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DEVICE FOR EMPTYING REFUSE RECEPTACLES

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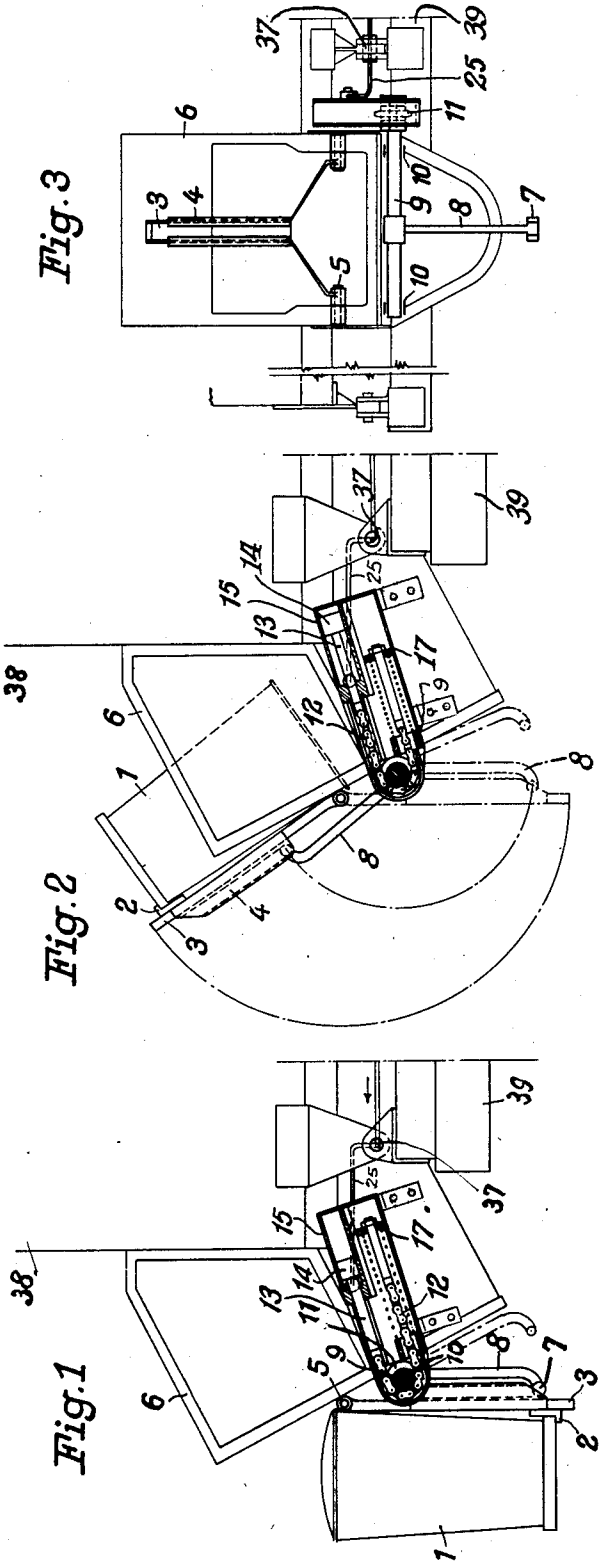


Fig. 1

Fig. 2

Fig. 3

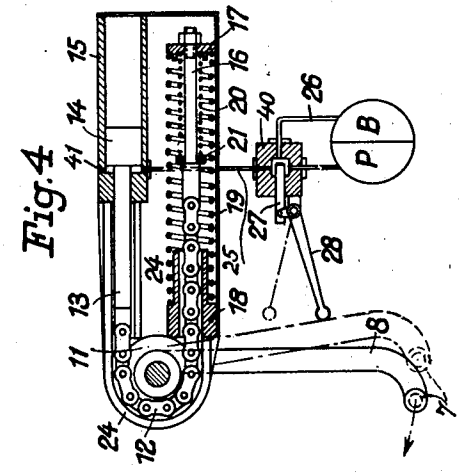


Fig. 4

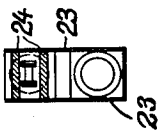


Fig. 5

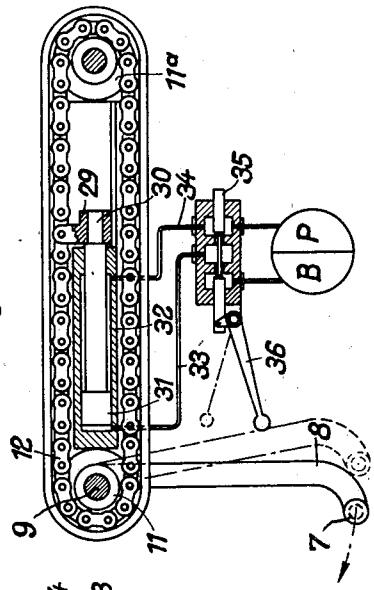


Fig. 6

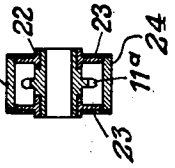


Fig. 7

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DEVICE FOR EMPTYING REFUSE RECEPTACLES

