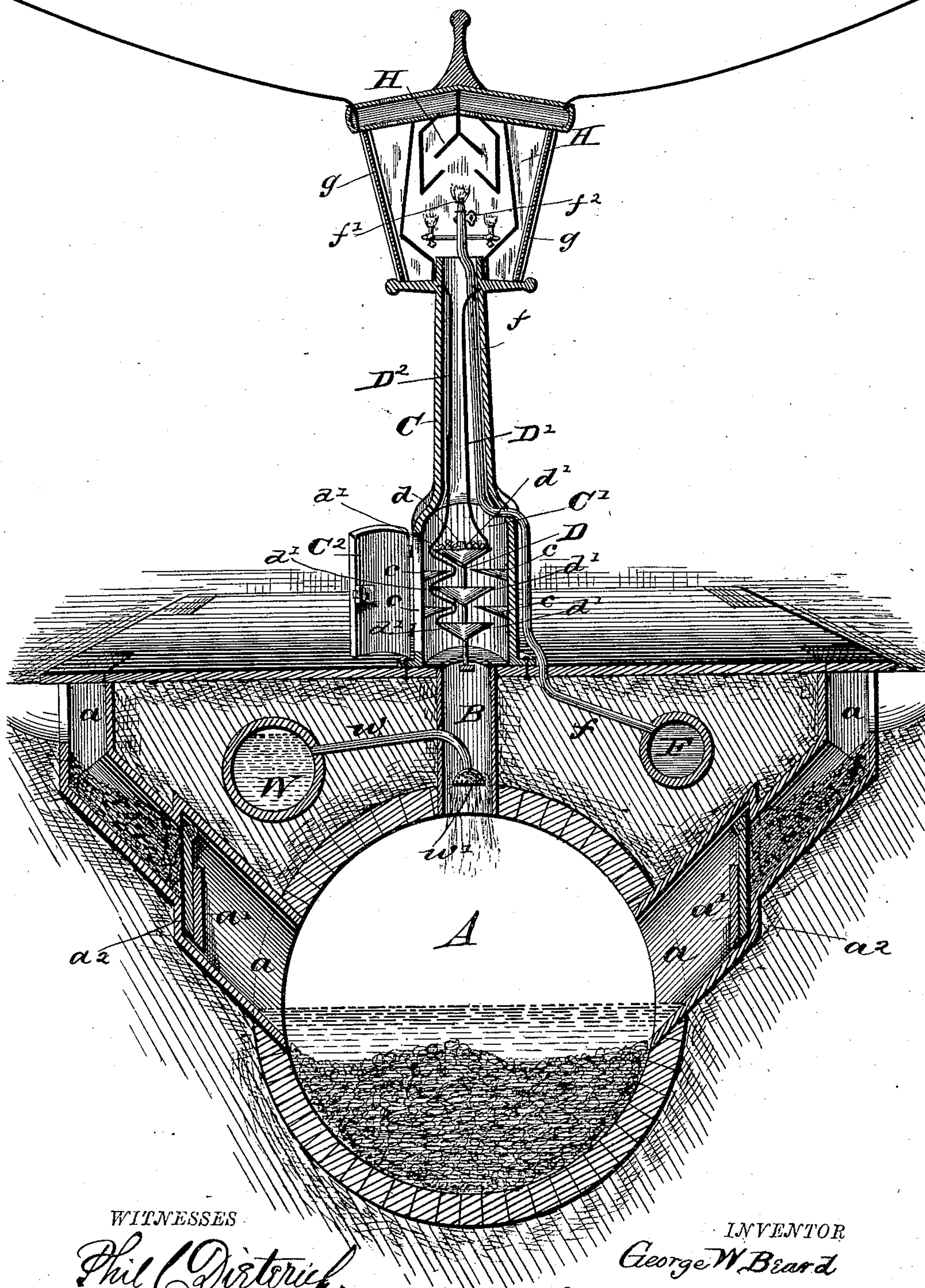


(No Model.)

G. W. BEARD.  
SEWER TRAP OR VENTILATOR.

No. 334,158.

Patented Jan. 12, 1886.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

GEORGE W. BEARD, OF BALTIMORE, MARYLAND.

