E. D. PERRY.

STREET FLUSHER.

APPLICATION FILED DEC. 21, 1916.

1,363,993.

Patented Dec. 28, 1920.

3 SHEETS—SHEET 1.

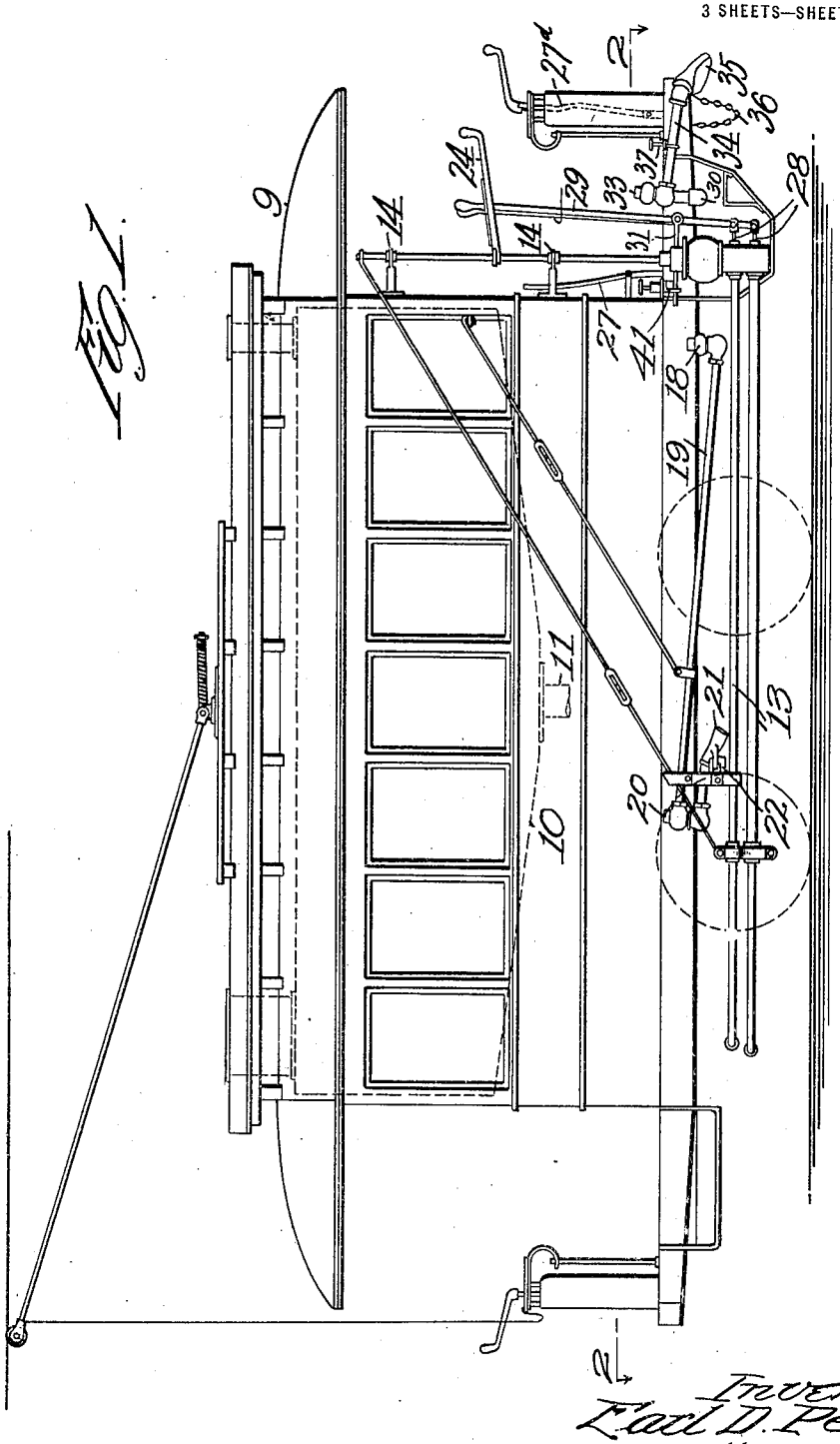


Fig. 1.

