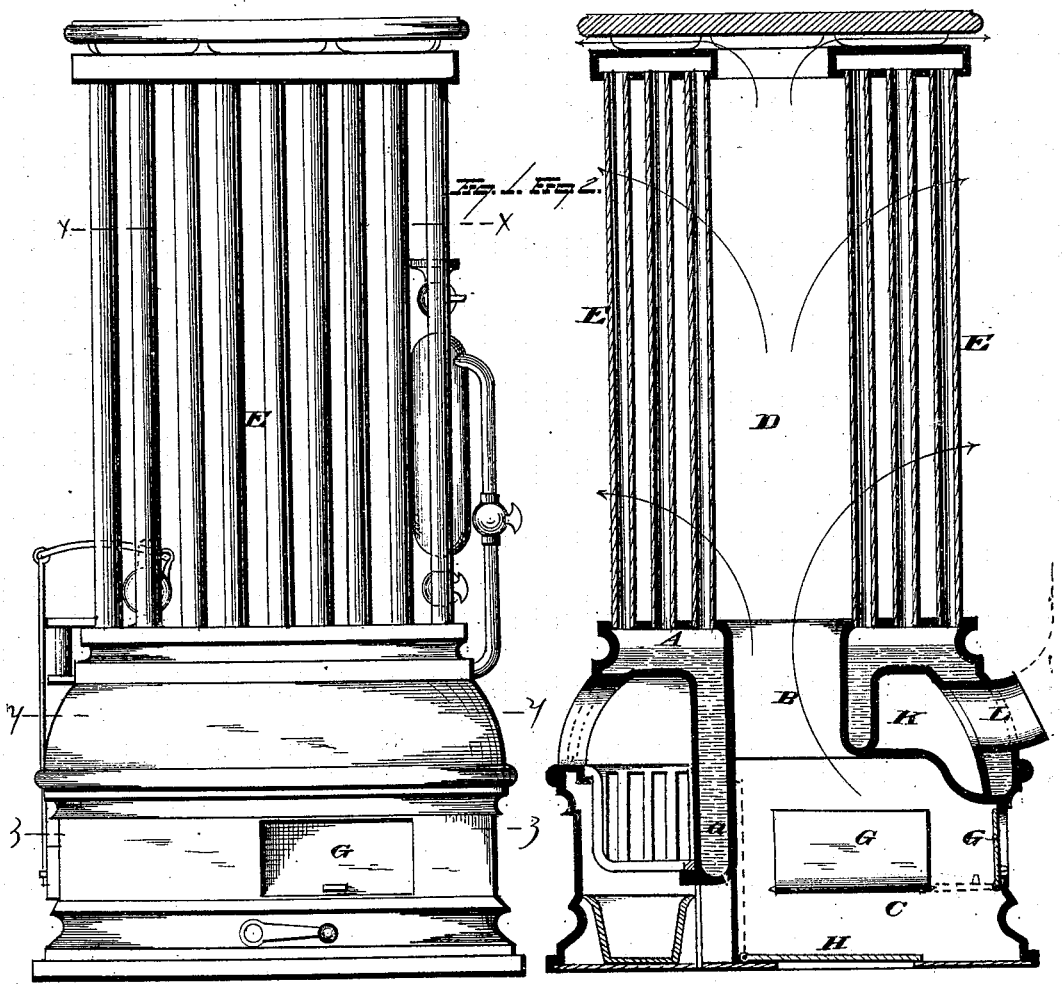
2 Sheets—Sheet 1.

W. H. BROWN.

Steam-Radiators.

No. 199,257. Patented Jan. 15, 1878.



WITNESSES

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2 Sheets—Sheet 2.

W. H. BROWN.

Steam Radiators.

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Fig. 3.

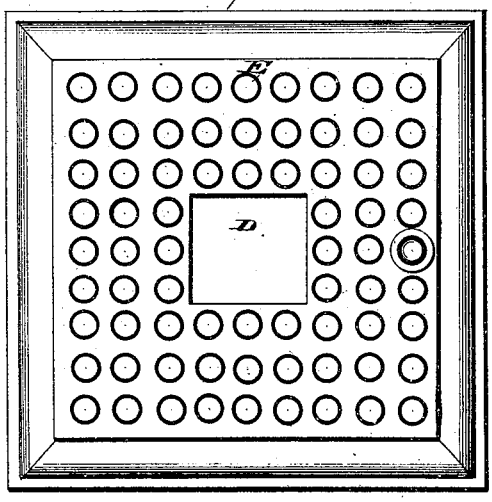


Fig. 4.

