J. H. CUNNINGHAM.

Steam-Radiator.

No. 200,983. Patented March 5, 1878.

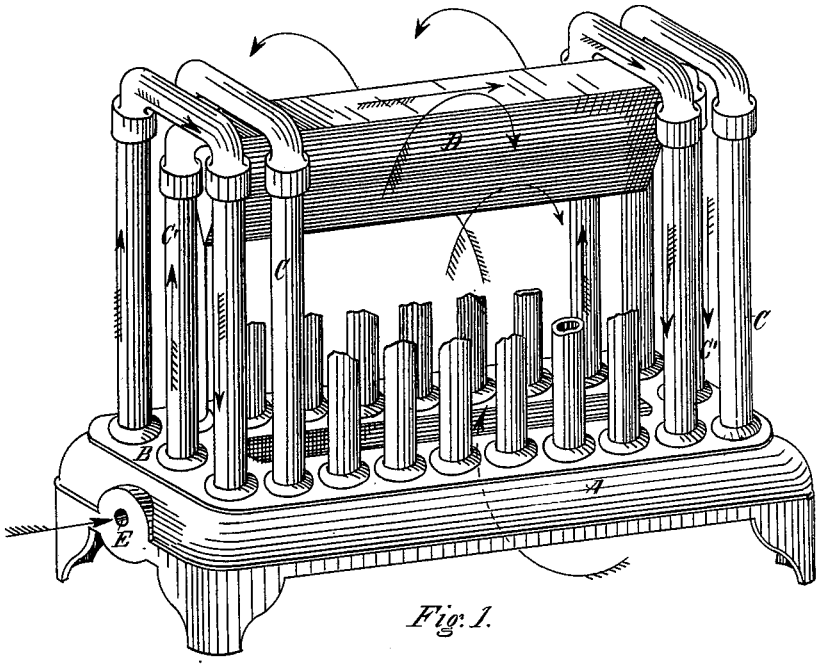

Fig. 1.

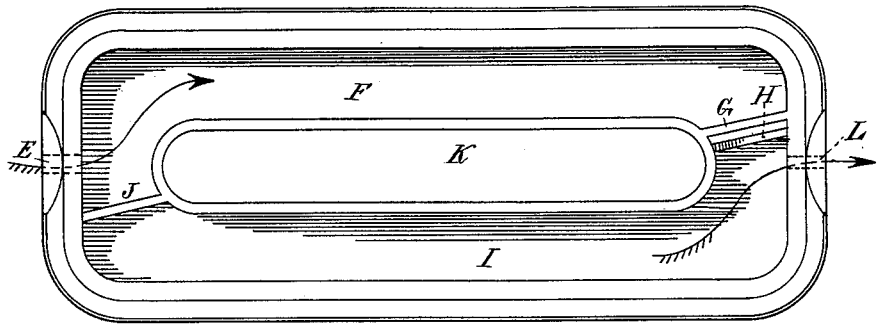

Fig. 2.

Witnesses:

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JOHN H. CUNNINGHAM, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **200,983**, dated March 5, 1878; application filed November 24, 1877.

To all whom it may concern:

Be it known that I, JOHN H. CUNNINGHAM, of the city of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in the Construction of Steam-Radiators for the heating of buildings or other places where steam is used for purposes of heating, which invention is fully set forth in the following specification.

The construction of the radiator is shown in the accompanying drawing, and is substantially as follows: The point E in the drawing represents the opening for the admission of steam. K I will call, for the purposes of description, an elongated or longitudinal slot or opening about two inches in width, and extending to within four inches (more or less) of each end of the base of the radiator. At the end of the radiator, where the opening E for the admission of steam is situated, and in the interior of the base, is a solid bridge-wall, J, extending from the top of the said base to the bottom of the same, and connecting the wall of the radiator with the wall forming the aforesaid slot, and thereby preventing the passage of steam from one chamber of the base of the radiator to the other at the end of the radiator thus far described. At the opposite end of the interior of the base is another bridge-wall, G, like the one first described, in that it forms a complete connection between the outer wall of the base of the radiator and the wall forming the longitudinal slot K, before mentioned, and extending to the top of said base and wall; but said last-described bridge-wall is unlike the first, inasmuch as this bridge-wall G, as shown in the drawing, is a hanging bridge-wall extending from the top of the base, and connecting, as aforesaid, to within about three-eighths ($\frac{3}{8}$) of an inch of the bottom of the base; and on the side of the last-described or hanging bridge-wall, and in the chamber I, where is situated the exit-opening L, and between said opening and the said hanging bridge-wall is the dam H, as represented in the drawing. This dam is built up from the bottom of the base about one-half of an inch in height, and connects the outer wall of the base of the radiator with the wall forming the longitudinal slot K, before described.

Secondly, the construction of the upper portion of the radiator may be described substantially as follows: The return-pipes C, as shown in the accompanying drawing, connecting, as they do, the two chambers F and I within the base, form passages for the circulation of steam from the chamber F to the chamber I. Then the two pipes, one at each end of the radiator, marked C′, are made to enter the base, one connecting with the chamber F and the other with the chamber I. An examination of the positions of the two bridge-walls J and G will illustrate this fully.

