W. H. BENNETT.

VENTILATION AND DISINFECTION OF BUILDINGS.

No 191,512. Patented June 5. 1877.

Fig. 1.

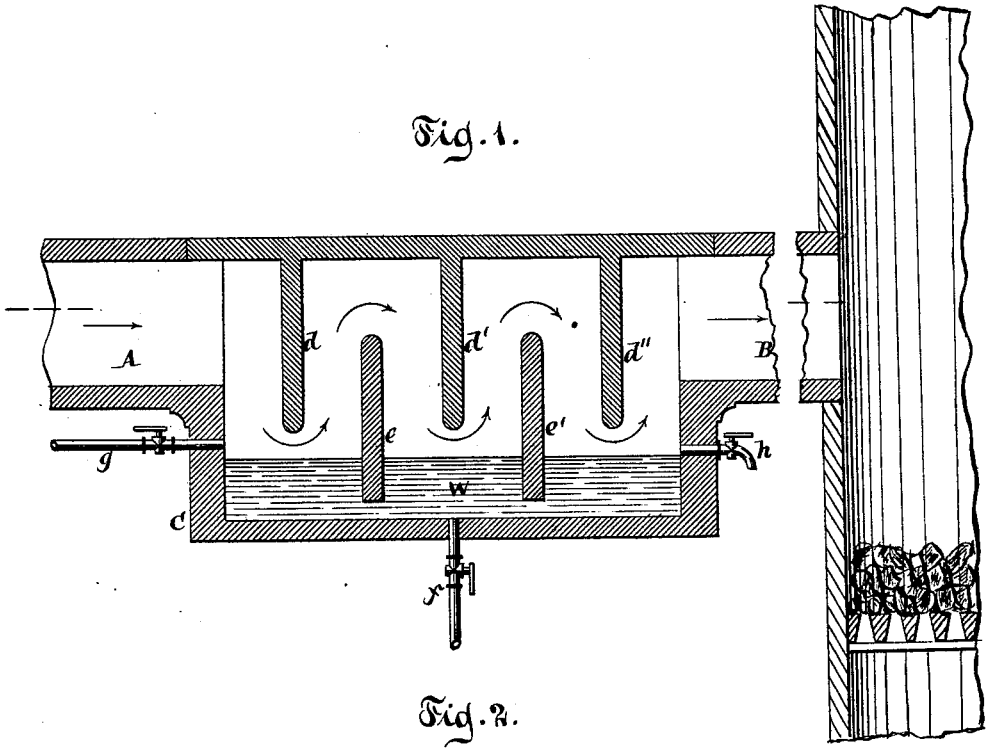
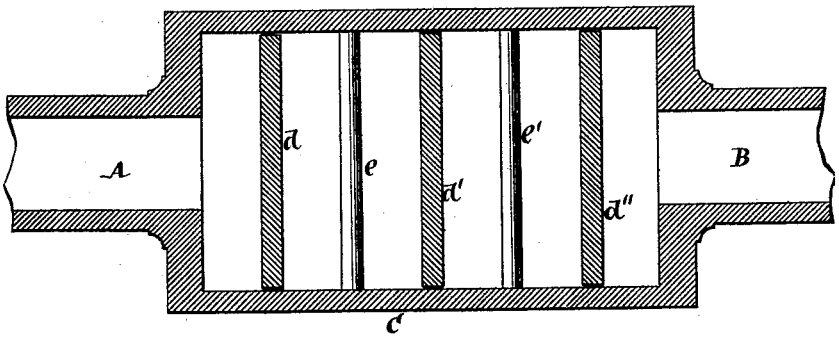


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BENNETT, OF BROOKLYN, ASSIGNOR OF ONE-HALF HIS RIGHT TO ENOCH RUTZLER, OF NEW YORK, N. Y.

IMPROVEMENT IN VENTILATION AND DISINFECTION OF BUILDINGS.

