June 11, 1935. O. BALLERT 2,004,744

HYDRAULIC REAR TIPPER FOR FAST DELIVERY VANS

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Fig.1

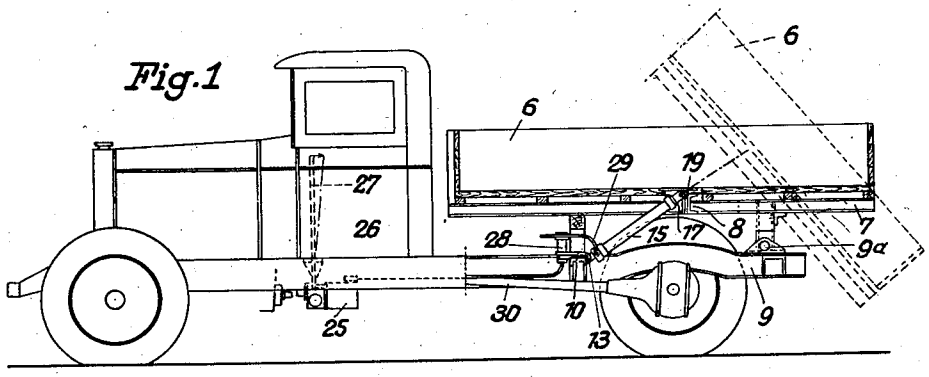


Fig.2

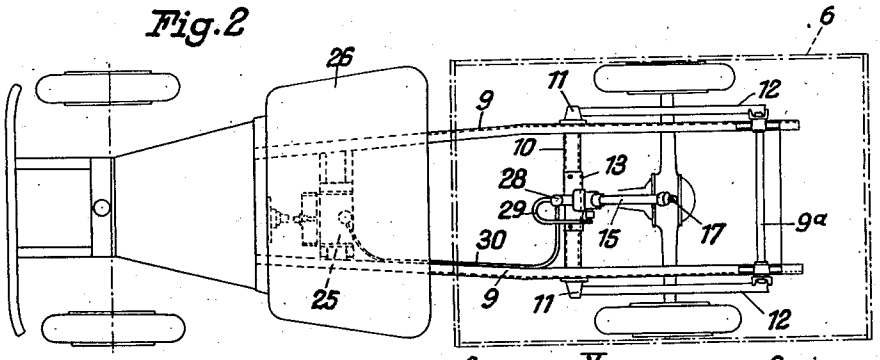


Fig.3

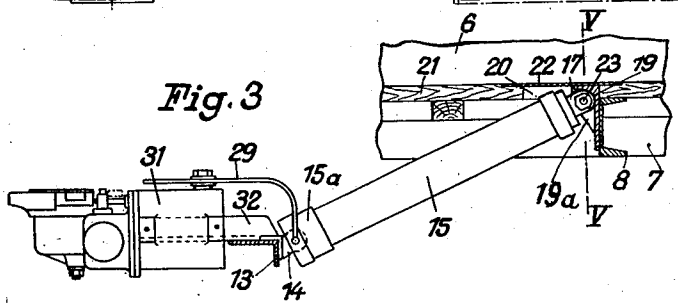


Fig.5

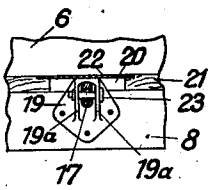
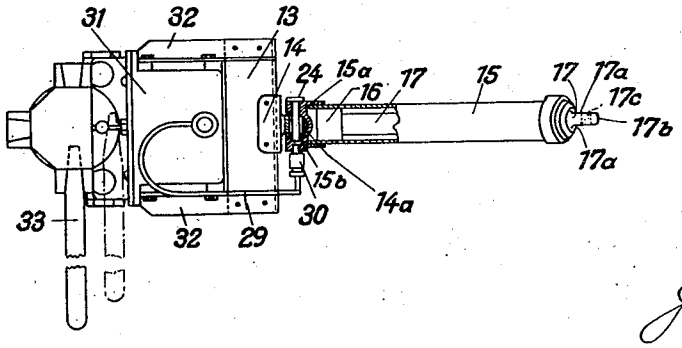


Fig.4



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HYDRAULIC REAR TIPPER FOR FAST DELIVERY VANS

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2 Claims. (Cl. 298—22)

Fast delivery vans are usually made light and short and can thus be easily turned about. They can therefore without difficulty be steered rear foremost right up to the dumping place. That being so, it is not necessary to provide them with a sideways tipping arrangement, a rear tipper is sufficient.

