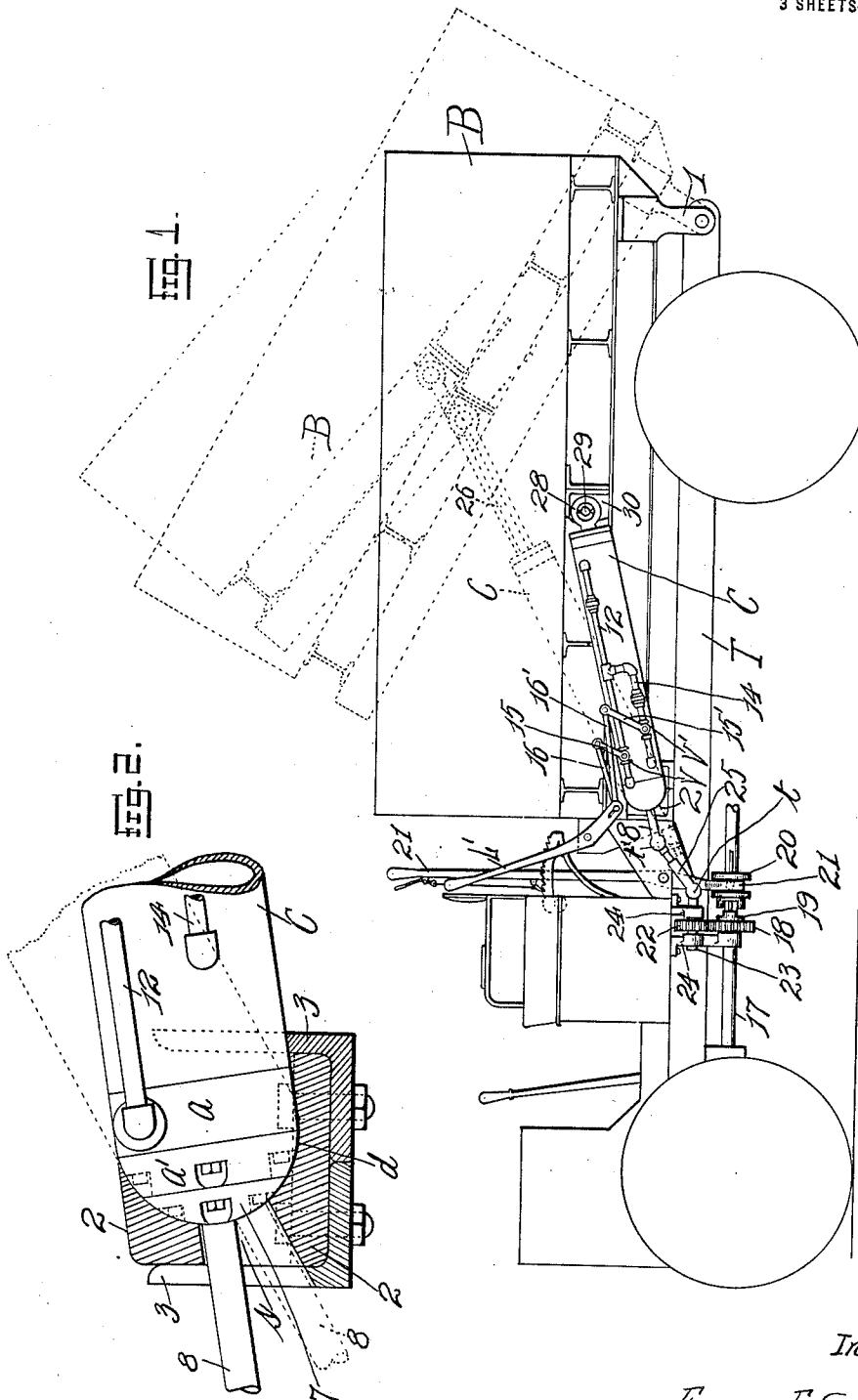


1,358,675.

