

G. W. OTTERSON.

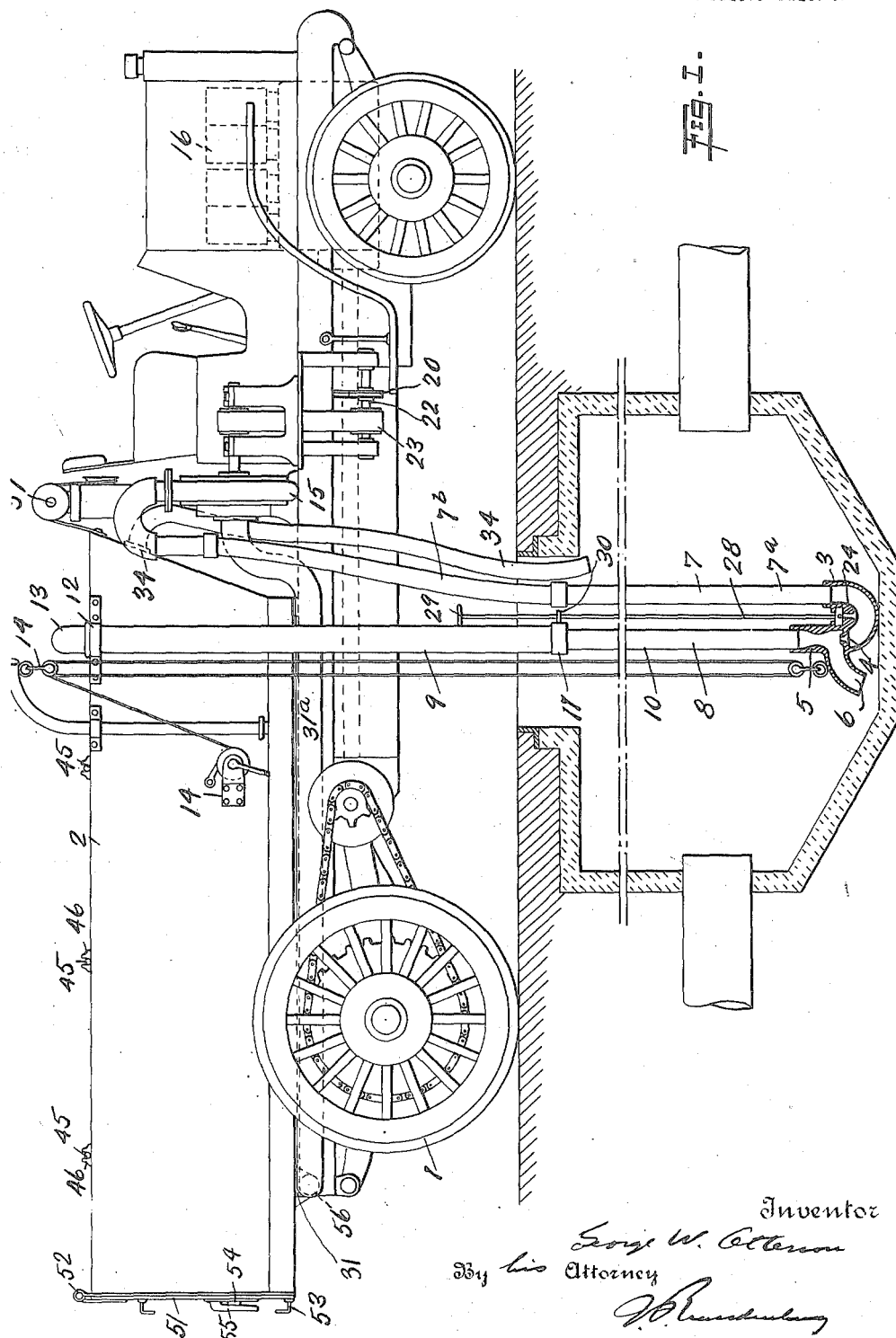
PORTABLE APPARATUS FOR CLEANING OUT CATCH BASINS.

APPLICATION FILED MAY 13, 1916.

1,295,056.

Patented Feb. 18, 1919.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

FIG. 2.

