Jan. 18, 1966 C. M. WEATHERBEE 3,229,829

DUMPING DEVICE

Filed Feb. 28, 1964 2 Sheets-Sheet 1

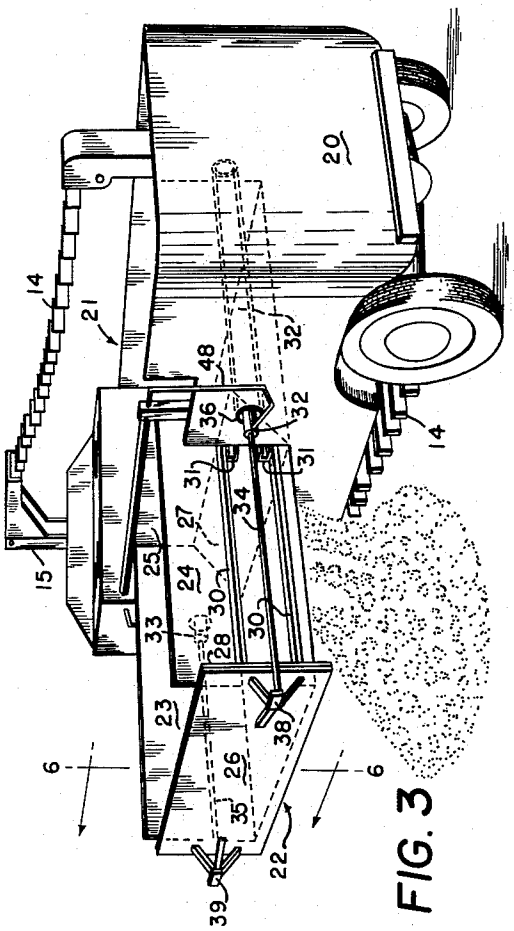


FIG. 3

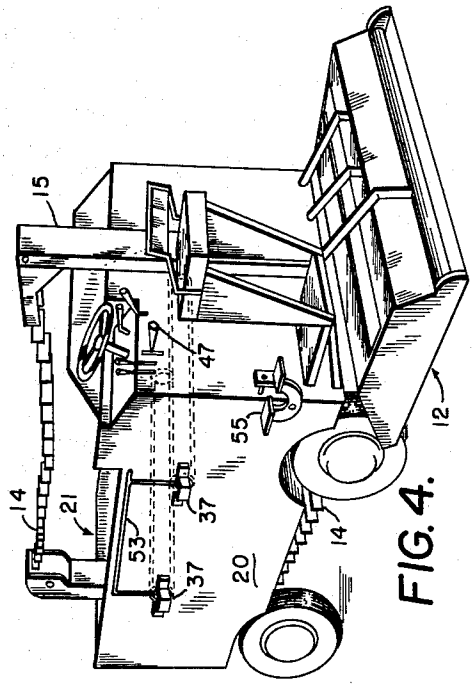


FIG. 4

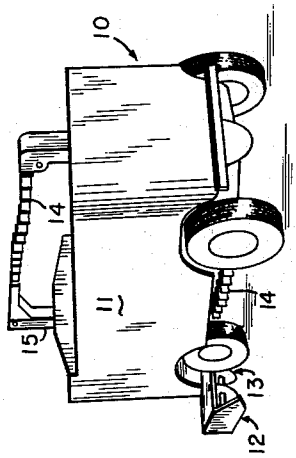


FIG. 1

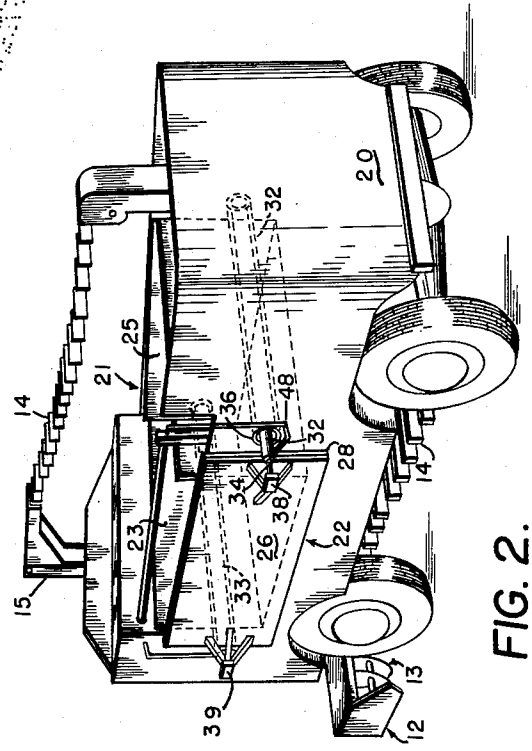


FIG. 2

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DUMPING DEVICE