E. E. SCHMITT.
DUMPING WAGON.
APPLICATION FILED APR. 30, 1920.

Patented Nov. 9, 1920.
3 SHEETS—SHEET 1.



Inventor

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3 SHEETS—SHEET 2.

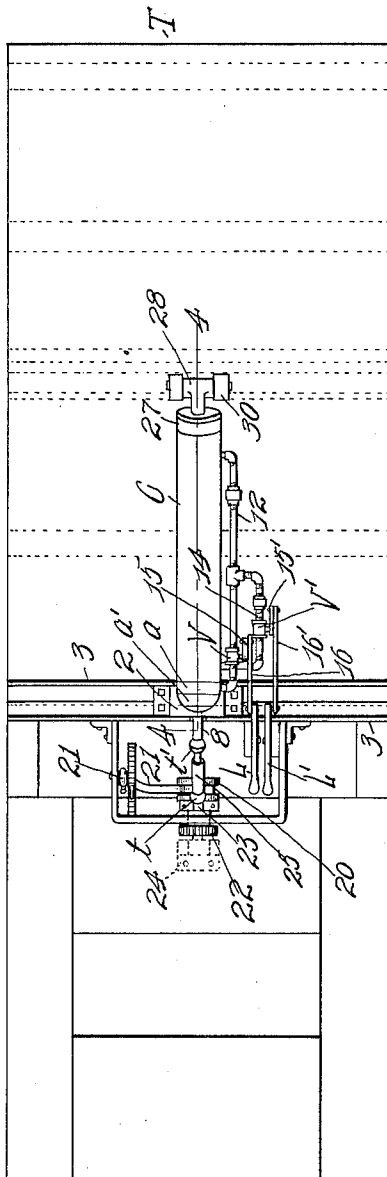


FIG. 3.

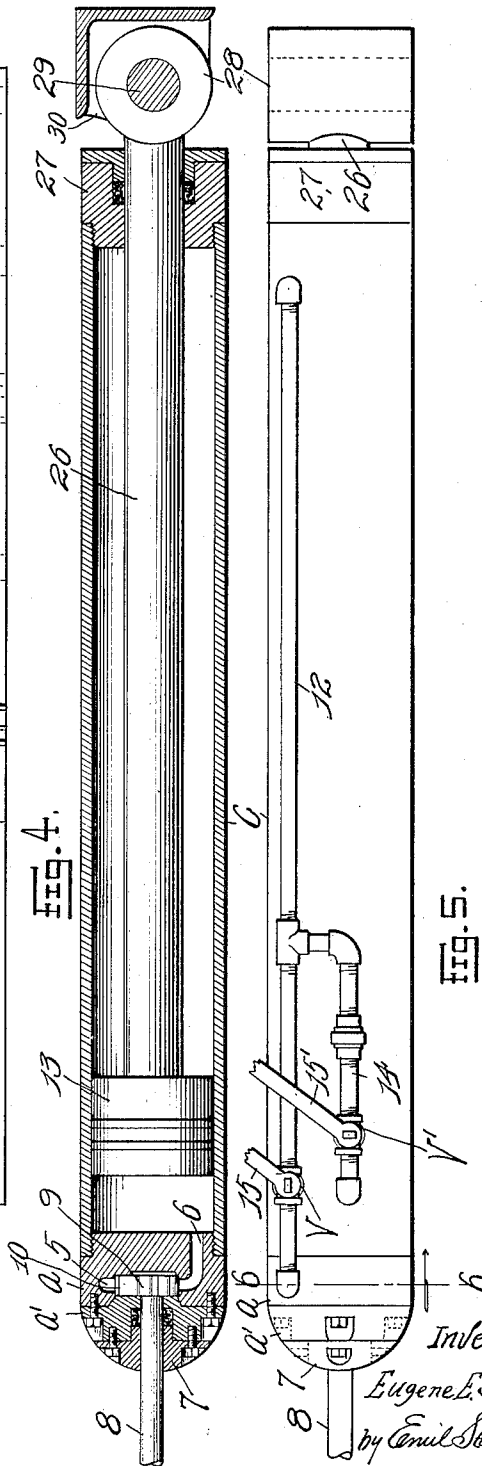


FIG. 4.

