J. SARGENT.
Sewer-Trap.

No. 200,573. Patented Feb. 19, 1878.

Fig. 1.

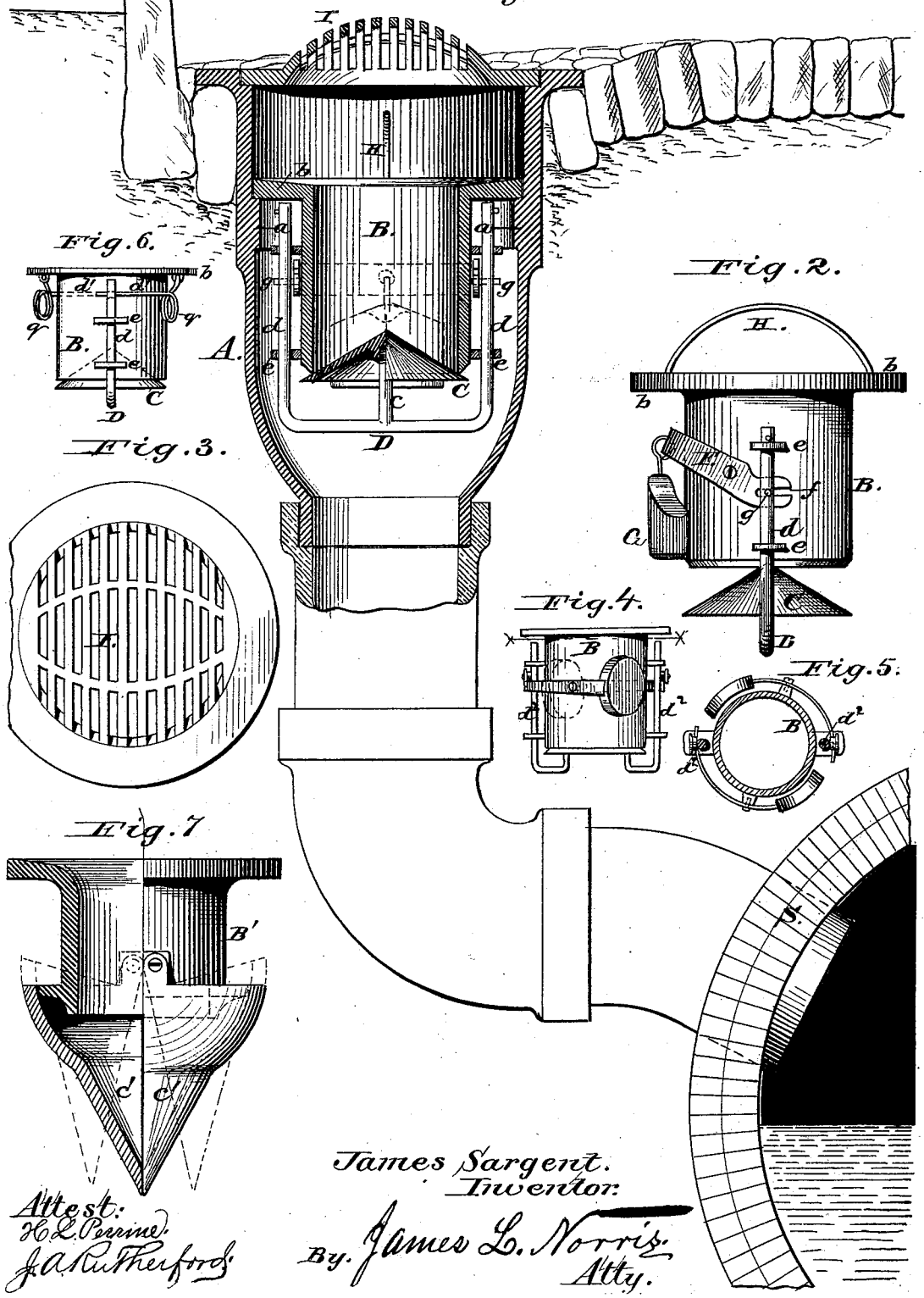

Fig. 6.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 7

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IMPROVEMENT IN SEWER-TRAPS.