Specification forming part of Letters Patent No. **191,512**, dated June 5, 1877; application filed April 7, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. BENNETT, physician, of the city of Brooklyn, county of Kings and State of New York, have invented a new and useful Improvement in, and Apparatus for, the Ventilation and Disinfection of Houses, Buildings, and Apartments, of which the following is a full and accurate description of my invention, and such as will enable others skilled in the art to make and operate it, reference being had to the accompanying drawings, forming part of this specification, in which like letters of reference make the corresponding parts in the figures.

My invention is particularly applicable to cleansing and disinfecting the air which enters apartments through the cold-air boxes, when said apartments are heated by hot-air furnaces, or by steam by the method known as indirect radiation.

Figure 1 is a perpendicular section of my invention. Fig. 2 is a horizontal section or plan view of the same.

A represents the outer portion of the cold-air box, through which the outer air communicates with the heater. B represents the inner portion of the same. C is a water-tank, attached to the under side of the cold-air box, and placed at any convenient position therein between the opening to the outer air and the chamber where the air is heated. *d*, *d'*, and *d''* are partitions, which run downward from the top of that portion of the cold-air box that covers the tank into the same to a point one inch below the plane of the bottom of the cold-air box A and B. Of course this distance may be varied, but experiment has proved that this distance works well and is much preferable. *e* and *e'* are partitions, which project upward from near the bottom of the tank to points situated one inch above the plane of the floor of the cold-air box A and B.

This distance, also, may be varied; but I find, as in the above instance, it is to be preferred.

These partitions *e* and *e'* do not touch the bottom of the tank C, (see Fig. 2,) or otherwise, so long as an opening is left, which will permit the water contained in said tank to flow freely and circulate beneath or through them, so as to obviate the necessity of filling each compartment separately.

The partition *d* should be at such a distance from the partition *e*, and from the end of the cold-air box A, that the area of the air-space between air-box A and partition *d*, and between partitions *d* and *e*, substantially equals the area of a transverse section of the air-space in the cold-air box, in order that the current of air may pass without constriction. The distance from *e* to *d'*, and generally the distances between the partitions, no matter how numerous they may be, is determined in like manner, and, therefore, equals the distance between the partitions *d* and *e*.

W is the water with which the tank is partially filled. *f* is a waste-pipe, furnished with a stop-cock, through which the fluid may be drawn off from the tank at will. This may be connected with sewer or not, as preferred. *g* is a supply-pipe, by means of which the tank may be conveniently supplied with water, though the same may be dispensed with, and the tank filled through a hole or door in the cover of the tank. *h* is a small hole or escape, supplied with a stop-cock or not, as preferred, to give notice, by the escape of water therefrom, when the tank is sufficiently full.

The position of waste-pipe *f* may be changed and a simple hole opened and closed with a cork, or by other means, substituted.

The object of this system of stop-cocks or orifices is to provide a method by which the water in the tank may be kept at a proper level as the same evaporates, and the tank washed free from the accumulation of deposit from time to time.

A dozen different methods of accomplishing this would suggest themselves to any practical plumber in a moment, and I have only given the above as convenient and effective methods of accomplishing that result.

The position of orifice or outlet *h* and height of the surface of the water may be determined thus: The tank should be filled until the space between the bottoms of the partitions *d*, *d'*, and *d''* and the surface of the fluid equals in area the cold-air box proper A B, so that the current of air will pass without constriction, and at that height the orifice or outlet *h* should be placed.

The area of cold-air boxes differs so greatly that no more precise rule can be given.

The arrows in Fig. 1 denote the direction taken by the current of air from out of doors as it enters the cold-air box at the end most distant from the heater, and is drawn along by the partial vacuum created in the bottom

of the heater by the rapid escape of heated air at the top through the hot-air pipes.