To ensure economy in working such a fast delivery van, the tipping device must also be light in weight and cheap to make.

Mechanical rear tippers hitherto devised for such vans have been subject to various disadvantages. If they were light and cheap, they were liable to wear out quickly. Further, if screw-spindles were used as the lifting-device, the tipper was not very effective.

Hydraulic tippers have proved the most effective. Those hitherto constructed have been, however, too dear and heavy. If located in the longitudinal axis of the chassis they had to be constructed as telescopic lifters and necessitated the fitting of a special bearing bar for the lifter in the frame of the chassis. In some cases it has been necessary to provide a special mounting for the pump.

The object of the present invention is a hydraulic rear tipper free from the above-mentioned defects. The invention consists in a single-piston lifter being disposed in the perpendicular midplane of the chassis in such an oblique position under the body of the truck, that at normal loading height and correspondingly low-lying centre of gravity of the truck the force to be exerted is but slightly in excess of the total weight exerted by the actual load plus the weight of the body. To enable the lifter to be placed in the requisite slanting position, on the one hand its lower fulcrum is mounted on the always available transverse member connecting the two front spring brackets of the rear springs, which in the low-frame chassis of such vans is relatively low-lying; the piston-rod fulcrum, on the other hand, being sunk into the floor of the body of the van. For this engagement of the piston-rod all that is required is the mounting of a crossbar connected with the two sills of the body. On the lower bedding of the lifter, if the device is worked by hand—and if the auxiliary driving-gear is located centrally, in the case of a power-driven tipper also—the pump is fixed. In such a case the aggregate consisting of pump and lifter can be built in as a whole in one piece. It is sufficient to fix the hoist-foundation by means of two screws on to the chassis, and to connect the top end of the piston by a bolt with the body-truss.

If in the case of a power-driven tipper the pump has to be fixed separately from the hoist, a special pipe-union is installed connected by a pipe with the pump.

In any case, whether with a hand- or a power-driven device the tipping-device is easily mounted.

The installation of the supply pipe is also quite simple. The introduction of the pipe into the hoist is made by means of a stuffing-box disposed as usual in the axis of the lower pivot bolt. The other end of the supply-pipe is attached rigidly by a flange to the pump and the pipe union respectively. The supply pipe is so bent as to take up over as great a length as possible the slight deflections that take place when the van is running or during tipping. Owing to the distortions produced in the chassis when travelling over uneven ground, and in consequence of unequal distribution of the load in the body of the van it may happen that the central axis of the hoist is deflected by a slight angle from the perpendicular midplane of the van. Both the lower hoist-fulcrum and the piston-rod head are made ball-shaped. The globularity of the bearing surfaces thus allows of a certain obliquity of adjustment of the hoist and ensures a proper transmission of pressure in such a contingency. Any strains caused by a chance tipping-over of the body are taken up by crossbolts passed through the inner and outer part of the ball bearing and lodged in the interior with sufficient play to allow of the necessary angular movement.

The invention is illustrated by examples in the drawing.

Fig. 1 is a wide elevation partly in section, Fig. 2 the plan, of a fast delivery van fitted with a hydraulic rear tipper, in which the pump, driven by the driving-motor of the van, is fixed separate from the lifter.

In Fig. 3 a side-elevation is shown, on a larger scale, of a hydraulic tipper fitted with a hand pump.

Fig. 4 is the plan corresponding to Fig. 3, and Fig. 5 is a section on line V—V of Fig. 4.

