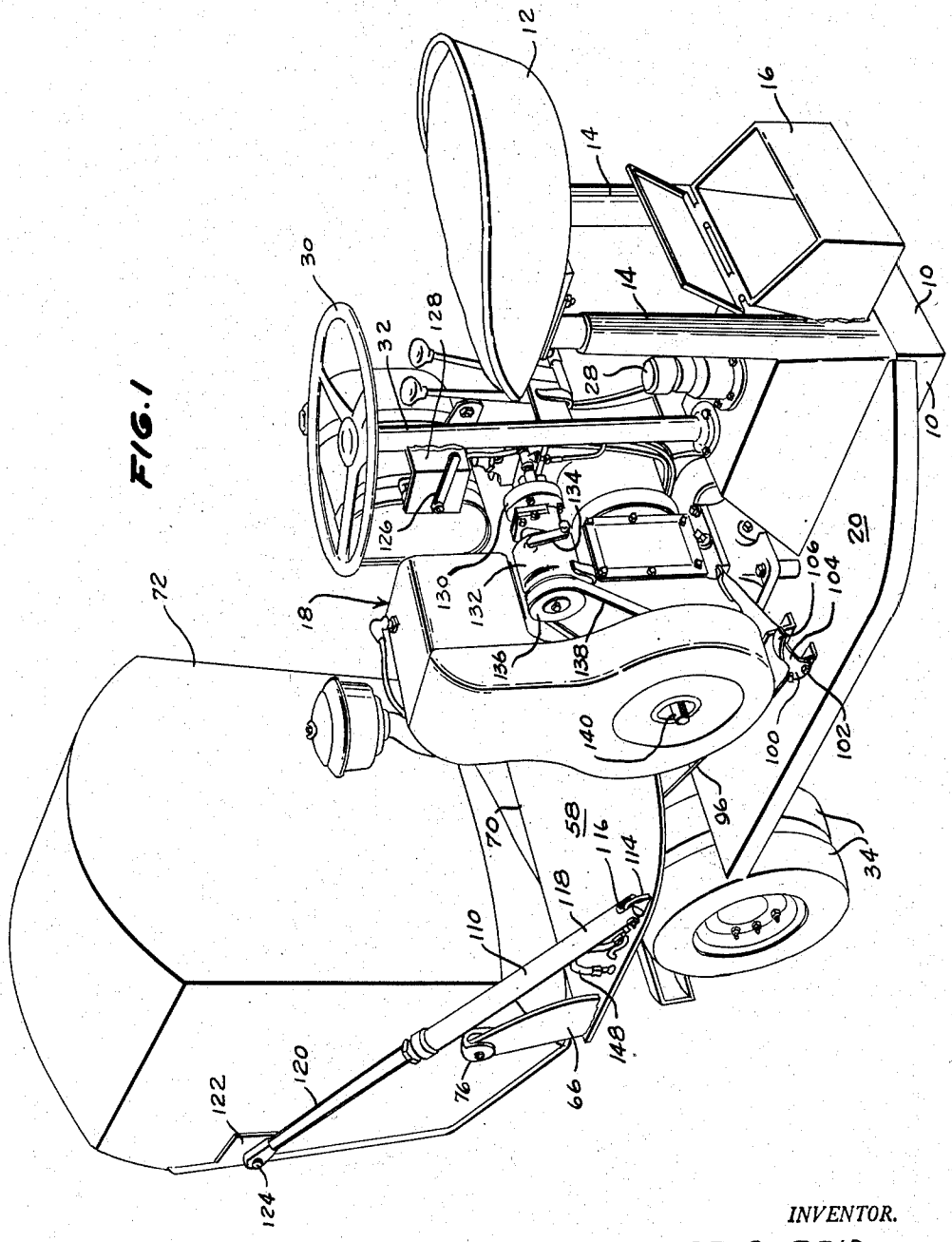
May 19, 1959 G. C. REID 2,887,339

ROTATING AND TILTING DUMPING VEHICLE

Filed Jan. 15, 1954 3 Sheets-Sheet 1

FIG. 1



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ROTATING AND TILTING DUMPING VEHICLE

