No. 635,861. Patented Oct. 31, 1899.

J. J. LAWLER.

RADIATOR FOR HEATING AND VENTILATING.

(Application filed Mar. 15, 1898.)

(No Model.)

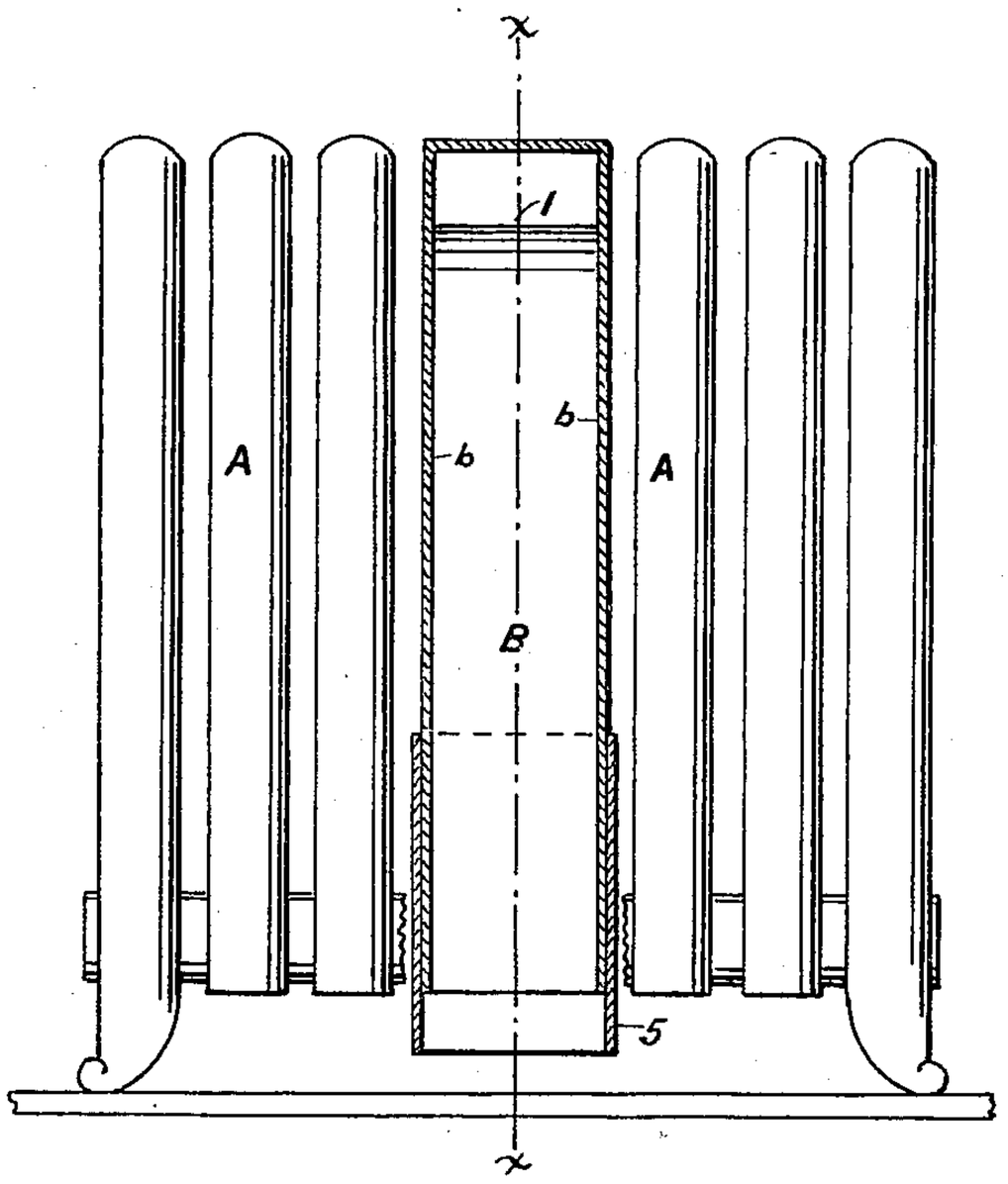

FIG. 1.

