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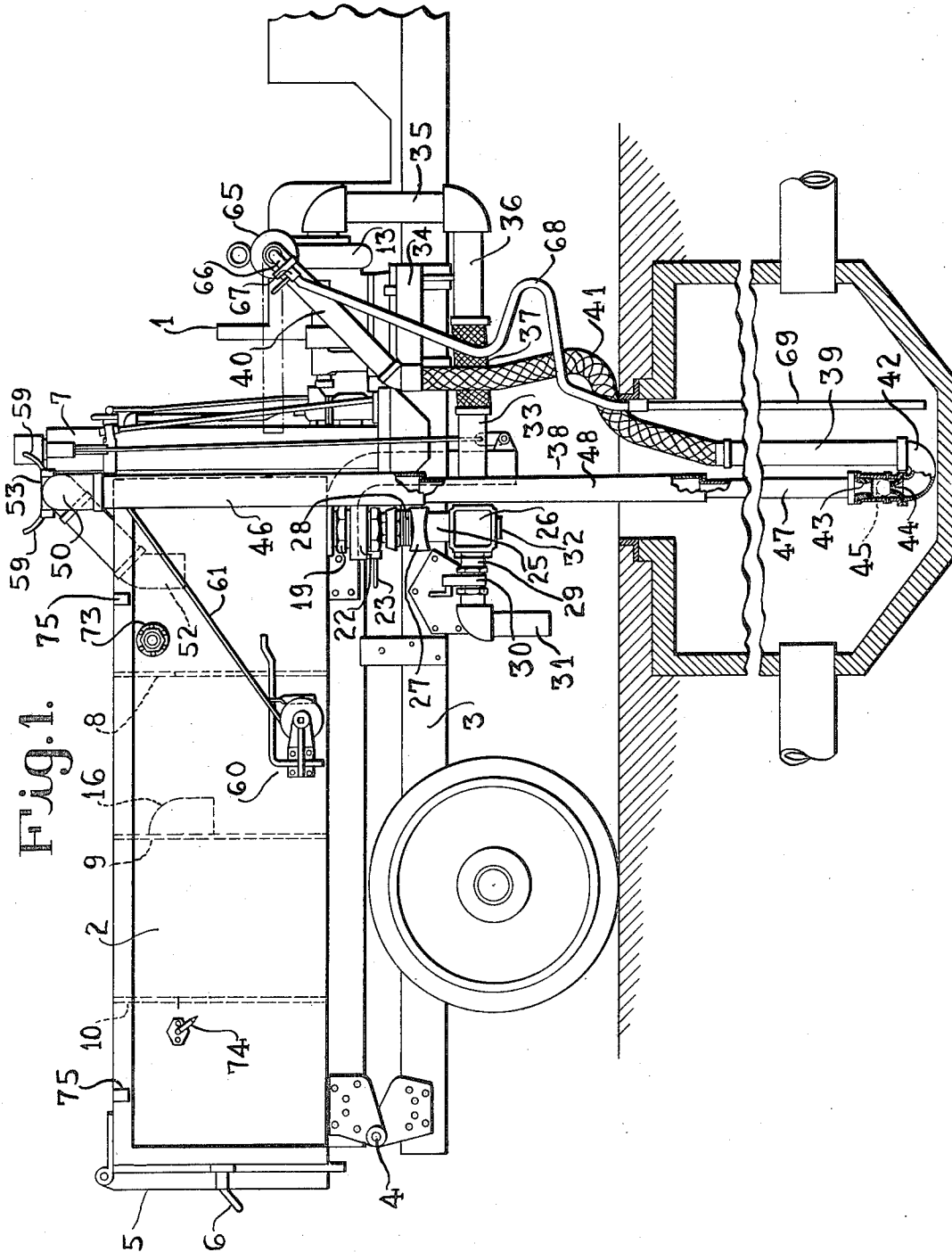
TRAVELING APPARATUS FOR CLEANING BASINS.

APPLICATION FILED NOV. 4, 1919. RENEWED OCT. 10, 1922.

1,437,008.

Patented Nov. 28, 1922.

3 SHEETS—SHEET 1.



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Fig. 2.