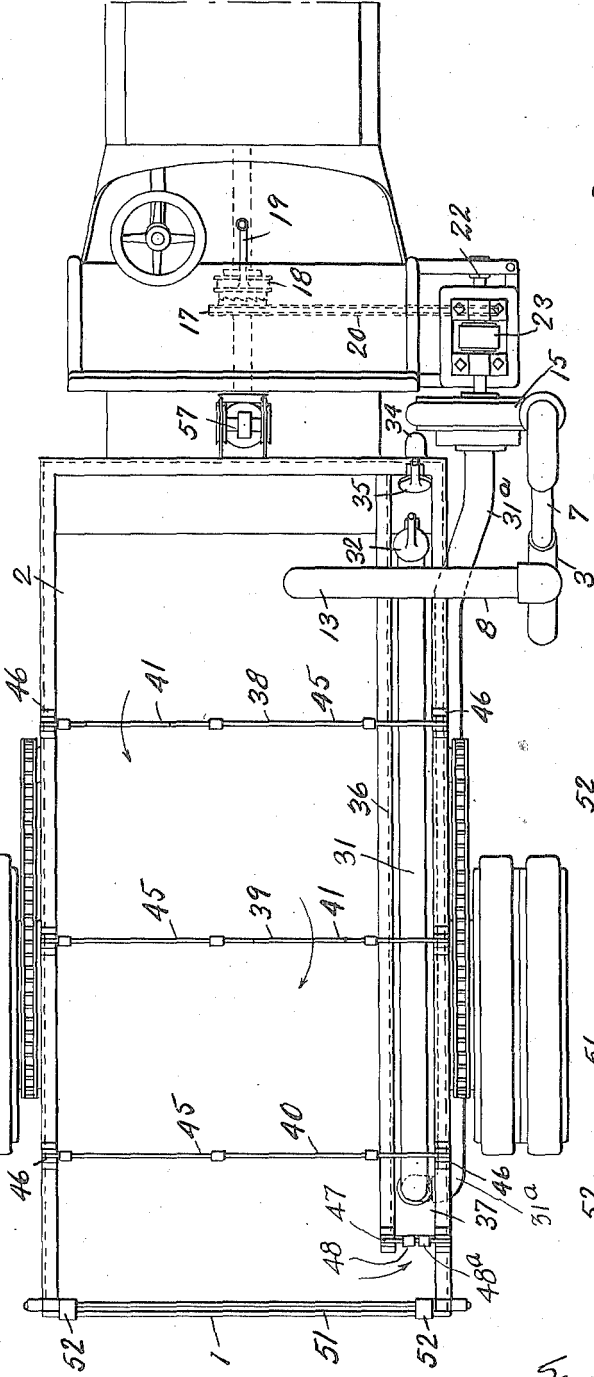


FIG. 3.

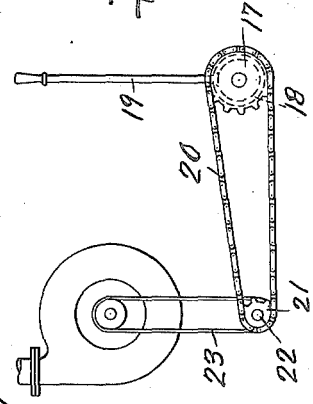
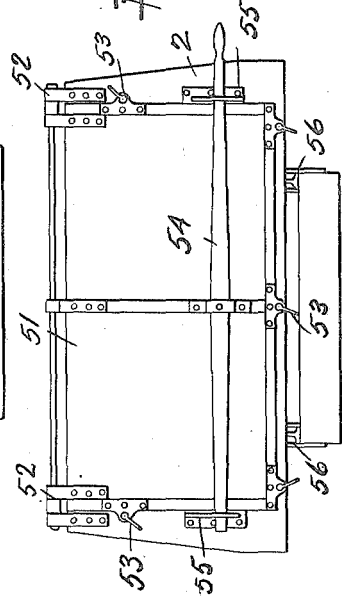


FIG. 5.



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FIG. 4.