## SEWER TRAP OR VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 334,158, dated January 12, 1886.

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*To all whom it may concern:*

Be it known that I, GEORGE W. BEARD, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented  
5 certain new and useful Improvements in Sewer Ventilation; 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  
10 the same, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the ventilation of  
15 sewers and to the purification and destruction of sewer-gas; and the novelty consists in the construction, adaptation, and arrangement of means for such purpose, as will be more fully hereinafter set forth, and specifically pointed  
20 out in the claims.

I trap the inflow by hinged gravity-gates, which open inward to admit sewage-water, &c., and have sufficient resistance to prevent escape of sewer-gas.

25 I connect the sewer at proper distances with hollow columns and conduct the sewer-gas or portions of it to a gas-flame connected with such column, and there burn the gas.

I arrange a shower of spray fed from the  
30 water-main with the passage which connects the sewer with the column, and utilize this shower to collect carbonic-acid gas from the rising sewer-gas and to deposit it with the sewage, allowing it to escape only at the mouth  
35 of the sewer, which should be submerged.

I provide for ozonizing the offensive part of sewer-gas—viz., the sulphureted hydrogen—by taking a portion of a current of electricity from a circuit and passing it through the  
40 mixed air and gas as it ascends from the sewer to the column.

I provide deflecting-plates adjacent to the gas-flame, which plates not only torture the direction of the gases while in the neighborhood of the flame, and assist complete combustion, but also radiate heat to destroy any disease-germs which may not have been consumed.

By my invention I treat each of the constituents of sewer-gas to destroy or obviate the deleterious effects. The shower at intervals

along the plane of the sewer takes up the germs and solid matter held in suspension and the carbonic-acid gas and deposits them into the sewage, from which, if they again  
55 arise, they are again deposited until with the sewage they are deposited beneath the surface of the river or elsewhere. These constituents can only escape through the passages which connect with the hollow columns, and in each  
60 of these passages I locate a shower. The electricity ozonizes the air, which is mixed with the rising gases, and this ozonized air disinfects and purifies the sulphureted hydrogen, which is the most offensive part of sewer-gas.  
65 The hydrogen gas is burned and increases the brilliancy of the gas. In case some parts of the gas have escaped treatment, the heated deflecting-plates serve to render them harmless.

The invention is illustrated in the accompanying drawing, which forms a part of this specification, and in which the figure is a vertical section taken on a plane transverse to the plane of the sewer.

Referring to the drawing, A designates the  
75 sewer, having drain-inlets *a*, in each of which is hinged a gravitate gate, *a'*, opening in the direction of the sewer A and having its seat against a shoulder, *a''*. The gate *a'* should be so conditioned that it will resist the inflow of  
80 house or street drainage sufficiently to hold enough of the drainage to seal the trap against escape of gas in the opposite direction. A properly-tensioned spring may be used to assist in this result. Along the line of the  
85 sewer I form at proper intervals gas-passages B, which passages connect the inner upper part of the sewer with a hollow column or lamp-post, C. The gas can only escape from the sewer through this passage B, and, for  
90 reasons which will presently appear, I desire to separate from the gas in its attempt to escape through this passage B its non-inflammable property—viz., the carbonic-acid gas—and also certain germs and particles of solid  
95 matter as may be held therein. I attain this separation by a spray or shower of water fed from the street water-main W through a pipe, *w*, having a showerer, *w'*. This shower is arranged to fall through the entire horizontal  
100 area of the passage B. The column or post C has an internal chamber, C', controlled by a



door,  $C^2$ , and secured to the inner side surfaces of this chamber are a series of conducting-plates,  $c$ . Suspended within the chamber  $C$  is a conducting-rack,  $D$ , composed of an upright,  $d$ , and a series of horizontal plates,  $d'$ . The rack  $D$  is arranged in the circuit of an electric-light apparatus, or other current of electricity impelled by a dynamo, and the plates  $d'$  are arranged in such juxtaposition to the plates  $c$  that a portion of the electric current will jump the space between the plates  $c$  and  $d'$  and "ground" itself through the metal column and connections. The circuit is made by a wire,  $D'$ , which is connected to the upper plate,  $d'$ , of the rack  $D$ , and a wire,  $D^2$ , which is connected to the lower plate of the rack. The wire  $D^2$  passes up through the gas-space between the plates  $c$  and  $d'$ , and lies close to each plate without touching. The electricity which leaves the main circuit serves to ozonize the air mixed with the sewer-gas, and this ozonized air serves to purify and disinfect and neutralize the sulphureted hydrogen of the gas.

