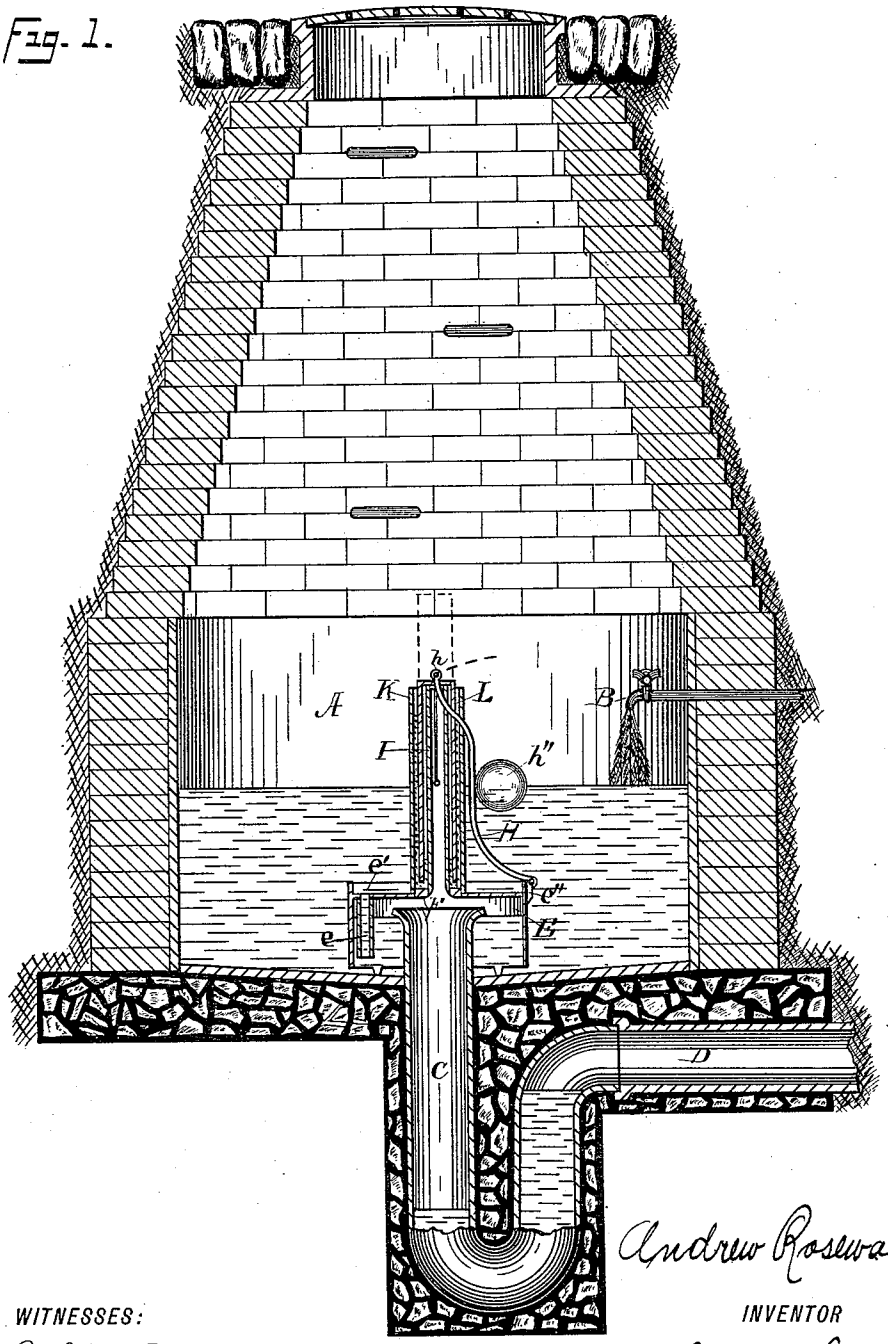
(No Model.) 2 Sheets—Sheet 1.

A. ROSEWATER.

FLUSHING TANK.

No. 428,254. Patented May 20, 1890.

Fig. 1.