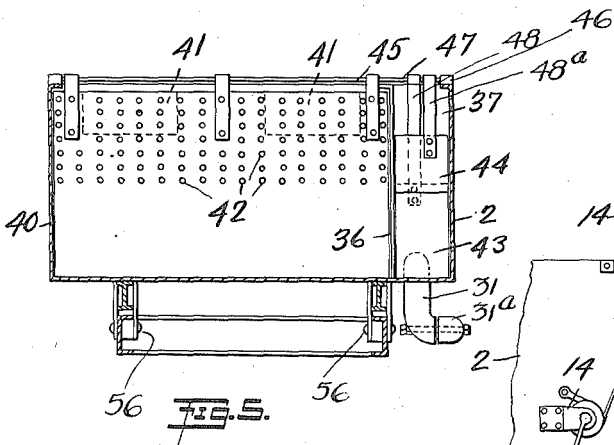
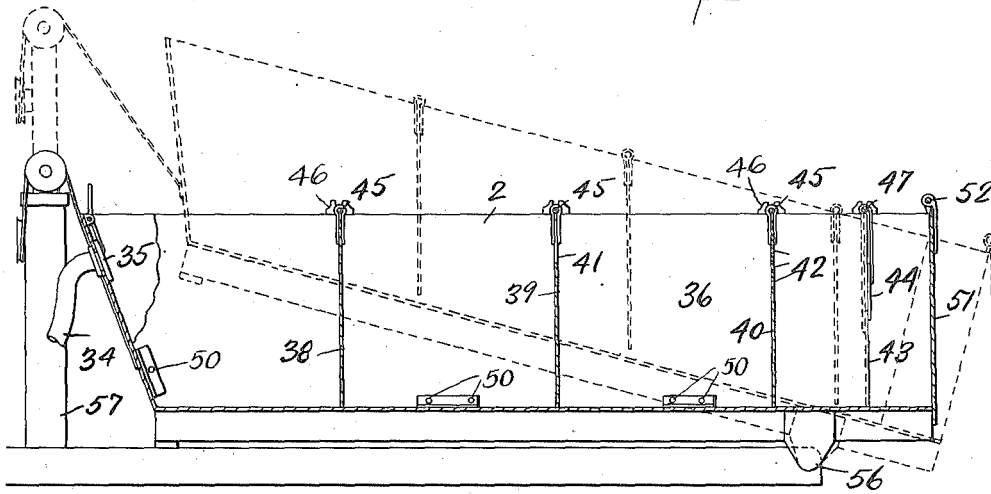
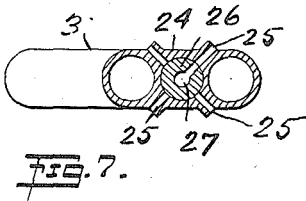
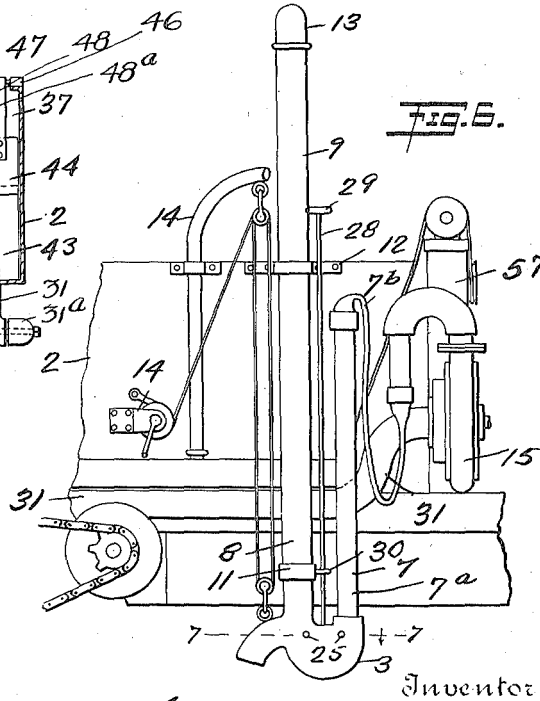


FIG. 6.



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4 SHEETS--SHEET 4.

