June 30, 1931. J. P. ROSENFELD 1,811,969

MATERIAL SPRAY APPARATUS

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Fig. 1.

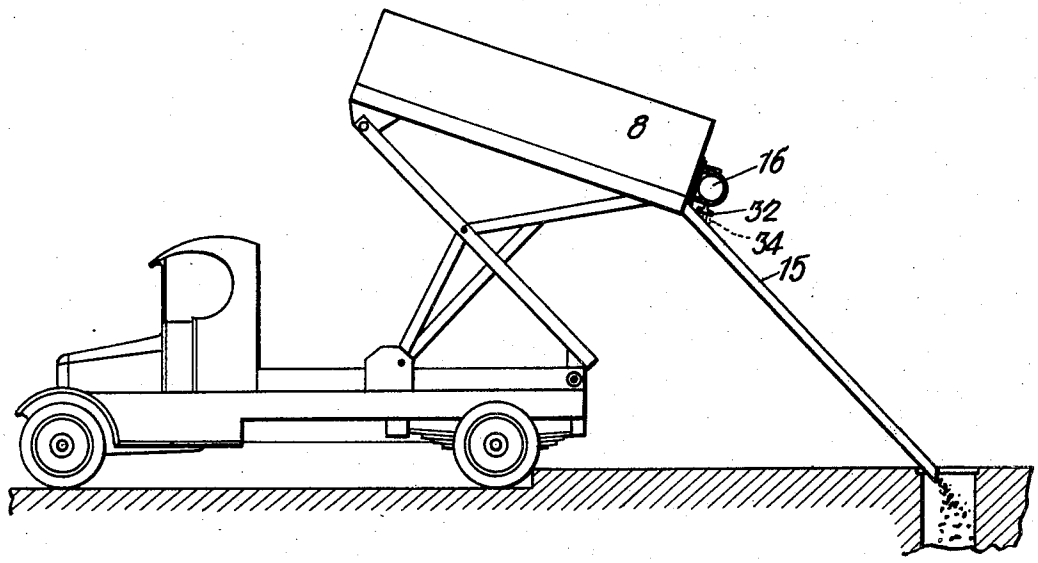
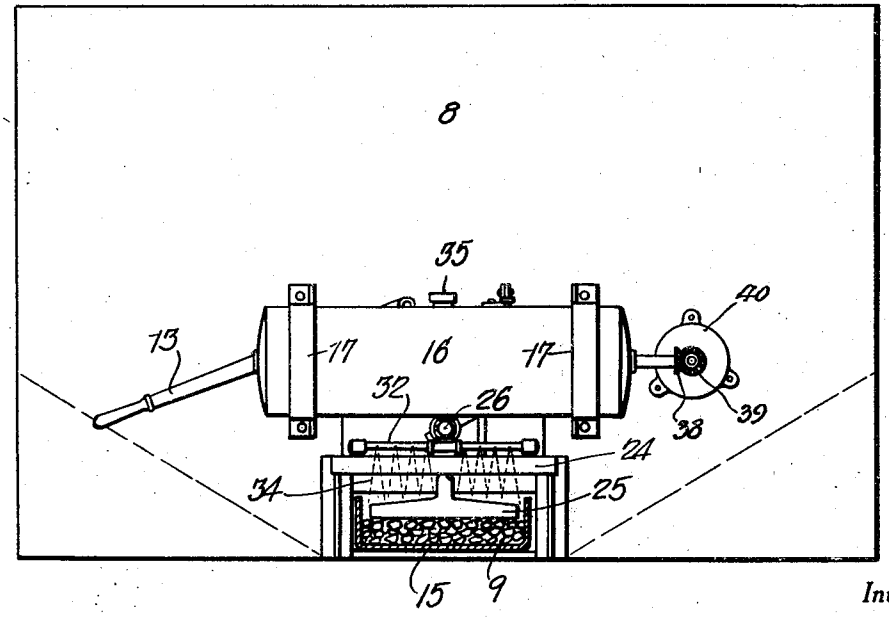


Fig. 2.



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Fig. 3.

