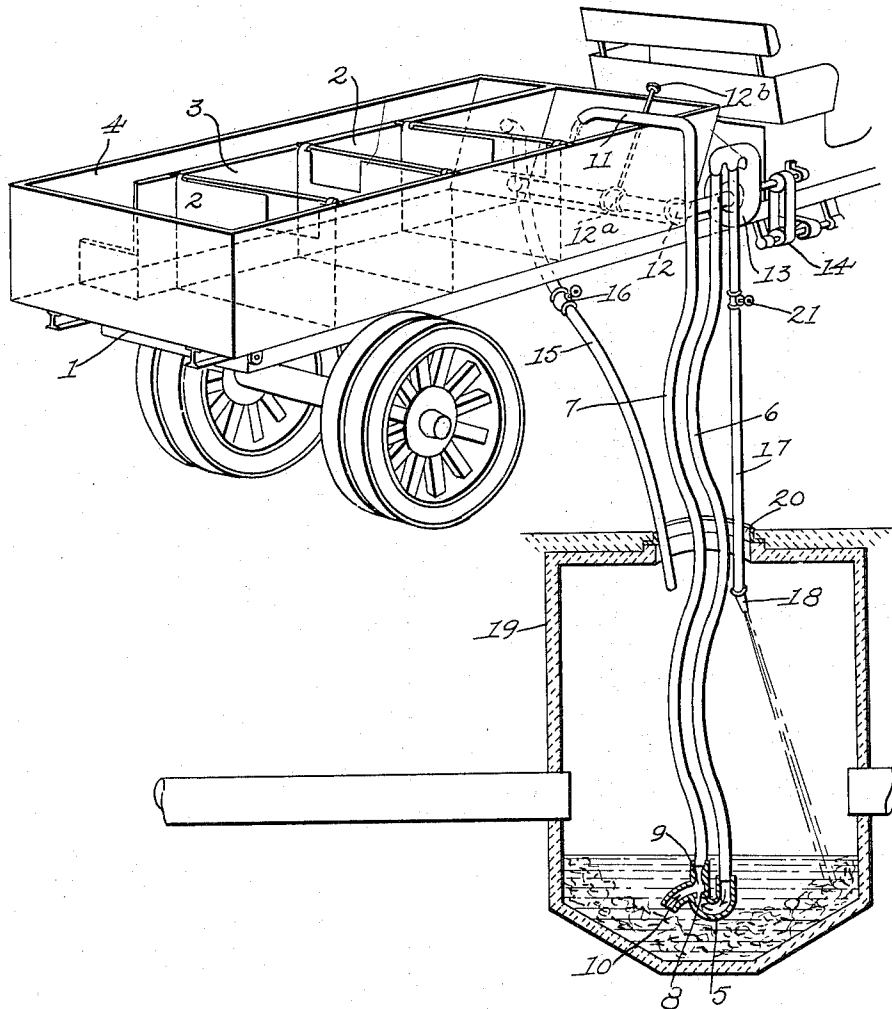


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 APPARATUS FOR CLEANING SEWER CATCH BASINS.
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APPARATUS FOR CLEANING SEWER CATCH BASINS.

Original application filed April 24, 1916, Serial No. 93,051. Divided and this application filed January 14, 1920. Serial No. 351,288.

To all whom it may concern:

Be it known that I, GEORGE W. OTTERSON, a citizen of the United States, and resident of Seattle, in the county of King and State of Washington, have invented a new and useful Apparatus for Cleaning Sewer Catch Basins, of which the following is a specification.

The invention is an improvement upon the apparatus for cleaning sewer catch-basins of my Reissue Patent No. 14,234 of December 16, 1916, and constitutes a division of my application Serial No. 93,051, filed April 24, 1916, for method of cleaning out city catch-basins.