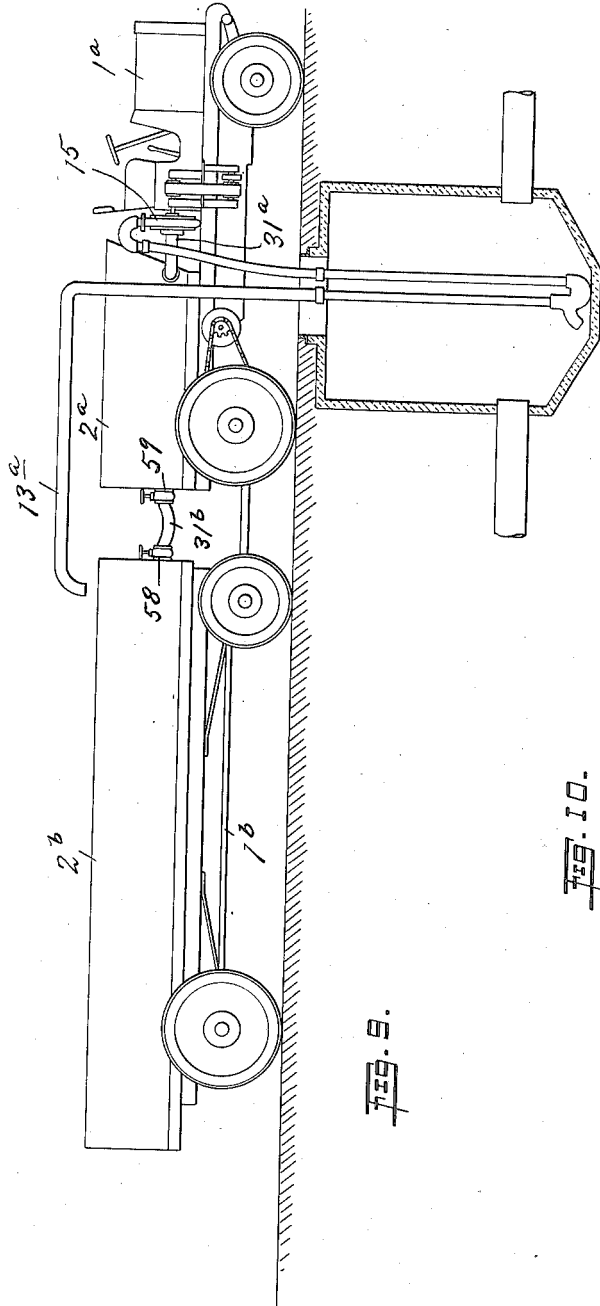


FIG. 9.

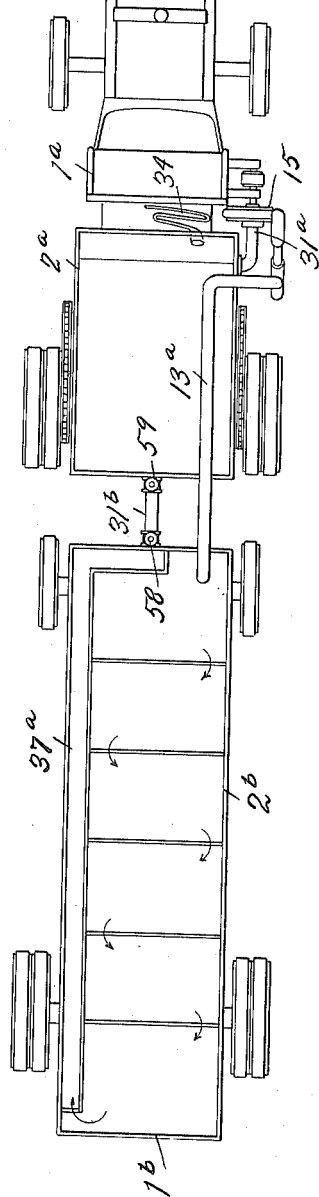


FIG. 10.

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UNITED STATES PATENT OFFICE.

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PORTABLE APPARATUS FOR CLEANING OUT CATCH-BASINS.

1,295,056.

Specification of Letters Patent.

Patented Feb. 18, 1919.

Application filed May 13, 1916. Serial No. 97,235.

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 certain new and useful Improvements in Portable Apparatus for Cleaning Out Catch-Basins, of which the following is a specification.

The object of this invention is to provide an effective and economical apparatus for cleaning out city catch-basins. Under the usual practice accumulations are removed from these catch-basins either by the use of long-handled dippers or by hoisting it out with buckets into which the material is shoveled.

My Reissue Patent 14,324 of December 19, 1916 discloses a traveling apparatus whereby the catch-basins are cleaned by means of a raisable and lowerable hydraulic ejector elevator mounted on a vehicle, forcing the liquid and solids upward into a settling bed, from which the force pump of the ejector derives its supply and in which the solids are transported away, after the liquid or a portion thereof has been returned into the sewer. The present invention comprises certain improvements in this type of apparatus, having for their objects to provide an advantageous mechanical mounting for the ejector elevator permitting an extensive range of vertical movement, to enable the settling bed to be dumped without disturbing the operating parts, and to provide an effective means for agitating the contents of the catch-basins while the ejector is in operation.

