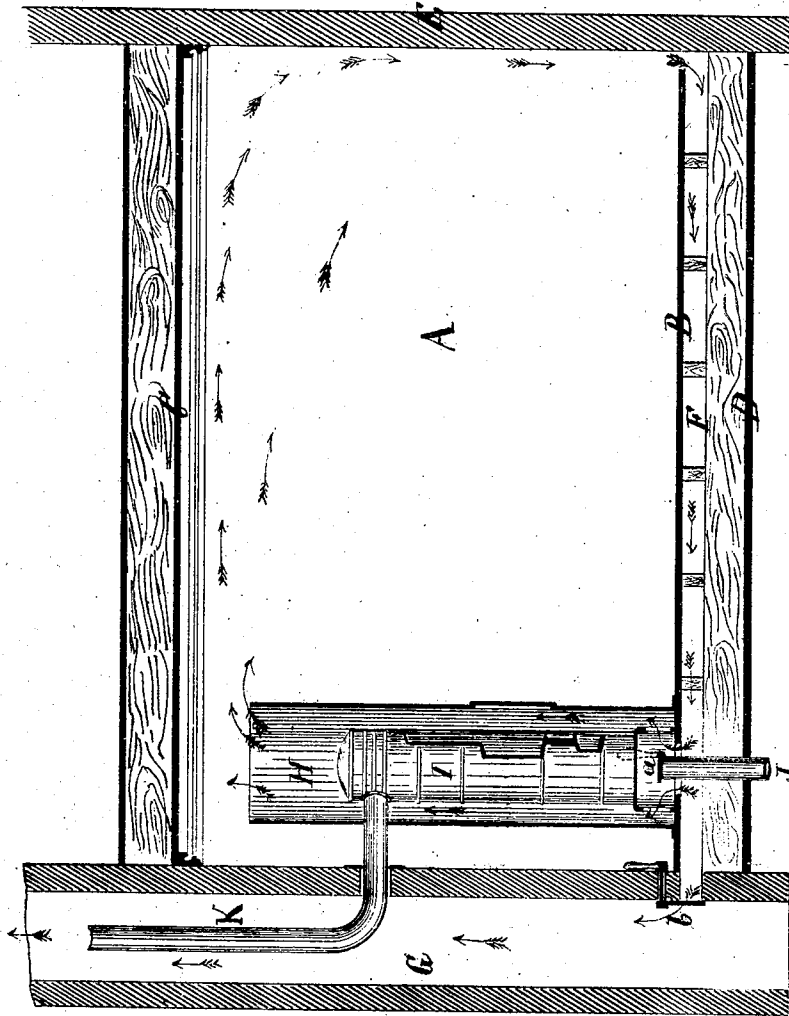


G. F. Schulz  
 Impr<sup>d</sup> System of Heating and Ventilation.  
 101168 PATENTED MAR 22 1870



Witnesses:

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# United States Patent Office.

G. F. SCHULZE, OF JANESVILLE, WISCONSIN.

Letters Patent No. 101,168, dated March 22, 1870.

## SYSTEM OF HEATING AND VENTILATING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, G. F. SCHULZE, of Janesville, in the county of Rock and State of Wisconsin, have invented a new and improved System of Warming and Ventilating Houses; and I do hereby declare the following to be a full, clear, and correct description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings forming part of this specification, in which the figure is a vertical section of a room illustrating my improved system.

My invention has for its object to more thoroughly heat dwelling and other houses, with greater economy of fuel than is now the case.

The primitive method of heating was by an open fire-place, of which the modern grate is a variation. While luxury has preserved the latter, economy has long since abandoned it. The fire-place was followed in progress by the common stove, which possesses the merit of radiating the heat from all sides. Without other appliances, and without intelligent direction and control of the heat, the stove is a defective and expensive medium for heating purposes.

The common stove radiates the heat but a short distance, warming only that portion of the air immediately surrounding it, which, as it becomes heated, is rarefied, and ascends, and is followed by a current of cold air from the floor of the room. This, in its turn, becomes heated and rises, thus producing a constant current of heated air. This current, however, is either limited to a narrow space immediately surrounding the stove, leaving the remote parts of the room cold and uncomfortable, or fills the upper part of the room only, leaving a current of cold air next the floor, so that the feet are surrounded by cold air, while the head and upper parts of the body are exposed to a dry, hot temperature.

