G. A. WOOD.

DUMPING TRUCK.

APPLICATION FILED DEC. 26, 1916.

1,271,973.

Patented July 9, 1918.

2 SHEETS—SHEET 1.

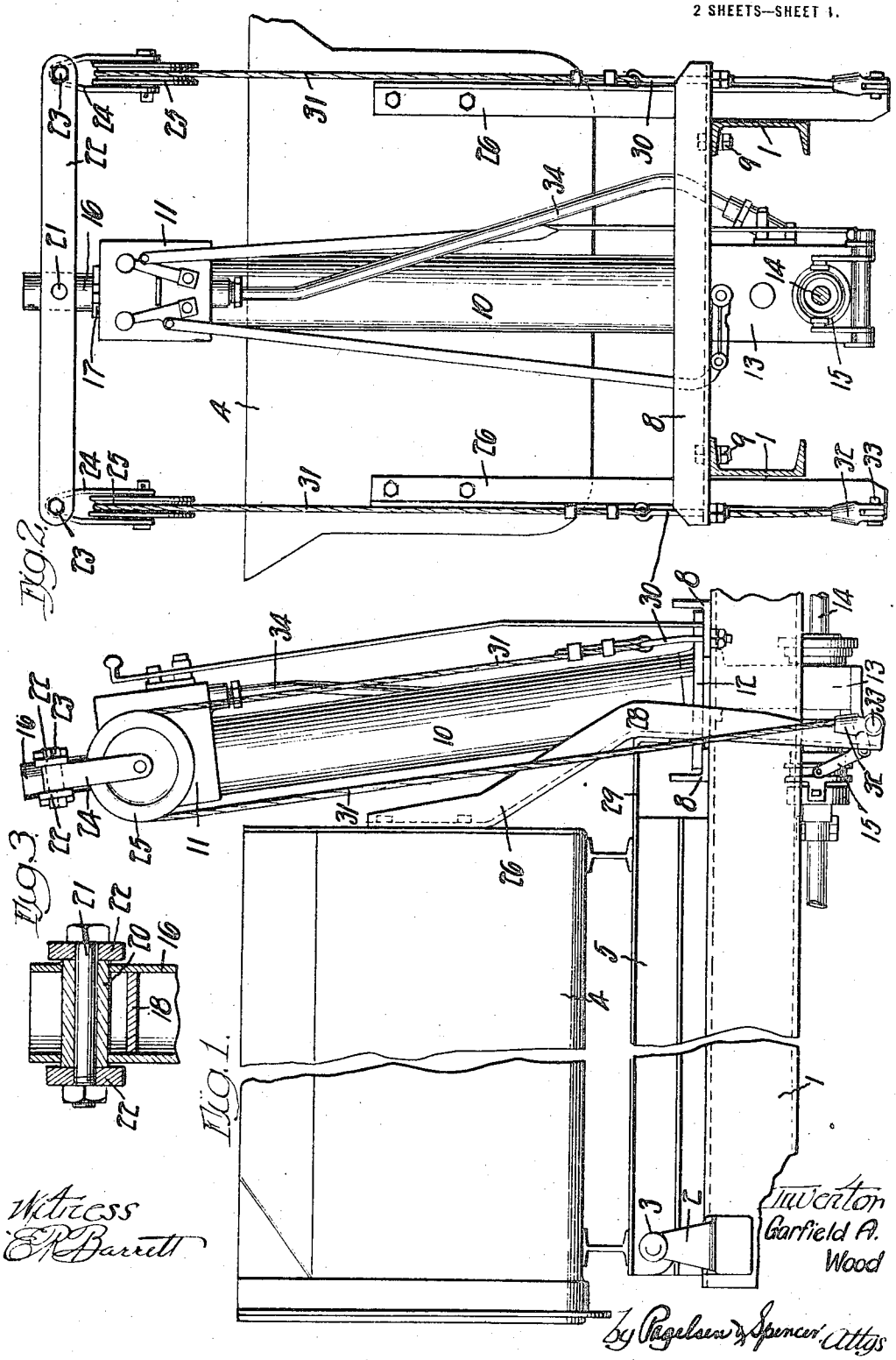


Fig. 2.

Fig. 3.

Fig. 1.

