

(No Model.)

C. H. HUMBERT.  
HOUSE VENTILATION.

No. 355,822.

Patented Jan. 11, 1887.

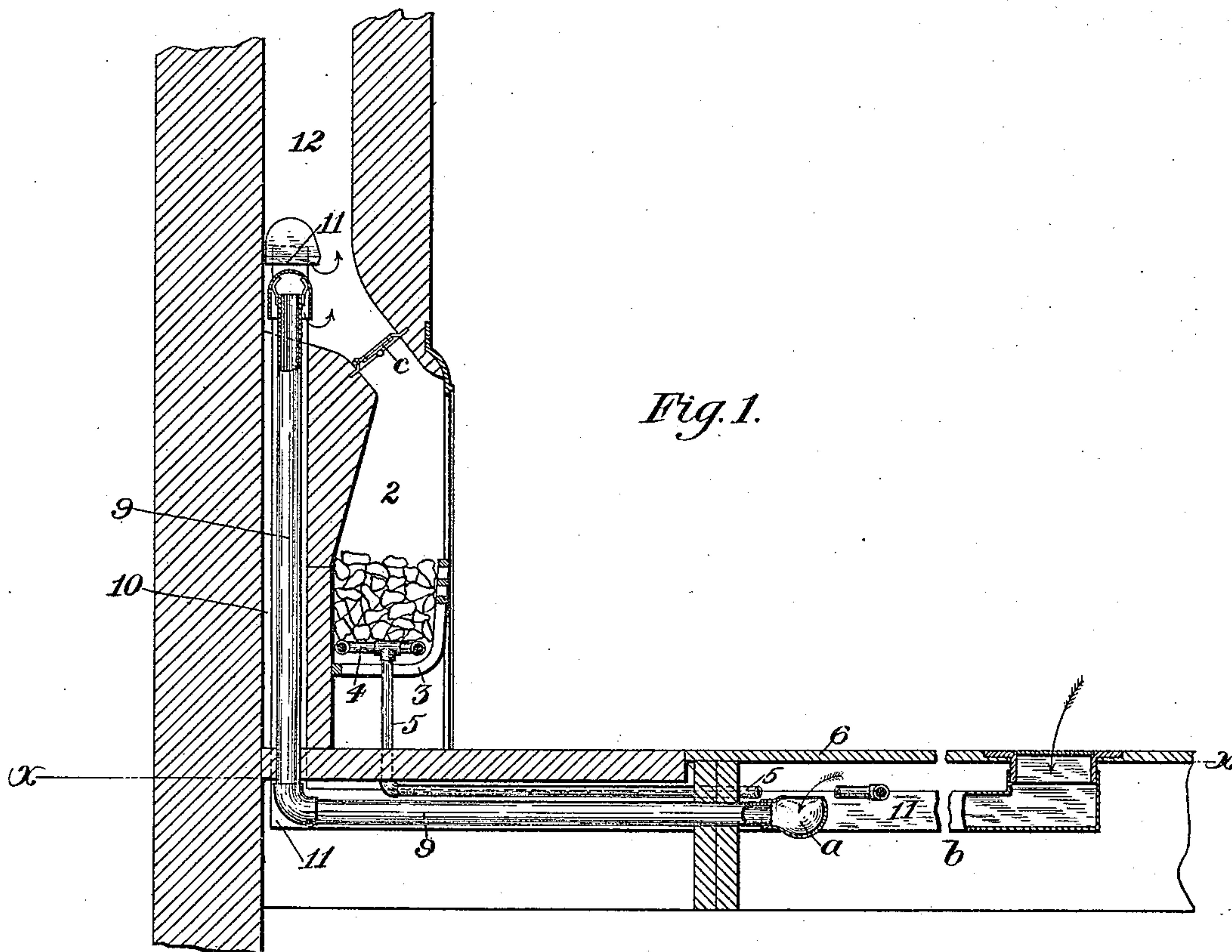
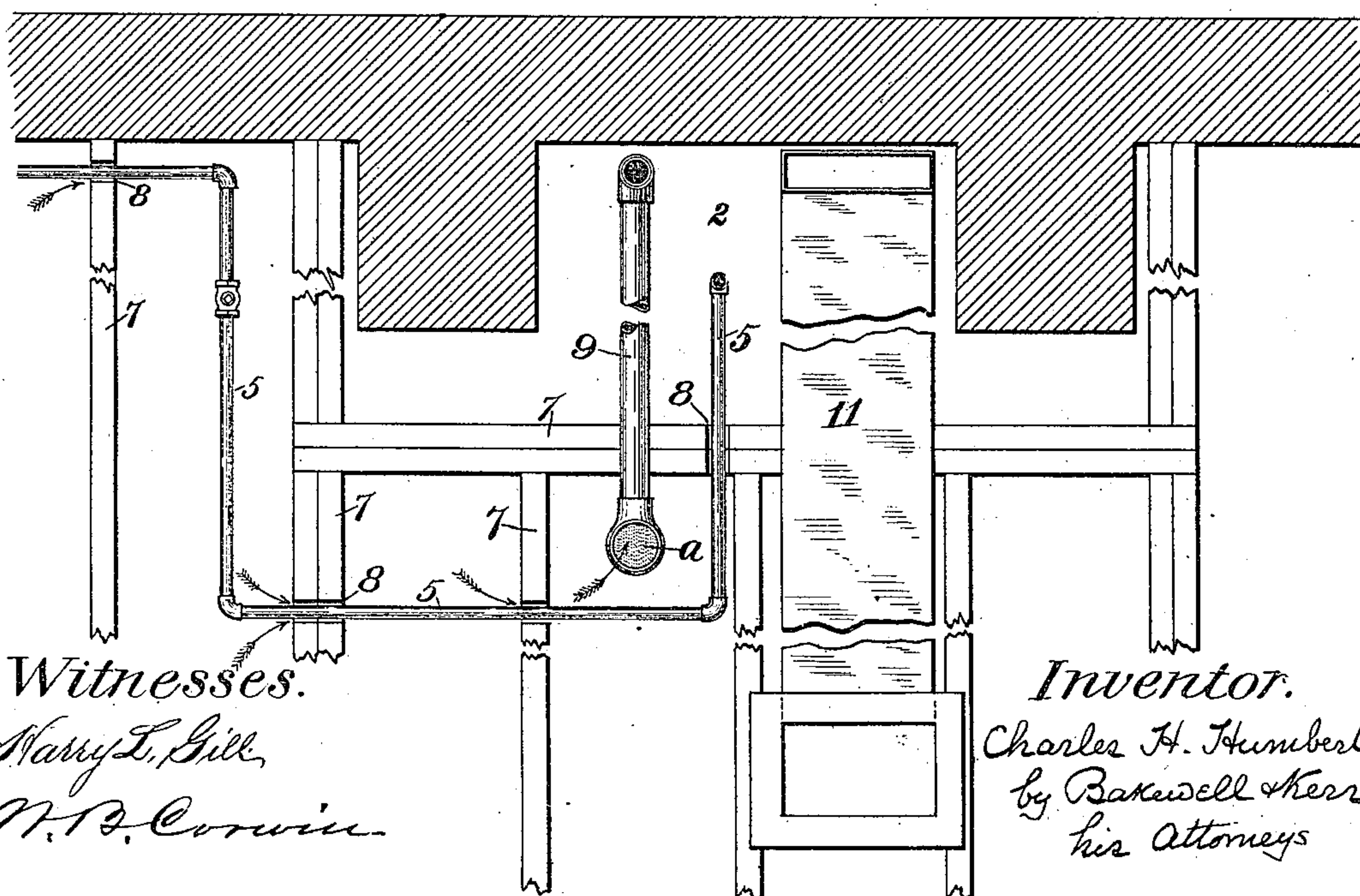