These defects in the method of heating by the common stove being recognized, a remedy should have been found, but attention seems to have been drawn to some other evil, in the efforts to cure which an economical and thorough system of heating was entirely overlooked.

Ventilation then became the object sought after. This, it was found, consisted in the introduction of fresh, and the expulsion of vitiated air. In order to prevent the introduction of cold air directly into a room, it was first carried to a furnace, and from thence discharged into the room or rooms through pipes. Difficulties in conveying heated air from the furnace to the rooms caused the discovery that, to introduce a quantity of heated air into a room, the expulsion of the same quantity of the air already in the room became necessary. At this point ventilation and heat-

ing became confounded, so that about the same quantity of partially cooled air is now withdrawn and wasted from a dwelling with few occupants, not for ventilation, but in order to warm the same, as is expelled from an equal-sized dwelling with many occupants, when the expulsion may be justified on account of ventilation.

This leads to the inquiry why unvitiated and only partially-cooled air is wasted. This partially-cooled air is much warmer than that outside the dwelling, and should be returned to the furnace and reheated, instead of heating the extreme cold air from without.

My invention, therefore, consists in producing a circulation of heated air from a heater or furnace through the space to be heated, and, after being partially deprived of its caloric, back to the furnace to be reheated, the circulation being continued indefinitely, or until the air becomes vitiated, when it is discharged, and fresh air introduced.

The accompanying drawings represent the section of a dwelling-house, of which—

- A is a room;
- B, the floor;
- C, the ceiling;
- D, the ceiling of a lower room; and
- E, an outside wall.

The floor B is raised slightly above the lower ceiling D, to leave an air-space, F, between them, which communicates at one end with the room A, and at the other end with the flue or chimney, G.

H is a hollow cylinder, open at both ends, placed vertically within the room A surrounding the stove, furnace, or other heater I, and communicating at its lower end with the space F beneath the floor.

J is a pipe connecting the interior of the cylinder with the outer air, or arranged in any suitable manner to supply cold air to the heater when desired.

It is provided with a valve or damper, *a*, by which the supply of cold air is introduced or cut off.

*b* is also a valve or register in the flue G, by which communication is opened or closed between the space F and said flue G.

The smoke and products of combustion are discharged from the heater into the flue G by means of the pipe K, in the usual manner.

The operation is as follows:

As the furnace I becomes heated, the air within the cylinder H is also heated, and rises against the ceiling C of the room. This is followed by a current of cold air from the space F, which, in its turn, also rises, and is discharged through the cylinder into the room.

The heated air so escaping from the cylinder moves along the ceiling C to the outside wall E, and in its passage becomes cooled sufficiently to cause it to descend to the floor, beneath which it is allowed to pass

back again to the heater, to be reheated and again discharged into the room. By this means a constant circulation is produced in the direction of the arrows, thoroughly warming all parts of the room.

When the air becomes vitiated, the valve *a* in the supply-pipe *J* and the valve *b* in the flue *G* are opened, the former to admit fresh air around the heater, and the latter to permit the discharge of vitiated air from the room *A* through the space *F* into the flue. Such vitiated air is caused to ascend the flue, as shown by the arrows, being heated by contact with the pipe *K* from the heater. These operations are continued alternately, as will be readily understood.

It must, however, be borne in mind that the heating of the room is continued during the ventilating process, so that it will not be subjected to sudden changes in temperature.

Several rooms may be heated by my improved system from the same heater, which may be placed in any preferred story of the dwelling or other structure.

It is requisite, however, to connect the room to be warmed with the top of the cylinder surrounding the heater, and the space below the floor with the bottom

of the cylinder, this vertical air-shaft or cylinder being principally the cause of the circulation.

I do not confine myself to any specific arrangement for distributing the heated air, as it may be varied indefinitely without departing from the principle of my invention.

Having thus described my invention,

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

The application of a hollow vertical air-shaft to a heater within the room to be heated, for the purpose of causing a constant circulation of heated air from the furnace through the space to be heated, and, after being partially deprived of its caloric, back to the heater to be reheated, continuing indefinitely, in combination with a ventilating process by which the vitiated air is expelled from the room or rooms, and cold air introduced, during the operation of warming, as herein shown and described.

G. F. SCHULZE

Witnesses:

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