Witness
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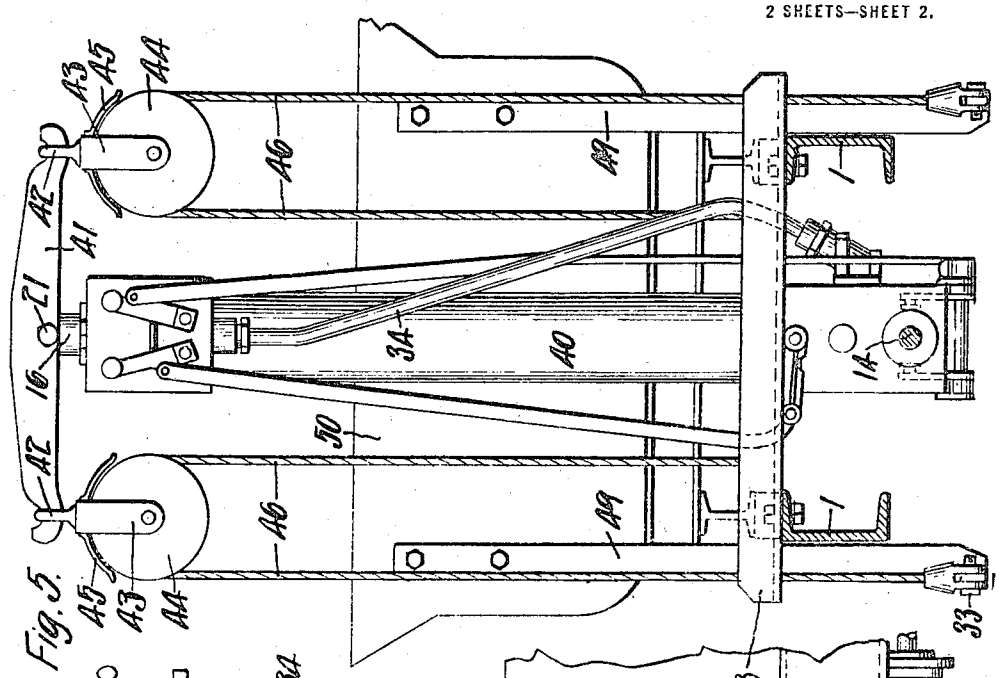


Fig. 5.

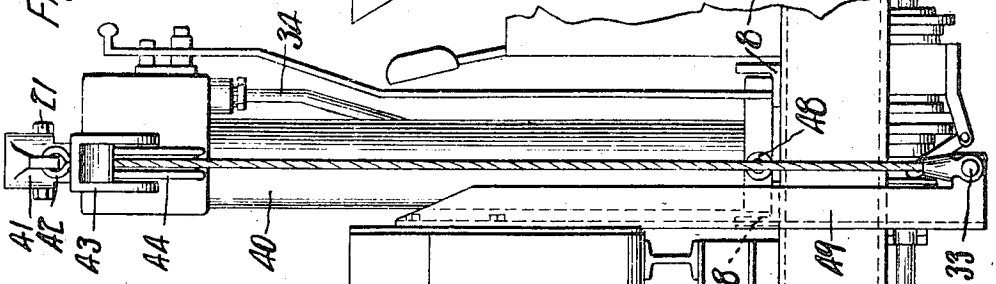
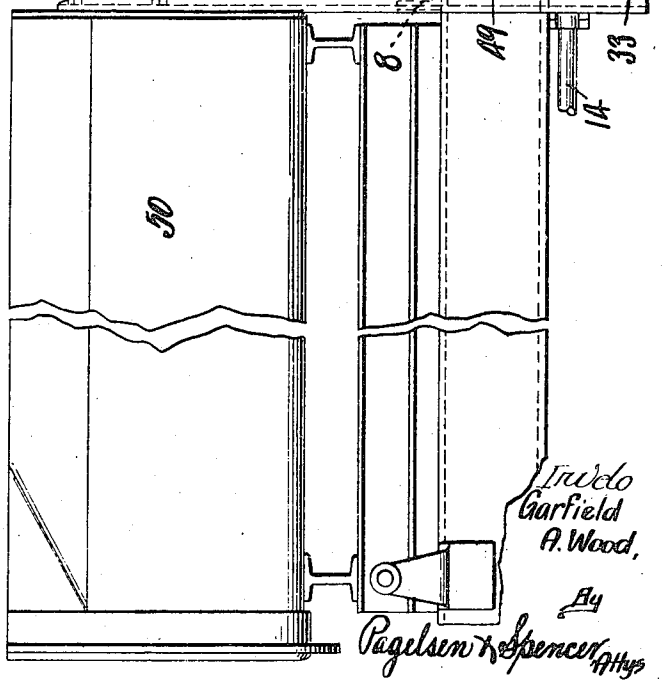


Fig. 4.



