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3,317,049

EDUCTOR UNIT

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2 Sheets-Sheet 1

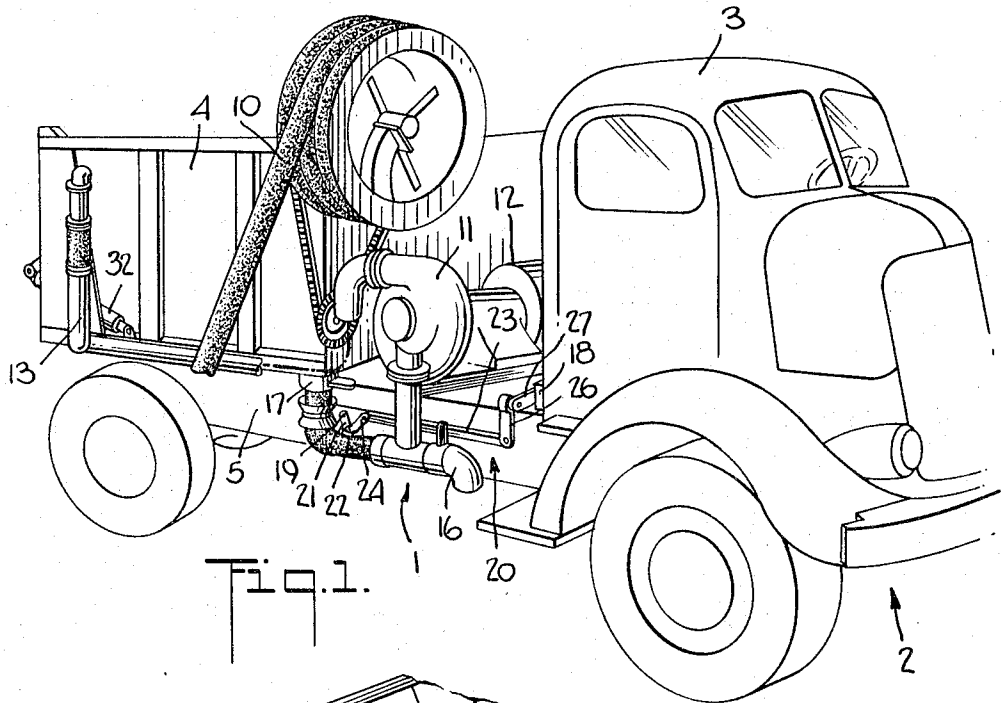


Fig. 1.

