Nov. 10, 1953 J. A. NICHOLSON 2,658,795

DUMP TRUCK BODY

Filed June 2, 1947 3 Sheets-Sheet 1

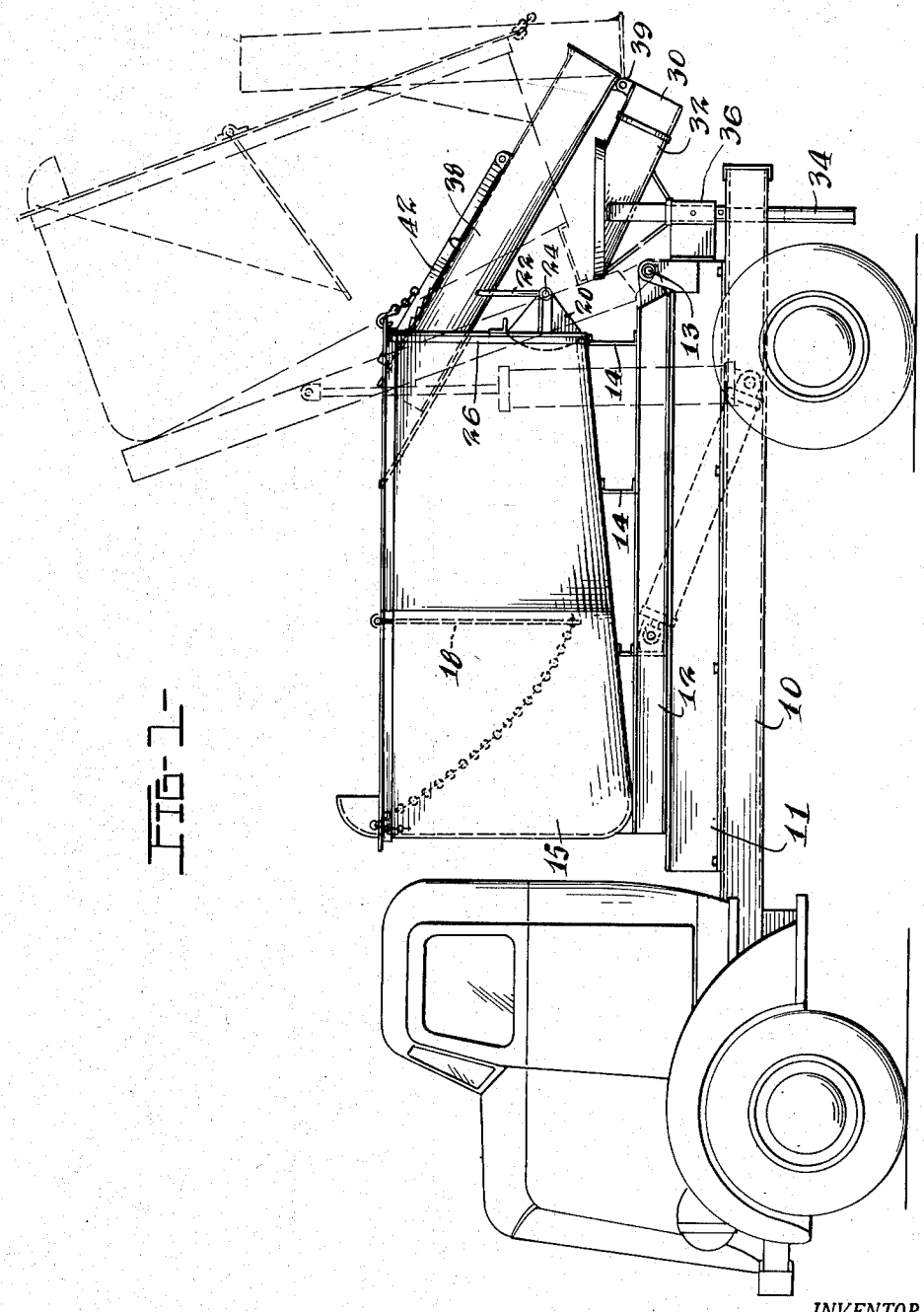


FIG. 1.