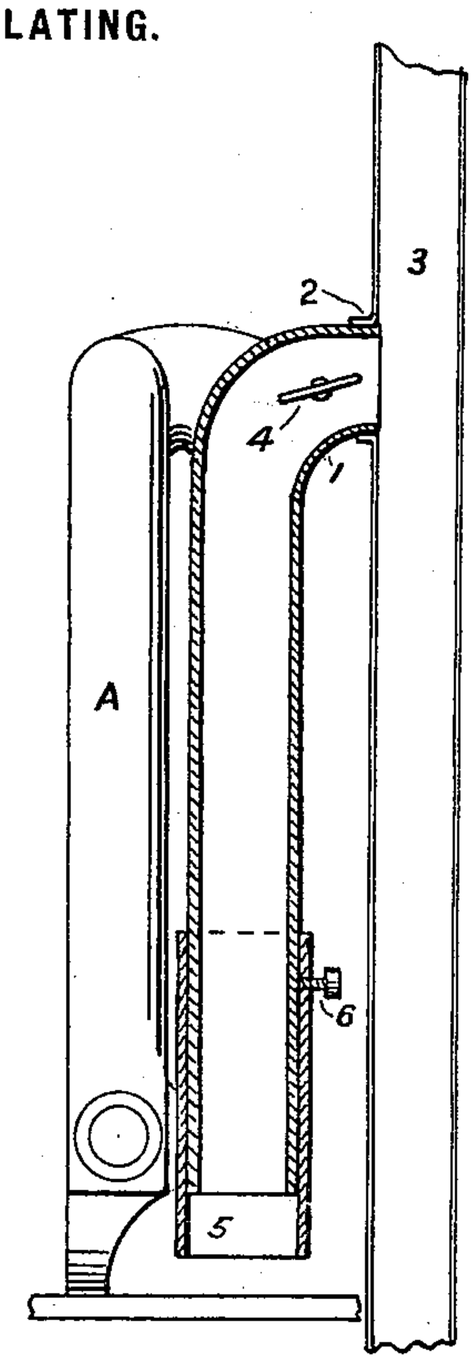

FIG. 2.

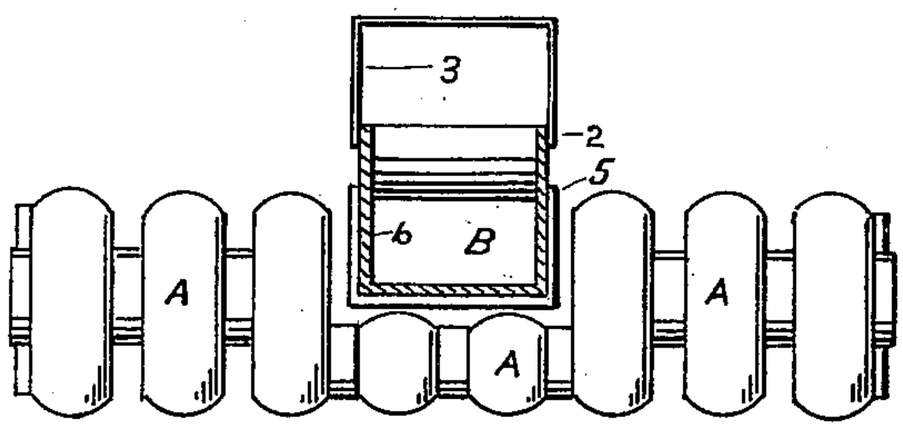

FIG. 3.

WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES J. LAWLER, OF MOUNT VERNON, NEW YORK.

RADIATOR FOR HEATING AND VENTILATING.

SPECIFICATION forming part of Letters Patent No. 635,861, dated October 31, 1899.

Application filed March 15, 1898. Serial No. 673,923. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. LAWLER, a citizen of the United States of America, and a resident of the city of Mount Vernon, county of Westchester, State of New York, have invented certain new and useful Improvements in Radiators for Heating and Ventilating, of which the following is a specification.

My invention relates to a system of heating and ventilating apartments and involves in its application the employment of a steam or hot-water radiator within the apartment to be heated and ventilated, through which radiator a heated fluid is circulated, a foul-air shaft leading from the apartment to a suitable place of exit, and a ventilating-chamber supported in close proximity to the circulating-tubes of the radiator and heated thereby, said chamber having its lower end open and adjacent to the floor of the apartment and its upper end connected to and communicating with the foul-air shaft.

