

April 9, 1935.

O. BALLERT

1,996,945

SELF LOADING VEHICLE

Filed April 21, 1932

2 Sheets-Sheet 1

Fig. 1

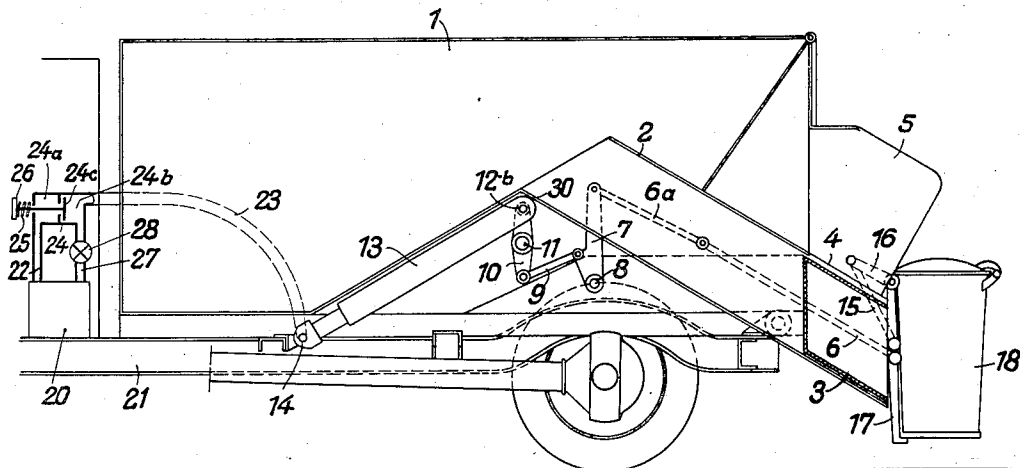
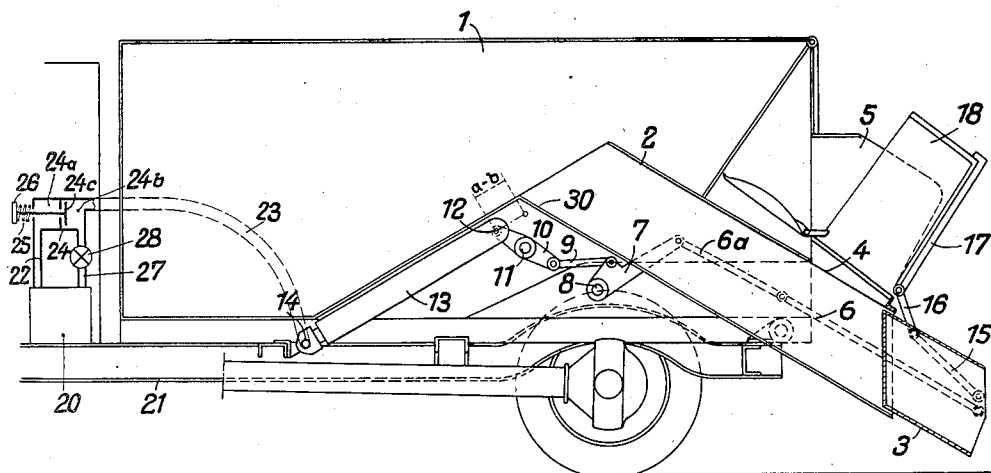