Witness
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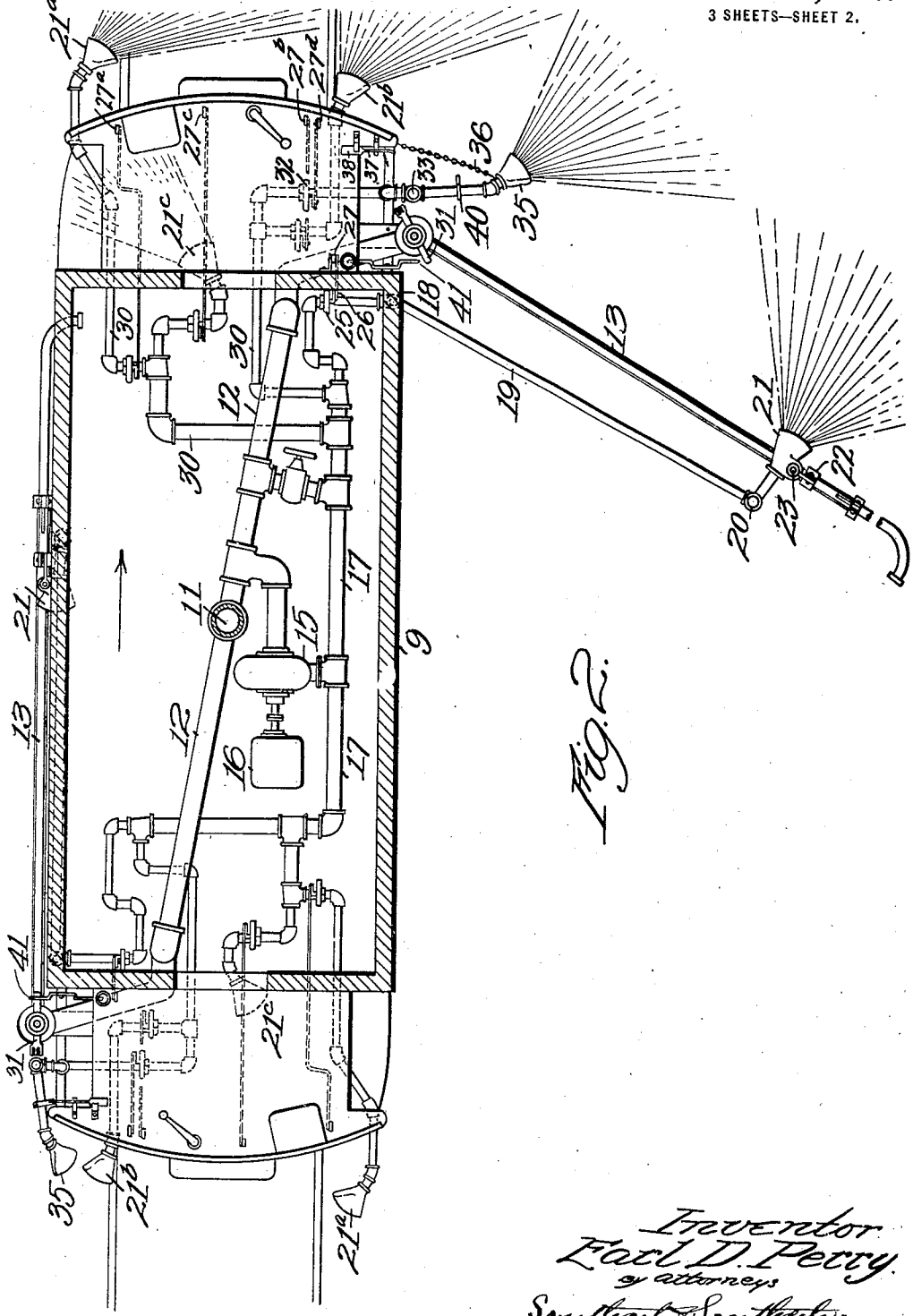


Fig. 2.

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3 SHEETS—SHEET 3.

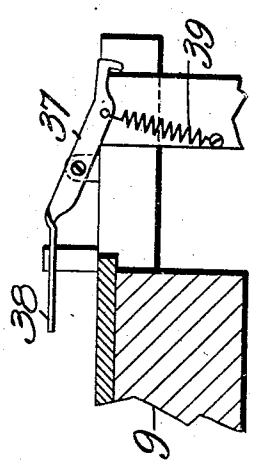


Fig. 5.

