

April 15, 1941.

A. W. RYBECK ET AL

2,238,343

CONCRETE MIXING PLANT

Filed Feb. 19, 1937.

2 Sheets-Sheet 1

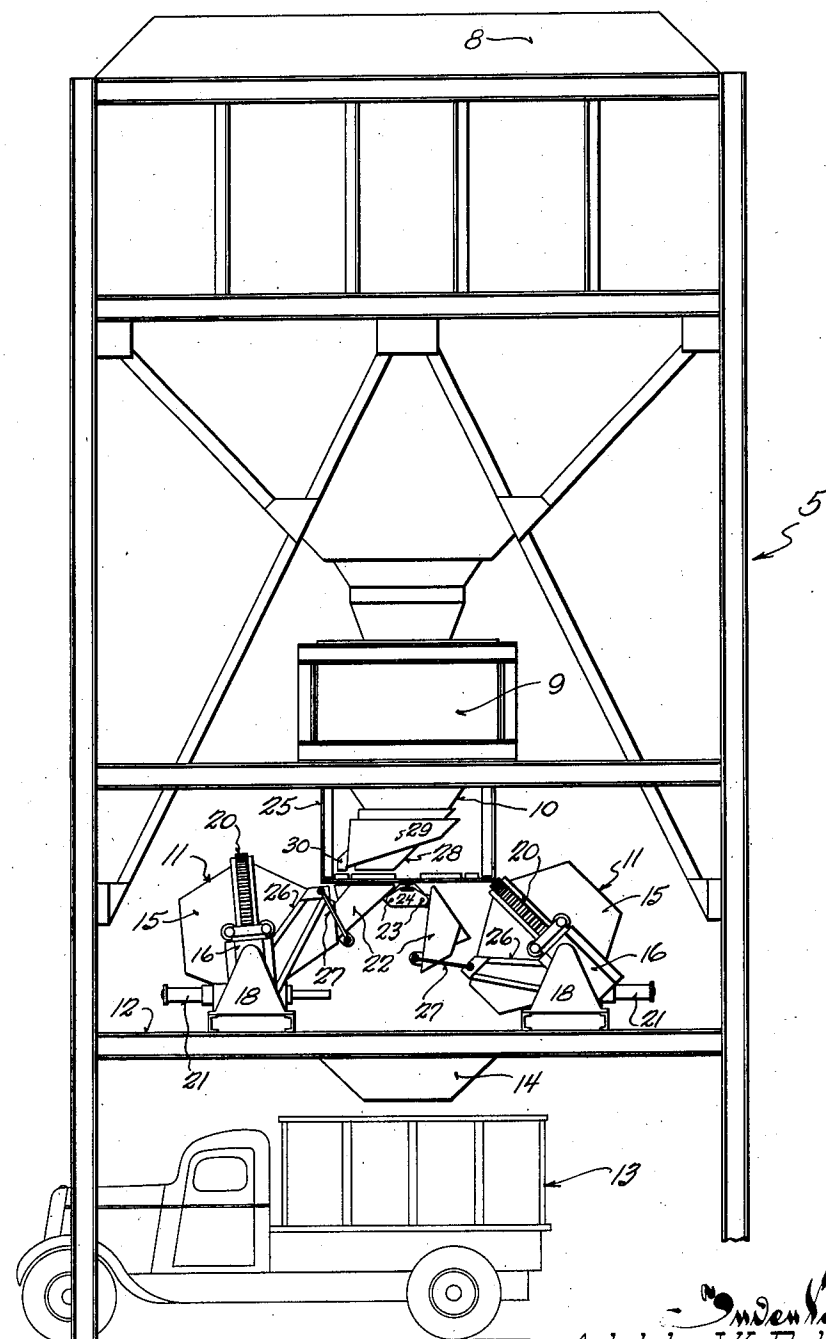


Fig. 1.