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Filed June 2, 1947 3 Sheets-Sheet 2

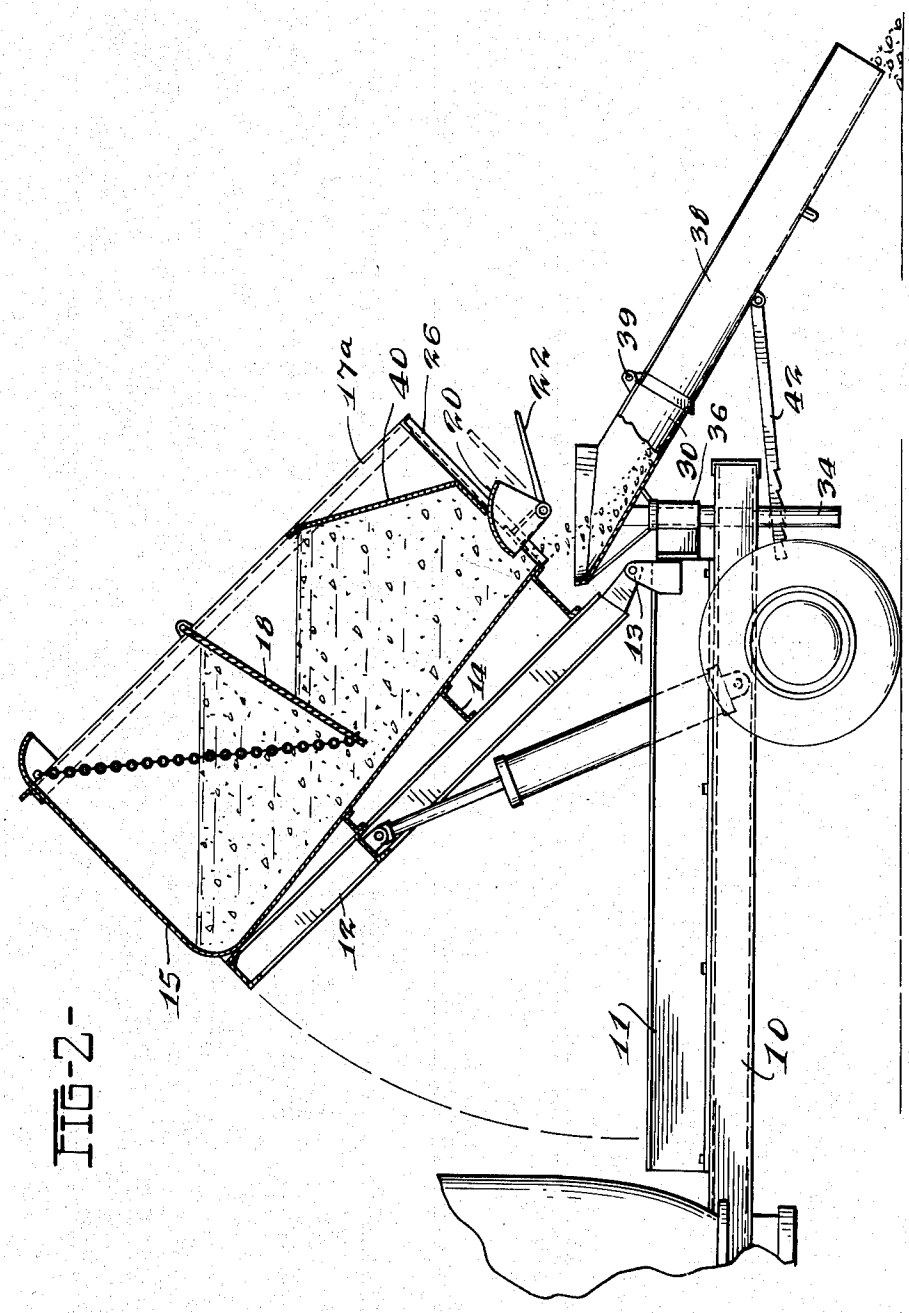


FIG-2-

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Nov. 10, 1953 J. A. NICHOLSON 2,658,795

