

No. 849,732.

PATENTED APR. 9, 1907.

E. E. FLORA.
CONCRETE MIXER.

APPLICATION FILED JAN. 23, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

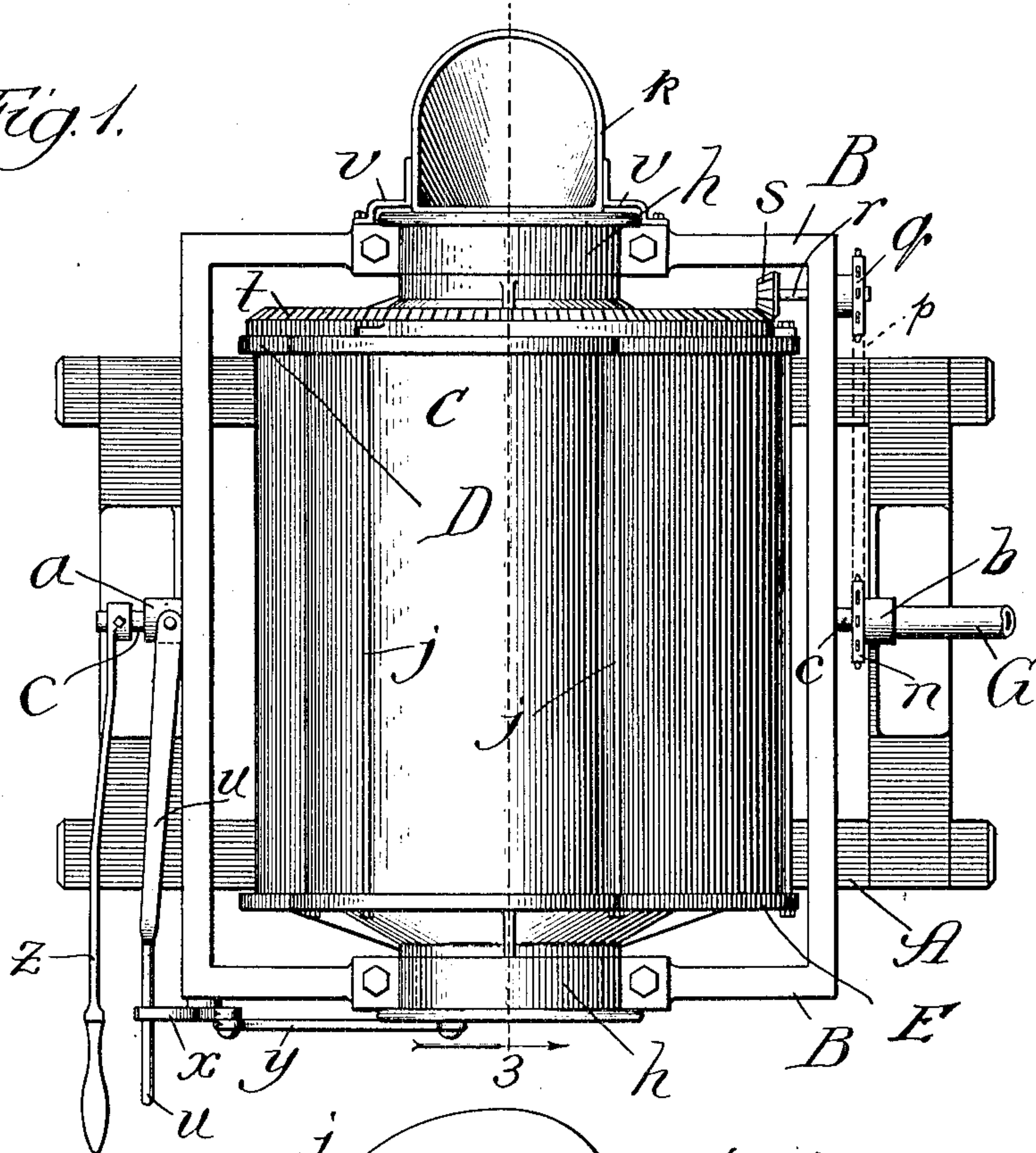
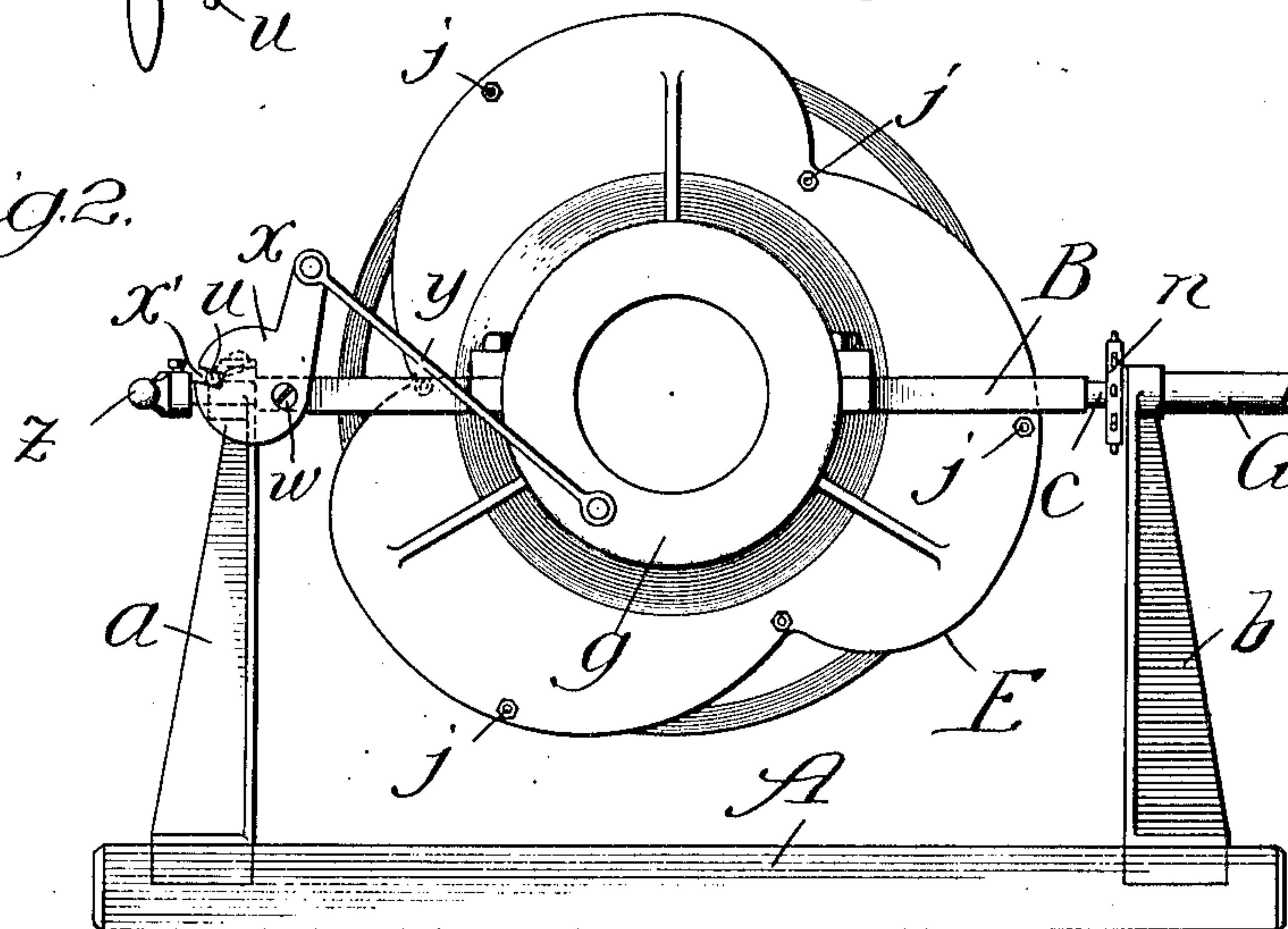


Fig. 2.