Fig. 2.





# UNITED STATES PATENT OFFICE.

CHARLES H. HUMBERT, OF PITTSBURG, PENNSYLVANIA.

## HOUSE-VENTILATION.

SPECIFICATION forming part of Letters Patent No. 355,822, dated January 11, 1887.

Application filed November 19, 1885. Serial No. 183,262. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. HUMBERT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in House-Ventilation; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical cross-section of a part of the room of a building illustrating my invention; and Fig. 2 is a horizontal section thereof on the line *x x* of Fig. 1.

Like letters and figures of reference indicate like parts.

In the utilization of natural gas for heating purposes in dwelling-houses and other buildings it has been the common practice to lead the service-pipe on the outside of the building to the level of the story where it is to be burned, and thence to arrange a branch pipe beneath the floor, and between the latter and the ceiling below, leading to the fire-place or stove. Such an arrangement is liable to be productive of some danger, because if a leak should occur in the pipe the gas is apt to accumulate in the space beneath the flooring, and if ignited would occasion an explosion, which would be the more serious and destructive on account of the confinement of the gas. No adequate means have yet been devised for obviating the danger which I have indicated, and many persons are deterred from using the gas on this account.

Another disadvantage, which has become apparent to those who employ gas for heating, is the poor facility for ventilation which its use permits. Heretofore when rooms have been heated by open fire-places using coal as fuel the draft of the chimney has been a most efficient means of ventilation, and the houses fitted with such open fire-places have been notable for their freedom from malarial diseases and other illnesses caused by close rooms and poor ventilation.

In the use of natural gas for fire-places economy of fuel demands that the flues should be reduced in diameter, so that the draft may not be great enough to carry much of the heat up the chimney, instead of allowing it to radiate into the room, and it has been usual to

effect this result by putting a damper into the throat of the flue, by means of which its draft may be properly lessened. The consequence of this is that ventilation of the apartment is impeded, and there being very little incoming draft of moist air the air in the room becomes dry and unhealthy. The dryness is so apparent that it cracks and warps the furniture of the house, and often causes great damage in this way.

It is the object of my invention to overcome the evils above indicated by affording means for bettering the ventilation of rooms and for the removal of leaking gas from beneath the floors in houses where the gas-pipes are there arranged.

Referring now to the drawings, 2 represents a fire-place of ordinary construction, having a grate, 3, and a gas-burner, 4, at its base.

5 is the gas-service pipe, which is arranged under the floor 6, so as to rest within notches 8 on the surfaces of the joists or trimmers 7. It leads to the gas-burner 4, which it supplies with gas. This is the usual arrangement of the service-pipe, and it is evident that any gas which might escape from the pipe would accumulate in the space *b* beneath the flooring, and from its proximity to the fire-place would be in danger of explosion. To obviate this I arrange a ventilating-pipe, 9, underneath the flooring, and extending thence up a vertical flue, 10, back of the fire-place, preferably to a point at a level with or above the throat of the chimney-flue 12, and above the damper *c*. Both ends of the pipe 9 are open, and the draft of the chimney-flue is sufficient to induce a current of air through the pipe from the lower end, *a*, into the chimney. This current will thoroughly ventilate the space *b*, and any leaking gas from the service-pipe will be induced along the latter and through the notches 8 in the joists into the ventilating-pipe. The flue 10 at the back of the fire-place corresponds to the usual dust-flue now in common use, and there need be no change in the construction of the fire-place for the adaptation of this feature of my improvement. I do not, however, desire to limit myself to this or any other peculiar mode of causing the ventilating-pipe to discharge into the chimney-flue. The advantages of this system of ventilating the space *b* will be apparent to any one familiar with the



use and the dangers of natural gas. With this system the practice of carrying the service-pipes on the outside of buildings, together with similar unsightly and inconvenient safety appliances, may be dispensed with, and the service-pipes may be arranged in the walls, as commonly practiced in the distribution of illuminating-gas, because any gas which may escape into the space between the walls will naturally rise, and, traversing the space *b*, will pass through the ventilating-pipe 9 into the chimney-flue.