Specification forming part of Letters Patent No. **200,573**, dated February 19, 1878; application filed January 26, 1878.

To all whom it may concern:

Be it known that I, JAMES SARGENT, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Traps for Drains, Sewers, &c., of which the following is a specification:

This invention relates to an improvement in that class of traps used in water-closets, drain-pipes, and for closing the laterals of sewers to prevent the escape of sewer-gases and foul air, and to open to permit the influx of water.

As heretofore constructed such traps have, under the pressure of inflowing water, opened on hinges or pivots, the opening extending vertically, and, while permitting the passage of water through the lower portion, also permitted the escape of sewer-gas and foul air through the upper portion at all times except when the entrance to the lateral basin or pipe has been fully occupied by the volume of water, and, as this entrance is seldom so fully occupied, the permission of the escape of these exhalations is a very serious defect, as it is well known that they contaminate the air and engender disease by their offensive odors and noxious qualities, and that in sewers their generation is greatest at the times when the traps are open, and the accumulated garbage and decaying matter deposited within the sewers is stirred up by the inflowing water.

To remedy this defect and provide an efficient and substantial trap, easily adjusted to its place and not liable to become deranged, is the object of my invention; and to this end it consists, first, in the combination, with a cylindrical trap-case, of a yielding conical or flaring valve the apex of which extends within said case, while its curved outer surface has its bearing on the lower edge thereof, whereby the opening of the valve will be entirely on a horizontal line, and only sufficient to permit the passage of the volume of water by which the depression of the cone is occasioned, so that during the passage of water no escape of foul air or sewer-gas can occur; second, in a drain-trap, the combination, with a cylindrical case, of a yielding conical or flaring valve the apex of which projects therein, suitable devices for retaining said valve against the lower edge of said case, and guides for holding it in a vertical and central position during its movement.

In the accompanying drawing, Figure 1 is a vertical central section of the upper terminus of a sewer-shaft and a similar section of a sewer-trap constructed according to my invention, and suspended in position for use. Fig. 2 is a side elevation of the trap detached, with the conical valve depressed. Fig. 3 is a top view of the grating. Fig. 4 is an elevation, and Fig. 5 a horizontal section, of a trap, showing a modified form of valve. Fig. 6 shows another modification of the same. Fig. 7 is a view, partly in section and partly in elevation, of an old form of trap, illustrating the defect in construction which my invention is intended to overcome.

The letter A indicates the curb in the upper portion of the wall of a shaft communicating with a sewer, S. Within this curb, near its top, is a ledge, *a*, formed therewith for supporting the cylindrical trap-case indicated by B, the flange *b* of which rests upon this ledge. C is a hollow conical or flaring valve, the apex of which projects centrally into the case B, while its flaring curved surface rests against the bottom edge of and entirely closes the lower end of said case. Downward from the center of the valve C projects a standard, *c*, which joins with and is supported by a bar, D, arranged under and having arms *d d* extending upward along the outer surface of the case. These arms pass through guides or ears *e e e e*, which project from diametrically-opposite parts of the wall of said case, and serve, in conjunction with the arms *d*, to hold the valve in a vertical central position with relation to the case, so that said valve will at all times thoroughly close the lower end of said case when elevated, but create an open annular passage of uniform width when depressed. These arms should have sufficient lateral play in their guide-bearings or ears *e* to permit the valve C to readily adjust itself to its perfect seat when said valve is pressed upward against the case. F is a loop-lever, which embraces the case B, and is pivoted near its opposite ends to the wall thereof, its short arms having cut therein slots *f*, through which project-pins *g* from the guiding and valve-supporting arms *d*. G is a weight hung to the outer