Witnesses:
E. E. Gaylord.
J. H. Landes.

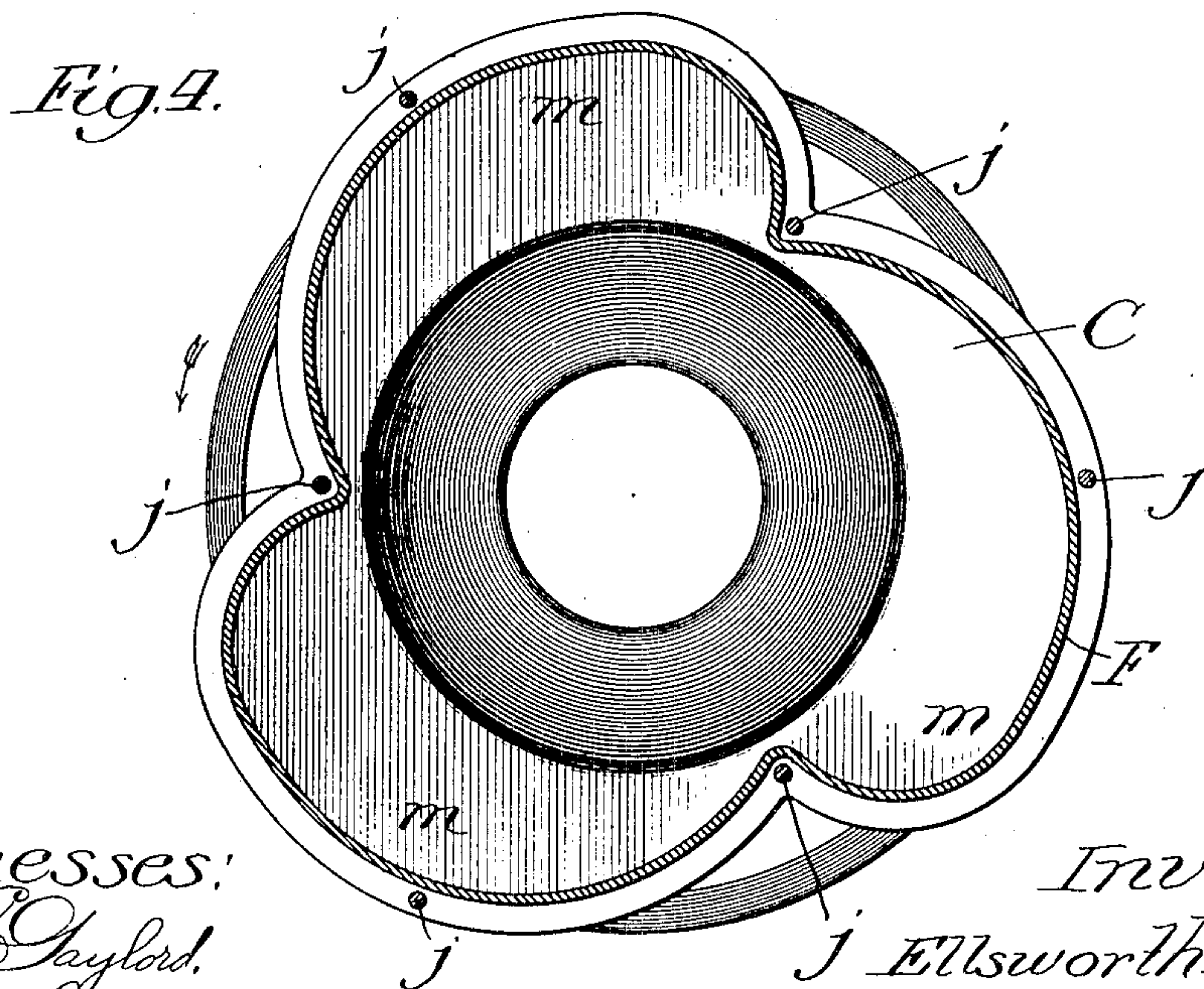
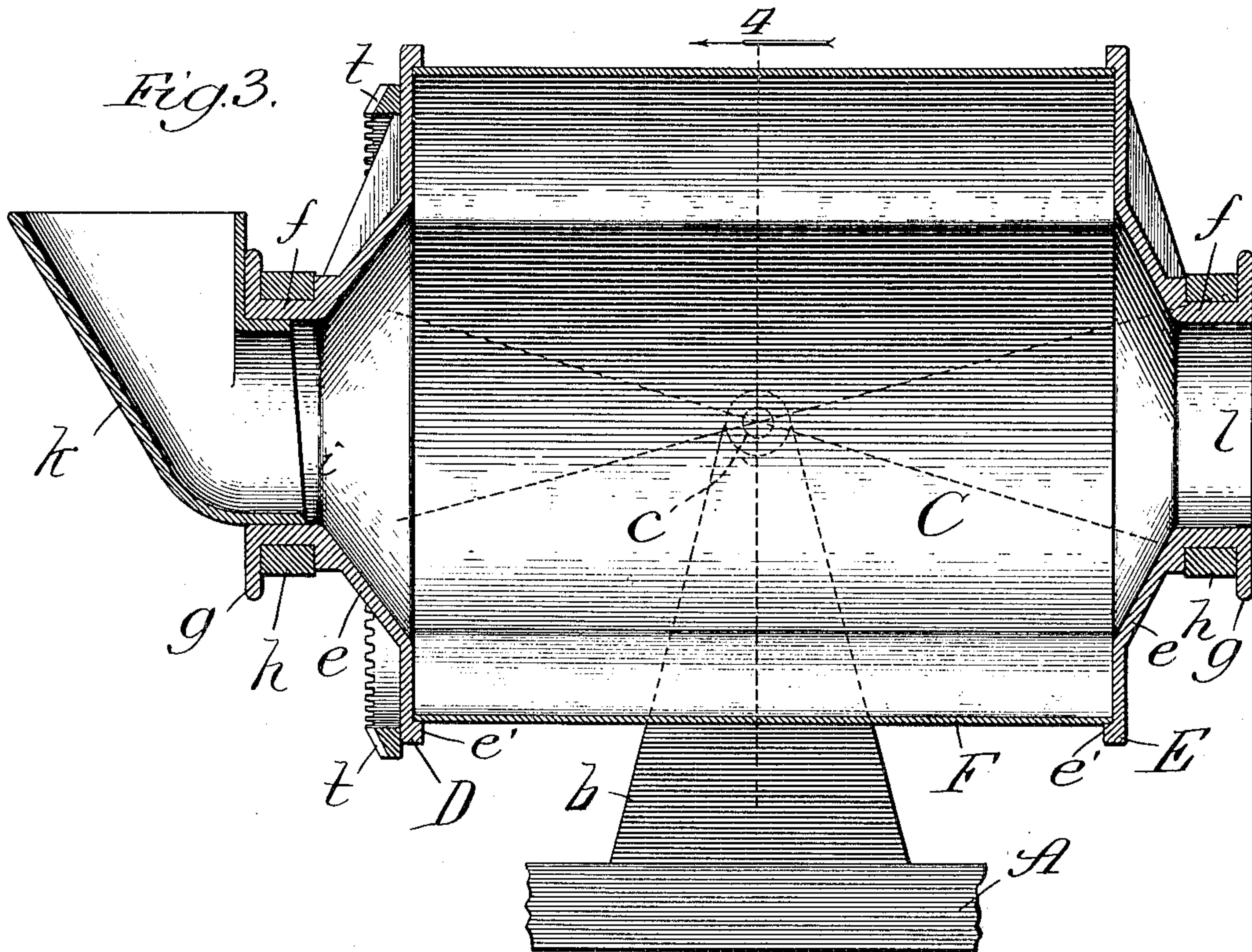
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ELLSWORTH E. FLORA, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. O. WILLIAMS, OF SOUTH BEND, INDIANA.

