J. A. MILLER.

Steam Radiators.

No. 153,176. Patented July 21, 1874.

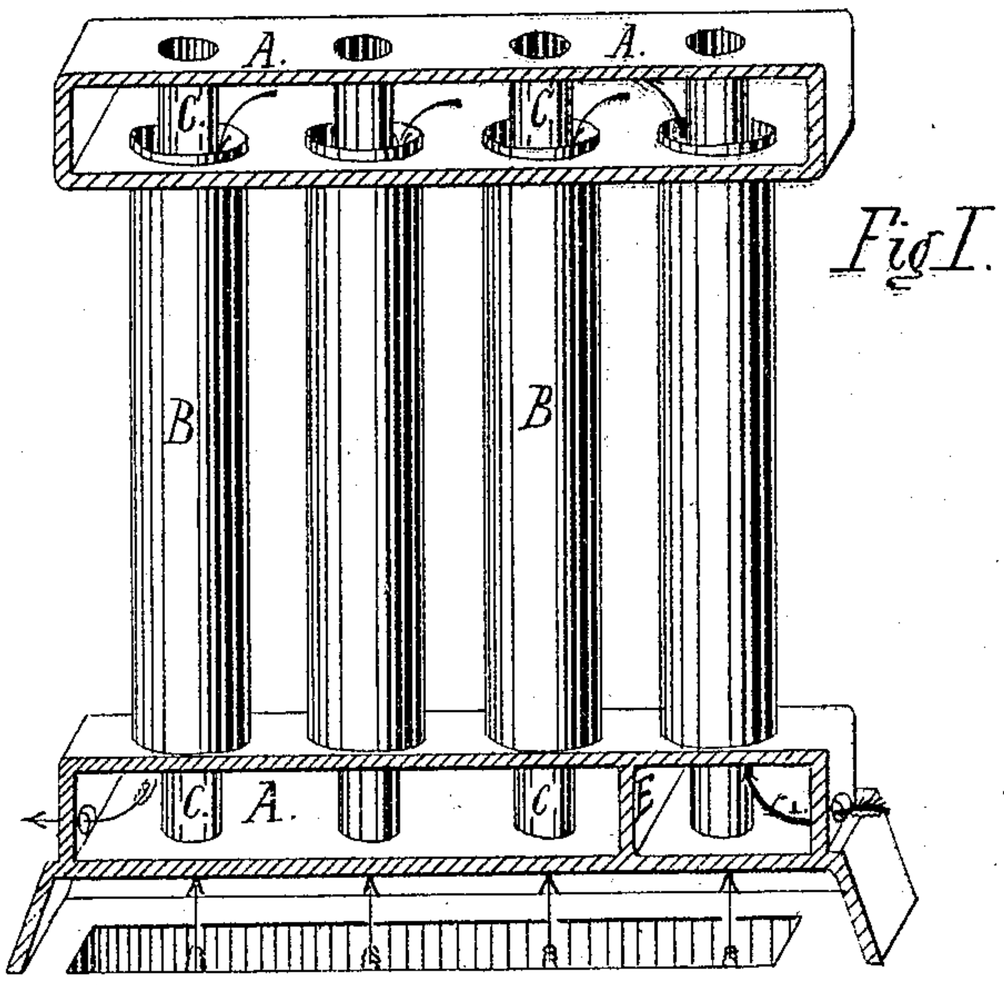


Fig I.

Fig II.