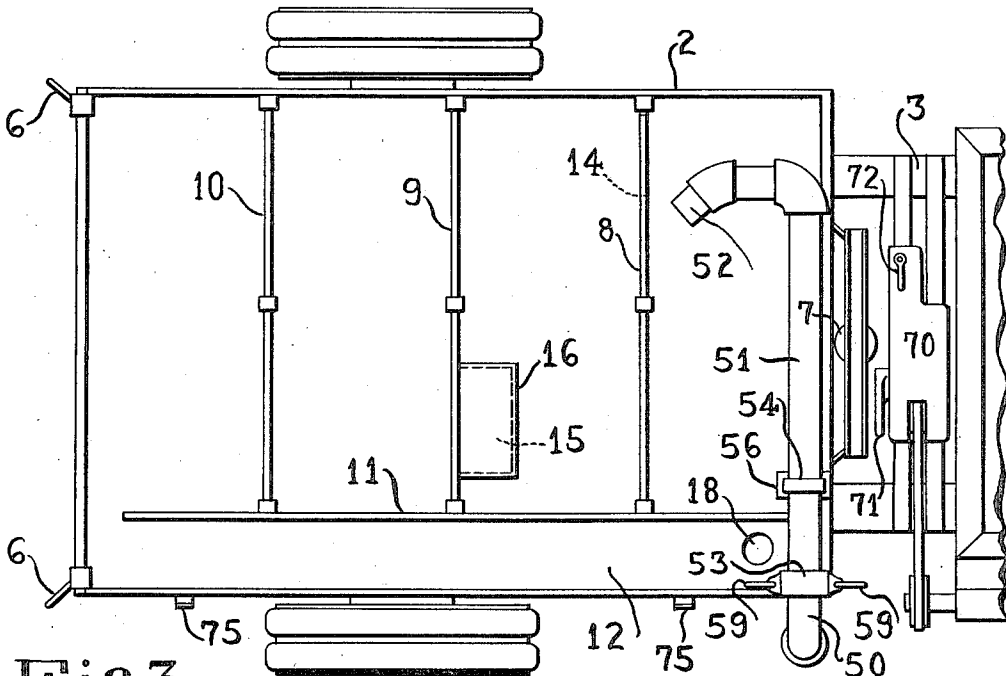
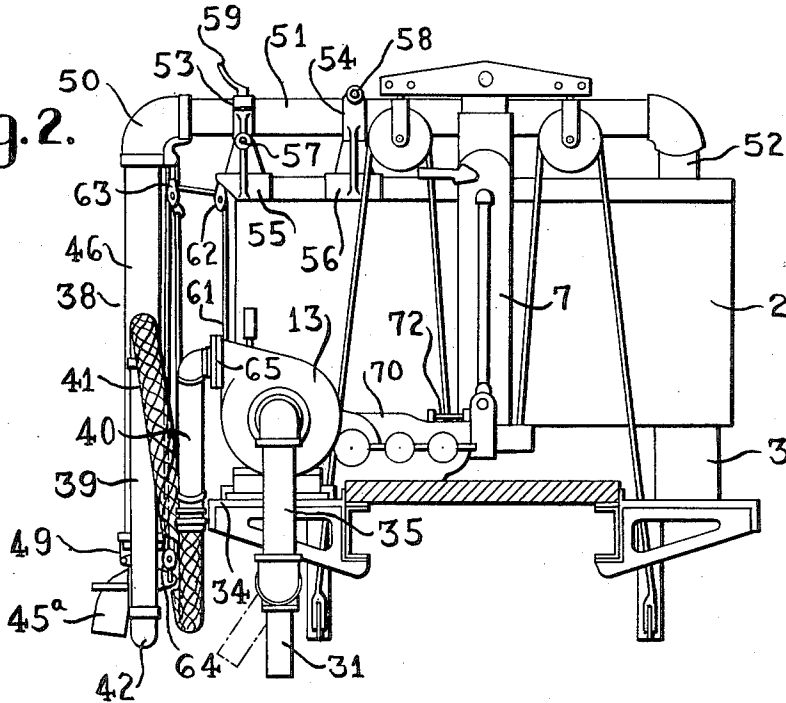


Fig. 3.