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FIG-3-

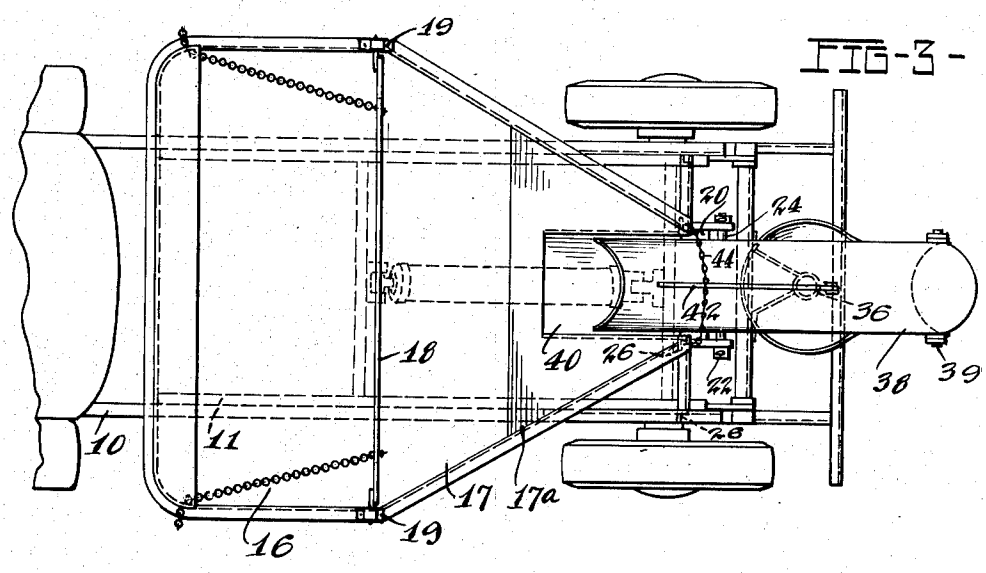
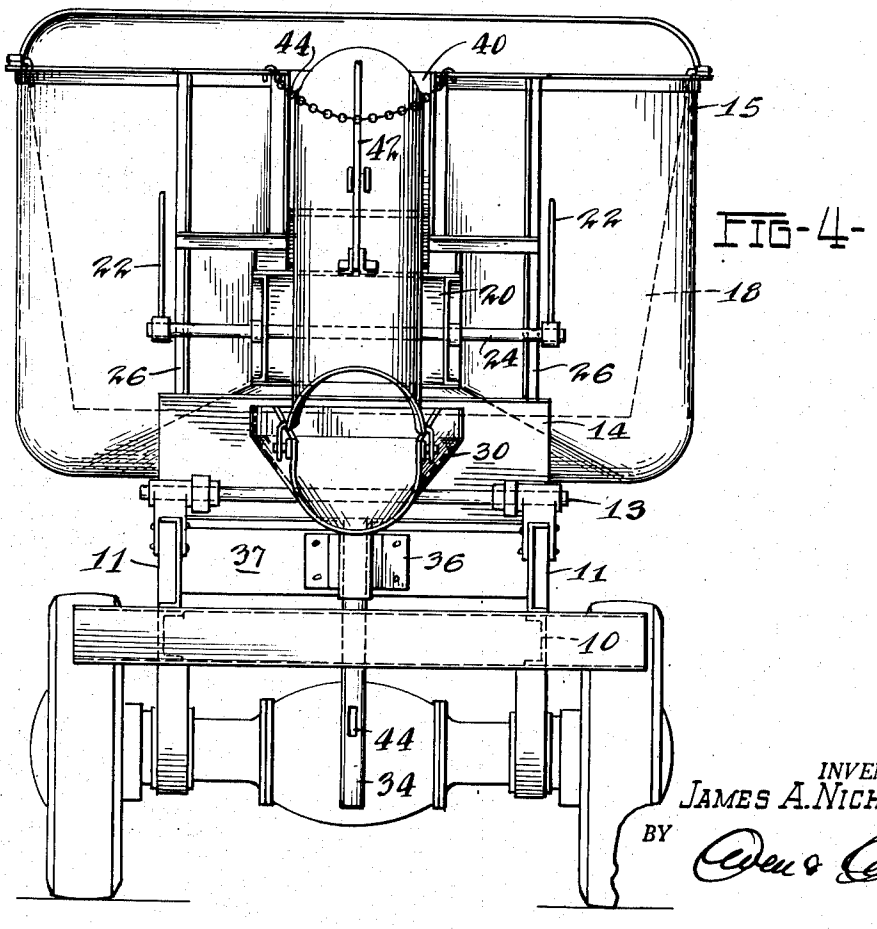


FIG-4-



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Patented Nov. 10, 1953

2,658,795

UNITED STATES PATENT OFFICE

2,658,795

DUMP TRUCK BODY

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Application June 2, 1947, Serial No. 751,891

7 Claims. (Cl. 298—17)

1

This invention relates to truck bodies and is particularly directed to a body for hauling concrete which has been mixed at a central plant.

