A. W. RANSOME.

CONCRETE MIXING APPARATUS.

APPLICATION FILED MAY 27, 1914.

1,350,179.

Patented Aug. 17, 1920.

2 SHEETS—SHEET 1.

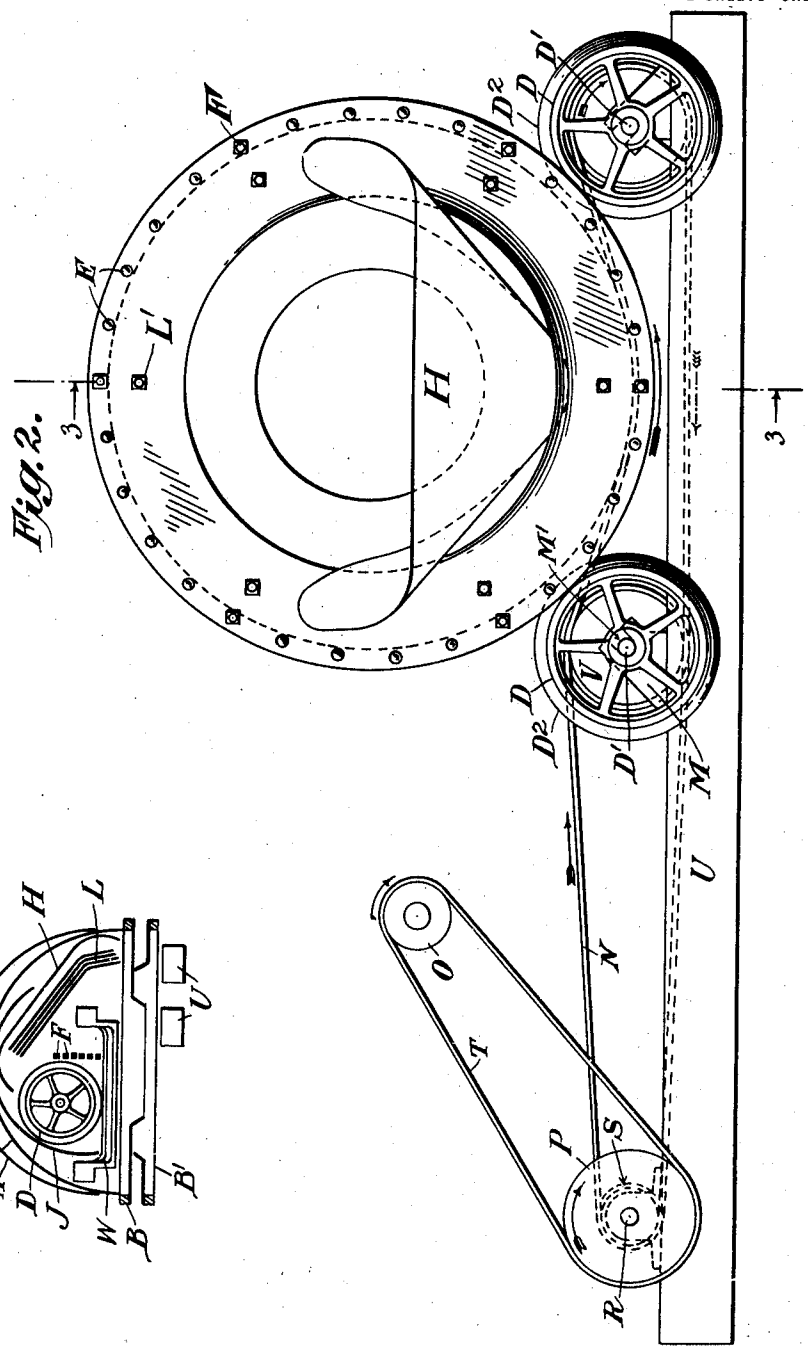


Fig. 2.