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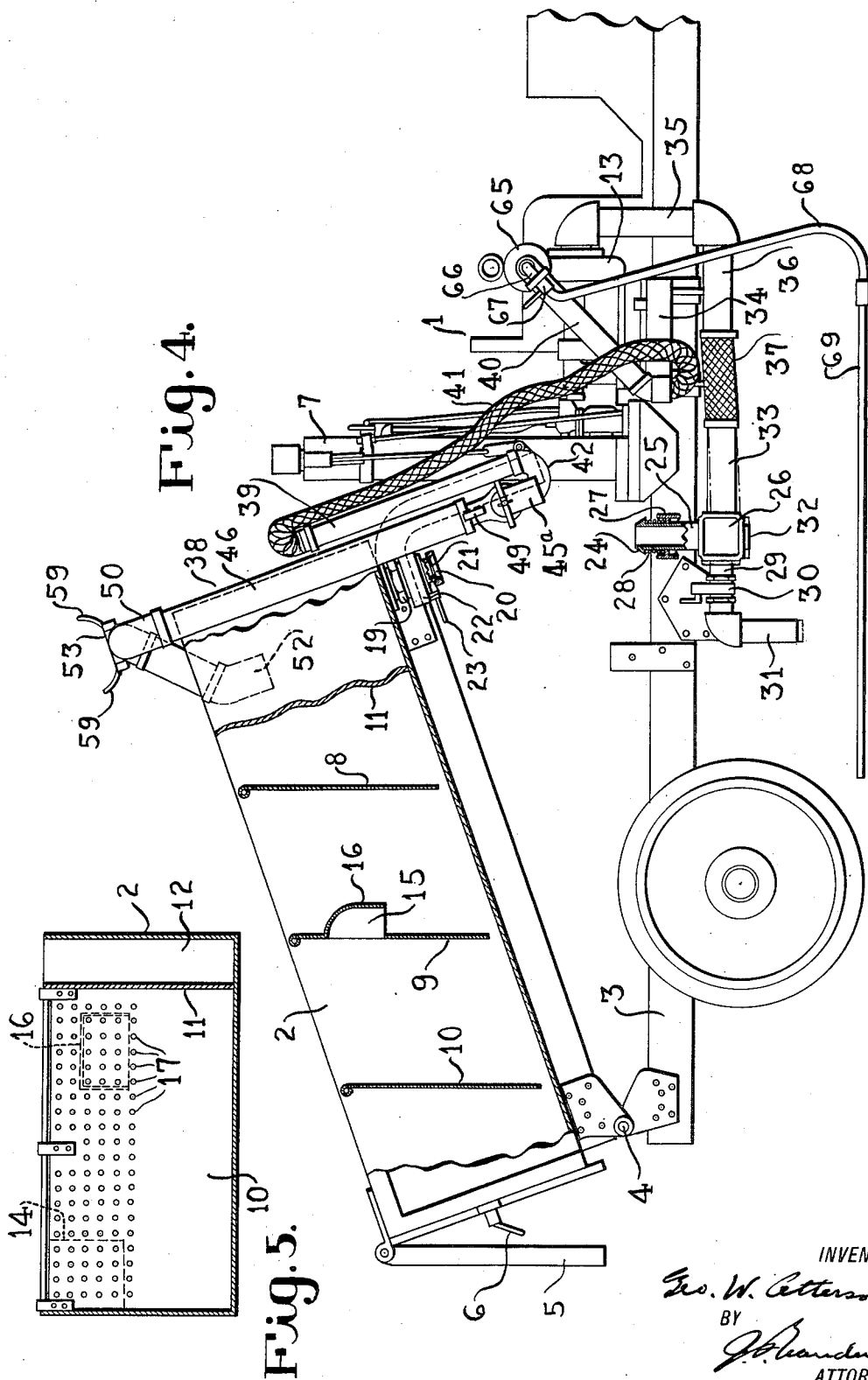
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UNITED STATES PATENT OFFICE.

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TRAVELING APPARATUS FOR CLEANING BASINS.

