J. HILL.

STREET FLUSHING APPARATUS.

APPLICATION FILED APR. 12, 1907.

900,015.

Patented Sept. 29, 1908.

3 SHEETS—SHEET 1.

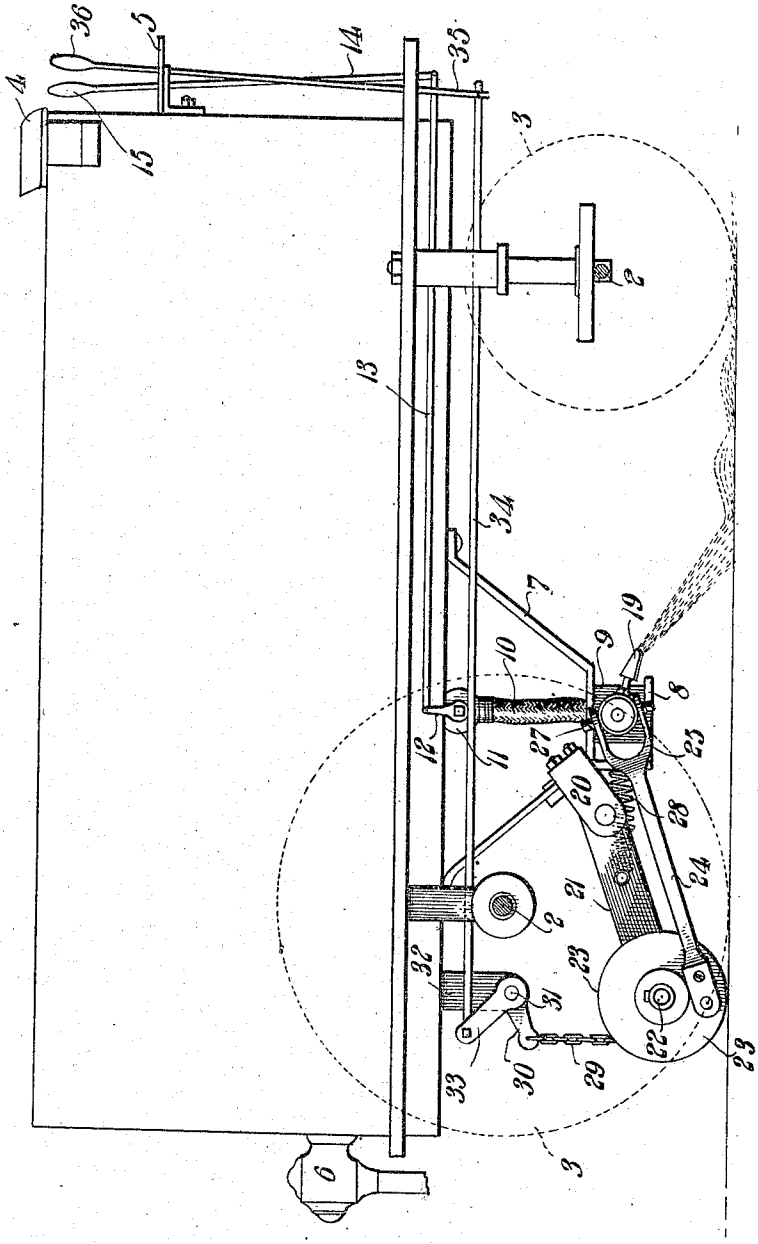

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

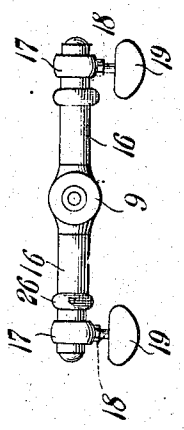


Fig. 4.

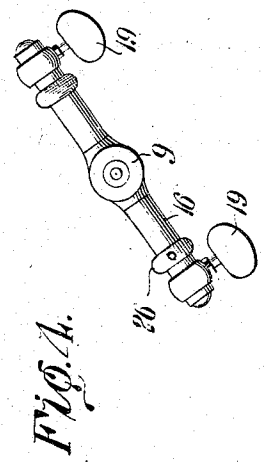


Fig. 5.