It has become increasingly common to mix concrete with air entraining cement at a central mixing station where the constituents can be carefully and expertly batched and to haul the mixed material to the site of the work in a ready mixed condition. For short hauls, trucks having ordinary dump bodies can be used but under some circumstances segregation of the contents occurs due to factors involved in the transportation of the material. For example, transportation over rough roads causes the more liquid fractions of the concrete to rise and a similar result is produced merely by permitting the concrete to stay in the body over a long period of time. An additional segregation of the materials occurs, with dump bodies, as the pouring of the concrete is done after the site of the work is reached. The known bodies commence delivery of the concrete as soon as the body is tilted through a small angle, perhaps 15°, which results in pouring off the more liquid fractions first and it is not until the pouring has progressed nearly to completion that the drier fractions move out of the truck. In some instances this segregation is so severe that the last of the concrete must be shovelled out.

Further, the known dump bodies discharge at so low a point that long chutes cannot be used to convey the concrete away from the truck but the material must be handled by means of carts or wheelbarrows. Attempts have been made to overcome this last disadvantage by raising the point of discharge by tapering the rear of the body upwardly to form a pouring spout at a considerable elevation above the ground. While additional chuting height may be obtained in this manner, bodies so constructed represent only a partial solution to the problems involved since pouring commences as soon as the angle of repose of the lighter fractions has been overcome and these fractions are decanted from the mass.

It is known that mixed concrete has a tendency to stick to a steel body so that when it is hauled in known bodies it must be discharged promptly at the site of the work or a portion of it will remain in the truck after the pouring operation is complete.

The primary object of the present invention is to overcome the disadvantages formerly inherent in truck bodies constructed for hauling mixed concrete or the like and to provide a body in which the effect of any segregation of the material occurring during hauling is substantially corrected, and in which no segregation due to discharge is present.

Another object of the invention is to provide

2

a truck body for hauling mixed concrete or the like in which the parts are so related as to result in a high discharge point, but with the discharge being made simultaneously of material from the top and from the bottom of the mass, the discharge being delayed until the angle of repose of the heavier fractions of the concrete has been reached.

Still another object of the invention is to provide a truck body of the above character which forms a dual compartment hopper when moved to initial discharging position so that the contents of the body are poured as a substantially uniform, homogeneous mass with the discharge from the upper hopper being utilized as a scouring agent for the surfaces of the lower hopper.

Other objects and advantages of the invention will become apparent from the following description of a preferred form, reference being had to the accompanying drawings in which:

Fig. 1 is a side elevation of a truck body incorporating the present invention, the body being shown in transporting position in full lines and in discharging position in dotted lines; Fig. 2 is a sectional view of the body in initial discharging position; Fig. 3 is a top plan view of the body in transporting position; and Fig. 4 is a rear elevational view.

Referring to the drawings, the body is shown mounted on a truck chassis 10 by means of sills 11 bolted thereto. A lower frame 12 is pivoted at 13 to the sills 11 and cross frame members 14 support a container 15. The container tapers upwardly toward the rear and terminates at its rear end at a point forwardly of the pivot point 13 for a purpose which is hereinafter described. As shown in the plan view, Fig. 3, the container 15 consists of a rectangular forward portion 16 and a rearwardly convergent portion 17 separated by a baffle 18 which is pivoted in trunnions 19 at the top and which terminates short of the bottom of the container so that the front and rear compartments are in communication with each other below the dividing baffle. The compartment 17 may be partially covered or closed at the top as at 17a to confine material during transportation, but the cover terminates above the normal level of concrete in the body so that no packing takes place during transportation. The cover surface also forms a support for a chute section as hereinafter described.

The relative volumes of the compartment 17 and the larger rectangular compartment 16 are such that the center of gravity of the entire mass is well forward on the truck, approximately two-thirds of the concrete being held forwardly of the baffle 18.

The baffle 18 is given a trapezoidal shape so that when it is disposed vertically as it will be in the transporting position concrete can move

freely around its side edges as well as beneath it. However, when the baffle is swung rearwardly as the container 15 is elevated the sides of the baffle approach closely the tapered sides of the rear compartment 17. If desired, a chain or other motion limiting device may be utilized to control the rearward swing of the baffle to the desired extent. By relating the shape of the baffle to the configuration of the compartment walls in such a manner that freedom of movement is permitted to the contents in the horizontal position but not at the time when the discharge takes place, it is possible for the operator to work the concrete during a waiting period by elevating the body and lowering it again. The concrete so worked can be prevented from sticking to the sides and bottom of the compartment.