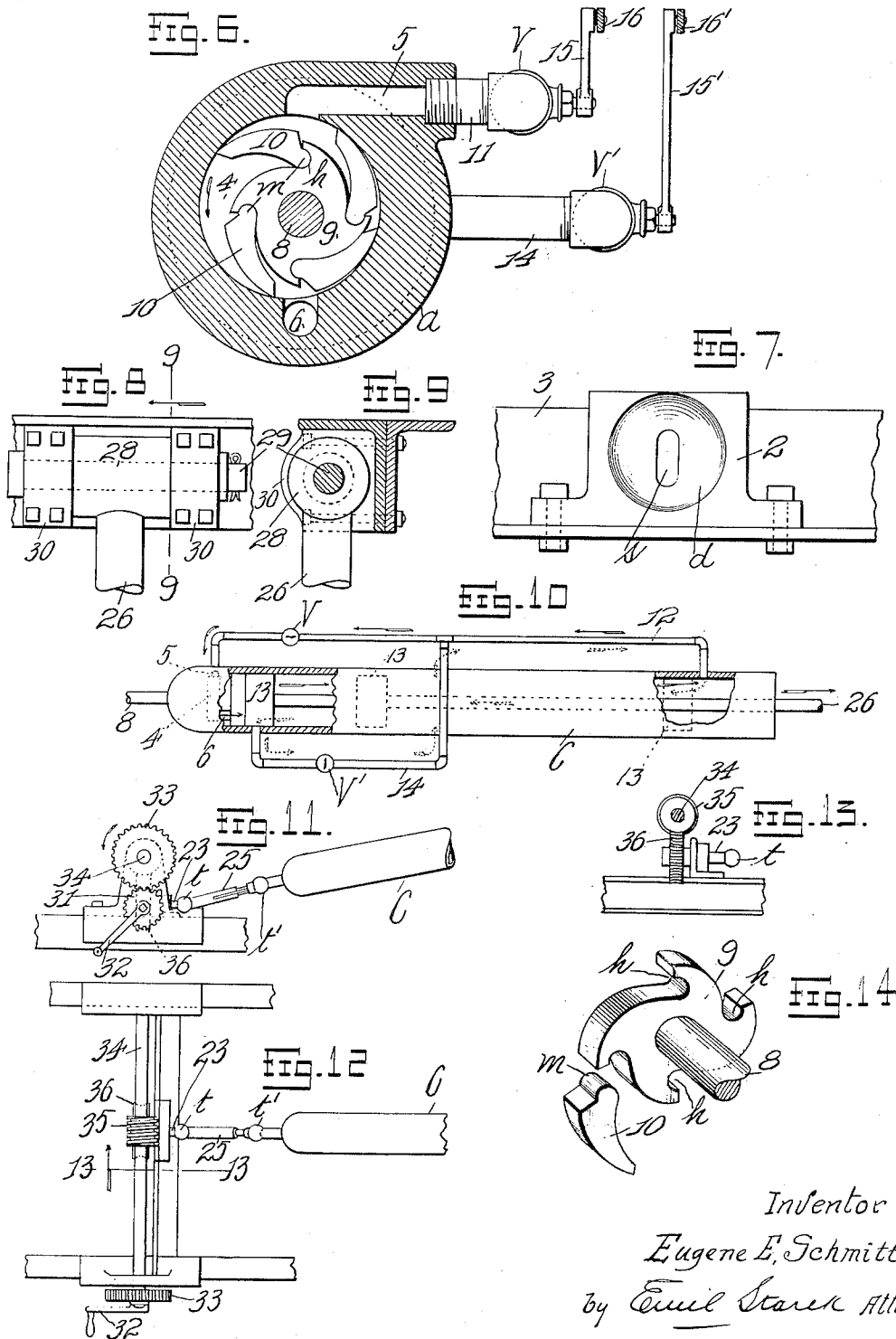
FIG. 5.