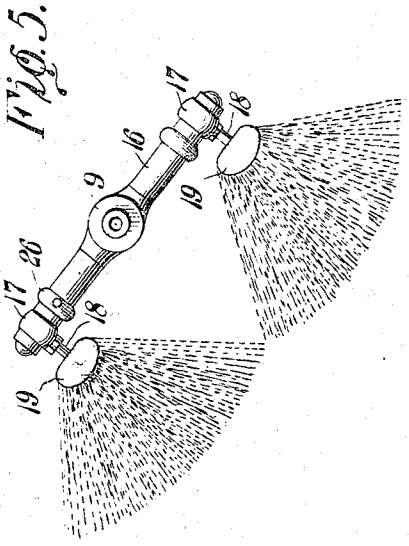
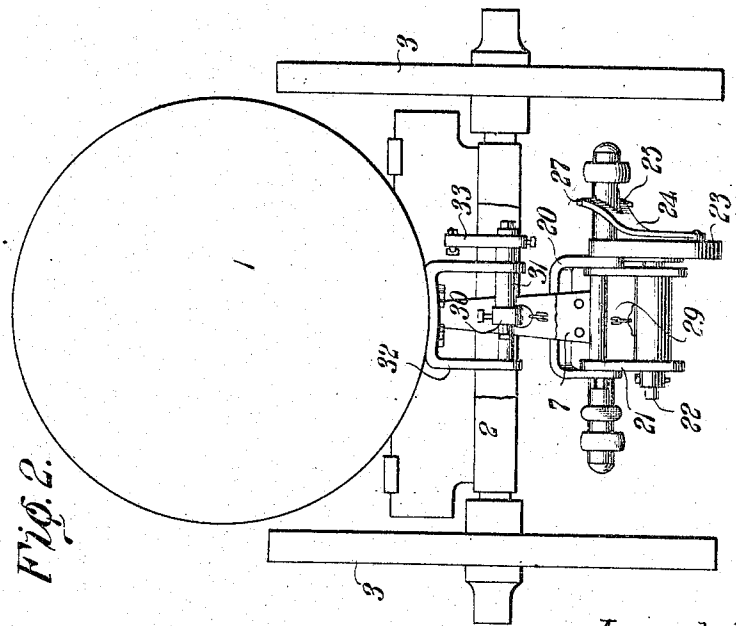


Fig. 2.