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FIG. 2

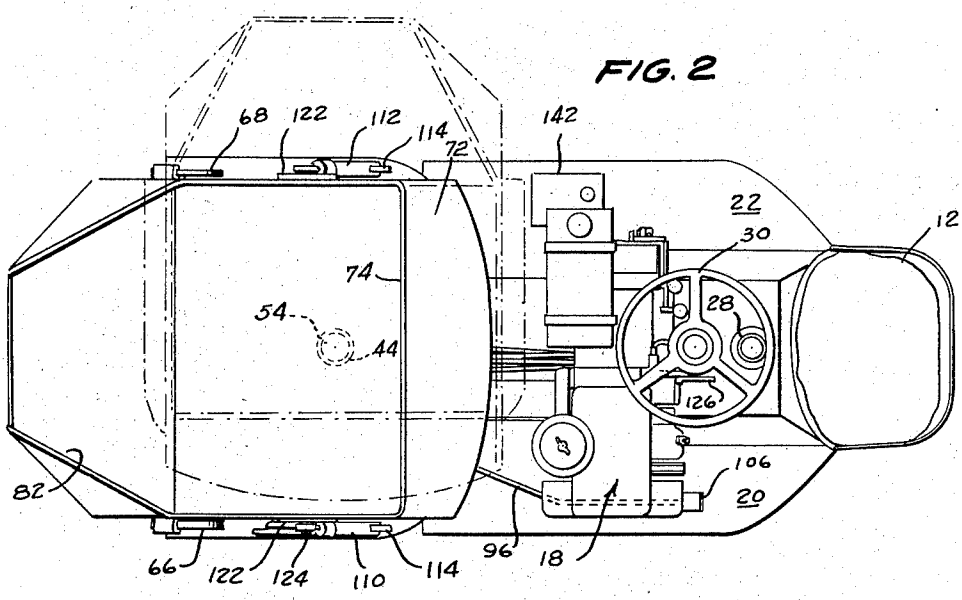
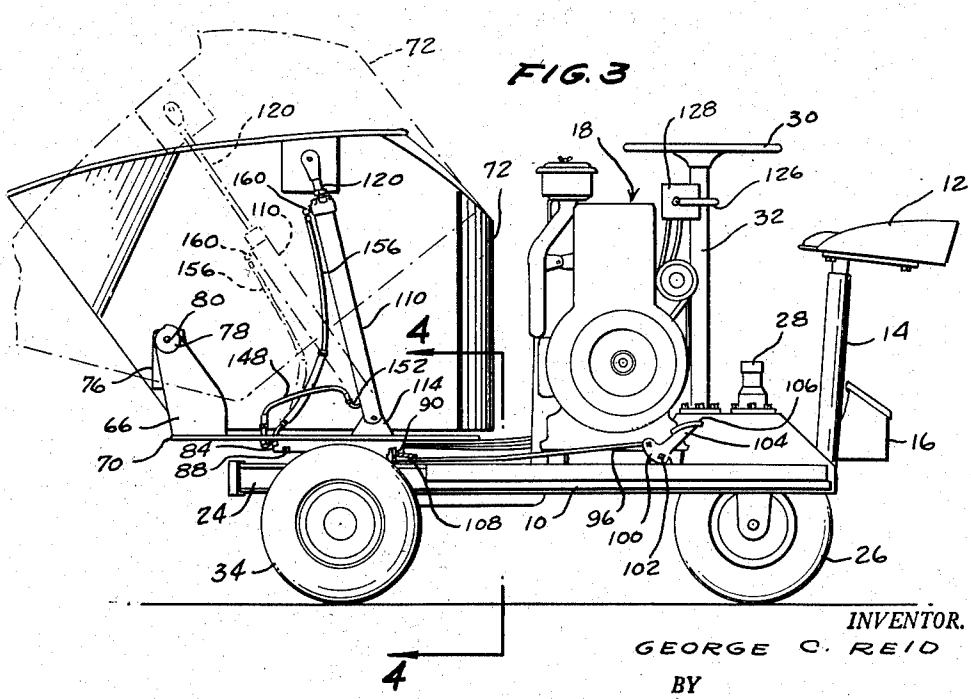