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

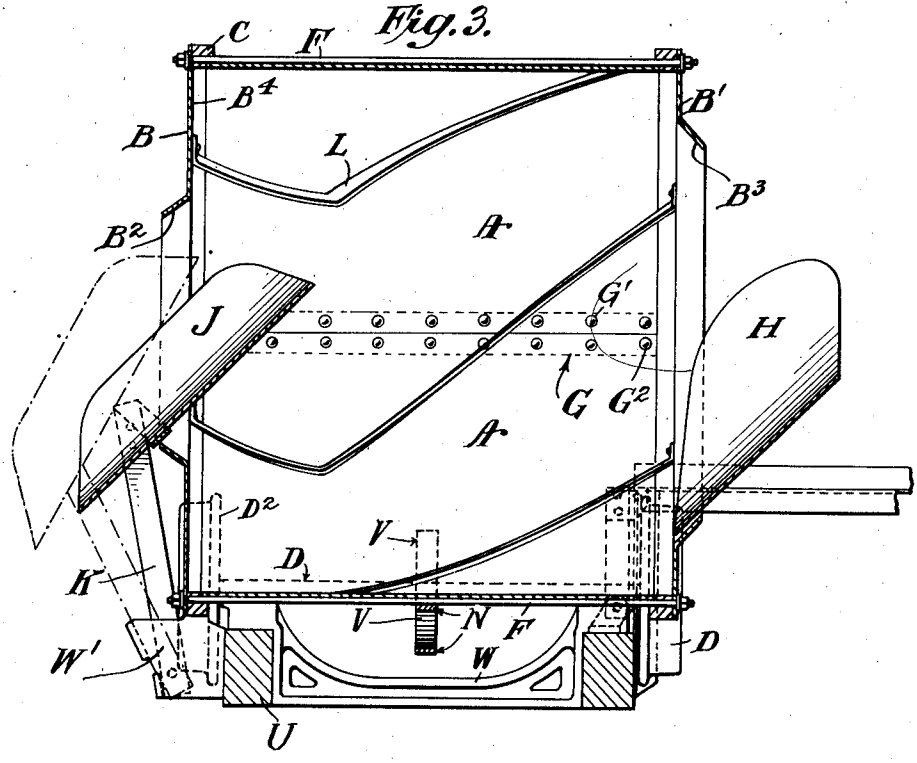


Fig. 4.

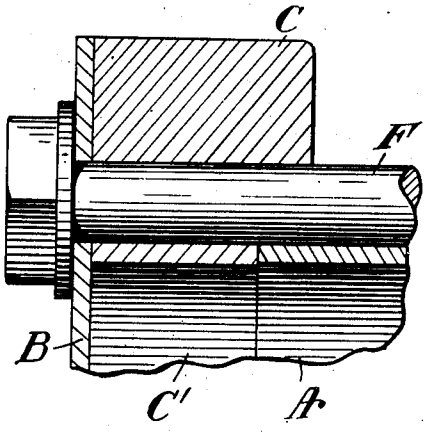
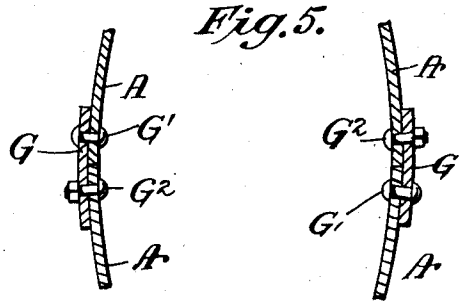


Fig. 5.



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UNITED STATES PATENT OFFICE.

ARTHUR W. RANSOME, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO RANSOME CONCRETE MACHINERY COMPANY, OF DUNELLEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

CONCRETE-MIXING APPARATUS.

1,350,179. Specification of Letters Patent. **Patented Aug. 17, 1920.**

Application filed May 27, 1914. Serial No. 841,185.

To all whom it may concern:

Be it known that I, ARTHUR WILFRID RANSOME, a citizen of the United States, and a resident of the city of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Concrete-Mixing Apparatus, of which the following is a specification.