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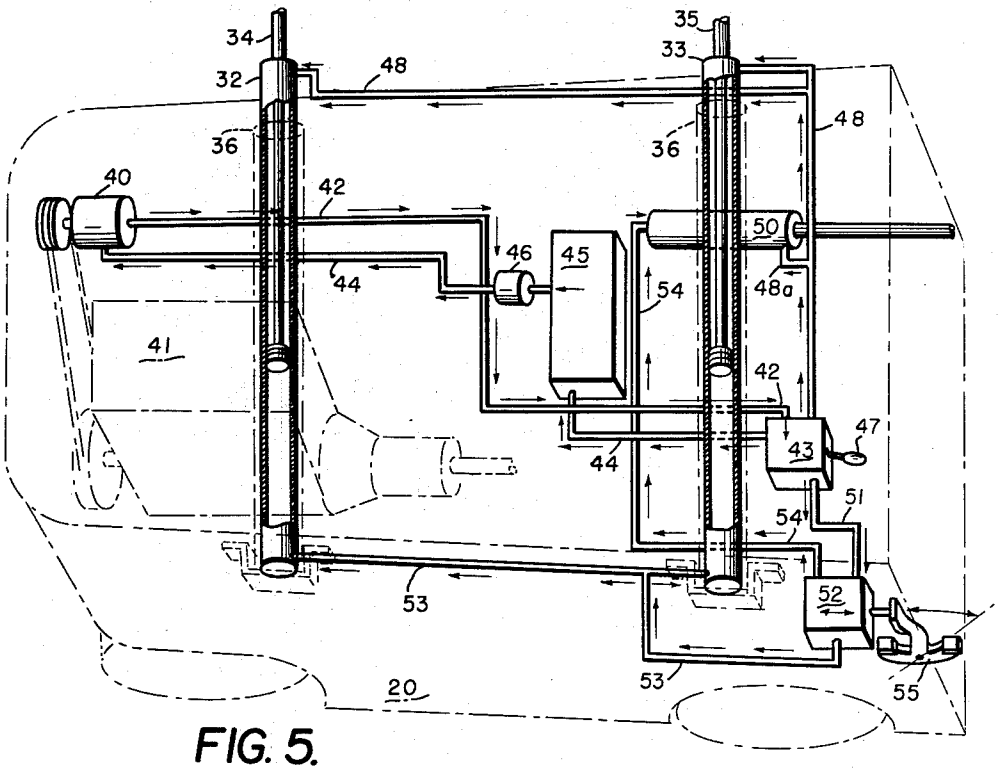


FIG. 5.

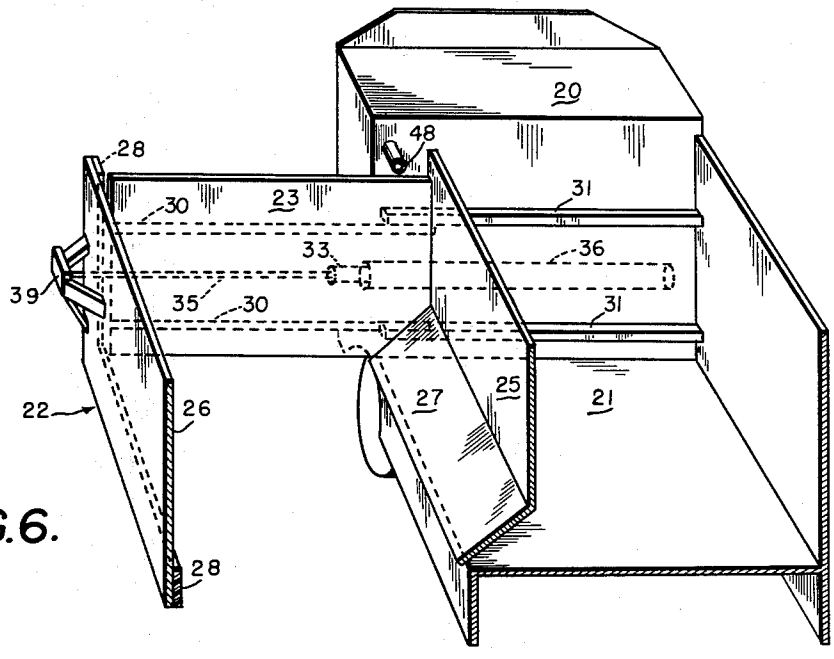


FIG. 6.

United States Patent Office 3,229,829 Patented Jan. 18, 1966

3,229,829

DUMPING DEVICE

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4 Claims. (Cl. 214—17)

This invention relates to a power-operated dumping device, especially adapted for vehicular use.