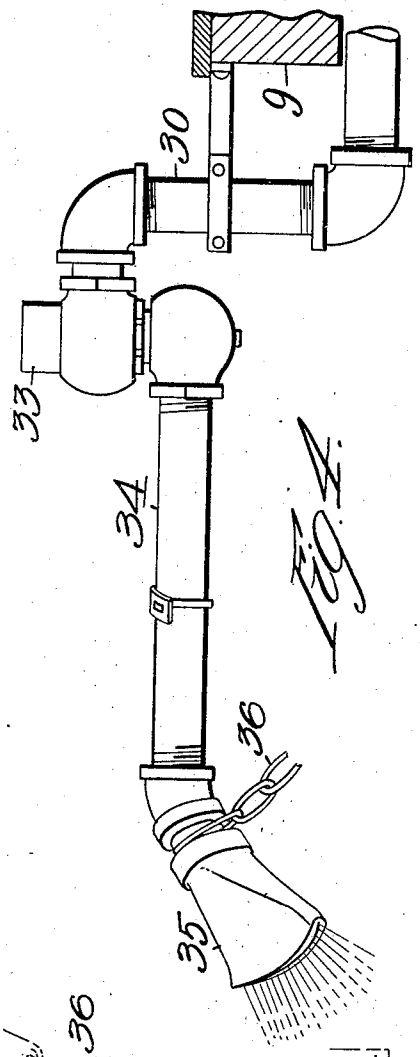


Fig. 4.

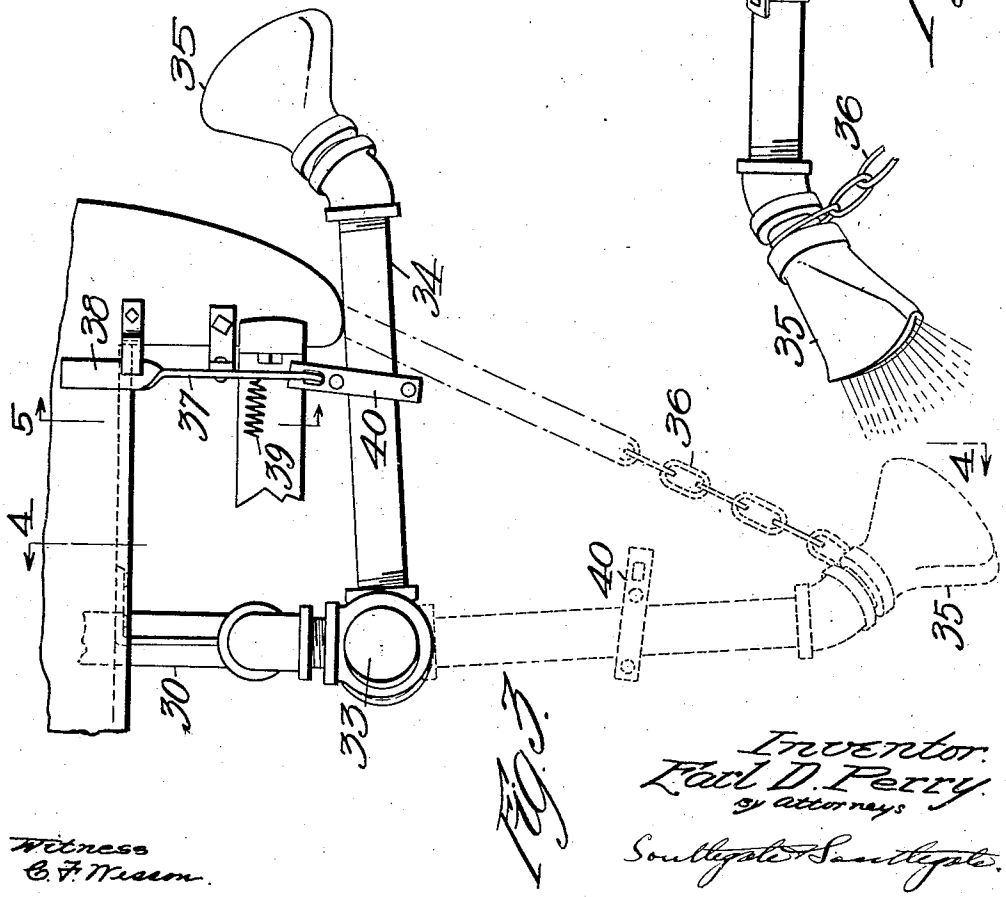


Fig. 3.