Fig. 2



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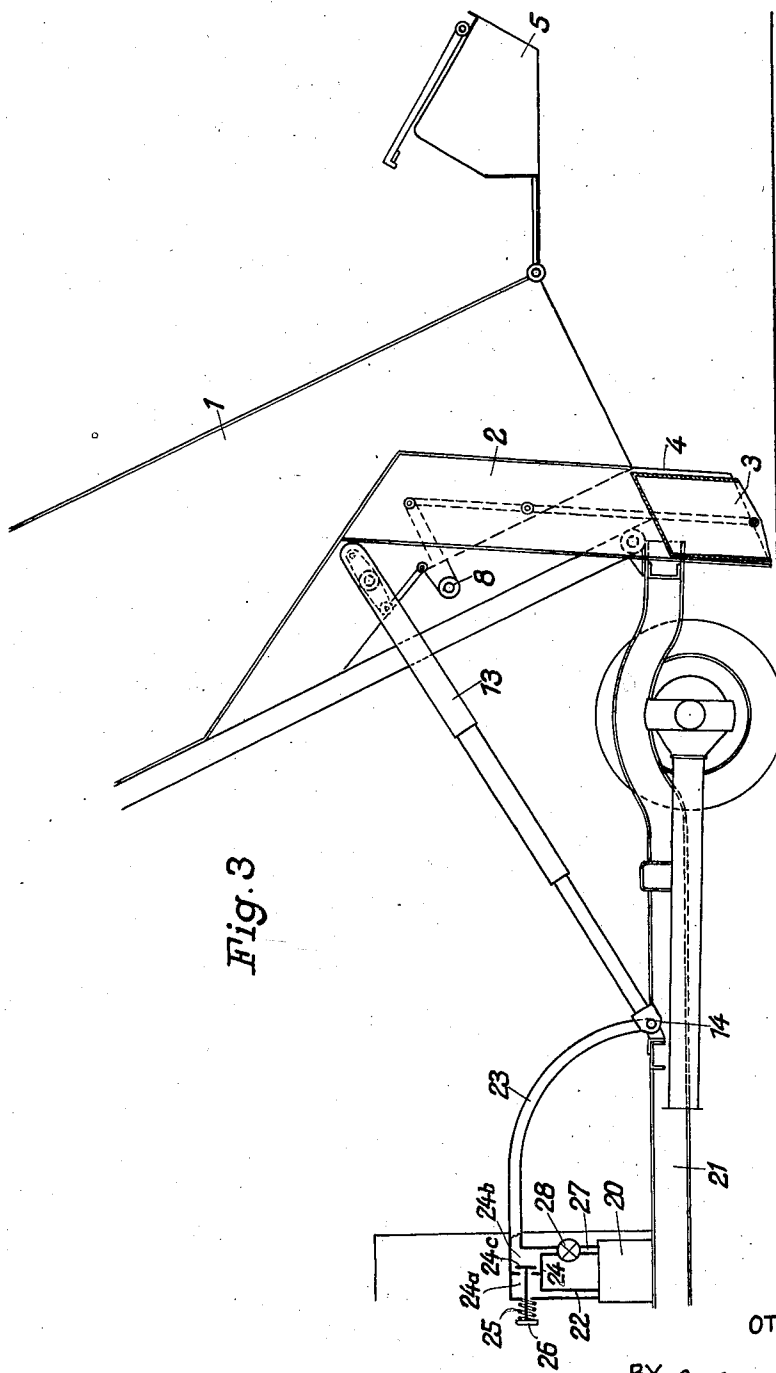
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SELF LOADING VEHICLE

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9 Claims. (Cl. 214-67)

In the methods of collecting refuse hitherto known it has been the practice to cart away the refuse in the body of the collecting truck in a non-compressed state, i. e. in the loose condition in which it is delivered into the truck from the domestic containers. Since such loose refuse has a specific gravity of only from 0.6-1, relatively large truck bodies are needed. Since the emptying of the domestic containers into the truck chute has to be made from the ground, there are required special lifting and emptying-devices. If refuse of a loose consistency is discharged into the truck it gives rise to large clouds of dust. A much more serious disadvantage lies in the fact that the space available at the refuse dumping stations cannot be utilized to the fullest extent since the volume of refuse dumped in a loose condition contracts after a short period to $\frac{2}{3}$ of its volume at the time of dumping. Yet a further disadvantage lies in the fact that loose refuse, if transported by rail, necessitates the use of extremely large cars, which on hygienic grounds have to be covered with tarpaulins.

All these disadvantages are obviated in my present invention by the refuse discharged from the domestic containers being compressed, and transferred in this compressed condition into the truck, whereby the same means as used for compressing the refuse are used also for its transfer to the truck. Supposing the refuse to be compressed to only 50% of its original volume, truck bodies of only one-half of the capacity hitherto used are needed. In case of transportation by rail the load capacity of the railway cars is also used to a correspondingly higher degree. The refuse dumps would thus be enabled to accommodate double the quantity of refuse. The compressing process to which the refuse is subjected causes its harder and lumpier constituents such as bottles and food tins etc. to be crushed into smaller compass and mixed along with the softer ingredients such as papers, vegetable refuse and ashes, into a firm turf-like mass which can be transported and unloaded with hardly any rising of dust. The fact that various components of the refuse are crushed and pounded by the compressing process, causes a decomposition of the solid mass of refuse to take place more quickly than is the case with loose refuse.

