

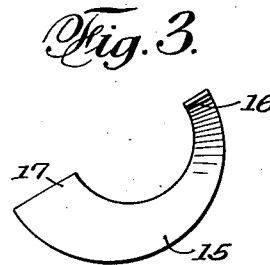
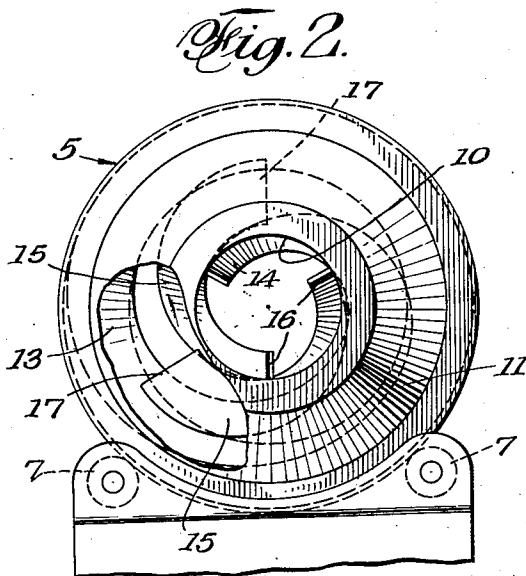
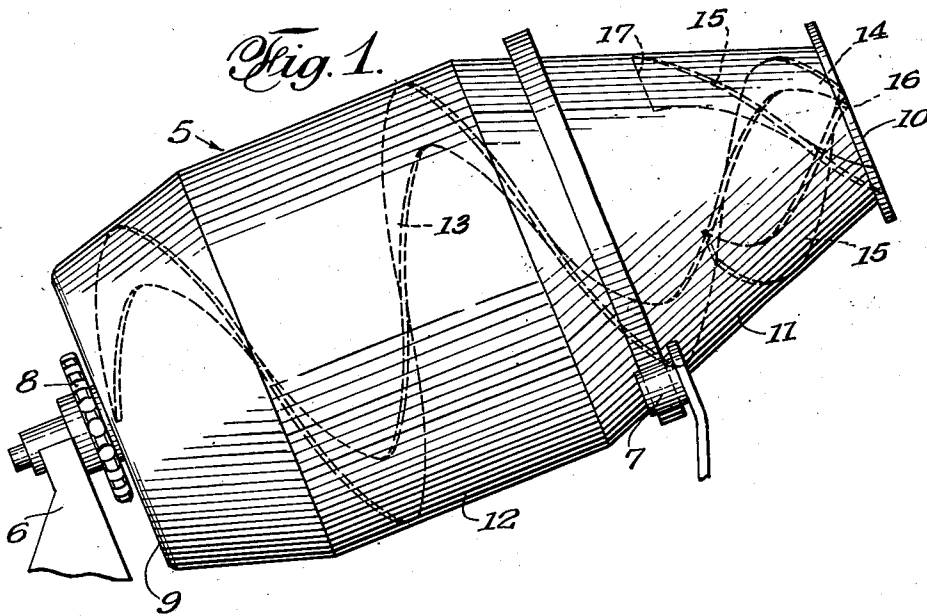
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C. L. WILLARD ET AL

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FEED HELIX

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INVENTORS
CARL L. WILLARD
J. JACK WILLARD
C. G. Stratton
ATTORNEY

RE 23320

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FEED HELIX

Carl L. Willard and J Jack Willard,
Lynwood, Calif.

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3 Claims. (Cl. 259-161)

REISSUED

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1 This invention relates to mixing drums and more particularly to the means within such drums for feeding material into or discharging material from the same.

An object of the present invention is to provide a drum of the character indicated and embodying material-feeding means, that is designed to obviate clogging of said drum particularly when the same receives material, such as aggregate.