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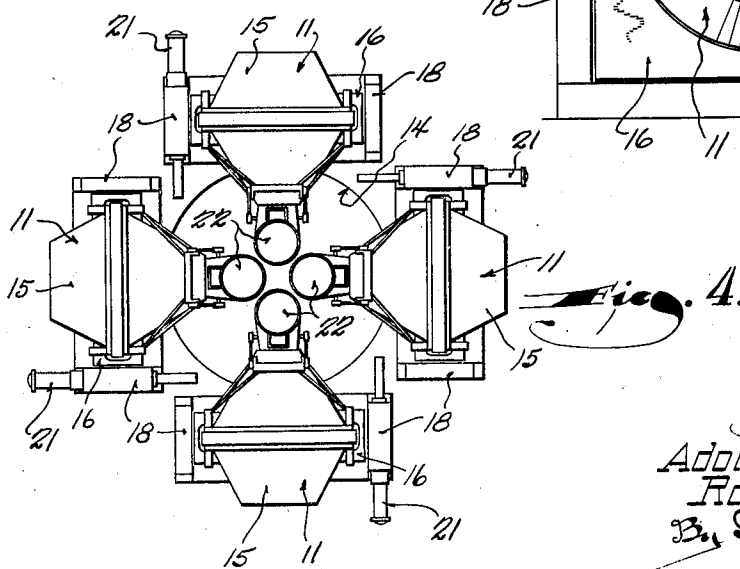
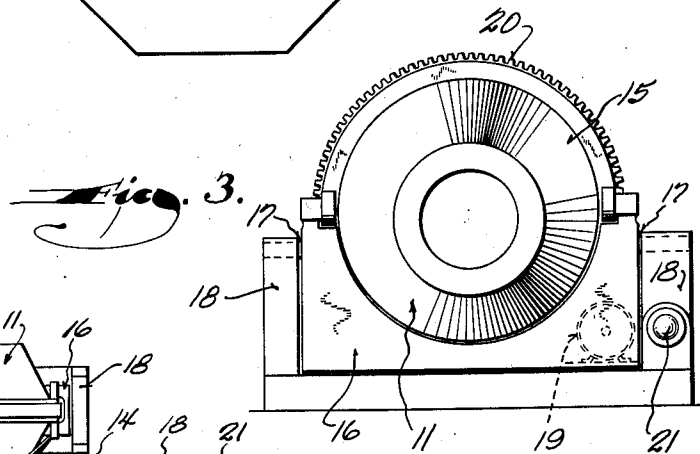
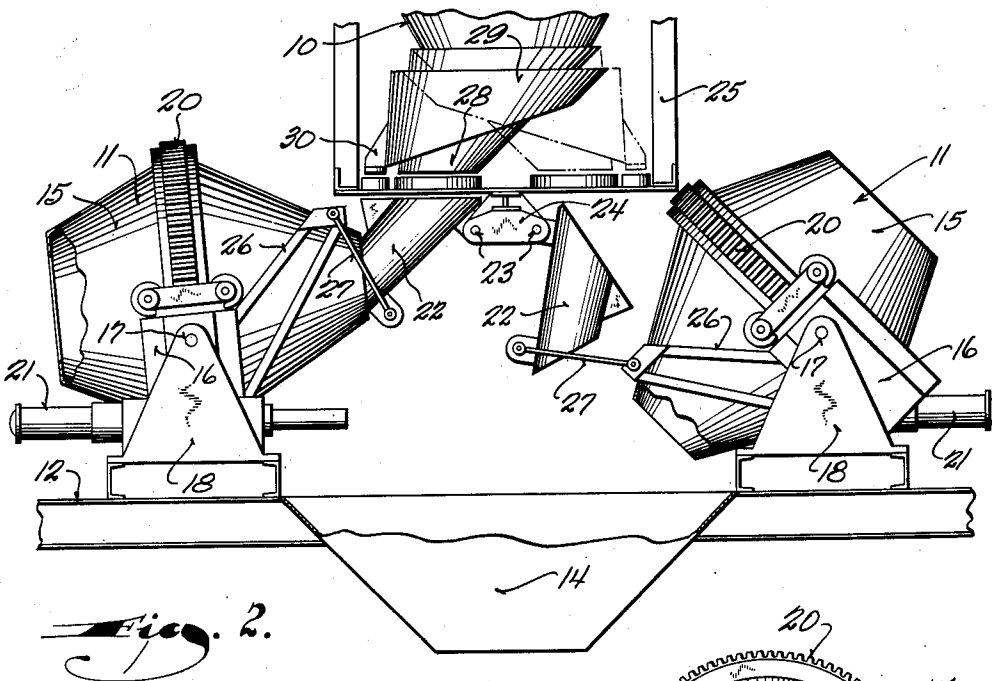
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CONCRETE MIXING PLANT

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4 Claims. (Cl. 259—152)

This invention relates to concrete mixers and refers particularly to concrete mixing plants of the type usually erected at large projects for continuous operation over comparatively long periods of time.

In plants of this character a battery of mixers is employed, all of which are fed from a common supply bin, and usually a single hopper receives the mixed concrete to conduct it into transit trucks or onto chutes for conveyance directly to the pouring location.