My reissue patent discloses vehicular apparatus carrying means constituting a tight settling-bed and a liquid reservoir, a hydraulic ejector elevator adapted to be lowered into and raised from the basins, a pump for withdrawing water from the reservoir supply and thereafter from the water separated by the settling bed, wherewith to create and maintain the ejector jet, which draws in and elevates the contents of the basin delivering the same through a discharge line into the settling bed, and a valved return line whereby water is returned to the basin at the conclusion of the operation, or as desirable, to leave the basin charged with liquid and to conserve the carrying capacity of the apparatus. Under the present invention means are also provided for delivering a high velocity jet or jets into the basin outside of the intake of the elevator, for the dual purpose of disintegrating the deposits and for supplying a suitable limited quantity of water to the basin during the cleaning operation to carry the material to the intake. The agitator jet is supplied from the pressure side of the pump, and therefore from the same source as the ejector jet, and is preferably delivered through an independent freely movable line with a nozzle which can be directed and moved about by hand to attack the accumulations at different points in the basin. The combination of instrumentalities whereby the agitator jet serves the ejector jet I find to be of great value in the cleaning of sewer basins, because the agitator jet not only loosens the material but also furnishes means for preserving a degree of fluidity about the intake which enables the elevator to operate

to best advantage. If the machine encounters a basin containing a standing body of water, the ejector tends to remove this water down to the intake, after which the agitator jet supplies enough liquid to the basin to maintain an advantageous working condition. If the basin should be dry, the agitator jet furnishes the necessary liquid to be drawn with the solids into the intake.

The drawing illustrates in perspective a simple embodiment of the apparatus.

The apparatus comprises a motor truck or other vehicle having a tank body 1, provided with transverse partitions or baffles 2, constituting it a settling bed, and with a longitudinal partition 3 adjacent one of its side walls, forming with this wall a return gutter 4 for the water. The vehicle carries a hydraulic ejector elevator, which is let down into the several catch-basins, the said elevator consisting essentially of a casting 5 connected with the lower ends of pressure and discharge lines 6 and 7, the said casting having a nozzle 8 connected with the pressure line and arranged to deliver its jet in line with a throat 9, below which the material from the catch-basin is admitted through a suction intake 10, to be seized by the jet and hurled upward through the discharge line, from which the water and solids are delivered through a spout 11 into the forward compartment of the settling-bed. Thence the liquid makes its way rearward in a circuitous course through and over the baffles, until freed of sufficient of its solids to be utilized for maintaining the jet. From the last of the settling compartments the water enters the rear end of the gutter 4, from the forward end of which it passes through a pipe 12 to the inlet of a centrifugal pump 13, which may be driven from the engine of the motor vehicle by connections, such as indicated at 14, and the delivery side of which is connected with the pressure line 6. By means of another line 15 connected with the forward end of the gutter 4, the excess water not required for starting the jet is returned to the catch-basin before the equipment proceeds to the next location. This line is provided with a valve 16, in order that, except in event of danger of the tank becoming overfull, the return of liquid to the catch-basin may be delayed until the cleaning operation has

been completed, since the ejector jet acts most efficiently with only a moderate amount of water in the basin.

From the foregoing it will be understood that the vehicle starts upon its rounds with a supply of water sufficient to prime the pump. At each of the catch-basins, one of which is represented at 19, the elevator is lowered through the manhole 20 as far as it will go, a valve 12^a in the line 12 is opened by means of a hand-wheel shaft 12^b, and the pump 13 is started, drawing water from the supply and forcing it through the pressure line 6 and through the nozzle 8, so as to entrain and elevate the contents of the basin in the manner that will be well understood. The combined stream of liquid and solids is delivered into the settling-bed, where a separation is effected. The liquid thus separated is used to maintain the ejector jet, being continuously withdrawn by the pump and forced down through the pressure line 6. The stream driven upward by the ejector through the discharge line 7 consists of the water of the jet itself, water drawn in from the basin, and the solids likewise drawn in. Consequently more water is delivered into the settling-bed than is withdrawn from it for the jet, and in addition the bed receives and retains all the solids from the basin. This is possible because the settling-bed, that is to say the region of separation and withdrawal, whether covered over or not, is open to the atmosphere. The separation of the liquid and solids raised from the catch-basin has a number of purposes. These are to maintain the ejector and elevator jet; to provide water for agitation, and for addition to the basin contents during cleaning; to provide a supply which will serve to start the ejector jet at the next basin operated upon; to provide a charge of liquid to be returned to the basin, so as to leave the same wet after it has been cleaned; and to conserve the holding capacity of the apparatus which may be used.

