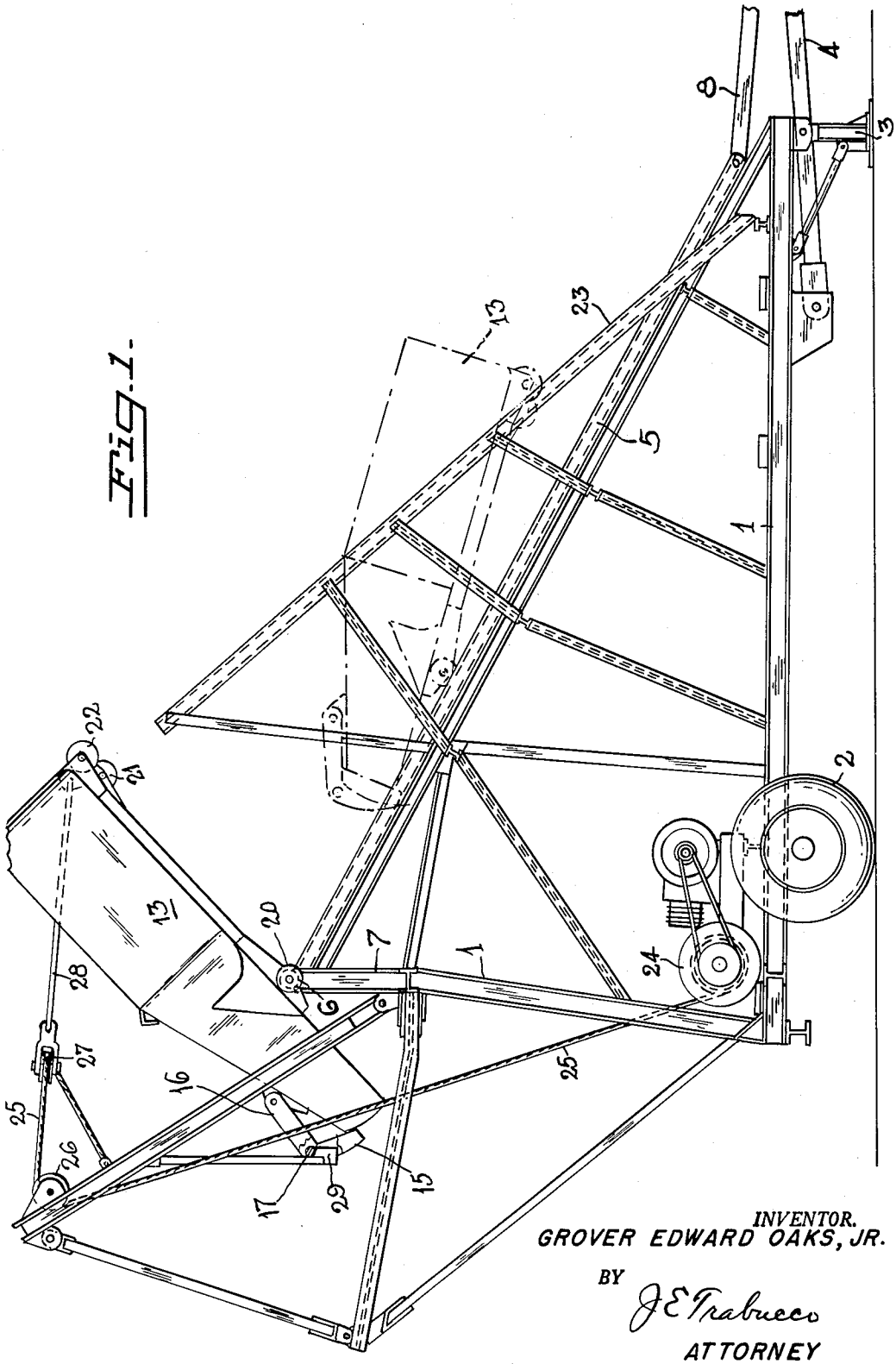
April 3, 1956 G. E. OAKS, JR 2,740,539

PORTABLE CHARGING ELEVATOR FOR CONCRETE MIXERS

Filed Sept. 18, 1953 3 Sheets-Sheet 1

Fig. 1.