For discharging cement or concrete, a mixing drum is conventionally provided with one or more helices which urge such mixtures outwardly while said drum is being rotated. The hand of these helices is in accordance with the direction of rotation of the drum. However, for feeding aggregate into the drum to become a cement or concrete mixture, the hand of the helices remains the same but the drum rotation is reversed, and in practice it is found that such aggregate does not readily feed into the drum heretofore used as rapidly as desired without the opening thereof becoming clogged.

Accordingly, another object of the invention is to provide efficient discharge means, in a mixing drum which also effects rapid feed or intake of materials to obviate clogging of the drum opening.

Our invention also has for its objects to provide such means that are positive in operation, convenient in use, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a side elevational view of a mixing drum embodying features of the present invention.

Fig. 2 is a partly broken end view as seen from the right of Fig. 1.

Fig. 3 is a detail view of a helical section employed in the construction.

2 The present invention is an improvement of the invention disclosed in our application entitled "Portable concrete mixer," Ser. No. 672,364, and filed May 27, 1946, now abandoned. Reference is made to said application for the general environment of the mixing drum shown in the accompanying drawing. In said drawing, a drum 5 is supported at one end in a bearing 6 and at the other by rollers 7 for rotation about its axis by a drive to a sprocket wheel 8. Said drum is preferably mounted so that its closed end 9 is lower than the opening 10 thereof at the other end and is thereby supported at an angle to the horizontal. No matter how otherwise formed, the drum, at the open end 10, is conically formed as at 11 being smallest at said open end which is, therefore, generally restricted in size with respect to the drum body 12.

Assuming the drum to have clockwise rotation, the same is provided with a feed helix 13 that extends for at least 360° and preferably more and is formed to be right-handed and, therefore, efficiently serves, during clockwise rotation of the drum, to urge a mixture therein outwardly through opening 10. For a counter-clockwise rotating drum, the helix should be of the other hand.

When the drum is to receive aggregate through its opening 10, it is rotated in the opposite direction and said helix will draw said aggregate into the drum. However, because of the dry nature of the materials comprising the aggregate, the openings in the drums heretofore in use, in practice become clogged since the helix is insufficient to draw the aggregate inward at a rapid enough rate. Further, the end of the helix in such a drum, adjacent said opening, acts to divert some of the material to fall outside of the drum.

According to our invention, to obviate the above faults, the helix 13, at its end 14 as it approaches opening 10, is gradually reduced in width. This reduction of the end of the feed helix serves to eliminate the fault of diverting material as stated above. In order to increase the capacity of the drum to receive dry aggregate, one or more helical sections 15, similar in form and design to the helix end 14, is provided in symmetrical arrangement to provide a plurality of feed elements 50 serving to draw material rapidly into the drum.

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Each section 15 is formed with a relatively narrow end 16 adjacent to opening 10 so that the same is not blocked thereby, and with a gradually widened portion terminating at 17 at an intermediate point of conical drum part 11.

It will be noted that by our present arrangement the overflow of the narrow portion of one helix, during discharge of aggregate is caught by the next helix following. Each of our helices tapers down in width to about one-half ($\frac{1}{2}$) of the wider end of same, the narrower width being at the opening of the drum. For loading, the reduced ends of our helices leaves a larger clear opening for the stream of aggregate to enter and to fall far back into the mixer drum and not on to the ground, and still the speed of discharge is not reduced. Since the reduced ends 14 and 16 of the helices 13 and 15 are about one-half the width of the wider inner ends, the same each has a proportionally smaller capacity to convey material outward of the drum. However, the sum of the widths of said narrow ends is equal to or greater than the width of the inner portion of helix 13. Consequently, during discharge, the aggregate brought by helix 13 toward opening 10 will, in part, fall from the narrowing end 14 because of the reduced width thereof. Ordinarily, such dislodgement of aggregate would fall back into the drum and the discharge capacity would be materially reduced. The helical sections 15, in this construction, catch such spillage and feed the same outward. It will be seen then that the reduced ends 14 and 16 have a discharge capacity at least equal to the feed capacity of the wider or main portion of helix 13.