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7 Claims. (Cl. 214—67)

My invention relates to a device for emptying refuse receptacles into refuse-collecting vehicles or refuse-collecting tanks. Devices of this nature, in which the refuse-receptacles are tipped and emptied by motor, are already known. Apart from the fact that such contrivances are complicated and heavy, and necessitate lengthy transmitting mechanism between the motor and the end of the truck, they above all have the disadvantage, that with them it is impossible by simple means to lift up and put down again the refuse-containers in a gentle manner. On the contrary, the violent shocks to which the containers are subjected during the emptying operation soon causes them to become badly damaged. It is moreover impossible with such contrivances to shake the refuse-containers rapidly to and fro when tilted, in order to remove properly the refuse adhering to the inside.

All these disadvantages are obviated by the present invention, which consists in the refuse-containers being tipped over by means of a hydraulically actuated device, said device being so arranged as to be either fixed to the tippable body of the collecting vehicle, or, if the body is immovable, on the oscillatable rearboard of the vehicle; and further in the fact of the pressure-fluid being delivered by a pipe passed through the axis of the body or through the axis of the oscillatable rearboard. Preferably the pressure-fluid is supplied by the same pump as supplies the pressure-fluid actuating the tilting-device. The device can thereby be so arranged, that only one motion of the refuse-container is actuated by the pressure-fluid, and the return of the refuse-container effected by means of a spring, the expelled pressure-fluid thus acting as a brake and preventing a too sudden slackening of the spring. A second embodiment of the invention consists in both the lifting-up and the returning of the refuse-container being actuated hydraulically. The use of the tilting-lever mechanism for moving the refuse-containers is already known. The present invention embodies an improvement thereon in allowing of the two tilting-levers to be uncoupled free of each other, thus enabling the refuse-container together with its tilting-levers to be operated by hand alone, without being dependent upon the arm actuated by the pressure-fluid.

In the drawing two embodiments of the device are shown diagrammatically.

Figs. 1–5 show a hydraulic device in which the return of the lower tilting lever is effected by tautened springs.

Figs. 6 and 7 show a purely hydraulic device.

In Figs. 1 to 4 and 6, the tilting lever is shown in dotted lines in an extreme position to which it may be moved and in which it is entirely out of contact with the container support.

In the drawing 1 designates the container resting on a shoulder 2 of the container-lifting arm 3, which is provided with two guide-rails 4 forming below an open slit. The lifting-arm 3 is fixed pivotally on the shoot 6 fixed on the rear side of the truck body 38. In the guide-rails 4 run the rollers 7 of the hydraulically operated tilting-lever 8 fixed upon a shaft 9, which is lodged at 10 on the body 38 of the truck. On the one end of the shaft 9 is fixed a chain-wheel 11, over which a chain 12 runs. The one end of the chain 12 is connected with the piston-rod 13 of the hydraulic piston 14 which slides in the hydraulic cylinder 15. The other end of the chain is joined to a rod 16, which is connected with an adjustable crosspiece 17. Between crosspiece 17 and the fixed stop 18 a coil-spring 19 is provided. When the refuse-container is raised this spring remains in tension throughout the whole length of the stroke. On bolt 16 there is provided a further spring 20, held between crosspiece 17 and a stop-ring 21. When the motion of the chain ceases, after the refuse-container is lifted, this stop-ring abuts upon the edge of the stop 18, and in case the motion continues, brings the spring 20 into tension. The purpose of this spring is to draw back the refuse-container immediately the hydraulic pressure ceases, thus causing the shaking movement which ensures the complete emptying of the truck. The cylinder 15 and stop 18 are held together by two metal side-sheets 23 so as to form a closed unit. A part of this closed unit is formed also by the guide-rails 24 for the chain 12. These guide-rails are necessary to prevent the chain from jumping the chain wheel 11 when the lever 8 is operated by hand, and thus to ensure the chain moving the piston. The hydraulic device is supplied with pressure-fluid from a pressure-tube 25, which tube in the embodiment shown in Fig. 1 turns upon the tilting pivot 37 of the body, the tilting-pivot 37 being mounted on the chassis 39. If the device is mounted on the oscillatable rear-board of a rigidly fixed non-tiltable truck-body, the pressure-fluid is supplied through a tube passing through the axis of the rear-board. In the embodiment shown in Figs. 1–5, P designates the pump and B the reservoir for the pressure-fluid. The pressure-fluid is passed through pressure-tube 25 into a steering-box 40, and when the control-valve 27 is opened runs back through pipe 26 into the reservoir B. As soon as control-valve 27 is moved to the right by the control-lever 28, and the flow through pipe 26 is thus stopped, the pressure-fluid passes into the annular chamber 41 of the cylinder 15 and pushes the piston to the right, thereby causing the refuse-container to be lifted. As soon as the control-valve is opened and the pressure falls, the return movement is effected,

first by means of springs 19 and 20, and finally by spring 19.

