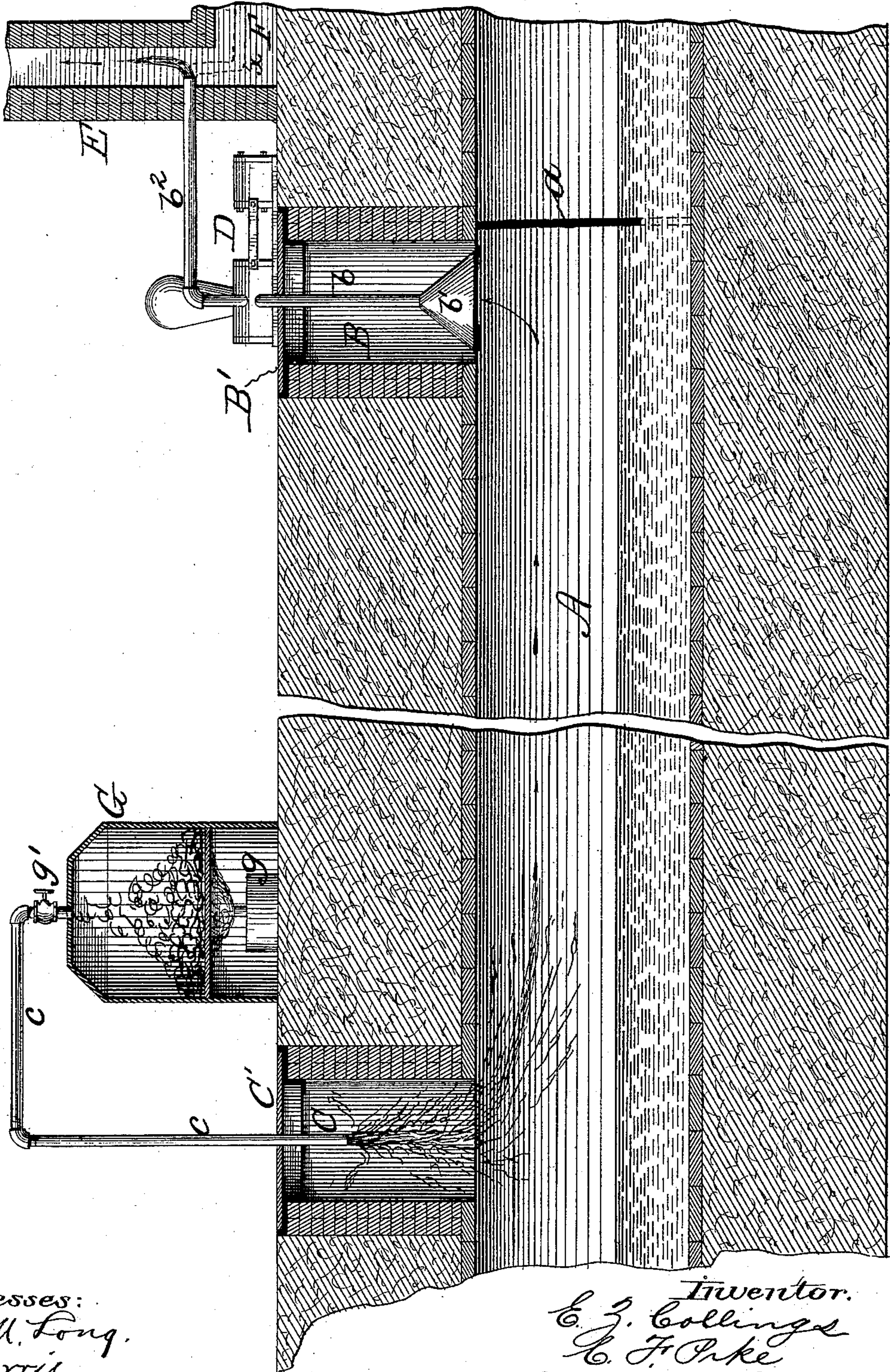


(No Model.)

E. Z. COLLINGS & C. F. PIKE.  
DISINFECTING SEWERS.

No. 297,229.

Patented Apr. 22, 1884.



Witnesses:  
A. M. Long.  
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# UNITED STATES PATENT OFFICE.

EDWARD Z. COLLINGS, OF CAMDEN, NEW JERSEY, AND CHARLES F. PIKE,  
OF PHILADELPHIA, PENNSYLVANIA.

## DISINFECTING SEWERS.

SPECIFICATION forming part of Letters Patent No. 297,229, dated April 22, 1884.

Application filed March 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD Z. COLLINGS, of Camden, in the county of Camden and State of New Jersey, and CHARLES F. PIKE, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Disinfecting Sewers, of which the following is a specification, reference being had therein to the accompanying drawing, which is a diagram illustrating our invention.