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DUMPING-WAGON.

1,358,675.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EUGENE E. SCHMITT, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Dumping-Wagons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

The present invention is directed to improvements in dumping wagons, and particularly to the bodies of motor trucks used for hauling coal, sand, rock, dirt, and similar material adapted to be dumped by the tipping of the body, as well understood in the art. The objects sought by my invention are to provide a motor truck or other vehicle with a tilting body that may be actuated from the shaft of the engine which drives the vehicle, or by hand depending on the style of vehicle to which the invention is applied; one in which the body is tilted by a push rod connected to a reciprocating piston of a dumping cylinder oscillating about a fixed horizontal axis, the piston being actuated in either direction by a confined body of fluid (preferably oil or a non-freezing liquid) circulating through and out of the cylinder from one side of the piston to the other, the direction of circulation being determined by the direction in which the piston is to be driven, said circulation being effected in one direction by a suitable rotary pump driven either from the shaft of the engine on the car, or by hand. A further object is to provide a dumping mechanism of the general character referred to which will be simple, under easy control of the operator, one permitting the tilting body to be locked against movement at any desired inclination; one which will allow the tilted body to return to its normal position of rest without jarring; and one possessing further and other advantages better apparent from the following detailed description of the invention in connection with the accompanying drawings in which—

Figure 1 represents an outline side elevation of a motor-truck provided with a dumping body to which my invention is applied; Fig. 2 is an enlarged middle vertical longitudinal sectional detail through the fulcrum block or seat about which the dumping cylinder oscillates; Fig. 3 is a top plan of the actuating mechanism, the dumping body being removed, and the truck-frame being

shown merely in outline; Fig. 4 is an enlarged vertical longitudinal middle section through the dumping cylinder and circulating pump thereof, on the line 4—4 of Fig. 3; Fig. 5 is a side elevation of the dumping cylinder; Fig. 6 is an enlarged cross-section through the pump chamber communicating with the cylinder on the line 6—6 of Fig. 5; Fig. 7 is a face view of the fulcrum block or dumping cylinder seat; Fig. 8 is a detail plan showing the manner of pivoting the push rod to the dumping body; Fig. 9 is a cross-section on the line 9—9 of Fig. 8; Fig. 10 is a diagrammatic plan of the oil circulation through the dumping cylinder and the circulating pipes; Fig. 11 is an end view of a modification showing a manually operated shaft for driving the oil pump; Fig. 12 is a top plan thereof; Fig. 13 is a cross-section on the line 13—13 of Fig. 12; and Fig. 14 is a perspective of the blade-supporting head of the oil circulating pump, one of the blades being shown in position for insertion in the head.

Referring to the drawings, and for the present to Figs. 1 to 10 inclusive, and Fig. 14, T represents a motor-truck frame and B the dumping body thereof, the hinge axis of the body being preferably below its plane of support when resting on the frame. In the present example the body is provided at the rear end with depending brackets 1, the lower ends of which are hinged to the frame (Fig. 1). This arrangement brings the hinge axis of the body considerably below the supporting plane of the frame, it being understood that there is a bracket on each side of the body, only one of which of course appears in Fig. 1. The construction of the frame and body is immaterial, and falls wholly within the purview of the skilled mechanic. In the present example angle bars and I-beams are made use of as clearly seen in the drawings. Disposed centrally on the frame T at a point below the front end of the dumping body B, is a fulcrum block 2 bolted to the horizontal legs of the angle-bars 3, 3, disposed across the frame T on either side of the block as clearly shown in Figs. 1, 2 and 3, the said block being provided with a semi-spherical cavity *d* forming a seat for the fulcrum end of the dumping cylinder C, the block being provided with a vertically elongated slot *s* leading from the bottom of the cavity for a purpose to presently more fully appear.