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PORTABLE CHARGING ELEVATOR FOR CONCRETE MIXERS

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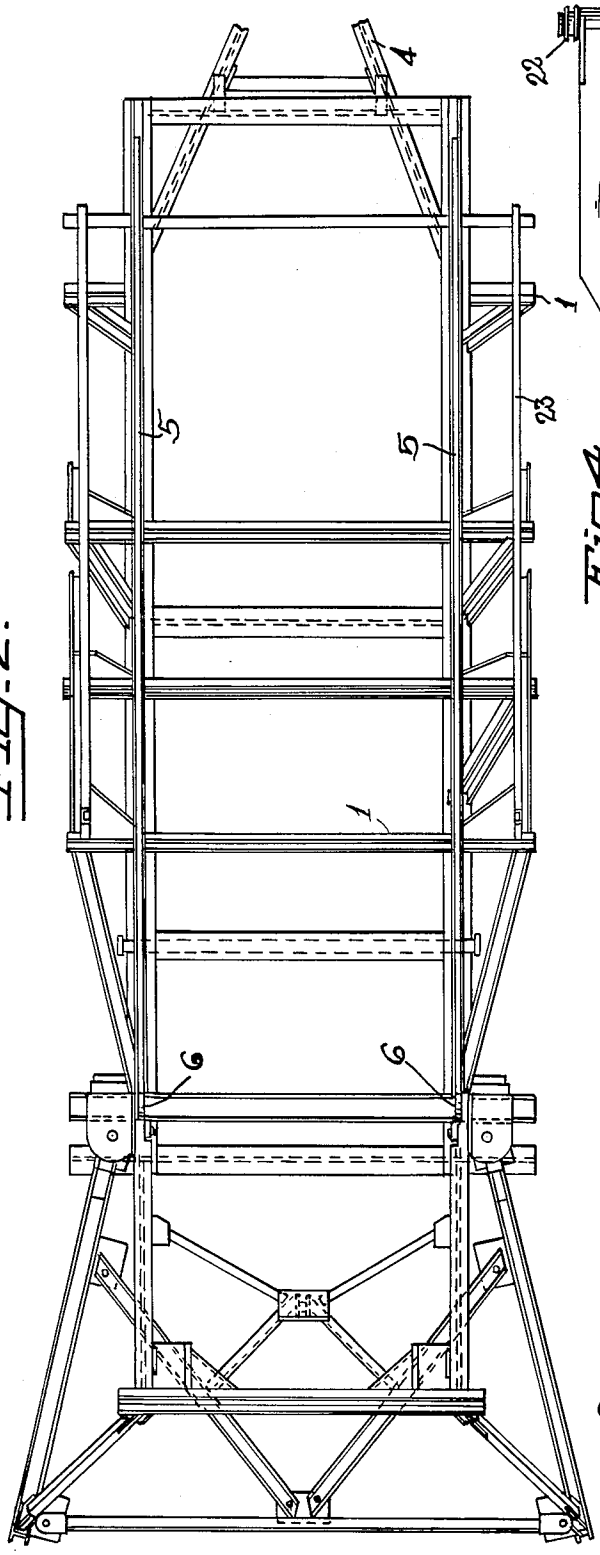


Fig. 2.