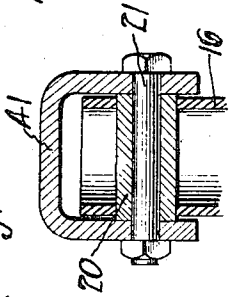


Fig. 6.

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UNITED STATES PATENT OFFICE.

GARFIELD A. WOOD, OF DETROIT, MICHIGAN.

DUMPING-TRUCK.

1,271,973. Specification of Letters Patent. Patented July 9, 1918.

Application filed December 26, 1916. Serial No. 138,762.

To all whom it may concern:

Be it known that I, GARFIELD A. WOOD, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and improved Dumping-Truck, of which the following is a specification.

It is common practice to dump the contents of truck bodies by lifting the front end upwardly about pivots at the rear end of the chassis, and hydraulic hoisting mechanism has been used for this purpose. The present invention relates to an improved means whereby the upward thrust of the piston rod is transmitted to the front end of the truck body and whereby compensation is made for relative twisting of the truck body and the sides of the chassis; also to a construction wherein the space at the rear of the driver's seat is more fully utilized for carrying purposes than heretofore; also to an improved arrangement of body irons whereby clearance is insured and the device is rendered applicable to truck frames regardless of the particular arrangement of rods and other elements within the frame; and it will be best understood from a consideration of the following description and claims and the accompanying drawings in which—

Figure 1 is a fragmentary side view of a motor truck showing a preferred embodiment of my invention. Fig. 2 is a vertical section looking from the right in Fig. 1. Fig. 3 is a longitudinal section through the upper end of the piston rod. Fig. 4 is a fragmentary side view showing a modification. Fig. 5 is a front view corresponding to Fig. 4, the seat being omitted. Fig. 6 is a longitudinal section through the upper end of the piston rod shown in Figs. 4 and 5.

Certain general combinations of elements and certain specific features relevant to the construction of the mechanism shown and claimed herein are claimed in my earlier co-pending applications for U. S. Letters Patent, namely,

S. N. 183,979, filed August 1, 1917 (renewal of S. N. 14,480, filed March 15, 1915) and the division thereof S. N. 115,957, filed August 21, 1916;

S. N. 14,479, filed March 15, 1915,

S. N. 117,236, filed August 28, 1916 and

S. N. 135,797, filed December 8, 1916.

In the embodiment shown in Figs. 1, 2 and 3, 1 indicates the side bars of the vehicle to the rear end of which are secured brackets 2 bearing pivots 3, about which the body 4 may be swung vertically for dumping purposes. The body may be provided along its lower side with longitudinal frame pieces 5 so arranged as to rest, when in lowered position, either on the side frames 1 or on special chairs carried thereby. This general construction is well known.

At a point slightly forward of the front end of the body is a supplementary frame comprising angle bars 8 preferably having their horizontal flanges facing one another, which are bolted at 9 to the side bars and have their ends projecting beyond the latter. Mounted upon the supplemental frame in any suitable manner is a hoisting cylinder 10, the upper end of which is surrounded by an expansion chamber 11 in free communication therewith. Also supported on the supplemental frame in any preferred manner, for example, by being attached directly to the base 12 of the hoisting cylinder, is a gear pump 13 which may be driven from the propeller shaft 14 by clutch mechanism 15, the details of which need not here be described. The cylinder incloses a piston (not shown) of customary construction having a hollow perforated piston rod 16 that extends out through a stuffing box 17 located at the upper end of the cylinder—as this piston rod serves as a part of the storage reservoir for oil whereby the hoisting is accomplished, its upper end is closed by a diaphragm 18 (Fig. 3).