The improvements relate to apparatus for the mixing of the aggregates of concrete and similar materials, and its objects are, among others, to provide for the construction of the apparatus in such a manner that its parts may be made, shipped unassembled, assembled, and placed in operation without difficulty and without the use of skilled labor or shop appliances, and disassembled or "knocked down" for shipment to another point with equal facility. To these ends the improvements involve the construction of the apparatus in dismemberable parts made in such form and size as to be "nested" or placed together when disconnected in such a manner as to form a compact assemblage which may be inclosed within a relatively small crate or box for shipment.

Concrete construction work is now carried on in practically every section of the globe, and frequently such work is done in places that are difficult to reach and which have very poor if any provision for the transportation of freight thereto. In such cases the reduction of the bulk of machinery to be transported is of great importance. Even where the work is done in places that have good transportation facilities, the use of concrete mixing machinery is generally temporary, and the machinery is shipped to the place where the work is to be done and then reshipped to some other point after a short use. A more important consideration, however, is the cost of shipping machinery of this character assembled from the manufacturer to the purchaser. Freight rates are based largely on cubical displacement, and a hollow drum, such as that of the ordinary concrete mixer has an extremely large cubical area in proportion to its weight. By so constructing the apparatus therefore that it may be packed and shipped knocked down in compact form and easily assembled at its destination, a very material saving in freight and the cost of handling is effected.

As the advantages above set forth are sufficient to emphasize the importance of the improvements the other advantages need not be discussed.

The improvements are illustrated in the accompanying drawings, in which Figure 1 is a diagrammatic view of the parts of a concrete mixing apparatus embodying the improvements, nested or housed for shipment and before being assembled. Fig. 2 is a side elevation of the apparatus assembled. Fig. 3 is a vertical cross section of the drum and adjacent parts taken substantially on the line 3—3 of Fig. 2 and looking in the direction indicated by the arrows. Fig. 4 is an enlarged detail partly in cross section of one of the connections between the drum head semi-cylindrical sheets and traction rings of the mixer. Fig. 5 is an enlarged detail of the splice plates and other parts at the joint of the semi-cylindrical drum sheets.

The drum proper consists of two semi-cylindrical nesting sections A of identical form and size and two heads B and B′, the former having an opening with an oblique annular flange B^2 surrounding it, and the latter with a larger opening having a similar flange B^3. When the two heads are placed together face to face the flanges overlap. The head B′ may be placed upon the head B^2 with its inner face in contact with the outer face of the latter. In either case the heads fit together so that they occupy a reduced space and form with the nesting section A, an inclosed space. The track rings C serve a double purpose, viz: That of annular tracks supporting the drum on the flanged rollers D and that of a reinforcement and cover for the joints between the side edges of the semi-cylindrical sections A and the heads. Each track C is secured to its head by means of a series of bolts E passing laterally through the head and the track. It is also pressed

against the head by the section A under the action of the tie bolts F—six in number—running from head to head, passing through the reduced portion C′ and clamping the inner edge of said portion and the outer edge of the sections A together. The internal diameter of the annular track is slightly less than the internal diameter of the drum composed of the sections A, and a slight inward projection of the portion C′ is thus provided in order to insure a good hold. The tie bolts F are provided with screw-nuts at their ends by which they are removably secured in position and by which the parts between the said nuts are compressed and held in position.

In order to make the joints of the semi-cylindrical drum sections A tight and to strengthen and reinforce them splice plates G are provided. These plates overlap the edges at the joint on the outside and are secured one of them to one section and the other to the other section by means of rivets G′, while the opposite side in each case is secured to the other section near its abutting edge by means of screw bolts G^2. By this provision it is necessary to disconnect one edge only of each splice plate G when the machine is dismembered, and to connect one edge only when the parts are assembled.