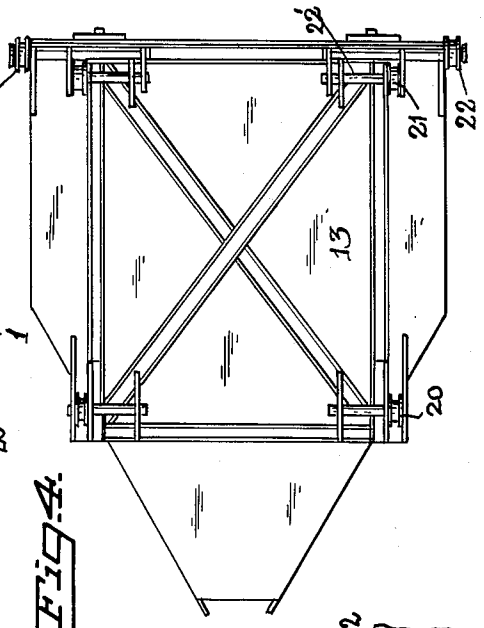


Fig. 4.

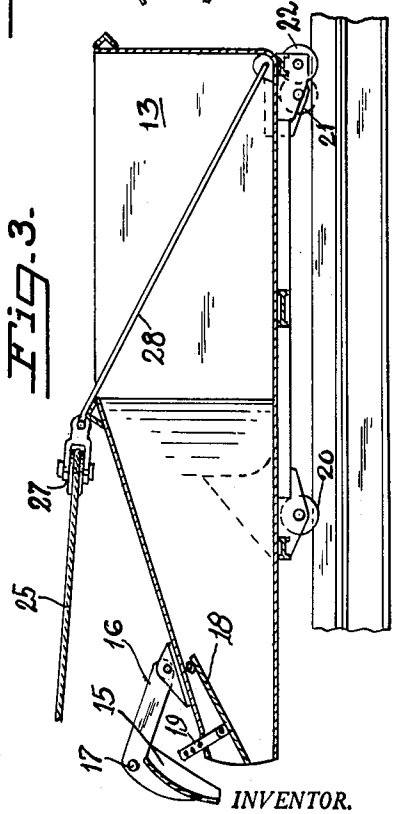


Fig. 3.

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PORTABLE CHARGING ELEVATOR FOR CONCRETE MIXERS

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Fig. 5.

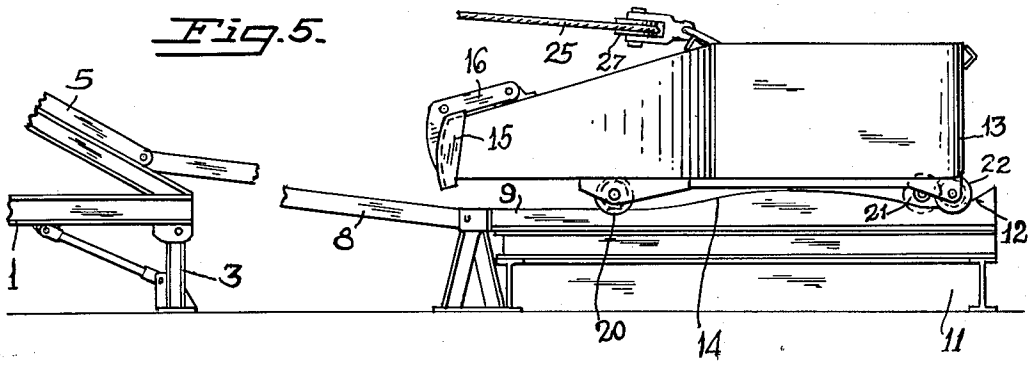


Fig. 6.