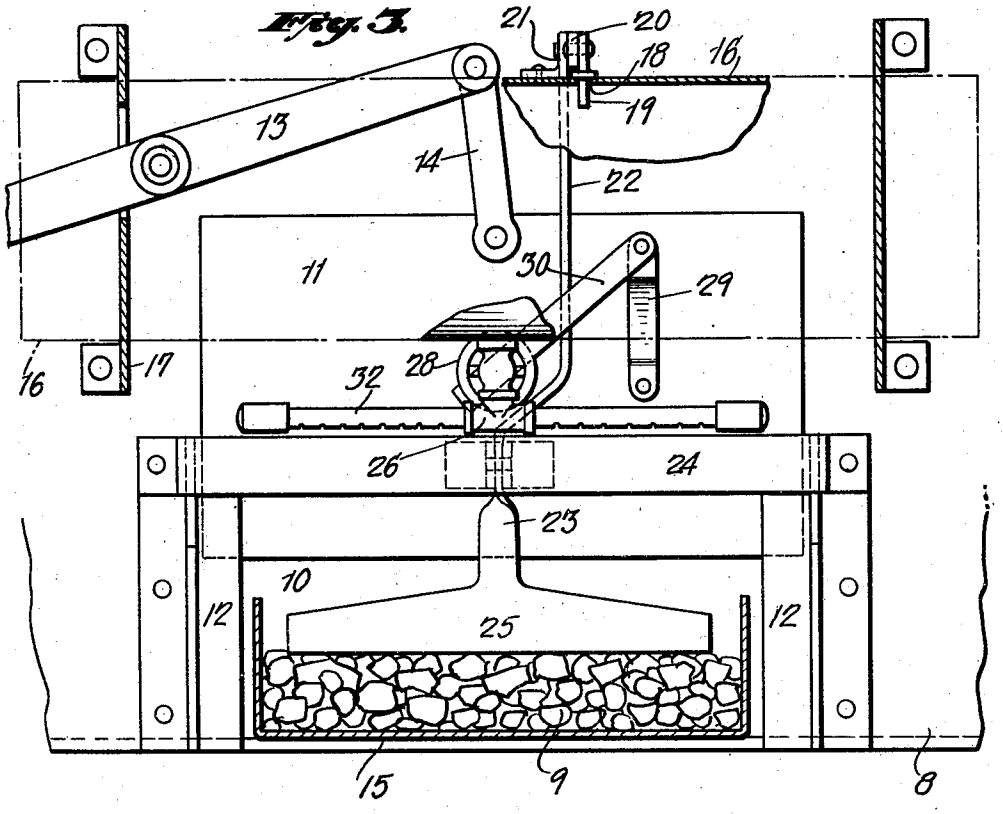
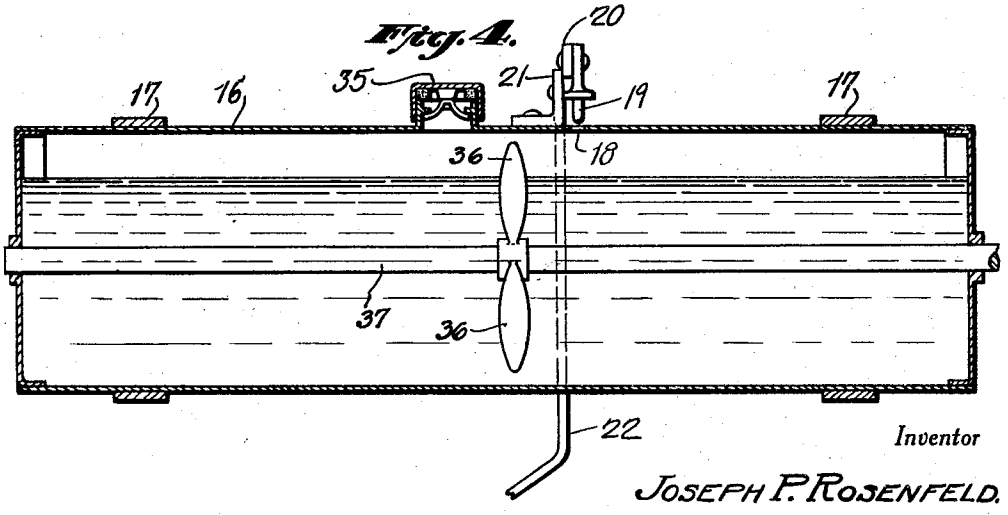


Fig. 4.