The piston rod is perforated above the diaphragm to receive the hollow sleeve 20 through which a pivot bolt 21 in turn passes; the bolt also passes through the bars 22 that extend equal distances in opposite directions transversely of the vehicle and have their ends connected by bolts 23 upon which supporting straps 24 for pulleys 25 are hung. In the preferred construction, the pulleys are located outwardly beyond the corresponding side bars. The front end of the body has secured thereto in any suitable manner body arms 26, which are preferably

located so that their lower ends, at least, normally extend down outside of the adjacent side bar, and which may have their intermediate portions bowed forwardly as indicated at 28 (Fig. 1) and connected to the members 5 by braces 29. Anchored to the ends of the front cross bar, for example, by means of eye bolts 30, are cables 31 which pass over the pulleys 25 and have their other ends attached to the lower end of the corresponding body arm, preferably by means of a shackle 32 and pivot 33.

The pump, upon being actuated, draws the stored oil from the expansion chamber and the space above the piston down through the pipe 34 and expels it through a passage (not shown) into the cylinder at a point beneath the piston, which thereupon rises and tilts the body. Any tendency to apply the forces to one side of the body in excess of those applied to the other side, such as might be caused by warping or by standing on uneven ground, is compensated for by slight pivotal movements of the cross bars 22; the body arms 26, passing down outside of the side bars 1, do not interfere with the clutch or other members which may be located in this region and yet may sink far enough to allow the use of a relatively short hoisting cylinder. At the same time, the lower ends of the body arms which follow quite closely the line of the cable attached thereto, are subjected to very little bending stress, and the members 29 co-act with the body and the upper portions of the body arms to form a truss whereby the greater bending stresses in the upper portions of the side arms are taken.

The embodiment shown in Figs. 4, 5 and 6 differs from that heretofore described in the following particulars:—The hoisting cylinder 40 is vertical and the cross arm 41, pivoted on a bolt 21 as before, is made in one piece, but the cylinder may be inclined and the cross arm may be made in any suitable form, for example, it may in some instances be fixed to the piston rod 16. It will be observed that the web of the cross arm 41 forms a cover for the open upper end of the hollow piston rod 16 (the diaphragm 18 may in some instances be omitted). The outer ends of the cross arm are notched to receive the eyes 42 of straps 43 wherein the pulleys 44 are mounted in such manner as to hang in a transverse plane through the center line of the hoisting cylinder. The straps may include the cable guides 45 and are capable of free universal swinging movement. Cables 46 pass over the pulleys and have one of their ends (preferably the inner ends) anchored to the base or other fixed part at 48; the other ends of the cables are connected to the body irons 49 on the body 50 although the relative arrangement of anchorages and body irons may be reversed and the construction still have its advantages as to clearance for the body. It will be observed that this arrangement of pulleys allows the body irons to be made straight and the front end of the body to extend close up to the rear side of the hoisting cylinder, which not only increases the capacity of the body but more evenly distributes the load upon the front and rear axles.

In other words, the arrangement of the pulleys in a transverse plane makes possible three desirable conditions; 1st, the positioning of the front end of the body close up to the cylinder, thus giving maximum capacity; 2nd, the use of large pulleys whereby the danger of breaking the wires of the steel cables in bending is avoided; and, 3rd, the positioning of the pin 33 close to the vertical plane through the front end of the body, thus lessening the stresses in the body arms—this without any possibility of the rear runs of the cables 46 bearing on the upper portion of the front end of the body when the latter is in lowered position.

The details may obviously be changed in many respects without departing from the spirit of my invention, and I do not, therefore, wish to be limited except as indicated by the subjoined claims.

I claim:—

1. In combination with the frame of a vehicle, said frame including side bars, a body pivoted adjacent the rear end to tip and having members secured to the forward portion thereof, said members depending below the upper faces of the corresponding side bars on the outer sides thereof, hoisting means for the front end of the body, said hoisting means comprising an upwardly projecting guide located substantially in the central vertical longitudinal plane of the vehicle, a member reciprocable therein, said member projecting transversely of the vehicle at the top, sheaves carried by the projecting portions of said member, and cable means connecting the sheaves to the lower ends of the corresponding depending members in runs which rise substantially vertically from the end of the corresponding depending member, the distance between the ends of the projecting portions of the reciprocable member being considerably less than the distance between the above mentioned runs of the cable means, said cable means being so constructed and arranged that the lifting stress applied to the depending members is maintained substantially equal and the front end of the body is caused to rise substantially twice as fast as the reciprocable member.

2. In combination with the frame of a vehicle, a body pivoted adjacent the rear end thereof to tip and having body arms depending from the front end thereof outside

of the sides of the frame, an upstanding guide forwardly of the body, a reciprocable member in the guide, the reciprocable member including at its upper end an arm extending transversely of the vehicle, sheaves supported at the ends of the arm and having their axes extending longitudinally of the vehicle, and flexible means passing over the sheaves and attached to the lower ends of the depending members, whereby the length of the arm is reduced.

