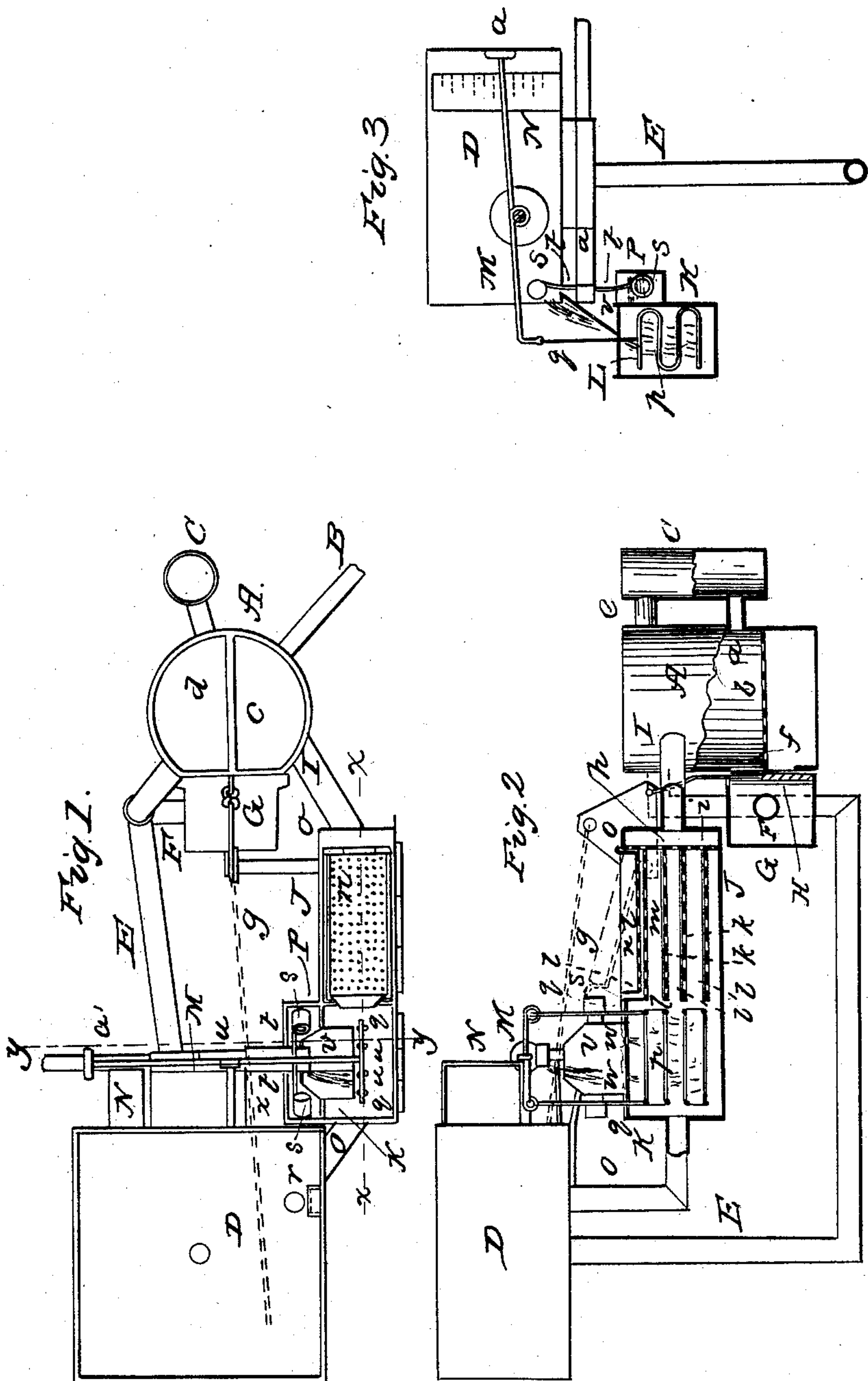


O. ABBOTT.

Heater.

No. 41,467.

Patented Feb. 9, 1864.