Near the lower edge of the rear wall of the rear compartment 17, and thus at the end of the container 15, a discharge gate 20 is provided which may be of any suitable form but which is shown as a partially cylindrical gate movable into and out of position by operating handles 22 at either side which are connected to the gate by shafts 24 journalled in vertical frame members 26.

A sectional chute, designated generally 30, is provided which includes a relatively stationary portion 32 carried by a stem 34 in a support 36 which is fixed to a rear cross frame member 37 attached to the sills 11. This member may be made adjustable as to height if desired and the chute may be easily removed by lifting the stem 34 out of its support 36. Since the chute is carried on a single stem it may be moved in any lateral direction around the center of the support for the stem to permit the material to be delivered at any desired point within the range of the chute.

A folding chute section 38, pivoted to the sides of the stationary section at 39, may be used to extend the range at which material is delivered. The section 38 when moved downwardly into alignment with the stationary chute section 32 assumes a position as shown in Fig. 2 so that material may be poured directly into prepared forms. When not in use or during transportation of mixed material, the section 38 is folded out of the way and is received in a central recess 40, of the container 15. The section 38 may be held in this position by a suitable fastening chain 41 which may be released when the chute is swung down or which may be left fastened if pouring is to be done directly into carts, barrows or field hoppers without using the extending section 38. It is thus unnecessary for the operator to handle the extending section 38 unless he intends to use it during pouring. A brace 42 may be passed through a slot 44 in the stem 34 to fix the chute section 38 in adjusted position when it is swung down for use. The brace 42 may have a series of adjusting notches in one surface or a pin and cooperating holes may be used to adjust it as is well known in the art.

The body may be moved from transporting to pouring position by any known form of hoist mechanism but a hydraulic unit is preferably provided having its cylinder pivotally connected to the frame of the truck and its piston associated with the subframe 12 so that movement of the piston out of the cylinder moves the body upwardly in the usual manner to elevate the contents to pouring position. As the body and its contents move upwardly the discharge gate 20 is moved to a position over the stationary chute portion 32. If the gate is then opened material will be discharged through it as indicated in Fig. 2. It will be seen that as the body moves to a position approximately 45° from the horizontal to bring the discharge gate over the chute, the discharge gate has moved upwardly around the pivot point 13 since in its horizontal position it is disposed forwardly of the point about which it pivots. Additional chuting height is thus provided over a body in which the discharge gate is rearwardly of, or vertically over, the pivot point.

When the body and its contents have been moved to the initial pouring position shown in Fig. 2 it will be seen that baffle 18 forms with the container sides and bottom a front hopper and the tapered compartment 17 forms a second hopper. The initial pouring position which causes the compartments to assume a hopper disposition is at such an angle that the angle of repose of heavier fractions of the concrete will be overcome as well, of course, as the angle of repose of the lighter, more pourable fractions, and the entire mass is ready to move as soon as the discharge gate is open. Since the angle of repose of the average of the contents has been exceeded, material poured through the gate comes not only from the mass which previously rested on the bottom of the container but also moves downwardly from the top since both sides of the hopper exert approximately equal pressures against the gate. There is some predominance of pressure against the material which previously formed the bottom of the mass during transportation and this predominance arises by pressure of the material trapped forwardly of the baffle 18. Since this material tends to move between the baffle and the bottom of the container 15 and to exert its force in a scouring action it tends to move the more solid material out of the container first. If any segregation has occurred due to transportation factors, the lighter, more liquid material at the top of the mass will still be discharged at approximately the same time so that a well mixed, homogeneous body of concrete moves through the discharge gate to the chute.

As pouring continues the body is raised progressively until the final pouring position is reached at which time the body has assumed a position approximately 70° from horizontal and the maximum gravitational force is exerted on the drier contents at the bottom of the hoppers. Substantially complete discharge is thus obtained and the effects of segregation caused during transportation of the material have been completely overcome, and pouring has been such that there has been no tendency to remove the more liquid materials first.

When the discharge gate 20 is first opened the trajectory of the material has a relatively great horizontal component so that the discharge gate must be located over the forward edge of the fixed section of the chute. However, as pouring continues the direction of discharge is more nearly vertical so that the discharge gate must be moved rearwardly with respect to the chute. This action takes place inherently by locating the pivot point rearwardly of the discharge gate and is indicated in Figs. 1 and 2.

