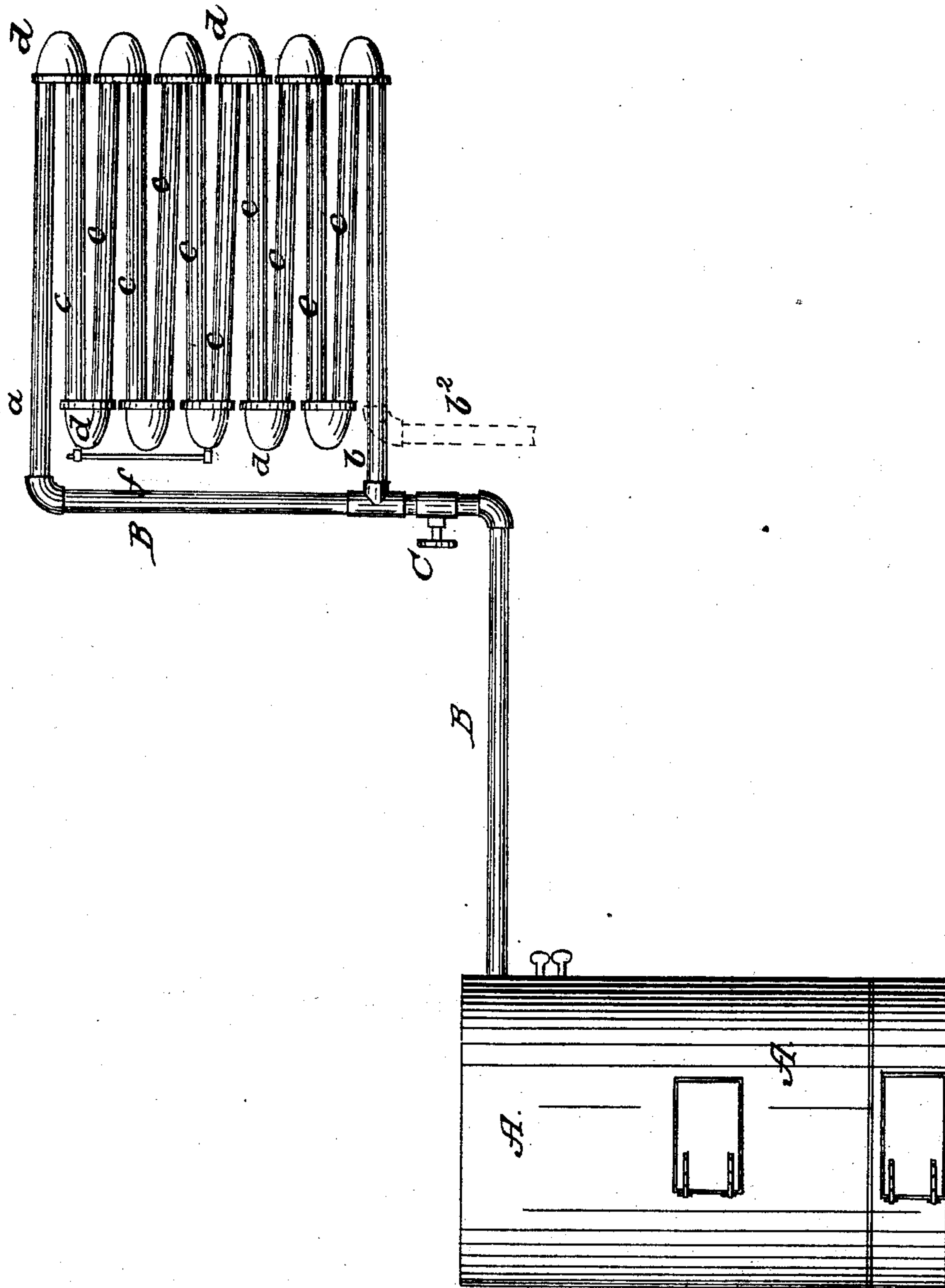


W. C. BAKER.
Steam Radiator.

No. 38,211.

Patented April 21, 1863.



witnesses
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att'y

UNITED STATES PATENT OFFICE.

WILLIAM C. BAKER, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. 38,211, dated April 21, 1863.

To all whom it may concern:

Be it known that I, WILLIAM C. BAKER, of New York, county and State of New York, have invented a new Mode of Supplying the Coils of Steam-Heating Apparatuses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to that kind of steam-heating apparatus in which the steam from a boiler is conducted to a steam "coil," which heats the air coming in contact with its external surface, and from which the condensed steam flows back to the boiler; and my invention has for its object a new mode of feeding or supplying the coil with steam and returning the condensed steam to the boiler, whereby the "return-pipe" usually employed is dispensed with.

