J. K. ABBOTT.

STEAM-RADIATOR.

No. 180,816. Patented Aug. 8, 1876.

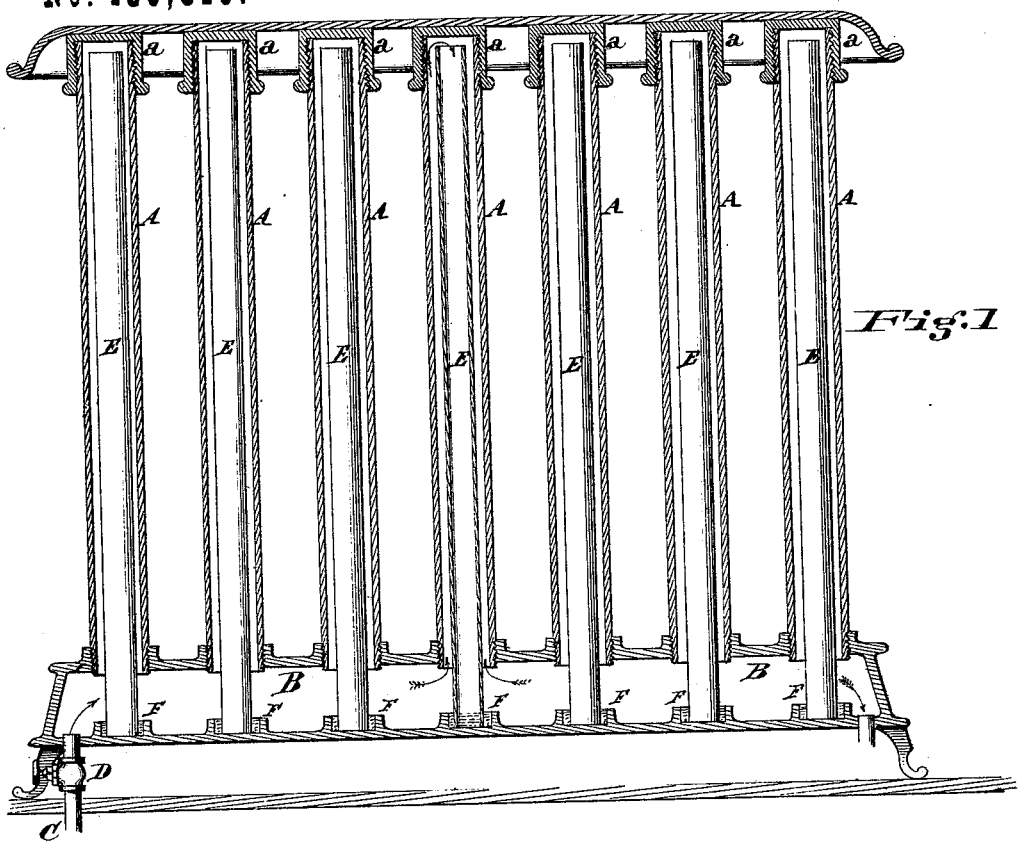

Fig. 1

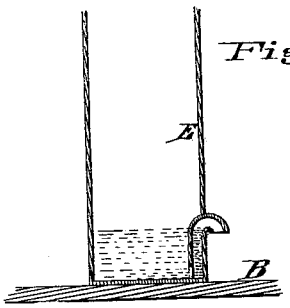

Fig. 2

Attest

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JOSHUA K. ABBOTT, OF CINCINNATI, OHIO.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **180,816**, dated August 8, 1876; application filed March 27, 1876.

To all whom it may concern:

Be it known that I, JOSHUA K. ABBOTT, of Cincinnati, Hamilton county, State of Ohio, have invented an Improvement in Radiators, of which the following is a specification:

My invention is designed, first, to avoid the removal of the interior air from the radiator, and thus render unnecessary the employment of air-discharging traps, valves, or vent-cocks; and, second, to utilize the retained air as a means for enabling the superficial radiating-surface of the heater to be increased or diminished by varying the pressure of steam, and still permit all parts of the radiating-surface to be heated by steam when necessary; and my invention consists, in the first part, in the provision, within the heating pipes or chambers of the radiator, of one or more air-receptacles, arranged so that the pressure and action will remove the air from the interior heating-surface of the radiator, and carry it for retention into the air receptacle or receptacles.

My invention consists, in the second part, in the combination of the air receptacle or receptacles and radiator with the usual or other steam-pressure-regulating valve or device, this combination enabling the superficial area of the radiating-surface of the heater to be graduated to any extent between its extreme limits to vary the temperature of the room.

Figure 1 is a vertical section of a radiator embodying my invention. Fig. 2 is a section of a modification in the construction of the air-retaining tubes.

My invention is applicable to radiators composed of separated sheets of metal, and in this case one interior air-retaining receptacle will be sufficient for each radiator; or it may, as the drawing shows, be composed of a series of pipes, each fitted with an air-retaining receptacle.

The pipes A are either fitted with the usual detachable caps *a*, or the ends closed by plugs, welded in as usual. The lower ends are secured in the base-chamber B, to which the steam is admitted and discharged. The steam-supply pipe C is fitted with a pressure-regulating valve, D, and the discharge-pipe may be fitted with any suitable trap, to govern the escape of the water resulting from the condensation of steam in the heater.

Each pipe or steam-chamber A is fitted with an air-retaining receptacle, E. In order that this may act as a retainer, it should be sealed at the bottom in any such way as that, while the sealing device will not permit the escape of the air, it will permit the water, from condensed steam, to flow out from the air-receptacle. I prefer, therefore, to use a water-trap at the bottom, as in Fig. 1, in which the pipe E is open at the bottom, and rests in a small chamber, F, filled with water. In operation the water will fill up in pipe E to the level of the top of chamber F, and flow over regularly afterward, and thus give free escape for the water from said pipe E without permitting the escape of its contained air. Or the pipe E may be closed at the bottom, and the sealing-trap formed as shown in Fig. 2.

In operation the effect of the entrance of steam to my radiator is to compress the interior air into the air chamber or chambers D, where it may be so retained that its presence will not prevent the steam from being able to reach every part of the heating-surface of the radiator. Owing to this provision, it is not necessary to provide any of the usual air-traps and vent-cocks, which are expensive and objectionable.

By the adjustment of the valve D, or the draft-regulator at the boiler, and the consequent regulation of the pressure of the steam, the degree of compression of the air may be increased or diminished, so that the whole of it may be forced into the receptacle E, or part only, the other part remaining in the annular space between pipes A and E. This gives the operator the means of raising or lowering the dividing-line between the air and steam, so that it may be adjusted to any point between the top and bottom of pipes A, so that it is in his power to increase or diminish the radiating power of the heater by thus increasing or diminishing the amount of surface upon which the steam is allowed to act and condense.

I claim—

1. A steam-radiator provided with air-retaining receptacles, substantially as described, for the purpose of avoiding the necessity of the discharge of the interior air, and permitting

its removal from the exterior walls of the radiator.

2. The combination, in a steam-radiator, of a steam-pressure-regulating device and radiating-pipes having one or more retaining-receptacles for air, substantially as described, for the purpose of enabling the radiating-surface to be graduated in any proportion to the full extent thereof by the regulation of the pressure of the steam.

In testimony of which invention I hereunto set my hand.

JOSHUA K. ABBOTT.

Witnesses:

JOHN E. JONES,

J. L. WARTMANN.