The invention essentially consists in forming a vehicle body with a bin or container having a floor and three walls, one side being left open. Within this bin or semi-enclosure, is arranged a tray-like member termed a dumping drawer, having four walls or a complete side enclosure, but no bottom. This member fits closely within the area defined by the bin and is slidable on tracks therein, and power-driven from a remote control. Hydaulic means including a pair of pistons mounted in cylinders are preferred for this purpose. One of the walls of the dump drawer is constructed to cover and seal off the open side of the bin when the device is in closed position. Seals are provided to render the device waterproof when in closed position. In operation, the dump drawer is moved telescopically externally of the bin to a position extending over the side of the vehicle body, in which position the contents of the bin is carried with the dump drawer and deposited on the ground, having fallen through the empty bottom of the drawer.

Other and further advantages and features of the invention will be described in connection with the drawing, wherein:

FIG. 1 is a front perspective view of a prior art type of ice rink resurfacing machine, prior to modification thereof by the present invention;

FIG. 2 is a front perspective view of the same machine modified by the present invention, the power-operated dumping drawer being in closed position;

FIG. 3 is a view similar to that of FIG. 2, the dumping drawer being shown in open position so as to discharge the contents of the vehicle;

FIG. 4 is a perspective view of the other side of the machine taken from the rear thereof;

FIG. 5 is a schematic plan view showing the hydraulic mechanism used to operate the dumping drawer and other parts of the machine; and

FIG. 6 is a fragmentary perspective view of the invention taken on lines 6—6 of FIG. 2.

By way of illustration, the invention is shown as applied to a commercial device known as an ice rink resurfacing machine, of the general type shown in U.S. Patent Nos. 2,642,679 and 2,763,939. From this illustration, it will be apparent how to apply the invention to other vehicles and for other uses.

The ice rink resurfacing machine shown in FIG. 1, prior to modification by the invention, comprises a power-driven truck **10**, having a hollow body or snow box **11**, and an ice refinishing unit **12** at the rear of the vehicle. In part the unit **12** consists of two oppositely pitched helix scraper blades **13** which are lowered onto the ice surface and drawn across it by the truck. When rotated, blades **13** scrape the ice, and the scrapings of snow, ice and slush are pushed toward the junction of blades **13** where they are picked up by a power-operated paddle conveyor **14** and lifted through a housing **15** to a point above snow box **11**, where the scrapings drop into the latter. A hydraulic power take-off connected to the vehicle engine to be described further below, is employed to raise and lower the unit **12**, and for other purposes. The unit of the type shown in FIG. 1 has no mechanical means for emptying the snow bin **11**, which operation must be performed manually in this example.

The remaining views of the drawing show the invention as applied to such a machine. According to the invention, the body **20** of the vehicle is provided with a three-sided receptacle or bin **21** having a floor, a front wall, a rear wall and one side wall, the other side wall being omitted. Bin **21** is formed with waterproof seams or joints, as by welding.

Into bin **21** is fitted a slidable tray or dump drawer **22** having side walls **23–24**, a rear wall **25**, and a front wall **26**. Drawer **22** has no bottom and is mounted with a very close clearance over the floor of bin **21**. Rear wall **25** is angularly bent inward to form a scraper **27** (FIGS. 3 and 6) to aid in ejecting the load.

Front wall **26** is made of sufficient size so as to overlap and close the open side of bin **21** when drawer **22** is closed. The closure is rendered waterproof by the provision of seals **28** of rubber or the like mounted on the inner edges of front wall **26** in position to abut against the edges of the opening in bin **21**.

Dump drawer **22** is mounted slidably within bin **21** by means of inter-engaging tracks **30–31** mounted respectively on the rear and front walls of bin **21** and on the outer sides af walls **23** and **24** of drawer **22**.

The driving means for operating the dump drawer **22** will next be described, with special reference to the diagrammatic FIG. 5. Since hydraulic drive means are preferred, a pair of hydraulic cylinders **32–33** containing pistons **34–35** are horizontally mounted in the truck **20** externally of the front and rear walls of bin **21**. Because, in the illustrated machine, both the front and rear portions of the body contain water tanks (not shown) the cylinders **32–33** are contained in pipes such as pipe **36**, FIGS. 2 and 3, passing across such tanks.

On the left, or closed, side of the vehicle, the cylinders **32–33** are welded in place as by straps **37**, FIG. 4. On the right, or drawer, side of the vehicle, piston rods **34–35** are connected to the front wall **26** of drawer **22** as by brackets **38–39**, FIGS. 2–3–6. These hydraulic means are of the common type wherein the pistons are actuable in and out of the cylinders by delivering fluid under pressure into the cylinder at one end or the other. Such actuation will of course open or close the dump drawer **22**.

In the example given, the vehcile **20** is provided with a source of hydraulic power which may be tapped for the purpose of operating the dump drawer **22**. These means consist of a hydraulic pump **40** belt-driven by vehicle motor **41**. Fluid duct or line **42** leads to a three-way spool type control valve **43**, and a return line **44** leads back to pump **40**, line **44** being passed through a reservoir **45** and filter **46** before connecting with pump **40**.