FIG. 3



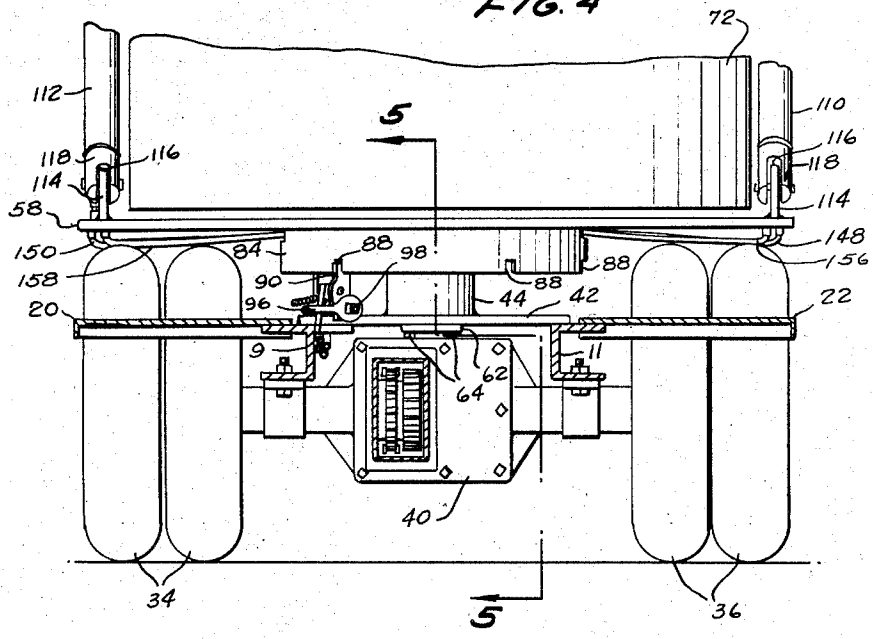
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ROTATING AND TILTING DUMPING VEHICLE

Filed Jan. 15, 1954 3 Sheets-Sheet 3

FIG. 4



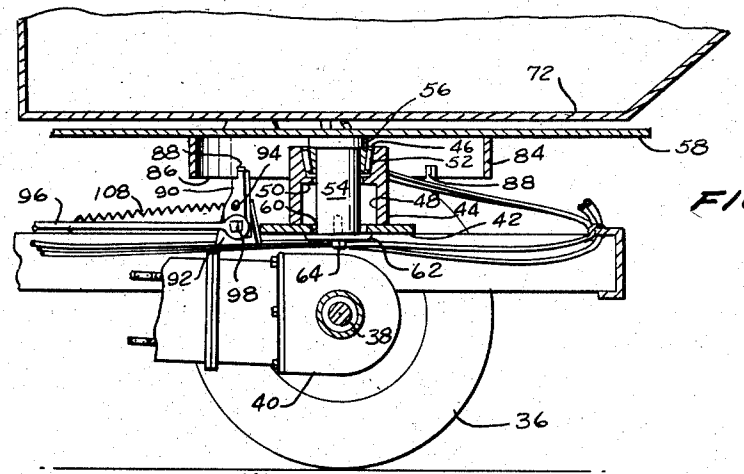


FIG. 5

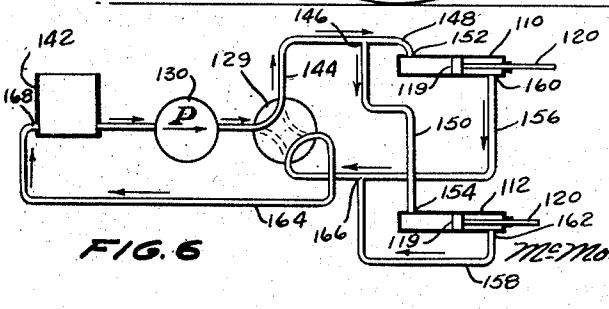


FIG. 6

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2,887,339

ROTATING AND TILTING DUMPING VEHICLE

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Application January 15, 1954, Serial No. 404,190

4 Claims. (Cl. 298—9)

This invention relates to automotive vehicles and more particularly to a concrete buggy.

It is the primary object of this invention to provide a concrete buggy in which concrete is transported to a dumping location, in which the dumping operation will empty any portion of the concrete contained in the bucket on the buggy and will stop and hold the bucket in any position from the lower to the full dumping point. Also, with the cement buggy of the present invention, the dumping operation can be accomplished from a number of different positions with respect to the longitudinal center line of the buggy. That is, the concrete may be dumped forwardly of the buggy, to either the right or left hand side of the buggy, or at points intermediate the forward and side positions.