The charging hopper H may be mounted in any suitable manner on the outside of the drum, so as to maintain it in its proper position, so that materials may be conveniently dumped therein from the charging platform I and conveyed thereby to the interior of the drum. This hopper is in substantially the form of a truncated hollow half cone, with the smaller end within the flange B^3 of the opening in the charging head of the drum and the larger end in suitable relationship to the platform I (or other loading structure) so that the materials may be conveniently deposited therein.

The discharge chute J is mounted at the discharge end of the drum on the frame or support K, so that it may be swung into and out of the said opening. It receives the mixed concrete from the blades L which carry the same to the top of the drum as the drum rotates and then dump them down in the zone occupied by the discharge chute J when in its inner position. When the drum is not in this position the materials fall with a rearward movement, and striking the blades below are deflected still farther backward, so that the materials are given a backward and forward movement during the mixing period.

The conformation of the charging and discharge chutes H and J is such as to enable them to be stored readily within the inclosed space.

The mixing blades L are detachably secured to the heads B and B′ by means of suitable bolts L′ passing through their flanged ends and through the said heads. They may be secured also at other points if desired. These blades are of substantially uniform construction, and fit one within the other so that they may be nested when the mixer is "knocked down."

The rollers D are keyed to shafts D′ and these shafts are journaled in suitable bearings in the supports M, the recess M′ in each support receives the shaft D, and permits it to be removed therefrom when the weight of the drum is not on it. The drum, however, will hold the shafts in the recesses when the parts are assembled and in position for operation.

The frames W space the timbers U and hold them in position, and the supports M are mounted thereon. The supports K which swing in and out to bring the chute J to its two positions are also mounted on an extension W′. In this manner the entire device is securely assembled, and the parts held in their proper positions.

The rollers receive the traction rings C, and are provided with flanges D^2 to prevent lateral movement. The belt N passes over the pulleys V keyed on the shafts D′ and under the drum between the two said pulleys, and imparts motion to the pulleys and the drum by frictional contact. This belt may be composed of chain or of other suitable material.

O represents the drive pulley of an electric motor or other source of power, and P the pulley by which power is transmitted to the belt N through the shaft R to which it and the reduced pulley S, over which the said belt passes, are keyed. Power is transmitted from the pulley R to the pulley S by the belt T.

The diagram of Fig. 1 shows the two heads placed horizontally with the frame and rollers resting thereon, the wings nested and placed so as to rest thereon, with bolts and other small parts placed between, the charging and discharge chutes placed over the said parts, and the two drum sections covering them all. This is one method of arranging the parts for transportation. It is obvious, however, that they may be otherwise arranged to great advantage. The timbers or sleepers U, as shown in Fig. 1, are placed beneath the heads of the drum, but they may be disposed of in any desired manner. It is obvious also that in order to reduce their length they may be made in sections, with or without means for folding or telescoping, and thus be capable of being packed with the other parts in the space inclosed by the section and ends of the cylinder.

The details of construction above de-

scribed may of course be varied within certain limits without departing from the scope of the invention, and the other accessories may be added to the mixer proper.

What I claim is:

1. In a knock-down concrete mixer, in combination, a drum having sides longitudinally partible into nesting segments, nesting ends for said drum, the ends adapted to form the bottom and the sides the roof of an inclosed space, removable nesting mixing blades, adapted to be stored within the inclosed space indicated, and charging and discharge chutes, shaped to conform to the space so inclosed.

2. In a knock-down concrete mixer, a cylindrical drum separable longitudinally into a pair of nesting side sections, and a pair of ends, the side sections being each provided with a splice plate, the ends being provided with outwardly circular extending flanges of unequal diameter, whereby said ends may be nested, the nested sides and ends, forming the roof and bottom of an inclosed space, removable mixing blades, removable supply and delivery chutes, sleepers, and removable drum supporting rollers on said sleepers, adapted to be stored within said inclosed space.

3. In a knock-down mixing drum, in combination; a pair of nesting longitudinally partible sides and nesting ends adapted to coöperate with the sides to form the roof and and bottom of an inclosed space, nesting detachable mixing blades, and chutes adapted to the inclosed space, the inclosed space being adapted to receive the drum supporting pulleys, and other parts of the structure.

