July 9, 1946. W. H. LEWIS 2,403,536

MIXER

Filed Nov. 3, 1943

Fig. 1

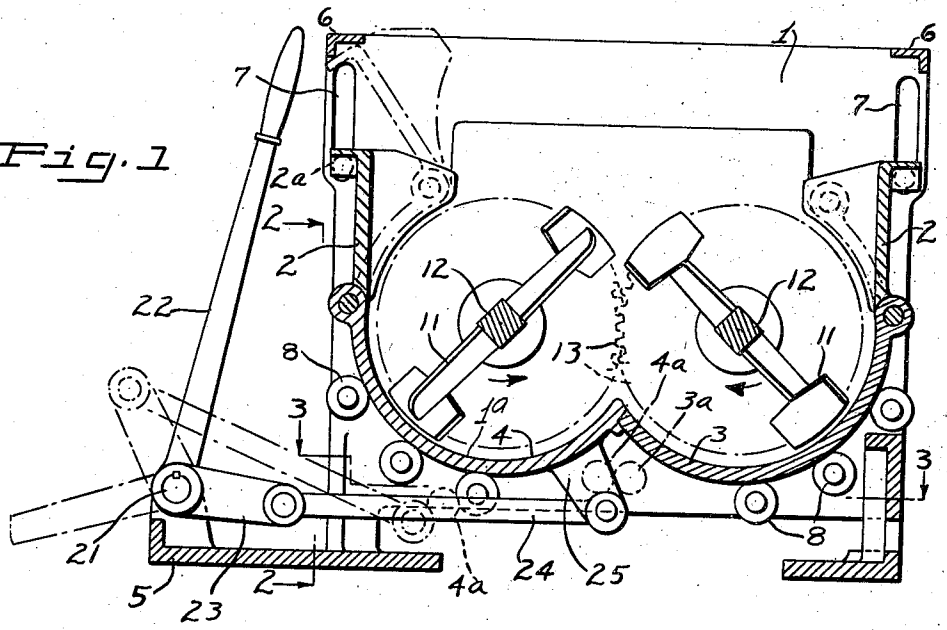


Fig. 2

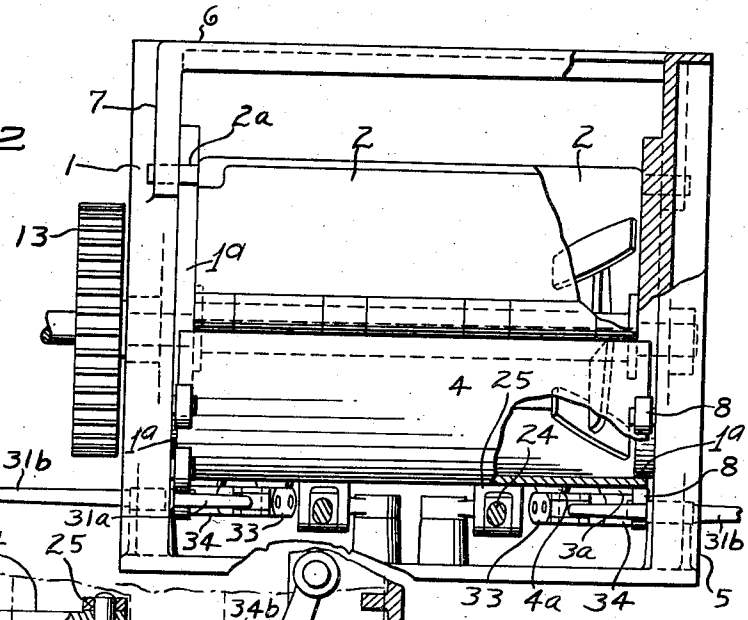
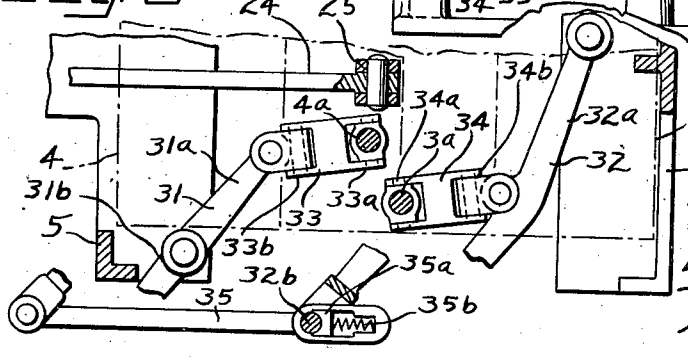


Fig. 3



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Patented July 9, 1946

2,403,536

UNITED STATES PATENT OFFICE

2,403,536

MIXER

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Application November 3, 1943, Serial No. 508,835

5 Claims. (Cl. 259—28)

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My present invention relates to a mixer for mixing concrete or other plastic materials.

