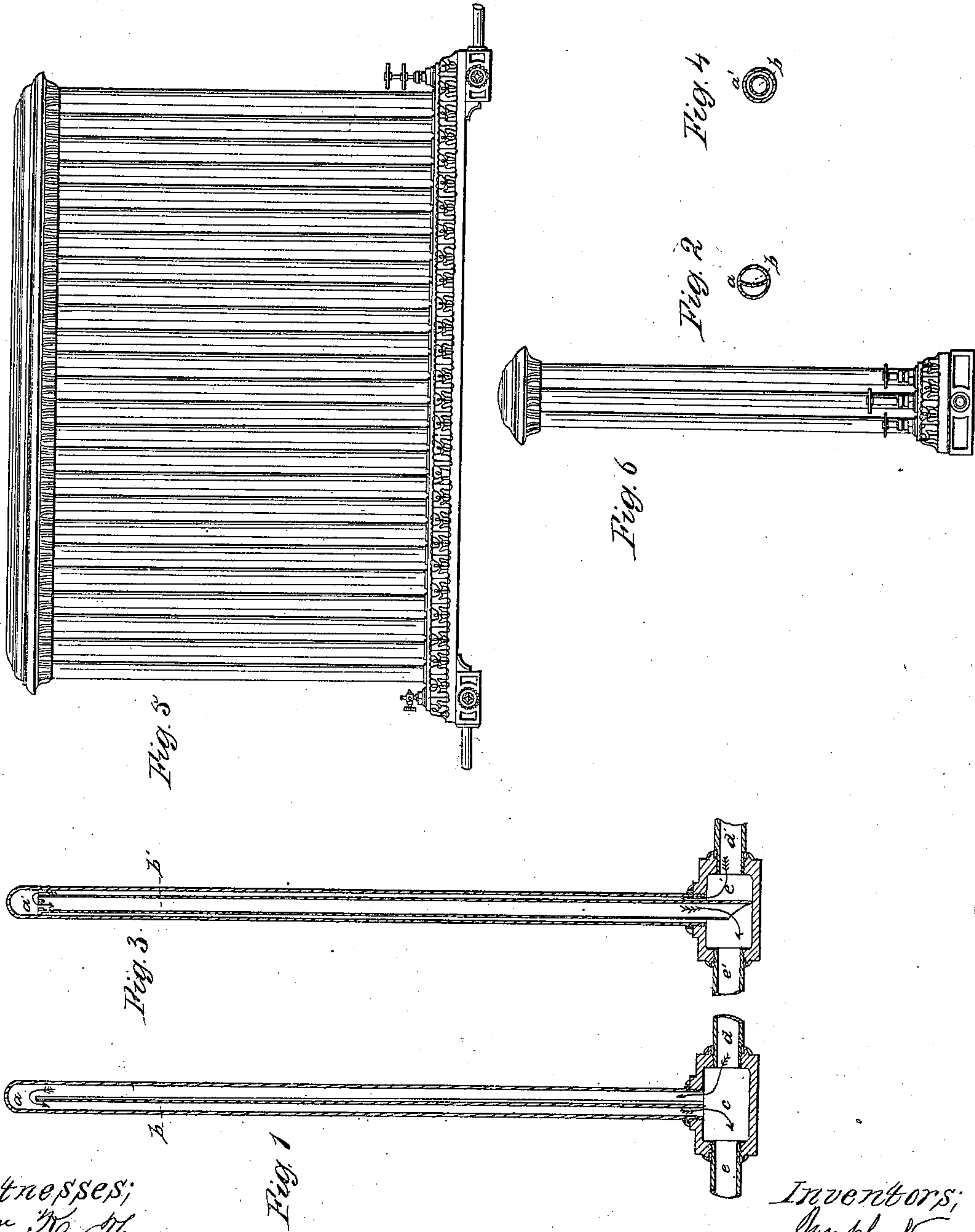


Nason & Briggs,

Steam Heater,

No 34,643,

Patented Mar. 11, 1862.



Witnesses;  
Jm H Thomas  
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# UNITED STATES PATENT OFFICE.

JOSEPH NASON, OF NEW YORK, AND ROBERT BRIGGS, OF BROOKLYN,  
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## IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. 34,643, dated March 11, 1862.

*To all whom it may concern:*

Be it known that we, JOSEPH NASON, of the city, county, and State of New York, and ROBERT BRIGGS, of Brooklyn, Kings county, State of New York, have invented a new and useful Improvement in Tubular Radiators and Condensers, which we declare to be fully described and set forth in the following specification and accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a radiating-tube with its interior diaphragm; Fig. 2, a transverse section of the radiating-tube and diaphragm; Fig. 3, a vertical longitudinal section of a radiating-tube with its interior tube; Fig. 4, a transverse section of the radiating-tube and interior tube; Figs. 5 and 6, a front elevation and end view in which the radiating-tubes are inserted in a steam-pedestal and combined to form a steam-radiator.

