

April 15, 1930.

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1,754,533

CONCRETE MIXER AND DISTRIBUTOR

Filed Jan. 21, 1929

2 Sheets-Sheet 1

Fig. 1.

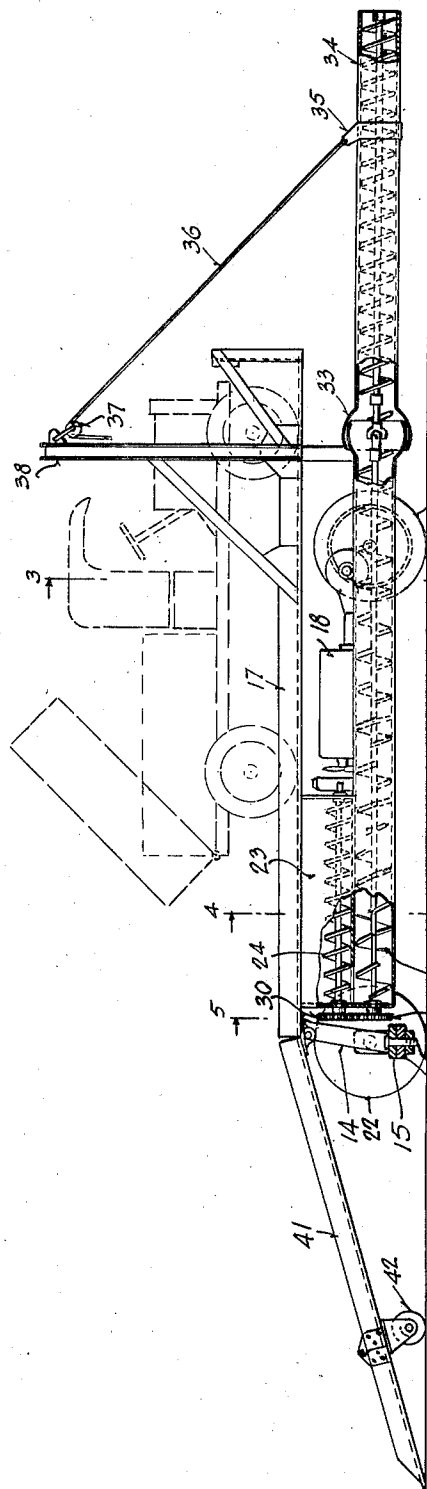
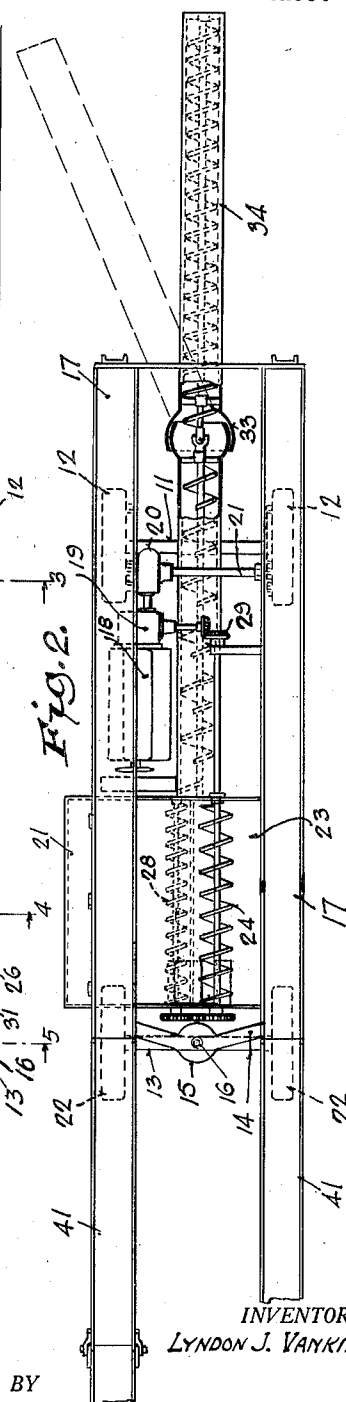


Fig. 2.



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Fig. 4.

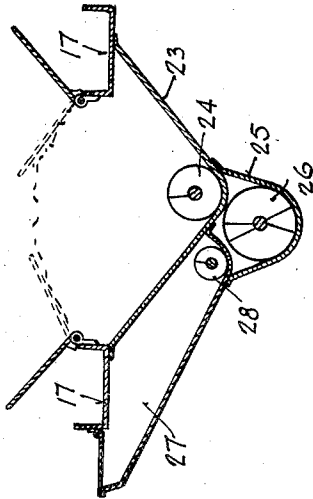


Fig. 5.

