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A. C. MENNINGEN

CHUTE FOR CONCRETE MIXERS

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Fig. 1.

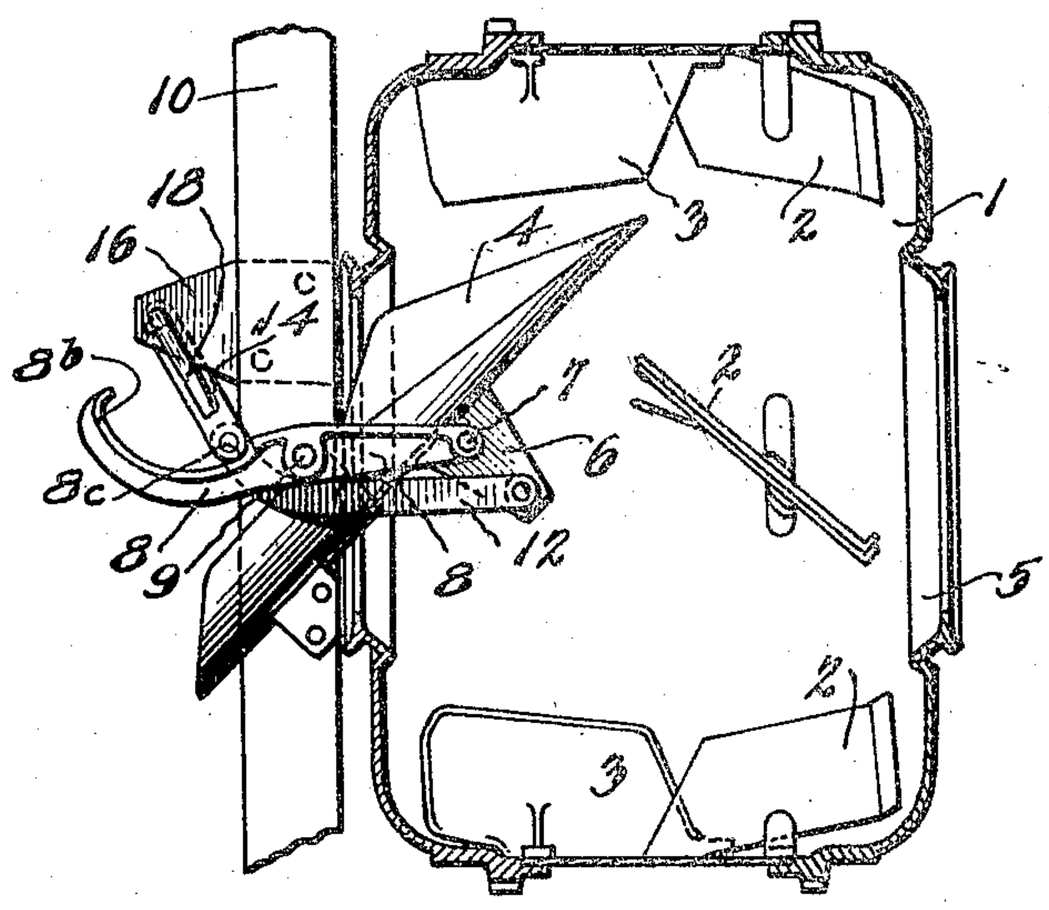
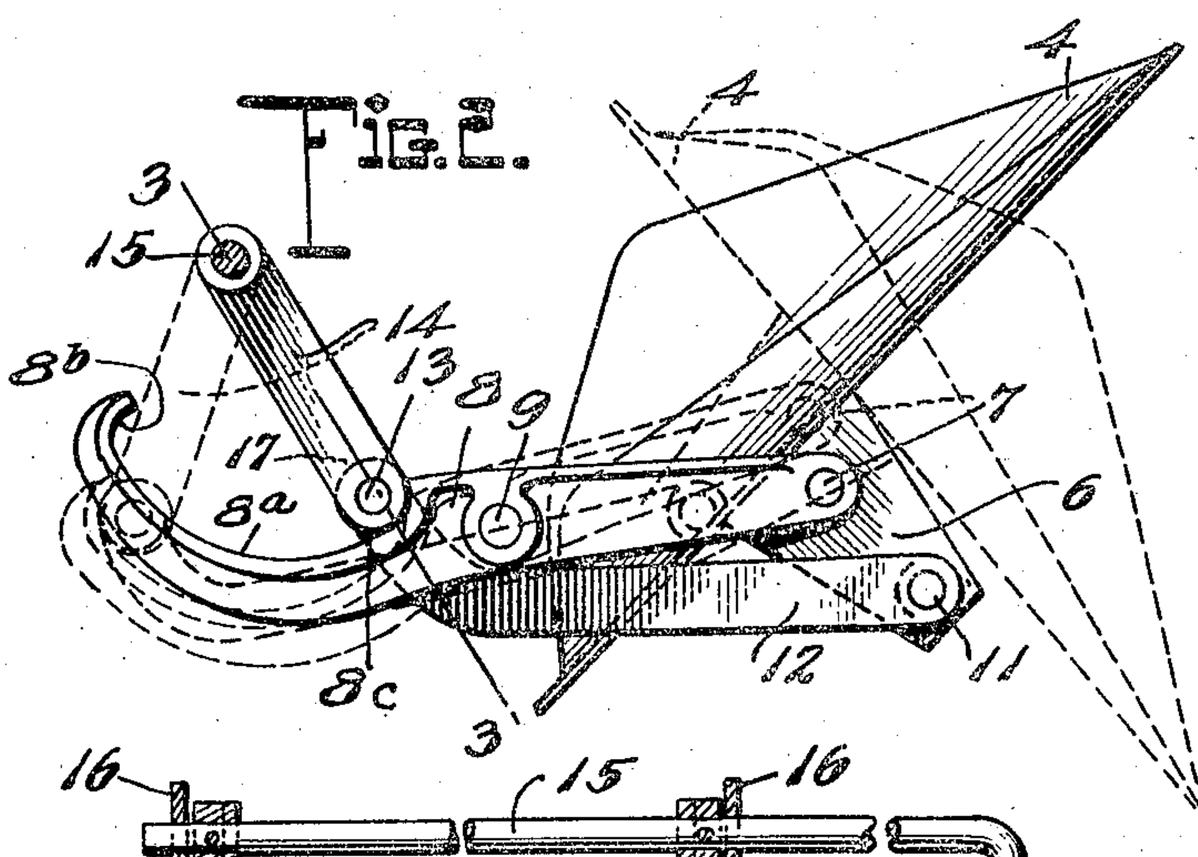