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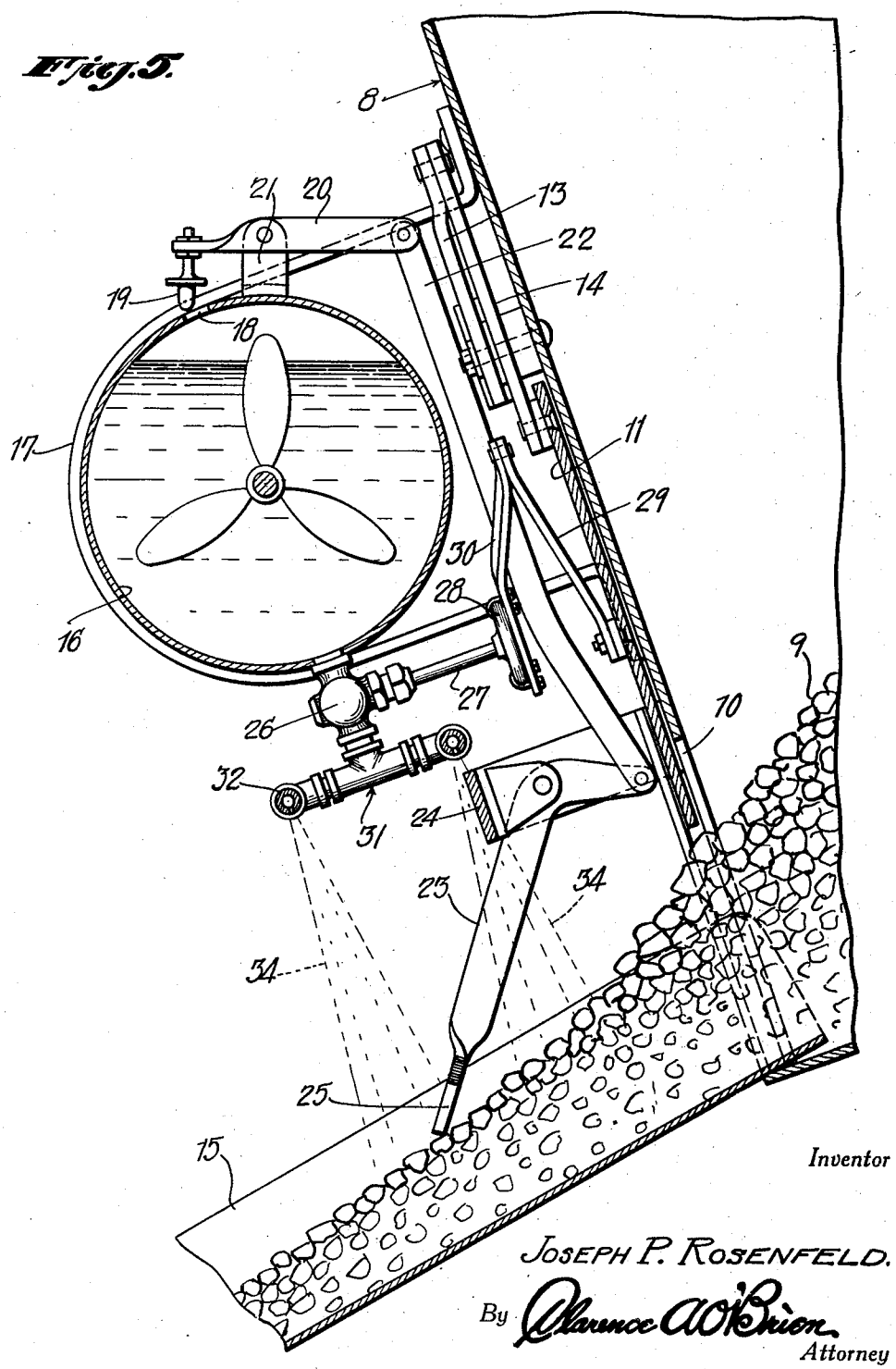
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Fig. 5.



