T. L. SMITH & E. W. MEYER.

CHARGING DEVICE FOR CONCRETE MIXERS.

APPLICATION FILED FEB. 1, 1909.

985,751. Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.

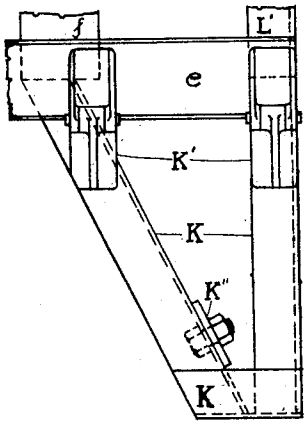

FIG. 3

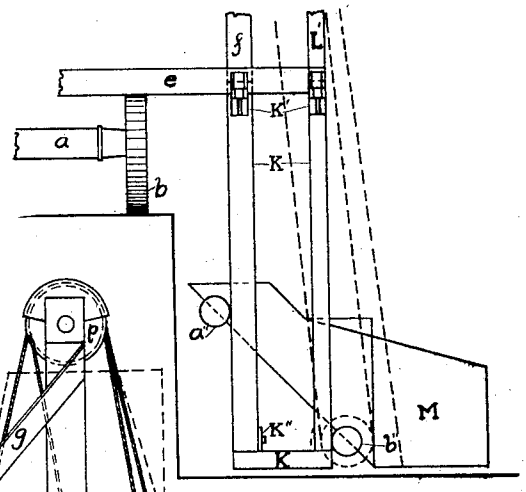

FIG. 4

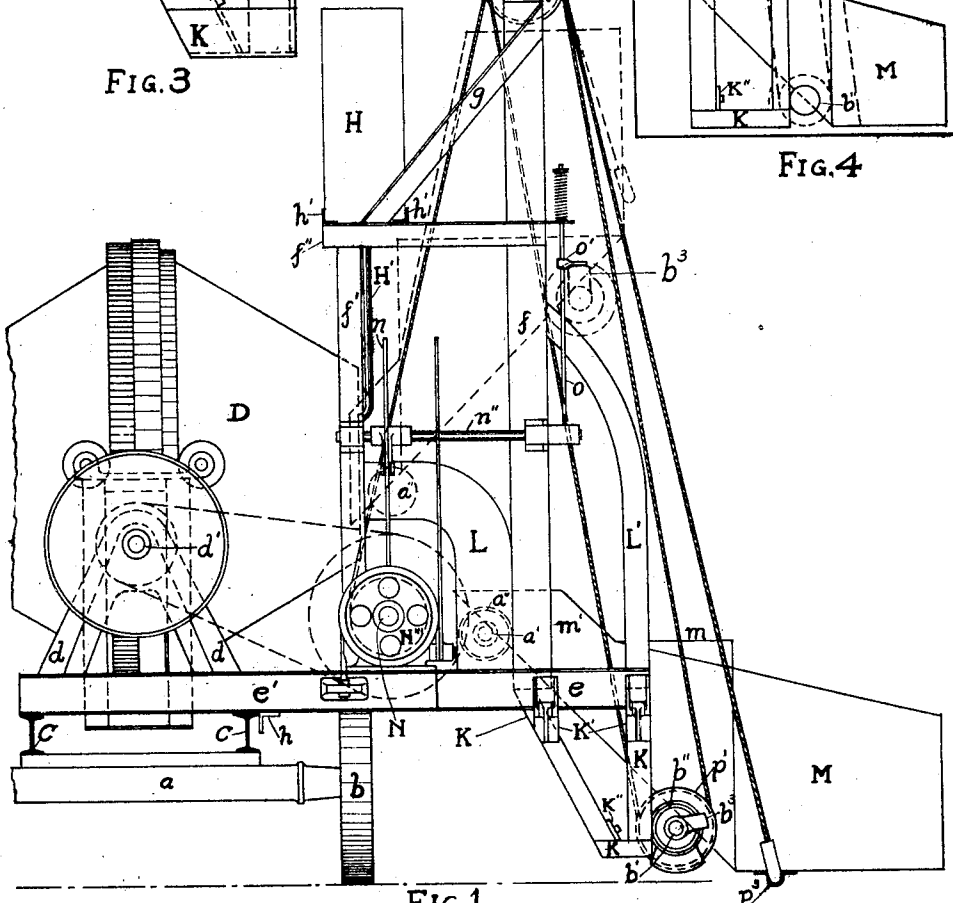

FIG. 1