Fig. 2.



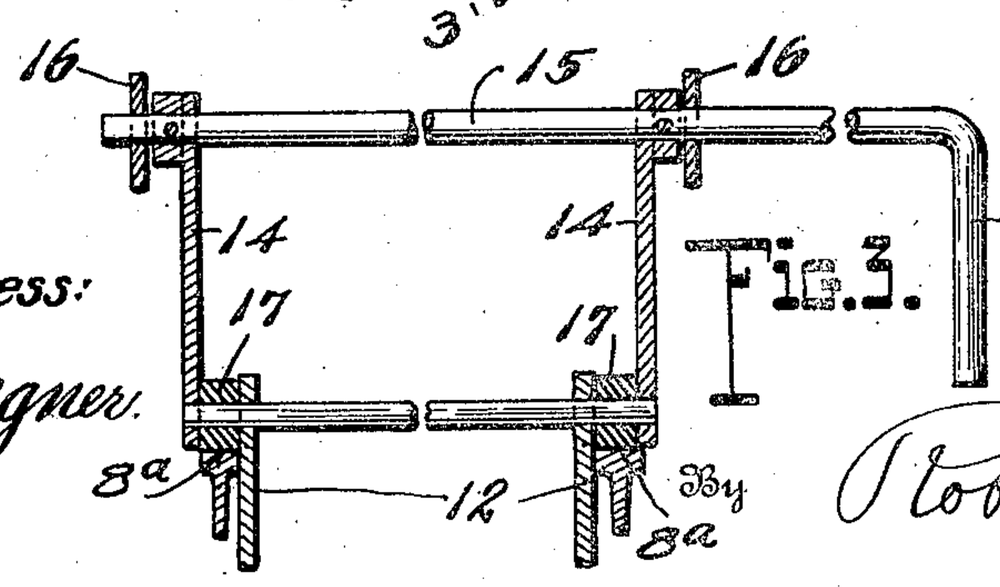


Fig. 3.

Witness:
C. H. Wagner.