The device for compression of refuse or similar materials on collecting trucks can be made in such a manner that it is actuated by the device provided for tilting the truck. A pressure piston by which the compressing of the refuse is effected and an emptying device by which the

domestic containers are emptied into the truck body are so connected with one another that when the pressure piston is drawn out of its cylinder the refuse container is tilted, whilst when the pressure piston is pressed back into the interior of the cylinder, the emptied container is swung back. The piston serving to compress the refuse is actuated (by means of a system of levers and rods) by the same hydraulic telescopic piston which serves for tilting the body of the truck, so that neither a special motor nor special pressure piping is required. The equipment of the truck body with the new device involves only a very slight increase in the total weight.

An embodiment of the invention is shown in the annexed drawings.

Fig. 1 shows diagrammatically a side elevation, partly in section, of a truck body equipped with the new device with the refuse container being hung on the back and the compressing piston pushed into its cylinder.

Fig. 2 shows diagrammatically a side elevation, partly in section, of the device with the refuse container tipped over into the emptying position and with the compression piston pushed out.

Fig. 3 shows diagrammatically a side elevation, partly in section, of the refuse collecting truck with the body tilted up into the emptying position.

In the drawings 1 designates the refuse collecting truck body. Into this projects in an inwardly and upwardly inclined direction the refuse-receiving and compressing passages such as cylinder 2 in the lower open end of which the pressure piston 3 slides. The inclined bottom wall of the chute cooperates with the vertical front face of the piston, by reason of the acute angular relation therebetween, to compress the refuse in front of the piston simultaneously with the forward movement of the piston in the chute to transfer the refuse from the chute into the refuse receiving body of the truck. Above the aperture 4 of the receiving cylinder 2 the chute 5 is arranged. The pressure piston 3 is provided at the back on either side with a pivot. The two pivots are connected with rods 6 and 6a respectively lying on either side of the receiving cylinder 2 and connecting the pressure piston 3 with the lever arms 7. These lever arms 7 are rotatably mounted at point 8 on the truck body and are connected by a rod 9 with the one end of the double armed lever 10 borne on point 11 in the truck body. The other end 12 of the double armed lever 10 engages at point 12 with the lifting device 13 oscillatably mounted at point 14 on the chassis 21. When the pressure piston 3 is moved then the carrying arm

17 upon which the domestic container 18 rests is also moved, by the intermediary of levers 15 and 16. 20 designates a pressure pump mounted on the chassis 21 and driven in a known manner by the motor (not shown) of the truck. Between the pressure pipe 22 of the pressure pump 20 and the pressure pipe 23 by which the pressure fluid is conducted with the hollow pivot 14 and thence to the hydraulic lifting device 13 there is inserted a casing 24 divided in two compartments 24a and 24b between which a safety valve 24 is arranged which can be regulated by means of the spring 25 and the nut 26. The compartment 24a is connected by the pipe 22 with the pressure pump 20. The compartment 24b is connected by the pipe 23 with the lifting device 13 and by the pipe 27 with the rear side of the pump. 28 designates a stop valve arranged in the pipe 27. When the parts are in the position shown in Fig. 2, when the pressure pump is set in motion and when the stop valve 28 is opened the hydraulic lifting device 13 is actuated, the outer telescopic piston of the lifting device being moved with its outer end 12 from a to b (see Fig. 2). Therefore all parts are brought into the position shown in Fig. 1. In this position the outer cylinder of the telescopic piston abuts against point 30 of the cylinder 2 rigidly connected with the body 1. When the pressure of the hydraulic lifting device is released all parts are removed from the position shown in Fig. 1 to the position shown in Fig. 2. The stop valve 28 being opened and the safety valve 24c being so regulated that only a small pressure can be exerted the parts are moved from the position shown in Fig. 2 into the position shown in Fig. 1; but owing to the low pressure the lifting device 13 abutting a point 30 of the cylinder 2 cannot tilt the heavy truck body.