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UNITED STATES PATENT OFFICE.

EARL D. PERRY, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO AMERICAN CAR SPRINKLER CO., OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

STREET-FLUSHER.

1,363,993. Specification of Letters Patent. Patented Dec. 28, 1920.

Application filed December 21, 1916. Serial No. 138,153.

To all whom it may concern:

Be it known that I, EARL D. PERRY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented new and useful Street-Flushers, of which the following is a specification.

This invention relates to a vehicle flushing device. The principles of the invention are capable of use in connection with automobile and horse-drawn tank vehicles, but the invention is particularly adapted for use on vehicles adapted to run on car tracks and carrying a tank for street flushing purposes.

The principal objects of the invention are to provide means whereby a tank car running on tracks will have a wide range of operation so that it can be used effectively to flush either a narrow or a wide street without danger of unduly injuring the street surface or sending a large volume of water up against the gutter in case of narrow streets; to provide means whereby one or a plurality of flushing nozzles can be employed at the same time according to the width of the street; and particularly to provide means whereby a flushing or scouring nozzle that is in use whenever the device is used at all for flushing purposes is assisted by one or more additional flushing nozzles that not only scour the surface of the street at a distance laterally from the first nozzle, but are arranged so that they will have the after-effect of taking up the wash from the first nozzle and carrying it away toward the side of the street, the last nozzle of the series taking the wash from all the rest and depositing it in the gutter.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a side elevation of a tank car constructed in accordance with this invention;

Fig. 2 is a sectional view of the same on the horizontal line 2—2 of Fig. 1, showing the parts under the tank in plan;

Fig. 3 is a plan on enlarged scale of one of the flushing nozzles showing a second position in dotted lines;

Fig. 4 is a sectional view of the same on the line 4—4 of Fig. 3, showing the nozzle in front elevation and in its operative position, and

Fig. 5 is a sectional view on the line 5—5 of Fig. 3, illustrating the holding latch in rear elevation.

It is a well-known fact that the forcing under pressure of a sheet of water on a street surface nearly parallel to its plane is an efficient way of scouring such a surface and removing the water and dirt. Such an arrangement is particularly adapted for horse-drawn or motor tank vehicles for the reason that they can move as near the sidewalk as may be desired, according to their construction, but when the same principle is applied to the car tank vehicle, which is restricted in its motion because it runs on car tracks, some difficulties are encountered.

In the first place where a wide street is to be cleaned it is necessary to use high pressure and direct the nozzles at a different angle from the car from that ordinarily employed on narrow streets if highest efficiency is to be obtained. In order to do this it would be desirable to have a different nozzle for each width of street because a single nozzle is depended upon both to scour the street surface and wash away the debris into the gutter under the same impulse. Different degrees of pressure would also be desirable in this case because the nozzles would have to carry the water farther in the case of a wide street than in the case of a narrow one.

This invention is designed to utilize the car type of tank vehicle for the flushing of street surfaces in a practical and efficient manner, and I have discovered that this can be done by the use of nozzles of the flat variety located so as to direct their sheets of water at comparatively obtuse angles to the street surface, by providing a series of them at different distances from the car or car tracks. Those farther away can be arranged to perform the scouring action as is the case with those nearer the car, but they also are so located with respect to the latter that they will take their wash and carry the water and dirt farther from the car track, and the last one of the series will deposit it in the gutter. In this way only so much force is necessary as may be needed to clean a narrow surface, and that itself is sufficient to carry the materials off as far as may be nec-

essary with this type of flusher and still leave the angle high enough so that the cleaning action is comparatively efficient under comparatively low pressure, if desired.

Referring now to the drawings, the invention is shown as applied to a tank car 9 running on street railway tracks and having the usual water tank 10 provided with an outlet 11 which in this case is shown as leading through two mains 12 to a pair of pivoted sprinkler arms 13. These sprinkler arms are mounted to turn on pivots 14, as is well understood in this art. In the form shown herein two sprinkler pipes are illustrated, although that is not necessary as far as this invention is concerned. Connected with one of the mains 12 is a pump 15 operated by a motor 16 suitably supported below the tank for the purpose of delivering water from the tank under pressure to a flusher main 17, shown as extending both forward and back.