Application filed November 4, 1919, Serial No. 335,650. Renewed October 10, 1922. Serial No. 593,660.

To all whom it may concern:

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

The invention comprises certain improvements in traveling apparatus for cleaning sewer catch-basins and the like of the type disclosed in my Reissue Patent No. 14,234, dated December 19, 1916, and Patent 1,295,056 of Feb. 18, 1919. One of the objects is to provide an improved construction of the hydraulic ejector elevator, whereby the same is movable in and out at the side to cooperate with catch-basins at various distances from the roadway and is raisable to a compact traveling condition without overhead projection or necessity for swinging the elevator lengthwise of the side. Another object is to provide means in the pressure line for adjusting the flexible hose section therein in such manner as to avoid kinking as the working elevator is lowered to follow the receding level of accumulations in the basin. Other improvements relate to the water outlet from the tiltable settling-bed tank, the connections to the intake side of the pump with which said outlet automatically breaks and makes connection when the tank is tilted and restored, and the means for returning water to the catch-basin at the conclusion of the operation, whereby simplicity and economy of construction with improved and more convenient operation are secured. These and other objects and features of the invention will become apparent as the specification proceeds.

In the accompanying drawings, forming a part hereof:

Fig. 1 is a side elevation of a machine with the forward portion of the vehicle broken away and portions of the elevator broken away and in section, showing the apparatus lowered into a catch-basin, intermediate portions of the basin and the apparatus therein being broken away for economy of space;

Fig. 2 is a vertical sectional front elevation, taken just in front of the pump, with the driver's seat omitted for clearance;

Fig. 3 is a plan view;

Fig. 4 is a side elevation of the machine with parts broken away and in section showing the pumping condition; and

Fig. 5 is a vertical section through the rear portion of the settling-bed.

The apparatus is mounted upon a motor vehicle 1. 2 is an oblong-rectangular tight tank supported upon the bed or frame 3 of the vehicle, whereon it is rearwardly hinged at 4 to permit of rear dumping. 5 is a top hinged tail-gate held tight closed by releasable clamps 6, and adapted to swing rearward when the tank is dumped by raising its forward end by a suitable or known form of hoist 7 deriving its power from the driving engine of the vehicle. A plurality of transverse baffles 8, 9 and 10 are hung upon top hinge rods within the main part of the interior of the tank, forming a series of compartments, the forward of which receives the discharge of liquid and solids elevated from the basins. A longitudinal stationary partition 11 extends parallel and adjacent one side from the front of the tank to a point near the rear, forming a longitudinal gutter or relatively clear water space 12. The baffles 8, 9 and 10 extend from this partition across to the opposite side of the tank, and the effect is to constitute the tank a settling-bed wherein the water is caused to deposit its solids, finally entering the gutter 12 from the rear sufficiently free from material to be handled by the pump 13. The transverse baffles are adapted to swing rearward in the same manner as the tail-gate when dumping, in order to permit the deposits to slide out from beneath them, and are preferably ported to cause the water to flow in a circuitous course. The first baffle is, as shown, formed with a large passage opening 14 in one upper corner, and the next baffle with an opening 15 at the remote side, the latter opening being guarded at the front by a hood 16 forming a diving passageway which holds sticks and floating objects in this compartment. The rear baffle is preferably provided with sieve openings 17 in its upper and major portion for effecting a final separation.

In the forward part of the gutter 12 in the bottom of the tank, there is an outlet opening 18, to the border of which is rigidly secured a downwardly projecting outlet fitting or neck 19, at the lower end of which

is a funnel mouth 20 containing a gasket 21, forming one member of an automatic make and break sealing joint, after the manner disclosed in my application Serial No. 240,441, filed June 17, 1918. A shut-off valve 22 is inserted in the downwardly projecting neck between the outlet opening 18 and the joint, for the purpose of preventing escape when the tank is tilted and also to prevent possible leakage to the pump when the machine is traveling. The handle 23 of this valve is located near the bottom of the tank, in the vicinity of the other parts controlled by the operator on the pavement.