bent portion or double arm of the loop-lever F. This weight is so regulated that it will pull down the outer portion of the lever F and cause the valve-supporting arms to rise, so that it will be pressed snugly against the lower end of the case B, perfectly closing the same when said valve is not depressed by water flowing into the trap. This weight should be so adjusted as to permit the depression of the valve before a sufficient quantity of water accumulates to overflow the case, and return it promptly when the overbalance of water has escaped, and so that the valve-opening will be surely contracted in proportion to the decrease of any volume of water passing therethrough, in order that there can never occur an opening not fully occupied by the flowing water, which thus prevents the escape through the trap of any sewer-gas or other noxious exhalations. H designates the bail or handle of the trap-case, by which it may be easily removed in case of clogging up by drifting trash, or carried from place to place, as desired. I is the grating, which covers the shaft-opening in the ordinary manner.

In Fig. 6 is represented a modified form of valve-raising devices, consisting of two spring-arms, d^1 d^1, having coils q formed therein, one terminal of each coil being firmly attached to the under side of the flange b, and the other ends projecting through holes in the arms d^1, and fitting loosely therein. When the valve is depressed these arms d^1 are deflected downward; but when said valve is relieved of pressure, the arms (by their resilience) lift it again to its bearing.

Another modification of the valve-lifting devices is shown in Fig. 5, in which separate counterweighted levers d^2 are pivoted to the upper ends of the valve-lifting arms by means of pins projecting from said arms through slots in the ends of said levers, which are curved to conform to the shape of the case.

The defect which is overcome by my invention is illustrated by Fig. 7, which is an elevation of a double flap-valve composed of two hollow half-cones, c' c', pivoted to a case, B′, at their corners, with their points downward, so as to fall together by gravity and form a complete cone. It will be seen that, however small a volume of water flows through and separates the two half-cones, a vertical opening will be made between the entire straight edges thereof, so that while water is flowing inwardly through the point of the cone the upper portion of the valve is open for the outward escape of sewer-gas and foul air. This defect is incident to all hinged valves, none of which will prevent the escape of vapors, while admitting the passage of water at any other time than when the entire area of the case or pipe is occupied by the inflowing stream.

In the construction of my trap it will be observed that all friction-bearings and joints are located above the level of the water-escape, and are therefore not liable to injury thereby, or to become clogged by sediment or trash. The arms d and bar D are placed at a sufficient distance from the case to prevent the lodging of trash or drift between them and said case.

The trap case and valve and connected devices I prefer to form of metal coated with a substance not readily liable to rust, such as iron or bronze plated with nickel. The curb A may be formed of metal or any suitable material used in the manufacture of drain-pipe, and is preferably constructed with an outward metal flange at its upper edge, even when the main body is of earthenware, in order to make a neat finish in setting the curb in place, and to resist the strain of vehicular travel; or an upper section of the curb may be made of metal and the lower portion of terra-cotta, concrete, or other suitable material. The nickel-plating of the trap case and valve, although rendering them more durable, may be omitted without detriment to their proper operation, and the flange may be omitted from the curb, if found desirable.

Having now fully described my invention, what I claim is—

1. The combination, with a cylindrical water-trap case, of a yielding conical valve the apex of which extends within said case, while its inclined surface has its bearing on the lower edge thereof, substantially as described, so that the opening of the valve will be entirely on a horizontal line, and only sufficient to permit the passage of the volume of water by which the depression of the cone is occasioned, whereby foul air or sewer-gas is prevented from escaping through the trap.

2. In a drain-trap, the combination, with a cylindrical case, of a yielding conical valve the apex of which projects upward therein, suitable devices for returning said valve to its bearing against the lower edge of said case, and guides for holding it in a vertical and central position during its movement, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

JAMES SARGENT.

Witnesses:
JAMES L. NORRIS,
JAMES A. RUTHERFORD.