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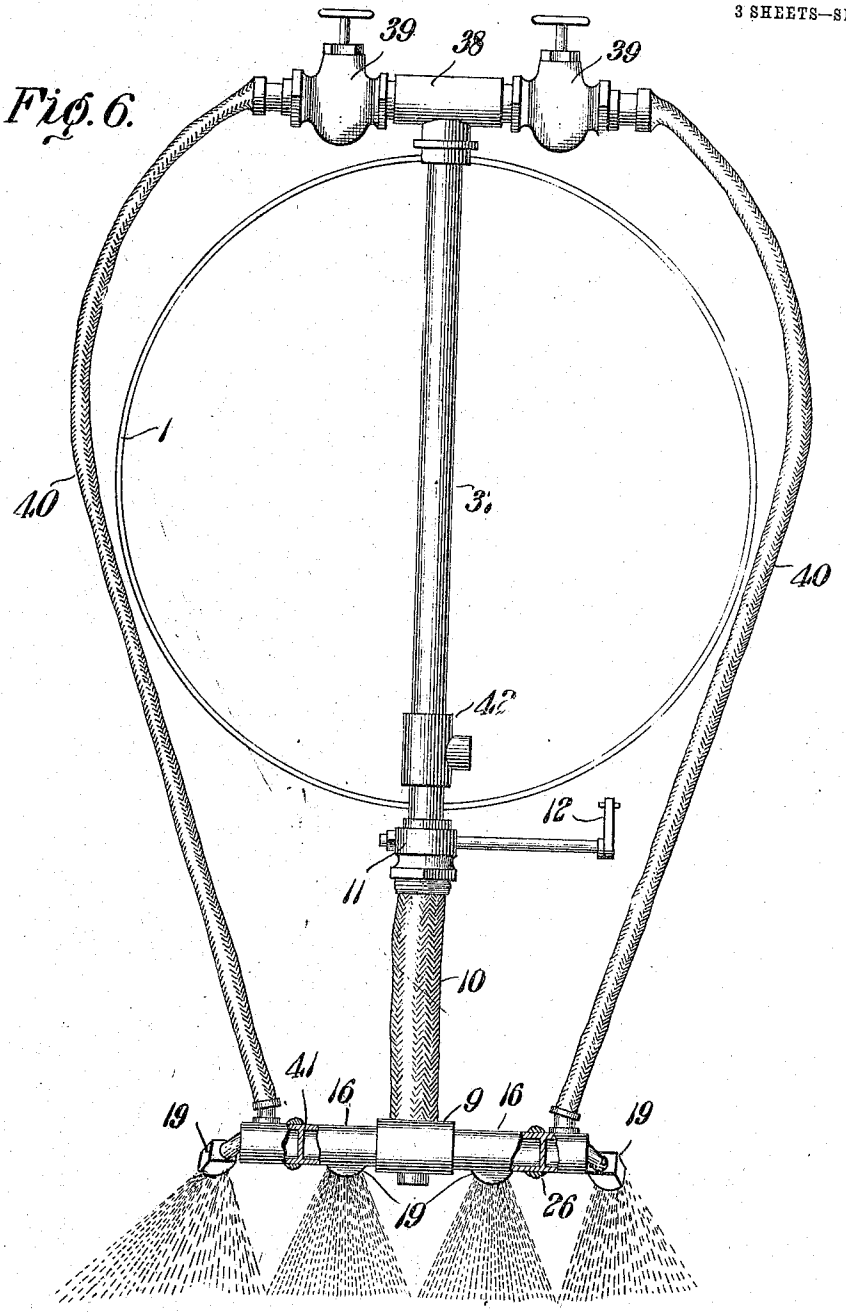
3 SHEETS—SHEET 3.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH HILL, OF WILLIAMSPORT, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO ROBERT L. SIGNOR, OF WILKINSBURG, PENNSYLVANIA.

STREET-FLUSHING APPARATUS.

No. 900,015. Specification of Letters Patent. Patented Sept. 29, 1908.

Application filed April 12, 1907. Serial No. 367,789.

To all whom it may concern:

Be it known that I, JOSEPH HILL, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Street-Flushing Apparatus, of which the following is a specification.

This invention has reference to improvements in street flushing apparatus, and its object is to provide a means whereby the flushing stream or streams may be caused to flow over a large area as the device is drawn along a street.

The invention consists essentially of a water tank mounted upon wheels in the ordinary manner and provided with water spraying nozzles of the fan type, with means for causing these nozzles to throw the jets from side to side through a considerable arc sufficient to cause a flow of water from the vehicle alternately to the opposite sides of the street when the vehicle is traveling along the center of the street. For this purpose, there are provided one or more spraying nozzles on each side of the central longitudinal plane of the vehicle, and these nozzles are connected so as to oscillate about a vertical axis located in the central longitudinal plane. When the nozzle support is at right angles to the plane of travel of the vehicle the water will be projected from the nozzles in fan-like streams directed downward and forward toward the pavement so as to strike the latter at some little distance from the nozzles and including an area in extent wider than the width of the vehicle. Then by oscillating the nozzle carrier about a vertical axis these streams are directed alternately to one side and the other of the vertical longitudinal plane so that the streams of water are projected first toward one side of the street and then toward the other, and where the roadway is crowned the streams will flow with a certain force toward the gutters. Now, by maintaining in the water tank an air pressure either such as would be obtained from the service pressure from the street plugs, or by means of a suitable air pump located on the tank, the water streams issuing from the nozzles may be made to hit the pavement with considerable force. By directing the streams forward and downward against the pavement with the requisite force the dirt is dislodged and washed toward the gutter, whence it will either flow into the sewer inlets or may be ultimately swept up and disposed of in any suitable manner.

The invention will be fully understood from the following detailed description taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a side elevation, partly in section, of the improved street flushing apparatus; Fig. 2 is an end view thereof; Figs. 3, 4 and 5 are plan views of the spraying nozzles and oscillating support therefor in different phases of its operation; and Fig. 6 is a vertical section, with parts in elevation, of a modified form.