The other member of the automatic joint includes a truncated conical head 24 on the vertical stem or inlet branch 25 of a T fitting 26. Said stem passes loosely through an opening in a bracket 27 on the side of the vehicle frame, and the entire fitting is urged upward by a spring 28 resting on a ledge in the bracket and bearing against the under side of the head. At the rear of said fitting is an outlet branch 29 containing a shut-off valve 30 and terminating in a swing nozzle 31 for returning liquid to the catch-basin after the cleaning has been completed, said nozzle being capable of being disposed at various degrees of downward and lateral inclination and of being turned upward when not in use. The bottom of the T body contains a removable cleaning plug 32, and at its forward side is a rigid outlet branch section 33, through which water passes to the intake of the pump 13. Said pump is mounted on a platform bracket 34 projecting outwardly from the side of the vehicle frame forwardly of the settling-bed, and preferably has its intake at the front, connected with vertical and horizontal rigid conduit sections 35 and 36, the ends of the sections 36 and 33 being connected by a flexible hose length 37 which accommodates the up and down movements of the fitting 26.

The hydraulic ejector elevator is preferably constituted of a telescopic discharge line 38 of rigid sections, a pressure line consisting of rigid sections 39 and 40 with an interposed flexible hose section 41, and an ejector 42 carried by and uniting the lower ends of said conduits, the ejector consisting of a return bend casting containing a throat 43 at the bottom of the discharge line, an upwardly directed ejector jet nozzle 44 in alignment with the throat, and a lateral suction intake 45 which may be prolonged downward to about the bottom of the bend by a short attachable nozzle 45^a.

The discharge line comprises an upper vertical pipe section 46 supported at one side at the front of the settling-bed, a lower section 47 which is secured to the discharge limb of the ejector body and an intermediate section 48, the lower and intermediate sections being adapted to telescope within the

upper section when the ejector is raised, at which time the ejector and vertically movable pipe sections are sustained by a suitable fastening 49 connecting the ejector with the lower end of the upper section.

The upper end of said upper vertical section 46 is united by an elbow 50 with a horizontal conduit section 51 extending transversely inboard over the forward end of the tank, said section carrying at its far end a down-turned spout 52 arranged to deliver into the forward settling compartment of the settling-bed. The transverse conduit section 51 constitutes a slidable arm whereby the elevator can be disposed close to the side of the vehicle or moved outward to various operating distances therefrom. For this purpose the horizontal conduit is supported slidably in collars 53, 54 on brackets 55, 56 which are secured to the top of the front of the tank, one adjacent the corner and the other somewhat inwardly therefrom. The outer bracket 55 contains an anti-friction roller 57 supporting the under side of the slidable pipe, and the inner bracket 56 has a similar roller 58 at the top. The sliding conduit section is of such length that when it is pushed in its spout 52 is adjacent and within the far side of the tank, and when the arm is pulled out as far as it will go, as well as in any intermediate position, the spout still delivers into the forward settling compartment. The outer collar 53 is desirably split and provided with lever clamping nuts 59 to lock the arm against displacement when the vehicle is in movement. The elevator is raised and lowered, and drawn into the side of the vehicle when raised, by means of a suitable hoist comprising a winch 60 on the side of the settling-bed and a cable 61 passing therefrom upward and forward to a block pulley 62 on the upper forward portion of the tank, thence to a block 63 on the upper part of the discharge line, thence downward to a block 64 on the ejector, and back to the block 63.

The rigid section 39 of the pressure line is secured to the inlet limb of the ejector and rises for a suitable distance alongside of the telescopic discharge line. The other rigid pipe section 40 of this line is connected to the pressure outlet 65 of the pump by a swivel joint, which enables it to be swung in the longitudinal plane, this section being disposed at various degrees of downward inclination as operating conditions may require. The free ends of the sections 39 and 40 are connected by the flexible hose section 41, of sufficient length to permit the maximum downward extension of the telescopic discharge line.

A small outlet fitting 66 is also connected with the pressure side of the pump, preferably being attached to the swiveled elbow of the swinging conduit 40. This fitting is

provided with a valve 67, whereby it can be opened and closed and receives a length of small flexible hose 68, constituting part of an agitator line. Secured to the end of this
 5 hose is a long rigid tube 69 of sufficient length to reach down into the basins, and constituting both an agitator nozzle and a mechanical tool wherewith to work the deposits and to fend off obstructions from the
 10 intake of the ejector.