Control valve **43** is provided with a control handle **47**. In a first or neutral position, fluid under pressure from pump **40** is merely recirculated via lines **42** and **44**.

A further fluid line **48** leads from valve **43** to the forward ends of cylinders **32–33** and a branch line **48a** leads to the forward end of a similar hydraulic cylinder **50** employed to raise and lower the ice refinishing unit **12** (not shown in FIG. 5). Still another fluid line **51** connects control valve **43** to a two-way pedal-operated spool type switch valve **52** having a pedal **55**. Passing from valve **52**, fluid line **53** leads to the rear of cylinders **32–33**. Another fluid line **54** leads from switch valve **52** to the rear of cylinder **50**.

By this arrangement, with switch valve **52** thrown to connect line **51** with line **54**, fluid pressure will be delivered either into line **54** or line **48** depending on the position into which the control valve **47** is shifted. A shift of valve **47** out of neutral in one direction will deliver pressure to line **54** and cause piston **50** to lower the unit **12** into contact with the ice. A shift of the

valve **47** in the other direction will deliver fluid pressure into line **48** and **48***a* to be lifted from the ice.

With switch valve **52** thrown in the other or second position, a shift of control valve **43** in one direction will cause fluid pressure to flow from line **51** into line **53**, thus actuation of pistons **34–35** takes place, these moving to their extended position, causing dump drawer **22** to exit from bin **21** and extend over the side of vehicle **20** and to dump its contents as shown in FIG. 3.

With valve **52** in the same position, but with control valve **43** again shifted, pressure will again be delivered into line **48**, causing pistons **34–35** to retract into their cylinders, and causing drawer **22** to retract into the bin **21** in the closed or FIG. 2 position.

The fact will have been noted from the above description that lines **48** and **48***a* are interconnected and always receive fluid pressure simultaneously. This condition has no practical effect on the operation above described, since a raising of the unit **12** from off the ice would never need to be accomplished with drawer **22** in open position. With drawer **22** already closed, pressure in line **48** would have no effect on the position of pistons **34–35**, and by the same token, pressure delivered into line **48** in order to close drawer **22** would have no effect in line **48***a* or cylinder **50**, since unit **12** would have been raised prior to any desired opening or closing of drawer **22**.

The normal procedure in operating the vehicle illustrated is to drive it onto the rink to be resurfaced (with drawer **22** closed and unit **12** raised), lower unit **12**, operate the vehicle to resurface the rink by driving it over the surface with unit **12** and conveyor **14** operating until the rink area is covered or until a full cargo of scrapings is accumulated in the bin **21**. Then unit **12** is raised, the vehicle driven off the rink, the dump drawer **22** is opened ejecting the scrapings, and then closed. The vehicle is then ready to repeat the performance.

The invention happens to have been illustrated in connection with a vehicle having hydraulic power means for purposes not originally intended to operate dump drawer **22**. If the invention were associated with a vehicle where only the dump drawer was to be operated, the arrangement shown in FIG. 5 would be simplified by the elimination of valve **52**, cylinder **50** and lines **48***a* and **54**. Line **51** would connect directly with line **53**. Pistons **34–35** could then be operated in one direction or the other simply by throwing control valve **47** into one operative position or the other, to cause dump drawer **22** to open or close.

What is claimed is:

1. In a dumping device, a body member having a bin constructed therein, said bin having a side aperture, a dumper member having continuously joined sidewalls substantially occupying the lateral dimensions of said bin exclusive of said aperture, and having a further external sidewall permanently connected to said other continuously joined sidewalls, said further external sidewall extending outside of and thence across the said side aperture of said bin thereby sealing said aperture when said dumper member is in closed position; guide track means interconnecting between said bin and said dumper member in the direction of said aperture allowing said member to move exteriorly of said bin through said aperture to the extent necessary to dump contents of said bin contained within said dumper member; power means, including a source of power carried by said body member, and shifting means interconnected between said power means and said dumper member actuating said dumper member out of and into said bin through said aperture for dumping and reloading purposes respectively.

2. The invention according to claim **1**, wherein the power means includes a source of hydraulic fluid under pressure carried by said body member and connected to hydraulic cylinder-piston means, said means being connected between said body member and said dumper member.

3. The invention according to claim **1**, wherein the power means includes a source of hydraulic fluid under pressure carried by said body member and connected by fluid lines to at least one hydraulic cylinder carried by said body member, a piston in said hydraulic cylinder, the external end of said piston being connected to said dumper member, and control valve means connected in said fluid lines for actuating said piston in either selected direction to shift said dumper drawer relative to said bin.

4. The invention according to claim **1**, there being waterproof sealing means carried in the joint formed between said external sidewall portion of said dumper member and the edges of said open side aperture of said bin.

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