The longitudinal connection and deflector combined, marked D in the drawing, is made to serve two purposes: First, as a connection, because, being hollow, a current of steam passes through it, said steam entering the pipe C′ from the chamber F, and, passing through the hollow connection D and C′, enters chamber I, and leaves the radiator by the outlet-opening L in the same manner as does the steam which passes through the return-pipes C, as designated in the drawing. The second purpose which this connection D is made to serve—viz., as a deflector—I will describe as follows: The top of the deflector is to be (in a radiator of ordinary size and for common and regular use) about two inches in width, the same width as that of the elongated slot K before described, which slot is situated directly under the deflector, as will be seen by reference to the drawing, both the slot and deflector corresponding in length, as is also fully illustrated. The said deflector, tapering, as is shown in drawing, regularly from the top to a point at its bottom, deflects or disseminates the hot air rising from the elongated opening K below, and thus forms a powerful agent for heating the air in the lower portions of a room, whereas, with radiators now in use, the hot air first rises to the top of the room, and so the air in the top of a room is heated to a high degree before any heat can be acquired in the lower portion of a room, where it is most needed and desired. The wall of said connection and deflector should be about three-sixteenths ($\frac{3}{16}$) of an inch in thickness.

Thirdly, the new, and in many respects peculiar, process which takes place within and in connection with this radiator may be described substantially as follows: Steam enters the chamber F through the opening E. The bottom or base of the radiator being cool, con-

densation must take place as a matter of course. The water formed by such condensation cannot, as will be readily seen, rise above a level with the top of the dam H, before described, for at that point the water must flow over the said dam into the chamber I. Now, as the bottom of the bridge-wall G is about upon a line one eighth ($\frac{1}{8}$) of an inch below the top of the dam H, the bottom of said hanging bridge-wall being about three-eighths ($\frac{3}{8}$) of an inch, and the top of said dam being about one-half ($\frac{1}{2}$) of an inch above the bottom of the chamber I, it is obvious that the surface of the water formed by condensation of steam in chamber F, as before described, can never be at a point higher upon the hanging bridge-wall than one-eighth of an inch, for it is at that height that the water flows over the dam H into chamber I.

It has been found by actual trial that upon admission of steam into chamber F, as before described, condensation will take place to a sufficient degree, so that the water will always rise and remain in said chamber at the height above indicated. Water, being always kept at the depth before described, forms a complete bar to the passage of the steam from chamber F to chamber I by any other course than through the return-pipes C, and by the course designated by pipe C′, the hollow longitudinal connection D, and pipe C′, before described; and by this process I claim that a positive circulation of steam is brought about from the chamber F to chamber I through the return-pipes C, pipes C′, and longitudinal connection D, before described.

The lower side of the inlet-opening E should be about one-sixteenth ($\frac{1}{16}$) of an inch above the surface of the water, or, in other words, nine-sixteenths ($\frac{9}{16}$) of an inch above the bottom of chamber F. By this arrangement the current of steam entering at opening E passes over the surface of the water, and cannot by any possibility pass through the water, disturbing the same, causing noise in the radiator; and by means of the peculiar construction of the inlet-opening E, in combination with the solid bridge-wall J, the hanging bridge-wall G, and the dam H, I hold that I have constructed a radiator that is positively noiseless.

In this connection it should be stated that the outlet-opening L, unlike the inlet-opening E, is situated so that its lower side shall be on a level with the bottom of chamber I, so that said chamber may be kept at all times well drained of condensation.

I now proceed to describe the process by which I produce what I hold to be a more nearly perfect circulation of air than has ever before been produced in connection with a steam-radiator.

The radiator is raised upon its legs to a height of about three (3) inches above the floor of the room, so as to afford free opportunity for the circulation of air from the outside. The steam, passing through the return-pipes C, pipes C′, and connection D, as before described, heats the air within the space between the return-pipes, which heated air will, of course, rise and be deflected upon the deflector D, and disseminated through the room, as before described. The heated air rising, the cool air will rush in from the outside under the radiator and through the longitudinal slot K, and thus will be kept up a constant circulation of air which is heated and disseminated through the room, as hereinbefore described.

I claim—

1. The opening E, the solid bridge-wall J, and the hanging bridge-wall G, in combination with the chambers F and I, and the whole in combination with pipes C C′ and hollow longitudinal connection D, constructed and arranged substantially as described, and for the purposes set forth.

2. The combination of the chambers F and I, constructed substantially as described, pipes C C′, and the hollow longitudinal connection D, substantially as and for the purposes set forth.

3. The steam-chambers F and I, in combination with opening E, pipes C′, and connection D, constructed and arranged substantially as described, and for the purposes set forth.

4. The combination of the longitudinal slot K, the return-pipes C, the pipes C′, and the hollow connection D, constructed and arranged substantially as and for the purposes set forth.

5. The deflector D, constructed substantially as described, and for the purposes set forth.

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Witnesses:

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