CONCRETE-MIXER.

No. 849,732.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed January 23, 1906. Serial No. 297,435.

To all whom it may concern:

Be it known that I, ELLSWORTH E. FLORA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Concrete-Mixers, of which the following is a specification.

My invention relates to improvement in devices of the rotary type for effecting thorough mixture in batches of granular or pulverulent material fed thereto; and it relates more particularly to a machine or device of this class adapted for mixing together the ingredients of concrete for building and other purposes.

My object is to provide, more especially, a concrete-mixer of the above type which shall be of comparatively simple and inexpensive construction and at the same time perform the mixing of either wet or dry ingredients with great thoroughness and rapidity.

Referring to the drawings, Figure 1 is a top plan view of my improved mixer; Fig. 2, an elevation of the discharge side thereof; Fig. 3, a broken section taken on line 3 in Fig. 1; and Fig. 4, a section of the casing or receptacle, taken on line 4 in Fig. 3.

Secured to a base A are standards *a b*.

B is a rectangular frame provided at opposite sides with trunnions *c*.

C is a casing or mixing-receptacle formed with heads D E, each head being dished to present the funnel-form parts *e e*, terminating in necks *f*, provided with outer end flanges *g*. The heads are journaled at the necks *f* in bearings *h* on the frame B. The neck portion of the head D presents a central inlet-opening *i*, loosely fitted with an upwardly-projecting hopper-shaped extension *k*, while the neck *f* of the head E surrounds an outlet-opening *l*.

It is very desirable in devices of this character to provide rotary mixing-receptacles without any internal mechanism or obstructions against free mixing movement of the contained concrete ingredients. Obstructions forming mixing-blades, deflectors, wall-pockets, or shelves in the receptacle are undesirable, particularly where wet concrete ingredients are to be thoroughly mixed, because the concrete tends to adhere thereto and pack or ball and solidify in the angles, thereby interfering with the operation and

making it very difficult to clean the interior of the receptacle after a run. In the construction shown the surrounding wall F of the receptacle C is shaped into three longitudinally-extending pockets *m* of involute form in cross-section, as indicated. It will be seen that the pockets are formed by the wall itself, and not by any plates or other obstructions fastened against the wall, and that the junctions between adjacent pockets form narrow pouring edges over which the material in the rotation of the receptacle pours in contradistinction to sliding backwardly from one pocket into the next in succession.

G is a hollow power-shaft journaled in the top of the standard *b* concentrically with the adjacent trunnion *c* and carrying a sprocket-wheel *n*, connected by means of a drive-chain *p* with a sprocket *q* on a shaft *r*, journaled in the frame B in the position shown. The shaft *r* carries a pinion *s*, meshing with a large gear-wheel *t*, fastened upon the head D. Turning of the shaft G thus causes rotation of the receptacle C in the bearings *h* on the frame B. The hopper extension *k*, as shown, projects into the opening *i*, but is fastened rigidly to the frame B by means of brackets *v* and is thus held against rotation. The trunnion *c* on one side of the frame D is journaled in a bearing-opening in the top of the standard *a*, while the other trunnion *c* is journaled in the hollow shaft or sleeve G, which in turn is journaled in the top of the standard *b* and carries the sprocket *n*, as stated. Pivoted at *w* upon the frame B is a lever *x*, provided with a notch *x'*. A link *y* is pivotally connected at one end to the free end of the lever *x* and at its opposite end with the flange *g* of the head E. A lever *u* is pivotally connected at one end to the top of the standard *a* and may be slid laterally into and out of engagement with the notch *x'*, in the lever *x*. When engaging the notch *x'* the lever *u* forms a fixed pivot for the movement of the lever *x* thereon. Fastened to the trunnion *c* to extend beyond the head D is a receptacle-upsetting lever or handle *z*.