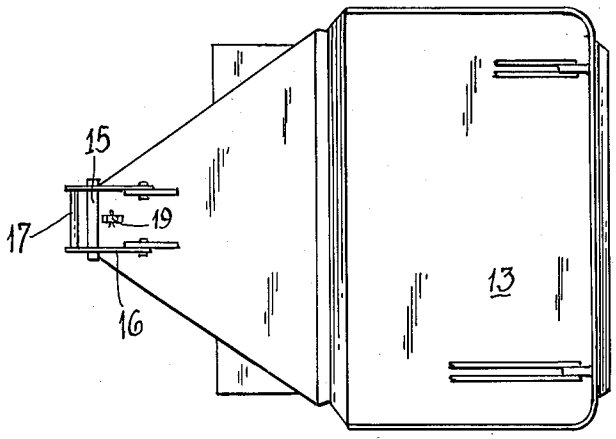
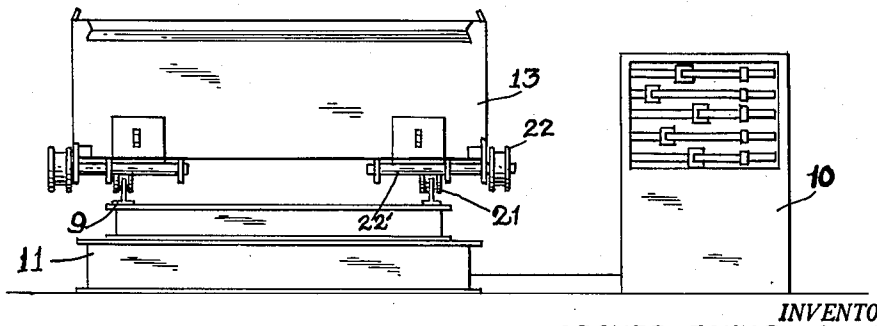


Fig. 7.



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2,740,539

PORTABLE CHARGING ELEVATOR FOR CONCRETE MIXERS

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Application September 18, 1953, Serial No. 380,972

6 Claims. (Cl. 214—2)

This invention relates to concrete mixing apparatus and more particularly to a portable charging elevator for use with cement mixing trucks.

It is now the common practice to load transit mix cement trucks at central mixing plants where the various ingredients making up a cement mixture are first weighed and suitably proportioned before being transferred to the rotatable mixing drums carried on such trucks. The cement mixture is agitated and thoroughly mixed by sets of blades mounted in the rotatable mixing drums as the trucks travel from the central mixing plant to the job. While the use of central mixing plants are desirable when the cement mixture supplied thereby is to be used at nearby locations, it is recognized that in instances where the mixing trucks carrying the cement mixture must travel considerable distances in proceding to the point of discharge, the increased costs of transportation are sometimes such that the operation is not economically advantageous. The expense of mixing and transporting the cement mixture increases in proportion to the distance a mixing truck travels enroute to the job.

It is therefore desirable from an economical operations viewpoint to locate the central mixing plant near the place where the cement material is to be used, and in this respect it is advantageous to provide a portable mixing plant which can be conveniently transported from the location of one job to another.

The present invention provides a portable charging elevator for concrete mixing trucks which may be conveniently moved from place to place, thereby making it possible to have the loading point close to the job.

An object of my invention is to provide novel charging apparatus for loading cement material into transit concrete mixers, embodying a loading skip actuated by a cable from a load receiving position at the lower end of an inclined track to a dumping position at the elevated end of such track where the contents are discharged into the mixing drum of a concrete truck mixer.

Another object of my invention is to provide improved portable charging apparatus for loading cement material into transit concrete mixers, one which embodies a novel inclined track system capable of automatically tipping a loading skip into a dumping position.

Other and further objects of my invention will be pointed out hereinafter or will be indicated in the appended claims, or will be obvious to one skilled in the art upon an understanding of the present disclosure. For the purpose of this application I have elected to show herein certain forms and details of a portable charging elevator for concrete mixers representative of my invention; it is to be understood, however, that the embodiment of my invention herein shown and described is for the purpose of illustration only and that therefore it is not to be regarded as exhaustive of the variations of the invention.

In the accompanying drawings:

Figure 1 is a side elevation of my invention, showing diagrammatically the loading skip in its discharging position;

Figure 2 is a top plan view of the track system forming a part of my invention;

Figure 3 is a longitudinal sectional view taken through the skip, showing the control door at the discharge end thereof in an open position;

Figure 4 is a bottom view of the skip;

Figure 5 is a side view of the skip; and a part of the track system, showing diagrammatically by the broken lines the control door in an open position;

Figure 6 is a top plan view of the skip; and

Figure 7 is an end view of the skip, showing the weighing scales in association therewith.

