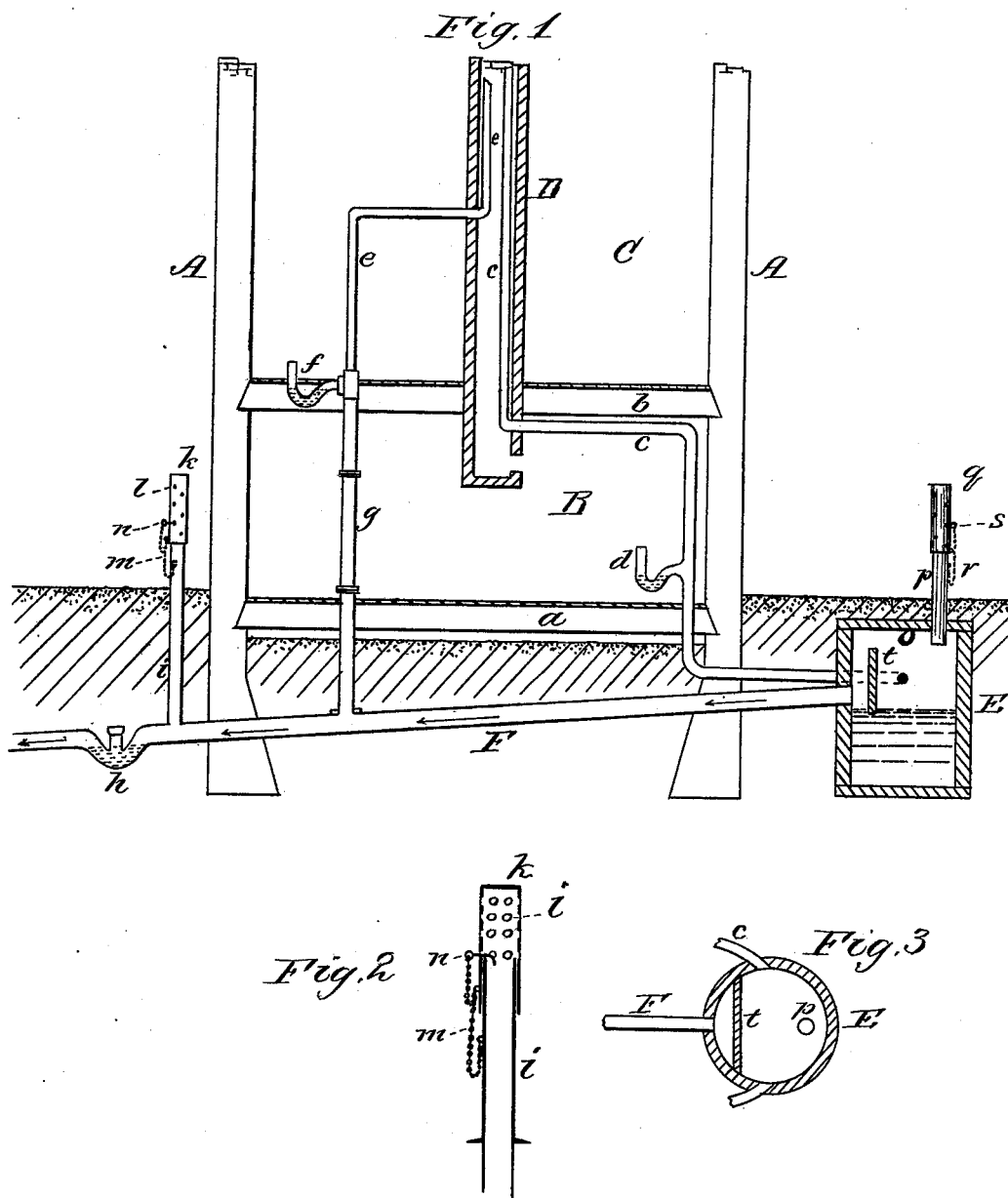


A. W. MURRAY.  
Ventilation.

No. 214,177.

Patented April 8, 1879.