Previous to my invention it has been customary to use one pipe to convey the steam from the boiler to the coil, and another pipe to conduct the condensed steam from the coil back to the boiler. In large buildings this renders the apparatus very complicated, and in all cases a great quantity of pipe and labor is requisite. It is obviously, then, a great desideratum to construct this kind of steam-heating apparatus with only one pipe to convey the steam to the coil, and also carry the condensed steam (or water) back to the boiler, and apparatuses have been put up with one pipe connected to the lower side or tube of the coil; but practice has shown that an apparatus so arranged will not work satisfactorily, because the condensed water cannot flow back freely against the pressure of the steam, as I will presently explain. (Of course the steam-pipe could not be connected to the top of the coil; the condensed steam falling to the bottom would never get out.)

My invention consists in connecting the steam-supply pipe to both the upper and lower tubes of the coil, substantially as hereinafter explained, whereby the condensed steam in the coil receives an equal pressure from all directions, and will freely descend through the (same) supply-pipe to the boiler, as hereinafter more fully described.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same, referring to the accompany-

ing drawings, in which is given an elevation of an ordinary upright boiler and a steam-coil, (such as usually employed with two pipes,) showing my improvement.

A is the boiler. B is the steam-pipe through which the steam is conducted from the boiler A to the coil, which is made, in the usual way, of a number of tubes, *c c c*, &c., connected together, as shown, by the return-bands *d d*, &c., forming a continuous passage for the steam back and forth till it reaches the end of lower tube at *b*, where the circuit is completed.

f is the automatic air valve or tube usually employed, which is so constructed that when the steam enters the coil the air in the latter will be forced to escape through said tube *f*; but as soon as the steam reaches said tube *f* its valve is closed by expansion of metal and no steam can escape from the coil. This apparatus or instrument is familiarly known in the art, and need not be particularly described by me here. This instrument *f* is generally placed at one end of the coil, (the end opposite to that at which the steam enters.) I place it near the center of the coil because I introduce the steam at both ends of coil.

c is the ordinary cock or valve for admitting the steam to or shutting it off from the coil.

As my invention relates only to the mode of combining the steam-pipe and coil so as to dispense with the return-pipe, I have not drawn or described the boiler apparatus in detail, but have only shown the connection between a boiler and coil.

I have before mentioned that attempts have been made to dispense with the return-pipe by connecting the steam-pipe to the lower tube of the coil. I have illustrated this arrangement by the dotted lines in the drawings, *b²* representing the steam-pipe coming from the boiler and connected, as shown, to the lower tube only of the coil. To employ this mode of arrangement it is necessary to give the tubes *c c* a much greater pitch or degree of inclination (which is quite objectionable, taking more room) to even approximate a working condition in the apparatus; but with an increased pitch of the tubes *c c* it is found that the condensed steam or water will not readily flow back against the steam, and the consequence is the water forming in the tubes *c* prevents their being raised to the same temperature they would attain were the condensed steam quickly

carried off from the tubes *c*, and, beside, when the steam is shut off the water in the tubes will freeze and burst them. In other words, practice demonstrates the fact that the steam entering in one direction the coil the water formed by condensation will not readily get out of the coil and back to the boiler, and the apparatus is so defective and liable to accident that the addition of a return-pipe in the usual manner is more desirable.

In my new arrangement I run the steam-supply pipe B up by the end of the coil and connect it to both the upper and lower tubes of the latter at *a* and *b*. When the cock *c* is turned, the steam enters the lower and top tubes of the coil about simultaneously, the air escapes at *f*, (in the usual way,) and the coil is perfectly filled with steam. Now, it will be observed that by connecting the coil at both ends to the steam-pipe B all the condensed steam which may be in or is formed in the coil will flow down to the lowest part of the coil with the slightest inclination of the tubes *c c*, because the steam investing the coil from both ends of the latter any body of condensed steam in the coil will be, relative to the steam-pressure, *in equilibrio*, and will by the law of fluids and its specific gravity seek the lowest part of the coil and run out of it back to the boiler. Thus I make the apparatus as perfect in its operation and heating capacity as though

two pipes were employed—one to supply the steam to the coil and another to carry off the condensed steam—and save all the expenses of the return-pipe. In fact, my invention embraces even advantages not found in the apparatuses now employed with two pipes—viz., by the introduction of the steam at both ends of the coil the latter is kept at a more even and higher average temperature throughout its entire length than when steam is supplied only to one end; and in my apparatus, where this is only the steam-pipe, there is less liability of freezing than where there is a great extent of return-pipe, (in large buildings especially,) which chills soon as the steam is shut off from the coils.

Having sufficiently explained my invention to enable those skilled in the art to make and use it, what I claim as new, and desire to secure by Letters Patent, is—

Conveying the steam from the boiler to the coil and the condensed steam from the coil to the boiler through one pipe, as described, by combining said pipe with both ends of the coil, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand and seal this 11th day of March, 1862.

WM. C. BAKER. [L. S.]

In presence of—

WM. LEE,

WM. M. FARRINGTON.