With the above objects in mind, it will be apparent that by the employment of the concrete buggy of the present invention, it will be possible to drive parallel to a concrete form and dump a continuous stream of concrete into the form, and by controlling the amount of concrete to be dumped, the form may be finished up to the grade nails, that is the last two inches approximately, thereby saving the time required to bring concrete up to the finish grade in the old way, that is by continuously returning to the initial dump point and adding sufficient concrete to bring the level of the concrete in the form up to the finish grade.

Other objects and advantages will become apparent from the following detailed description, forming the specification, and taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of the concrete buggy or dump truck embodying this invention;

Figure 2 is a top plan view of the buggy shown in Figure 1;

Figure 3 is a side elevational view thereof;

Figure 4 is a cross sectional view taken on line 4—4 of Figure 3;

Figure 5 is a cross sectional view taken on line 5—5 of Figure 4; and

Figure 6 is a diagrammatic showing of the hydraulic system whereby the double-acting hydraulic cylinders may be operated.

With continued reference to the drawings, there is shown an automotive concrete buggy or dump truck, a structural frame 10 upon which is mounted at one end thereof, a seat 12 upon a pair of spaced tubular standards 14 with a tool box secured at the lower ends of the standards 14 and extending therebetween and outwardly therefrom, the tool box being identified by the reference numeral 16. The frame 10 also supports an engine, generally indicated at 18, which may be of the air-cooled type. The metal structural frame 10 has also provided in connection therewith a pair of laterally extended flanges 20 and 22 which define running boards on opposite sides of the structural frame member 10 and extend longitudinally thereof from the back end, or the end upon which the seat 12 is mounted, to a location spaced

from the front end 24 of the frame, the upper surfaces of the respective running boards may be suitably roughened to provide a non-skid surface and they are preferably made of a structural metal. The frame 10 is mounted upon pneumatically tired wheels including a single rear guiding wheel 26 rotatably mounted on tapered roller bearings contained within the pivot bearing housing 28 and operatively connected to the steering wheel 30 mounted at the top of a vertical steering post column 32, the steering column and steering wheel are disposed centrally of the frame and immediately to the front of the driver's seat 12 so that the wheel 30 will be convenient to the driver for controlling the direction of travel of the vehicle.

It will be noted that the front end 24 of the frame 10 is supported upon a pair of dual wheels 34 and 36 rotatably carried upon opposite ends of a transverse axle 38 which extends from a differential housing 40 having the usual gearing therein so that the power generated by the engine 18 may be transmitted to the dual wheels 34 and 36, hence making these wheels the driving wheels of the concrete buggy.

The front end 24 of the frame member 10, includes a pair of spaced parallel longitudinally extending channels 9 and 11, and disposed immediately over the differential housing 40 is a platform bearing support plate or beam 42 resting upon the top surface of the channels 9 and 11 and extending therebetween and secured thereto by any suitable means such as welding, the plate 42 defining a bed plate. The bed plate or beam 42 carries centrally thereon an upstanding hollow column 44 provided with a bearing race 46 at its upper end in the bore 48 thereof. An internal annular flange 50 formed integrally with the column 44 extends laterally from the interior wall of the bore 48, as shown in Figure 5, to define a stop for the bearing 52 which carries stem or stub shaft 54. The bearing 52 being received in the race 46 so that the bearing is carried by the column 44. The stem 54 is provided at its upper end with the peripheral, outwardly extending collar 56 which acts as a stop for the upper end of the bearing 52.

The stem 54 carries at its upper end a platform 58 and the platform 58 is secured upon the upper end or collar 56 of the stem 52 centrally of the platform on its lower face so that the platform 58 is rotatably mounted for movement in a horizontal path about the vertical axis of the column 44.

The bed plate or beam 42 is provided with a hole 60 to receive the lower end of the stem or stub shaft 54 therein, the end face of the stub shaft at this end terminating in the same plane as the lower or bottom surface of the bed plate 42, and a washer or collar 62 is carried by the lower end face of the stem 54 so that the washer 62 abuts the bed plate or beam 42 on its bottom surface, and the washer or collar 62 is secured removably upon this end of the stem as by bolts 64 extending upwardly through the washer collar 62 and into the lower end face of the stem 54 in suitable threaded apertures provided therein. Thus, it will be seen that the stem or stub shaft 54 is prevented from having undesirable longitudinal movement or end play within the support column 44.

The platform 58 which is rotatably carried by an anti-friction bearing 52 for rotational movement about the vertical axis of the support column 44 actually defines a turntable. Mounted on the anti-friction bearing 52, which is shown as being a tapered roller bearing so that upon removal of the collar or washer disc 62, the stem 54 may be lifted out of the support column 44.