In the accompanying drawings illustrating the invention:

Figure 1 is a side elevation of an embodiment of the invention, the hydraulic elevator being shown lowered into a catch-basin, its ejector and the catch-basin being in vertical section;

Fig. 2 is a plan view;

Fig. 3 is a rear elevation of the settling bed tank;

Fig. 4 is a side elevation of this tank, broken lines being used to show the tank in the act of being tilted for dumping;

Fig. 5 is a vertical transverse section through the rear portion of the settling bed tank;

Fig. 6 is a side elevation of a portion of the apparatus, showing the elevator raised;

Fig. 7 is a section on the line 7-7 of Fig. 6;

Fig. 8 is a detail view of the pump drive;

Fig. 9 is a side elevation, somewhat diagrammatic, of another embodiment of the invention; and

Fig. 10 is a plan view of the same.

In carrying out the invention I preferably make use of a motor-driven vehicle for transporting the hydraulic ejector elevator with its pressure and discharge lines and a force pump connected with the former and a supply of water for priming the pump. The vehicle 1 of Figs. 1 to 5 is provided with a rectangular tank body 2, constituting a settling bed. The elevator is mounted on one side of the vehicle and comprises an ejector 3 having a jet nozzle 4 delivering in line with a throat 5, the material to be ejected being admitted through a suction intake 6. Pressure and discharge lines 7 and 8 connect with the ejector and permit it to be lowered into and raised from the catch-basins. The discharge line 8 comprises upper and lower rigid sections 9 and 10, the lower section being adapted to slide within a suitable joint 11 at the lower end of the upper section, and the upper section being itself slidable within a guide or mounting 12 on the vehicle. The upper section of this piping terminates in a spout 13, arranged to deliver its stream into the main portion of the interior of the tank 2 adjacent the forward end of the same. The pressure line 7 comprises a lower, rigid section 7^a, approximately the length of the section 10 of line 8, and an upper flexible or hose section 7^b which connects the rigid section with the outlet of a rotary force pump 15 mounted on the vehicle frame.

The described telescopic construction and slidable mounting of the discharge line, in conjunction with the flexible section of the pressure line, enable the elevator to be lowered and raised vertically into and out of the catch-basins without rising to an undue height when elevated. The lowering and raising may be effected by means of a simple hoisting mechanism, designated generally by the numeral 14, the cable of which is attached to the ejector.

Provision is made for driving the pump 15 from the vehicle-propelling motor 16. In the illustrated arrangement there is a sprocket wheel 17 loose on the vehicle pro-

peller shaft and adapted to be coupled therewith by means of a clutch 18 having suitable operating means 19, and this sprocket is connected by a chain 20 with another sprocket wheel 21 on a lay shaft 22, from which a belt 23 passes to a pulley on the pump shaft.

The hydraulic ejector has an agitator outlet for loosening the accumulations in the catch-basins, and in conjunction therewith rotary means for changing the direction of the agitator stream, in order to reach the material at all sides. For this purpose an opening is formed in the top of the body of the ejector 3, between the pressure and discharge lines 7 and 8, and in this opening is secured a small tubular casing 24 having a plurality of radiating apertures or nozzles 25. A tubular distributor valve 26, having a single opening 27 to register successively with the apertures, is mounted rotatably within this casing, wherein it may be turned by means of a vertical shaft 28. The said shaft is of sufficient length to project upward above the manhole when the ejector is lowered into a catch-basin, and is provided at its upper end with a suitable handle 29 above a guide 30 on the upper section 9 of the discharge line 8, wherein the rod slides when the pipe is extended or shortened.

The pump draws its supply from the tank 2 through a pipe line leading from the forward end of the tank near the bottom thereof. This line preferably confines two suitably connected sections 31 and 31^a, of which the first extends lengthwise within the gutter 37, hereinafter specified, having its forward end adapted to be opened and closed by a valve 32. The rear end of this pipe section passes downward through the bottom of the tank, or is connected to a suitable fitting, and beneath the tank is shown as rotatably jointed to the rear end of the section 31^a, which extends to the inlet of the pump. The axis of this joint 31^b is coincident with the axis of the pivotal support 56 of the tank, of which mention will be made hereafter, so that the connection between the pump and tank need not be broken in order to dump.