One of the principal objects of this invention is to provide a mixer of this class having a bottom which may be readily opened for discharging the contents of the mixer, and the bottom of which may be substantially sealed against leaking when substances to be mixed, or liquid-like substances or mixes contained therein.

Another important object of this invention is to provide a mixer of this class having an openable bottom and which is so constructed that stones, large pieces of aggregate, or the like will not easily lodge between the closing gates or the gates and the gate frame to prevent full closing the bottom.

An important object also of this invention is to provide a mixer of this class in which the discharge gates are slidably mounted and further so that they are closed with a shear-like action whereby stones, pieces of aggregate, or the like, are removed from the forward moving edges of the gates as the latter are closed.

A further object of this invention is to provide a mixer of this class having novelly mounted gates and side walls and which may be easily operated for both opening and closing the discharge gates of the same, and to provide a structure of this class which will not readily get out of order.

With these and other objects in view as will appear hereinafter, I have devised a mixer, for concrete and other plastic materials, having certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawing and to the characters of reference thereon which form a part of this application, in which:

Fig. 1 is a side elevation of my mixer, in a preferred form;

Fig. 2 is a sectional elevation of the mixer, taken through 2—2 of Fig. 1; and

Fig. 3 is a sectional view taken through 3—3 of Fig. 2, showing the means for connecting the coincident ends of the gates for simultaneously operating the same.

The mixer consists of a mixing box comprising rigid or stationary side walls 1, movable side walls 2, and bottom or discharge gates 3 and 4. The stationary or rigid side walls 1 are part of the rigid or supporting structure, and they are shown as supported on a sub-frame 5 which supports the side walls 1 in spaced relation. The upper portions of the side walls 1 are secured together by tie members or rails 6, these rails connecting the ends of the side walls 1 and are positioned considerably above their upper edges. The side walls 2 are positioned between the ends of the

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side walls 1. There are provided oppositely positioned and outwardly directed trunnions 2a at the upper portions of the side walls 2 and these trunnions extend into and are slidable in vertical guides 7 which extend substantially from the upper portions of the side walls 1 to immediately below the connecting rails 6. The lower portions of the side walls 2 are adapted to swing about such trunnion as will be hereinafter described.

The gates 3 and 4 are of circular cross-section and are positioned with their concave sides directed upwardly. The axes of the circular cross-sections are parallel and perpendicular to the side walls 1. The opposite circular edges of the gates 3 and 4 are slidably mounted in circular paths, conforming to the circular cross-sections of the gates, against the bottom edges 1a of the side walls 1. The outermost straight edges of the gates are hingedly connected to the lower edges of the side walls 2, as shown best in Fig. 2.

The gates are held in such circular paths by the means of a plurality of rollers 8 which are mounted on brackets 9 depending from or attached to the side walls 1.

The adjacent edges of the gates are so constructed that they overlap, as shown in Fig. 2. The gate 3 is adapted to move to its closed position before the gate 4 is moved over the upper edge of the gate 3, thereby preventing to a large extent pieces of stones, aggregate, and the like, from becoming lodged between the gates and thereby preventing proper closing. With the construction shown, the gates not only are permitted to close, but they substantially seal thin or liquid contents within the mixer.

As shown in the drawing, the gates and side walls 2 are so mounted that as the gates are shifted to their open positions, as indicated by dotted lines in Fig. 1, the upper edges of the gates continue in their circular paths and carry with them the lower edges of the side walls 2, and cause such side walls to be raised and the lower portion of the side walls to be swung inwardly with respect to the upper edges, as also shown by dotted lines in the drawing.

Within the mixer are mounted the usual mixing members, and they are here shown as paddle members 11 supported on rotatable shafts 12. The shafts are revolubly mounted in journals carried by side walls 1 and the coincident ends of the shaft 12 are provided with meshing gears 13, one of the shafts being extended and connected to a suitable drive mechanism (not shown).

As here shown, the gates are opened substantially simultaneously, and the opening force is applied to the gate 4. The opening mechanism consists of a rock shaft 21 having an operating lever 22. This rock shaft is shown as having short arms 23 which are pivotally connected by

links 24 to lugs 25 located at the underside of and near the inner edge of the gate 4.

