ST. JOHN CLARKE & R. WELCKER.

APPARATUS FOR MIXING AND DELIVERING CONCRETE AND THE LIKE MATERIALS.

APPLICATION FILED DEC. 24, 1910.

995,422. Patented June 13, 1911.

Fig. 1

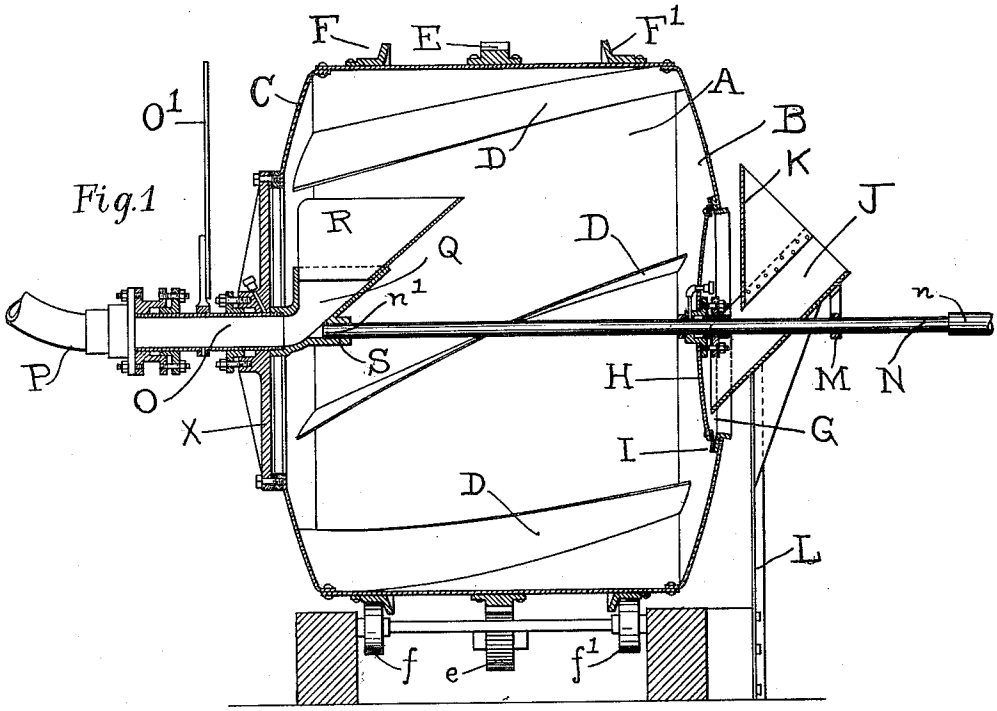
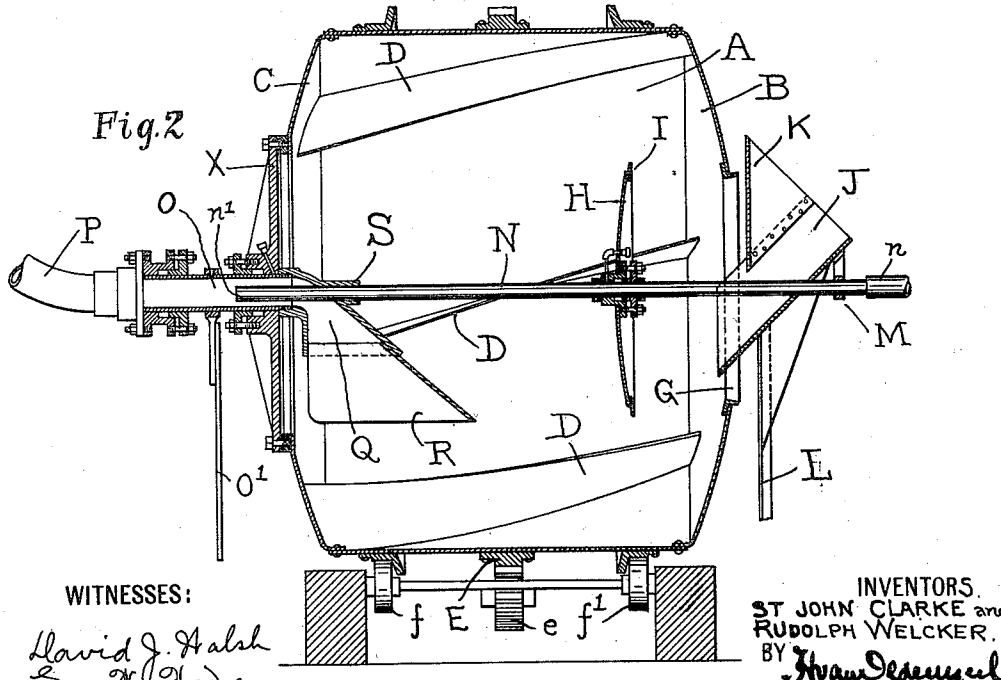


Fig. 2



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APPARATUS FOR MIXING AND DELIVERING CONCRETE AND THE LIKE MATERIALS.