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Fig. 6.

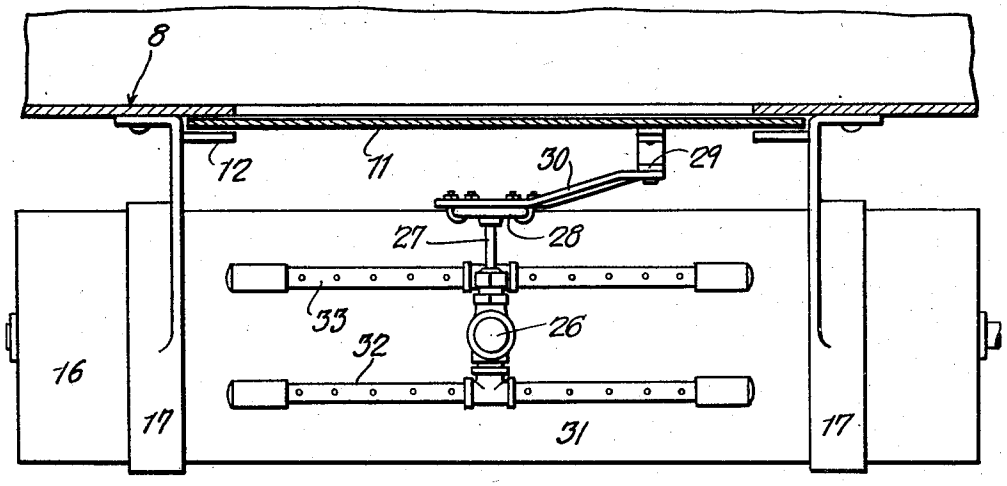
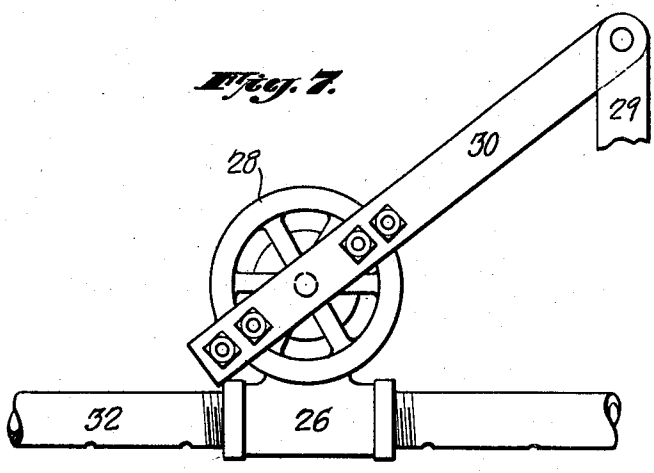


Fig. 7.



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UNITED STATES PATENT OFFICE

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MATERIAL SPRAY APPARATUS

Application filed September 13, 1929. Serial No. 392,453.

This invention relates to an improved apparatus or device which is especially adapted for spraying fluid on a moving body of granular or piece material, for instance, coal, in such a manner and proportions as to dampen the material sufficiently, to settle the dust.

The invention is especially, but not necessarily adapted to be used in association with a delivery chute such as is employed in association with a modern coal delivery truck, but it is susceptible of equally efficient results when employed in other capacities, such as for instance, ash dumping trucks, sand and gravel conveying wagons, and analogous vehicles.

It is a matter of common knowledge that in certain dry seasons, when the truck body is tilted and the coal shot down the chute, considerable dust and dirt is raised. This is of course objectionable, and under some conditions, the coal is watered at the yard before delivery, but this materially adds to the weight of the coal and produces an undesirable shortage and under some conditions, the coal becomes entirely too wet for convenient and sanitary handling.

Under the conditions, I have evolved and produced a simple and economical device which is principally intended for spraying a limited quantity of water upon the coal as it flows down the chute, whereby to dampen it to a degree sufficiently to eliminate objectionable dirt and dust.