WITNESSES:

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ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

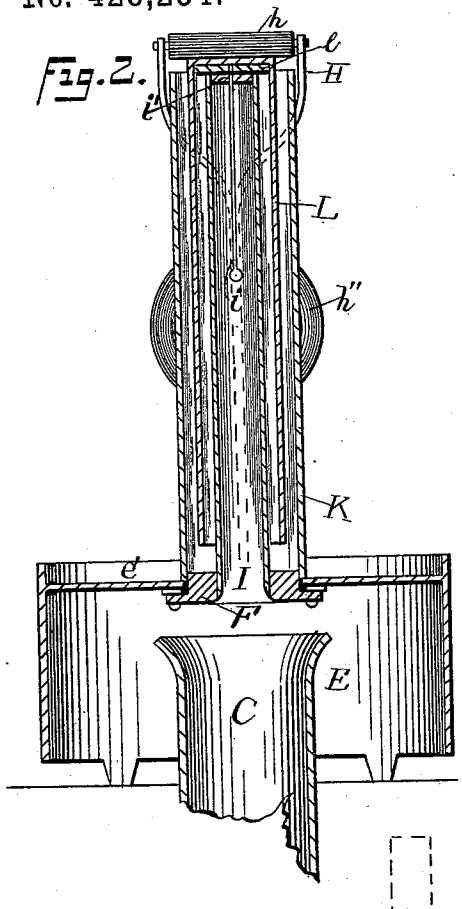


Fig. 3.

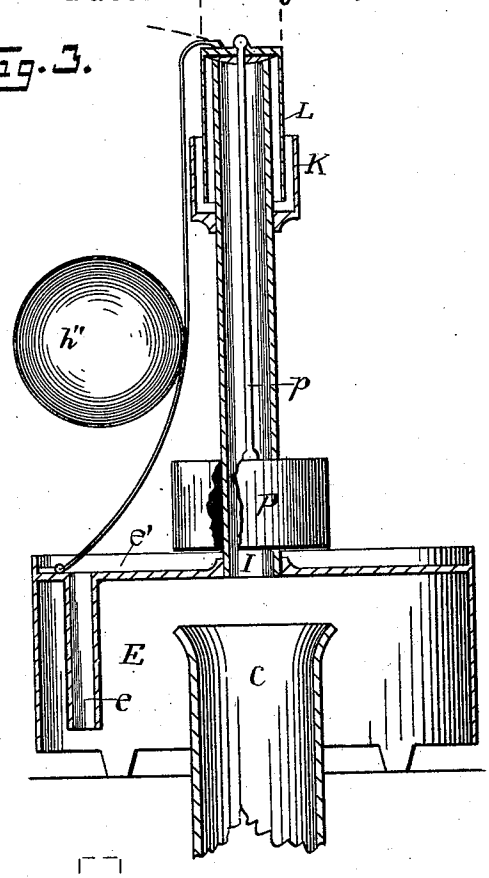


Fig 4

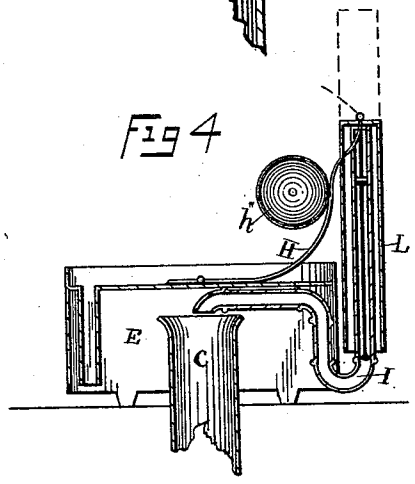
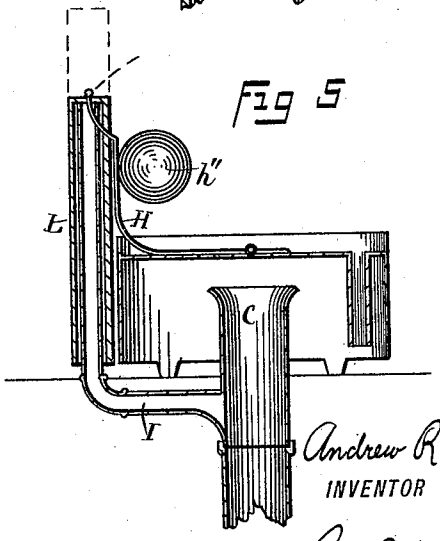


Fig 5



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UNITED STATES PATENT OFFICE.

ANDREW ROSEWATER, OF OMAHA, NEBRASKA.

FLUSHING-TANK.

SPECIFICATION forming part of Letters Patent No. 428,254, dated May 20, 1890.

Application filed November 19, 1889. Serial No. 330,871. (No model.)

To all whom it may concern:

Be it known that I, ANDREW ROSEWATER, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Flushing-Tanks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to devices for automatically flushing sewers, pipes, conduits, &c.