Heretofore, these plants have been so constructed that the several mixers employed were loaded at one end and discharged from the opposite end of their drums, and as the mixers usually employed in plants of this character are quite large, their charging openings were necessarily widely separated. This wide separation of the charging openings, together with the fact that the aggregates come from a central source, required a high elevation for the material supply bin and the batching or measuring hopper to obtain the proper flow of aggregates into the mixers.

Obviously, any factors which require an increase in the overall height of the plant are objectionable, and it is therefore an object of this invention to reduce the overall height of a concrete mixing plant through a new and novel arrangement of the mixers.

More specifically it is an object of this invention to provide an improved manner of loading or charging a battery of concrete mixers from a central source so that the aggregates have a short substantially straight path from the central source directly to any selected mixer.

Another object of this invention is to so arrange a battery of tilting drum mixers of the type in which one end of the drum provides both the charging and the discharging opening, that all of the drums discharge into a common hopper and have their combined charging and discharging ends located in juxtaposition to a source of supply from which the aggregates may be directly chuted into any one selected mixer.

Another object of this invention is to group a plurality of concrete mixers of the type described about a common vertical axis and to provide a rotatable spout fed from a measuring or batching hopper and movable into alignment with any selected mixer to direct the aggregates thereto.

Another object of this invention is to provide a movable chute for each mixer arranged so as to conduct the aggregates directly into the drum

of the mixer and to swing out of the path of the drum as it tilts to discharge its contents.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side view of a concrete mixing plant embodying this invention;

Figure 2 is an enlarged side view of the mixers showing their relationship to each other and to the supply bin and concrete receiving hopper, parts thereof being broken away and in section;

Figure 3 is an end view of one of the mixers; and

Figure 4 is a top view of four mixers illustrating the manner in which they are grouped about a common center.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates the fabricated framework of the mixing plant. At its top the framework supports a supply bin 8, which, as is customary in plants of this character, is partitioned to provide separate compartments for the different materials which are elevated thereto by conveyors (not shown). Beneath the supply bin 8 is a measuring or batching hopper 9 into which the different materials of the aggregate flow from the supply bin 8. The measuring or batching hopper 9 properly proportions the materials and discharges the aggregate from a central discharge 10.

The battery of mixers 11 is mounted on a floor 12 preferably located at an elevation permitting transit trucks or other vehicles 13 to be driven thereunder. The mixers are grouped about a central concrete receiving hopper 14 which has its open top at the level of the floor 12 so that the several mixers may discharge their contents directly into it. From the hopper 14, the concrete flows into a waiting transit truck 13 or onto a chute (not shown) for conveyance directly to the pouring location.

The mixers 11 are of the tilting drum type in

which the drum 15 is rotatably hung or supported in a cradle 16 which is pivotally supported as at 17 (see Figure 3) between upright pedestals 18. The motor or other driving unit 19, indicated in dotted lines in Figure 3, is carried by the tilting cradle so that the driving connection between it and the ring gear 20 of the drum is at all times maintained even as the drum is tilted. Power actuated tilting mechanism 21 is preferably provided to tilt the drum.

Inasmuch as the specific construction of the mixers does not actually form a part of this invention, a detailed description thereof is unnecessary and for such description reference may be had to Patent No. 2,054,469, issued to Adolph W. Rybeck September 15, 1936.

It is important to note, however, that these mixers while capable of being charged from either end are essentially the so-called front end charging mixers. In other words, they are charged and discharged at the same end of the drum.

Regardless of the number of mixers in the battery, whether it is two, as shown in Figures 1 and 2, or four, as shown in Figure 4, or any other convenient number, they are grouped about the vertical axis of the concrete receiving hopper 14 which is also common to the discharge 10 of the measuring or batching hopper 9. It is preferable that the mixers be so mounted that the axes of their drums intersect this common vertical axis so that each mixer discharges properly into the hopper 14.

Each mixer has a supply chute 22 arranged to conduct material into the open front end of the drum when the drum is in its charging position. This supply chute is pivoted as at 23 from a central support 24 suspended from a supporting structure 25 carried by the framework of the plant. The pivotal mounting of the chute 22 permits it to be swung from a charging position to a position clear of the mixer to allow unrestricted discharge of the drum contents.

A connection between the chute and the cradle which carries the drum swings the chute automatically to its position clear of the drum as it is tilted to discharging position and returns it to its proper charging position when the drum is tilted back to loading position. This connection comprises a rigid bracket 26 carried by the cradle and a link 27 connecting the outer end thereof with the chute.

