

J. L. FRISBIE.
Steam Radiator.

No. 111,192.

Patented Jan'y 24, 1871.

Fig. 1.

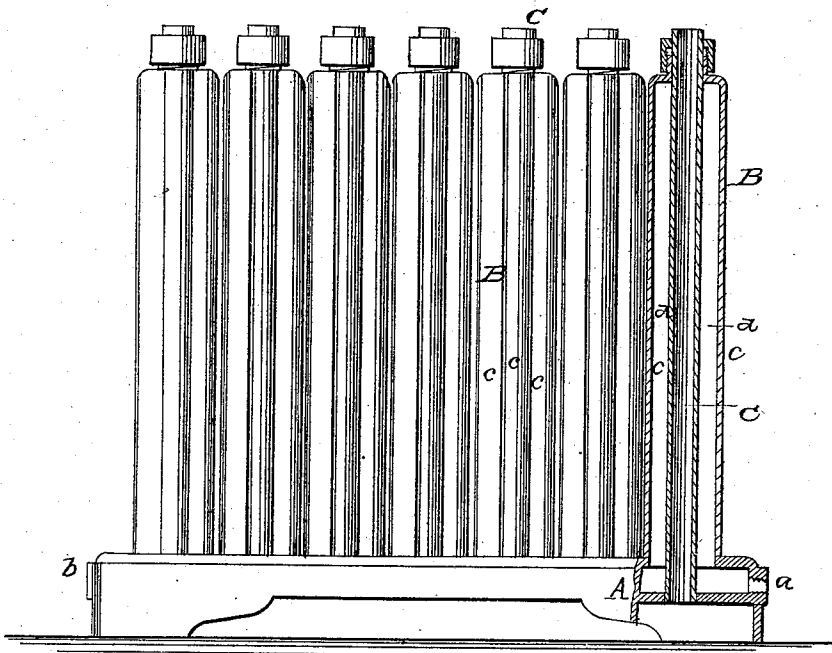
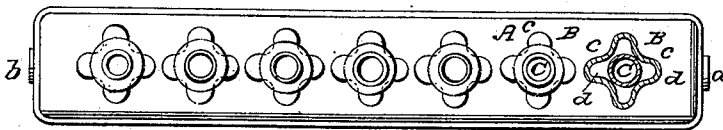


Fig. 2



J. L. Frisbie

UNITED STATES PATENT OFFICE.

JOHN L. FRISBIE, OF BROOKLYN, NEW YORK, ASSIGNOR TO MARSHALL T. DAVIDSON, OF SAME PLACE.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **111,192**, dated January 24, 1871.

To all whom it may concern:

Be it known that I, JOHN L. FRISBIE, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Steam-Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a partly-sectional front elevation of a steam-radiator constructed in accordance with my invention, and Fig. 2 a partly-sectional plan of the same.

Similar letters of reference indicate corresponding parts.

My invention has for its object an easy or prompt and certain expulsion of the air contained in the radiator when letting on the steam, also an extended area of radiating and steam-condensing surface or surfaces within a given space or compass, and the mutual supporting of the inner and outer tubes, together with lightness and cheapness in the construction of the radiator.

To these ends, the invention consists in a radiator composed of a series of corrugated steam-pipes or upright ducts, closed from communication with the atmosphere at their upper ends, but open at their bottoms to a steam-base, on which they are mounted, and receiving up through them a corresponding series of air-tubes of slightly lesser diameter than the distance between the interior projections of the corrugated steam-pipes, which, as thus combined with the interior air-pipes, that are open top and bottom for the circulation of air up through them, form vertical circulating-passages for the steam, and others for the confined air or steam combined, as hereinafter more fully described, and present both an inside and outside radiating or steam-condensing surface.

Referring to the accompanying drawing, A represents the base of the radiator, formed with an upper chamber or steam-space, that has connected with it, as at *a* and *b*, the necessary inlet and outlet pipes for the live and condensed steam.

Mounted on this base, and in communica-

tion at their lower ends with the steam-chamber thereof, is a series, consisting of any suitable number, of vertical ducts or outer pipes, B B, of a corrugated form or irregular shape in their transverse section, being composed, as it were, of a few or limited number of vertical corrugations or hollow wings, *c*, forming interior ducts *d*.

Projecting in a concentric relation up through these pipes B B are tubes C C, open to the air at top and bottom, by passing through the steam-space of the base and through stuffing-box-like projections on the upper or close ends of the outer pipes. These tubes C C are of slightly lesser diameter than the distance between the interior projecting surfaces of the corrugated pipes B B.

The steam, being admitted at *a*, is somewhat obstructed by the air-pipe C passing vertically through the chamber A, and is thereby diverted upwardly through the nearest ducts *d*, while a corresponding diminution of pressure on the opposite side of said air-tube will cause a downward current through the duct *d* behind it, thus keeping up a sufficient circulation to expel the air from the series of ducts.

A radiator thus constructed may be composed mostly or wholly of cast-iron, without a multiplicity of joints or intricate fitting, and is strong and more or less ornamental; but its principal characteristics are that a ready course is established for the steam up or within certain of the ducts *d*, while confined air is being expelled by the flow of the steam down or through the others, as above described, thus causing the air to be driven out of the pipes B B, and effecting a perfect or free circulation for the steam through the radiator; also a very extended radiating or steam-condensing surface for a given space or compass is established by reason not merely of the corrugated surface of the outer pipes, B B, but of the specified combination and arrangement of the inner air-tubes, C C, with said corrugated outer pipes, which combination and arrangement effect a double, or inside and outside, radiating-surface for the steam in its several courses up and down the radiator, there-

by securing the condensation of the steam before its escape, and largely contributing to the working economy of the radiator.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of the outer steam-pipes, B B, of corrugated form, or made with hollow wings *c*, constituting interior ducts, *d*, and

serving to support the inner air-pipes, C C, with the base A, all arranged for operation substantially as specified.

JNO. L. FRISBIE.

Witnesses:

FRED. HAYNES,
HENRY C. BANKS.