In carrying the invention into practice I find it expedient to provide a horizontally disposed water containing tank of about ten gallon capacity or other desired amount as may best be adapted for the size of the truck load of material and this is suspended on the rear end of the vehicle body in a position to cooperate with the customary sliding end gate. This tank is equipped on its bottom with a suitable distributing head and appropriate valved means is associated therewith, for controlling the flow of water, whereby to permit a fine stream of water to gravitate onto the coal as it moves down the chute, in order to dampen it to the desired degree, for efficient and practical results.

The improved structure is characterized by numerous minor details, and these will be described as the description goes on.

In the drawings:

Figure 1 is a side elevational view of a conventional coal truck showing the chute in position and the water spray or distributing device on the truck associated with the chute.

Figure 2 is a rear end view of the truck, and the device.

Figure 3 is an enlarged fragmentary sectional and elevational view showing the relationship of the details more plainly.

Figure 4 is a longitudinal sectional view through the water containing tank.

Fig. 5 is an enlarged fragmentary vertical sectional view through the chute, truck body, the device and its mechanical parts.

Fig. 6 is a bottom plan view of the structure.

Fig. 7 is an enlarged detail view showing the automatic valve control means.

The general assembly of parts may well be seen in Fig. 5. Here, the reference numeral 8 designates the body of the vehicle or truck, which in this instance, is loaded with coal 9. The coal discharges through the outlet opening 10 which as is usual, is closed by a slidably mounted check plate or door 11. This door is mounted in appropriate guides 12 as seen in Fig. 3. Moreover, as shown in the last-named figure, an operating lever 13 is pivotally mounted on the truck body and connected with the door through the medium of a link 14 and by forcing down on the lever the door can be raised up to open position to allow the coal to gravitate down the delivery chute 15.

A horizontally disposed water containing tank of an appropriate capacity is designated by the numeral 16 and is attached to the truck body by straps or equivalent attaching means 17. The straps embrace the tank and are riveted or otherwise fastened to the body of the truck.

The tank has a vent opening 18 in its top and a vent control valve 19 in association therewith, this being mounted on a horizontal operating arm 20 attached to the brackets 21. An operating link 22 is con-

nected with this arm and extends downwardly alongside of the slide door 11 where it is pivotally connected at the lower end, to an actuator 23 in the general nature of a bell crank. This is mounted on the bracket means 24 and has its lower end twisted laterally and provided with a transverse blade 25 which is somewhat in the nature of a baffle plate. This hangs down in the trough and is swung back and forth according to the amount of coal which glides down through the trough.

As soon as the coal starts flowing down, it acts on the blade 25 and the link 22 and this opens the vent 18. When however, the coal stops flowing, it is obvious that the counter-balanced nature of the valve 19 allows it to close the vent hole 18 and this prevents or stops discharge of the water.

The water is discharged from the tank through a cut-off valve 26 having a control 27 provided with a turning wheel 28. In this connection it is observed that novel means is associated with the wheel 28 and the door 11 for automatically opening the valve 26 as the door 11 is lifted up to open position, this means comprising an inner arm 29 pivoted to the door and a complemental arm 30 which is operatively connected with the wheel 28 to function as a crank.

Obviously then, as the door 11 is lifted, and assuming that the valve 26 is opened, the water will be delivered into a distributing head structure, generally indicated by the reference character 31. This preferably comprises a plurality of spaced parallel horizontal pipe members 32 and 33, and a multiplicity of apertures in the under side as seen in Figure 6. Thus the water is distributed evenly and flows down in miniature streams 34 onto the coal in the chute. The flow of liquid from the tank may be controlled by the vent valve 19, or valve 26 alone, or in combination with each other.

It is yet to be mentioned that the reference character 35 in Fig. 4 designates a removable filler cap which permits the water to be placed in the tank. I might state too that although I have not shown it, suitable heating means may be provided in the interior in cool weather, for maintaining the water in an appropriate fluid condition. I also wish to state that it is not necessary to employ water, since under some conditions a special chemical fluid may be utilized for not only moistening or dampening the coal, but for coating it to render it more combustible.

In practice, the operator forces down on the handle portion of the lever 13 and through the medium of the links 14, the door 11 is lifted up to open position to uncover the discharge hole 10. Then coal 9 flows down and by gravity in the usual way through the trough-like chute 15. As the door 11 rises, the means 29 and 30 acts on the valve 26 to open the valve and to allow the water to pass into the distributor 31 and to gravitate in the aforesaid stream 34 onto the coal.