Inventor
A. C. Menningen

By Robb & Robb Stell
Attorneys

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UNITED STATES PATENT OFFICE.

ADOLPH C. MENNINGEN, OF WEST ALLIS, WISCONSIN, ASSIGNOR TO KOEHRING COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION.

CHUTE FOR CONCRETE MIXERS.

Application filed April 2, 1923. Serial No. 629,433.

To all whom it may concern:

Be it known that I, ADOLPH C. MENNINGEN, a citizen of the United States, residing at West Allis, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Chutes for Concrete Mixers, of which the following is a specification.

A feature of primary importance in the operation of concrete mixers is the need for discharge means for the mixing drum such as will enable an emptying of the drum as quickly and efficiently as possible.

The present invention embodies a novel type of discharge chute for concrete mixing machines, the same being a chute of the general type disclosed by Koehring Patent No. 899,414 issued September 22, 1908, wherein the chute is adapted to extend a very considerable distance into the drum of the mixer so as to receive thereon, when discharging, a relatively large quantity of the aggregates mixed within the machine. The result is that when the discharge chute is turned to its discharging position the outflow of the mixed aggregates is produced in an exceedingly quick manner. Moreover, according to the construction referred to, the mounting of the discharge chute enables it to become a part of the mixing function of the machine, in that when said chute is in its non-discharging position it acts as a means for returning the aggregates being mixed from the discharge end of the mixing drum toward the inlet end of the drum.

The discharge chute of the present invention is peculiarly mounted upon what may be characterized as a floating fulcrum, and owing to such mounting and the operating features provided for moving the chute, the device is rendered self-balancing in both its mixing position and its discharge position. The mounting of the chute upon a floating fulcrum and the use of the special actuating parts to be hereafter described, enables the chute to be very easily operated by manual power as the device is so arranged that the aggregates lifted and dropped in the mixing action of the mixing drum have a tendency to assist the operating means to shift the chute to either its discharge position or its mixing position after the movement of the chute has been initiated. In other words, by adoption of the invention under practical conditions the operator is assisted in the manual movement of the chute after a preliminary movement of the said part has been commenced and produced to a slight degree. It may be noted moreover that owing to the provision of special fulcrum levers and linkage connections the chute is rendered self-locking at its opposite extremities of inclination wherein it discharges and mixes, according to its particular disposition.

In the drawings, Figure 1 is a sectional view of a concrete mixing drum, showing a discharge chute embodying the essential features of the invention.

Figure 2 is a somewhat enlarged view bringing out more fully by dotted lines the range of movement of the operating parts when the chute is shifted from its discharging position to its mixing position, the latter being depicted by the said dotted lines.

Figure 3 is a sectional view through the mechanism taken about on the line 3—3 of Figure 2.

The mixing instrumentalities of the mixing drum 1 of the drawings may be largely of a conventional type and include the diagonal mixing blades 2 and the elevating buckets 3. The action of the mixing is well known and the buckets 3 lift the aggregates being handled in the drum 1 and drop them by gravitation as the buckets approach their uppermost positions in the rotation of the drum. In the above manner the contents or aggregates in the drum are poured onto the discharge chute 4 when the latter is in its mixing position, illustrated by dotted lines in Figure 2, under which conditions the chute 4 acts to cascade the aggregates back toward the inlet end of the drum which is designated at 5. The chute 4 is equipped with operating arms 6, fulcrumed at 7 upon the inner ends of the supporting levers 8. The levers 8 are pivotally mounted at 9 upon the frame-work 10 of the machine. Connected with the arms 6 of the chute 4 below the fulcrum point 7 of said arms, and by means of a pivot 11, are connecting and shifting links 12. These links 12 are straight for the major portions of their bodies, but curve upwardly toward their outer ends and at a point exterior to the drum 3 so as to be readily connected as by the pivots 13 with the operating arms or levers 14 which likewise are pivoted by a rock shaft 15 to

brackets 16 on the frame-work 10. The outer ends of the levers 8 virtually constitute curved tracks or extensions 8^a upon which operate rollers 17, the outer extremities of said portions 8^a having laterally curved lugs providing dwells 8^b adapted to receive the rollers 17 and limit the outward shifting of the operating levers 14. The rock shaft 15 which carries the levers or arms 14 is equipped with an operating member or handle 18, by which the said levers are adapted to be rocked. Of course the shaft 15 might be actuated by some power means connected up with the motive power by which the mixer is driven, but this feature is immaterial to the invention which lies primarily in the peculiar mounting of the discharge and mixing chute and its peculiar operation.