In order to loosen the solidified accumulations and to bring them within the range of action of the ejector jet, one or more disintegrating streams are employed, delivered through an additional line 17 branched off from the outlet of the pump and terminating in a suitable nozzle 18, which may be moved about within the interior of the catch-basin. As the accumulations disappear the ejector is lowered further, until it finally rests upon the bottom of the catch-basin, and when everything is removed the pump is stopped, the elevator raised out of the manhole, and the valve 16 opened to permit the water, except that needed to prime the pump for the next operation, to flow back into the catch-basin. The settling-bed with its solids is then transported

to another catch-basin and the same process repeated, and when the settling-bed is as full of solids as is thought desirable, the vehicle proceeds to an appropriate spot and its contents are dumped.

The action of the apparatus in the embodiment illustrated is particularly effective when there is only a slight depth of water around the ejector, the operation being especially satisfactory when the ejector draws in some air through its intake. As the operation removes water from the basin, it quickly arrives at the most favorable condition, assuming the basin to have originally contained a substantial amount of liquid; and thereafter the small amount desirably present during cleaning, for carrying the material to the intake, is supplied through the agitator line 17. The quantity of water so introduced can be regulated by means of the valve 21 seen in the line 17. If the basin was originally dry, this introduction of water is advantageous to supply a medium for carrying the solids into the intake. At the conclusion of operations, water is run back into the basin through the overflow line 15, leaving the basin well charged with liquid, which is of great importance, because a dry sewer basin is a menace to health, whereas one charged with water is not.

It will be perceived, therefore, that the machine will operate upon either wet or dry basins, and that in either event it leaves the basins wet.

What I claim as new is:

1. Vehicular means for cleaning sewer catch-basins, having in combination a hydraulic ejector elevator adapted to be lowered into and raised from the basins, a settling-bed to receive the discharge of the elevator, a force pump having an intake connection for supplying it with water separated by the settling-bed and having its pressure side connected with the ejector, a valved return line for running water back into the basin at the conclusion of the operation, and means connected with the pressure side of the pump for delivering a high velocity jet into the basin for agitation and to supply a limited quantity of water to be drawn into the intake of the elevator with the basin contents during cleaning.

2. Vehicular means for cleaning sewer catch-basins, having in combination a hydraulic ejector elevator adapted to remove the contents of the basins, a settling-bed to receive the discharge of the elevator, a force pump having an intake connection for supplying it with water separated by the settling-bed and having its pressure side connected with the ejector, and means connected with the pressure side of the pump for delivering a high velocity jet into the basin for agitation and to supply a limited quan-

tity of water to be drawn into the intake of the elevator with the basin contents during cleaning.

3. Vehicular means for cleaning sewer catch-basins, having in combination a hydraulic ejector elevator adapted to remove the contents of the basins, a settling-bed to receive the discharge of the elevator, a force pump having an intake connection for supplying it with water separated by the settling-bed and having its pressure side connected with the ejector, and a freely movable line connected with the pressure side of the pump and provided with a valve and nozzle and adapted to deliver a limited quantity of water in the form of a high velocity agitator jet into the basin.

4. Vehicular means for cleaning sewer catch-basins, having in combination a hydraulic ejector elevator adapted to remove the contents of the basins, a settling-bed to receive the discharge of the elevator, a force pump having an intake connection for supplying it with water separated by the settling-bed and having its pressure side connected with the ejector, a return line for running water back into the basin, and means connected with the pressure side of

the pump for delivering a high velocity jet into the basin for agitation and to supply a limited quantity of water to be drawn into the intake of the elevator with the basin contents during cleaning.

5. A traveling machine for cleaning catch-basins carrying a hydraulic ejector elevator adapted to remove the contents of the basins, and a pump the pressure side of which is connected with the ejector, combined with means connected with the pressure side of the system for delivering a high velocity jet into the basin for agitation and to supply a limited quantity of water to be drawn into the intake of the elevator with the basin contents during cleaning.

6. In a traveling machine for cleaning catch-basins, the combination of a hydraulic ejector elevator adapted to remove the contents of the basins, a pump the pressure side of which is connected with the ejector, and a freely movable flexible hose also connected with the pressure side of the pump and provided with a nozzle for delivering a high velocity jet into the basin during the cleaning operation.

GEORGE W. OTTERSON.