995,422. Specification of Letters Patent. Patented June 13, 1911.

Application filed December 24, 1910. Serial No. 599,231.

To all whom it may concern:

Be it known that we, ST. JOHN CLARKE, a citizen of the United States of America, and RUDOLPH WELCKER, a subject of the Queen of the Netherlands, residing, said ST. JOHN CLARKE at Bogota, county of Bergen, State of New Jersey, and said RUDOLPH WELCKER at Bronx Manor, city of Yonkers, county of Westchester, State of New York, have invented a new and useful Apparatus for Mixing and Delivering Concrete and the Like Materials; and we do hereby declare the following to be a full, clear, and exact description of the same.

The present improvements, in apparatus for handling and delivering concrete materials, mortar or like semi-solids, relate to new arrangements of parts whereby the one apparatus is employed, with great efficiency, for both mixing the concrete (or other material) and for delivering the mixed material to a more or less distant point of use (for instance, in the lining of tunnels or subways, or in the building of walls) at any plane with relation to the new apparatus.

While our improvements may, obviously, be embodied in many forms of apparatus, we have preferred to use (and have illustrated in the accompanying drawings) a Ransome concrete-mixer, of usual form, having added thereto a supply door, an improved discharge chute and a pipe for leading compressed air, or other pressure medium, into the discharge chute in the direction of discharge of the material from the mixer.

Referring to the accompanying drawings, Figure 1 shows, in vertical section, our new apparatus when used for delivering semi-solids—such as mortar or concrete—to a point of use, as between the wall of a tunnel and a frame. Fig. 2 is a like view of the machine when in use for receiving concrete materials and mixing the same.

A indicates the body of a casing—a Ransome concrete mixer, in this instance—having also the receiving end B and the discharging end C. The mixer has the usual blades D, for stirring the concrete materials and for lifting and dropping quantities of the same.

In order to rotate the casing about its axis, it has the usual external circular gear ring E, which meshes with and is driven by the pinion *e*. The mixer-casing also has the two usual track rings, F, F^1, running upon rollers when the casing is rotated.

The supply end of the casing has a filling opening or port, G, and this port is opened or closed, as desired, by the sliding of a door H, provided with an edge gasket, I, for assuring an air-tight joint when the door is in fully closed position (that shown in Fig. 1).

At its discharge end, the illustrated mixer is provided with a plate, X, bolted in place and permanently closing the usual opening. A tubular continuation, O, hereinafter spoken of, passes through said plate, at the rotation axis of the apparatus, and said plate is free to rotate around the pipe while the pipe may be rocked in either direction and freely of the plate.

A chute J, having a front wall K which thus completes a hopper from which the chute continues, is supported by an angle bar L in position to deliver concrete into the mixer when the door H has been pushed (as shown in Fig. 2) inwardly and the supply opening G is unobstructed all around.

For sliding the door H to either open or close port G, any suitable means may be used. We preferably employ a pipe N to which the door is secured. Said pipe is used also for supplying fluid under pressure (as compressed air) to draw mixed material from the casing and force said material to any desired point of use in manner hereinafter described. In order to supply fluid under pressure to pipe N, the latter is connected with a flexible or other pipe, *n*, in turn connected with a source of compressed air. Near one end, pipe N is arranged to slide in a bearing formed in a part M suspended from the hopper.

The apparatus has a discharge chute preferably, as before stated, disposed to rock about the axis of rotation of the mixer casing. In the form shown, the chute has a receiving hopper Q to the exit end of which a tube or tubular continuation O is secured. At its discharge end, the part O leads into a pipe, P, of a length and flexibility sufficient to deliver the concrete to any desired point of use.

The hopper Q is shown as provided with a flaring extension R, in order to increase its receiving capacity. At its rear end—that is to say, at a point in line with the tubular

continuation O,—the hopper has a projection S with an opening therethrough and adapted to constitute a bearing for an end of the pipe N which, as before stated, is slidable. In its retracted position (causing door H to close the port G) the discharge end *n* of pipe N lies as shown in Fig. 1, so as not to interfere with the passage of concrete from hopper Q to pipe O, when the discharge chute is turned into receiving position. In its advanced position (causing the door H to open the port G), said discharge end *n* of pipe N lies as shown in Fig. 2, that is thrust forward into the tubular continuation O of the chute.

As will be understood, the chute is free to rock about pipe N, in order that the chute may be swung to either receiving or rejecting position. To rock said chute, a handle, O^1, is connected to the part O of said chute.