A pair of spaced, parallel mounting lugs 66 and 68 extend upwardly from the turntable 58 adjacent the front edge 70 thereof and at opposite sides thereof. The mounting lugs 66 and 68 are somewhat arcuately formed so as

to have their upper ends extend forwardly of the front edge 70 of the turntable 58, and the upper end of each of the identical mounting lugs 66 and 68 is provided with a suitable aperture therethrough. A concrete bucket 72 having an open top 74, the forward end of which is somewhat convergent to define a funnel-like discharge, is mounted upon the lugs 66 and 68 and extends therebetween, the bucket 72 being so mounted as to be movable in an arcuate path about a horizontal axis provided at the upper ends of each of the mounting lugs 66 and 68. The particular manner in which the bucket is mounted upon the mounting lugs is clearly shown in Figures 1 and 3 where it will be seen that a mounting plate 76 is secured on either side of the concrete bucket 72 as by being welded thereto and has integrally formed at its upper end an L-shaped ear 78 having the shorter leg thereof extending laterally and outwardly from the side of the concrete bucket upon which it is mounted, and the longer leg thereof extending downwardly generally parallel to and spaced from the associated mounting plate 76 so as to define a mounting lug receiving socket which is arranged to fit over the upper end of a mounting lug, either 66 or 68 depending upon which side of the bucket the ear is mounted. Each ear 78 is provided with an opening or aperture centrally therethrough adapted to register with the aperture provided adjacent the top of each of the mounting lugs so that a pin 80 may be inserted into the registering openings or apertures to rotatably mount the concrete bucket 72 upon the mounting ears 66 and 68, so that, in effect, the concrete bucket 72 is rotatably mounted upon the turntable 58 and is rotatable about the pins 80 as an axis in an arcuate path perpendicular to the path of movement of the platform 58.

Thus, the concrete bucket 72 will be rotated as the turntable is moved in its arcuate path since the bucket is carried upon the turntable. The rotation of the turntable 58 and the bucket 72 along therewith is accomplished manually and is capable of being secured against further rotation in a plurality of positions, which are roughly, where the convergent sides define a chute or funnel-like discharge exit 82 which will be so disposed as to be along the longitudinal center line of the concrete buggy frame or in the straight ahead position; or the discharge exit 82 may be disposed right angularly to the longitudinal center line of the concrete buggy frame to the right side thereof as shown in broken lines in Figure 2 which will be the right side position; or the bucket may be similarly rotated to the left hand side of the concrete buggy by rotation of the turntable in the counterclockwise direction; and also, the bucket may assume a position to the right and to the left of the straight ahead position but intermediate the right and left hand positions respectively.

In order to lock the turntable in the desired angular, rotated position with respect to the longitudinal center line of the concrete buggy frame, the angular relation being especially relative to the position of the concrete bucket 72, a depending annular flange 84 is carried by the bottom surface of the turntable 58 so as to be concentric with the vertical axis of the support column 44 and spaced outwardly therefrom. The free edge 86 of the flange 84 is provided with a plurality of recesses or slots 88 spaced equally from each other about the periphery of the flange 84, and more specifically, each recess or slot 88 being angularly spaced at 45° intervals. Five such slots or recesses are provided. The flange 84, it will appear, defines a lock collar. A latch arm 90 is pivotally mounted intermediate its ends upon a bracket 92 secured upon the frame 10, the pivot being defined by a pivot pin 94. The upper end of the latch arm 90 which projects above the top of the bracket 92 is adapted to engage into selected ones of the slots 88 to thereby prevent rotation of the turntable 58 about its vertical axis.

A rod 96 has one end thereof pivotally connected at the lower end of the latch 90 as by a nut 98. The other end of the rod 96 remote from the latch arm 90 is secured at one end of a bell crank 100 pivotally mounted as at 102 upon a bracket secured on the flange or running board 20. The other end or arm 104 of the bell crank 100 carries at its end remote from the pivot point 102 a foot pedal 106. Upon depressing the arm 104 so that it rotates in a clockwise direction about the pivot 102, the rod 96 will be moved rearwardly, that is toward the end of the buggy remote from the turntable, which in turn will cause the latch arm 90 to rotate about the pin 94 in a clockwise direction and against the tension of a spring 108 so as to disengage with the selected notch 88.