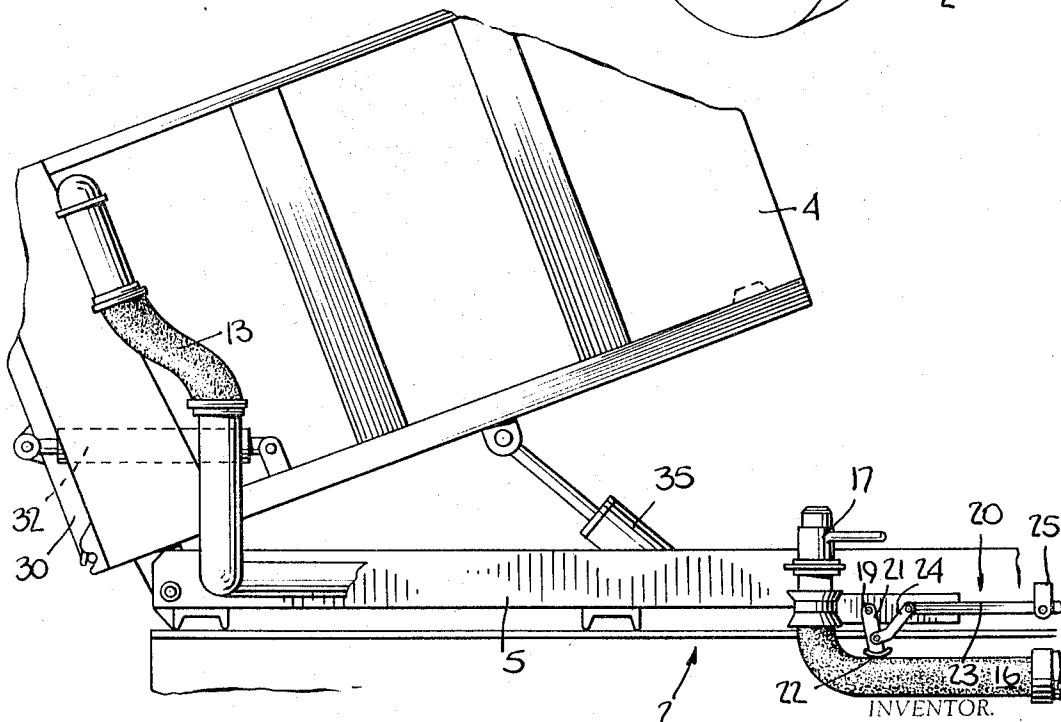


Fig. 2.

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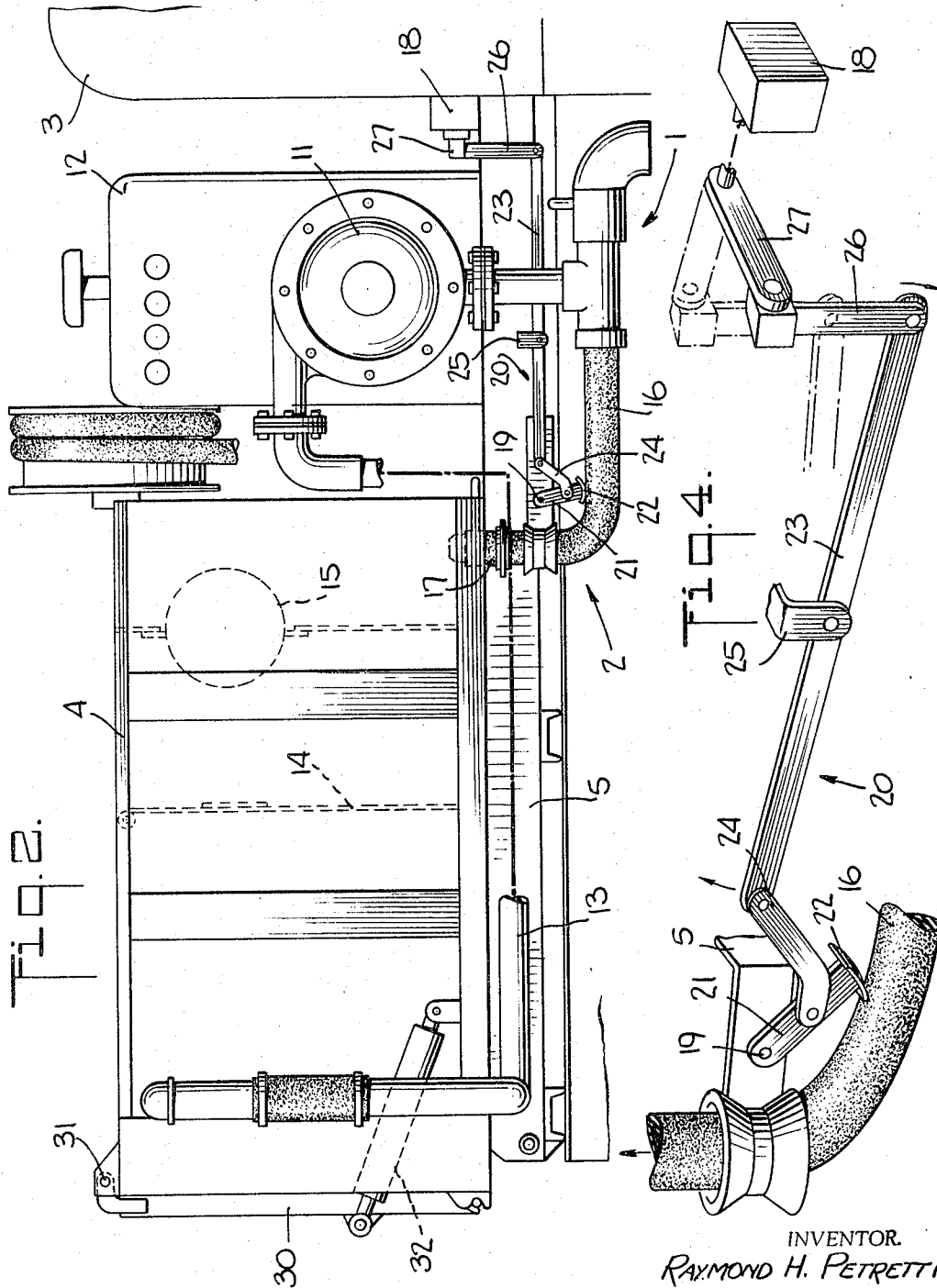
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3,317,049