Referring to the drawings, there is shown an ordinary cylindrical water tank 1 mounted upon axles 2 and supported in the usual way by wheels 3. The tank is provided with the ordinary driver's seat 4 and foot-rest 5 and also with an inlet valve 6 of ordinary construction through which water coming from a fire plug or street plug of any kind may pass to the interior of the tank 1. In order that suitable pressure may be maintained within the tank 1, the latter is closed tightly and may be provided with a suitable pressure gage, not shown. When the service pressure is sufficient, the water entering the tank 1 will of itself produce sufficient compression of the air therein to establish the desired pressure in the tank, but where this pressure is insufficient a suitable air pump may be provided, arranged either for operation by hand or by connection with the vehicle wheels. Since this air pump may be of any ordinary type and since it may or may not be provided, as desired, it is not shown in the drawings. Fast on the bottom of the tank 1, or, if desired, to the running gear of the apparatus, is a hanger 7, supporting a bracket 8 a short distance above the surface of the roadway. In this bracket 8 is pivotally mounted a T-coupling 9 having a short end projecting upward and there connected by a flexible pipe 10 to a valve 11 fast on the bottom of the tank and communicating with its interior. The valve 11 is provided with a rock arm 12 connected by a link 13 to a lever 14 at the front of the vehicle, having a handle 15 within easy reach of the driver when upon the seat 4. To the T-coupling 9 there are secured two pipes 16 projecting laterally therefrom in opposite directions and these

pipes terminate in heads 17 to which are attached laterally-projecting nipples 18 each carrying spraying heads 19 of the fan or spreader type. These heads both project in a forward direction and are either themselves inclined downwardly or their nozzles or openings are so inclined to direct numerous streams of water, or a fan of water, downward and forward against the pavement.

Fast on the rear arm of the hanger 7 is a yoke 20 of U-shape, having its two arms projecting rearward and downward at an angle. These arms carry the forward end of a frame 21 to the other end of which is journaled the axle 22 of a small wheel or roller 23, and this roller 23 has secured to it a pitman 24, the other end of which is forked, as shown at 25, where it straddles a ring 26 on one of the pipes 16, to which ring the bifurcated or forked end 25 is connected by stud pins 27.

The frame 21 is constrained toward the surface of the pavement by a spring 28 connected to said frame at one end and to the bracket 8 at the other end. The free or rearward end of the frame 21 is connected by a chain 29 to a rock arm 30 on a short rock shaft 31 fast in a bracket support 32 on the bottom of the tank 1, and this shaft 31 carries another rock arm 33 connected by a link 34 to a lever 35 at the front of the tank and extending upward and terminating in a handle 36 within easy reach of the driver when mounted on the seat 4.

The vehicle will be provided with the usual pole, with means for hitching the horses thereto, so that they may draw the flushing apparatus along the street under the control of a driver mounted on the seat 4.

Now, let it be supposed that the tank is as full as may be of water under such pressure as is supplied from the street mains or as may be determined upon by the driver, who may operate a suitable air pump, before mentioned but not shown. Let it also be supposed that the driver is proceeding along the center of a street which has been suitably paved and which it is desired to flush and clean with the water in the tank. The driver manipulates the handle 15 of the lever 14 in such manner as to open the valve 11, when the water under pressure will flow through the flexible pipe 10 and be diverted by the T-coupling 9 to the two pipes 16, and will ultimately issue through the heads 19 in a downward and forward direction, as indicated in Fig. 1, and will strike the pavement on an arc of considerable extent, the streams being of sufficient area to meet at the center. Since the water is directed under a considerable pressure it will tend to loosen any dirt which may be on the pavement, and it will be carried with the stream of water which flows under the force of projection onward toward the front and side of the vehicle, as indicated in Fig. 1.