When the truck body is full and has to be emptied then the stop valve 28 is closed. A sufficient pressure can now be exerted by the pressure pump and the truck body 1 can now be tilted (see Fig. 3).

As shown the lifting and emptying of the container 18, the compressing of the refuse in the cylinder 2 and the tilting of the truck body 1 are effected by the same lifting device 13.

I claim:

1. In a refuse collecting vehicle, a vehicle body to receive the refuse, a lifting device adapted to tilt the body to discharge the refuse, means extending into the body for compressing refuse dumped into said means and for transferring the compressed refuse into the body, and operative connections between said lifting device and said means for actuating the same, power for actuating said means being derived through said lifting device.

2. In a refuse collecting vehicle, a vehicle body to receive the refuse, a lifting device adapted to tilt the body to discharge the refuse, an inwardly and upwardly inclined cylinder extending into the body, a piston slidable in said cylinder to compress and transfer into the body refuse dumped into the cylinder in advance of the piston, said cylinder having a charging aperture in advance of the piston in its extreme outward movement, and means for actuating said piston operatively connected with said lifting device.

3. In a refuse collecting vehicle, a vehicle body to receive the refuse, an inwardly and upwardly inclined cylinder extending into the body, a piston slidable in said cylinder to compress and transfer into the body refuse dumped into the cylinder in advance of the piston, said cylinder

having a charging aperture in advance of the piston in its extreme outward movement, said piston having its front face at an acute angle to the bottom wall of the cylinder, whereby forward movement of the piston compresses the refuse in front thereof between its vertical front face and the inclined bottom wall of the cylinder.

4. In a refuse collecting vehicle, a vehicle body to receive the refuse, an inwardly and upwardly inclined cylinder extending into the body, a piston slidable in said cylinder to compress and transfer into the body refuse dumped into the cylinder in advance of the piston, said cylinder having a charging aperture in advance of the piston in its extreme outward movement, a hydraulic lifting device for tilting the body for dumping the refuse, said piston being provided with pivots on each side, and a system of links and levers connecting said pivots with the lifting device for actuation thereby.

5. In a refuse collecting vehicle, a vehicle body adapted to receive the refuse, means including an inwardly and upwardly inclined passage in said body, and a piston having its front face at an acute angle with the bottom of said inclined passage movable in said passage for compressing refuse dumped in advance of the piston and transferring it into the body, said cylinder having a charging aperture in advance of the piston in its extreme outward movement, and means for actuating said piston past said aperture toward the inward end of said passage and back again.

6. In a refuse collecting vehicle, a vehicle body adapted to receive refuse and means for transferring refuse into the body from a low level to a higher level including a passage extending into the body, and a piston movable in said passage, said passage having a charging opening ahead of the extreme outward position of said piston, together with a movable support for receiving a refuse container in upright position, and connections for moving said piston and support, whereby the refuse is dumped from said container in advance of the piston when the latter is in retracted position and the support is returned in position to receive a filled container in the transfer movement of the piston.

7. In a refuse collecting vehicle, a vehicle body to receive the refuse, an inclined passage and a piston movable therein for transferring refuse into the body, said passage having a charging opening ahead of the extreme outward position of said piston, a hinged support at the lower end of said passage for receiving a refuse container in upright position, and means for actuating the piston and hinged support in synchronism, whereby to dump the refuse from a container on the support in advance of the piston when the piston is retracted, and to return the container support to receiving position in the advance movement of the piston.

8. In a refuse collecting vehicle, a vehicle body to receive the refuse, a lifting device adapted to tilt the body to discharge the refuse, means extending into the body for compressing refuse dumped into said means and for transferring the refuse into the body, a support for receiving a refuse receptacle movable to a position to dump the refuse into the compressing and transfer means, and actuating connections from said lifting device for simultaneously actuating said means and support.

9. In a refuse collecting vehicle, a vehicle body to receive the refuse, means extending into the

body for compressing refuse dumped into said means and for transferring the compressed refuse into the body, a common hydraulic lifting device for tilting the body to discharge refuse and for actuating said means, a pressure pump adapted to actuate said hydraulic lifting device, and means controlling the fluid pressure delivered to said lifting device by the pump whereby a low pressure capable of actuating only the refuse compressing and transfer means or a high pressure capable of tilting the body may be selected at will.

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