**EDUCTOR UNIT**

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8 Claims. (Cl. 210-241)

The present invention relates to an eductor unit and more specifically to an improved eductor unit which is adapted to remove debris from sewers, catch basins and the like and to deposit them into a dump truck.

The present application is an improvement over my co-pending United States application Ser. No. 279,190, filed May 9, 1963, and now Patent No. 3,262,571.

In such eductor units, as described in said prior application, the debris in sewer and catch basins is sucked up by the eductor unit and is deposited into a large tank usually mounted on a truck.

The truck has filtering means therein which causes the heavier debris to be deposited in the truck but permits the water to be circulated through the tank and be re-used to loosen debris in the catch basin. Hence, the water is re-circulated.

A flexible return conduit or pipe is mounted on the tank body to return the filtered water back to the catch basin. When the tank is full it is tilted upwardly so that the debris is ejected from the rear thereof. It has been found that if the return pipe is not disconnected by the operator before the tank is lifted, the pipe will be severed.

In addition, the rear panel or wall of the tank has usually been opened manually when the tank is to be cleaned. This has caused some difficulty since the rear panel cannot be controlled easily by manual operation.

The present invention overcomes these difficulties and provides an improved ejection unit whereby means are provided for automatically stopping the tank lifting operation if the exit pipe is not disconnected.

Another object of the present invention is the provision of an improved eductor unit having an improved control means for preventing the return pipe from being severed.

Another object of the present invention is the provision of an improved control mechanism which may be easily installed on existing eductor units.

Another object of the present invention is the provision of an improved control mechanism which is accessible so that maintenance costs are minimized.

Another object of the present invention is the provision of an improved eductor unit in which hydraulic means are used to control the opening and closing of the rear panel of the tank.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of a truck showing applicant's improved eductor unit;

FIG. 2 is a side elevational view thereof;

FIG. 3 is an elevational view showing the tank in lifted position; and,

FIG. 4 is a diagrammatic perspective view showing the operation of the safety mechanism of the present invention.

Referring more particularly to the drawings, the educ-

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tor unit 1 of the present invention is adapted to be mounted on a truck 2 which comprises a front cab 3 and a rear tank 4 pivotally mounted on the frame 5 of the truck 2.

The eductor unit 1 comprises an eductor hose 10 adapted to be lowered into a catch basin (not shown) to draw up debris and fluid, such as water, from the catch basin by means of a pump 11 which is operated by a motor 12. The debris is deposited by the pump 11 into the rear of the tank 4 by means of a suitable conduit 13.

The debris and fluid pass through the filtering units 14 and 15 in the tank 4 so that heavy material remains in the tank and the filtered fluid may then be removed from the tank by a return hose or pipe 16 which is also connected to the pump 11. The cycle is then repeated until the catch basin is clean. When the tank 4 is full, the rear door 30 is opened and the tank is tilted by hydraulic mechanism 35 controlled by switch assembly 18 to permit the tank to draw up the heavy material.

Details of the eductor unit and the filtering unit are more fully described in my said co-pending application Ser. No. 279,190.

The return pipe 16 has a fitting 17 thereon which permits the return pipe 16 to be disconnected from the tank 4 when the tank 4 is tilted upwardly to eject debris therefrom. However, if return pipe 16 is not disconnected, it will be raised with the tank 4 and will be severed.

In order to prevent this, an automatic control mechanism 20 is provided to prevent this tank 4 from being lifted if the return pipe 16 has not been disconnected.