If the upper end of a vertical or inclined tube whose length considerably exceeds its diameter be closed and its lower end inserted in a steam-vessel, it is found, upon admitting steam to the vessel, that the air contained in the tube (although specifically heavier than steam of the same density) does not suffer any material displacement, but remains permanently in equilibrio and prevents the ingress of steam. It follows, therefore, that such a tube is practically useless for the purposes of steam radiation and heating. We have found, however, that by the introduction of an interior diaphragm or an interior tube in the manner hereinafter set forth this condition of equilibrium is prevented and that an inward current of steam and an outward current of air are at once established and maintained upon opposite sides of the diaphragm or the interior tube until the influent steam has completely displaced the air and filled the radiating-tube; and our invention relates exclusively to the construction of compartments or separate passages in radiating-tubes by means of diaphragms, plates, or interior tubes, as herein set forth.

The first modification of our invention is shown in Figs. 1 and 2, in which *a* is the radiating-tube; *b*, the diaphragm; *c*, the steam-pedestal; *d*, the inlet-pipe; *e*, the outlet-pipe. The diaphragm *b*, extending from the bottom

of the radiating-tube *a* nearly to the top, may be made of sheet-iron or other metal or suitable material. Its width should be such that when slightly curved and pushed into the tube it will be kept securely in place by the frictional contact of its edges against the surface of the tube. When steam is admitted to the pedestal *c* through the inlet-pipe *d*, if no air be present it will enter and fill the radiating-tube *a*; but if the tube be wholly or partially filled with air, as usually happens at starting, the air will be gradually and completely displaced and ejected in the manner before explained, the inferior gravity of the steam causing it to flow upward into the tube on one side of the diaphragm and the superior gravity of the air causing it to flow downward on the opposite side of the diaphragm into the pedestal *c*, and thence outward through the outlet-pipe *e*, as indicated by the arrows.

The second modification of our invention is shown in Figs. 3 and 4, in which *a'* is the radiating-tube; *b'*, the interior tube; *c'*, the steam-pedestal; *d'*, the inlet-pipe; *e'*, the outlet-pipe. The interior tube *b'* extending from the lower part of the pedestal *c'* nearly to the top of the radiating-tube *a'*, may be made of sheet-iron or other suitable metal, and its function of separation will be adequately performed if the metal is simply bent into cylindrical form and the edges brought tolerably well in contact without joining or fastening. It may be placed loosely in the radiating-tube *a'* with its lower end resting upon the bottom of the pedestal *c'*. When steam is admitted to the pedestal *c'*, its inferior gravity will cause it to flow upward into the radiating-tube *a'*, while the superior gravity of the air will cause it to flow downward through the interior tube *b'* into the lower part of the pedestal *c'*, and thence outward through the outlet-pipe *e'*, as indicated by the arrows.

The drawings are confined to the illustration of our invention as applied to steam-radiators for heating purposes. It is not deemed necessary to exhibit its application to condensers, as the only modification of the exhibited arrangement would be to immerse the tube or series of tubes in a cooling medium in the manner well known and practiced in what is called "surface condensation."



We are aware that interior tubes have been employed heretofore for the purpose of maintaining the requisite circulation in tubes with closed ends. In such cases, however, the junction of the interior tubes and their mode of construction and operation are especially different from that found in our invention, inasmuch as the interior tubes, being merely feeders, are always in communication with an influent pipe or chamber which is separate and distinct from the effluent pipe or chamber communicating with the exterior tubes. In such a system the circulation within the tubes obviously depends upon a difference of pressure within the influent and effluent chambers. An example of this mode of construction may be found in Peclat's "Traite de Chaleur." In our invention the interior and exterior tubes are in communication with a single chamber, the function of the interior tube being simply to divide the space of the exterior tube into two passages, the one for the admission of steam from the chamber below, and the other for the exit of air into the same chamber. The difference between these two modes of construction is still further apparent from the fact that in our invention a

single pipe will answer the double purpose of supplying steam and taking off the water of condensation. In the other mode two pipes are necessary, the one for supplying the steam and the other for carrying off the water of condensation.

Having thus described the nature of our invention and shown how it can be carried into effect practically, we desire to say that we do not claim the combination of an interior with an exterior tube communicating with separate influent and effluent chambers and pipes, as these have been before known and used; but

What we claim as our invention, and desire to secure by Letters Patent, is—

The method, as herein substantially described, of constructing the tubes of steam radiators and condensers, with an interior diaphragm or dividing-plate, or its equivalent, and an interior tube, in combination with a single steam-chamber.

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Witnesses:

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