WITNESSES,  
Geo. B. Porter.  
David W. Messer

INVENTOR,  
Alexander W. Murray,  
per Cha. H. Fowler,  
Attorney.

# UNITED STATES PATENT OFFICE

ALEXANDER W. MURRAY, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN VENTILATION.

Specification forming part of Letters Patent No. 214,177, dated April 8, 1879; application filed February 14, 1879.

*To all whom it may concern:*

Be it known that I, ALEXANDER W. MURRAY, of Chicago, in the county of Cook and State of Illinois, have invented a new and valuable Improvement in Ventilation; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal section of my invention, showing the sewer and other pipes connected to the interior of a dwelling, and the arrangement of pipes under ground. Fig. 2 is a detail view of the fresh-air pipe with regulating-cap; and Fig. 3 is a sectional view of the catch-basin.

This invention has relation to the system of ventilating dwellings, sewers, sewer-pipes, sink and soil pipes, with their traps, usually arranged in dwellings of modern build.

The object of the present invention is to construct means whereby the elimination, oxidation, destruction, and conversion of gas known as "sewer-gas" into pure air are effected by the rapid currents of air passing through sewers to kitchen chimney or chimneys, as will be hereinafter described, and subsequently pointed out in the claims.

In the accompanying drawings, A represents the walls of a dwelling or other similar structure, (shown in section.) with floors *a b*, which divide the dwelling into two or more stories, B C. The chimney D, which is of the ordinary construction, passes down through the floor *b* into the lower story, B, which represents the kitchen. Said chimney has connected to it below the floor *b* a vent-pipe, *c*, extending horizontally under the floor, and near the end thereof taking a course downward and passing out through the lower floor, *a*, and through the wall A, after which it connects with a catch-basin, E, as will be hereinafter described.

Directly above the floor *a* is a trap, *d*, communicating with the vent-pipe *c*, said trap being also connected to a sink, through which the waste passes.

Above the floor *b*, and communicating with

the space in the chimney D, is arranged a vent-pipe, *e*, having connected thereto, on a line with the floor *b*, a trap, *f*, from commode or closet.

Below the floor *b*, and connecting with the vent-pipe *c*, is a soil-pipe, *g*, somewhat larger in diameter than the vent-pipe, which passes through the floor *a* and connects with a sewer-pipe, F, located below the surface of the ground. One end of the pipe F connects with the catch-basin E, after which it is disposed on an incline passing through the walls A, and provided with a trap, *h*.

A pipe, *i*, connects with the sewer-pipe F, passing up through the ground a sufficient distance to have attached to its open end a ventilating cap, *k*. This cap has holes or perforations *l* for the purpose of insuring perfect ventilation, and is connected to the pipe *i* by a chain, *m*, one end of said chain having a hooked rod, *n*, connected thereto for holding and supporting the cap *k* at the desired height with relation to the end of the pipe, in order to regulate the degree of ventilation, the end of the rod passing through one of the holes *l* in the cap, and resting on the top edge of the pipe which supports the cap.

The catch-basin E is provided with a suitable top, *o*, through which passes a vent-pipe, *p*, provided at its upper end above the surface of the ground with a ventilating-cap, *q*, secured by chain *r* and perforated similar to cap *k*, and held at the desired height upon the end of the pipe by rod *s*.

Within the interior of the basin E is a partition, *t*, of less height than the basin, so that a space below and above is obtained, the space above allowing a current of air to pass into and from sewer-pipe F to catch-basin, the partition deflecting it in an upward direction and away from contact with the contents of said basin.