The object of my invention is to provide an automatic flushing device that shall be extremely simple of construction, positive and quick acting, and possessing great flushing powers; and in furtherance of this object my invention consists in the construction, combination, and arrangement of parts, as hereinafter more fully described, pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical sectional view of my automatic flushing device as arranged and adapted to work in combination with a flushing-tank. Fig. 2 represents an enlarged detail view more clearly illustrating the operating parts. Fig. 3 shows a modification wherein I employ a float-actuated mercurial seal for the seal shown in Figs. 1 and 2. Fig. 4 illustrates a modification wherein the sealing-chamber is eliminated, the compressing-tube being led into the air-compressing chamber from without. Fig. 5 shows a modification wherein the compressing-tube is led directly into the trap.

Similar letters of reference refer to corresponding parts throughout the drawings.

In my present invention I aim to overcome the great objection generally encountered in flushing devices—that is, complexity of construction and unreliability of action. To attain the best results, a flushing device should be simple of construction, sudden and positive of action, free of valves, and the operating parts should be light and readily adjustable. These principles I endeavor to embody in my invention, wherein—

A represents a flushing-tank of the ordinary form of construction, which is provided at a convenient point with a supply-pipe and regulating-cock B, by means of which a constant stream of water is brought within the tank. Leading from the lower part of said tank is a trap or inverted outlet siphon C made of iron, clay, or other suitable material, which connects with a sewer or other outlet D at some point below the inner base of the tank. This trap may be of any suitable construction, but must be water and air tight throughout its entire length. The upper end of said trap, which extends the requisite distance from the bottom of the tank, may be straight and of the generally uniform diameter of the section, or, what is preferable, be bell-mouthed, as illustrated.

Immediately above and encircling the bell-mouthed end of the siphon-outlet C is situated the air-compressing chamber E. This chamber is in the form of an inverted vessel, the lower open end being provided with three supporting-legs, upon which the chamber rests, while the upper or deck portion is provided with two annular openings, the central and larger one being adapted to contain the threaded collar F, while the smaller one holds the repriming-tube *e*, as shown. The chamber, which may be of iron, clay, copper, or any other suitable material and of any desired conformation, is provided upon its deck portion with a repriming-chamber *e'*, which is preferably formed by extending the sides of the chamber. The repriming-tube *e* leads from said repriming-chamber to within a certain distance of the bottom of the main or air-compressing chamber, the lower open end of said tube determining the line of compression. At a suitable point the compressing-chamber is provided with a lug *e''*, which is adapted to engage the bifurcated end of the float-actuated rod H.

Extending vertically a suitable distance from the central opening of the air-compressing chamber E is an air-compressing tube I. This tube is held by means of an outside screw-thread within the collar F, and communicates directly with the air-compressing chamber E, as clearly illustrated in Fig. 2.

The collar F, which is preferably of metal, is provided with an interior and an exterior

screw-thread, the former being adapted to engage the threaded end of the compressing-tube I, while the latter holds the casing-tube K. The collar F is provided in addition with a projecting flange, which is adapted to work against the lower surface of the air-compressing chamber and is held by means of suitable screws. The annular space between the tubes I and K constitutes the sealing-chamber, within which is hung the sealing-vessel L, as illustrated in Fig. 2. This sealing-vessel is open at its lower end, while the upper closed end is provided upon the inner side with a rubber buffer *l*. While at rest the sealing-vessel closes the air-compressing tube I by forcing the buffer *l* upon the open end of said compressing-tube, and thus with the liquid within the sealing-chamber forming the seal, by means of which the flush is actuated.

The movable float-actuated rod H, attached to the repriming-chamber *e'*, is provided at its upper end with a bifurcated arm, between which works a small anti-friction roll *h*. This roll is adapted to work upon the closed upper end of the inverted sealing-vessel L and holds said vessel in a locked position until the rod is actuated by means of the float *h''*. The lower end of the rod H is pivotally attached to the compressing-chamber E, while the upper rolled end is adapted to work upon the sealing-vessel L and alternately lock and release said sealing-vessel, as will be understood by referring to the figures.

The air-compressing vessel is placed above the bell-mouthed end of the trap C, so that the open end of the compressing-tube I lies in the center of the trap.