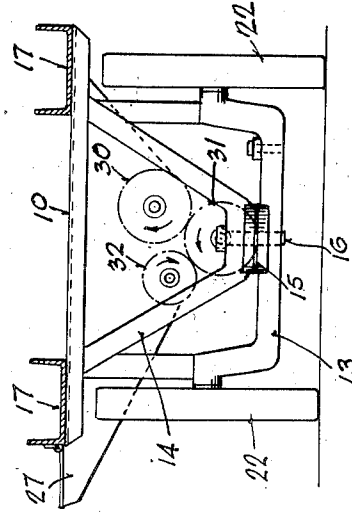
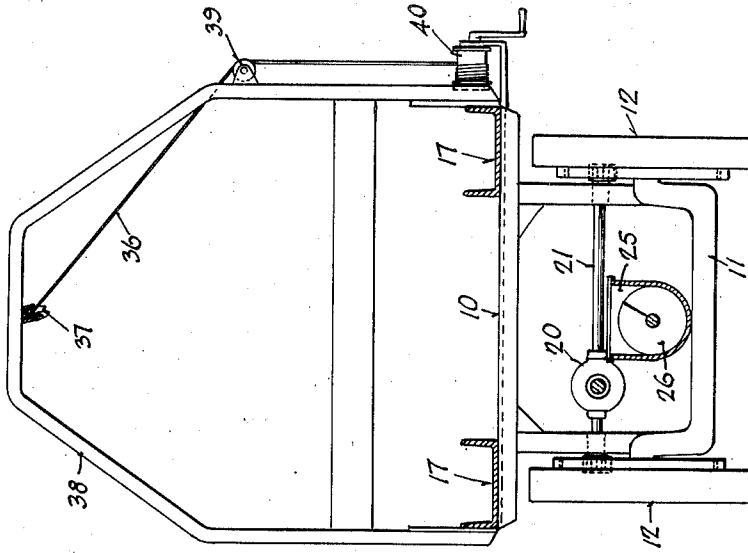


Fig. 3.



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CONCRETE MIXER AND DISTRIBUTOR

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My invention relates to an improved apparatus for mixing a batch of concrete preparatory to laying the same, and distributing the mixture according to the requirements of the work being performed.

It comprises a vehicular construction, capable of moving from place to place under its own power, and carrying a suitable hopper for the reception of the sand and gravel, with a separate hopper for the reception of the cement, together with Archimedean propellers working in such hoppers. The action of the propellers mentioned serves to agitate the sand and gravel and the cement, and feed those substances into a common chamber, wherein the substances are thoroughly mixed by the action of a third propeller of the same type.

The said common chamber, and the propeller working therein, are of considerable length, so as to permit a thorough mixing of the substances to be effected while the substances are passing to the discharge end of the chamber. A suitable quantity of water will be introduced into the common chamber during the mixing operation, so as to thoroughly saturate the batch. A tubular distributor, having capacity for lateral vibration, is swiveled to the discharge end of the mixing chamber, and a continuation of the propeller extends to the outlet of the distributor. A universal joint connects the shafts of the propellers in the mixing chamber and the distributor, so that while the remoter propeller may work with its axis diverted, the mixing and discharging operation of the batch takes place as a continuous operation.

The apparatus is surmounted by parallel tracks having an open space between them directly over the hopper which receives the sand and gravel, such tracks being accessible from the ground level by means of an inclined runway or ramp. A dumping truck with its load of sand and gravel can thus mount the superstructure of the apparatus, and dump the sand and gravel into the hopper, through the space between the tracks.

The apparatus is provided with a motor or motors having for its or their purpose,

first, the propulsion of the apparatus from place to place, and second, the actuation of the several feeding and mixing propellers, these mechanisms being coupled to the motor, when the service of either is required.

These and the other features residing in my invention will now be described in detail, and the novelty of the apparatus will be pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a view in side elevation, partly in section, showing the general arrangement of my invention, and showing in phantom a sand and gravel truck as having climbed upon the apparatus and discharged its load into the hopper.

Fig. 2 is a plan view of the apparatus shown in Fig. 1, the truck not being shown in the latter view.

Fig. 3 is an enlarged vertical sectional view on the line 3—3, Fig. 1 looking in the direction of the arrows.