While we have illustrated and described what we now regard as the preferred embodiment of our invention, the construction is, of course, subject to modifications without departing from the spirit and scope of our invention. We therefore, do not wish to restrict ourselves to our particular form of construction illustrated and described, but desire to avail ourselves of all modifications that may fall within the scope of the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. In a mixing device, a drum arranged on a fixed inclined axis and having a reduced open end above the closed end thereof, said drum being adapted to be selectively rotated in both directions, a helical blade extending between said ends around the inner face of the drum for at least 360°, the end of the blade adjacent the open end of the drum being progressively reduced in width toward said open end to reduce obstruction to material entering into the drum while the same is rotated in one direction, said blade, including its reduced end, being adapted, upon rotation of the drum in the other direction, to discharge material from the open end, and at least one intermediate helical blade of lesser length than the mentioned helical blade disposed in the reduced end of the drum and also being progressively reduced in width toward said open end to catch material spilling from the first-mentioned blade to discharge the same during rotation in one direction of the drum and to draw said material into the drum during rotation in the other direction of the drum, the sum of the widths of the reduced ends of all of the blades being at least equal to the width of the widest portion of the first-mentioned helical blade.

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2. In a mixing device, a drum arranged on a fixed inclined axis and having a reduced open end above the closed end thereof, said drum being adapted to be selectively rotated in both directions, a helical blade extending between said ends around the inner face of the drum for at least 360°, said blade being of substantial width from the closed end of the drum to a point nearer to but spaced from the open end thereof, the end of the helical blade extending from said point to the open end of the drum being progressively reduced in width toward said open end to reduce obstruction to material entering into the drum while the same is rotating in one direction, said reduced end of the blade, thereby having a smaller capacity to convey material to the drum opening than has the wider portion thereof when the drum is rotating in the opposite direction, and one helical blade section having a length approximating that of the progressively reduced end portion of the helical blade and positioned in the drum similarly to the position of said reduced portion, said helical blade section being progressively reduced in width similarly to said reduced end portion of the helical blade, the sum of the widths of the reduced ends of both the blade section and the reduced end portion of the blade being at least equal to the width of that portion of the latter blade that is inward of the mentioned point of the drum, whereby material conveyed by said inward portion toward the reduced end portion thereof, upon dislodgement from said reduced portion, is caught by the blade section, and whereby both said reduced ends effect discharge of material in amounts substantially equal to that conveyed by the inward portion of the helical blade.

3. In a mixing device, a drum arranged on a fixed inclined axis and having a reduced open end above the closed end thereof, said drum being adapted to be selectively rotated in both directions, a helical blade extending between said ends around the inner face of the drum for at least 360°, said blade being of substantial width from the closed end of the drum to a point nearer to but spaced from the open end thereof, the end of the helical blade extending from said point to the open end of the drum being progressively reduced in width toward said open end to reduce obstruction to material entering into the drum while the same is rotating in one direction, said reduced end of the blade, thereby, having a smaller capacity to convey material to the drum opening than has the wider portion thereof when the drum is rotating in the opposite direction, and two helical blade sections in the drum each having a length approximating that of the progressively reduced end portion of the helical blade and uniformly spaced from each other and from said reduced end portion, each helical blade section being progressively reduced in width similarly to said reduced end portion of the helical blade, the sum of the widths of the reduced ends of both blade sections and of the reduced end portion of the blade being at least equal to the width of that portion of the latter blade that is inward of the mentioned point of the drum, whereby material conveyed by said inward portion toward the reduced end portion thereof, upon dislodgement from said reduced portion, is caught by one or both of the blade sections, and whereby said three reduced ends effect discharge of material in amounts substantially equal to that

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conveyed by the inward portion of the helical blade.

CARL L. WILLARD.
J JACK WILLARD.

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