Our improvements have relation to disinfecting sewers, and have for their object the accomplishment of such result and the destruction of all fungus; and the invention consists of the novel combination and arrangement of parts comprising a complete disinfecting apparatus, as hereinafter specifically described and claimed.

Referring to the accompanying drawing, A represents a sewer, and B and C two inlets or man-holes thereof. The opening B may be near the outlet of the sewer, while the opening C is at the extreme opposite end, or at the beginning of any of the ramifications of the sewer. At the opening B is placed a pump, fan, ejector, or other suitable suction apparatus, D, which communicates by a pipe,  $b^2$ , with a chimney or conduit, E, or a furnace, F. When to the latter, the pipe  $b^2$  is continued into the same, as shown in dotted lines  $x$ . The opening B is sealed by a cap or cover, B', which is provided with a pipe,  $b$ , having, if desired, a funnel-shaped end,  $b'$ . Said pipe  $b$  is connected to pump D, as shown. On either side of the man-hole or opening whereat the suction is created is placed a removable diaphragm,  $a$ . The opening C is provided with a cap, C', having a pipe,  $c$ , which leads to a disinfectant-gas generator, G. The pipe  $c$  is provided with a valve,  $g'$ . Said generator may be of any suitable or ordinary construction, and the gas may be evolved therein by introducing thereinto a mixture of chloride of lime and vinegar, which chemically act upon each other to evolve chlorine gas; or black oxide of manganese, common salt, and sulphuric acid may be placed within the generator, and heat (shown at  $g$ ) applied thereto for producing the chlorine; or sulphur may be used, it

being inserted in the generator and set fire to or heated, to produce fumes of sulphur; or any other suitable combination of ingredients may be employed, and treated in any desired manner to evolve any of the well-known disinfectant gases or fumes, as we do not confine our invention to the particular kind of disinfectant-gas used, nor to the way in which it is evolved.

The operation is as follows: The gas, being generated in the device G, is confined therein by the closing of the valve  $g'$ . Such gas therefore accumulates under pressure in the generator. The pump D is then started. It exhausts the air within the sewer and creates a draft in the direction of opening B, as indicated by the arrows. Simultaneously with or subsequently to the formation of such artificial draft, the cock or valve  $g'$  is opened, permitting the gas in the generator to expand and propel itself into the opening C, and thence into the sewer. Such gas, entering the path of the artificial draft, is thereby gradually conveyed through the sewer A to the end B, the generator meanwhile still continuing to feed gas to the opening C. When the gas reaches the pump and escapes therefrom, it is stopped, and, if desired, the valve  $g'$  is closed. The sewer is then either filled with gas, according to the volume forced thereinto by the generator G, or such gas has traveled the length of the sewer from opening C to aperture B. In its passage it has attacked and destroyed all fungus growth adhering to the exposed inner walls of the sewer, and thoroughly disinfected and deodorized the latter, thereby rendering it innocuous. By stopping the operation of pump, the gas is confined in the sewer, thereby deriving the full effect of its use. It is gradually used up or carried off by the water passing through the sewer. The water, thereby becoming impregnated with chlorine or the disinfectant gas used, also becomes a disinfectant for the sewer, so that while the gas acts upon the upper part of the sewer such water produces a corresponding effect upon the lower portion thereof; hence the sewer is doubly disinfected.

We have shown and described the generation of the gases at the sewer inlet-openings; but it is evident that the gas may be produced



at one or a central location, compressed into reservoirs, and conveyed to the inlets, either by transporting the reservoirs thereto or conducting the gas through pipes.

5 The air exhausted from the sewer may be forced to a furnace, F, or other purifier before being allowed to escape into the atmosphere; or it may be conveyed through chimney E to some altitude.

10 We are aware that the products of combustion have been forced into a sewer, and to that we make no claim; but

What we claim is—

15 1. The combination, with a sewer having man-holes, of a disinfecting apparatus consisting of a generator having a pipe extending into one man-hole, and a pump or exhaust placed at the other man-hole, substantially as described.

2. The combination, with a sewer having 20 man-holes and a plate, *a*, of a disinfecting apparatus consisting of a generator having a pipe extending into the man-hole, and a pump or exhaust placed at the other man-hole, substantially as described. 25

3. In combination with a sewer, a gas-generator and suction appliances having pipe *b*, with flaring end *b'*, substantially as shown and described.

In testimony whereof we affix our signatures 30 in presence of two witnesses.

EDWARD Z. COLLINGS.  
CHARLES F. PIKE.

Witnesses:

S. J. VAN STAVOREN,  
CHAS. F. VAN HORN.