The fulcrum end of the dumping cylinder is screwed to the inner cylindrical section *a* of the cylinder of an oil circulating pump, said section having formed therein a circular oil chamber 4 to which leads an intake passage 5 at a suitable point of its circumference, and from which leads a discharge passage 6 at a point diametrically opposite, the said passage 6 being disposed parallel to the axis of the cylinder C and directly discharging thereinto (Figs. 4, 10,). One side of the chamber 4 is closed by the inner wall of the spherical segment or casting *a'* forming the outer section of the cylinder of the oil pump, the section *a'* being bolted to the section *a* as shown in Figs. 4 and 5. The section *a'* is provided with a stuffing box or gland 7 of usual construction, the outer surface of the gland and that of the section *a'* forming conjointly a half sphere which fits the semi-spherical cavity or depression *d* of the fulcrum block 2, thereby permitting the dumping cylinder C to oscillate about the fulcrum block when the pump-cylinder casting formed by the assembling of the section *a*, and *a'*, and the gland 7 is deposited in the cavity *d* of said block. Passing through the stuffing box 7 and through the outer section *a'* of the pump cylinder is a shaft 8, the same terminating in the pump chamber 4 in a star-disk or head 9 formed with a series of peripheral depressions *h* which receive the hinge-pin formations *m* of the blades 10, said disk as well as the shaft 8 being disposed eccentrically to the axis of the chamber 4, whereby for a portion of the revolution of the shaft and disk the pump blades are caused to fold against the periphery of the disk by the cylindrical walls of the chamber, and permitted to open outwardly for the remaining portion of said revolution, as clearly shown in Fig. 6. Leading from the passage 5 is a nipple 11 to which is coupled one end of a circulating pipe 12, the opposite end of said pipe tapping the dumping cylinder C just beyond or at the limit of the outward stroke of the piston 13, said pipe 12 having leading therefrom a branch circulating pipe 14 which taps the cylinder at the limit of the inward stroke of the piston, the pipe 12 between its point of connection with the branch pipe and the nipple 11 and the branch 14 being each provided with an ordinary rotary one-way valve V, V', respectively, the stems of which are provided with lever arms 15, 15', respectively, from which lead the links 16, 16', the front ends of said links being respectively connected to the lower lever arms of the actuating levers L, L', pivoted to the truck-frame within easy reach of the driver. It is apparent from the connections described that with a throw of a lever L, L', in one direction the valve (V, V',) controlled thereby will be closed,

and with a throw in the opposite direction the valve will be turned to open position. In the present example, rotation is imparted to the shaft 8 and its disk 9 from the engine shaft 17 by the following arrangement: Mounted loosely on the shaft (Fig. 1) is a gear wheel 18 the hub of which is formed with a clutch member 19 with which coöperates the sliding clutch member 20 controlled in the usual way by a shifting lever 21 well understood in the art. The gear wheel 18 is in mesh with a pinion 22 on a shaft 23 supported by the hangers 24, the rear end of said shaft being coupled by a universal joint *t* to a telescoping or extensible shaft 25, which is in turn coupled by a universal joint *t'* to the shaft 8. It is apparent from the connections described that rotation of the engine shaft 17 will cause rotation to be imparted to the shaft 8 and hence to the disk 9 and the blades 10 carried thereby. Leading from the piston 13 is a piston rod or push rod 26 the outer end of which operates through a stuffing box 27 at the free end of the dumping cylinder C, said rod terminating outside the cylinder in a loop 28 loosely embracing a hinge pin 29 mounted in the blocks or bearings 30 bolted to the bottom of the dumping body B near the center thereof (Fig. 1).