3. In combination with the frame of a vehicle, said frame including side bars, a body pivoted adjacent the rear end of said frame to tip and having members secured to the forward portion thereof, said members depending below the upper faces of the corresponding side bars, hoisting means for the front end of the body, said hoisting means comprising an upwardly projecting cylinder, a piston rod reciprocable in said cylinder, a cross-arm mounted to swing in respect to the upper end of said piston rod about a substantially horizontal axis, a pair of tension members attached to the opposite ends of said cross-arm at equal distances from the pivotal axis thereof, said tension members being attached to the lower ends of the corresponding depending members whereby the lifting stress applied to opposite sides of the body is maintained substantially equal, the cross arm having a U-shaped channel formed in its lower side at the middle, and the upper end of the piston rod being received in said channel.

4. In combination with the frame of a vehicle, said frame including side bars, a body pivoted adjacent the rear end of said frame to tip and having members secured to the forward portion thereof, said members depending below the upper faces of the corresponding side bars on the outer sides thereof, hoisting means for the front end of the body, said hoisting means comprising an upwardly projecting cylinder, a piston rod reciprocable in said cylinder, a cross-arm mounted to swing in respect to the upper end of said piston rod about a substantially horizontal axis, pulleys supported on the opposite ends of said cross-arm at equal distances from the pivotal axis thereof, cables anchored to the frame and passing over said pulleys, said cables having their other ends connected to the corresponding depending members on the body whereby the lifting stress applied to opposite sides of the body is equalized.

5. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting hoisting cylinder, a hollow piston rod reciprocable in said cylinder, a transversely extending arm, a bolt passing through the piston rod and across the opening therein from side to side a short distance below the upper end of the rod, said bolt also passing through the arm, whereby the arm may tilt on the rod, and means for connecting the ends of the arm to the body.

6. In combination with the frame of a vehicle, a body pivoted adjacent the rear end thereof to tilt, an upwardly projecting guide carried by the frame forwardly of the front end of the body, a member reciprocable therein, cable means attached to the front end of the body on opposite sides of said guide, said cable means being actuatable by and movable relatively to said reciprocable member to tilt the body, sheaves of a diameter greater than the width of the guide from front to rear supported on the reciprocable member, the cable means passing over the sheaves, the connection between the sheaves and the reciprocable member being so constructed and arranged that a plane transversely of the vehicle and passing through the runs of the cable means which lead directly to the body lies forwardly of the rear surface element of the guide throughout the length of said runs when the body is in lowered position.

7. In combination with the frame of a vehicle, a body pivoted adjacent the rear end thereof to tilt, an upwardly projecting cylinder carried by the frame forwardly of the front end of the body, a piston rod reciprocable therein, cable means attached to the front end of the body on opposite sides of said cylinder, said cable means being actuatable by and movable relatively to said piston rod to tilt the body, the connection between the cable means and the piston rod including a pulley carried by said piston rod and rotatable about a fixed axis and arranged in a plane transversely of the vehicle, said pulley being of greater diameter than the cylinder.

8. In combination with the frame of a vehicle, a body pivoted adjacent to the rear end of said frame to tip, an upwardly projecting guide carried by the frame forwardly of the front end of the body, a member reciprocable in said guide, a cross-arm carried by the member, a pair of pulleys one on each end of the cross-arm and rotatable about fixed axes, the plane of said pulleys extending transversely of the frame, and flexible means operatively connected to the front portion of the body and passing over said pulleys whereby the body may be tilted, the radius of said pulleys being greater than the distance from the upper front end of the lowered body to the vertical plane which passes centrally through the cross-arm and transversely of the vehicle.

9. In combination with the frame of a vehicle, a body pivoted adjacent to the rear end of said frame to tip, members secured to the front end of said body and depending therefrom on the outside of said frame, an upwardly projecting guide carried by the

frame forwardly of the front end of the body, a member reciprocable in said guide, a cross-arm carried by the member, a pair of pulleys one on each end of the cross-arm, the plane of said pulleys extending transversely of the frame, and flexible means operatively connected to the lower ends of said depending members and passing over said pulleys whereby the body may be tilted.