The mode of operation of my device is as follows:

The outer air, coming through the air-box A in the direction of the arrow, strikes the first partition *d*. It is then deflected downward, losing a portion of its suspended matter. When it reaches partition *e* its course is turned upward, then over partition *e*, and along the cold-air box until it reaches partition *d'*, when its course is again turned downward upon the surface of the fluid. It then loses still more of its suspended matter, and so on, until all the partitions are passed and it enters box B, greatly purified and cleansed, on its way to the heater.

A second apparatus may be applied to the hot-air pipes leading from the heater, which, if done, will cleanse and purify the air still more thoroughly, and prevent the transmission of dust and ashes taken from the heater itself.

A further and important advantage may thus be secured, to wit: The hot air, passing over and impinging on the surface of the water in the tank, will evaporate the same quite rapidly, thereby moistening the air and rendering any water-pan in the heater quite unnecessary. Moreover, the vapor of the water will keep the partitions aforesaid quite moist, greatly aiding them in entrapping matter suspended in the hot air. The moisture will constantly drip from said partitions, washing with it the deposit, and keeping them quite clean.

It is obvious that the longer the tank C, and the more numerous the said partitions, the more completely will the hot air passing through the same be purified; but, under ordinary conditions, the number shown in the drawing will be found to answer the purpose; but when the source from which the supply of air is drawn is unusually burdened with foreign matter, the length of the tank and the number of partitions should be increased.

It is advisable, though not necessary, to make the tank C wider than the cold-air box proper A B, for thus the distance between the bottom of the partitions *d*, *d'*, and *d''* and the surface of the water may be diminished and still have an aperture of the same area in square inches as the cold-air box. Thus the current of air is not constricted, though compelled to pass in a thinner stratum over the surface of the fluid—in other words, the space above the surface of the fluid is diminished vertically, while it is increased transversely.

If that portion of cold-air box over tank is expanded to the width of the tank, a better result will be had.

The necessity of the partitions *d*, *d'*, and *d''*, and *e* and *e'*, may be thus avoided: widen the water-tank and that portion of the cold-air box in contact therewith, and bring down that portion of the cold-air box which covers said tank until the same approaches closely the surface of the water, so that the air must pass over said surface in a thin stratum.

Though this method of construction will accomplish the result to a certain extent, still it does not bring every particle of air in contact with the surface of the water, as do the partitions, and it is, therefore, not as perfect in its operation. Should it, however, be employed, care must be taken that the area of the space between the surface of the water and that portion of the cold-air box forming its cover, is substantially equal to the area of the passage in the cold-air box, so that the current of air is not constricted.

The disinfection of the air is accomplished by adding to the water in the tank or tanks a small quantity of carbolic acid, (in the proportion of from one to four fluid drams or teaspoonfuls to the gallon of water,) or other volatile disinfectant which will mix with the water, vaporize with it, and by the current of air will be carried to every apartment to which said currents have access.

The medical profession regard it as proved beyond dispute that many of the gravest diseases (especially those of a contagious or infectious character) to which man is subject, are spread, and the infection is borne, by and through the air.

My invention, when applied as a disinfector, will be found a preventive to a great extent. This, I claim, would be of inestimable value in hospitals as well as in houses where contagious or infectious disease is present, thus directly tending to improve the sanitary condition of all large cities and towns, to reduce to a minimum the occurrence of contagious disease, and to reduce materially the rate of mortality.

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

The tank C, having the partitions *d*, *d'*, and *d''*, with or without partitions *e* and *e'*, or the equivalent of said partitions, hereinbefore set forth, the waste-pipe *f*, supply-pipe *g*, and the escape *h*, in combination with the cold-air box or air-supply pipe of a hot-air furnace or steam-heater, where the method known as indirect radiation is employed, substantially as and for the purpose described.

In testimony that I claim the foregoing improvement in the ventilation and disinfection of buildings, &c., as above described, I have hereunto set my hand this 3d day of April, 1877.

WILLIAM H. BENNETT.

Witnesses:
ISAAC J. MACCABE,
HENRY P. WELLS.