The gates are so connected that the gate 3 is first closed and then the gate 4 is closed over the inner edge of gate 3, as stated above. In Fig. 3 is shown a mechanism for effecting such operation. On the base or frame 5 are pivoted a pair of rocker arms or levers 31 and 32, the lever 31 being pivoted intermediate its ends, whereas the lever 32 is pivoted at one end. The short arm 31^a of the lever 31 is connected through a link 33 and universal joints 33^a and 33^b to a lug 4^a carried at the underside of the gate 4. The intermediate portion of the lever 32 is similarly connected through a link 34 and universal joints 34^a and 34^b to a lug 3^a at the underside of the gate 3. The opposite end or long arm 31^b of the lever 31 is connected by a link 35 to the free end of the lever 32. The connections of the various levers to the links 31 and 32 is such that both gates are closed substantially simultaneously, and for this reason the length of the arm 31^a and the length of the opposite arm 31^b of the lever 31 are made proportional to the length of the lever arm 32^a (the distance of the connection of the link 34 from the pivotal axis of the lever 32) and the total length of the lever 32 (that is, the distance between the pivotal connection of the link 35 and lever 32 from the pivotal axis of the lever 32).

The pivotal connection of the link 35 with the lever 32 is such that the gate 3 is closed before the closing of the gate 4. Such effect is obtained by providing a shoe 35 which is longitudinally slidable in the end of the link 35 which is connected with the lever 32, and this shoe is held, by a spring 35^b, against the pivot pin 32^b carried at the free end of the lever 32.

A similar arrangement of arms and levers may be provided at the opposite end of the gates 3 and 4.

The mechanism shown for effecting such closure of the gates is intended merely as a diagrammatic representation of the mechanism for effecting the functions stated.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions, I do not wish to be limited to the same, but desire to include in the scope of my invention the construction, combination, and arrangement substantially as set forth in the appended claims.

I claim:

1. In a mixer of the class described, an enclosure, a discharge gate means for the bottom of the enclosure, said gate means comprising a pair of gates of circular cross-section, said gates being positioned with their concave sides directed upwardly and with the axes of their circular cross-sections parallel to each other and each of the gates being slidably mounted at its opposite circular edges in a circular path at the bottom of the enclosure, the inner edge of one gate being slidable over the adjacent edge of the other gate when the gates are closed, and means for closing in sequence the latter gate and then the first gate over the adjacent edge of the latter gate.

2. In a mixer of the class described, a rectangular enclosure having a pair of rigid opposite side walls, another pair of side walls positioned at opposite ends of the first side walls, said other side walls being vertically slidable with respect to the first side walls and the lower portion of the vertically slidable side walls being adapted to swing inwardly about their upper edges, and a pair of gates of circular cross-section mounted at the bottom of the enclosure, said gates being positioned with their concave sides directed upwardly and with the axes of their circular cross-sections parallel to each other, and each of the gates being slidably mounted at its opposite circular edges in a circular path, the normally outer edges of the gates being hingedly connected to the lower edges of said vertically slidably side walls.

3. In a mixer of the class described, a rectangular enclosure having a pair of rigid opposite side walls, another pair of side walls positioned at the opposite ends of the first side walls, said other side walls being vertically slidable with respect to the first side walls and the lower portion of the vertically slidable side walls being adapted to swing inwardly about their upper edges, and a pair of gates of circular cross-section mounted at the bottom of the enclosure, said gates being positioned with their concave sides directed upwardly and with the axes of their circular cross-sections parallel to each other, and each of the gates being slidably mounted at its opposite circular edges in a circular path, the normally outer edges of the gates being hingedly connected to the lower edges of said vertically slidable side walls, the inner edges of said gates being adapted to overlap each other.

4. In a mixer of the class described, a rectangular enclosure having a pair of rigid opposite side walls, another pair of side walls positioned at the opposite ends of the first side walls, said other side walls being vertically slidable with respect to the first side walls and the lower portion of the vertically slidable side walls being adapted to swing inwardly about their upper edges, and a pair of gates of circular cross-section mounted at the bottom of the enclosure, said gates being positioned with their concave sides directed upwardly and with the axes of their circular cross-sections parallel to each other, and each of the gates being slidably mounted at its opposite circular edges in a circular path, the normally outer edges of the gates being hingedly connected to the lower edges of said vertically slidably side walls, the inner edge of one gate being slidable over the adjacent edge of the other when closing the gates.

5. In a mixer of the class described, an enclosure, a frame for said enclosure, a discharge gate means for the bottom of the enclosure, said gate means comprising a pair of gates of circular cross-section, said gates being positioned with their concave sides directed upwardly and with the axes of their circular cross-section parallel to each other, said gates being rotatable about their axes for opening the same, the inner portions of the gate being separable from each other to form an opening extending between the opposite sides of the mixer, means for opening one of the gates, a lever pivotally mounted intermediate its ends on said frame below said one gate, a link pivotally connecting one end of the lever to said one gate, a second lever pivotally mounted at one end on said frame below the other gate, a link pivotally connecting said other gate to the intermediate portion of the lever, and a link connecting the opposite end of the first lever to the extended end of the second lever.

WILLIAM HURST LEWIS.