The spring 108 is connected at one end to the latch arm 90 intermediate the ends of the arm, and is secured at its other end upon the rod 96 a short distance from the point of connection of the rod 96 to the latch arm 90. The spring 108 is so tensioned as to normally maintain the latch arm 90 within the selected recess or slot 88. However, the depression of the foot pedal 106 and the resultant clockwise rotation of the latch arm 90 will further tension the spring 108 in such manner that upon release of the foot pedal 106, spring 108 will tend to rotate the latch arm 90 about its pivot pin 94 in a counterclockwise direction. Thus, the concrete bucket 72 may be manually rotated along with the turntable 58 so as to assume any of the previously described positions with respect to the longitudinal center line of the buggy itself, and be locked in the desired position by operation of the latch arm 90 being received within the selected one of the recesses or slots 88 in the lock collar 84 corresponding to the desired position of the concrete bucket 72 with respect to the longitudinal center line of the concrete buggy.

In addition to the rotation of the concrete bucket 72 upon the turntable 58 to a selected angular position, hydraulically operated means whereby the concrete bucket 72 may be rotated about the pins 80 in a vertical path perpendicular to the horizontal path of movement of the bucket upon the turntable 58, is provided. More specifically, the means whereby the concrete bucket 72 may be rotated in a vertical plane about a horizontal axis so as to dump the concrete contained within the bucket at any given point and at the selected angular relation to the longitudinal center line of the concrete buggy, includes a pair of double-acting hydraulic cylinders 110 and 112. One end of each of the hydraulic cylinders is pivotally mounted upon an upstanding plate-like ear or lug 114, the end to be secured thereon is provided with a transverse groove 116 into which groove the ear or lug 114 is received, and the lower end 118 of each of the hydraulic cylinders is thereby secured upon the turntable 58 upon which the ears 114 are secured, by having a bolt and nut passing through the respective ear or lug 114 and the groove 116 so that the lower ends 118 of each of the hydraulic cylinders may move in a vertical path about the respective ears 114 as an axis. The upper end 120, which is actually the cylinder rod telescopically received within the respective hydraulic cylinders and movable longitudinally of the cylinder in response to hydraulic fluid pressure, is secured adjacent the upper edge of the concrete bucket upon a mounting plate 122 by a pin or bolt 124 so as to be pivotally mounted at this point.

The operation of the double-acting hydraulic cylinders 110 and 112 is controlled by the operator by movement of the control valve handle 126 which is externally mounted upon the hydraulic fluid control valve housing 128 carried on the steering post column 32. This will permit hydraulic fluid pressure generated by the pump 130 to flow to the cylinders. The pump 130 is operatively connected to the engine 18 through a pump clutch contained within the pump clutch housing 132. The housing mounts a clutch shifting lever 134 externally thereon to transmit the power from the pulley 136 which is

driven by a pulley belt 138 connected between the driven pulley 136 and the engine drive shaft 140.

The pump 130, when placed in operation by movement of the clutch shifting lever 134 in the proper direction, will draw the hydraulic operating fluid from the hydraulic fluid reservoir 142, so as to be drawn into the control valve 129 contained within the housing 128, so that upon movement of the control valve handle 126 in a clockwise direction, the hydraulic fluid will be forced through flexible line 144, which branches as at 146 into two other fluid conduits 148 and 150, which enter the lower ends of the respective double-acting hydraulic cylinders 110 and 112 as at 152 and 154 respectively. Two branches or branch conduits 156 and 158 are connected at one end to the upper end of the cylinder portion of the respective hydraulic cylinders 110 and 112 as at 160 and 162 respectively to define return lines which merge into a single return line or conduit 164 as at 166. The return line 164 is connected into the two-way valve 129 and continues to enter the reservoir 142 as at 168.