I will now describe the devices which I have invented for ventilating the rooms of buildings in which the use of gas renders the ventilation imperfect. A pipe or flue, 11, extends from the chimney-flue 12 down the dust-flue 10 and under the flooring within the space *b* to a convenient point, where it opens through the floor 6 into the room above. It may there be provided with a register for opening and closing its adit. The action of the draft of the chimney upon this ventilating-pipe is similar to that before described with reference to the ventilating-pipe 9, and a constant current of air will be maintained from the room through the register and into the chimney-flue. It is desirable to have the register in the floor, for the reason that the air removed will then be from the coldest strata and will not interfere with the heating of the room. I do not, however, desire to limit myself to this arrangement of the ventilating-flue, because, if it be desirable, the latter may be so built as to enter the side of the room through the wall, or it may enter the ceiling of the room below the apartment in which the fire-place is situated. There may also be several ventilating-flues for each fire-place, each flue opening into a separate part of a single room, and in the same way, by a proper arrangement of the flues, a single fire-place may be employed to ventilate several rooms or halls, whether they be on the same floor or on different floors. This system of ventilation may be employed with advantage in hospitals, factories, and other buildings in which good ventilation and pure air are desirable.

I am aware that I am not the inventor of a ventilating-flue leading from a room and discharging into a chimney, and do not claim, broadly, such a device. My invention in this regard consists in the combination of such a flue with a damper situate in the chimney, when the ventilating-flue discharges into the chimney back of the damper. The result of this combination is that it causes the ventilation of the apartment in which the device is situated to be kept nearly constant, whether the damper in the flue be closed or open, and that it enables the air to be drawn either through the throat of the chimney or from another part of the room at will by a simple manipulation of the damper *c*. Thus suppose the adit of the flue 11 to be situate at a remote part of the room from the fire-place say at or near the

ceiling. Then if the damper *c* be opened the draft of air induced in the chimney-flue 12 will take the most direct course through the throat of the fire-place, while very little will be drawn through the flue 11, so that the air removed will be that near the floor and next to the fire-place. If, however, the damper *c* be closed or nearly closed, so as to cut off the direct draft from the fire-place, the draft of the chimney will induce a greatly-increased draft through the flue-pipe 11, which will not only compensate for the diminution of direct draft from the fire-place, but will draw the waste air from another part of the room. In this way the place from which the air is removed may be determined, according to the necessities of the case, by operation of the damper *c*, and persons are enabled to partially close the damper for the purpose of increasing the heat thrown off from the fire-place without materially lessening the ventilation of the room. It will be found that the amount of the draft of the ventilating-pipe varies inversely with the area of the space afforded by the damper *c*. This would not be so if the ventilating-flue opened into the chimney in front of the damper, since then the ratio of variation of draft would be direct and the good results above noted would not be obtainable.

I have reduced my invention to actual practice, and have found that the device acts as above stated.

In order to protect the ventilating-pipes 9 and 11 from soot or dirt which might fall into their open ends within the chimney, I prefer to cover them with ventilating shields or caps of ordinary pattern, (see Fig. 1,) and in order to prevent clogging of the pipe 9 with dust its inner end within the space *b* may be covered with wire-gauze.

By the use of the word "fire-place" in the following claims I do not limit myself to an open fire-place, but intend to include stoves and other heaters, the combustion of whose fuel causes a draft in the chimney-flue.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. As a device for ventilating closed spaces in buildings, the combination of a chimney-flue, a fire-place for inducing a draft therein, a closed space, and a gas-service pipe located therein, and a ventilating-flue leading from such closed space and discharging into the chimney-flue for the purpose of removing leaking gas, substantially as described.

2. As a ventilating device, the combination of a chimney-flue, an open fire-place for inducing a draft therein, a damper situate in the chimney-flue, and a ventilating-pipe leading from a room desired to be ventilated and discharging into the chimney-flue back of the damper, whereby the ventilation is made regulable, substantially as and for the purposes described.

3. As a device for ventilating closed spaces containing gas-service pipes in buildings, the



combination of a chimney-flue, a fire-place for  
inducing a draft therein, a closed space, and  
a gas-service pipe located therein, and a ven-  
tilating-flue leading from such closed space  
5 and discharging into the chimney-flue above  
the adit of the fire-place flue thereinto for the  
purpose of removing leaking gas, substantially  
as and for the purposes described.

In testimony whereof I have hereunto set  
my hand this 16th day of November, A. D. 1885.

CHARLES H. HUMBERT.

Witnesses:

THOMAS W. BAKEWELL,  
W. B. CORWIN.