In the form shown in the drawings this main is connected by a pivot joint 18 with a pipe 19 which is adapted to swing about the pivot and receive water under pressure from the main. This is also provided with a similar joint 20 for delivering water to a flushing nozzle 21. This nozzle is pivoted on a bracket 22 on the pipe 13 by means of a pivot pin 23. The relation of the pivots 18, 20, 23 and 14 is such as to give a substantially parallel motion to the pipe 19 with reference to the pipe 13 and to swing the nozzle 21 out into a position substantially perpendicular to the pipe 13 when in the position shown in Fig. 2. When the spray pipe 13 is folded up to the side of the car and held by the pivoted latch 41, as shown on the upper side of Fig. 2 and also in Fig. 1, the nozzle 21 is moved into a position nearly parallel with it and with the side of the car, so that it will not project out and take up unnecessary room. When the arm 13 swings outwardly it brings the nozzle 21 to a position more and more nearly normal to the side of the car, the farther the pipe swings. Consequently by swinging the spray pipe the necessary distance by means of a handle 24 the operator has full control of the position and direction of the flushing nozzle 21.

The discharge of the water from the pipe 17 to the pipe 19 is controlled by a valve 25. The stem of this valve is provided with an arm which is connected by a link 26 with a lever 27 by which the valve is opened and closed. The two spray pipes 13 are shown as independently controlled by two valves 28 and two levers 29 pivoted on an arm 31, as is usual.

The pressure mains 17 are shown as extending in both directions from the center of the car so as to supply a duplicate arrangement on the other end and the other side of the car with water under pressure, and they are also connected with a plurality of other pipes 30 having nozzles 21^a, 21^b, 21^c and the like also for flushing purposes. Each one of these is separately controlled by a valve like the valve 25 having the same kind of connections, a series of handles 27^a, 27^b, and 27^c being shown for controlling these valves.

Another handle 27^d of a similar character is shown as controlling a valve 32 connected with one of these pipes 30. This pipe is provided with a pivot joint 33 conducting water to a pipe arm 34 swinging on the center thereof, and provided with a flushing nozzle 35. It is to be observed with reference to Fig. 1 particularly, that this pivot joint 33 is not mounted in exactly vertical position so that the pipe arm 34 depends down from it slightly. The reason for this construction is to cause the arm to swing back by gravity into the position shown in Fig 3, that is, it is folded to inoperative position whenever it is not to be in use. Gravity is depended upon for this purpose, and the pressure of the water introduced into the pipe is depended upon for swinging it out to its operative position, a chain 36 being employed for limiting its outward motion.

On the car is located a flexible spring-pressed latch 37 having a projection 38 extending inward on which the motor-man can step to swing the latch up in opposition to the spring 39. This latch is adapted to engage in a notch in the convex end of a strap 40 carried by the arm 34. This automatically latches the same and holds it in position until released by pressing in the projection 38. If then the pressure is introduced it has the effect of swinging the arm out to the position shown in dotted lines in Fig. 3, while gravity will bring it back as soon as pressure is shut off. In this way the motor-man has immediate control of this nozzle without having to shift it back and forth manually. It is not usually intended to operate it for flushing purposes except when it is in its extended position, as shown in Fig. 2, although the nozzle 21 can be operated for flushing purposes at various distances from the car by reducing the pressure.

It will be observed that there is a relationship between the several nozzles 21^a, 21^b, 35 and 21. The nozzle 21^a is directed inwardly from the left side of the car to flush the street surface under the car and between the tracks and to wash the material out over the right-hand track. The nozzle 21^b is located in such position as to flush or scour the surface of the street over the right-hand track and for a narrow space to the right-hand side of it, and it is also located slightly back of the nozzle 21^a so that the solid particles washed up by the latter and

the water left from it are deposited in front of the sheet of water as it strikes the pavement from the nozzle 21b. The nozzle 35 when it comes into operative position is also designed to direct its sheet of water so as to strike the street back of the position in which the materials left by the nozzle 21b are flowing so that while they are in motion it will take them up and increase their velocity but direct them also toward the side of the street. This position of the parts is indicated in Fig. 2, and it will be observed that if a narrow street is being operated upon these three nozzles will be sufficient. If, however, it is desired to operate on a wide street the nozzle 21 is brought into position as indicated, and there the same process above described is repeated. The sheet of water strikes the ground at the rear of the position at which the sheet from the nozzle 35 strikes it and picks the same up and carries it along with it to the gutter. I find a convenient angle at which to dispose these several nozzles from the horizontal to be from twenty-one to twenty-six degrees, but I do not wish to limit myself to any particular angle.