Hence, it will be seen that upon movement of the control valve handle 126 in a clockwise direction, hydraulic fluid will be forced from the reservoir 142 by action of the pump 130 to flow into the flexible line or conduit 144 and thence through the branch lines 148 and 150 to enter the lower ends of the cylinder body portions of the the respective cylinders 110 and 112 so as to impinge or exert pressure upon the piston 119 in each of the respective cylinders to thereby force the fluid on the other side of the pistons 119 out through the return branch lines 156 and 158 and into the return conduit 164 and back into the reservoir 142. This will force the piston rods 120 in each of the hydraulic cylinders to move outwardly longitudinally of the cylinder body portion of each of the hydraulic cylinders, and since the upper end of each of the piston rods 120 are pivotally connected upon the concrete bucket 72, the concrete bucket will be forced to move in its vertical path about its horizontal axis provided by the pins 80 and dump the contents of the concrete bucket. It will, of course, be realized that the amount of movement of the bucket 72 in its vertical path about its horizontal axis may be readily controlled by cutting off the flow of hydraulic fluid into the line or conduit 144 by movement of the control valve handle 126 to a position where fluid will no longer be enabled to enter into the flexible line or conduit 144. Further rotation of the concrete bucket 72 about its horizontal axis may be accomplished in the dumping direction by further causing elevation of the piston rods 120 so that any amount of the concrete or other material within the bucket 72 may be dumped at any location, or all of the material within the bucket may be dumped at a single location. The direction of flow of the hydraulic fluid in the dumping operation is shown by the arrows in the diagrammatic sketch of the hydraulic fluid system shown in Figure 6.

To rotate the bucket 72 from a dumping position, shown in broken lines in Figure 3, to an upright position, as shown in solid lines in Figure 3, the control valve handle 126 is moved from its neutral position, in full lines in Figure 3, in a counterclockwise direction so that the two-way valve 129 will cause the hydraulic fluid from the reservoir 142 to flow into the return conduit 164. The fluid will then flow into the return branch conduits 156 and 158 so that the fluid will be under pressure by action of the pump 130 and will enter the piston cylinder portion of each of the hydraulic cylinders 110 and 112 to thereby cause the piston 119 in each of the cylinders to move toward the lower end thereof and force the fluid in that end of the cylinder out through the lines 148 and 150 and through the line or conduit 144 and then through the two-way valve 129 so as to by-pass the pump 130 and flow into the return line 164 and thence back into the reservoir 142. In effect, in the return of the concrete bucket 72 to its initial position, as shown in full lines in Figure 3, from the dumping position as shown in full lines in Figure 1 and in broken lines in Figure 3, the respective lines or conduits 148 and 150 and a portion of the line or conduit 144 act in the nature of a return line.

From the foregoing, it will be readily apparent that the concrete buggy of the present invention includes means whereby the concrete bucket or container 72 may be selectively rotated about the vertical axis and in a horizontal plane so as to have its discharge end angularly disposed with relation to the longitudinal center line of the automotive concrete truck or buggy. Also, in addition to the selective angular position of the material-containing receptacle 72, means are provided whereby the material-containing receptacle 72 may be moved or rotated in a vertical arcuate path about a horizontal axis perpendicular to the vertical axis of rotation of the means whereby the bucket 72 may be angularly disposed, and the means which causes dumping of the material within the bucket is hydraulically operated by the operator of the vehicle from a location adjacent the steering column 32 upon which the control valve housing 128 is secured as by welding. Also, the means for causing the material within the bucket to be dumped therefrom is operatively connected to the engine 18 of the concrete truck or bucket in the manner hereinbefore described.

In operation, it will be evident that the concrete truck or buggy embodying this invention will be capable of dumping the concrete straight ahead, to either side at a ninety degree or right angular location or position with respect to the straight ahead position and at a dumping position of the material-containing receptacle intermediate the straight ahead and the position to either side. Also, any portion of the contents of the receptacle mounted on the concrete buggy may be dumped at any given location. Or, with the bucket or receptacle 72 in one of the side positions, a longitudinally extending concrete form may be filled to the desired depth with the material contained within the receptacle 72 as the concrete buggy or truck is moved in a direction parallel to the form. Thus, a later spreading operation to level off the concrete or other material dumped into the form will be avoided, and excessive dumping of the material at any one location will be eliminated.

Essentially, the present invention is in a concrete buggy or truck of the automotive type having an engine and a frame with the turntable rotatably carried by said frame adjacent to one end thereof for movement in a horizontal plane about a vertical axis, a receptacle 72 carried upon the turntable 58 and mounted for rotation about an axis perpendicular to the axis of rotation of the turntable 58, and means, defined by the hydraulic system as shown in Figure 6, operatively connected to the buggy engine 18 to move the container 72 about its axis of rotation. In addition, the present invention includes means carried by the frame 10 to selectively lock the receptacle 72 in a given position of movement about its axis, this means being defined by the latch arm 90 and the lock collar 84 with which it cooperates.