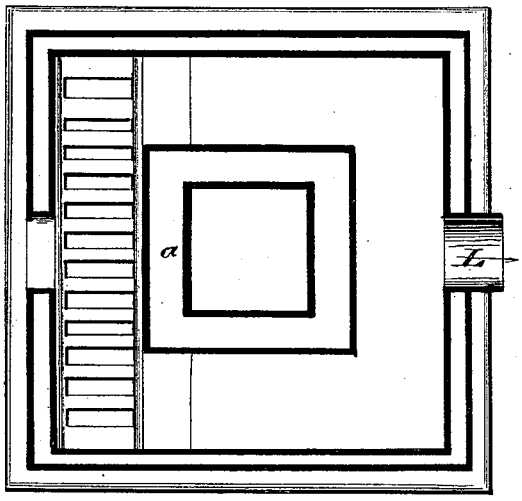
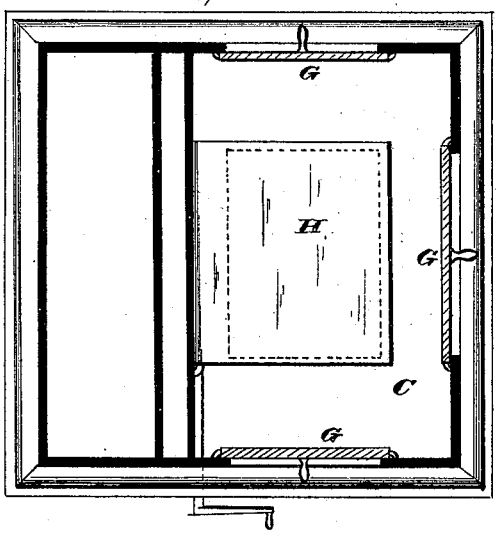


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM H. BROWN, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO ISABELLA S. BROWN, OF SAME PLACE.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **199,257**, dated January 15, 1878; application filed June 12, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. BROWN, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Steam-Radiator Stoves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention consists of a steam-radiator stove designed to warm buildings, and at the same time ventilate them by introducing pure and fresh steam-heated air. It is constructed with a cold-air chamber formed in its base, and having communication through side dampers with the chamber or apartment in which it is placed, and also through a bottom damper with the outer atmosphere. This air-chamber, by means of a central body-opening formed in a boiler located above it, connects with an upper arrangement of steam-pipes, which latter have a common base-connection with the boiler. The heated air deflected from the radiating-surfaces of the steam-pipes, and passing out from among them, creates a vacuum for the air to be drawn up from the base-chamber, and a current through this latter is obtained.

In heating a building the cold-air damper is closed, and the base-chamber has draft-communication only with the side dampers. After the apartments, however, are sufficiently heated the draft-communication is reversed, and the cold-air damper only has communication with the base-chamber, and fresh pure air is admitted into the building in a warmed condition.

The radiator may be used as an ordinary stove, to be located directly within the room or rooms to be warmed, drawing its supply of air through side dampers communicating immediately with the room, and after the latter is warmed cold air is introduced through the bottom damper connecting with the outer or open air. Or it may be used as a furnace-stove, to be located in a cellar, basement, or other suitable portion of a building, and a chamber or casing built about it. This stove-inclosing chamber is provided with hot-air pipes, leading therefrom into the different apartments to be warmed. As the cold air passes through the base-chamber it becomes warmed to a considerable extent, so that upon reaching the steam-pipes the latter are not suddenly struck with cold air, as would otherwise be the case, and thus a hasty or undue condensation of steam therein is avoided.

In the use of the stove directly within the room to be warmed, not only is a direct radiation therefrom obtained, but, by the introduction of fresh warmed air into the apartment, both a direct and an indirect radiation is obtained—a result which has been sought for in various ways, but never accomplished as by this construction.

Hence, the advantage of my invention is seen in its use in schools, where I would use the radiator as an ordinary stove, directly located in the rooms, and allowing a separate stove to each apartment.

Refering to the drawings, Figure 1 is a view in elevation of a stove embodying my invention. Fig. 2 is a vertical section of the same. Figs. 3, 4, and 5 are cross-sections, respectively through lines *x x*, *y y*, and *z z* of Fig. 1, showing corresponding views of the steam-pipe arrangement, the smoke-flue, and the cold-air chamber in the base of the stove.