In this instance the tank body 2 constitutes a settling bed wherein a rough separation of the liquids and solids elevated from the catch-basin is effected, the excess liquid being returned into the sewer through a line 34 which connects with the forward portion of the tank, preferably at a greater height than the pipe 4, and is provided with a suitable inlet valve 35.

The interior of the tank is divided by a longitudinal partition 36 placed close to one side of the tank and extending from the forward wall to within a short distance of the back wall, thus forming a gutter 37

which communicates at its rear end with the main portion of the interior of the tank. The pipes 31 and 34, heretofore mentioned, connect with the forward end of this gutter.

The main body of the tank is provided with a plurality of transverse baffles 38, 39 and 40, which aid in causing the liquid to throw down its solids before entering the rear end of the gutter 37. Of these the baffles 38 and 39 are preferably formed with large openings 41, located in the upper portions of these baffles and in staggered relation to each other, while the baffle 40 is preferably provided with a multiplicity of comparatively small perforations 42. The rear end of the gutter 37 is guarded by a baffle 43, which extends from the bottom of the tank part way upward toward the top and the height of which may be increased as the material accumulates in the tank by a supplementary baffle 44, which at first may be moved away from the entrance to the gutter.

In order to permit the solids to be dumped by an endwise tilting movement of the settling bed, the baffles 38—40 are swingingly supported by hanging them from rods 45, which preferably rest in open slots in bracket lugs 46 on the side walls of the tank. The baffle plates 43 and 44 are similarly hung from a rod 47, to which they are connected by hangers 48 and 48^a. As thus mounted the baffles normally hang vertically by their own weight and are removable by simply lifting them out. The partition 36 being also removable by taking out bolts 50 which fasten it in place, the settling bed is capable of ready conversion into a cargo-carrying receptacle.

The rear wall of the tank is formed by an end gate 51, hingedly supported at the top as indicated at 52, so as to be capable of swinging outward at the bottom when the tank is tilted for dumping. This gate when closed is held tightly to a suitable seat against the rear ends of the bottom and side walls of the tank by means of clamping devices 53 and also by a holding bar 54, which latter is pivoted at its center to the gate and cooperates at its end with slotted keepers 55 on the side walls of the tank.

The tilting of the settling bed tank about its rearwardly disposed pivot 56 may be effected by any of the appropriate means for such purposes, such as a hydraulic jack 57.

In the use of this form of the apparatus it will be understood that the vehicle starts upon its rounds with a sufficient supply of water in the tank 2 to prime the pump. When a catch-basin is reached the manhole cover is removed and the ejector elevator lowered into the catch-basin until its ejector portion rests upon the material therein. The pump 15 is then coupled with the propeller shaft of the vehicle, so that a stream of water

is drawn from the tank and forced downward through the pressure line 7 to the jet passage or nozzle 4, whereby a high velocity jet is created which sucks in the material through the intake 6 and impels it upward through the discharge line 8 into the forward end of the main portion of the settling bed. Here the water gradually finds its way rearward through the openings in the baffles and around their edges until it reaches the rear end of the gutter 37, by which time it has deposited practically all of the solids. From this gutter the pump continues to draw its supply throughout the operation, and at the conclusion the valve 35 is opened so as to permit the water remaining in the tank, or the excess amount which is not needed for priming the pump at the next catch-basin, to flow back into the sewer through the line 34. While the ejecting and elevating action proceeds a comparatively small agitating jet is delivered in different directions from the outlet 24, so as to loosen the accumulations, thereby facilitating their removal. When the apparatus has visited a number of catch-basins and the settling bed is as full of solids as is desirable, the vehicle proceeds to an appropriate spot to dump its load. This is accomplished by releasing the end gate and by elevating the forward end of the tank, which done, the baffles and the end gate swing freely and permit the material to slide rearward out of the tank.