From the foregoing the operation will be readily understood and is substantially as follows: The dumping cylinder C, pipes 12 and 14, and the chamber 4 of the pump cylinder are filled with oil or any suitable non-freezing liquid the circulation of this liquid in a given direction determining the direction of movement of the piston 13 and push-rod 26 thereof. Referring to the diagrammatic illustration in Fig. 10, and assuming that the dumping body B of the motor-truck is in its normal position of rest and is to be tilted to dumping position, the driver by manipulating the levers L, L', closes the valve V' and opens the valve V, and by shifting the clutch member 20 to engaging position with the complementary member 19, and starting the engine, rotation will be imparted to the shaft 17, and to the gear 18 which in turn, through the intermediate gearing previously described, imparts rotation to the shaft 8 and to the disk or head 9 within the pump chamber 4. Assuming the rotation of the disk 9 to be in the direction indicated in Fig. 6, it is apparent that by reason of the eccentric position of the disk relatively to the axis of the chamber 4, the blades 10 will be caused to fold against the disk by the circular walls of the chamber during a portion of their sweep, the said blades unfolding or swinging outward from the disk for the balance of their sweep with each revolution of the shaft 8 (Fig. 6); and as each blade successively folds and unfolds, the oil in the cham-

ber which is in front of a gradually folding blade will be forced out through the passage 6 into the dumping cylinder behind the piston 13 thereby forcing the piston outwardly. In its outward movement the oil in front of the piston will be forced into the pipe 12 and be forced through the pipe past the open valve V back into the chamber 4 through the passage 5, the oil circulating in the manner described (see full arrows Fig. 10) so long as the piston 13 is being forced outwardly. With an outward movement of the piston the push rod 26 is forced out of the cylinder and thereby tilts the body B about the hinge axis of the brackets 1 pivoted to the frame T. As the body B starts to tilt it naturally lifts the pin 29 and the push rod 26 pivotally coupled thereto, so that the push rod while moving outwardly from the cylinder C is at the same time raised or oscillated upwardly, causing the dumping cylinder to oscillate vertically about its support in the fulcrum block 2, the semi-spherical formation of the assembled members $a, a', 7$, freely rotating in the semi-spherical depression d of the block. In these vertical oscillations the shaft 8 must necessarily participate, the inclined top and bottom walls of the slot s allowing the shaft free play for this purpose, as obvious from Fig. 2. Necessarily the vertical webs of the angle bars 3, 3, opposite the cylinder C and shaft 8 are cut away to allow for the oscillations of these members (Figs. 2, 3). These oscillations by the way necessitate a telescopic form of shaft 25 as clearly obvious from Fig. 1, a vertical upward oscillation of the dumping cylinder necessarily shortening the distance between the joints t and t' . When the body B has been tilted the necessary degree to dump its load, the oil pump is stopped by either stopping the engine or disengaging the clutch sections 19, 20, and the valve V turned to closed position. We thus have both valves V, V', closed so that the liquid can no longer circulate, and the body is locked against movement in either direction. After the body B has been emptied, the driver opens the valve V' (valve V remaining closed) whereupon the combined weights of the body and piston will force the confined liquid to circulate as indicated by the dotted arrows in Fig. 10, the liquid in front of the piston being forced through the pipe 14 past the open valve V' into the pipe 12, whence it flows into the cylinder behind the piston, the latter continuing inwardly until it reaches the full position shown in the diagram, by which time the body has returned to its normal position of rest on the truck frame T. To again dump the body the valve V' is again closed and the valve V opened, the oil pump set in motion, when the same operations as previously described will be

repeated. The fulcrum terminal of the dumping cylinder C need not necessarily rest in a dished out fulcrum block such as 2, but the arrangement shown is a decidedly desirable construction, being simple, strong, durable, and economical.

In some builds of automobiles it is inconvenient to gear the pump shaft 8 to the shaft of the engine. In that case suitable provision may be made to drive the shaft 8 by hand. In Figs. 11, 12 and 13, is shown a hand drive in the form of a pinion 31 operated by a crank 32, the pinion engaging a gear wheel 33 on a transverse shaft 34 provided with a worm 35, the latter meshing with a worm gear 36 carried by the shaft 23 forming the last member of the flexible or jointed shaft previously described. It is clear from the connections shown that a turning of the crank 32 will impart rotation to the pump shaft 8. Other means for imparting rotation to the pump shaft may be resorted to without in any wise departing from the nature or spirit of the invention. In fact the construction may be changed in many details without involving a departure from the invention. Features shown but not alluded to are well known in the art and require no description in the present connection. Many of the parts are herein illustrated conventionally only, no attempt being made at detailed description because well within the purview of the skilled mechanic. Obviously, the invention may be applied to horse-drawn vehicles as well as to self-propelled vehicles. In the case of the former the circulating pump would in the majority of cases be hand operated.