$F$  designates the gas-main, and  $f$  a gas-pipe leading to a burner,  $f'$ , controlled by an ordinary cock or valve,  $f^2$ . The burner is located near the top of the column  $C$  in a frame,  $g$ , having glass sides. This portion of the device comprises practically a street gas-lamp. Above the burners I support a number of deflecting-plates,  $H$ , which serve not only to make the gas-passage tortuous, to hold the gas momentarily against escape to insure its burning, but the plates absorb heat, and this heat being radiated serves to destroy any germs of disease which may have escaped the water shower, the electric shower, and the flame.

While I have described what I consider the best means of carrying out the invention, it will be understood that modifications in details may be made within wide limits without departing from the principle or sacrificing the advantages of the same.

Parts of the device may be used without the whole.

While I consider the means for employing electric darts through the gas important in cities where the corporation controls the electric-lighting apparatus, these may be omitted without materially affecting the other features of the invention.

The gates  $a'$  serve a useful purpose in connection with the passage  $B$  and the showering apparatus. It is well known that the sewer-gas will lie close to the sewage. The gates  $a'$  prevent its escape through the drains.

The showering apparatus serves to break up the stratum of gas on or near the surface of the sewage, and as it moves about it is drawn within the influence of the draft in the passages  $B$ .

What I claim as new is—

1. The combination, with a sewer and its drain-connections  $a$ , and with vertical passages  $B$ , leading from the top of the sewer, of gates  $a'$ , hinged in the drains to allow the ingress of water and prevent the egress of gas, and a showering apparatus arranged to break the stratum of gas, as and for the purposes set forth.

2. The combination, with the sewer and its connection  $B$  with a gas-burning jet, of a showering-rose,  $w'$ , arranged within the passage  $B$ , and having connection with the water-main  $W$ , as and for the purposes set forth.

3. The combination, with the sewer  $A$  and passage  $B$ , of the hollow column  $C$ , having a door-controlled chamber,  $C'$ , with a series of conducting-plates,  $c$ , of the rack  $D$ , having conducting-plates  $d'$ , arranged alternately with the plates  $c$  and wires  $D'$   $D^2$ , as specified.

4. The combination, with an electric light circuit,  $D'$   $D^2$ , a street gas-lamp, a sewer, and connections for leading sewer-gas to said lamp, of alternating electric conducting-plates, as  $c$  and  $d'$ , arranged in the passage for the gas, and adapted to serve as and for the purposes specified.

5. In a device for ventilating sewers, as described, the combination, with the burners and with a showering apparatus, as  $w$   $w'$ , for eliminating solid matters and carbonic-acid gas from the sewer-gas, of deflecting-plates, as  $H$ , arranged above the burners to absorb and give off heat, and to retard the passage of the gas when in close contact with the burners, as set forth.

6. The combination, with the sewer, the hollow column  $C$ , and its burner  $f'$ , connected by a passage,  $B$ , of a showering means, as  $w$   $w'$ , arranged in the passage  $B$  to wash and eliminate portions of the gas, and deflectors, as  $H$ , arranged adjacent to the burner to retard and force the inflammable portions into close relation with the burner, as specified.

7. The combination, with the sewer, the hollow column and its gas-burning connections, and with the passage  $B$ , connecting said sewer and column, of means, as  $w$ , for showering water within the passage to separate the inflammable portion of the sewer-gas and conduct it back to the sewage, of electrical conductors, as  $c$   $d'$ , and connections for ozonizing the air and neutralizing the sulphureted hydrogen, and of deflectors, as  $H$ , for insuring the combustion and purification of the hydrogen-gas, as set forth.

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

GEORGE W. BEARD.

Witnesses:

JNO. T. MADDON,

JOHN N. GARDNER.