Referring to the drawings the numeral 1 designates a suitable supporting frame mounted for convenient movement from place to place on wheels 2. The wheels are arranged to support the forward end of the frame, and depending legs 3 serve to support the rear end of such frame when the apparatus is in operation. Inclined braces associated with the legs and the frame normally hold the legs in upright positions. The legs may be swung upwardly against the frame when the braces are detached, or if desired, they may be removed when the frame and the apparatus supported thereby are to be transferred from one job to another. Secured to the rear end of the frame is a tongue 4 which may be connected to a truck or other vehicle for towing purposes.

Mounted on the frame is a skip supporting track comprising a pair of parallel inclined rails 5, the upper ends of which adjoin semi-circular wheel receiving sockets 6 positioned in the upper ends of two upstanding members 7, such sockets providing suitable stop means for the front wheels of a skip. Detachably connected to the lower ends of the inclined rails 5 are inclined extension or articulation rails 8, the rear ends of which abut the forward ends of weighing rails 9, the latter being operatively connected in the usual manner to suitable weighing scales 10. The weighing rails 9 are suitably supported as at 11, and their rear ends are formed with suitable depressions or other stop means 12 which are adapted to prevent the rear wheels of a skip or bucket 13 from traveling rearwardly beyond such depressions. The weighing rails are preferably formed with gradually inclined wheel supporting surfaces, as at 14, which are adapted to retard the rearward movement of the skip as it returns to its stationary loading position.

The skip 13 is open at its top side except for a tapered forward portion which has converging top and lateral sides. A discharge opening, controlled by a hinged closure gate 15, is arranged at the forward end of the skip. The closure gate 15 is carried by two hinge members 16 which are pivotally connected at their rear ends to two upstanding lugs provided on the top side of the skip. Secured to the forward ends of the hinge members 16 is a bail or cross bar 17. Adjustably positioned in the tapered forward portion of the skip is a pivoted baffle 18 which may be raised or lowered to control the flow of the material through the discharge opening. The baffle 18 is held in a suitably adjusted position by means of an apertured bar 19 which projects upwardly through a slot in the top side of the skip, the said bar being held in adjusted position by a pin or the like extending through one of its apertures. Mounted on the underneath side of the skip are a pair of front flanged wheels 20 and a pair of rear flanged wheels 21. The said pairs of wheels are adapted to support the skip on the rails 5, 8 and 9 during the operation of the apparatus. Rotatably mounted on stub-shafts 22' secured to the underneath side of the skip adjacent the rear wheels 21, are flanged tipping wheels 22 which project outwardly beyond the

lateral sides of the skip. The tipping wheels 22 are spaced substantially farther apart than the front and rear supporting wheels.

Supported on the frame 1 is a skip tipping track comprising a pair of spaced inclined tipping rails 23 which are arranged in outwardly spaced relation with respect to the rails 5. The tipping wheels 22 of the skip are adapted to engage with and travel over the tipping rails 23 as the skip is elevated to a dumping position. The pitch or slope of the tipping rails 23 is substantially more acute or closer to the vertical than that of the rails 5. As shown in Figure 1 the position of the tipping rails 23 with respect to the rails 5 is such that the tipping wheels 23 will first engage with the said tipping rails soon after the skip in its upward travel to a dumping position, has become entirely supported on the rails 5. The tipping rails support the rear end of the skip when once the rear wheels have left the rails 5 as the said skip continues its upward movement. The lower ends of the tipping rails 23 extend below or at least to positions in horizontal alignment with the lower end portions of the rails 5.

A pair of suitably actuated winches 24 (one of which is shown on the drawings) are mounted for simultaneous operation on the frame 1, such winches preferably being driven by an electrical motor or a gasoline engine supported on the frame. A cable 25 secured at its ends to each of the winches 24 and to the frame 1 extends over a pulley 26 secured on the upper part of the frame 1, and such cable also extends over a sheave 27 which is connected by a strap 28 to the rear side of the skip 13. The pulley 26 is positioned forwardly of the upper ends the rails 5 and 23, and the said pulley is arranged considerably higher than the wheel receiving sockets 6.