4. In combination, a knock-down mixing drum, rollers, sleepers and frames constituting means for supporting said drum, a chain motor, and pulley constituting means for driving said drum and chutes for supplying and discharging material, the drum being longitudinally separable, the separated parts of the drum adapted to inclose a space in which may be stored said supporting and said driving means, and said chutes.

5. In combination, a knock-down mixing drum, means for supporting said drum on which means it may turn, and means for imparting turning motion to said drum, the drum being separable into sections adapted to inclose with the ends, a space in which space said supporting and driving means may be stored.

6. In combination, a knock-down mixing drum, means for supporting said drum on which means it may turn, means for imparting turning motion to said drum, and chutes whereby material may be supplied to and removed from the drum, the drum being separable into sections adapted to inclose with the ends, a space in which space said supporting and driving means and said chutes may be stored.

7. In a knock-down concrete mixer in combination, a drum consisting of an exterior part and ends adapted to said part, the exterior part being separable into nesting elements and the ends being removable from said exterior part, the dimensions being such that the nested exterior part may form the sides and the ends, the bottom of an inclosed space, and driving parts, chutes, and nesting mixing blades, all adapted in size to be packed into the space formed by the nested exterior parts and ends of said drum, whereby a compact knock-down structure adapted for easy shipment is produced.

8. A concrete mixer consisting of a cylindrical casing or drum formed of a plurality of longitudinal sections, means for detachably connecting said sections together, heads for the ends of said cylindrical casing formed respectively with feed and discharge openings, track-rings interposed between the ends of said cylindrical sections and said heads, and means for detachably connecting and clamping said heads, said track members, and said cylindrical sections together, to form said cylindrical casing.

9. A concrete mixer consisting of a cylindrical casing or drum formed of a plurality of longitudinal sections, means for detachably connecting said sections together, heads for the ends of said cylindrical casing formed respectively with feed and discharge openings, track-rings supporting said drum and having a portion thereof serving as a reinforcement and cover for the joints between the side edges of the longitudinal sections and a reduced portion of said rings, bolts detachably connecting said heads and tracks, and tie bolts passing from head to head through the track-rings and clamping all the parts together.

10. A compact portable knock-down concrete mixer consisting of a cylindrical casing separable longitudinally into two sections, removable ends adapted to form with the said sections the sides and bottom of an inclosure, a track-ring adapted to surround said ends and bind together the casing parts, tie-bolts, adapted to pass through the ends and to fasten the whole together, and driving parts, chutes, and mixing blades, all adapted in length to be contained in the said inclosure whereby a compact portable, self-contained knock-down concrete mixer is produced.

11. A concrete mixer consisting of a cylindrical casing or drum formed of a plurality of longitudinal sections, means for

detachably connecting said sections together, heads for the ends of said cylindrical casing formed respectively with feed and discharge openings, rings connected with said cylindrical sections and said heads, and means for detachably connecting and clamping said heads, said rings, and said cylindrical sections together, to form said cylindrical casing, said rings being of greater diameter than said sections and heads and arranged to extend beyond them when they are disconnected and the sections placed upon the superposed heads to form a housing whereby the edges of said heads and sections are protected by the rings.

12. A concrete mixer consisting of a cylindrical casing or drum formed of a plurality of longitudinal sections, heads for the ends of said cylindrical casing formed respectively with feed and discharge openings, means for detachably connecting said sections and heads together, blades mounted within the sections, a charging hopper, a discharging chute, a support for said chute, rollers adapted to receive said rings and frames for supporting the said rollers, all having a greatest dimension less than the diameter of said heads and sections, whereby said heads and sections may be placed together to form a housing inclosing said members.

Witness my hand this 22nd day of May, 1914, at the city of New York, in the county of New York, and State of New York.

ARTHUR W. RANSOME.

Witnesses:
MARY H. LEWIS,
S. J. COX.