With the foregoing understanding of the construction proposed by this invention, and after noting that near the pivot points of the levers 8 they are equipped with dwells 8^c opposite the dwells 8^b or at the opposite ends of the track extensions 8^a, the operation of the device may be set forth. Assuming the parts to be in the full line positions of Figures 1 and 2, the contents of the drum 1 are being discharged, and movement of the chute 4 toward its mixing position is resisted by the factor of the weight of certain portions of the aggregates which are pouring down upon the chute 4 at the portion to the left of its fulcrum or axis 7, and by the further fact that the lever arms 14 are adjusted to maintain the rollers 17 in the dwells 8^c of the levers 8, thus practically locking the levers against upward movement at their outer or track ends.

To shift the chute to its mixing position the operator merely pulls outward upon the handle 18, thereby rocking the shaft 15 and its levers or arms 14 to shift the latter in an outward direction, until the rollers 17 are stopped in their movement by the lugs providing the dwells 8^b of said levers, (see Figure 2). In the above operation the links 12 are pulled outwards, and thereby rock the chute 4 on its fulcrum to make it assume its reverse mixing position on the dotted lines of Fig. 2. Additionally the action of the lever arms 14 is to push down on the outer ends of the levers 8 and elevate the fulcrum point 7 of the chute, so that it is not only rocked to its mixing position but it is raised somewhat to assume a mixing position in which it has the highest efficiency for mixing action in relation to the various blades 2 and pickup buckets 3 of the drum 1.

With the peculiar movement of the chute in mind it is clear that when the rollers 17 enter the dwells 8^b of the levers 8 the levers 14 provide in effect lock members positively cooperating with the levers 8 to prevent unauthorized shifting of the chute from its mixing position. Likewise, it is evident that the chute 4 is practically supported by a floating pivot for the reason that the fulcrum point 7 moves up and down as the chute 4 rocks thereon. In the movement of the chute the weight of the materials dropping upon either end tends to continue the movement of the chute duly initiated by the handle 18 as soon as the pivot connections 11 between the links 12 and chute arms 6 pass beyond the dead center point, in either direction of movement, in relation to the fulcrum point 7 of the chute. This reduces the amount of effort or power required for effecting a full movement of the chute in either direction, in an obvious manner.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is,

1. In a concrete mixing machine in combination, a mixing drum and a chute therefor, movable from non-discharging to discharging positions, a floating fulcrum for the chute, including a pivot, and supporting levers carrying the pivot, operating parts linked to the chute to tilt it on its fulcrum, and means on the operating parts to engage and rock the supporting levers in the tilting operation.

2. In a concrete mixing machine in combination, a mixing drum and a chute therefor, movable from non-discharging to discharging positions, a floating fulcrum for the chute, including a pivot, and supporting levers carrying the pivot, operating parts linked to the chute to tilt it on its fulcrum, and means on the operating parts to engage and rock the supporting levers in the tilting operation comprising rollers to roll in contact with the supporting levers.

3. In a concrete mixing machine in combination, a mixing drum and a chute therefor, movable from non-discharging to discharging positions, a floating fulcrum for the chute, horizontal supporting levers pivoted between their ends and carrying the fulcrum at one end, tracks at the opposite ends of said levers, and operating parts linked to the chute to tilt it on its fulcrum, and engaging means carried by the operating parts engaging the tracks of the levers to rock the same as the chute is tilted.

4. In a concrete mixing machine in combination, a mixing drum and a chute therefor, movable from non-discharging to discharging positions, a floating fulcrum for the chute, means for turning the chute about said fulcrum, the turning means of the chute comprising levers and connections intermediate said levers and the chute such that in one position the levers may lock the chute against unauthorized movement from its non-discharging position, and in another

position the levers may lock the chute against unauthorized movement from its discharging position.

5. In a concrete mixing machine the combination of a mixing drum, a mixing chute disposed therein and means for moving said chute from a mixing position to a non-mixing position comprising a floating fulcrum for the chute together with actuating means for the chute to move it about said fulcrum, the actuating means for the chute comprising parts capable of locking the chute against unauthorized movement from its mixing position and its non-mixing position.