The skip is loaded in the usual way with sand, cement and other materials comprising a cement mixture by a power shovel or other suitable means while such skip is stationed on the weighing rails 9. As the hoisting mechanism is operated and the winches 24 are rotated in a counter-clockwise direction (Fig. 1) the skip 13 is drawn upwardly over the articulation rails 8 and onto the rails 5. As the upward movement of the skip continues the tipping wheels 22 engage with the tipping rails 23, and at this point the rear wheels 21 leave the rails 5 and no longer support the rear end of the skip. The tipping rails 23 being steeper and more acutely inclined than the rails 5 cause the rear end of the skip to become progressively more elevated than its forward end as the said skip travels upwardly, and when the upper ends of the rails have been reached the skip will have been tipped to a position whereby its rear end is substantially higher than its forward end. The forward wheels 20 upon leaving the rails 5 enter the sockets 6 in the upstanding members 7, thereby arresting the forward movement of the skip. However, since the hoisting mechanism is continuing to function, the rear end of the skip will be drawn upwardly, and the said skip will continue to tip and pivot in a counterclockwise direction about the said sockets. As such final tipping action occurs a hook 29 suspended in a suitable position from the frame 1 engages with the bail or cross bar 17 of the closure gate 15 and holds the latter against downward movement with the front end of the skip, thereby causing the said gate to open and allow the contents of the skip to be discharged into a transit mixer or other receiver positioned beneath. The skip in its final discharging position, as shown in Fig. 1, is sufficiently inclined toward the vertical to cause its contents to be discharged through the then open discharge opening. When the cables 25 are slackened by suitably controlling the winches 24 the force of gravity causes the skip to reverse its pivotal movement and turn about the sockets 6 in a clockwise direction, thereby returning the tipping wheels 22 to positions resting on the tipping rails 23. The skip under the control of the winches is then returned by gravity to its loading position on the weighing rails 9.

It is to be noted that the skip may be supported on the rails 5 when the apparatus is being transported from place to place and similarly the weighing scales and the weighing rails may either be loaded onto the frame or conveyed in a trailer or the like to their destination.

It is also understood that instead of having the rails 23 of the tipping track positioned outwardly with respect to the rails 5 of the inclined supporting track such tipping track may be positioned between the rails 5, and in such an event the wheels 22 will be arranged to engage with such tipping track. If desired, one set of cables, pulleys and winches may be used instead of duplex sets of such elements, and similarly the tipping track may comprise but one rail which may be arranged between the rails 5.

What I claim is:

1. In a portable charging elevator for concrete mixers, a weighing scale having skip supporting track means operatively connected thereto, a supporting frame mounted on wheels, an inclined track secured on the frame, and arranged to receive and support a skip after the latter is loaded while on the track means associated with the scale, wheel receiving sockets positioned at the upper end of the track, a second inclined track secured on the frame and arranged along side the first mentioned track, the second track being inclined at a substantially steeper angle than the first mentioned track, a skip mounted for movement over the tracks, the said skip having uniformly spaced front and rear pairs of wheels arranged tn engage with the first mentioned track, the front wheels being adapted to enter the sockets when the skip has traveled a predtermined distance up the tracks, a second pair of wheels mounted on the rear end of the skip and arranged to engage with the second track, pulley means secured on the frame and positioned forwardly of the upper end of the tracks and at a substantially higher level than the sockets and cable means connected to the rear end of the skip and extending over the pulley means the said cable means being connected to winch means.