If, during pouring, it has not been necessary to utilize the folding chute section 38 this element can remain in its initial position and will slide with relation to the recess 40, being held by the retaining chain 41.

While the invention has been described in con-

nection with a specific form and disposition of the parts it should be expressly understood that numerous modifications and changes may be made without departing from the spirit of the appended claims.

What I claim is:

1. A truck body for hauling mixed concrete or the like comprising a tiltable container, a divider forming front and rear compartments in said container with the compartments in communication with each other below said divider when the container is in hauling position, the side walls of said rear compartment being convergent from front to rear, means to tilt the front end of said container to a discharging position in which each compartment is disposed to discharge material from the top and bottom of a contained mass, and in which said front compartment discharges into and through said rear compartment below said divider, a discharge gate at the lower side of the rear wall of the rear compartment through which the body contents discharge, and a pivot for said body disposed below said discharge gate about which said body is tilted from hauling to discharging position.

2. A truck body for hauling mixed concrete or the like comprising a tiltably mounted container having vertically disposed side walls, a trapezoidal divider forming front and rear compartments in said container, means pivoting the long edge of said divider for swinigng movements in said container, the side walls of said rear compartment being convergent from front to rear, means to elevate said container to tilted discharging position, whereby said divider approaches closely the side walls of said rear compartment when the latter is moved to discharging position but is spaced therefrom when the compartments are in horizontal position, a discharge gate at the lower side of the rear wall in the rear compartment, and a pivot for said body disposed adjacent to the lower rear portion of the container and about which said container is tilted to discharging position.

3. A truck body for hauling mixed concrete or the like comprising a container, a divider positioned across the width of the container forming forward and rear compartments in said container with the compartments in communication with each other below said divider, a discharge gate at the lower side of the rear wall of the rear compartment, a cover over the rear portion of the rear compartment, a pivot for said body disposed below and rearwardly of said body, and means to elevate the body about said pivot to discharging positions at which the walls of the container and said divider form a forward hopper and the walls of the container and said cover form a rear hopper, said forward hopper positioned to discharge into said rear hopper simultaneously with the opening of said discharge gate.

4. A truck body for hauling mixed concrete or the like comprising a container having converging bottom and side walls at the rear thereof, a divider positioned across the width of the container forming forward and rear compartments in said container with the compartments in communication with each other below said divider, a discharge gate at the lower side of the rear wall of the rear compartment, a cover over the rear portion of the rear compartment, a pivot for said body disposed below and rearwardly of said body, and means to tilt the body about said pivot to discharging positions at which the walls of the container and said divider form a forward hopper and the walls of the container and said cover form a rear hopper, said forward hopper positioned to discharge into said rear hopper simultaneously with the opening of said discharge gate.

5. A truck for hauling mixed concrete or the like comprising a chassis frame, a container mounted on said chassis frame, a discharge gate in the lower side of the rear wall of said container, a pivot for said body disposed below and rearwardly of said discharge gate when said container is in transit position, means to tilt the body upwardly and rearwardly about said pivot, a chute carried by said frame and disposed rearwardly of said discharge gate and out of position to receive material discharged from said gate until said container is moved upwardly and rearwardly to predetermined discharging positions and the discharge gate portion of the container is thereby tilted upwardly and rearwardly over the chute whereby the body contents flow rearwardly toward said discharge gate and are discharged therethrough.

6. A truck for hauling mixed concrete or the like comprising a chassis frame, a container mounted on said frame and having converging bottom and side walls at the rear thereof, a discharge gate in the lower side of the rear wall of said container, a pivot for said body disposed below and rearwardly of said discharge gate when said container is in transit position, means to elevate the body about said pivot, a chute carried by said frame and disposed rearwardly of said discharge gate and out of position to receive material discharged from said gate until said container is tilted upwardly and rearwardly to predetermined discharging positions in which the body contents flow rearwardly toward said discharge gate and are discharged therethrough.

7. A truck for hauling mixed concrete or the like comprising a chassis frame, a container mounted on said frame and having converging bottom and side walls at the rear thereof, a discharge gate in the lower side of the rear wall of said container, a cover over the rear portion of the converging side walls, a pivot for said body disposed below and rearwardly of said discharge gate when said container is in transit position, means to elevate the body about said pivot, a chute carried by said frame and disposed rearwardly of said discharge gate and out of position to receive material discharged from said gate until said container is tilted upwardly and rearwardly to predetermined discharging positions in which the body contents flow rearwardly toward said discharge gate and are discharged therethrough.

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