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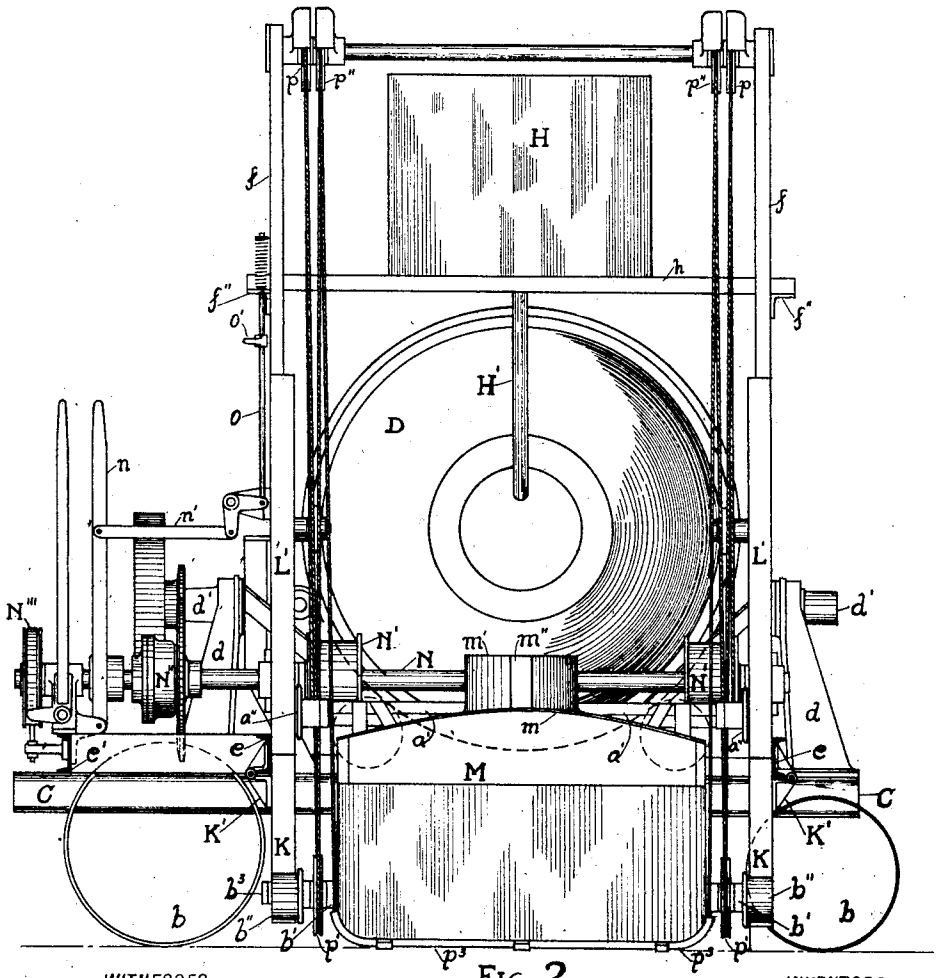

FIG. 2

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UNITED STATES PATENT OFFICE.

THOMAS L. SMITH AND EDWARD W. MEYER, OF MILWAUKEE, WISCONSIN, ASSIGNORS TO THE T. L. SMITH CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

CHARGING DEVICE FOR CONCRETE-MIXERS.