In operation, and when filling the mixer-casing, the parts are as in Fig. 2—with the pipe N advanced so as to have the door H in open position, while the handle O^1 has been swung to give the chute Q a half-turn. Concrete materials are then poured into hopper J and discharge into the mixer. When sufficient material has been supplied to the mixer, the pipe N is pulled (to the right, in the drawings) and door H closes port G. Upon rotation of the mixer casing, the blades D agitate the materials and lift quantities of the same and then drop these toward the mass. The chute Q, being then turned so as not to receive material, assists in distributing falling concrete over the mass. While the mixing is going on, fluid under pressure is not supplied through pipe N.

As soon as the concrete materials are sufficiently mixed, air is supplied through pipe N and rushes through the part O of the discharge chute (the passage of the air thus giving the chute the property of an injector) and outwardly through pipe P. The handle O^1 is now given another half-turn, and, as a result, the chute Q is turned to a receiving position, that shown in Fig. 1. The door H being, as aforesaid, closed, in order to make the mixer quite air-tight, the continued rotation of the latter lifts quantities of the mixed concrete, and these portions are dropped into the hopper R of the chute and fall into the tubular continuation O. At that moment, the concrete is moving in the direction of its discharge (toward pipe P) and is readily carried, by the compressed air, in that same direction, through that pipe, to the desired point of use. The tendency, if any, of the concrete to clog the hopper Q, or to form a bridge therein, is overcome by the backing-up, at intervals, of quantities of air from the tubular continuation O. Should such clogging or bridging take place, it is merely necessary to turn the chute to the position shown in Fig. 2, whereupon the material will fall from it. Upon return to the position of Fig. 2, the chute is again ready for action.

While we have, in practice, found the illustrated device to be very efficient and economical, we do not desire to be understood as limiting ourselves thereto.

We claim:

1. In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing having a discharge port, with a hopper within and inclosed by the mixer casing, and having its discharge end communicating with said port, and means for injecting a stream of air directly into the outlet of said hopper and directing said air toward the discharge port, said casing having means for feeding concrete toward the hopper.

2. In an apparatus for handling concrete and the like materials, a mixer casing having a discharge port, means, comprising a pipe having its discharge end within the casing, alined with and a substantial distance from the discharge port, for injecting a stream of air under pressure into the latter, and means inclosed within the mixer casing for directing concrete into the stream of air aforesaid, said casing having means for feeding concrete toward said directing device, all in combination with a pipe communicating directly with said discharge port and leading to a point of discharge of the concrete.

3. In an apparatus for handling concrete and the like materials, the combination of a closed rotatable mixer casing having a discharge port, with a hopper within and inclosed by the mixer casing and having its discharge end communicating with said discharge port, and means for injecting a stream of air under pressure directly into said hopper and directing said stream toward the discharge port, said casing having mixer blades rotatable therewith, for feeding concrete toward the hopper aforesaid.

4. In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing having a discharge port, with a hopper within and inclosed by the mixer casing and with its discharge end communicating with said discharge port, said hopper adapted to swing about a horizontal axis, to receive or to reject concrete fed thereto, means for swinging said hopper, and means for injecting a stream of air under pressure directly into said hopper and directing said stream toward the discharge port, said casing having means for feeding concrete toward the hopper.

5. In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing having a discharge port, with a hopper within and inclosed by the

mixer casing and with its discharge end communicating with said discharge port, and means, comprising a pipe passing through the wall of said hopper near the base of the latter, said pipe having its discharge end alined with said discharge port, for injecting a stream of air under pressure toward the said port, said casing having means for feeding concrete toward the hopper.

6. In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing having a discharge port, with a hopper within and inclosed by the mixer casing and with its discharge end communicating with said discharge port, and means, comprising a slidable pipe passing through and having a bearing in the wall of said hopper near the base of the latter, and with the discharge end of said pipe alined with said discharge port for injecting a stream of air into the latter, said casing having means for feeding concrete to the hopper.

7. In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing, a discharge chute leading therefrom and mounted to be rocked about a horizontal axis, means, within the casing for moving the mixed material toward said chute, and a slidable pipe for supplying fluid under pressure directly to said chute and having one of its bearings carried by the latter.

8. In an apparatus for handling concrete and the like materials, the combination of a mixer casing having internal mixing and lifting blades, with a discharge chute therefor mounted to be rocked about a horizontal axis, a supply door for the casing, and a slidable pipe carrying said door and having its discharge end slidably fitting in the discharge chute for leading fluid under pressure thereinto in the direction of discharge of material therethrough.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

ST. JOHN CLARKE.
RUDOLPH WELCKER.

Witnesses:
WM. H. BERRIGAN,
JOHN H. HOVING.