In the rotation of the receptacle the link *y* vibrates the lever *x* on the pivot at *x'* and swings the frame B up and down to oscillate the said frame upon the bearings *a b*, and thus rock the receptacle at right angles to its axis of rotation. Thus it will be understood that

during rotation the receptacle rocks endwise automatically while the levers $u x$ are in engagement.

In operation the ingredients to be mixed together are fed into the receptacle C through the hopper k and opening i nearly to the level of the lower side of the opening l . During the rotation of the receptacle in the direction of the arrow in Fig. 4 the mass to be mixed is raised by the pockets m and poured from one pocket into another, thus causing the ingredients to become intimately intermixed. The involute shape of the pockets is of great importance, because it insures particularly intimate mixing of the contained mass in a limited number of rotations and rocking movements of the receptacle, presents no corners in which plastic material may lodge and adhere, and renders the pockets self-cleaning. For example, as the material is carried upward by the deep side of a pocket m it is poured over into the pocket following and spread out. At the same time it slides upon the base-surface of the pockets in a manner to prevent any adhesion of the mixture thereto. The automatic rocking movement of the receptacle causes the concrete to pour first in the direction of one end of the receptacle and then in the direction of the opposite end, thereby preventing any tendency to vertical stratification and insuring intimate mixture longitudinally as well as transversely throughout the receptacle. Thus a more thorough mixing of the ingredients of the concrete is produced in a limited number of turns of the receptacle than can be effected by any other mixer of which I am aware.

It may take from twelve to fifteen rotations and oscillations of the receptacle to effect the desired thorough mixing, depending upon the character of the mass. When this is done, the contents may be discharged by disengaging the levers $u x$ and pressing down the lever z to turn the receptacle on the trunnions c and upset it to pour the mixed mass through the discharge-opening l while the receptacle rotates. When all the contents are thus discharged, the receptacle may be righted again by raising the lever z and the lever u caused again to engage the notch x' of the lever x ready for another batch.

In the construction shown the heads D E describe the same contour as the surrounding wall of the receptacle and are formed with flanges e' to receive or overlap the ends of the said wall. The heads and surrounding wall of the receptacle are held together by tie-

rods j , passing longitudinally across the outer surface of the surrounding wall and fastened by means of nuts to the heads, all as indicated in the figures. The surrounding wall is preferably of sheet or plate metal, and the heads are preferably cast. In the event that the surrounding wall becomes worn in use or rusts through it may be readily removed and replaced with another surrounding wall. In constructing machines of different lengths the same heads may be employed, which is an advantage.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination of a frame, a mixing-receptacle on the frame having a non-perforated surrounding wall formed with a plurality of internal pockets of curved involute shape in cross-section, a ridge formed between the members of each pair of said pockets by their junction and forming a pouring edge from one pocket into the other in the rotation of the receptacle, and means for rotating the receptacle on the frame.

2. In a machine of the character described, the combination of a frame, a mixing-receptacle on the frame, means for rotating the receptacle on the frame, and means on the frame operating automatically to rock the receptacle endwise during its rotation.

3. In a machine of the character described, the combination of a frame, a mixing-receptacle on the frame, means for rotating the receptacle on the frame, attachable and detachable means for automatically rocking the receptacle endwise during its rotation, and means for upsetting the receptacle on the frame.

4. In a machine of the character set forth, the combination of a frame, a mixing-receptacle on the frame having a non-perforated surrounding wall formed with a plurality of pockets of curved involute shape in cross-section, a ridge formed between the members of each pair of said pockets by their junction and forming a pouring edge from one pocket to the other in the rotation of the receptacle, said receptacle having heads provided centrally with inlet and outlet openings respectively, and means for rotating the receptacle on the frame.

ELLSWORTH E. FLORA.

In presence of—

J. W. DYRENFORTH,
J. H. LANDES.