Witnesses.  
Thos Douglas  
Crown Reed

Inventor  
O. Abbott

# UNITED STATES PATENT OFFICE.

ORRIN ABBOTT, OF NEW YORK, N. Y.

## IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. 41,467, dated February 9, 1864.

*To all whom it may concern:*

Be it known that I, ORRIN ABBOTT, of No. 3 West Forty-first street, in the city, county, and State of New York, have invented a new and Improved Air-Heating and Ventilating Apparatus or Device; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan or top view of my invention; Fig. 2, a side sectional view of the same, taken in the line *x x*, Fig. 1; Fig. 3, a transverse vertical section of the same, taken in the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain a simple and efficient means for supplying buildings with pure warm air or with air of a desirable temperature and containing a necessary amount of moisture requisite for health.

To this end the invention consists in arranging and combining with one or more stoves or heaters a foul-air and a hot-air conveying pipe, the latter being provided with certain means for charging the warm or heated air with moisture, and the former arranged in such a manner as to serve as a means to regulate the draft of the stove or heater to which it is attached.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a stove or heater, which may be constructed in any suitable way. The one represented in Figs. 1 and 2 consists of a cylinder, *a*, provided near its lower end with a fire-grate, *b*, and with two chambers, *c d*, at its upper part, one, *c*, being an air-heating chamber and having a cold-air pipe, B, leading into it from the outer side of the building to be heated, and the other, *d*, being a foul-air chamber, which communicates with the smoke-pipe C of the stove or heater by means of a pipe, *e*.

D represents a compartment to be heated and ventilated by my invention, and E is a pipe which leads from the bottom of said compartment into the chamber *d*. This pipe E has a branch pipe, F, attached to it, which leads into a box, G, the latter being arranged in such a manner that it may be swung around

in front of the feed-opening of the stove or heater A, and serve as a door for the same, as shown in Fig. 2. The front of this box G is provided with a vertically-sliding damper, H, which may be raised or lowered so as to conduct the air from box G, either above or below the grate *b*, as may be desired. This damper may be operated by a wire or chain, *g*, extending into the compartment D.

I is a pipe which leads from the air-heating chamber *c* into a box, J, which is provided with a vertical perforated partition-plate, *h*, to form a narrow compartment, *i*, into which the heated air enters through the pipe I, and also to form a wider compartment, *j'*, which is provided with a series of horizontal perforated plates, *k*, on each of which one or more strips, *l*, of cloth or any absorbent material, is placed. The top *m* of this compartment *j'* is also perforated, and it has a perforated dish or reservoir, *n*, attached to it at one end by a hinge, *o*, to admit of the dish or reservoir being adjusted in a horizontal position or more or less inclined, as may be necessary. The top *m*, as well as the dish or reservoir *n*, may also be provided with one or more strips of cloth, *l*. (See Fig. 2.)

The compartment *j'* communicates with a box, K, in which a frame, L, is suspended, having a piece of cloth or any other absorbent material, *p*, attached to it. This frame L is connected by rods *q* to one end of a scale-beam, M, which works over a graduated plate, N, as shown clearly in Fig. 3. O is a pipe which leads from the box K into the compartment D to be heated, the upper end of O communicating with the upper part of the compartment. This pipe O has a small branch pipe, *r*, leading from it, which communicates with the bottom of the compartment D, to admit of the feet of persons being warmed. This branch pipe may be opened and closed by means of a register arranged in the ordinary way. To the inner side of the box K there is attached a reservoir, P, in which a series of revolving buckets, *s*, work, said buckets being attached to radial arms *t* on a shaft, *u*, which may be rotated by ordinary clock mechanism. These buckets *s*, as they rotate, discharge water on an inclined plate or chute, *v*, which conducts said water down to openings *w* in the top of the box K, the water passing through said openings upon the cloth *p*. (See Figs. 2 and 3.)



