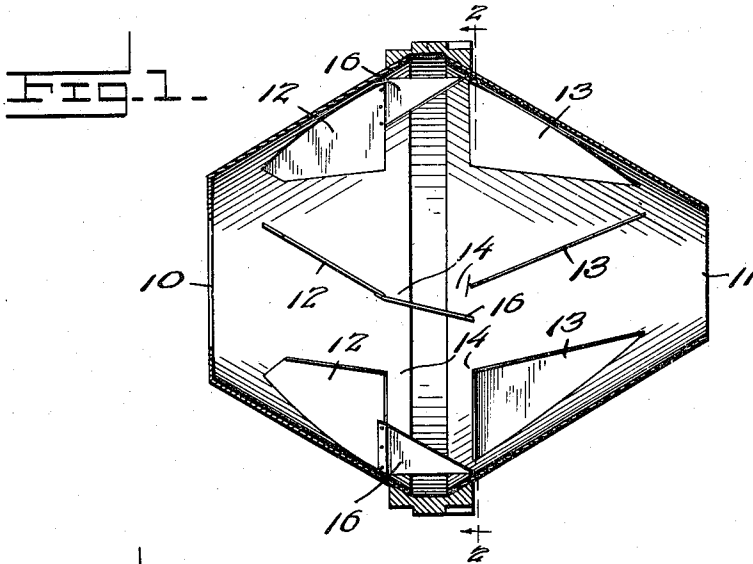
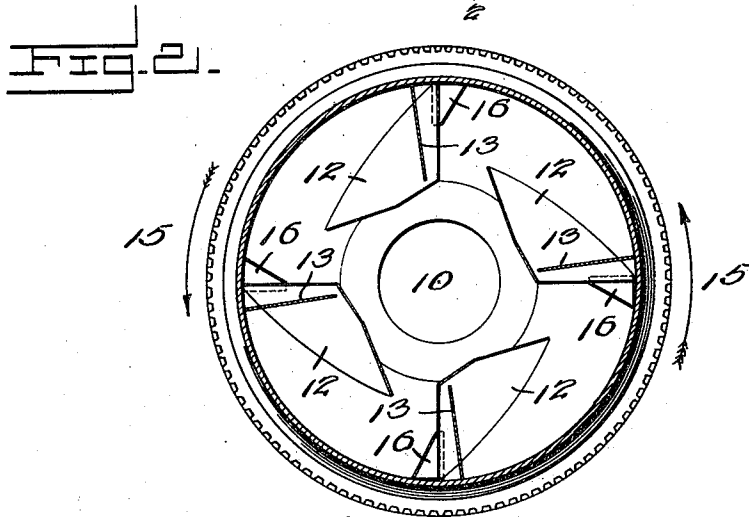
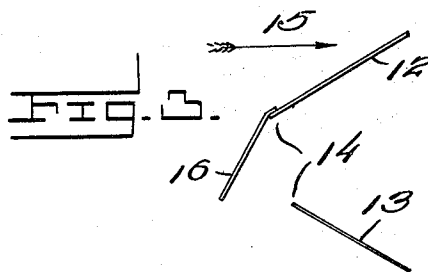


T. L. SMITH.
CONCRETE MIXER DRUM.
APPLICATION FILED JAN. 23, 1913.

1,150,896.

Patented Aug. 24, 1915.



Witnesses
L. P. [Signature]
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UNITED STATES PATENT OFFICE.

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CONCRETE-MIXER DRUM.

1,150,896.

Specification of Letters Patent.

Patented Aug. 24, 1915.

Application filed January 23, 1913. Serial No. 743,868.

To all whom it may concern:

Be it known that I, THOMAS L. SMITH, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Concrete-Mixer Drums, of which the following is a specification.

My invention relates to improvements in the drums for concrete mixers and more particularly to the blade arrangement in drums that are tilted to discharge.

The objects of my improvement are to increase the mixing efficiency and the uniformity of the discharged product and incidentally to reduce the waste of material splashing out of the drum. I attain these objects by the construction illustrated in the accompanying drawing, in which—

Figure 1 shows a central longitudinal section of the drum. Fig. 2 shows a transverse section of the drum on the line 2—2 of Fig. 1 looking toward the left, and Fig. 3 shows diagrammatically the arrangement of one set of blades.

Similar reference numerals refer to similar parts throughout the several views.

The drum here shown is of a type well known in the art of concrete mixing. The feed and discharge openings are at the respective ends of the drum, concentric with its axis. The drum is so mounted in the mixing machine that it is maintained in horizontal position during the feeding of the batch to the drum and during the mixing of the batch, and is tilted to an inclined position during the discharge of the batch, the rotation of the drum being constant and uninterrupted during the successive performances of these various operations.

The mixing of the ingredients of which the concrete is composed, sand, stone, water and Portland cement, is effected by the blades attached to the interior surfaces of the drum.

10 is the feed opening through which the batch is introduced to the drum, and 11 is the discharge opening through which the concrete makes its exit when the axis of the drum is in inclined position.