The water can flow only when the vent 18 is open as is obvious. The vent 18 is opened and remains open so long as the actuator 23 and 25 is in the position seen in Fig. 5. When however, the coal becomes clogged or stops flowing, instead of the water flooding, the vent 18 automatically closes because of the peculiar counter-balancing and weight action of the valve 19. Thus the water stops flowing automatically.

For the purpose of agitating the contents of the tank 16 when a chemical is placed therein for mixture with the water, I provide a mixing device which includes a plurality of blades 36 mounted upon a rotatable shaft 37 journalled in the end walls of the tank. One end of the shaft extends beyond the end wall and carries a gear 38 for meshing engagement with the drive gear 39 of an electric motor 40, the latter being mounted on the tail board or other convenient part of the body 8.

The invention is in the provision of a water delivery tank on the rear end of the truck for distributing sufficient water to moisten the coal to allay dust. It is important to note however, the automatic vent means, the novel actuating means for it, which cooperates under the action of the coal itself, together with the automatic door controlled valve means for distributing head.

A consideration of the drawings in connection with the description will enable the reader to obtain a clear understanding of the construction, operation and advantages and features of the appliance. Therefore a more lengthy description is regarded as unnecessary.

Minor changes in shape, size, materials, and rearrangement of details coming within the field of invention defined in the following claims, may be resorted to in actual practice if desired.

Having thus described my invention, what I claim as new is:—

1. In a structure of the class described, in combination, a vehicle body having a discharge opening, a delivery chute connected with said opening, a sliding door for said opening, a water containing tank supported on said vehicle body over said chute, valved distributing means on the bottom of said tank, and an operating connection between said valved means and said door, whereby the door controls said valved means to open the valve when the door is open, and to close the valve when the door is closed, and means on the tank and operable by the material passing through the chute for controlling the discharge of the water from the tank through the valved means.

2. In a structure of the class described, in

combination, a vehicle body having a discharge opening, a delivery chute connected with said opening, a sliding door for said opening, a water containing tank supported on said vehicle body over said chute, valved distributing means on the bottom of said tank, an operating connection between said valved means and said door, whereby the door controls said valved means to open the valve when the door is opened, and to close the valve when the door is closed, and vent means for said tank including an actuator adapted to descend into the chute and operable by the material passing down through said chute.

3. In a structure of the class described, in combination, a coal truck body having a discharge opening, a sliding door for said opening, a chute adapted for association with said opening, a horizontally disposed water containing tank supported from said vehicle body, valved distributing means on said tank located over said chute and including an operating crank for the valve, an arm connection between said crank and said door, operating means for the door, said tank having a vent opening, a closure for said vent opening, a swingably mounted member on said body descending into the said chute, and an operating connection between said member and said vent closing means.

4. In a structure of the character described, a material container having a discharge opening, a fluid containing tank associated with the container and having a vent opening, means communicating with the tank for discharging the fluid therefrom on to the material passing from the container, a closure for the vent opening, an operating member engageable with the discharging material for actuation thereby and means operatively connecting the vent closure to the member for actuation thereby.

5. In a structure of the character described, a material container having a discharge opening, a closure for said discharge opening, a fluid containing tank mounted on the container, valved discharge means associated with the discharge opening of the container and communicating with the tank in a manner to spray the fluid therefrom on to the material passing from the discharge opening, means operatively connecting the valved discharge means of the tank with the closure for actuation thereby, a bracket mounted on the container, an operating member pivotally mounted on the bracket for swinging movement adjacent the discharge opening in a manner to be engaged by the material passing therefrom for actuation thereby, said tank being provided with a vent opening, a closure pivotally supported on the tank and adapted to close the vent opening and a bar operatively connecting the vent closure to the operating members for actuation thereby, said operating member, the vent closure and the bar constituting means for controlling the discharge of the fluid from the tank through the valved discharge means of said tank.

In testimony whereof I affix my signature.

JOSEPH P. ROSENFELD.