In the accompanying drawings I have illustrated a radiator specially constructed for use in connection with my system, and in said drawings—

Figure 1 is an elevation of a radiator, partly in section, showing a ventilating-chamber, two tubes in front of said chamber not being shown. Fig. 2 is a section through line *x x* of Fig. 1, showing the ventilating-chamber connected to the foul-air shaft; and Fig. 3 is a plan view showing two tubes in front of the ventilating-chamber, the latter being shown in section at the elbow where it connects with the foul-air shaft.

Similar reference characters denote similar parts in the several views.

One of the best-known forms of steam or hot-water radiators consists of two or more parallel rows of vertical tubes. The number of tubes is usually the same in each row, and the tubes are so connected at their upper and lower ends as that a heated fluid can circulate freely through all of them. In order to apply my invention to such form of radiator in the best manner, I omit one or more tubes from one of the rows, preferably the rear row, so as to provide a space for the reception of a ventilating-chamber. By such arrangement the ventilating-chamber may be entirely within the vertical plane of the radiator and will be subjected to heat from the radiator over a greater portion of its surface.

Referring to the drawings, A designates the vertical tubes of the radiator, through which a heated fluid, as steam or hot water, circulates. It will be seen that two of the tubes in the rear row are omitted, and in the space thus formed a ventilating-chamber B is supported. In the construction illustrated this chamber is a separate piece secured to the radiator; but it is obvious that such chamber might form an integral part of the radiator. Preferably the chamber is rectangular in cross-section, so that three of its sides *b* will be exposed to heat radiated directly from the tubes. The chamber B is open at its lower end and terminates, preferably, about on a level with the lower ends of the tubes A. Its upper end is provided with an elbow 1 open at the outlet where it connects with the mouth 2 of a foul-air shaft 3, which may be concealed in the wall or be in sight, as best suits conditions connected with the particular installation. The foul-air shaft may extend to the open air through the roof or wall of a house, or it may open into an attic if used in country houses. A damper 4 of any preferred style, either clapper or balanced, may be used to check ventilation when desired.

A sleeve 5 may be telescopically connected to the lower end of the chamber B, whereby the chamber can be lengthened or shortened, and thereby adjusted nearer to or farther from the floor. The sleeve is held in place by a thumb-screw 6 or by any other suitable fastening. For lavatories, bath-rooms, or places where the radiator is set on brackets above the floor this sleeve may be a foot or more long, so as to reach the point from which it is desired to remove foul or impure air.

Such being the construction, the operation is as follows: When the heating fluid is turned on, so as to circulate through the tubes A, the walls *b* of the chamber B are heated by radiation. The temperature of the air within the chamber is raised and, becoming lighter, it rises, passing through the elbow 1 into foul-air shaft 3, and this displacement of the warm air causes colder air to rise up within the chamber B to replace the heated air which has entered the foul-air shaft. In this man-

ner a circulation of air is established and the carbonic-acid gas or any foul air, which is heavier than the air within the room, and thus occupies a place near to the floor, is drawn up through the chamber B and conducted to without the apartment. This continues as long as the radiator is warm and the damper 4 is open.

The radiation from the heater is "direct." No floors, walls, or other parts of the building need be cut, nor need any opening for the ingress of fresh air be provided. It is found in practice that sufficient fresh air enters an apartment through joints at windows and doors to keep the air in the apartment "sweet," provided the foul air is carried off, so that it will not be mixed with fresh air. This separation of the pure and impure air is accomplished by means of my ventilating-chamber when the latter is heated by a radiator and is connected with a foul-air shaft or flue.

Having thus described the invention, what I claim is—

1. The combination with a radiator formed of a series of parallel rows of vertical tubes through which a heated fluid is adapted to circulate, a space being formed in one of said rows substantially as described, of a ventilating-chamber supported in said space, the lower end of the chamber being open and adjacent to the floor of the apartment in which the radiator is located, and a foul-air shaft leading out from said apartment and with which the upper end of the ventilating-chamber communicates.

2. A radiator formed of a series of rows of vertical tubes through which a heated fluid is adapted to circulate, and having a space in one of said rows, and a ventilating-chamber supported in said space and having an open lower end, substantially as described.

Signed by me this 14th day of March, 1898.

JAMES J. LAWLER.

Witnesses:

GASTON E. CORDEAU,

JOHN A. MCKAY.