A series of blades 12 is placed in the receiving end of the drum, and a corresponding series of blades 13 is placed in the discharge end. These blades 12 and 13 are placed opposite each other in pairs as shown

in Figs. 1 and 3, and are all inclined relative to the drum's axis as shown in Figs. 1 and 2. Each pair of blades converges toward the medial cross plane of the drum, the blades of each pair being spaced apart leaving a comparatively narrow opening 14 between them. The ends of the blades forming this opening being parallel to each other and substantially perpendicular to the axis of the drum. The blades are substantially triangular in shape, varying in width radially of the drum from the deep edge forming the opening 14 to nothing as the feed and discharge openings are approached. The drum is to be rotated in the direction of the arrows 15 of Figs. 2 and 3, that is, with the points of the blades which are near the ends of the drum in advance and the opening 14 following in the direction of rotation. The blades therefore tend constantly to force the material contained in the drum toward the median plane thereof and away from the ends thus preventing the waste of material due to splashing through the open ends of the drum. Also, as each pair of blades progresses upward on the ascending side of the drums the material is crowded together sidewise of the trough formed by each pair of blades and endwise of the drum, and is forced by gravity and inertia consequent on the movement of the drum, to flow through the deep narrow openings 14. This movement of material endwise of the drum together with the constant turning over thereof due to the rotary movement of the drum results in an exceedingly efficient mixing of the batch of material.

To each of the blades 12 on the feed side of the drum auxiliary blades 16 are attached, extending across the openings 14 near the interior surface of the drum. These auxiliary blades also are triangular in shape having their broad sides attached to the blades 12 and their points directed toward the discharge end of the drum. They are also placed at an angle relative to the drum's axis in such manner as to tend to throw the material toward the discharge end. Their function is two fold. First to effect a turning over and an endwise movement of heavy portions of the material that might otherwise continually roll around at the largest diameter of the drum and through the openings 14 without being

mixed as quickly as the material that comes in contact with the blades 12 and 13. This action of the material is noticed particularly in mixing comparatively dry concrete for stairways or other inclined formations, which kind of concrete is particularly sticky and apt to form balls of the size of the openings 14. In such case these balls will be disintegrated by the blades 16 and their contents thrown into the path of blades 13. The second function of these auxiliary blades is to equalize the kinds of material in the discharge when the concrete which is being produced is of the kind known as sloppy concrete which contains an abundance of water. In mixing this kind of concrete without the blades 16, the larger and heavier stones are apt to gather at the bottom of the drum and will be retarded in discharge when the drum is tilted, the more fluid part of the mixture flowing out first carrying most of the stone with it, but still leaving quite a residue of the largest pieces of stone to form the last of the discharge. These auxiliary blades 16 not only prevent the stone accumulating in the bottom of the drum, but also, by their inclination, start what stone happens to be there toward the discharge opening on the first movement of discharge. The effect is that the stone in sloppy concrete passes out in its proper proportion to the other elements and there is no more stone in the last part of the discharge than in the first. This movement toward the discharge end of the drum is also facilitated by the blades 13 on the discharge side of the drum being a little shorter than the blades 12 on the feed side as shown in Fig. 3. The portion of the blades 12 which extends beyond the blades 13 will assist in this impulse toward the discharge opening.

The various details of construction and arrangement here shown as an exemplification of this invention may be changed without departing from the spirit or scope thereof as defined by the claims.

What I claim as my invention, is:—

1. A rotary drum for mixing concrete composed of two frustums of cones attached together at the larger diameters and having axial feed and discharge openings at their smaller diameters; a plurality of pairs of blades attached to the interior of the drum,

one blade of each pair being attached to each cone opposite to the other member of the pair, the blades of each pair lying in planes which are equally and oppositely inclined to each other and to the axis of the drum similar to the letter V, the adjacent edges of each pair of opposing blades being spaced apart at the medial plane of the drum, the opposed edges of the blades at the opening between them being substantially radial of the drum, and auxiliary blades of comparatively small width radially of the drum attached to said radial edges of the blades on the feed side of the drum and extending across the intervening space between the opposed blades, said auxiliary blades being also inclined to the axis of the drum in the same direction as the blades on the feed side of the drum.

2. A rotary drum for mixing concrete composed of two frustums of cones attached together at the larger diameters and having axial feed and discharge openings at their smaller diameters; a plurality of pairs of blades attached to the interior of the drum, one blade of each pair being attached to each cone opposite to the other member of the pair, the blades of each pair lying in planes which are equally and oppositely inclined to each other and to the axis of the drum similar to the letter V; the adjacent edges of each pair of opposing blades being spaced apart at the medial plane of the drum, the opposed edges of the blades at the opening between them being radial of the drum, said edge on the blades on the feed side of the drum being slightly behind the opposed edge of the blades on the discharge side of the drum as referred to the direction of rotation of the drum, and auxiliary blades attached to said radial edges of the blades on the feed side and extending across the intervening opening between the opposed edges, said auxiliary blades being of materially less height radially of the drum than the main blades and inclined to the axis of the drum in the same direction as the blades on the feed side thereof; all of the blades being substantially triangular in form.

THOMAS L. SMITH.

Witnesses:

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