The arrangement shown in Figs. 1 and 2 differs from that shown in Figs. 3–5 in the type and mounting of the pump. The remaining parts are the same, are designated by the same reference numbers, and are—on account of the larger scale—in some cases more easily to be seen from Figs. 3–5.

6 is the body of the van. 7 are the sills of the body. 8 is a crossbar connected with both sills of the body. 9, 9 designate the two side members of the chassis. 9a is a transverse axle lodged on the two side members, upon which the van body 6 pivots when being tipped. 10 is the crossbar connecting the two front spring brackets 11, 11 of the rear springs 12, 12. On the cross member 10 is fixed the hoist foundation consisting of a sheet metal angle 13. Upon this is screwed or riveted the lower fulcrum-bearing 14. 15 designates the hoist-cylinder, 16 the hoist-piston and 17 the piston-rod (see Fig. 4). The outer end of piston-rod 17 is flattened off on either side 17a, 17a and engages with its ballshaped front surface 17b against a bearing 19 (see Figs. 3 and 5) fixed on the cross member 8 and provided with a correspondingly globular hollowed-out face. Bearing 19 passes into an opening 20 in the floor 21 of the van body 6. Opening 20 is covered in with a metal sheet 22. The outer end of piston-rod 17 is connected with bearing 19 by a link-bolt 23 which is passed through both side walls 19a of bearing 19 and through a hole 17c made in the flattened-off outer end of the piston-rod 17. The outer flattened-off end of the piston-rod 17 has between the side faces 19a, and the hole 17c has with respect to the bolt 23, as much clearance as is necessary in order to allow of angular displacements of the hoist 15, 17 from the midplane taking place—as explained above. The fulcrum-bearing 14 is provided with a ballshaped plug 14a, which engages in a correspondingly ballshaped hollow in the bottom 15a of the cylinder and is connected with it by a link-bolt 24 (see Fig. 4). The plug 14a has enough clearance sidewards in the globular hollow in the cylinder-bottom 15a and with respect to the link-bolt 24 to allow of angular displacements of hoist 15, 17 from the midplane of the van as explained above.

In the example of the application of the invention shown in Figs. 1 and 2 a motor pump 25 is used, the said motor pump being mounted separate from the hoist under the driver's seat. Lever 27 actuates the escape-valve of the pump.

In the example of the application shown in Figs. 3–5 a hand pump 31 is used, fixed by means of angle irons 32 directly on the hoist-foundation 13. The hand pump 13 is actuated by means of an insertable hand lever 33.

In the example shown in Figs. 1 and 2 a pipe union 28 is fixed on to the hoist-foundation 13 and is connected by pipe 29 with the hoist 15, 17 and by pipe 30 with the motor pump 25.

In the example shown in Figs. 3–4 the pump is connected directly with the hoist by pipe 29. Pipe 29 is connected in the customary manner with the interior of the cylinder 15 through a boring 15b by means of a stuffing-box 30 lying in the axis of the link-bolt 24.

I claim:

1. In a fast delivery vehicle, a chassis, a body tippable about a transverse journal connecting the chassis and body, an obliquely placed hydraulic hoist comprising a piston and cylinder, joined to the chassis at its cylinder end and to the body at its piston end, the connection between said cylinder and chassis including ball and socket joint elements and a bolt connecting the elements of said joint, there being sufficient clearance between said bolt and one of said elements to permit limited lateral displacement of one of said elements with respect to the other.

2. In a fast delivery vehicle, a chassis, a body tippable about a transverse journal connecting the chassis and body, an obliquely-placed hydraulic hoist comprising a piston and cylinder joined to the chassis at its cylinder end and to the body at its piston end, the connection between said piston and body including joint elements, one having a convex spherical face, and the other a concave spherical seat to receive said face, and a bolt interconnecting said joint elements, there being sufficient clearance between said bolt and one of said elements to permit limited lateral displacement of one of said elements with respect to the other.

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