Fig. 4 is a vertical sectional view, transversely of the apparatus, in the line 4—4, Fig. 1, the arrows pointing to the said line indicating the direction in which the view is taken.

Fig. 5 is a like view on the line 5—5, Fig. 1.

In Figs. 1 and 2, the end of the apparatus at the left is the front end, and that at the right, is the rear end, and will be so referred to hereinafter.

My invention is embodied in a vehicular construction having a body conventionally indicated by the numeral 10 in Figs. 3 and 4, supported at its rear end upon a dropped axle 11, the ends of the axle 11 being carried in the boxes of traction wheels 12, 12. The front end of the body is supported upon a dropped axle 13 through a bolster 14 and a fifth wheel 15, connecting the axle and the bolster through a king bolt 16, to permit front wheel steering. As a part of the body construction 10, I have shown channeled tracks 17, 17, such tracks constituting the side bars of the body. The purpose of the channel formation of the parts 17, 17, will be described hereinafter. The rear axle 11 and the bolster 14 support the operating mechanisms

of the apparatus, in a plane below that in which the body 10 extends.

The motor 18 is conveniently mounted between the front wheels and the rear wheels, or otherwise arranged as desired, and drives the reducing gears of a transmission 19, which in turn operates a differential 20, and through the latter a driving shaft 21, equipped with pinions in mesh with ring gears carried by the rear wheels 22, 22. The transmission may be coupled to the differential shaft, to propel the apparatus, when desired.

The space between the parallel channel side bars 17, forms the mouth of a hopper 23, in the bottom of which is mounted for rotation a shaft carrying an Archimedeian propeller 24, acting to move in a forward direction with respect to the apparatus, the sand and gravel which are dumped into the hopper, and to mix during the forward movement.

The front end of the hopper opens downwardly into a common mixing chamber 25, of trough shape, and extending substantially the length of the apparatus. Journaled for rotation in the said chamber, is a shaft carrying an Archimedeian propeller 26.

A hopper 27 for the cement used in the mixture, is arranged at one side of the apparatus, as indicated in Figs. 2, 4 and 5, the mouth of the said hopper being adjacent one of the channel side bars 17. A shaft journaled in the bottom of the said hopper 27, carries a rotating propeller 28 of the kind previously described, in the action of which the cement is moved forwardly of the apparatus, until it reaches an opening in the bottom of the hopper 27, and is permitted to drop into the common mixing chamber 25. The shaft of the propeller 24 carries a gear 29, driven by the motor through the transmission 19, when clutched thereto. A gear 30 at the front end of the shaft of the propeller 24 meshes with a gear 31 upon the front end of the shaft of the propeller 26, and this in turn meshes with a gear 32 upon the front end of the shaft of the propeller 28, so that the mixing and feeding propellers rotate in unison, but not necessarily at the same rate of speed.

As the sand and gravel and cement enter the common mixing chamber 25, a suitable quantity of water is introduced into the said chamber, to produce a proper constituency of the batch. The feeding movement of the mixing propeller 26 is toward the rear of the apparatus, and contrariwise to the direction of movement of the sand and gravel by the feeding propeller 24 and of the cement by the feeding propeller 28.

To permit distribution of the batch which has been mixed by the action of the propeller 26, I connect by means of a ball and socket joint 33 at the rear end of the chamber 25, an extension in the form of a tube 34,

which I term a distributor. The ball and socket connection 33 permits a swinging movement of the distributor 34 in a horizontal plane, so that the batch can be disposed at such places and in such quantity as may be necessary. The swinging movement of the distributor from side to side, can be effected either manually or mechanically. The movement of the batch through the tubular distributor 34, is accomplished by a like Archimedeian propeller carried by a shaft supported axially in the distributor, and connected to the shaft of the mixing distributor 24 by a universal joint, as shown in Figs. 1 and 2.

In order to support the free end of the distributor clear of the work, I provide a sling or loop 35, to which is connected a cable 36 passing over a guide roller 37, supported at the top of an arch 38, fixed to and rigidly braced upon the body of the apparatus. The cable 36, after leaving the guide roller 37, passes to one side of the arch 38, and over a guide roller 39, thence to a winch 40, mounted on the body of the apparatus. By means of the latter the altitude of the free end of the distributor 34 may be regulated.