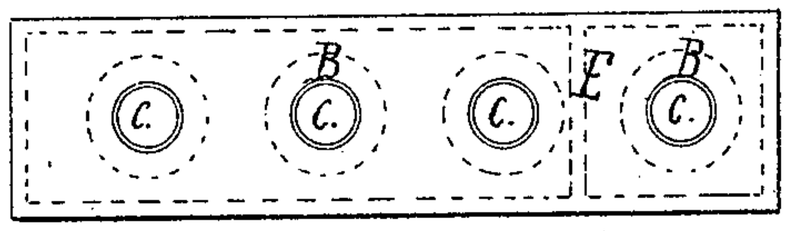
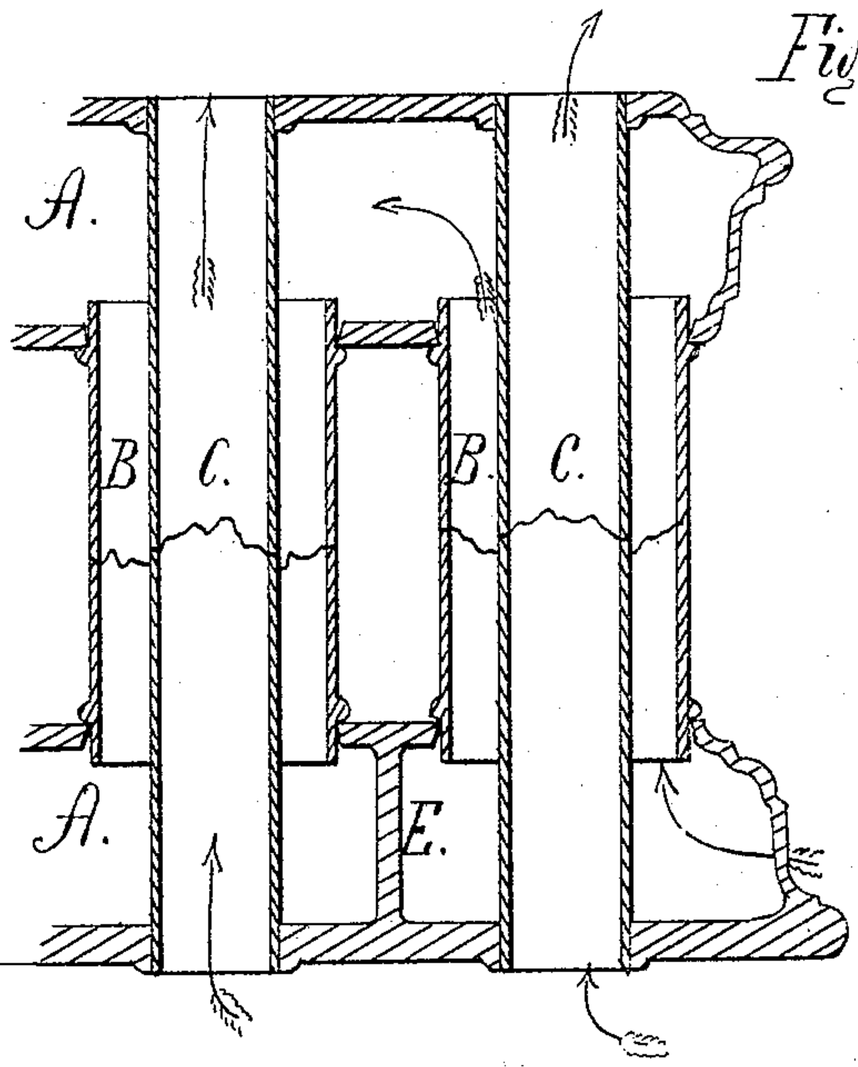


Fig III.



Witnesses

Henry J. Miller

Joseph A. Miller Jr.

Inventor

Joseph A. Miller

UNITED STATES PATENT OFFICE.

JOSEPH A. MILLER, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **153,176**, dated July 21, 1874; application filed November 6, 1873.

To all whom it may concern:

Be it known that I, JOSEPH A. MILLER, of the city of Providence, in the State of Rhode Island, have invented Improvements in Steam-Radiators, of which the following is a specification:

My invention relates to that class of devices known as steam-radiators; and it consists in the combination of the several elements, for the purposes to be hereinafter described.

Figure I is a perspective view, showing the radiator in section. Fig. II is a top view, and Fig. III is an enlarged section.

Corresponding letters refer to corresponding parts.

