a drum forty inches in length and with a radius of two feet. It will be noticed that the blade 3 is deflected at the point *a* for a purpose hereinafter explained. This point in my machine is eight inches from the drumhead. This blade is then so set that its outer edge at the point *c* is seven and one-half inches from the axial plane upon one side, while the point *c'* is correspondingly distant from said plane upon the opposite side thereof. In order to better understand the setting of said blade with reference to the relation of its own plane to radial lines, reference may be had to Fig. 7, which is a diametrical section, cutting the blade 3 along the line *a c* and showing said section to be upon a radial line from the axis of said drum. Since the blade 4 performs the function of carrying material toward the receiving end of the drum as said blade approaches and passes a horizontal plane through the axis of said drum, manifestly its plane should be such as to aid in performing that function. Upon said diametral section the plane of said cross-section of said blade 4 might be upon a radial line, as in case of the blade 3, companion thereto; but preferably I make said blade to have a plane through its cross-section, which is parallel to that of the cross-section of said blade 3. In practice I set the blade 4 upon the said diametral section, so that there is a distance of fifteen inches between it and its companion blade, and I give it correspondingly the same incline from end to end of drum, as already stated, with reference to said blade 3, but reversely. It should be understood that said rule is not stated as one from which no variation may be made; but, on the contrary, it is stated as one which in the present instance gives satisfactory results. Manifestly where a drum of greater diameter is used and with a different-size opening, the plane of said blade may be varied within the limits of effectiveness.

For the purpose of stiffening the blades and connecting them together at the point of crossing, a suitable rivet 12^b may be passed through the holes 12 12^a therein.

It may be seen, Fig. 5, that the blade 3 is properly curved or rounded at its outer edge between the points *c c'*, so as to follow the line of the inner surface of the drum. The length of the line *e d* is mathematically determined by well-known trigonometric rules. Said blade 3 is deflected at the point *a*, and from *a* to *b* the plane of said blade is practically parallel with the corresponding part of the blade 4, and thus serves to cause said contents to fall wholly within the drum rather than close to the opening 2^a at the end of the drum, where a portion of said contents might be lost. A discharging-chute 13 is provided with ears 13^a, which are axially pivoted to standards 14, secured to the framework. Said chute when tilted into position is made to receive at its inner end the contents of said drum as it falls over said lip *a*. Said chute is made to tilt by means of a cranked shaft 15, which is provided with a crank 15^a and is made to wind a chain 16, which is secured thereto by a stud or pin 16^a. At each end said chain is secured to the under side of said chute by staples 16^b or other suitable means, and thus as said crank is turned in one direction said chute is tilted and made to receive and discharge the contents of said drum, while if it be turned in the opposite direction said chute will be outside of the lines of drop from said point or lip *a*. The inner end of said chute is suitably formed or shaped so as not to interfere with the continued operation of said drum when discharging concrete. At both ends of said drum and concentric with the circumference thereof it is made to carry a cone or funnel shaped shield 17, which projects out and over the frame parts, and thus protects the bearings from the injurious effects of either cement or mortar.

It is manifest that within reasonable limits some variation from the angles herein stated may be made and still the machine in all its parts will perform its intended function. Hence I do not restrict my claims to the precise angles given.

Having now fully described my invention, what I claim as new is—

1. In a rotary concrete-mixer, a rotary drum provided with a series of pairs of blades, each pair comprising an inner and outer blade, which are so set with reference to an axial plane of said drum, that the two blades cross each other at a point about midway of the length of said drum. and at sufficient angle so that as said drum is rotated, the contents thereof will be moved along the blades alternately from one end of said drum toward the other, according to the direction of the incline; and said outer blade being widened from one end thereof to said point of

crossing, and deflected at a point therebetween, near the discharge end of said drum, both for discharging purposes, said blades being so set, and the outer blade being so deflected that a cross-section of said outer blade through said point and along the line of deflection, will follow a radial line from the axis of said drum, and a cross-section of said inner blade upon the plane of said radial line will be substantially parallel thereto, in combination with means for the operation of said drum.

2. In a rotary concrete-mixer a rotary drum in combination with a series of pairs of outer and inner blades, 3 and 4, said blades extending from end to end of said drum, and so placed that they have a reverse incline with reference to an axial plane thereof, said inclines being such that as said drum is rotated, the contents thereof is moved alternately in opposite directions, said outer blade being widened and deflected near the discharge end of said drum, both for discharging purposes, and being so set and being so deflected that a cross-section thereof through said point and along the line of deflection, will follow a radial line from the axis of said drum, and said inner blade being so set that as said contents is raised by said outer blade a portion thereof falls thereon and is carried in the reverse direction.

3. In a rotary concrete-mixer, a hollow cylindrical drum with drumheads partially closed, and a series of pairs of blades fixed therein which extend from end to end thereof, one of which is denominated an outer blade, and the other an inner blade, said blades being such and so placed that as said drum is made to operate, and the blades of any given pair are successively brought into operative position, the contents of said drum will be moved alternately in opposite directions, said outer blade being widened for part of its length from the discharging end of said drum, and deflected at a point near said end, both for discharging purposes, in combination with means for the operation of said drum.

4. In a drum of a rotary concrete-mixer, one of a pair of blades denominated the outer blade, said blade being widened for a portion of its length from one end thereof, and deflected at a point within said widened portion near said end both for discharging purposes, in combination with a companion blade denominated an inner blade which crosses the same and is secured thereto, both said blades adapted to be secured to said drum, and to have their respective inclines with reference to the axial plane of such drum such, that as the drum is rotated, a part of any contents thereof will be moved toward one end of said drum, while another part thereof will be moved in the opposite direction—and further so adapted that when set within such drum, a radial line from the axis thereof will pass over said point of deflection and transversely through said blade.

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