985,751. Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed February 1, 1909. Serial No. 475,499.

To all whom it may concern:

Be it known that we, THOMAS L. SMITH and EDWARD W. MEYER citizens of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Charging Devices for Concrete-Mixers, of which the following is a specification.

Our invention relates to charging devices for concrete mixers; and the objects of our invention are, first to provide a device that will be capable of lifting the material to be mixed from any distance below the level on which the mixer stands; second, to provide such a device that shall be readily portable with the mixer; third, to provide such a device that will dispense with all gates and latches and discharge into the mixer by tilting the car more or less, to spill the material rapidly or slowly, and fourth, to provide a light, durable, handy device requiring the minimum of power to operate. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1, is a view of the loading device in operative relation to the concrete mixer, and Fig. 2, is a view looking at the device from the right hand side of Fig. 1. Fig. 3, is a view of one of the feet which helps to support the device, and Fig. 4, is a fragmentary view showing the material being hoisted from a level below the level on which the mixer stands.

Similar letters refer to similar parts throughout the several views.

We have shown the charging device applied to a concrete mixer of the type shown in United States Patent 690,783, granted to T. L. Smith, January 7th, 1902, and as the mixer itself forms no part of our present invention, and is fully described in the patent above referred to, only a brief statement of its parts is necessary here.

a Fig. 1 is one of the axles and *b b*, Fig. 2, are the wheels of the truck on which both mixer and charging device are mounted. *c c* are the longitudinal members of the truck frame on which the mixer is supported by the pedestals *d d*. D is the mixing receptacle or drum, which, in the type of machine shown, tilts to discharge around the center line of the trunnions *d' d'*.

We have shown our charging device applied to a tilting mixer as it is most difficult of application in this instance on account of the upward swinging movement of the feed end of the drum. Obviously the charging device may be applied to any non-tilting mixer as for instance that shown in United States Patent 880,248, of February 25th, 1908.

The charging device is supported on two channel irons *e e*, Fig. 2, extending transversely of the truck frame *c c*. The left hand end of the hoisting mechanism is supported on a shorter transverse channel *e'*. Attached to each channel *e*, and extending vertically therefrom are two uprights, *f* and *f'*, connected together by a transverse angle *f''* at the top of *f'*. They are also connected by an inclined angle *g*. The two main frame pieces constructed as detailed above are joined together by the longitudinal angles *h* near the truck frame and *h' h'* at the top of *f'*, the two latter angles forming the support for the measuring water tank H. H' is the discharge pipe from the tank H, which conducts the measured quantity of water for the batch to the feed end of the mixing drum.

It will be noted that the frame work of the charging device overhangs the truck frame, and therefore it is advisable to support it independently of the truck while the device is in operation. For this purpose a foot is provided under each transverse channel *e*, formed by riveting the angles K to each other and attaching them to the channels *e*, by means of the hinges *k'*. The variable space between the bottoms of the feet and the ground is to be filled by blocking and wedges. The abutting surfaces of the hinges and angles prevent these feet swinging toward each other, beyond the vertical position, and a bar *k''* connects the feet together while the machine is in operative position. This bar has a notch in its lower edge near each end, which notches are so placed that they will slip over a bolt in each foot, and prevent the feet swinging apart. When the machine is to be transported and bar *k''* is slipped off the bolts, the feet are swung upward through 180° in opposite directions and secured in their upper positions by hooks on the channels *f*.

Inside and outside tracks, L L' are riveted to the frames. L is formed with a cross

section like that of a channel iron as shown at *e*, Fig. 2, and on account of the sharp bend of 90° which is given it, from the vertical to the horizontal, it is formed of a light steel casting, preferably. L′ which is bent to a much greater radius is formed of an angle iron.