The stove is shown adapted to be used with an ordinary side fire-box located in its base-section, but, if desired, may be constructed upon the fuel-magazine principle.

The boiler A is constructed in full cross-measurement of the stove, and provided with the central opening B, through which the base-chamber C has communication with the open space D formed in the central vertical body of the stove by the arrangement of the steam-pipes E. These latter continue up from the boiler, and may or may not be connected at their upper extremities with one another.

The boiler has a portion of its casting extended down to form a vertical water-chamber, *a*, at the back of the fire-box, and thus expose greater fire-surface to the action of the flames. This water-chamber may, if desired, be formed entirely around the cold-air

opening through the boiler, above the partition separating the same from the cold-air chamber, and thus be subjected to the heat of the products of combustion as the latter pass on their way to the smoke-exit.

But my invention is broader than any special construction of the boiler or the above-mentioned water-chamber extension, and any suitable formation of the same may be used.

The cold-air chamber C formed in the base of the stove is of any suitable dimensions, and provided with the side dampers G, controlling its communication with the chamber or apartment in which it is placed. Its lower horizontal body is provided with the damper H, the opening which it controls being adapted to be connected with the outer air by any desired means.

The smoke-flue K completely surrounds the central air-opening B of the boiler, and allows the products of combustion, in their passage about the same to their exit out through the smoke-pipe L, to give up their heat to warming the air which flows through this opening. At the same time, by locating this flue between the boiler and the draft-chamber, both of these latter receive heat from the discharging smoke, and thus the flue jointly warms the central air-opening, the boiler, and the cold-air chamber, all formed in the base of the stove. The stove is placed over such open-air connection, so as to suitably communicate therewith. Air-valves, automatic or otherwise, will be attached to each stove, to vent its pipes, and a heat-regulator is also connected with the same, which is not particularly described here, as it forms no part of the improvement to be illustrated in this patent. The same may be said of the device for maintaining a constant water-line in the steam-boiler. Both of these attachments may be omitted from the construction of the stove without impairing my invention, as the latter may be used independently of such specially-adapted attachments; but I preferably provide this ventilating-stove with them, as they well answer the subsidiary purposes in view.

In warming the building, the lower or cold-air damper is closed, and the side dampers connecting with the room or the stove-inclosing chamber are opened. This causes the apartments to be thoroughly warmed, as it heats the air within them without an introduction of outer or cold air. But when the proper degree of temperature is reached the damper-communication is reversed, and while the draft-connection with the open apartment or the stove-inclosing chamber is closed, the cold-air draft is substituted therefor. This allows the pure outer atmosphere to rush in, and, passing through the cold-air chamber of the stove, it flows up through the central opening of the boiler, and circulates among the steam-pipes, and through the spaces formed between them. The radiating-surfaces of these pipes deflect this air therefrom in caloric currents, and the latter enter the rooms or apartments as warmed fresh air.

By this construction I obtain a mode of ventilating rooms at the same time that I supply them with warmth, and the fresh outer air, retaining its purity, is rendered both a ventilating and a heating agent.

This invention is intended especially for school-rooms, offices, hotels, and similar buildings, as it affords great facilities in heating such apartments, but is also adapted for use in all buildings.

Mechanism for detaching the damper-rod from its controlling lever and engaging it over a stud on the stove, so as to hold the damper closed, if desired, even when the steam-pressure is low, is preferably used with this stove.

While the stove is shown in the drawings as square, this is entirely optional, and the form of the stove in cross-section may be circular, or of any desired style.

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

1. A steam-heater consisting in the combination, with a boiler located within the fire box or chamber of the heater and suitable steam-pipes connected with said boiler, of a cold-air chamber extending through the boiler and between the steam-pipes, substantially as set forth.

2. In the combined steam-heating and air-ventilating stove, the boiler made with a central air-passage connecting the cold-air chamber in the base of the stove with the upper air-chamber surrounded by the series of steam-pipes, substantially as described.

3. The horizontal smoke-flue between the boiler and the cold-air chamber in the base of the stove, and entirely encircling the lower portion of the central air-passage of the boiler, substantially as described.

4. The combination, with a steam-boiler depending into the fire-chamber and steam-pipes connecting with the upper portion of the boiler, of a cold-air chamber formed in the base of the stove, and extending upwardly through the boiler and within the series of steam-pipes, the base of the heater being provided with dampers in its bottom and sides, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of June, 1877.

WILLIAM H. BROWN.

Witnesses:

CAR. BYFIELD,

LIVINGSTON HOWLAND.