6. In a concrete mixing machine in combination, a mixing drum, a chute movably mounted adjacent to one end of the drum, means supporting said chute comprising a frame-work, supporting levers mounted on said framework and provided with a fulcrum for said chute, operating levers connected with the chute for moving it about said fulcrum, and cooperating means between said operating levers and said supporting levers for shifting said fulcrum of the chute.

7. In a concrete mixing machine the combination of a mixing drum, a chute cooperating therewith and mounted adjacent to one end thereof, a supporting frame-work, supporting levers on said framework equipped with a fulcrum upon which the chute is mounted, operating levers on the frame-work, connections between said operating levers and the chute to turn the chute about the fulcrum aforesaid, and means intermediate the operating levers and the supporting levers for moving the fulcrum simultaneously with the movement of the chute about its fulcrum.

8. In a concrete mixing machine the combination of a mixing drum, a chute cooperating therewith and mounted adjacent to one end thereof, a supporting frame-work, supporting levers on said frame-work equipped with a fulcrum upon which the chute is mounted, operating levers on the frame-work, connections between said operating levers and the chute to turn the chute about the fulcrum aforesaid, means intermediate the operating levers and the supporting levers for moving the latter simultaneously with the movement of the chute about its fulcrum, and coacting with said supporting levers for locking the chute against unauthorized movement after it assumes a position at either extreme of its movement about its fulcrum.

9. In chute mechanism of the class described, the combination of a chute, a frame-work, supporting levers, a fulcrum carried by said levers and supporting said chute, operating levers on the frame-work, connections between said operating levers and the chute for turning the latter about its fulcrum, and other connections intermediate the operating levers and the supporting levers for shifting the latter to cause a floating movement of the fulcrum at the time of turning of the chute about the same.

10. In chute mechanism of the class described comprising in combination a frame-work, supporting levers pivoted between their ends thereon, a fulcrum carried by corresponding ends of said levers, a chute supported by said fulcrum and adapted to rock thereon, operating levers, connections between said operating levers and the chute to turn it about said fulcrum, and means intermediate the supporting levers and the operating levers for limiting the extent of movement of the latter.

11. In chute mechanism of the class described comprising in combination a frame-work, supporting levers pivoted between their ends thereon, a fulcrum carried by corresponding ends of said levers, a chute supported by said fulcrum and adapted to rock thereon, operating levers, connections between said operating levers and the chute to turn it about said fulcrum, and means intermediate said operating levers and the supporting levers for rocking the latter about their pivots as the operating levers turn the chute about its fulcrum.

12. In chute mechanism of the class described comprising in combination a frame-work, supporting levers pivoted between their ends thereon, a fulcrum carried by corresponding ends of said levers, a chute supported by said fulcrum and adapted to rock thereon, operating levers, connections between said operating levers and the chute to turn it about said fulcrum, and means intermediate said operating levers and the supporting levers for rocking the latter about their pivots as the operating levers turn the chute about is fulcrum, the supporting levers being provided with means for limiting the movement of the operating levers, and the supporting and cooperating levers cooperating with one another to hold the chute at different positions to which it may be turned around its fulcrum, as against unauthorized movement.

13. Chute mechanism of the class described comprising in combination a frame-work, levers, supporting means on said frame-work pivoted between its ends, a chute pivoted to one end of said supporting means, operating lever means co-acting with the other end portion of said supporting lever means for rocking the latter to cause a floating movement of the chute, link connecting means between the operating lever means and the chute for turning the chute about its point of pivotal support on the supporting lever means, and means for actuating said operating lever means.

14. In chute mechanism as described, in combination a frame-work, supporting levers pivoted between their ends to the frame-work, a fulcrum on corresponding ends of the supporting levers, a chute pivoted to the supporting levers by said fulcrum, operating levers on the frame-work, rollers carried thereby engaging the supporting levers, the supporting levers being equipped with track portions to engage said rollers, and dwells at the ends of said track portions to coact with the rollers to limit the movement of the operating levers, a rock shaft carrying the operating levers, means for actuating said rock shaft, and links connecting the operating levers with the chute to turn the latter about the fulcrum incident to movement of the operating levers, the said operating levers being adapted to simultaneously move the supporting levers to float the fulcrum in the manner specified.

In testimony whereof I affix my signature.

ADOLPH C. MENNINGEN.