The loading or charging car or skip M is preferably formed of sheet steel, with all the top open except the decked over part *m*. The side of the skip toward the mixer is formed on a slant which terminates in an upwardly inclined spout. This spout has a slot, *m*″, in its outer wall to accommodate the water pipe H′ when the car is in its upper position shown in dotted lines on Fig. 1.

The car has an axle *a*′ attached rigidly to it under the spout *m*′. This axle carries at each end a flanged roller *a*″ which travels in the curved track L, the purpose of both tracks and rollers being to tilt the car from its horizontal position to its practically vertical position, shown in dotted lines Fig. 1, during the upward movement of the car. During the downward movement of the car it is tilted back into the horizontal position, and these rollers *a*″ and tracks L might well be termed the tilting tracks and rollers. Another axle *b*′ is riveted to the car on its inclined side and near its bottom, carrying at each end flanged guide rollers *b*″ which travel on the guide tracks L′.

The hoisting apparatus comprises a shaft N carrying drums or spools N′, a friction clutch and sprocket wheel N″ and a brake wheel N‴. The clutch lever *n* is connected by a link *n*′ and a crank arm to a trip shaft *n*″ which is connected through a crank arm with the trip rod *o*, and its tappet *o*′. The axle *b*′ carries a corresponding tappet b^3 which engages and lifts the tappet *o*′ as the car reaches the upward limit of its travel, thus disengaging the friction clutch.

The rope ends are attached to the spools N′ and the rope leads from there over the outer sheaves *p p* under the lower sheaves *p*′ *p*′ over the upper sheaves *p*″ *p*″, and finally under the car through the pipe p^3. The rope will automatically adjust itself through the pipe p^3 equalizing the length of the rope on each side of the car.

In operation the car M is on the ground being loaded with a batch of stone, sand and cement, while the preceding batch is being mixed in the drum D. As soon as the mixer is discharged and the car M is loaded, the operator throws in the friction clutch N″ by means of the lever *n*, and the car starts its upward travel. As the car is supported by the rope at the axle *b*′ and the pipe p^3, and as the center of gravity of the load is outside of p^3, the rollers *a*″ will hug the right hand side of the tracks L, Fig. 1. The car will remain horizontal as it goes upward until the rollers *a*″ engage the curves of L, when the car will commence to tilt. By the time the front inclined side of the car has become horizontal, its spout is fully introduced to the feed opening of the mixer drum D, and to prevent the spout being withdrawn the tracks L′ curve from this point toward the mixer drum around the elevated position of *a*′ as a center. As the car continues its upward movement it merely pivots around *a*′ and pours its contents into the mixing drum. If the sand is dry the car may discharge too rapidly in which event the operator may lower the car a little or the tappet *o*′ may be set lower. When the sand is wet it discharges with difficulty if there is no stone in it and its flow should not be interrupted after it starts.

Under some conditions and in some locations it is extremely advantageous to lift the material from a level several feet below the mixer. In this event, the feet K shown in the drawings are removed and similar feet, but of the requisite length, five, seven or ten feet long are attached in their place. For instance, in the erection of a large building on a crowded city thoroughfare, the mixer can be set on the main floor of the building, the gravel, stone, sand and cement, can be unloaded over chutes conveying the material to the basement where it is loaded as needed in the car M, charged in the mixer on the floor above and discharged therefrom into the bucket of a concrete elevator, all of which can be done without occupying the street.

It is thus seen that, over and above correct mechanical design by which different parts are adapted to the functions which they have to perform, the entire device is distinctly portable, the material may be elevated from a level below the mixer, and all gates and latches are avoided by tilting the car to discharge by pouring over its front edge, and the amount of this tilting and consequent rapidity of discharge is under control of the operator.

What we claim as our invention and desire to secure by Letters Patent is—

1. A charging device for a concrete mixer consisting of a loading car having an open discharge spout adapted to enter the feed opening of the mixer drum, guide tracks engaging said car and hoisting means for operating said car, said guide tracks so constructed as to introduce the discharge spout of the car to the feed opening of the mixer and to tilt the car for discharge by the upward movement given by the hoist.