Now, suppose the driver of the vehicle proceeding along the middle of the roadway desires to flush the surface of the roadway not only in the plane of progress of the vehicle and so much to the side thereof as the fan streams when stationary will reach, but also the entire width of the roadway. Under these conditions he properly manipulates the handle 36 of the lever 35 to permit the wheel 23 to be lowered under the action of the spring 28 into contact with the surface of the roadway, the wheel being lifted away from the roadway when it is desired that it be inactive. Now this wheel, traveling along the roadway under such frictional contact therewith as may be caused by the force of the spring 28, will through the pitman 24 oscillate the spray-head carrier about the vertical axis in the bracket 8, which oscillation is permitted by the flexibility of the pipe 10. The fan-shaped streams of water will now be directed first to one side of the vehicle at an angle to the vertical plane of travel thereof, and then to the other side of this plane, and since the roller 23 is comparatively small, this oscillation will be correspondingly rapid and it may be timed so as to occur two or more times within a distance equal to the length of the flushing apparatus. This alternate sweep of the streams from one side to the other, coming with considerable force from the nozzles of the spraying heads, will cause the cleansing of the entire surface of the street by the passage along its middle of the apparatus herein described.

With spraying nozzles such as I have shown there is very little splashing, but in order to save the horses drawing the vehicle from being splashed a suitable shield may be provided, although this is not shown in the drawing. Nor is the location of the spraying apparatus necessarily that which I have shown, for it may be otherwise located with relation to the vehicle, and may even be so located as to cause the stream to be projected rearwardly from the vehicle. The nozzles of the spraying heads are of any suitable type, and each head may, if desired, have a simple flat opening to form the fan-shaped stream of water. It will be understood, of course, that instead of the flexible pipe 10 a rigid pipe may be used with a swivel joint to permit the oscillation of the spray-head carrier so that such connection presents sufficient flexibility to the connection between the tank and the carrier as to permit the desired oscillation of the latter on a vertical axis.

While I have described the tank as being drawn by horses, it will be understood that any suitable motive power may be used and that the oscillation of the spraying heads may be effected in other ways than the specific way which I have illustrated. It will also be

understood that the spraying heads may be under the control of suitable valves so that one only can be placed in action if it be so desired, as when the flushing apparatus is proceeding along the roadway near the gutter. I have not illustrated such sprinkler-head valves, since they may be such as are commonly used with watering carts having fan sprinkler-heads.

Referring to Fig. 6, the connection with the tank 1 to which the flexible pipe 10 is coupled is continued upward by means of a pipe 37 which extends upward to the top of the tank and is there connected with a T-head 38, to each branch of which latter there is coupled a valve 39. Extending from each valve 39 is a flexible pipe 40 outside the tank 1, and connected at the lower end to the outer respective end of the corresponding pipe 16. In the structure shown in Fig. 6 there are four spray heads 19, one at the outer end of each pipe 16 and the others in said pipe 16 but nearer to the pivot thereof. Each pipe 16 is divided into two parts by a diaphragm 41 so that water coming through the pipe 10 will reach the two spray heads 19 nearest to the pivot point of the pipes 16 and water coming through the flexible pipes 40 will reach the respective spray heads 19 at the ends of the pipes 16. The last named spray heads may be arranged with relation to the pipes 16 in any position desired, but preferably these spray heads will project in the same general direction as the other spray heads 19 and may diverge outwardly and downwardly from the general line of travel. The means for oscillating the spray head holder in the structure shown in Fig. 6 is not illustrated, but may be the same as that shown in the other figures.

In the normal operation of the machine the outermost spray heads 19 will throw the water toward the sides of the street to a certain extent even when the entire structure is not oscillated since these outermost spray heads may project from the spray head holder at an angle to the line of travel, and when the holder is oscillated the streams thrown from the outermost spray heads will cause the water to flow through a wide area toward the gutters of the street, while the other spray heads take care of the dirt toward the middle of the street.

Now, let it be supposed that it is desirable to sprinkle but one side of the street, say toward the gutter. The wheel 23 is raised and when the water is turned on through one of the valves 39 and one of the flexible pipes 40 the particular spray head 19 with which this pipe is in communication is set in operation and the reaction of the outflowing water will cause the spray head holder to assume its proper relative position around the pivot to direct the water as desired. This operation, it will be seen, is entirely automatic, and, consequently, no lever or other mechanism for adjusting the spray head carrier is necessary.