The operation is as follows: The cold air from the exterior of the building passes through the pipe B into the chamber C of the stove or heater, where it is heated and passes through the pipe I into the compartment *i* of the box J, from whence it passes through the perforated partition *h* into compartment *j'*, and over the cloths *l* on the horizontal perforated plates *k*, and is thoroughly charged with moisture, which is dripping through the cloths in consequence of the dish or reservoir *n* being supplied with water from a tank arranged for that purpose. The perforated plates *k* and cloths *l* cause the water to descend through the compartment *j'* in a fine drip or mist, and the warm air is spread by the perforated partition-plate *h*, so that as the former passes through the compartment *j'* it will readily absorb the moisture. The warm moist air passes from the compartment *j'* into box K and over the cloth *p*, which is on the frame L. This cloth *p* is also kept in a saturated state by the water discharged upon it by the buckets *s*, and in case the warm air, in passing through the compartment *j'* of box J, does not become sufficiently charged with moisture, it will take up a sufficiency from the cloth *p* and enter the compartment D in a proper moist state. The saturated cloth *p* is counterpoised on the beam M by a weight, *a'*, and it is designed to have the cloth *p* kept at a certain point of saturation, which will be indicated by the beam M on the graduated plate N, the buckets *s* keeping up the supply of water. If, therefore, the air passes from the chamber *j'* through the box K in a rather dry state, it will absorb considerable moisture from the cloth *p*, greater than the supply, and the diminished gravity of the cloth will be indicated by the beam M. In this case the dish or reservoir *n* will be adjusted in a sufficiently horizontal position to admit of a requisite supply of water passing through the compartment *j'* to supply the deficiency. On the other hand, if the warm air should pass from the compartment *j'* into the box K in a sufficiently moist state, little or no moisture would be absorbed from the cloth *p*, and the latter would be surcharged, and the increased gravity indicated by the beam M. In this case the dish or reservoir *n* would be inclined to diminish the supply of water to the compartment *j'*. Thus it will be seen that the cloth *p*, in consequence of being suspended to the scale-beam M, serves as an indicator, and enables the attendant or fireman to keep the warm air in a proper moist state without any difficulty whatever.

The foul air is drawn from the lower part of the compartment by means of the pipe E, the chamber *d*, in consequence of being

heated, producing the necessary draft for that purpose. By this arrangement, therefore, a circulation is kept up in the compartment D, the pure, warm and moist air entering the upper part of the compartment and the vitiated air passing from the lower part of the compartment through pipe E.

In cases where small buildings are to be heated and ventilated, one stove or heater, as represented in the drawings, will be sufficient; but when the invention is to be applied to large buildings two stoves or heaters may be employed, one for heating the air to supply the building and the other for drawing the vitiated air therefrom.

The heat of the stove or furnace may be regulated as desired by adjusting the damper H. When the latter is lowered to admit the air from pipe E above the fire-grate *b*, the heat of the stove will be diminished, and it will be increased when the damper is raised to admit the air into the stove below the fire grate.

I do not claim, broadly or irrespective of the arrangement herein shown, ventilating and heating rooms by drawing out the foul air from the bottom and introducing heated air at the top, for that has been previously done; but

I do claim as new and desire to secure by Letters Patent—

1. The combination of the water-drip compartment *j'*, hot-air-conducting pipe O, and foul-air pipe E with one or more stoves or boilers, arranged substantially as shown, in connection with the apartment to be heated, so that the foul air will be drawn from the compartment by the rarefying of the air in E or the chamber with which it communicates, and a circulation of pure warm air be kept up in the compartments.

2. Regulating the supply of water to the compartment *j'* by means of the hinged dish or reservoir *n*, arranged substantially as described.

3. The indicator formed of the cloth *p*, attached to a frame, L, inclosed within a box, K, and suspended from a scale-beam, M, in connection with the water-supply apparatus, composed of the rotatory buckets *s*, working within the reservoir P, substantially as set forth.

4. The box G, provided with the damper H, and communicating with the foul-air pipe E, and arranged relatively with the feed-opening *f* in the stove or heater, for the purpose specified.

ORRIN ABBOTT.

Witnesses:

THOS. L. J. DOUGLAS,  
GEO. W. REED.