Figs. 9 and 10 illustrate the fact that portable settling beds, such as contemplated by the invention, may be mounted upon separate, auxiliary vehicles. This development of the invention may be carried out in various ways, and, of course, there may be more than one of these auxiliary vehicles for use with the main vehicle, and the auxiliary vehicles may be equipped with self-propelling mechanism, or, as illustrated herein, they may be in the nature of trailers. The main vehicle is designated 1^a, and, in addition to the hydraulic ejector elevator and pump, carries a tank 2^a, which in this instance is not used for settling and is therefore of comparatively small size, since it is required to carry only sufficient water for priming the pump 15, which may be driven as before and the inlet of which is connected with this tank by a pipe 31^a.

The trailer 1^b, suitably coupled with the main vehicle, carries a settling bed tank 2^b, which is here shown diagrammatically, but will be understood as being substantially like the tank 2 heretofore described and having like capabilities in respect to dumping. The spout 13^a of the hydraulic elevator is extended rearward, so as to discharge into the forward end of the baffled portion of the tank 2^b. From the forward end of the gutter 37^a a detachable hose connection 31^b con-

ducts the water from the settling bed to the tank 2^a to replenish the supply for the pump when the apparatus is in operation. Valves 58 and 59 may be used to close the corresponding openings in the tanks when the vehicles are separated. The line 34 for returning the water into the sewer may lead from the gutter 37^a as before. As in the other embodiment of the invention, the valve 35 controlling this line is preferably opened only after the conclusion of the operation of cleaning out a catch-basin, since the ejecting action is most effective when there is little water in the basin.

What I claim as new is:

1. In an apparatus for cleaning out city catch-basins, the combination with a vehicle, of a hydraulic ejector elevator carried by the vehicle to be lowered into the catch-basins, the said elevator having telescopic piping, and a mounting on the vehicle wherein said piping is vertically slidable.

2. In an apparatus of the character described, and in combination with a vehicle, and a force pump thereon with means for driving the same, a hydraulic elevator carried by the vehicle and having pressure and discharge lines, the discharge line terminating in a spout and being of telescopic construction and slidably guided on the vehicle, and the pressure line being connected with the outlet of the pump and of a flexible character.

3. In an apparatus of the character described, and in combination with a vehicle, and a force pump thereon with means for driving the same, a hydraulic elevator carried by the vehicle and comprising an ejector with pressure and discharge lines, the discharge line comprising upper and lower rigid telescopic sections and the pressure line, leading from the pump, comprising a hose, and means for telescoping and extending the discharge line and for raising and lowering it as a whole and thereby raising and lowering the ejector.

4. In an apparatus of the character described, and in combination with a vehicle, and a force pump thereon with means for driving the same, a hydraulic elevator comprising an ejector having vertical rigid pressure and discharge line sections united therewith, a flexible section interposed between the rigid pressure line section and the outlet of the pump, a rigid upper discharge line section in telescopic relation to the lower section of said line, means on the vehicle for guiding the discharge line for vertical movement as a whole, and means for raising and lowering the ejector.

5. In an apparatus for cleaning out city catch-basins, the combination with a vehicle, of a hydraulic ejector elevator carried by the vehicle to be lowered into the catch-basins, the said elevator having telescopic piping, a

mounting on the vehicle wherein said piping is vertically slidable, an agitator outlet from the ejector, a rotary member for changing the direction of discharge from said outlet, 5 a vertical shaft for operating said rotary member, and a guide on the upper portion of the telescopic piping wherein said shaft is vertically movable.

6. In an apparatus for cleaning out city 10 catch-basins, the combination with a hydraulic ejector elevator adapted to be lowered into the catch-basins, of an agitator outlet from said ejector, a rotary member for changing the direction of discharge from 15 said outlet, and a vertical shaft for operating said member.

7. In an apparatus for cleaning out catch-basins, a vehicle, a dumping tank pivotally supported thereon, a hydraulic elevator carried by the vehicle, and a pump having its

outlet connected with said elevator, in combination with a line from the tank to the inlet of the pump, and a connection in said line in the region of the pivot of the tank permitting the dumping thereof without disconnection from the pump. 25

8. In an apparatus for cleaning out catch-basins, a vehicle, a settling bed thereon having a rearwardly located pivotal support, a hydraulic elevator carried by the vehicle, 30 and a pump having its outlet connected with said elevator, in combination with a line leading from the tank to the inlet of the pump, said line comprising a section extending from the forward part of the tank rearward to the pivotal region and another section leading forward therefrom to the pump, 35 and a flexible connection between the rear ends of said sections.

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