In the embodiment shown in Figs. 6 and 7 the recoil spring is absent, and the device instead is worked entirely hydraulically, the chain in this case being an endless one and conducted over a second chain-wheel 11*a*. In this arrangement the chain at that point is connected by means of a catch 29 with piston-rod 30 and piston 31. This piston moves inside a cylinder 32, said cylinder being closed and caulked at both ends, and the pressure-fluid being delivered into the space before and behind the piston through two pressure-tubes 33 and 34 respectively. Control valve 35 in this case is made double-seated, so that when control-lever 36 is lifted, both chambers of the hydraulic cylinder are supplied with the pressure-fluid and the piston is pushed forward to the right, whereas when the control-lever 36 is in the extreme pulled-over position, only the annular chamber is subjected to pressure and the piston 31 presses back the fluid through pipe 33 into the reservoir, whereby the piston moves to the left. In case the tilting has to be effected by hand, it is only necessary to swing outward and tilt over the lever 3 along with the refuse-container, this being made possible by the fact that the slit in the guide-rails 4 is open below and thus allows the rollers 7 to leave the slit; so that lever 3 may be lifted without lever 8 of the hydraulic device being in any way affected.

Referring to Figures 1, 2 and 4 particularly of the drawing of this application, operation of the mechanism to provide a shaking of the refuse can for the purpose of dislodging any material sticking or frozen to the sides is accomplished in the following manner. By closing the valve 27 of the control mechanism governing the fluid pressure in the conduit 25, the pressure fluid enters the annular space 41 and shifts the piston 14 with its rod 13 to the right, and through the intermediation of a chain 12, the chain wheel 11 is caused to operate. The operation of the chain wheel 11 which is keyed to the axle or shaft 9 by means of a lever 8 fastened thereon, swings the container 1 upward into the position as shown in Figure 2. In this raised position resulting from the connections involving the stop 17 and the spring members as well as the chain 12, the spiral spring 19 is placed under tension as soon as the stop 21 abuts against the dog 18. In the extreme operating position the auxiliary or supplemental spring 20 is likewise under tension. In the highest swinging position considerable potential energy is accumulated in both springs, which upon the release of pressure in the cylinder 15, will cause the oscillating arm 8 to quickly draw back, carrying with it the bin. This is preferably controlled by the operation of the valve and a by-pass or a relief thereupon. To properly accomplish a repeated shaking operation the valve 27 is open and closed rapidly after the springs have been placed under tension, and resulting therefrom is a rapid jerking back and forth of the bin, consequently eliminating any contents thereof which are frozen or stuck to the sides.

I claim:

1. In a refuse carrying vehicle, the combination of loading and unloading mechanism comprising a pivoted container holder, a hydraulic motor arranged to operate said container about the pivot, potential energy means arranged to continuously urge said holder to lowered position and arranged to operate with greater energy in the unloading position of the container than in the loading position, and master means governing the operation of said combination, whereby shaking movement may be imparted to the container when in unloading position.

2. A trash collector elevating and unloading mechanism comprising a pivoted collector holder, a hydraulic motor, a compound potential energy means, flexible means interconnecting said motor and said means, and in actuating relation to said pivoted holder, and means controlling the energization of said motor.

3. A device for emptying refuse-collecting containers into the body of a refuse collecting truck, comprising a tiltable container support, biasing means tending to move said support into normal position, power driven means for driving the support into tilted position against the force of said biasing means, means for retarding the return movement of said support, and control means for said power driven means, said biasing means being arranged to more rapidly overcome the retarding means in the tilted position of the support than in the intermediate positions whereby a shaking movement or relatively rapid return movement of the support may be effected by said control means when in the tilted position.

4. A device for emptying refuse-collecting containers into the body of a refuse collecting truck, comprising a tiltable container support, biasing means for said support, retarding means for said support, and power driven means for tilting the support, said biasing means being arranged to exert increased force in the tilted position of said support, and control means for said power driven means, whereby through the operation of said control means and the increased force of the biasing means in the tilted position of the support, a shaking movement of the support in said position and a more rapid return movement of the support may be effected.

5. A device for emptying refuse-collecting containers into a tiltable truck body, comprising a tiltable container-support and pressure-fluid operating means therefor mounted as a unit on the tiltable truck body, a tube arranged about the pivotal axis of the body, and a pressure-fluid supply pipe for said operating means conducted through said tube.

6. A device for emptying refuse-collecting containers into the body of a refuse collecting truck, comprising a tiltable container support arranged to tilt and support a container in emptying position, spring biasing means for said support, pressure-fluid operating means for tilting said container support into emptying position, said biasing means being arranged to exert increased tension in the emptying position of the support, and means for controlling said pressure fluid operating means to cause it to co-act with the increased tension in the biasing means to impart a shaking movement to the container when in the emptying position.

7. A device for emptying refuse-collecting containers into the body of a refuse collecting truck, comprising a tiltable support arranged to tilt and support a container in emptying position, pressure-fluid operating means for tilting the container support into emptying position, spring biasing means for said support comprising a main spring and a supplemental spring, said supplemental spring being arranged to act only in the emptying position of the support.

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