Rotatably mounted beneath the discharge 10 of the measuring or batching hopper is a spout 28. Being rotatably mounted, the spout 28 is selectively positionable over any one of the supply chutes 22 to conduct material from the hopper 9 directly into the selected chute.

Measured quantities of water are conducted into the drum along with the aggregates from a funnel-like receptacle 29 encircling the spout 28 and having its outlet 30 arranged to discharge into the chute 22.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that this invention provides a substantial improvement in concrete mixing plants of the character described, by reducing the overall height of the plant, for through this reduction in height, a lower initial cost is achieved, and the conveyors which elevate the materials to the supply bin consume less power since the materials need not be elevated to such a high level. A faster charging cycle is also made possible as the aggregates

enter the drum at higher velocity since the flow is almost in a straight downward line.

Another advantage of this invention which will be readily apparent to those skilled in the art, and which contributes to effect a faster charging cycle, is that the automatically operated feed chutes seal their drum openings and permit the rotatable spout to be moved into alignment with the next mixer immediately after the charging operation is completed.

What we claim as our invention is:

1. In a concrete mixer: a rotatable mixing drum having a common charging and discharging opening at one end; a tilting cradle mounting the drum for endwise tilting movement from a charging to a discharging position; a supply chute for conducting material into the combined charging and discharging opening of the drum; means pivotally mounting the receiving end of the supply chute so that its discharging end is movable from a position directing materials into said end of the drum to a position clear of said end of the drum; and an operative connection between the cradle and the supply chute for supporting the discharge end of the chute, said connection holding the chute in its proper charging position independently of the drum and moving the chute to its position clear of the drum upon tilting of the drum to discharging position.

2. A concrete mixing plant comprising: a plurality of tilting drum type mixers adapted to be charged and discharged through the same end and grouped about a common vertical axis with the combined charging and discharging ends of their drums facing said axis; a supply hopper above the mixers, said hopper having a discharge opening substantially on said axis; a spout beneath said discharge opening rotatable about said vertical axis to direct aggregates toward any one selected mixer; an individual chute for each mixer arranged to conduct material from the spout into the drum of its respective mixer; and means independently of the drum for moving the chute of each mixer into and out of operative position by tilting of the mixer drum to its charging and discharging positions respectively.

3. A concrete mixing plant comprising: a central concrete receiving hopper; a plurality of mixers of the tilting drum type that may be charged and discharged at the same end; said mixers being mounted above the concrete receiving hopper and grouped about the vertical axis of the central concrete receiving hopper with the combined charging and discharging ends of their drums facing said axis so that all of said mixers may discharge into said central concrete receiving hopper; an aggregate supply hopper above the mixers having a discharge opening substantially on said vertical axis; a spout beneath said discharge opening, said spout being rotatable about said vertical axis to direct material toward any one of the mixers; a supply chute for each mixer; means hingedly mounting each chute for bodily movement from a position at which it conducts material from the spout into the drum of its respective mixer to a position clear of the mixer drum; and means independent of the drums operable by the tilting of the mixer drums for automatically swinging their chutes to inoperative positions clear of the drums as the drums are tilted to discharging positions, and for swinging the chutes to their operative positions for conducting material from the spout into the drums as the drums are tilted to their mixing positions.

4. A concrete mixing plant comprising: at least two mixers of the tilting drum type that may be charged and discharged at the same end; a concrete receiving hopper beneath said mixers; an aggregate supply hopper above the mixers having a discharge opening substantially in vertical alignment with the concrete receiving hopper; means mounting the mixers for rotation on an axis such that their combined charging and discharging ends point toward the substantially common vertical axis of the receiving and supply hoppers so that each mixer may discharge into the receiving hopper, said means also mounting the mixers for tilting motion from mixing positions in which their combined charging and discharging ends point toward the supply hopper to discharging positions at which their combined

5 charging and discharging ends point toward the receiving hopper; a short adjustable spout structure for selectively directing aggregates from the supply hopper toward any one of the mixing drums; a supply chute for each mixer pivotally mounted for bodily swinging motion from a position directing aggregates from the supply hopper into the combined charging and discharging end of its mixing drum to an inoperative position clear of the drums; and means connecting each of the supply chutes with the mounting means of their respective mixing drums so that the chutes are swung on their pivots between said positions during tilting of the drums from mixing positions to discharging positions respectively.

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