Heretofore it has been the usual practice to extend the partition *t* flush with the top of the catch-basin E, or, in other words, close it at its top, which would fill the space in the sewer-pipe F with foul gases generated by the decomposition and fermentation of the animal or vegetable matter that may adhere to the inside of said pipe between the catch-basin and

the junction of the soil-pipe *g*; and should there be a crevice or opening in the sewer-pipe from any cause, the foul gases therein would escape into the dwelling, a portion of the air in its course passing into fresh-air pipe *i*. With the partition *t* open at the top, the suction of the two vent-pipes *c e* would draw air into the sewer-pipe (through these crevices) instead of expelling it, and also prevent the accumulation of foul gases therein. If the partition *t* was closed, the water in the catch-basin *E* would become more foul by absorbing the foul gases generated in the sewer, and when the water is poured into trap *d* there would be a volume of noxious gas forced out of the fresh-air pipe *g* and vent-pipe *c*. Again, if the partition *t* was closed and water poured into trap *f*, there would be a volume of noxious gases forced out of fresh-air pipe *i*, and were there some means of locking the regulating-caps *k q*, they would be forced up by the action of the gases, providing the force of the gas would overcome the weight of the caps.

It will, therefore, be seen that opening the partition at the top would remove all these objections, and the current of air accelerated (by the pouring of water into trap *f*) toward catch-basin *E*, and thence to vent-pipe *c*.

The regulating-caps *k q* can be so adjusted with relation to the pipes *i p* as to admit only a small quantity or current of air into the sewer, which is found necessary in extreme cold weather, in order to prevent it from freezing, also where the vent-pipes are not carried up within the chimney and the draft being defective, thereby giving the chimney more power.

The pipes *i p*, it will be noticed, extend a sufficient distance above the surface of the ground so as to prevent them from being covered with snow, rubbish, or anything being put in sewer to aid its being stopped.

The vent-pipes *c e*, after passing through the walls of the chimney, pass upward near or to the top thereof.

The roof or main water-pipe is connected to the catch-basin *E* at a point below the outlet of said basin into the sewer-pipe *F*.

When water is poured into the trap *f*, the air in soil-pipe is forced partly through fresh-air pipe *i*, and partly through catch-basin *E*, into sewer and waste-pipe of sink through vent-pipe to top of chimney. When water is poured into sink-trap *d*, the air in waste-pipe, or that portion of the vent-pipe *c* below the trap, is forced into catch-basin *E*, and out of it into main sewer, thence up soil-pipe, through vent-pipe *e*, to top of chimney.

When both traps are in use at the same time, the air escapes through the fresh-air pipes *i p*; but when the traps are at rest, the

fresh air circulates through every inch of the pipes that are thus connected, and in this way purifies the air in sewer by process of oxidation and elimination.

When the rain-water enters catch-basin *E*, it forces the foul water near bottom of basin into main sewer without forcing large lumps of grease into main sewer, which would stop them up at times. In houses where the chimneys are already built or so constructed that it is very difficult to place or arrange the vent-pipes in the space of the chimneys, the pipes may simply enter the same, and in this way the impurities that may still be in the air are destroyed by heat and contact with soot of chimney.

A very important feature of my invention is the fact that the vent-pipes, through the power given them by the heat of chimney, act as suction-pipes, as it is by the rapid currents of fresh air through the sewers and its escape into the open air above chimney by the aid of these suction-pipes that I prevent the accumulation in the pipes of sewer-gas.

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

1. The combination, with the fresh-air pipe or pipes connected to a sewer-pipe, of a perforated regulating cap or caps capable of vertical adjustment, and held at the desired height with relation to the fresh-air pipe or pipes by a suitable locking device or support, substantially as and for the purpose set forth.

2. The vent-pipes *c e* and traps *d f*, in combination with the soil-pipe connecting the sewer-pipe *F* with the catch-basin, said vent-pipes extending up into the chimney *D*, substantially as and for the purpose described.

3. The catch-basin *E*, provided with partition *t*, constructed and arranged as described, and the fresh-air pipe *p*, substantially as and for the purpose set forth.

4. The catch-basin *E*, in combination with sewer-pipe *F*, said basin having partition *t*, open at top, pipe *p*, and regulating cap *q*, substantially as and for the purpose set forth.

5. The vent-pipes *c e*, having secured thereto traps *d f*, in combination with sewer-pipe *F*, pipes *i p*, with regulating-caps *k q*, and the catch-basin *E*, provided with partition *t*, open at the top, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ALEXANDER WILCOXSON MURRAY.

Witnesses:

EDWARD W. EDWARDS, M. D.

GEORGE MCPHERSON.