While there is shown and described the preferred embodiment of the invention, it is to be understood that the structure is susceptible to change and modification within the practicability of the invention and therefore should be limited only by the scope of the claims appended hereto.

What is claimed is:

1. In a concrete buggy, a frame having a front end and a rear end, an axle positioned transversely of said frame adjacent the front end and below said frame, a traction wheel rotatably mounted at each end of said axle, means for supporting said frame on said axle, a steerable wheel assembly positioned adjacent to and beneath the rear end of said frame, means for pivotally mounting said wheel assembly on a vertical axis located substantially midway between the sides of said frame, means for rotating said wheel assembly about said verti-

cal axis, a beam positioned upon said frame so as to extend along and centered over said axle and secured to said frame, a turntable superimposed upon said beam and connected to said beam for rotating movement in clockwise and counterclockwise directions about a vertical axis, and an upstanding bucket having a discharge spout facing upwardly and in carrying position superimposed upon said turntable so that the spout extends forwardly of the front end of said frame, means mounting said bucket on said turntable for rotating movement about a horizontal axis from the position in which the discharge spout extends forwardly and in the carrying position to a position in which the discharge spout extends downwardly and in a dumping position, said turntable upon execution of the rotating movement in clockwise direction moving the bucket to the position so that the spout extends laterally from one of the sides of said frame and upon execution of the rotating movement in counterclockwise direction moving the bucket to the position so that the spout extends laterally from the other of the sides of said frame.

2. In a concrete buggy, a frame having a front end and a rear end, an axle positioned transversely of said frame adjacent the front end and below said frame, a traction wheel rotatably mounted at each end of said axle, means for supporting said frame on said axle, a steerable wheel assembly positioned adjacent to and beneath the rear end of said frame, means for pivotally mounting said wheel assembly on a vertical axis located substantially midway between the sides of said frame, means for rotating said wheel assembly about said vertical axis, a beam positioned upon said frame so as to extend along and centered over said axle and secured to said frame, a turntable superimposed upon said beam and connected to said beam for rotating movement in clockwise and counterclockwise directions about a vertical axis, and an upstanding bucket having a discharge spout facing upwardly and in carrying position superimposed upon said turntable so that the spout extends forwardly of the front end of said frame, means mounting said bucket on said turntable for rotating movement about a horizontal axis from the position in which the discharge spout extends forwardly and in the carrying position to a position in which the discharge spout extends downwardly and in a dumping position, said turntable upon execution of the rotating movement in clockwise direction moving the bucket to the position so that the spout extends laterally from one of the sides of said frame and upon execution of the rotating movement in counterclockwise direction moving the bucket to the position so that the spout extends laterally from the other of the sides of said frame, and means carried on said frame adjacent said beam to lock said turntable when the bucket discharge spout extends laterally from the front end of the frame or either side of said frame.

3. The concrete buggy according to claim 2, wherein said means comprises a collar dependingly secured to said turntable, said collar having a plurality of angularly spaced notches therein opening to the lower end thereof, and a latch arm carried upon said frame adjacent said collar and resiliently urged into locking engagement with a selected one of said notches.

4. In a concrete buggy, a frame having a front end and a rear end, an axle positioned transversely of said frame adjacent the front end and below said frame, a traction wheel rotatably mounted at each end of said axle, means for supporting said frame on said axle, a steerable wheel assembly positioned adjacent to and beneath the rear end of said frame, means for pivotally mounting said wheel assembly on a vertical axis located substantially midway between the sides of said frame, means for rotating said wheel assembly about said vertical axis, a beam positioned upon said frame so as to extend along and centered over said axle and secured to said frame, an upstanding hollow column secured centrally of said beam, a stub shaft journaled in said column for rotating movements in clockwise and counterclockwise directions, a platform secured to the upper end of said stub shaft for movement with said shaft, and an upstanding bucket having a discharge spout facing upwardly and in carrying position superimposed upon said platform so that the spout extends forwardly of the front end of said frame, means mounting said bucket on said platform for rotating movement about a horizontal axis from the position in which the discharge spout extends forwardly and in the carrying position to a position in which the discharge spout extends downwardly and in a dumping position, said platform upon execution of the rotating movement in clockwise direction moving the bucket to the position so that the spout extends laterally from one of the sides of said frame and upon execution of the rotating movement in counterclockwise direction moving the bucket to the position so that the spout extends laterally from the other of the sides of said frame.

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