The control unit 20 comprises a lever 21 pivotally mounted on the frame 5 of the truck by pin 19 and has a shoe 22 at its lower end which is in overlying relationship to the return pipe 16. The lever 21 is connected by link 24 to one end of a two-arm lever 23 pivotally on the frame 5 by bracket 25. The other end of the two-arm lever 23 has an upwardly directed arm 26 extending therefrom which has a link 27 operatively connected to the switch unit 18.

It will be seen that if the shoe 22 is moved upwardly, the two-arm lever 23 will pivot in a clockwise direction to lower the control arm 26. This moves the switch operating arm 27 from the position shown in dotted lines to the position shown in order to actuate switch unit 18 and shut-off the lifting operation by breaking a circuit to the hydraulic mechanism 35. Hence, when the tank 4 is being raised without disconnecting the return pipe 16, the pipe 16 will strike the shoe 22 to cause the switch unit 18 to be turned off so that the raising of the tank will stop. The operator then realizes that the return pipe 16 has not been disconnected and will disconnect fitting 17 before turning the switch 18 on again. Thus, the present invention provides a safety unit in which the return pipe 16 will not be severed.

The rear panel 30 of the tank is pivoted at 31 to the top of the tank 4 as is usual of such structures. However, instead of the rear panel 30 being opened manually, a pair of hydraulic cylinders 32 are mounted on the tank which are adapted to move outwardly and inwardly under hydraulic pressure in order to open and close the panel 30. Hence, the opening of the panel can be easily controlled by controlling the fluid pressure applied to the hydraulic cylinders 32 so that a greater control over the rear panel 30 is permissible by the present invention.

It will be thus seen that the present invention provides an improved eductor unit wherein effective control means are provided to prevent severing of the return pipe and wherein said control means are easily applied to existing eductor units. Furthermore, the present invention pro-

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vides an improved means for controlling the opening of rear panel of the eductor unit when the tank is to be cleaned.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. An eductor unit comprising a debris-collecting tank, means for depositing a fluidized debris in said tank, return means disconnectedly mounted on said tank for removing at least some of the fluid parts of said debris from said tank, means for lifting said tank to remove other portions of the debris therefrom, and control means operable by said return means for preventing the tank from lifting if the return means are not disconnected from said tank.

2. An eductor unit comprising a debris-collecting tank, means for depositing a fluidized debris in said tank, a return conduit disconnectedly mounted on said tank for removing at least some of the fluid parts of said debris from said tank, means for lifting said tank to remove other portions of the debris therefrom, and control means operable by said conduit for preventing the tank from lifting if the return conduit is not disconnected from said tank.

3. An eductor unit comprising a debris-collecting tank, means for depositing a fluidized debris in said tank, a return pipe disconnectedly mounted on said tank for removing at least some of the fluid parts of said debris from said tank, means for lifting said tank to remove other portions of the debris therefrom, switch means adapted to operate said lifting means, and control means operatively connected to said switch means and actuatable by said return pipe for operating said switch means to prevent the tank from lifting if the return pipe is not disconnected from said tank.

4. An eductor unit as claimed in claim 3 wherein said control means comprises a pivotally mounted shoe over-

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lying said return pipe and operatively connected to said switch means by lever means.

5. An eductor unit as claimed in claim 4 wherein said lever means comprises a two-arm lever having one end connected to said shoe by a link and its other end connected to the switch means by link means.

6. An eductor unit comprising a tank for collecting debris, means for lifting said tank, said tank having a pivotally mounted rear door and having means to open said door when the tank is lifted to remove the debris therefrom, hydraulic means operatively connected to said rear door and adapted to control the opening thereof, return means on said tank for removing fluid from the tank, and means for preventing the lifting of said tank if the return means is not disconnected from said tank.

7. An eductor unit as claimed in claim 6, wherein switch means are provided to operate said lifting means, said return means comprises a return pipe disconnectedly mounted to said tank, said means for preventing the lifting of the tank comprises a pivotally mounted shoe overlying said return pipe and operatively connected to said switch means by lever means to operate said switch means when the return pipe is not disconnected from the tank.

8. An eductor unit as claimed in claim 7, wherein said lever means comprises a two arm lever having one end connected to said shoe by a link and its other end connected to the switch means by link means.

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