One important point of this invention lies in the relative arrangement of the nozzles to each other so that each one farther from the center of the street is at the rear of the next one, and is so directed as to pick up the water and dirt being carried along by it and assist them to move farther along toward the gutter.

It is to be remembered that during flushing the car is moving forward and it can move at a very rapid rate and still do very efficient work with this arrangement, thus providing an additional advantage over the motor or horse-drawn vehicles in use. The speed of the car itself is taken advantage of to assist in forcing the various streams of water forwardly while the nozzles are directed outwardly in such a way as to further force them to the side and finally into the gutter. In this way no deposit is left along the street, and yet the device is flexible enough so that it can be used for narrow and wide streets at pleasure, and no adjustment of the nozzles to change the angle at which the streams strike the surface of the street is necessary. In fact, all the nozzles are preferably permanently fixed so that the angle cannot be changed.

The nozzles 21, 21b, and 35 are so arranged preferably that the right-hand edge of each is slightly lower than the left-hand edge, giving a slight tilt to the sheet of water deposited upon the street surface.

It is understood of course that only one end of the car has been described, the other end being arranged in the same way so that when traveling in the opposite direction the same conditions can be obtained, and a single car traveling along a single or double track will be adapted to flush the entire surface of the narrowest or widest street, and yet the amount of water discharged and the force with which it is brought over to the gutter can be regulated so that a great amount of water need not be washed up over the curb on the sidewalk.

It will be seen, therefore, that the auxiliary nozzles 35 and 21 have two functions; namely, to scour the surface of the street and to pick up a flowing body of water and dirt previously set in motion and carry the same outwardly toward the gutter. As a matter of fact, the latter function is especially important because in many streets the scouring action ought to be stronger and more efficient near the car tracks where there is often a pavement of paving stones while the rest of the street is of dirt or smooth pavement.

Although I have illustrated and described only a single form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In a flushing machine, the combination with a vehicle, of a front nozzle located at the side of the vehicle and discharging forwardly, outwardly and downwardly, and a plurality of additional nozzles all directed downwardly, outwardly and forwardly and each one being located at the rear and to the right-hand side of the first one, the second nozzle being mounted to swing on an axis at the side of the vehicle and being adapted to be forced out into operative position by the force of the water passing through it, the third nozzle being mounted to swing outwardly from the side of the vehicle and having manual means for operating it.

2. In a flushing machine, the combination with means for supplying water under pressure, of a flushing nozzle connected therewith and mounted to swing freely about an axis located slightly inclined, whereby the nozzle will swing in one direction by the force of gravity and will swing in the other direction when water is admitted to it under pressure.

3. In a flushing machine, the combination of a supply pipe for supplying water under pressure, a pipe arm, a pivot joint for connecting the pipe arm with the supply pipe and supporting the pipe arm therefrom, said pivot joint being mounted at a slight inclination from the vertical, whereby the pipe arm will be adapted to swing into one position by the force of gravity, and a nozzle on said pipe arm.

4. In a flushing machine, the combination

of a supply pipe, and a pipe arm pivoted thereto on an inclined axis, said pipe arm having a flushing nozzle at the end thereof, a stop located in position to hold the pipe arm in one extreme position, said pipe arm being adapted to swing out from that position on account of the force of water passing through it, and means for limiting the outer position thereof.

5. In a flushing machine, the combination of a supply pipe and a pipe arm pivoted thereto and having a flushing nozzle thereon, of a spring latch for holding the pipe arm in its retracted position, said spring latch being adapted to be drawn back to release the arm, whereby upon the forcing of water through it it will swing outwardly, said arm being mounted at an inclination so that when the water is turned off it will swing back to its folded position to be engaged by the latch.

In testimony whereof I have hereunto affixed my signature.

EARL D. PERRY.