At the front of the apparatus, I provide an inclined runway or ramp, which may conveniently be formed of two channels 41, 41, corresponding to and aligned with the channel side bars 17, 17. The parts 41 of the inclined runway may be detachable from the apparatus, or may be hinged thereto as shown. In the latter case the extreme forward ends of the runway will be hinged, so as to enable such ends to be folded over, and permit forward propulsion of the apparatus. Suitable rollers or truck wheels 42, at the under side of the parts 41 will support the runway during the travel of the apparatus.

In operation, a truck loaded with sand and gravel is driven up the inclined runway and on to the elevated body or platform of the apparatus. A fixed abutment on the body prevents the truck from over-running. The dumping mechanism of the truck is then operated to throw the load into the hopper 23. The truck may then be backed off the platform, and cement in suitable proportions will be introduced into the hopper 27. The shaft of the feeding conveyor 24 will now be coupled to the motor, and through the gears 30, 31 and 32, the two feeding and the mixing propellers will be rotated. As the sand and gravel and the cement are passed into the common mixing chamber, the mixing propeller moves the saturated mass to the rear of the apparatus and into the distributor 34, the rotating propeller of which discharges the batch with a continuous flow, and deposits it at the places desired, the latter being determined by the momentary position of the swinging distributor. After a layer has been deposited, the traction wheels will

be coupled to the motor, and the apparatus moved forward to a new position.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, is:

1. In a wheeled structure of the character described, an elevated vehicle body upon which a loaded sand and gravel truck may be positioned, a hopper below the body to receive the load of sand and gravel, an associated hopper for receiving cement, rotating propellers in the said hoppers for feeding the substances in the hoppers, a common chamber for receiving such substances, a laterally movable distributor leading from such chamber, a mixing propeller in the chamber for mixing the substances and passing the batch to the distributor, and means for actuating the propellers.

2. In a wheeled structure of the character described, an elevated vehicle body upon which a loaded sand and gravel truck may be positioned, a hopper below the body to receive the load of sand and gravel, an associated hopper for receiving cement, rotating propellers in the said hoppers for feeding forwardly the substances therein, a common chamber for receiving such substances, a laterally movable distributor leading from such chamber, a mixing propeller in the chamber for mixing the substances and passing the batch to the distributor, a motor supported by the wheeled structure, and connections therefrom to the several propellers to actuate the latter.

3. In a wheeled structure of the character described, an elevated vehicle body upon which a loaded sand and gravel truck may be positioned, an inclined runway on which the truck may travel, a hopper opening downwardly below the body to receive the load of sand and gravel, an associated hopper for receiving cement, rotating propellers in the said hoppers for forwardly feeding the substances therein, a common mixing chamber for receiving such substances, a laterally movable tubular distributor leading from the said chamber, a mixing propeller in the chamber for passing the mixed substances to the distributor, a distributing propeller arranged in the tubular distributor, the shafts of the mixing propeller and the distributing propeller having a swiveled connection at their abutting ends, a motor, connections therefrom to actuate the several propellers, and other connections for propelling the wheeled structure.

4. In a wheeled structure of the character described, an elevated vehicle body upon which a loaded sand and gravel truck may be positioned, the wheeled structure having dropped front and rear axles, a hopper for receiving the sand and gravel dumper by the truck, an associated hopper for receiving cement, and a common chamber arranged be-

low the hoppers for receiving the substances deposited therein, feeding propellers rotating in the hoppers, and a mixing propeller rotating in the common chamber, the said hopper, chamber and propellers being arranged above the plane of the dropped axles, and a motor for actuating the said propellers.

5. In a wheeled structure of the character described, an elevated vehicle body upon which a loaded truck may be positioned, a hopper opening downwardly below the body to receive the load when dumped by the truck, a rotating propeller in the said hopper for forwardly feeding the substances therein, a mixing chamber for receiving such substances, a mixing propeller in the said chamber for moving the mixed substances rearwardly, means for rotating the said propellers, and a laterally movable distributor swiveled to the chamber for distributing the mixed substances.

6. In a wheeled structure of the character described, an elevated vehicle body upon which a dumping truck may be positioned, the wheeled structure having dropped front and rear axles, a hopper for receiving the load dumped by the truck, and a chamber arranged below the hopper for receiving the substances deposited therein, a feeding propeller rotating in the hopper, a mixing propeller rotating in the chamber, the said hopper, chamber and propellers being arranged above the plane of the dropped axles, and a motor for actuating the said propellers.

In testimony whereof, I have signed my name at Milwaukee, this 23rd day of November, 1928.

LYNDON J. VAN KIRK.