2. In a portable charging elevator for concrete mixers, a supporting frame mounted on wheels, an inclined track secured on the frame, wheel receiving sockets positioned at the upper end of the track, a second inclined skip tipping track secured on the frame and arranged alongside the first mentioned track, the second track being inclined at a substantially steeper angle than the first mentioned track, a skip mounted for movement over the tracks, a hinged gate normally closing a forward discharge opening in the skip, the said gate carrying hook engaging means, a pair of front supporting wheels mounted on the skip and arranged for engagement with the first mentioned track, the said front wheels being adapted to enter the sockets when the skip has traveled a predetermined distance up the tracks, a pair of rear supporting wheels mounted on the skip and arranged for engagement with the first mentioned track, a pair of tipping wheels mounted on the rear end of the skip and arranged to engage with the tipping track, means for actuating the skip upwardly over the tracks, the said means being adapted to tip the skip forwardly to a discharging position when the front wheels become lodged in the sockets, and hook means arranged to engage with and hold the hook engaging means of the gate as the skip is tipped forwardly to a discharging position, whereby the gate is opened.

3. In a charging elevator for concrete mixers, an inclined track, a second inclined track arranged alongside the first mentioned track, the said second track being inclined at a substantially steeper angle than the first mentioned track, a skip mounted for movement over the tracks, a hinged gate normally closing a forward discharge opening in the skip, the said gate carrying hook engaging means, a pair of front supporting wheel mounted on the skip and arranged for engagement with the first mentioned track, a pair of rear supporting wheels mounted on the skip and arranged for engagement with the first

mentioned track, a pair of tipping wheels mounted on the rear end of the skip and arranged for engagement with the second track when the skip has traveled up the first mentioned track a predetermined short distance, a pair of wheel receiving sockets positioned at the upper end of the first mentioned track, the said sockets being constructed and arranged to receive and hold the front wheels when the skip has traveled up the tracks a predetermined longer distance, means for actuating the skip up the tracks, the said means being constructed and arranged to tip the skip forwardly to a discharging position when the front wheels become lodged in the sockets, and hook means arranged to engage with and hold the hook engaging means of the gate when the skip is tipped forwardly to a discharging position, whereby the gate is opened.

4. In a track system for use in charging concrete mixers, an inclined track having parallel rails, wheel receiving sockets arranged in line with and directly adjacent the upper end of the track rails, and a second inclined track positioned alongside and in spaced relation to the first mentioned track, the second track being inclined at a substantially steeper angle than the first mentioned track, and the second track being constructed and arranged with its lower end crossing and extending below the lower end portion of the first mentioned track and the second track having its upper end extending substantially above the upper end portion of the first mentioned track.

5. In a charging elevator for concrete mixers, a supporting frame, a weighing scale having skip supporting tracks operatively connected thereto, a pair of parallel inclined tracks mounted on the frame and arranged to receive a skip after being loaded on the tracks associated with the scale, the said inclined tracks having wheel engaging stop means at the upper ends thereof, a second pair of parallel inclined tracks mounted on the frame and arranged alongside and in laterally spaced relation to the first mentioned inclined tracks, the second inclined tracks being inclined at a substantially steeper angle than the first mentioned inclined tracks, and the lower end portions of the second tracks extending below the lower end portions of the first mentioned inclined tracks and

the upper ends of the second tracks extending substantially above the upper end portions of the first mentioned inclined tracks, a skip mounted for movement over the tracks, the skip having uniformly spaced front and rear pairs of wheels arranged to engage with the tracks of the weighing scale and the first mentioned inclined tracks, the front wheels being adapted to engage with the stop means of the first mentioned inclined tracks when the skip has traveled upwardly a predetermined distance on the inclined tracks, a second pair of wheels mounted on the rear end of the skip and arranged to engage with the second pair of tracks, and means controlling the movement of the skip over the tracks.

6. In a track system for use in charging concrete mixers, an inclined track having parallel rails, wheel engaging stop means at the upper ends of the rails, a second inclined track having parallel rails positioned in laterally spaced relation to the rails of the first mentioned track, the second inclined track being inclined at a substantially steeper angle than the first mentioned track and the second track being arranged with its upper end portion positioned substantially above the upper end portion of the first mentioned track and the second track having its lower end portion extending at least to a position in horizontal alignment with the lower end portion of the first mentioned track.

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