A suitable encased transmission 70 is provided for driving the pump and the dumping hoist from the engine of the vehicle. This transmission may be varied and need not be
 15 described in detail. One control handle 71 enables the pump to be started and stopped at will, and another handle 72 controls the hoist.

The tank has an inlet fitting 73 in its side
 20 near the top adapted to receive a hose for filling the tank from a hydrant or plug. An indicator pointer 74 on the same side of the tank, operated by a float, not shown, in the interior, indicates the amount on board.

The operation will be briefly described. Before starting operations the settling-bed tank is filled with water through the inlet 73 to within a suitable distance of the top, as indicated by the pointer 74. The filling hose
 25 is then disconnected and the vehicle proceeds, with the elevator raised and close to the side of the tank, to a basin or sump to be cleaned. Here the elevator is pulled out to such distances as may be necessary in order
 30 to position it over the opening, this operation being accomplished by virtue of the slidability of the horizontal continuation 51 of the discharge line in the brackets 55, 56. The fastening 49 is then opened and the
 40 winch 60 used to lower the movable sections 47, 48 of the telescopic discharge line, the ejector 42 and the section 39 of the pressure line into the basin, the lowering being continued until the ejector rests upon the bed
 45 of deposits. The valve 22 is now opened and the pump started. Water is withdrawn from the clear water compartment 12 of the settling-bed and forced downward through the pressure line 40, 41, 39 to the ejector nozzle
 50 in the basin, where a powerful upwardly directed ejector jet is created which draws in the surrounding water and solids and impels them up through the telescopic discharge line 38 and its horizontal continuation
 55 51 and out through the spout 52 into the first settling compartment of the tank. Separation of the liquid and solids is effected in the bed and the liquid is constantly withdrawn from the gutter by the pump to
 60 maintain the ejector jet. The attendant on the sidewalk uses the tube 69 to work the contents of the basin hydraulically and mechanically and to manipulate objects either to cause them to enter the intake or to keep
 65 them away. The liquid discharged through

this nozzle into the basin not only serves to boil up the deposits but also adds a sufficient amount of liquid to preserve the best working condition, the amount of water thus added being regulated by the valve 67. As
 70 the deposits are removed the ejector is lowered further into the basin, and from time to time the swiveled section 40 of the pressure line is swung so as to keep the hose section 41 free from bends. When the cleaning
 75 is finished, the pump is stopped and the valves 22 and 67 are closed and the elevator is raised and fastened at the side of the vehicle. The vehicle is then moved slightly, if necessary, and the return nozzle 31 is swung
 80 to a position in which it will deliver into the opening of the basin. Next the valve 30 is opened, permitting water to run back into the basin, in order that it may be left
 85 charged with liquid and to conserve the carrying capacity of the tank. When a proper amount has been allowed to escape, as indicated by the pointer 74, leaving enough liquid in the settling-bed to start operations at the next basin, the said valve is closed and
 90 the nozzle can be swung to an upright position if desired. When not in use the tool 69 is supported in clips 75 on the side of the tank.

In case of the ejector becoming clogged
 95 during cleaning, it is quickly cleaned by stopping the pump, whereupon the column of water in the discharge line falls back and expels the obstruction.

What I claim as new is:

1. In a vehicular apparatus of the character described, comprising a settling-bed, and a force pump having an intake connection from the settling-bed, a hydraulic ejector elevator comprising pressure and discharge
 100 lines and an ejector adapted to be raised and lowered at the side of the vehicle, the pressure line connected with the pressure side of the pump and the discharge line delivering into the bed, and having a transverse section of
 105 said discharge line which is slidably guided on the vehicle, permitting the elevator to be moved in and out from the side.

2. In a vehicular apparatus of the character described, comprising a settling-bed, and a force pump having an intake connection from the settling-bed, a hydraulic ejector elevator comprising pressure and discharge
 110 lines and an ejector adapted to be raised and lowered at the side of the vehicle, the pressure line connected with the pressure side of the pump and the discharge line delivering into the bed, and having a transverse section of
 115 said discharge line which terminates in a spout over the interior of the settling-bed, and guides on the vehicle wherein the transverse conduit section is slidably supported, permitting the elevator to be moved in and
 120 out from the side.