In order that the water within the tank, which, as before stated, is under pressure, may reach the hose 10 on the pipe 37, a T-coupling 42 may be included with one branch open to the interior of the tank. It will be understood that the hose 40 are sufficiently flexible to permit the movement of the pivoted support for the spraying heads about its pivot in the manner described.

I claim:—

1. A street flushing apparatus comprising a suitable vehicle, a water tank carried thereby, a nozzle below the tank and adapted to direct a stream of water downwardly at an angle against the street surface, a carrier for the nozzle depending from said vehicle and adapted for oscillation about a vertical axis, and means for causing the oscillation of the nozzle to direct the stream of water to each side of the central line of travel of the nozzle along the street by the progressive travel of the vehicle along the street.

2. A street flushing apparatus comprising a suitable vehicle, a water tank carried thereby, a carrier depending from the vehicle in its longitudinal median plane and adapted for oscillation about a vertical axis, nozzles mounted on said carrier on opposite sides of its axis and arranged to direct each a stream of water downwardly at an angle against the street surface, and means for oscillating the carrier and the nozzles mounted thereon to direct streams of water alternately to each side of the line of travel by the progressive movement of the vehicle.

3. A street flushing apparatus comprising a suitable vehicle, a tank mounted thereon, an oscillating carrier, spraying heads carried thereby, connections between the tank and the carrier at the axis of oscillation of the latter, a frame pivotally supported at one end from the tank, a wheel or roller at the other end of the frame arranged for engagement with the roadway surface, and a pitman connecting said wheel or roller with the oscillating carrier at one side of its axis of oscillation.

4. A street flushing apparatus comprising a suitable vehicle, a tank mounted thereon, spraying heads, a carrier therefor mounted on the vehicle for oscillation on a vertical axis and carrying said spraying heads so as to direct the streams issuing therefrom in a downwardly inclined direction against the roadbed, a drive wheel and connections for oscillating the spraying head carrier, mounted on said vehicle, a spring for urging said drive wheel against the roadway, and means for lifting said drive wheel away from the roadway against the action of the spring.

5. In a street flushing apparatus, a suitable vehicle, a water tank carried thereby,

nozzles shaped to direct a wide, thin stream of water at an angle toward the street surface, and means for oscillating said nozzles to direct the streams issuing therefrom alternately to either side of the median line of travel of the vehicle by the progressive movement of said vehicle along the street.

6. In a street flushing apparatus, a suitable vehicle, a water tank carried thereby, nozzles below the tank with their discharge ends directed forwardly and at an angle toward the surface of the street, and means for oscillating the nozzles about a vertical axis by a progressive movement of the vehicle along the street.

7. In a street flushing apparatus, a suitable vehicle, a water tank carried thereby, a nozzle carrier below the tank and capable of oscillation on a vertical axis, said nozzle carrier being provided with compartments on each side of the vertical axis, means for coupling either or both compartments to the water tank, nozzles mounted on said carrier and directed downward at an angle toward the street surface, and means for oscillating said carrier about its vertical axis to direct the streams issuing from the nozzles alternately toward opposite sides of the street by the progressive movement of the vehicle along the street.

8. In a street flushing apparatus, a suitable vehicle, a water tank carried thereby, a nozzle carrier below the tank and capable of oscillation on a vertical axis, nozzles mounted on said carrier on opposite sides of the axis of the carrier, and means for coupling the nozzles independently to the tank to cause them to adjust themselves to the line of travel by the reactive effect of the streams of water issuing therefrom.

9. In a street flushing apparatus, a suitable vehicle, a water tank carried thereby, a nozzle carrier below the tank capable of oscillation on a vertical axis, nozzles on each side of the axis of the carrier and mounted on said carrier to direct streams of water downwardly at an angle to the street surface and forwardly with relation to the direction of travel, means for coupling the nozzles independently to the tank, and means rendered active by the progressive travel of the vehicle along the street for automatically oscillating the carrier and the nozzles thereon to direct the streams of water alternately toward opposite sides of the street.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOSEPH HILL.

Witnesses:

WILLIAM R. GOEBRIG,

JOHN AINSWORTH.