2. A charging device for concrete mixers comprising a charging car having a constantly open discharge spout adapted to enter the feed opening of the mixer drum, guides engaging the car and hoisting means for operating said car, said guides constructed to move the car spout laterally into the

feed opening of the mixer drum, and tilt the car around its discharge spout by the upward movement given by the hoist.

3. In a charging device for concrete mixers, a charging car having an open discharge spout, guide projections on the car in different horizontal planes, tracks extending between the projections, the inner track curved toward the horizontal direction at the proper height to introduce the discharge spout to the feed opening of the mixer, the outer track being curved in a circle around the inner guide projection, and hoisting means to operate the car.

4. A charging device for concrete mixers comprising a loading car having an open discharge spout adapted to enter the feed opening of the mixer drum, guide rollers under the spout at about the top of the car, other guide rollers in front of and at about the bottom of the car, guide tracks on each side of the car each track extending between a pair of rollers, the inner and outer edges of the tracks being curved at their upper ends in such a manner that the discharge spout is introduced to the feed opening of the mixer and the car is tilted to discharge by the upward movement of the car.

5. A charging device for concrete mixers comprising a charging car having inner guide rollers near the discharge lip of the spout, and outer guide rollers near the bottom of the car, straight guide tracks for said rollers extending substantially to the ground level or below the same, the upper part of the spout roller track curved into the horizontal plane in such manner that the spout rollers in following this track introduce the discharge lip of the spout to the feed opening of the mixer, the upper part of the outer guide track being curved around the spout roller as a center, and hoisting means engaging the car to elevate and tilt the same.

6. A charging device for concrete mixers comprising main sills extending transversely of the truck frame, guide tracks extending upward from said sills, removable sections of track attached to and extending downward from said sills, a loading car between and having projections engaging said guide tracks, and hoisting mechanism engaging said car.

7. In a charging device for a concrete mixer, a charging car having an open discharge spout elliptical in cross section and adapted to enter the feed opening of the mixer drum, guide projections on the car in different horizontal planes, tracks extending between the projections, the inner surface of the track curved toward the horizontal direction at the height at which it is desired to discharge the car, whereby the spout is introduced horizontally to the feed opening of the mixer drum while the outer guide projections continue their upward movement to tilt the car, and hoisting means to operate the car.

8. In an elevating and charging device for a concrete mixer, a car or bucket with an open discharge spout adapted to enter the feed opening of the mixer drum, upper and lower guides on said car, substantially vertical tracks extending outside of the upper guides and inside of the lower guides, hoisting means to operate the car, the track for the inner guides being curved inward at the height of the feed opening of the drum, whereby the discharge spout of the car is moved into the feed opening while the body of the car and the outer guides continue their upward movement.

9. A charging device for concrete mixers consisting of a loading car, hoisting means for operating said car, guide projections on the spout side of said car and guide tracks extending between said projections, the lower guide projection being between the center of gravity of the car and the guide track.

10. In a charging device for concrete mixers, a charging hopper or car, hoisting means for operating said hopper, a hoisting rope connected at its ends to the hoisting means, the intermediate part of the rope passing loosely through guiding means on said hopper, whereby the parts of the rope on opposite sides of the car are automatically equalized in length.

11. A charging device for concrete mixers comprising a charging hopper or car, guide rails and hoisting means for said car, said car having its side that is toward the mixer gradually merged into a spout of elliptical form in cross section adapted to enter the feed opening of the mixer drum and be tilted therein, the spout and merging side of the car being inclined to the bottom of said car, guiding means for the car carried by the spout and inclined side of the car and engaging the guide rails.

In testimony whereof, we affix our signatures in the presence of two subscribing witnesses.

THOMAS L. SMITH.
EDWARD W. MEYER.

Witnesses:
E. O. MANKTELOW,
H. H. GERLACH.