10. In combination with the frame of a vehicle, a body pivoted adjacent to the rear end of said frame to tip, members secured to the front end of said body and depending therefrom on the outside of said frame, an upwardly projecting guide carried by the frame forwardly of the front end of the body, a member reciprocable in said guide, a cross-arm carried by the member, a pair of pulleys one on each end of the cross-arm, the plane of said pulleys extending transversely of the frame, and a pair of cables each having one end connected to the lower end of the corresponding depending member and passing over a corresponding pulley, the other ends of the cables being anchored to a fixed portion of the vehicle, whereby the body may be tilted.

11. In combination with the frame of a vehicle, a body pivoted adjacent to the rear end of said frame to tip, an upwardly projecting guide carried by the frame forwardly of the front end of the body, a member reciprocable in said guide, a cross-arm centrally pivoted to tilt in respect to the upper end of the member, a pair of pulleys one on each end of the cross-arm, the plane of said pulleys extending transversely of the frame, and flexible means operatively connected to the front portion of the body and passing over said pulleys whereby the body may be tilted.

12. In combination with the frame of a vehicle, a body pivoted adjacent the rear end of said frame to tip, body irons fixed to the front end of the body and depending therefrom substantially in the vertical plane of said end when the body is lowered, a guide carried by the frame, a member reciprocable in the guide, a cross head secured to the member, a pair of pulleys carried by the cross head on opposite sides thereof, the pulleys being rotatable about fixed axes and being located substantially in a common plane which intersects the member, and flexible means operatively connected to the lower ends of the body arms and passing about said pulleys whereby the body may be tilted.

13. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting hoisting cylinder, a hollow piston rod reciprocable in said cylinder, a cross head fitting over the top of said piston rod and having flanges which depend considerably below the upper end of the piston rod on the outside thereof to exclude dirt therefrom, and flexible means coöperative with said cross head for tilting the body as the piston rod is projected from the cylinder.

14. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting hoisting cylinder, a hollow piston rod reciprocable in said cylinder, a cross head fitting over the top of said piston rod to exclude dirt therefrom, said cross head being pivotally mounted on the piston rod, and flexible means coöperative with said cross head for tilting the body as the piston rod is projected from the cylinder.

15. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting guide, a member reciprocable therein, said member having a cross head including horns, pulley blocks hooked over the horns, and flexible means passing over said blocks whereby the body may be tilted when the member is projected from the guide.

16. In combination with the frame of a vehicle, said frame including side bars, a body pivoted adjacent the rear end of said frame to tilt and having members secured to a portion thereof forwardly of the pivotal point, said members depending below the upper faces of the corresponding side bars on the outer sides of the body when the body is lowered, hoisting means for tilting the body about its pivot, said hoisting means including an upright guide, a member reciprocable therein and flexible means for connecting said last named member to the lower ends of the depending members, said flexible means being substantially in the transverse plane of the vehicle which includes the central line of the guide.

17. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting hoisting cylinder, a hollow piston rod reciprocable in said cylinder, a transversely extending arm, a bolt passing through the piston rod and across the opening therein from side to side a short distance below the upper end of the rod, a tubular bushing surrounding the bolt and interposed between the bolt and the walls of the rod, said bolt also passing through the arm, whereby the arm may tilt on the rod and means for connecting the ends of the arm to the body.

18. In combination with the frame of a vehicle, a body pivoted thereon to tilt, an upwardly projecting hoisting cylinder, a hollow piston rod reciprocable in the cylinder, a horizontal pivot extending across the rod slightly below the upper end thereof and projecting from the rod on each side, a cross arm having portions arranged in vertical planes and each perforated to re-

ceive the corresponding projecting portion of the pivot, sheaves hung on the cross arm, and flexible means passing over the sheaves for tilting the body as the piston is projected from the cylinder.

19. In combination with the frame of a vehicle and a body pivoted thereon to tip, hoisting means for the front end of the body, said hoisting means comprising an upwardly projecting cylinder, a piston rod reciprocable therein, a swingable cross arm carried by the piston rod, sheaves supported on the ends of the cross-arm for universal swinging movement in respect thereto, and cable means passing over the sheaves and connected to the body.

20. In combination with a vehicle body arranged to tip, an upright guide, a thrust member reciprocable in respect thereto, a tiltable cross arm of substantially channel shape in cross-section movable with the thrust bar, and means whereby the cross arm is utilized to tilt the body.

GARFIELD A. WOOD.