When all the parts have been properly assembled, so that the sealing-vessel L rests within the sealing-chamber formed by the tubes I and K, the bifurcated arm of the float-rod locking upon the sealing-vessels, as shown in Figs. 1 and 2, it is necessary, in order to make the operation of my device possible, to fill the sealing-chamber with water, so as to form a seal. This is also necessary as regards the trap C, which is filled with water until it reaches its point of overflow. When this has been accomplished and the supply-water has been turned on at the desired rate of speed by means of the cock B, the operation of my device is as follows:

As the water rises within the tank A, it also rises within the air-compressing chamber E, and as it reaches the line of compression, determined by the lower open end of the repriming-tube *e*, confines a column of air, which fills said chamber, the compression-tube I, and extends to the water-level within the trap C. The water, rising within the compressing-chamber and trap, forces the air downward, and as a result the water within the trap is also forced downward until the maximum point is reached. At this instant, as illustrated in Fig. 1, the water has risen sufficiently high to reach the float *h''*, and this float, being fixed to the rod H, carries said rod into a perpendicular position until the sealing-vessel L escapes the roll *h*. The unconfined vessel forced by the air within is carried upward, which permits the compressed air within the compressing-chamber and the trap C to escape into the sealing-chamber, and from thence into the tank. The equilibrium within the air-compressing chamber having been disturbed, the water rushes into the siphon-outlet, and rapid, powerful, and complete siphonage ensues. The inward rush of water again causes the sealing-vessel to assume its closed position, and, as the water gradually recedes, the bifurcated end of the rod H again locks upon said sealing-vessel and secures it as before. The open-ended tube *e*, within the repriming-chamber *e*, having offered no resistance to the rise of water, is of course filled. A moment after the tank has been emptied the water within the repriming-chamber will have escaped by means of the tube *e*, and thus afford a temporary open-air communication with the chamber from above, through which a fresh supply of air will refill the chamber, thus destroying the siphonage until the water shall again have risen to the line of compression, when the operation will be as before.

To prevent derangement of the sealing-vessel L, I provide said vessel centrally with a downwardly-extending rod *i*, which is provided at the free end with a ball and works within a small transverse brace *i'*, which is fixed to the compressing-tube I, as illustrated in Fig. 2. As a protective means, I also prefer placing a rubber washer between the collar F and the compressing-chamber, so as to get the chamber perfectly air-tight.

In my several modifications I attain equally satisfactory results with devices somewhat differing from that described in Figs. 1 and 2. Fig. 3, for instance, represents a modification wherein the operating parts are precisely as described before, with the exception that I shorten the sealing-chamber and provide it with mercury in place of water. The sealing-vessel receives impulsion by means of a float P, which is attached to the vessel by means of the rods *p p*. The operation is as described before.

In the modification shown in Fig. 4 I lead the compressing-tube within the chamber from below, and fasten it by any suitable means to said chamber. By means of this arrangement I am enabled to eliminate the outer tube K. (Shown in Fig. 1.)

In Fig. 5 I lead the air-compressing tube directly into the outlet-siphon, the sealing-vessel being operated as in the previous cases.

The operation of all of my devices is of course intermittent, the speed being regulated by means of the inlet-pipe.

Having thus described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a flushing-tank

provided with a supply-pipe and a siphon outlet-pipe, of a fixed air-compressing chamber above said siphon-outlet, of an air-compressing tube leading within said compressing-chamber, a sealing-tube encompassing said compressing-tube, a pivoted float-actuated rod adapted to intermittently lock and release said sealing-tube, and a repriming-opening within the said compressing-chamber, all arranged and adapted to work substantially as and for the purpose specified.

2. The combination, with a flushing-tank provided with a supply-pipe and a siphon outlet-pipe, of a fixed air-compressing chamber above said siphon-outlet, an air-compressing tube leading within said siphon-outlet, a sealing-tube encompassing said compressing-tube, a pivoted float-actuated rod adapted to work upon said sealing-tube, and a repriming-opening within said compressing-chamber, all arranged and adapted to work substantially as described.

3. In a flushing-tank, the combination, with a supply-pipe and a siphon-outlet, of a fixed air-compressing chamber surrounding the free end of said outlet-siphon, an air-compressing tube leading into said compressing-chamber, a sealing-chamber above said compressing-chamber, a sealing-vessel working within said sealing-chamber, a pivoted float-actuated locking-rod adapted to intermittently lock and release said sealing-vessel, and a repriming-tube leading within said air-compressing chamber, all arranged and adapted to work as hereinbefore described.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW ROSEWATER.

Witnesses:
J. D. ZITTLE,
G. W. SUES.