3. In a vehicular apparatus of the char- 130

acter described, comprising a settling-bed, and a force pump having an intake connection from the settling-bed, and a hydraulic ejector elevator comprising pressure and discharge lines and an ejector adapted to be raised and lowered at the side of the vehicle, the pressure line connected with the pressure side of the pump and the discharge line delivering into the bed, the combination in said elevator of an upper vertical section of the discharge line, a lower section connected to the ejector and an intermediate section telescoping between the other sections, and a transverse section connected with said upper section and slidably supported on the vehicle, permitting the elevator to be moved in and out from the side.

4. In a vehicular apparatus of the character described, comprising a settling-bed, and a force pump having an intake connection from the settling-bed, and a hydraulic ejector elevator comprising pressure and discharge lines and an ejector adapted to be raised and lowered at the side of the vehicle, the pressure line connected with the pressure side of the pump and the discharge line delivering into the bed, the combination in said pressure line of a flexible hose section and a swinging arm section, substantially as and for the purpose set forth.

5. In a vehicular apparatus of the character described, the combination with a tiltable settling-bed body having a water outlet, a hydraulic ejector elevator, and a pump the pressure side of which is connected with the ejector, of a bracket on the vehicle frame, a conduit fitting floating on a spring in said bracket and having an outlet branch connected by a flexible conduit section with the intake of the pump and a vertical inlet branch adapted for automatic make and break with said water outlet.

6. In a vehicular apparatus of the character described, the combination with a tiltable settling-bed body having a water outlet, a hydraulic ejector elevator, and a pump the pressure side of which is connected with the ejector, of a conduit fitting supported on the vehicle frame having one outlet branch connected with the intake of the pump, an inlet branch adapted for make and break connection with said water outlet, another outlet branch adapted to return water to the sewer, and a valve in the last-named branch.

7. In a vehicular apparatus of the character described, the combination with a tiltable settling-bed body having a water outlet, a hydraulic ejector elevator, and a pump the pressure side of which is connected with the ejector, of a conduit fitting

supported on the vehicle frame having one outlet branch connected with the intake of the pump, a vertical inlet branch adapted for automatic make and break connection with said water outlet, another outlet branch provided with a spout to return water to the sewer, and a valve in the last-named branch.

8. In a vehicular apparatus of the character described and in combination with a tiltable tank body, a hydraulic ejector elevator, and a pump the pressure side of which is connected with the ejector, a water outlet fitting on the forward lower part of the tank body, a shut-off valve in said fitting outside of the tank, and a fitting on the vehicle frame connected with the intake of the pump with which said valved fitting on the tiltable tank automatically makes and breaks connection.

9. In a vehicular apparatus of the character described and in combination with a tiltable tank body, a hydraulic ejector elevator, and a pump the pressure side of which is connected with the ejector, a water outlet fitting on the forward lower part of the tank body, a shut-off valve in said fitting outside of the tank, and a conduit fitting supported on the vehicle frame having one outlet branch connected with the intake of the pump, an inlet branch adapted for make and break connection with the valved outlet fitting of the tank, and another outlet branch provided with a valve adapted to return water to the sewer.

10. In an apparatus of the character described and in combination with a hydraulic ejector elevator and a pump the pressure side of which is connected with the ejector, a flexible agitator hose also connected with the pressure side of the pump and a combined hollow stirring rod and nozzle connected with said agitator hose and of a length to reach down into the lower portion of a catch basin in the hands of an attendant on the surface.

11. In a vehicular apparatus for cleaning sewer catch-basins and the like carrying pressure and discharge lines and an intake and ejector member connected between said lines and adapted to be lowered into the catch-basins, and a pump the pressure side of which is connected with said pressure line, of another, flexible, valved, line connected with the pressure side of the pump and a combined hollow stirring rod and nozzle connected with said line and of a length to reach down into the lower portion of a catch basin in the hands of an attendant on the surface.

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