The radiator consists of the base chamber A, the upper chamber A, the tubes or hollow columns B B, and the tubes C C. The tubes B B are secured to the chambers A A, as shown, and the tubes C C are placed concentric within the tubes B B, and are secured by expanding the same on each end. When so secured, the tubes or hollow columns B B present their outer surface to the air and their inner surface to the steam, whereas the tubes C C present their inner surface to the air and their outer surface to the steam. When the space below the base chamber A A is closed to the floor, and fresh air is supplied to this space by an air duct or flue, the fresh air can only enter the room through the tubes C C, as is indicated by the arrows, and is heated before it enters the room. The base chamber A has a partition, E, near the end where the steam is let in, dividing this part of the chamber from the part where the steam and condensed water are let out, and compelling the steam to ascend through the annular space between the tube B and tube C into the upper chamber A, filling the same, and gradually descending, through the annular spaces between the tubes B B and C C, to the base or lower chamber, expelling the air and giving free vent to the condensed water through the exit-pipe, as is shown by the arrows in Fig. I. The tubes B B may be plain metallic tubes of uniform diameter, and if so, they may be forced into the holes in the chambers A A by pressure, so as to make a steam-tight joint; or they may be ornamental cast columns, having shoulders against which the chambers A A rest, and a cement joint be used, as shown in Fig. III, and the tubes C C afterward secured by an expander. All the tools required to construct the radiators are drills and expanding-tools, nor is there any skilled or costly labor required in their construction. The tubes C C acting as stays and tie-rods as well as heating surfaces, and the tubes B B as columns, and their bearing being well distributed over nearly the whole of the flat surfaces of the chambers A A, these chambers may be made of lighter metal, and still be able to withstand a higher steam-pressure than is the case with the usual construction, while all the material used is useful as a heating-surface.

When rooms are heated by steam-radiators, fresh cold air is generally as much as possible excluded, and ventilation necessarily deficient; and when cold air enters by door or window, the colder and consequently heavier air falls to the floor and makes the room uncomfortable and unhealthy. Indirect radiation where air first heated by steam-pipes is admitted by register is not always possible, nor is this method as pleasant and comfortable as direct radiation. By the use of the radiator, as shown in Fig. I, a supply of fresh pure air can in all cases be secured, either by connecting the space below the chamber A with an unused chimney-flue, or by a flue through the wall with the outer air, or with the hall of the building, and direct radiation with a supply of fresh air secured. When the radiator is placed as in Fig. I, over a cold-air flue or duct in the floor, the air can only enter the room through the tubes C C, and only so fast as the air is heated to a temperature higher than the air in the room. Pure fresh air is constantly supplied without local drafts; and if proper means of ventilation are secured to carry off the vitiated air, perfect ventilation and a warm and comfortable room, with the least expenditure of steam is the result.

In some rooms where modes of supplying fresh air exist, or where doors are opened so often as to bring in sufficient, and more than sufficient, fresh air, I make my radiator open between the lower or base chamber A and the floor, so that the colder air near the floor may

freely pass to the lower part of the tubes C C; and as a strong upward current always exists within these tubes, the cold air is drawn to and through the same, and discharged into the room heated, producing a circulation of air throughout the room, and securing a more uniform temperature.

The efficiency of a radiator depends on the complete expulsion of all the air from its interior, so as to allow the steam to fill every part thereof. The partition E in the chamber A, by compelling the steam to ascend and get on top of the colder air, completely insures this; and when steam is let onto this radiator, a person can feel how the heat gradually descends as the air is expelled, until the whole has a uniform temperature.

The ground plan of the radiator may have any form or dimension required; also, in some cases, more than one tube C may be placed within each tube B, so as to give more heated air, with less direct radiation.

Having thus described my invention, I claim—

The base chamber A, divided by partition E, in combination with the concentric tubes B and C and the upper chamber A, forming upward and downward annular steam-passages, substantially as and for the purpose specified.

JOSEPH A. MILLER.

Witnesses:

HENRY J. MILLER,

JOSEPH A. MILLER, Jr.