Having described my invention what I claim is:

1. In a dumping wagon, a tilting body mounted to oscillate in a vertical plane, a vertically oscillatable dumping cylinder fulcrumed at one end, the opposite end pointing toward the body, a push-rod leading from said end and pivotally coupled to the body, means at the fulcrum end of the cylinder for circulating a confined body of fluid through and out of the cylinder in proper direction to force the push-rod in a direction to tilt the body, a shaft leading from said fluid-circulating means in a direction opposite from the cylinder, a driving member, and intermediate connections between said member and shaft for actuating the latter and circulating the fluid body as aforesaid.

2. In a dumping wagon, a tilting body, a cylinder oscillatable about a fixed axis, a pump-chamber communicating with one end of the cylinder, a circulating pipe leading from the pump chamber and communicating with the cylinder near the opposite end thereof, a second circulating pipe leading from the end of the cylinder adjacent the

pump chamber and tapping the first pipe at
 a point removed a suitable distance from
 said chamber, a manually operated valve in
 the first pipe located at a point between
 5 juncture of the pipes and the pump-cham-
 ber, a manually operated valve in the second
 pipe disposed at a convenient point between
 the ends thereof, a piston in the cylinder
 reciprocating between the points of connec-
 10 tion of the respective pipes with the cylin-
 der, means under the control of the operator
 for actuating the valves, a push rod leading
 from the piston through the end of the cylin-
 der opposite from the pump chamber, a
 15 tilting body coupled to the push rod, a
 pump in the chamber aforesaid for circulat-
 ing a liquid through the cylinder and cir-
 culating pipes aforesaid in a direction to
 force the piston in proper direction to tilt
 20 the body, the latter by its weight and with
 a proper setting of the valves effecting a
 circulation of the liquid in the opposite di-
 rection to allow the body to settle to its
 normal position of rest, and means for actu-
 25 ating the pump.

3. In a dumping wagon, a tilting body
 oscillating in a vertical plane, a vertically
 oscillatable dumping cylinder fulcrumed at
 one end, the opposite end pointing toward
 30 the body, a push-rod leading from said end
 and pivotally coupled to the body, a pump
 at the fulcrum end of the cylinder for cir-
 culating a confined body of fluid through
 and out of the cylinder in proper direction
 35 to force the push rod in proper direction to
 tilt the body, a shaft for the pump leading

from the fulcrum axis of the dumping cylin-
 der in a direction opposite from the cylin-
 der, a drive shaft, and intermediate flexible
 shafting between the drive shaft and pump 40
 shaft for actuating the latter.

4. In a dumping mechanism of the char-
 acter described, a fulcrum block provided
 with a substantially semi-spherical seat or
 depression, a dumping cylinder terminating 45
 in a semi-spherical formation deposited in
 said depression and oscillating therein about
 a horizontal fulcrum axis, the walls of the
 block being provided with a vertically elon-
 gated slot opposite said axis, a pump-shaft 50
 leading from the fulcrum terminal of the
 cylinder through said slot, means for im-
 parting rotation to said shaft, a piston in
 the cylinder, a push rod leading from the
 piston through the end of the cylinder op- 55
 posite the fulcrum terminal thereof, and a
 member on the inner end of the pump-shaft
 for circulating a confined body of fluid
 through and out of the cylinder in proper
 direction to force the piston and push-rod 60
 thereof outwardly, a tilting body coupled to
 the push rod, and valves in the circuit of
 the fluid positioned to permit the fluid to
 circulate in the opposite direction under the
 weight of the body bearing against the 65
 push rod.

In testimony whereof I affix my signature,
 in presence of two witnesses.

EUGENE E. SCHMITT.

Witnesses:

EMIL STAREK,
 ELSE M. SIEGEL.